THE PTEROMALIDAE OF NORTH-WESTERN EUROPE (HYMENOPTERA: CHALCIDOIDEA)

BY

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686 *Text-figures*

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SYNOPSIS

A new key to the families of Chalcidoidea is presented so as to facilitate recognition of Pteromalidae, the limits of which are difficult to define succinctly. The main part of the work deals with Pteromalidae ; this family is keyed to species level in all except a few genera which need further study. Full synonymy is given, as far as possible, at all levels. The distribution, and where known the biology, of each species is indicated. More than 800 species are dealt with ; 4 new genera and 87 new species are described. The work is based mainly on a critical study of type-material ; almost all (663) of the types of Palaearctic Pteromalidae in the British Museum (Nat. Hist.), and also about 300 types in other important European collections, were examined.

INTRODUCTION

SINCE the publication of Walker's *Monographia Chalciditum* (1833–1839) and volumes 4 and 5 of Thomson's *Hymenoptera Scandinaviae* (1876–1878), no monograph including all the described Pteromalidae of the region has appeared. The former work, though it includes nearly 250 of the species now known from Europe, is of little use because of its poor descriptions and lack of keys. Thomson's work is still a fundamental treatise and remarkable for its excellent descriptions, but it does not include more than about half the number of genera or species now known. Neither of these works was provided with illustrations. Thomson recognized comparatively few of Walker's species because he was unable to see their types (or indeed those of most of the species previously described by other British and Continental authors). In fact, none of the 19th and 20th century writers on Chalcidoidea had access to more than a negligible amount of each other's original material. Consequently great confusion has arisen. In some cases the same species has been listed twice in the same publication under different specific names, these being sometimes placed in different genera. This has happened for instance in the *Check List* of Kloet & Hincks (1945) which first induced me to begin a revision of the British Pteromalidae. The wealth of species described by Walker clearly offered a unique basis for such a revision as I was able to study his types. My revision began with papers published in *The Entomologist's monthly Magazine* (1956–1957). It soon became evident that a wider treatment of the group was expedient, and that a revision was likely to be of limited use unless accompanied by keys for identifying the numerous genera and species. These conclusions led to the preparation of the present work.

After the time of Thomson, publications dealing with Pteromalidae were, until recently, sporadic. Ashmead (1904) keyed out the subfamilies, tribes and genera of Pteromalidae, Cleonymidae and Miscogasteridae (the two latter are now included in Pteromalidae). The work of Schmiedeknecht (1909), which was a compilation, mainly followed that of Ashmead. In some ways these two works were an improvement on Thomson's, but some features contained in them were retrograde. Ashmead attached too high a value to the mandibular dentition and some other characters, which led him to define some artificial groups which are in fact heterogeneous. Ruschka (1912–1924) and Masi (1907–1953) made notable contributions to the study of Pteromalidae, by revising certain genera and species, and describing new taxa. Kryger also worked on certain Pteromalidae ; his little-known paper of 1934 included keys to the genera. Nikol'skaya's useful work (1952) also contains keys to genera. After 1945, interest in Chalcidoidea revived and in succeeding years much excellent work was done in revising older taxa and describing new ones, by Bouček, Delucchi, Erdös, Ferrière, Hedqvist, Kerrich, von Rosen and others. Their work need not be discussed here, because I have cited in the text all of their papers dealing with European Pteromalidae. I should just like to say that I have learnt a great deal from their efforts.

I have examined the types of nearly all the species described by the chief European authors (the exceptions are those described by Rondani and Kurdjumov, and many

of those described by Förster, whose collections were not available for study, and those of Nees and Ratzeburg whose collections were for the most part destroyed by military action during World War II). Therefore the synonymy presented here depends very largely upon the direct comparison of type-specimens, which has not been attempted before on a comprehensive scale. Walker's types have been particularly valuable because I have been able to compare with them large quantities of fresh material which I have collected during the past 20 years in the country in which Walker himself collected (often in the type-localities), as well as much material collected by others. This has, in the case of the majority of species, made it possible to find a virtually exact match for type-specimens and to study the range of variation without having to worry unduly about the distracting features of geographical variation. The same procedure has been applied to the species described by Thomson, using the fine assemblage of fresh material collected in Sweden by Dr. J. F. and Mrs. D. M. S. Perkins, and other material which I collected there in 1959.

The present study concerns primarily the fauna of the north-western part of Europe, especially the British Isles and Scandinavia. Some species and genera from other parts of Europe, and even from other regions, are included where this is considered expedient for special reasons. Thus all the genera so far described from Europe have been included in the keys to genera for the sake of completeness. It is therefore hoped that the revision may be of rather more than local interest.

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TAXONOMIC AIMS

These have been to revise the synonymy by a study of type-specimens, to attempt a more satisfactory delimitation of genera and higher categories, to give some biological information, and to provide a representative though not exhaustive bibliography.

Regarding delimitation of genera, the writer has been rather conservative in accepting as valid all those which could be maintained on the basis of reasonably clear-cut characters (not necessarily the same in both sexes). Possibly a number of genera, now regarded as distinct, will eventually be united ; but it is wise not to attempt this until the European fauna has been more adequately surveyed.

The present revision is exploratory rather than exhaustive, and can doubtless be improved upon when the keys have been tested and some little-known genera better worked. The taxonomy of Chalcidoidea at family level is still in a state of flux. Keys to the families have been published by Richards (1956), Ferrière & Kerrich (1958), and Peck *et al.* (1964). These, particularly that of Peck *et al.*, are extremely useful and a great improvement on earlier ones ; but the characters used to separate some of the families are not definite enough, whilst one character used (the relative size of the hind coxae in Torymidae) is misleading. Thus Ashmead (1904 : 229) included Torymidae in a section having " hind coxae very large and long, usually five or six times larger than the anterior coxae "; Richards (1956 : 67) put Torymidae (excluding Megastigminae) in a section having "hind coxae large, 5–6 times longer than the front one ". I do not know of any European Torymid having the hind coxae more than about two and a half times as long as the front coxae. The ratio of the average length of the hind coxa to that of the front coxa is indeed somewhat greater in Torymidae than in Pteromalidae, but some of the latter approach the condition seen in Torymids with shortest coxae, hence the character is

not very definite. I therefore include here a new key to the families, which embodies an attempt to cover as far as possible the extremes of variation within each. Such extremes often make it difficult to define the limits of a family concisely. Possibly a more mature classification may result in a reduction in the number of families. Thus Eucharitidae might be united with Perilampidae ; Leucospididae with Chalcididae ; Eupelmidae, and even Torymidae, with Pteromalidae ; Tetracampidae, Elasmidae, Signiphoridae, Aphelinidae, and Trichogrammatidae, with Eulophidae. The problems of higher categories, however, need discussion in a separate paper.

The only reasonably comprehensive modern key to the European genera of Pteromalidae is that of Bouček (*in* Peck *et al.*, 1964) which is excellent and includes very good figures. But as the authors state (1964 : 27) it incorporates recent changes only in part. My own keys, worked out independently, embody some differences of detail and emphasis as compared with that of the above authors, although in the main I agree with their grouping of the genera. I regret that my keys to the genera (and to the subfamilies) of Pteromalidae are so lengthy, but this was unavoidable when I had to take into account the considerable range of variation in some groups.

In order to keep the size of the work within reasonable bounds, full descriptions of genera and species have been omitted except in special cases (new taxa ; redescription of an important type-species). Consequently a worker will have to rely on the keys, which have been carefully integrated and made as detailed as possible.

The term " sp. indet." is sometimes used in my keys and text for certain species which are probably valid but which I do not wish to describe at present, either because my material is inadequate or for some other reason.

Regarding biological information, clearly many of the older host-records are untrustworthy because of erroneous identifications (in some cases both of a parasite and its host). In most cases the material upon which the records were based no longer exists or cannot be recognized. Where such data could be verified it has been included, but in general I have been fairly ruthless in rejecting old records, knowing many to be valueless or even misleading. In doing so I have no wish to disparage earlier workers who produced so much of value in spite of severe practical limitations. References cited refer chiefly to descriptions but include the more important ones dealing with biology ; amongst the latter is the extremely valuable catalogue of Peck (1963).

Nomenclature of plants in the main follows Clapham, Tutin & Warburg (1962). That of insect hosts for the most part follows Kloet & Hincks (1945, 1964). Various Continental works were also consulted for species not contained in the above to find as far as possible the most up to date nomenclature.

TYPE SPECIMENS

Most species were described before the formal designation of types had become customary. A lack of type-fixation has often resulted in confusion in nomenclature. Types have been examined by the writer unless the contrary is stated.

Types are designated here in nearly all cases where this has not already been done. LECTOTYPE means a present designation ; Lectotype a designation in some previous work. The writer has attached his lectotype label to each type which he has personally designated. Holotype means that the describer either designated one specimen as such or had only one specimen. If neither of these conditions applies but there is a strong presumption that the describer had only one specimen, this is referred to as " ? holotype " or " probably holotype ". Often it is not evident how many specimens of a given species the describer possessed, although his collection now contains only one (e.g., many Walker species). Such a single specimen is not necessarily a holotype, as for instance when the describer gave a size-range or mentioned more than one locality. Where there is any doubt, I have usually designated the single extant specimen as lectotype, provided that it agrees with the description. " Type destroyed " means that definite evidence of this exists. " Type lost " means that, although there is no positive information of its destruction, the type could not be located after extensive search.

The types of all Walker species are located in the BM(NH) unless the contrary is stated in the text. Most of Walker's original specimens bear a characteristic rectangular label with the generic and specific name followed by the words " Stood under this name in the old B.M. Collection, C. Waterhouse " (on the underside of the label) ; to avoid repetition, this label is referred to as Waterhouse label. Walker probably rearranged his collection 1846–8 and again in 1860, and when doing so he transferred some of his species to genera different from those in which he had originally described them ; for example, many *Miscogaster* species were transferred to *Lamprotatus*. The Waterhouse labels were added after this, consequently they sometimes bear the name of the genus to which the species had been transferred, and not the original one. Walker also synonymized some of his species at later dates (chiefly 1846–8) ; in such cases the Waterhouse label bears another species-name. These changes have all been elucidated by reference to Walker's publications and every care has been taken to ensure that the original material has been correctly identified as such. The types of only 23 of Walker's European species are missing, as listed below ; three of them (*Pteromalus bryce, P. felginas* and *Selimnus diores*) are not cited in Walker's *Lists* (1846, 1848) and were certainly returned to de Romand in Geneva (see note under *Selimnus diores*, p. 149). In the case of types marked * the species cannot be recognized ; the others have either been definitely recognized or else placed with a fair degree of probability.

Cyrtogaster poesos (1848 : 164, ♀)
Eutelus signatus (1834 : 357, ♂)
Gastrancistrus alectus (1848 : 158, " ♂ ")
Merisus splendidus (1834 : 167, ♀)
Meromalus flavicornis (1834 : 178, ♂)
Miscogaster lugubris (1833 : 462, ♂)
Miscogaster nicaee (1839 : 197, ♂)
Miscogaster stygne (1839 : 201, ♂)
Miscogaster tenuicornis (1833 : 462, ♀)

Ormocerus aletes (1848 : 163, ♀)
**Platyterma terminale* (1834 : 306, ♀)
**Platyterma comptum* (1834 : 341, ♀)
**Pteromalus aeson* (1848 : 174, ♂)
**Pteromalus amabilis* (1836 : 495, ♀)
**Pteromalus bryce* (1842 : 336, ♀)
**Pteromalus felginas* (1842 : 336, ♀)
Pteromalus lentulus (1839 : 232, ♂)
**Pteromalus mediocris* (1835a : 97, ♀)
Pteromalus pandens (1872a : 101, ♂)
**Pteromalus tiburtus* (1839 : 251, ♂)
Selimnus diores (1842 : 335, ♀)
Trigonoderus hirticornis (1836a : 23, ♂)
Urolepis cychreus (1850 : 131, ♂)

The types of all Thomson and Zetterstedt species are in Universitetets Zoologiska Institutionen, Lund, unless otherwise stated.

DATES OF PUBLICATION

The date given on the title-page of Thomson's *Skandinaviens Hymenoptera* (4e Delen) is 1875. I have cited 1876 as being the correct date of this part, for the following reason. Ashmead (1900, *Proc. U.S. natl. Mus.* **22** : 325–6) pointed out that Howard had given reliable evidence which showed that this part of Thomson's work appeared later than Mayr's paper on Encyrtidae in *Verh. zool.-bot. Ges. Wien* **25**. The latter was read in December 1875 and not published until 1876.

In determining the dates of publication of some other works (e.g., Westwood, 1839) I have made use of internal evidence from sources such as MSS and letters.

The plates A–P in *The Entomologist* **1**, drawn by Haliday, were published separately with different numbers of the periodical (Walker, in litt. to Haliday) during 1841 and 1842. As the precise date of publication for some of them cannot be determined, I have cited 1841–1842 as an inclusive date.

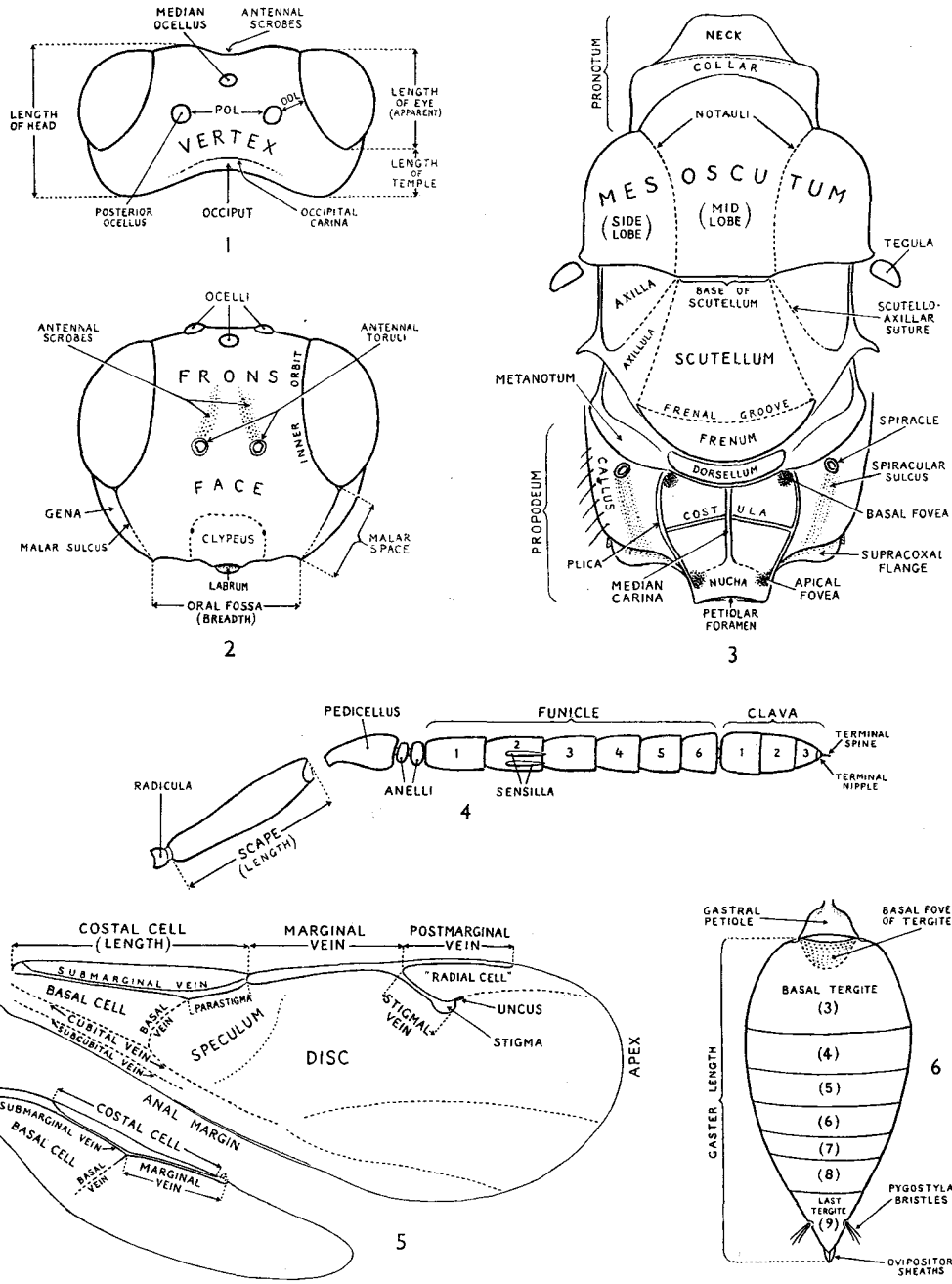
TERMINOLOGY

The terms used are nearly all illustrated in Text-figs. 1–6, and are in the main those employed by Richards (1956). A few terms, which either differ from those of Richards or need more explanation, are the following :

Antenna : unless otherwise stated, the Text-figures illustrate the right antenna viewed from the outside.

Antennal clava : this is regarded as having at most 3 segments. In many species a small area (" terminal nipple ", Text-fig. 4) is differentiated at the tip of the clava. and may be quite large in rare cases ; it is not regarded as being a true segment.

Antennal formula denotes : scape ; pedicellus ; number of anelli ; number of funicular segments ; number of claval segments. Thus the formula of the antenna in Text-fig. 4 is 11263.



FIGS. 1–6. Terminology : 1, head, dorsal ; 2, head, frontal ; 3, thorax, dorsal ; 4, antenna ; 5, wings ; 6, petiole and gaster.

Antennal scape : the length of the scape (Text-fig. 4) does not include the radicula, which is sometimes hidden or hard to measure.

Axillula : a small subtriangular area on each side of the scutellum, marked off by impressed lines from both the scutellum and the adjacent axilla. Apparently present in all Pteromalidae, but indistinct or absent in some members of other families (e.g., Chalcididae, Eurytomidae).

Dorsellum : the central area of the metanotum (Text-fig. 3) ; the " metascutellum " of my previous papers, and of some other authors.

Eye : *length* in general means the true length as measured in the vertical axis of the head ; in descriptions of the head in dorsal view, however, " length " means apparent length as measured in the longitudinal axis of the body (see Text-fig. 1).

Face : the area below the antennal toruli, between the eyes and above the clypeus, bounded laterally below the eyes by the malar sulci (= " lower face " of some authors).

Frenum : the area of the scutellum lying behind the frenal groove when present (Text-fig. 3).

Frons : the area above the antennal toruli, between the eyes and below the median ocellus (= " upper face " of some authors).

Gaster (Text-fig. 6) : *length* is measured in dorsal view, from the junction with the petiole to the tips of the ovipositor sheaths (when the latter are far exserted, as in *Anogmus strobilorum*, the length of the exserted portion is not included in the length of the gaster). The gaster comprises abdominal segments 3–9 (numbered in Text-fig. 6), but in many cases it is convenient to refer to abdominal tergites 3 and 9 as the " basal tergite of the gaster " and the " last tergite " respectively.

Mandibular formula : number of teeth in left and right mandibles ; thus 3.4 indicates three teeth in left mandible, four in right mandible.

Mesosternum : used in the traditional sense ; the " subpleural area " of Richards (1956, fig. 38).

Pronotal collar : length of the collar (e.g., median length) is measured in the longitudinal axis of the body ; breadth of the collar is measured in the transverse axis of the body.

Propodeum : *length* is measured along the median longitudinal line (with the latter as nearly as possible at right-angles to the line of sight).

The structure of the pleural and ventral parts of the thorax is illustrated by Richards (1956, figs. 37, 38). In the main this is followed, though in the keys I have occasionally referred to the " mesopleuron " in its traditional sense (meaning mesepisternum + mesepimeron).

The text-figures have been drawn by the author, using a Watson stereoscopic binocular microscope and magnifications of × 50 and ×100. Some figures published in earlier papers have been partly redrawn. Measurements were made with an eyepiece micrometer.

KEY TO FAMILIES OF CHALCIDOIDEA

1 Petiole of gaster composed of two segments, each of which is longer than

broad, while both together are as long as the rest of the gaster (*Mymaromma*)
MYMARIDAE (part)

– Either the gaster has a petiole composed of one segment, which is sometimes inconspicuous ; or it is sessile 2

2 (1) Head (Text-fig. 7) with antennal toruli much nearer to the eyes than to each other, and separated by not more than their own diameter from the eyes ; frons with an impressed transverse straight line just above the antennal toruli ; from the ends of this line two other pairs of lines extend along the orbits on to the vertex and face respectively. Nearly always macropterous, with hind wing (Text-fig. 8) having a basal stalk which is composed solely of the submarginal vein, the wing-lamina not extending to its base ; wing, beyond the hamuli, nearly always linear with its front and hind edges subparallel. Fore wing (Text-fig. 8) venation characteristic : marginal vein relatively short, stigmal vein rudimentary, the tip of the latter most often situated before the middle of the wing, rarely beyond it. Antennae without true anelli. Tarsi four- or five-segmented. Body non-metallic
MYMARIDAE

– Antennal toruli rarely nearer to the eyes than to each other, if so then the frons lacks impressed lines running along the orbits and the transverse line, if present, is usually not straight, whilst the structure of the fore and hind wings is different, the antennae usually have one or more anelli, and the body is often metallic. Tarsi sometimes with only three segments 3

3 (2) Apterous forms, or brachypterous forms having the wings shortened, rudimentary, or (occasionally) represented by narrow filaments . . . 4

– Forms having wings, except very rarely the hind wings, fully developed, sometimes narrow but never filamentous 10

4 (3) Males only : species associated with figs (*Ficus* spp.). Body and appendages often very aberrant in structure ; apterous, or with wings represented by filaments ; tarsi often heteromerous ; ocelli usually absent
AGAONIDAE and some **TORYMIDAE (SYCOPHAGINAE)**

– Males and females : species not associated with figs 5

5 (4) Tarsi with three segments. Small to minute species, 0·3 to 1·4 mm. ; antennae with only five to eight segments and usually very short
TRICHOGRAMMATIDAE (part)

– Tarsi with four or five segments. Species often larger ; antennae often with a greater number of segments 6

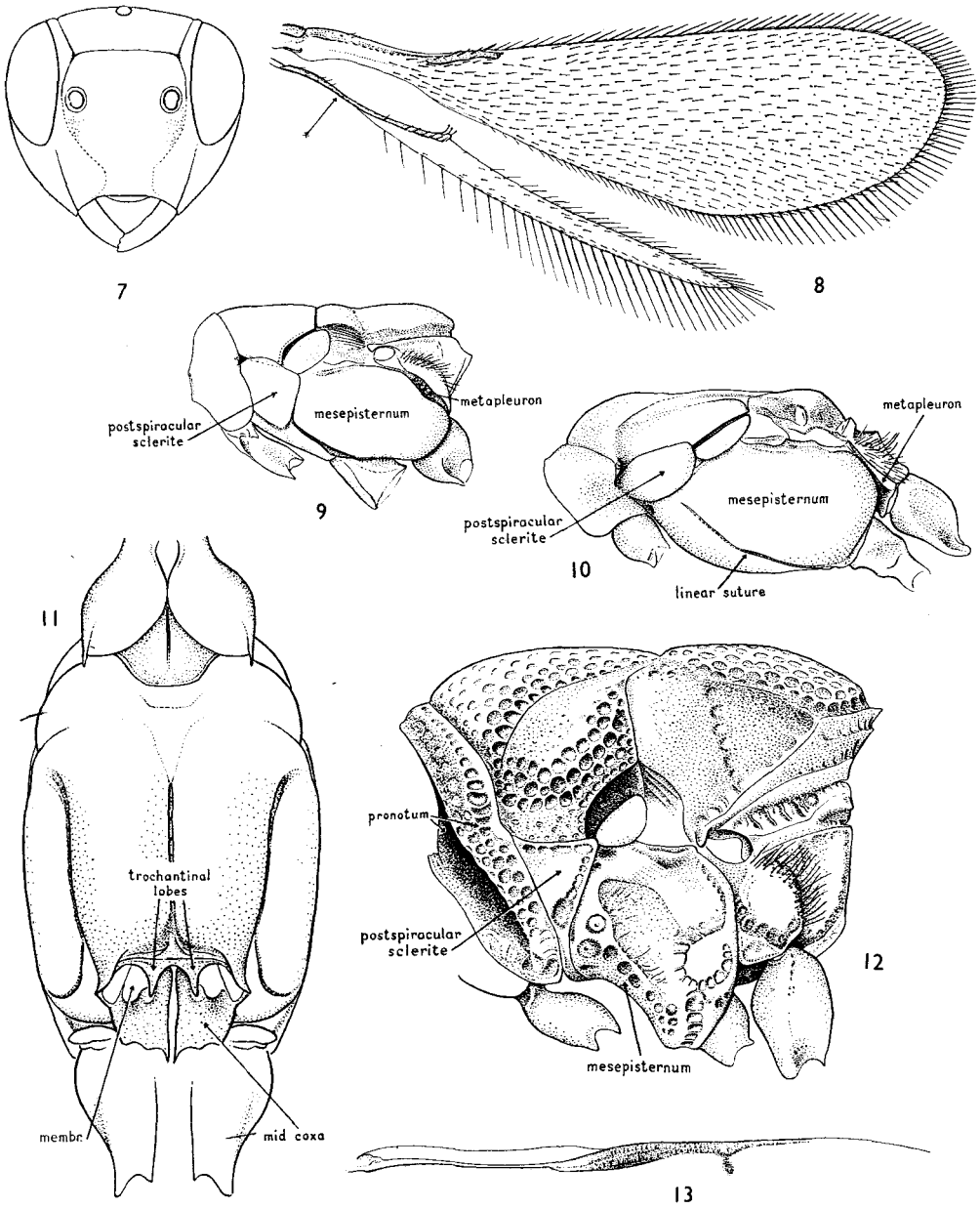
6 (5) Tarsi with four segments . . . . . **EULOPHIDAE** (part)

– Tarsi with five segments 7

7 (6) Mid coxae inserted at or slightly in front of the middle of the mesepisternum (Text-fig. 9) ; mid tarsi thickened proximally, tapering distally, their first segment, and often some of the following segments, with a double row of short thick spines beneath ; mesepisternum (Text-fig. 9) convex, without a femoral groove . . . . . **ENCYRTIDAE** (part)

- Mid coxae inserted at or near the hind end of the mesepisternum. Mid tarsi with or without short thick spines beneath. Mesepisternum with or without a femoral groove 8

8 (7) Mid tarsi thickened proximally, tapering distad, their first segment, and often some of the following segments, with a double row of short thick spines beneath ; mesepisternum (Text-fig. 10) convex, without a true femoral groove, though separated from the mesosternum by an impressed line or suture ; mid coxae ventrally with a membranous area (Text-fig. 11, membr.) at their bases . . . . . **EUPELMIDAE** (part)



FIGS. 7–13. 7, *Polynema* sp., ♀ head ; 8, *Ooctonus soykai* (Hincks), ♀, wings ; 9, *Microterys* sp., ♀, thorax, profile ; 10, *Eupelmus urozonus* Dalman, ♀, thorax, profile ; 11, *Calosota acron* (Walker), ♀, thorax, ventral ; 12, *Perilampus ruficornis* (F.), ♀, thorax, profile ; 13, *Eucharis adscendens* (F.), ♀, fore wing, venation.

– Mid tarsi not thus thickened, without a double row of short thick spines beneath. Mesepisternum, except in a few Aphelinidae, not evenly convex, but having a femoral groove. Mid coxae ventrally touching the trochantinal lobes, without a membranous area at their bases 9

9 (8) Antennae with six to eight segments ; pronotum not large, shorter than the mesoscutum . . . . . **APHELINIDAE** (part)

– Either the antennae have 11 to 13 segments ; or else the pronotum is large, longer than the mesoscutum . . . . **PTEROMALIDAE** (part)

10 (3) Females only : tarsi heteromerous, fore and hind tarsi with five segments, mid tarsi with four segments 11

– Females and males : tarsi not heteromerous 12

11 (10) Antennae with twelve to thirteen segments. Fore wing (Text-fig. 66) with postmarginal and stigmal veins well-developed. Moderate-sized species, length 2·0 to 3·5 mm. (*Macromesus* only) . . . **PTEROMALIDAE**

– Antennae with eight segments. Fore wing : postmarginal vein absent or rudimentary, stigmal vein short (much as in Text-fig. 31). Minute species, length 0·5 to 0·8 mm. (some *Encarsia*) . . . . . **APHELINIDAE**

12 (10) Tarsi with three segments. Small to minute species, length 0·3 to 1·4 mm. ; antennae with only five to eight segments and usually very short ; hairs of fore wing often in longitudinal lines . **TRICHOGRAMMATIDAE** (part)

– Tarsi with four or five segments. Species often larger ; antennae often with a greater number of segments ; hairs of fore wing rarely arranged in longitudinal lines 13

13 (12) Tarsi with four segments 42

– Tarsi with five segments 14

14 (13) Mid coxae (Text-fig. 9) inserted about level with the middle of the mesepisternum, or even anterior to this, the mesosternum being very short ; mesepisternum enlarged and at least partly covering the mesepimeron, convex, without a femoral groove ; mid tibiae with a very thick apical spur ; mid tarsi thickened proximally, at least their first segment with two rows of short stout spines beneath.

Notauli usually absent, occasionally present or even complete but in such cases very superficial. Metapleuron often very narrow or invisible. Last tergite of gaster often more or less V-shaped . . . **ENCYRTIDAE**

– Mid coxae (Text-figs. 10, 12, 15, 17, 20, 24, 26) inserted behind the level of the middle of the mesepisternum. Mesepisternum, except in most female and some male Eupelmidae, and a few aberrant species of other families, neither enlarged nor evenly convex, but having a femoral groove. Mid tibial spur and mid tarsi, except in most Eupelmidae, not thus modified . 15

15 (14) Mid tarsi thickened proximally and tapering distally, their first segment, and usually some of the following segments, with two rows of short stout spines beneath ; mid coxae separated from the trochantinal lobes of the mesosternum by a membranous area (Text-fig. 11, membr.) which allows the coxae to be swung directly forwards ; spur of mid tibia thick ; mesepisternum (except in *Oodera*) greatly enlarged, evenly convex and without a femoral groove, though separated from the mesosternum by a linear suture, see Text-fig. 10. Pronotum often divided longitudinally down the middle, by a groove, a membranous line, or a carina. Postspiracular sclerite (Text-fig. 10) often longer than high, tending to be convex, sometimes free ventrally and overlapping the mesepisternum somewhat. Propodeum nearly always shorter medially than at the sides, sometimes nil medially ; its hind margin being deeply, almost semicircularly, excised. Antennae of

female most often with one anellus, seven funicular segments, and a solid or three-segmented clava . . . . . **EUPELMIDAE**

– Mid tarsi not modified as in the above ; mid coxae without a membranous area ventrally and not capable of being swung directly forwards ; spur of mid tibia rarely so thick ; mesepisternum nearly always with a femoral groove, which extends from the base of the mid coxa towards the base of the fore wing. Pronotum, except in some exotic Pteromalidae Cleonyminae, not divided longitudinally. Postspiracular sclerite not free ventrally, nearly always as high or higher than broad, usually flat, or somewhat concave with its upper and hind margins slightly raised. Propodeum usually not shorter, but often longer, medially than at the sides 16

16 (15) Postspiracular sclerite (Text-fig. 12) lying in the same plane as, and fused with, the lateral part of the pronotum ; the latter is rigidly coadapted to the mesepisternum. Thorax in profile (Text-fig. 12) short and high. Gaster often with only one or two tergites visible in dorsal view. Notauli complete 17

– Postspiracular sclerite [absent in a very few species] not lying in the same plane as, and not fused with, the lateral part of the pronotum ; the latter can usually swing forwards away from the mesothorax. Thorax sometimes otherwise in shape. Gaster most often with more than two tergites visible in dorsal view 18

17 (16) Pronotum not visible from above, being hidden by the mesoscutum which is strongly convex, or protuberant anteriorly. Mandibles nearly always sickle-shaped, in a few species very short, straight, and hanging down vertically ; in these species the antennal scape is shorter than the first funicular segment and hardly longer than broad, whilst the head is narrower than the thorax. Petiole of gaster longer, often very much longer, than broad, often as long as the rest of the gaster ; third abdominal tergite usually covering the rest in dorsal view. Fore wing (Text-fig. 13) : stigmal vein usually directed at approximately a right angle relative to the costal edge, sometimes slightly oblique. Head in front view usually more or less triangular. Antennae very varied in form : most often without anelli or with only one, usually with seven or eight funicular segments ; flagellum in male often with branches. Scutellum in exotic species often with bizarre processes . . . . . **EUCHARITIDAE**

– Pronotum clearly visible in dorsal view of thorax. Mandibles not sickle-shaped. Antennal scape very much longer than the first funicular segment, and much longer than broad. Petiole very short and transverse ; dorsal surface of gaster often occupied wholly or nearly wholly by the connate third and fourth abdominal tergites. Fore wing : stigmal vein oblique. Head in front view not triangular. Antennal formula usually 11173, sometimes 11171 ; flagellum without branches. Scutellum without, or with at most short, teeth or processes . . . . **PERILAMPIDAE**

18 (16) Females only : mandible with a proximal appendage which lies against the underside of the head and is transversely ridged, these ridges sometimes appearing like serrations. Third or fourth segment of antenna often with a process or appendage. Species associated with figs (*Ficus* spp.).

The only species found in Europe is *Blastophaga psenes* (L.) which occurs in south-west Europe, Asia, and Africa . . . . . **AGAONIDAE**

– Males and females : mandibles without such an appendage. Third and fourth segments of female antenna without processes. Species, except some Torymidae and Eurytomidae, not associated with figs 19

19 (18) Species associated with figs (*Ficus* spp.).
In Europe only *Philotrypesis caricae* (Westwood), found in south-west Europe, Asia, and Africa. The female has the last two gastral segments much lengthened to form a half-cylinder which covers about the proximal third of the ovipositor sheaths, the latter much longer than the body ; spiracles of propodeum placed about midway between the front and hind margins of the sclerite (Sycophaginae) . . . . **TORYMIDAE** (part)

– Species not associated with figs ; apical segments of female gaster rarely thus lengthened, if so then the propodeal spiracles are close to the hind margin of the metanotum 20

20 (19) Females only : last tergite of gaster (ninth abdominal) (Text-fig. 14) emarginate posteriorly, with a small articulated flap (epipygium, ep.) in the arc of the emargination; pygostyles (p.) attached very near to or at the hind margin of the tergite, and tending to be longer than thick. Ovipositor sheaths more or less far exserted, their exserted portion usually equalling at least one-third the length of the hind tibia, sometimes longer than the whole body ; sheaths often transversely striate. Anterior margin of metapleuron (Text-fig. 15) often sinuate . . . . . **TORYMIDAE**

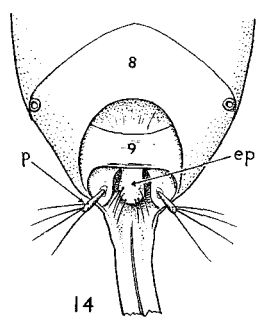
– Males and females : last tergite of gaster (ninth abdominal) (Text-figs. 16, 18, 25, 48–50, 55, 56–58) normally triangular and not emarginate posteriorly, without an articulated epipygial flap, its apex resting on the ovipositor sheaths, and its pygostyles more or less distant from its hind margin ; pygostyles rarely longer than thick, sometimes placoid. In some Pteromalidae Ormocerini the last tergite is turned up, away from the ovipositor sheaths, and the pygostyles (Text-fig. 16) are attached to its hind margin ; but these species have no articulated epipygial flap. Ovipositor sheaths seldom far exserted, if so then they are reticulate, longitudinally aciculate, or smooth. Anterior margin of metapleuron straight or evenly curved . 21

21 (20) Hind femora strongly swollen, only 1·5 to 3 times as long as broad, their ventral edge armed with teeth or more or less serrated ; hind tibiae usually conspicuously curved, their apices sometimes obliquely truncate.
Antennae most often with one anellus and seven funicular segments, or without anelli and with eight funicular segments. Head and dorsum of thorax most often with strong, and sometimes dense, umbilicate piliferous punctures. Pronotum often large and subrectangular 22

– Hind femora rarely so strongly swollen, if so then having their ventral edge unarmed ; hind tibiae at most slightly curved, their apices not obliquely truncate.
Antennal formula often other than above. Head and dorsum of thorax very often without conspicuous piliferous punctures. Pronotum often shorter, or shaped differently 25

22 (21) Postspiracular sclerite usually invisible or (Text-fig. 17) forming only a small or narrow plate near the tegula, if rather larger (some Leucospididae) then the tegula nearly touches the pronotum ; mesopleuron narrowing ventrad, mesepimeron absent or indistinctly defined because of coarse sculpture ; body most often black, sometimes with white, yellow, or red markings, rarely metallic. Antennae with one anellus and seven funicular segments, or without anelli but with eight funicular segments 23

– Postspiracular sclerite (Text-figs. 15, 20, 24, 26) larger and extending far ventrad ; tegula usually separated from the pronotum by at least its own length ; mesopleuron usually distinctly divided into a mesepisternum and epimeron. Body very often metallic, if non-metallic then the antennal formula is usually different from the above 24



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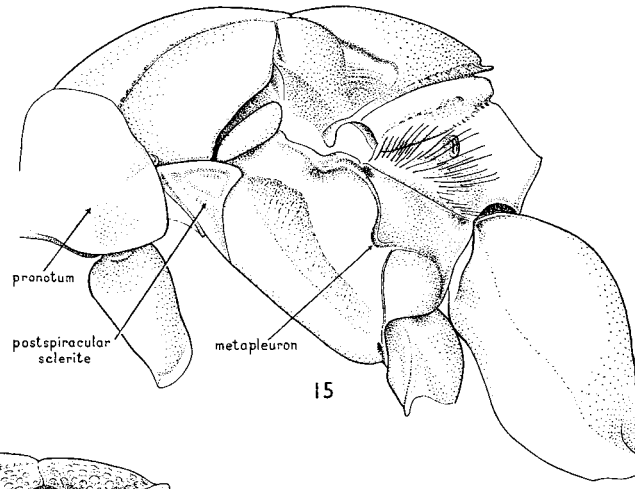

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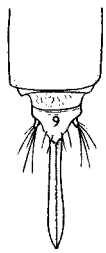

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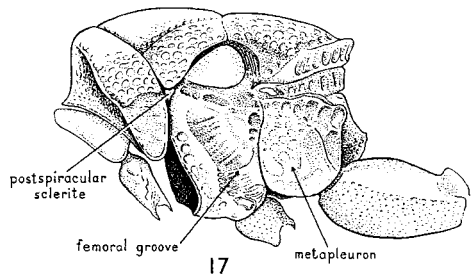

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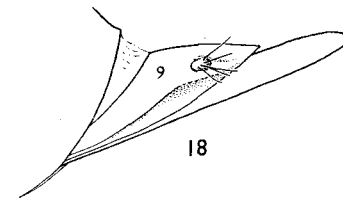

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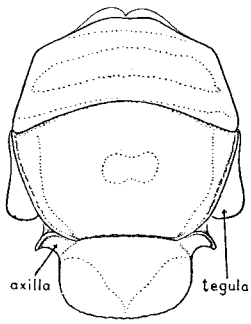

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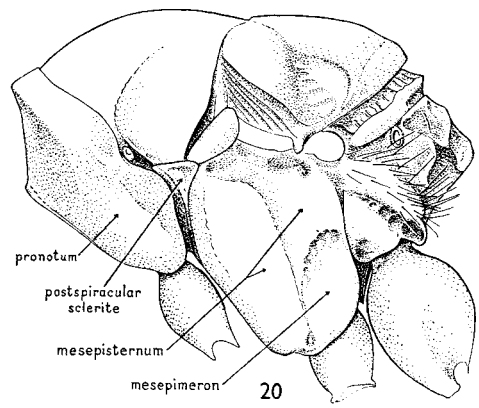

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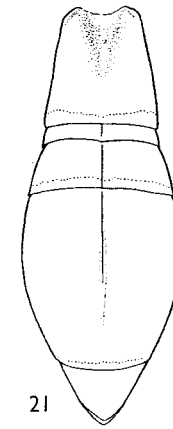

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FIGS. 14–21. 14, *Torymus regius* Nees, ♀, apex of gaster and base of ovipositor sheaths, dorsal (p, pygostyle ; ep, epipygial flap) ; 15, *Torymus bedeguaris* (L.), ♀, thorax, profile ; 16, *Gastrancistrus crassus* Walker, ♀, apex of gaster ; 17, *Brachymeria minuta* (L.), ♀, thorax, profile ; 18, *Eurytoma robusta* Mayr, ♀, apex of gaster ; 19, *Leucospis gigas* F., ♀, thorax, excluding metanotum and propodeum ; 20, *Habrocytus musaeus* (Walker), ♀, thorax, profile ; 21, *Polistomorpha surinamensis* Westwood, Type ♀, gaster.

23 (22) Tegulae relatively short, up to twice, but rarely more than 1·5 times, as long as broad, their front edge distinctly separated from the pronotum ; marginal vein of fore wing at least slightly longer than the stigmal vein, postmarginal usually not longer than the marginal and sometimes very short or rudimentary ; axillae separated by at most their own width ; glossa not elongate, not or hardly projecting below the mandibles ; femoral groove extending far up the mesepisternum (Text-fig. 17) : notauli most often complete and moderately deep, occasionally superficial posteriorly ; female ovipositor not recurved over the dorsum of the gaster, the latter without a dorsal groove or ridge . . . . . **CHALCIDIDAE**

– Tegulae (Text-fig. 19) elongate, 2·5 to 3·5 times as long as broad, reaching or nearly reaching the pronotum ; marginal vein of fore wing short, at most three times as long as thick, sometimes nearly punctiform, not longer than the stigmal vein, postmarginal vein very long ; axillae (Text-fig. 19) very small and widely-separated, often not distinctly marked off from the scutellum ; glossa more or less elongated, projecting below the mandibles ; femoral groove shorter, extending barely two thirds up the mesepisternum ; notauli usually absent, sometimes weakly indicated anteriorly ; female ovipositor in most species recurved and often lying in a groove along the dorsum of the gaster, if the ovipositor is normal then the dorsum of the gaster is convex and hard, with a median longitudinal line or ridge (Text-fig. 21) . . . . . **LEUCOSPIDIDAE**

24 (22) Inner orbits of eyes diverging at most slightly ventrad ; antennae inserted at least slightly above the level of the ventral edge of the eyes ; postspiracular sclerite, sometimes also the metapleuron, bare ; postmarginal vein of fore wing shorter than the marginal, sometimes hardly longer than the short stigmal vein . . . . . **TORYMIDAE** (part)

– Inner orbits of eyes diverging strongly ventrad ; antennae inserted distinctly, often far, below the level of the ventral edge of the eyes ; postspiracular sclerite and metapleuron usually more or less hairy ; postmarginal vein of fore wing usually as long or longer than the marginal vein. (Chalcedectinae) (p. 36) . . . . . **PTEROMALIDAE** (part)

25 (21) Pronotal collar (Text-fig. 22) large, subrectangular, its length from about two thirds that of the mesoscutum to longer than the latter ; head, and dorsum of thorax excluding the propodeum, with numerous conspicuous piliferous punctures (Text-fig. 23) which usually coalesce to form a deep, coarse honeycomb sculpture ; genae with a sharp edge or flange ; propodeum usually grooved or excavated down the middle ; body usually non-metallic, rarely metallic, sometimes partly to wholly yellow or reddish . . . 26

– Not agreeing with all the above characters. If the pronotal collar is comparable with the above in size and form, then either the head and thorax have a different type of sculpture, or else the genae are not sharp-edged . 27

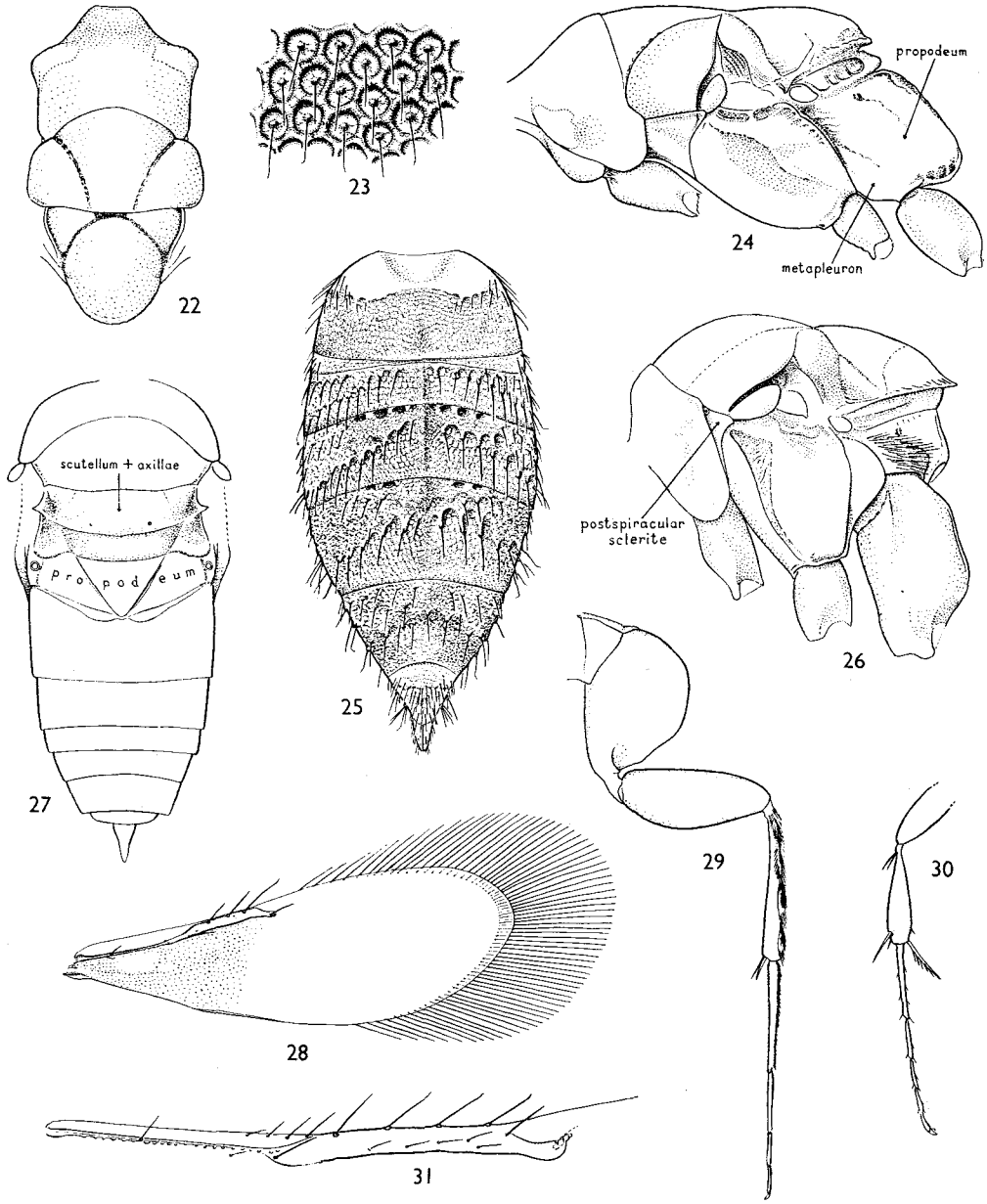
26 (25) Antennae with one anellus, seven funicular segments, and a solid or indistinctly segmented clava ; inner orbits of eyes diverging strongly ventrad **PTEROMALIDAE** (part)

– Antennae with at most six funicular segments ; inner orbits of eyes diverging at most slightly ventrad . . . . . **EURYTOMIDAE** (part)

27 (25) Pronotal collar subrectangular, large, from about half as long as, to longer than, the mesoscutum. Mesoscutal notauli complete 28

– Pronotal collar either not subrectangular, or else shorter than in the above. Notauli complete or incomplete 35

28 (27) Marginal vein of fore wing four to eight times as long as the stigmal vein ; postmarginal vein not or hardly longer than the stigmal. One or more of the



FIGS. 22–31. 22, *Tetramesa linearis* (Walker), ♀, thorax, excluding propodeum ; 23, *Eudecatoma biguttata* (Swed.), ♀, sculpture of mesoscutum ; 24, *Tetramesa petiolata* (Walker), ♀, thorax, profile ; 25, *Ormyrus punctiger* Westwood, ♀, gaster ; 26, same, thorax, profile ; 27, *Signiphora subaenea* (Förster), ♀, thorax and gaster ; 28, *Thysanus ater* Walker, ♀, fore wing ; 29, *Elasmus* sp., ♀, hind leg and metapleuron ; 30, *Thysanus ater* Walker, ♀, mid leg, excluding coxa and trochanter ; 31, *Pteroptrix dimidiata* Westwood, ♀, fore wing venation.

pygostylar bristles of the gaster very long (Text-fig. 39). Either the antennal toruli touch the edge of the oral fossa, or else the face has tubercles or crests . . . . . **PTEROMALIDAE** (part)

– Either the marginal vein of the fore wing is at most three times as long as the stigmal vein ; or the pygostylar bristles are relatively shorter, the antennal toruli are remote from the edge of the oral fossa, and the face is unarmed . 29

29 (28) Antennae with 10 or 11 segments, of which four to six are funicular segments. Metapleuron (Text-fig. 24) not or indistinctly marked off from the propodeum, usually more or less hairy ; propodeum with a median longitudinal channel, or flat medially ; axillulae not or only vaguely marked off from the scutellum ; body usually non-metallic, black, brown, or partly to entirely yellow to reddish, but rarely metallic . . . **EURYTOMIDAE** (part)

– Antennae usually with 13 segments, occasionally with 12 ; funicle with six to nine segments. The other characters rarely present in combination . 30

30 (29) Body black, non-metallic ; propodeum with a median longitudinal channel ; scutellum without an offset frenum . . . **EURYTOMIDAE** (part)

– Either the body is at least partly metallic ; or else the propodeum lacks a median channel, and usually also the scutellum has a frenum marked off by an impressed line 31

31 (30) Gaster with a conspicuous, subrectangular, reticulate or striate petiole. Front margin of metapleuron not sinuate ; hind femora neither swollen nor with teeth ventrally ; stigma of fore wing small **PTEROMALIDAE** (part)

– Gaster with a relatively inconspicuous, subconical, smooth or nearly smooth petiole 32

32 (31) Antennae inserted below the level of the ventral edge of the eyes. Either the fore wing virtually lacks a speculum and has the marginal vein hardly longer than the stigmal vein ; or else the vertex has six to eight specialized dark bristles which point forwards (as in Text-fig. 36) . **PTEROMALIDAE** (part)

– Antennae inserted level with or above the ventral edge of the eyes. Fore wing usually with a speculum, marginal vein usually longer than the stigmal vein. Vertex either with more numerous, or less specialized, bristles 33

33 (32) Antennae with nine funicular segments ; stigma of fore wing small ; vertex with six to eight long dark bristles (much as in Text-fig. 36) **PTEROMALIDAE** (part)

– Antennae with at most seven funicular segments. Either the stigma of the fore wing is large, or else the vertex is clothed with more numerous ordinary hairs or bristles 34

34 (33) Pronotal collar sharply margined anteriorly. Squat, bright, metallic species much resembling Perilampidae ; gaster shorter than thorax, subglobose, ovipositor sheaths in female not exserted ; mandibles large, bidentate **PTEROMALIDAE** (part)

– Pronotal collar not margined. Species disagreeing in some other respect from the above . . . . . **TORYMIDAE** (part)

35 (27) Hind tibia with two stout apical spurs, one or both of these curved ; hind coxae (Text-fig. 26) nearly as long as their femora, with a fine carina along their dorsal edge ; middle segments of gaster with some strong piliferous punctures which are usually modified and form part of transverse bands of characteristic sculpture (Text-fig. 25) ; marginal vein of fore wing six to nine times as long as the very short stigmal vein ; antennae 13-segmented ; postspiracular sclerite (Text-fig. 26) very narrow, fused with and lying in the same plane as the mesopleuron . . . . . **ORMYRIDAE**

– Hind tibia often with only one apical spur, if with two then both are straight ; hind coxae rarely so long as in the above ; middle segments of gaster most often without conspicuous piliferous punctures, without transverse bands of sculpture resembling those of Ormyridae ; marginal vein of fore wing often relatively shorter and the stigmal relatively longer ; antennal formula often otherwise ; postspiracular sclerite rarely fused with the mesopleuron 36

36 (35) Hind coxae greatly enlarged (much as in Text-fig. 29) and almost laminar ; hind tibiae with a row of about four to six long bristles on their dorsal edge, and a series of about four others on their external surface, with two long apical spurs ; fore wing with one to three isolated bristles on the membrane below the apex of the submarginal vein; antennae with nine segments . . . . . **ELASMIDAE** (part)

– Hind coxae neither so greatly enlarged nor so strongly flattened ; hind tibiae without specialized series of long bristles, often with only one apical spur ; the other characters usually different 37

37 (36) Thorax (Text-fig. 27) : axillae not distinctly marked off from the scutellum, the two together forming a transverse band ; propodeum with a triangular median area ; gaster sessile, its basal segment as broad as the propodeum ; antennae five to seven-segmented, with scape, pedicellus, two to four anelli, and a long undivided clava. Fore wing (Text-fig. 28) with fringes from one third to more than half the breadth of the wing, stigma rudimentary. External edge of mid tibia (Text-fig. 30) often with two to four long strong bristles ; mid tarsi sometimes much longer than mid tibiae **SIGNIPHORIDAE**

– Thorax : axillae distinctly marked off from the scutellum ; propodeum without such a triangular median area ; gaster most often petiolate or subpetiolate with its basal segment at least slightly narrower than the propodeum ; antennal formula nearly always otherwise 38

38 (37) Antennae with three to nine segments. Postmarginal vein of fore wing usually absent or represented by a short stub, only occasionally as long as the stigmal vein 39

– Antennae with 10 to 13 segments. Postmarginal vein of fore wing usually well-developed and as long as or longer than the stigmal vein, occasionally shorter, but rarely absent 40

39 (38) Gaster subsessile, the petiolar segment, if present, transversely linear and not easily visible ; postphragma extending at least slightly, often far, into the gaster. Postmarginal vein of fore wing at most about one sixth the length of the marginal vein, but usually less. Pronotum very short and strongly transverse. Scutellum at least slightly, often strongly, transverse **APHELINIDAE** (part)

– Gaster petiolate, the petiolar segment, even if very short, clearly visible. Either the postmarginal vein is at least one quarter the length of the marginal vein ; or else the gastral petiole is conspicuous, rectangular, and reticulate, and the pronotum is large, longer than the mesoscutum . . 40

40 (39) Propodeum extensively pilose : its median third with several hairs which converge towards the median line and leave at most a narrow strip down the middle uncovered ; antennae with 11 segments of which six are funicular segments ; hind edge of basal tergite of gaster very convex, so that in some aspects it appears as if a rather deep groove is present between it and the second tergite ; spur of fore tibia weak and straight ; fore wing without a speculum ; pronotum from nearly as long as, to longer than, the mesoscutum ; scutellum with four long bristles. (Females of Tetracampinae) **TETRACAMPIDAE**

– At least the middle third of the propodeum bare, except in some exotic Pteromalidae in which the antennae have seven funicular segments. Hind edge of basal tergite of gaster not so convex, without the appearance of a groove between it and the second tergite. Spur of fore tibia usually stronger and curved. Fore wing often with a speculum. Pronotum often relatively short. Scutellum usually with more than four bristles . . . 41

41 (40) *Females* with spur of fore tibia weak, nearly straight, only about one quarter as long as the first tarsal segment ; spur of mid tibia not longer than that of the hind tibia ; antennal formula 11163. *Males* with fore wing with a black sausage-like swelling which occupies the marginal vein and the distal part of the submarginal vein ; antennal formula 11153. *Both sexes* with pronotum campanuliform, at least about three quarters as long as the mesoscutum ; anterior tentorial pits forming conspicuous foveae, very large in *males* ; occiput slightly margined (Platynocheilinae)
TETRACAMPIDAE (part)

– *Females* with spur of fore tibia stronger and longer, nearly always curved but if straight then the antennal formula is different and the pronotum is relatively shorter. Antennal formula rarely 11163, if so then the pronotum is relatively shorter, and the anterior tentorial pits are small. *Males* with fore wings without a black swelling occupying this position, sometimes with the marginal vein short and broad, but not swollen
PTEROMALIDAE (most species)

42 (13) Marginal vein of fore wing punctiform or virtually so. Either the fringe of the fore wing is extremely long, the length of its longest hairs fully equal to the breadth of the wing ; or the antenna of the female is five-segmented with scape, pedicellus, two minute anelli, and a long clava which is solid or has at most slight traces of segmentation. Minute species, 0·5 to 0.7 mm. (Antheminae and Arrhenophaginae) . . . . **ENCYRTIDAE** (part)

– Marginal vein of fore wing very distinctly, usually much, longer than broad. Fringe of fore wing most often relatively shorter. Antenna of female nearly always with a different structure. Size usually greater 43

43 (42) Antenna with six funicular segments and one discoid anellus, the latter often hard to see ; middle third of propodeum pilose, the hairs converging towards the median line and leaving at most a narrow median strip uncovered ; fore wing without a speculum. (Males of Tetracampinae)
TETRACAMPIDAE (part)

– Antennae with at most five funicular segments ; at least the middle third of the propodeum bare ; fore wing most often with a speculum 44

44 (43) Hind legs (Text-fig. 29) having their coxae greatly enlarged and strongly compressed laterally, almost laminar ; outer surface of their tibiae with numerous coarse blackish bristles, some of which form a pattern like a series of lozenges.
Fore wings narrow, nearly or quite three times as long as broad, their front and hind margins nearly parallel ; marginal vein extremely long, hardly at all bent at its junction with the submarginal ; postmarginal and stigmal very short. Mid and hind femora flattened and strongly expanded. Occiput with a sharp edge, the posterior ocelli close to this or almost touching it. . . . . **ELASMIDAE**

– Hind coxae not so large and not laminately compressed ; outer surface of hind tibiae without coarse bristles forming a pattern 45

45 (44) Fore wing with postmarginal vein as long as or longer than the stigmal vein, the latter not very short . . . . . **EULOPHIDAE** (part)

– Fore wing with postmarginal vein either absent, or clearly shorter than the stigmal vein, the latter sometimes very short or even rudimentary . . 46

46 (45) Gaster distinctly constricted at its junction with the propodeum, and a petiole always present even though sometimes strongly transverse ; endophragma not extending into the gaster. Stigmal vein forming an angle of not less than about 35° with the costal edge of the wing. Body most often at least partly metallic, if non-metallic then the scutellum usually has a pair of impressed submedian longitudinal lines . . . . **EULOPHIDAE** (part)

– Gaster subsessile, i.e., its base almost as broad as the propodeum ; the petiole, if present, very difficult to see ; endophragma extending at least slightly, usually far, into the gaster. Stigmal vein (Text-fig. 31) usually forming a very acute angle with the costal edge of the wing. Body non-metallic, black, or partly to entirely yellow or brown. Scutellum without submedian impressed longitudinal lines . . . . . **APHELINIDAE** (part)

THE LIMITS OF THE FAMILY PTEROMALIDAE

These are not easy to define even when only the European fauna is considered. In the present work Pteromalidae are regarded as including Cleonyminae and Miscogasterinae, groups which have often been given family rank. The chief difficulties arise when one tries to find satisfactory characters for distinguishing many male (and a few female) Eupelmidae, and some male Torymidae, from Pteromalidae. Such Eupelmids and Torymids would run in my family key to Pteromalidae, therefore I have inserted special couplets in my key to subfamilies of Pteromalidae in order to deal with these difficult cases. The genus *Oodera* Westwood, sometimes placed in Pteromalidae Cleonyminae, is dealt with in my key to families. It is in fact very close to some Cleonyminae, but on a balance of characters I place it in Eupelmidae. This exemplifies the sort of difficulty referred to above. It would be unwise to attempt a formal definition of Pteromalidae until the families of Chalcidoidea have been more adequately surveyed on a world-wide basis. Meanwhile workers will have to rely on the key to families, which has been so constructed so as to make allowance for exceptional and difficult cases. The great majority of Pteromalinae should run, in the key to subfamilies, to couplet 45 ; only a small number will run to other couplets.

PTEROMALIDAE

KEY TO SUBFAMILIES

1 Mesoscutal notauli complete or (some Diparinae) incomplete but meeting on the disc of the mesoscutum 2

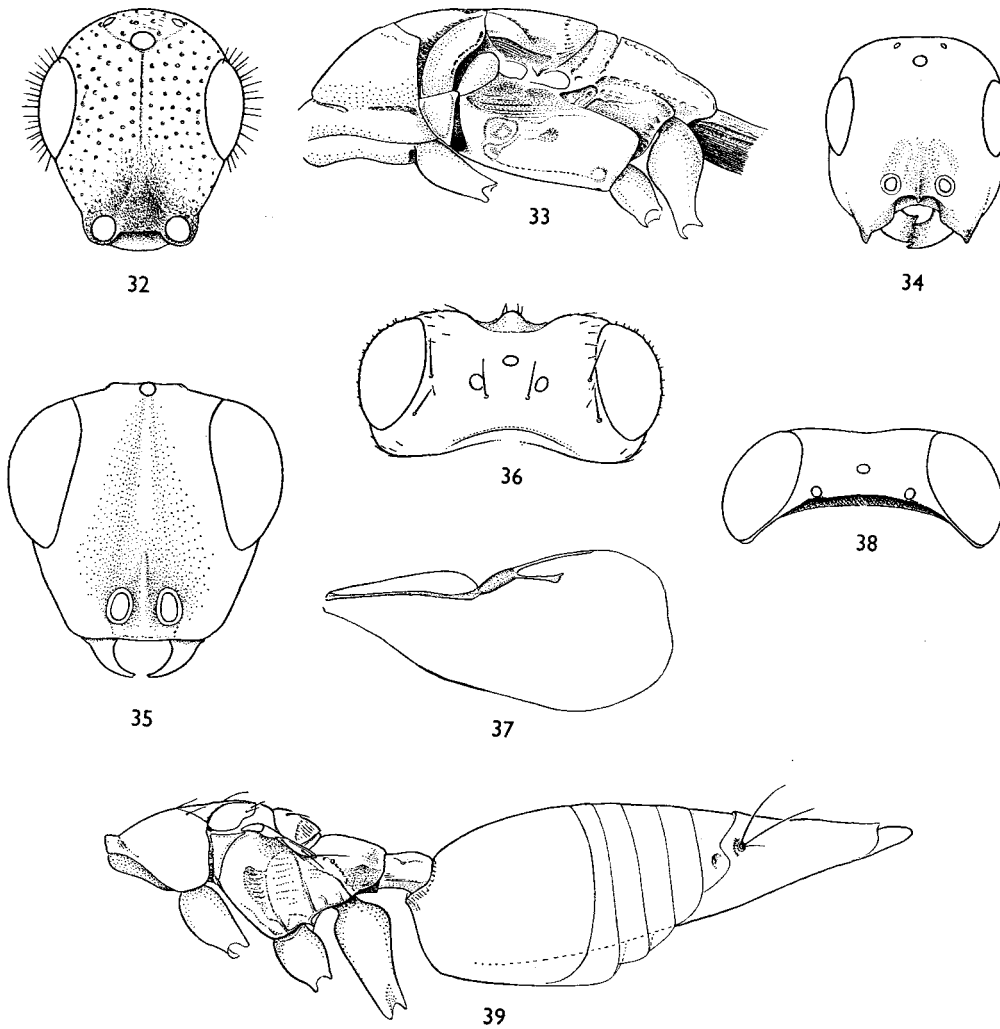
– Notauli neither reaching the hind margin of the mesoscutum, nor meeting on its disc 33

2 (1) Antennal toruli (Text-fig. 32) touching the lower edge of the head and situated on facial lobes which project ventrad slightly below the level of the clypeus ; antennae without anelli, with seven funicular segments, and a solid or three-segmented clava. Mesopleuron (Text-fig. 33) produced posteriorly in the form of a lamina which completely overlaps the metapleuron ; mesosternum with a broad deep median excavation (mesolcus) extending from its hind margin more than half-way towards the front of the sclerite. Propodeum

with the outer rim of each spiracle partly hidden by a raised flap of the callus ; postero-lateral corners of propodeum dentiform.

Body black or weakly metallic ; head, and dorsum of thorax excluding the propodeum, with very conspicuous piliferous punctures, the interspaces between these to a large extent, or at least those of the scutellum, with reduced microsculpture and so more or less polished. Mandibles bidentate

SPALANGIINAE (p. 48)



FIGS. 32–39. 32, *Spalangia erythromera* Förster, ♀, head ; 33, same, thorax, profile ; 34, *Theocolax formiciformis* Westwood, ♀, head ; 35, *Cea pulicaris* Walker, ♀, head ; 36, *Dipara petiolata* Walker, ♀, head ; 37, *Epicopterus choreiformis* Westwood, ♀, fore wing ; 38, *Eunotus cretaceus* Walker, ♀, head ; 39, *Dipara petiolata* Walker, ♀, thorax and gaster.

– Antennal toruli nearly always at least slightly separated from the lower edge of the head, but if touching it then not situated on projecting facial lobes, and antennae with only five or six funicular segments. Mesopleuron rarely produced posteriorly in the form of a lamina, if so (*Spalangiopelta*, some Pirenini) then the lamina does not completely overlap the metapleuron ; mesosternum usually with at most a narrow median longitudinal impressed line, if this line is rather broad then it is situated mainly in the front portion of the sclerite. Propodeal spiracles not overlapped by a raised flap. The other characters not present simultaneously 3

3 (2) Ant-like species with head, thorax, and gaster all at least partly testaceous. Foramen magnum situated near the top of the head. Face, on either side of the clypeus, often with a tubercle, crest, or forwardly-projecting tooth (Text-fig. 34), sometimes (Text-figs. 70, 71) with a second crest on each side just below the level of the antennal toruli ; malar sulcus absent. Antennae 8- to 11-segmented, without anelli or, some males only, with one anellus. Propodeal spiracles separated by much more than their own length from the hind margin of the metanotum.

Wings sometimes vestigial ; when developed having the marginal vein very long, the stigmal vein short, the postmarginal vein equal to or shorter than the stigmal ; parastigma with a callus which often bears a conspicuous tuft of dark bristles. Body of *Theocolax* ♀, Text-fig. 50

CEROCEPHALINAE (p. 56)

– Species rarely ant-like ; head, thorax and gaster rarely all testaceous-marked, if so then the foramen magnum is not situated near the top of the head, and the face has neither crests nor teeth. Antennae often with a different formula. Propodeal spiracles rarely separated by more than their own length from the hind margin of the metanotum 4

4 (3) Spiracles of propodeum situated about half-way between the front and hind margins of the sclerite. Antennal toruli (Text-fig. 35) placed on either side of the clypeus and close to the edge of the oral fossa, separated from it by a distance at least slightly less than the height of the toruli ; antennae with three anelli and five funicular segments. Malar sulcus absent. Mandibles bidentate. Body of *Cea* ♀, Text-fig. 51. . . . **CEINAE** (p. 45)

– Spiracles of propodeum always nearer to the front margin of the sclerite than to its hind margin, sometimes even touching the metanotum.[1] Antennal toruli separated from the edge of the oral fossa by at least their own height except in *Neodipara*, some Eunotinae, and some Cleonyminae, in which the antennae have a different formula 5

5 (4) Antennae inserted on either side of the clypeus, with their toruli touching the edge of the oral fossa ; with five funicular segments, without anelli or with only one minute anellus. Body black with a weak metallic tinge ; gastral petiole elongate, yellow. Mandibles bidentate . **NEODIPARINAE** (p. 66)

– Antennal toruli at least slightly separated from the edge of the oral fossa, far above it in male *Dipara petiolata*, the only species having a blackish body and elongate yellow gastral petiole 6

6 (5) Vertex (Text-fig. 36), in addition to some fine hairs, with 6 to 12 conspicuously strong dark bristles, most or all of which curve forwards ; scutellum with four long bristles only, usually (at least the frenum) longitudinally strigose. Notauli usually complete and more or less strongly convergent,

[1] The male of *Merostenus excavatus* [Eupelmidae] has the propodeal spiracles only slightly nearer to the front margin than to the hind margin of the propodeum, but it has 1 anellus and 7 funicular segments in the antenna.

sometimes incomplete but meeting on the disc of the mesoscutum. Gaster (Text-fig. 39) usually attached to the propodeum at a relatively high level, the lower edge of the petiolar foramen being usually level with the upper surface of the hind coxae as seen in profile ; one or more of the bristles of each pygostyle very long. Antennae 11- to 13-segmented, with one anellus ; in female with seven funicular segments and a solid or three-segmented clava ; in male with nine funicular segments and a short clava which is solid or imperfectly two-segmented. Body of *Dipara* ♀♂ Text-figs. 39, 52 **DIPARINAE** (p. 63)

– Vertex clothed with hairs or bristles which are relatively uniform in length and most often finer and shorter than in the above ; scutellum usually with more than four bristles, if with only four then the scutellum is not longitudinally strigose. Notauli complete, not meeting posteriorly. Gaster usually attached to propodeum at a lower level, with the petiolar foramen situated between the hind coxae 7

7 (6) Macropterous ; front edge of costal cell of fore wing (Text-fig. 37) strongly curved apically, so that the wing appears excised at the point where the submarginal vein meets the marginal vein (*Epicopterus* and some exotic genera) . . . . . **EUNOTINAE** (part) (p. 67)

– Either the front edge of costal cell of fore wing in its apical portion is straight or at most weakly sinuate ; or the species is brachypterous . . . 8

8 (7) Species with the following combination of characters : head (Text-fig. 38) with posterior ocelli touching the occipital edge, which is sharp ; head in front view subtriangular ; genae long to very long ; scutellum large, slightly to considerably longer than the mesoscutum, sometimes more or less overlapping the gaster ; fore wing with postmarginal vein usually at most as long as, rarely slightly longer than, the stigmal vein ; first tergite of gaster very large, usually concealing the remaining tergites though sometimes (*Scutellista*) occupying only about half the gaster, in which case the scutellum partly overlaps the gaster ; propodeal callus with a raised longitudinal crest which ends posteriorly in a tooth ; antennae eight- to ten-segmented, inserted at least slightly below the level of the ventral edge of the eyes. Body of *Eunotus* ♀, Text-fig. 54 . **EUNOTINAE** (part) (p. 67)

– If the occipito-vertical edge is sharp, then the posterior ocelli do not touch it (except sometimes in *Pirene*, in which the head is not subtriangular, the genae are short, the scutellum is smaller, and the other characters do not all agree with the above). Head in front view more often more or less oval ; scutellum rarely distinctly longer than the mesoscutum, not overlapping the gaster [except partly in some exotic Cleonyminae] ; fore wing with postmarginal vein often longer than the stigmal ; first tergite of gaster rarely occupying more than half the total length ; propodeal callus rarely with a longitudinal ridge ; antennal formula often otherwise . . 9

9 (8) Wings bitten off somewhere near their bases, so that the venation, except part of the submarginal vein, is missing (dealate specimens of *Bairamlia*) **ASAPHINAE** (part) (p. 77)

– Wings fully developed with complete venation 10

10 (9) Fore wing with marginal vein conspicuously thickened, either throughout, or in its proximal half (cf. Text-figs. 285, 286, 291, 323, 324) . . . 11

– Fore wing with marginal vein not conspicuously thickened. Note : the parastigma, which may be thickened, is not counted as part of the marginal vein 13

11 (10) Clypeus with at most a trace of strigose sculpture at the sides, its anterior margin subtruncate ; hind tibia with one spur ; antennal formula 11263 (male *Epicopterus* only) (Text-figs. 72–74) . . **EUNOTINAE** (part) (p. 67)

– Either the clypeus is wholly radiately strigose ; or its anterior margin is bilobed, and the hind tibia has two spurs ; or the antennal formula is different 12

12 (11) Either the head and thorax are yellow and black, non-metallic ; or the antennal formula is 11173 . . . **MISCOGASTERINAE** (part) (p. 95)

– Head and thorax usually metallic, if non-metallic then without yellow markings ; antennal formula otherwise . **PTEROMALINAE** (part) (p. 352)

13 (10) *Females* with tarsi heteromerous, mid tarsi with only four segments ; fore and hind tarsi with five ; face with a longitudinal impressed line on either side, each lying somewhat mesad of its corresponding malar sulcus, extending from the eye towards the oral edge ; postspiracular sclerite imperfectly developed and not distinctly separated from the mesopleuron, sometimes apparently absent ; antennal formula 11172. *Males* with face with longitudinal impressed lines like those of the female ; postspiracular sclerite as described for females ; antennal formula 11173 or 11182. Body and appendages, Text-figs. 49, 61–66 . . . . **MACROMESINAE** (p. 42)

– *Females* with tarsi not heteromerous, all with five segments ; face, except in some species of the exotic genus *Belonea*, without longitudinal impressed lines like those described for Macromesinae ; postspiracular sclerite distinctly separated from the mesopleuron by a suture, sometimes very small or narrow but often large. *Males* with face lacking longitudinal impressed lines like those described above ; postspiracular sclerite as in females. Antennal formula most often otherwise 14

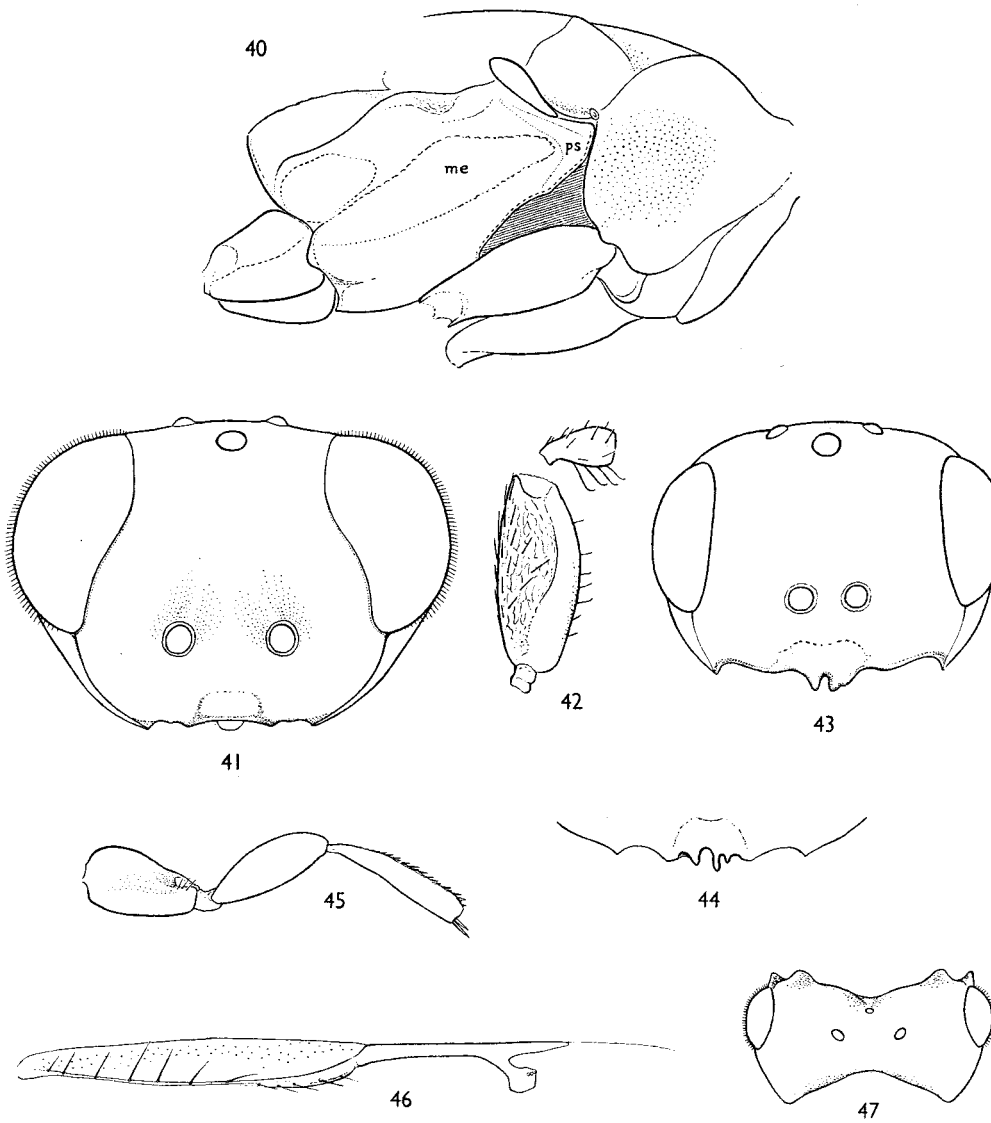
14 (13) Males only with eyes very large and dorsally touching or almost touching the posterior ocelli, but their inner orbits diverging strongly ventrad. Antennae (cf. Text-figs. 276, 278–280) very short : either with two anelli and three funicular segments ; or three anelli and two funicular segments ; or four anelli but only one funicular segment. Small species, at most 2 mm. in length. (Some Pirenini) . . . **MISCOGASTERINAE** (part) (p. 95)

– *Either* females ; *or* males with eyes smaller and not nearly touching the posterior ocelli dorsally, and the other characters not all present simultaneously. Males with inner orbits diverging strongly have longer antennae, with either one anellus and seven funicular segments ; or no anelli but eight funicular segments 15

15 (14) Inner orbits of eyes (Text-fig. 41) diverging strongly ventrad, at an angle of 20° to 45° to the vertical axis of the head. Antennae with seven or eight funicular segments ; with only one anellus, or without true anelli ; clava sometimes solid, sometimes two- or three-segmented. Labrum often visible even when the mandibles are closed. Head and thorax often with numerous and conspicuous piliferous punctures. Postspiracular sclerite large and broad, often more or less hairy 49

– Inner orbits of eyes parallel or diverging only slightly ventrad. Antennae rarely with more than six funicular segments, if with seven, some Chrysolampinae, some Asaphinae, *Sheloceras* (Miscogasterinae), some ♂ Torymidae, then the inner orbits of the eyes are nearly parallel ; at least one anellus present, often two, occasionally three or four ; clava most often three-segmented, occasionally two-segmented. Labrum very rarely visible. Head and thorax usually with sparser or inconspicuous piliferous punctures. Postspiracular sclerite large or small, nearly always bare 16

16 (15) Antennae 13-segmented ; most often with two anelli and six (occasionally seven) funicular segments, or three anelli and five funicular segments ; occasionally with only one anellus, but then with seven funicular segments. Petiolar foramen of propodeum most often bounded by a more or less cre-



FIGS. 40–47. 40, *Macromesus amphiretus* Walker, ♂, thorax, lateroventral ; 41, *Cleonymus laticornis* Walker, ♀, head ; 42, *Macroneura vesicularis* (Retzius), ♂, scape and pedicellus ; 43, *Halticoptera hippeus* (Walker), ♀, head ; 44, *Callimerismus fronto* (Walker), ♀, clypeus and genae ; 45, *Colotrechnus subcoeruleus* Thomson, ♀, hind leg, excluding tarsus ; 46, same, fore wing, part ; 47, *Cratomus megacephalus* (F.), ♀, head.

scentic, smooth or transversely-aciculate strip ; or with a convex, reticulate nucha. The propodeum, medially, is often produced caudad of the bases of the hind coxae ; the supracoxal flanges, except in a few species, are not very narrow and linear. Anterior margin of clypeus often with teeth. Postmarginal vein of fore wing often longer than the marginal vein. Petiole of gaster often distinctly sculptured, sometimes longer than broad 17

– Antennae 10-, 11-, or 12-segmented ; if with two anelli, then only five funicular segments ; sometimes three or four anelli but in that case at most three funicular segments ; often only one anellus but then at most six funicular segments.

Propodeum without a nucha, its petiolar foramen bounded by a simple ridge ; propodeum, medially, not or hardly produced caudad of the bases of the hind coxae ; supracoxal flanges, except in a few species, very narrow and linear. Anterior margin of clypeus rarely with teeth. Postmarginal vein of fore wing in most species shorter than, and only rarely longer than, the marginal vein. Petiole of gaster smooth, usually more or less transverse, rarely as long as broad. Body of *Semiotellus* ♀, Text-fig. 56 ; of *Pirene* ♀, Text-fig. 57 . . . . . **MISCOGASTERINAE** (part) (p. 95)

17 (16) Antennae inserted very high on the head, their toruli distinctly nearer to the median ocellus than to the anterior margin of the clypeus . . . 18

– Antennae inserted lower down the head, their toruli equidistant from the median ocellus and the anterior margin of the clypeus, or nearer to the latter 19

18 (17) Antennal formula 11263 ; marginal vein of fore wing 4 to 4·5 times as long as the stigmal vein, costal cell very narrow, 12 to 20 times as long as its maximum breadth ; all coxae, femora, and tibiae red, sometimes also the gastral petiole and part of the gaster. Body of *Panstenon* ♀, Text-fig. 55 **PANSTENONINAE** (p. 92)

– Either the antennal formula is 11173 ; or else the marginal vein of the fore wing is less than three times as long as the stigmal vein, the costal cell is relatively broader, and at least the coxae are mainly metallic 19

19 (18) Marginal vein of fore wing 3·5 to 6 times as long as the stigmal vein ; pronotal collar (Text-fig. 53) large, at least half as long as the mesoscutum, sharply margined anteriorly. Antennal formula 11263 or 11173 ; hind tibia with two strong apical spurs ; petiole of gaster usually distinctly sculptured, longer than broad, and subrectangular (Text-fig. 53) **CHRYSOLAMPINAE** (p. 86)

– Marginal vein of fore wing rarely more than three times as long as the stigmal vein; if more than three times, then either the pronotal collar is shorter, or else it is immarginate 20

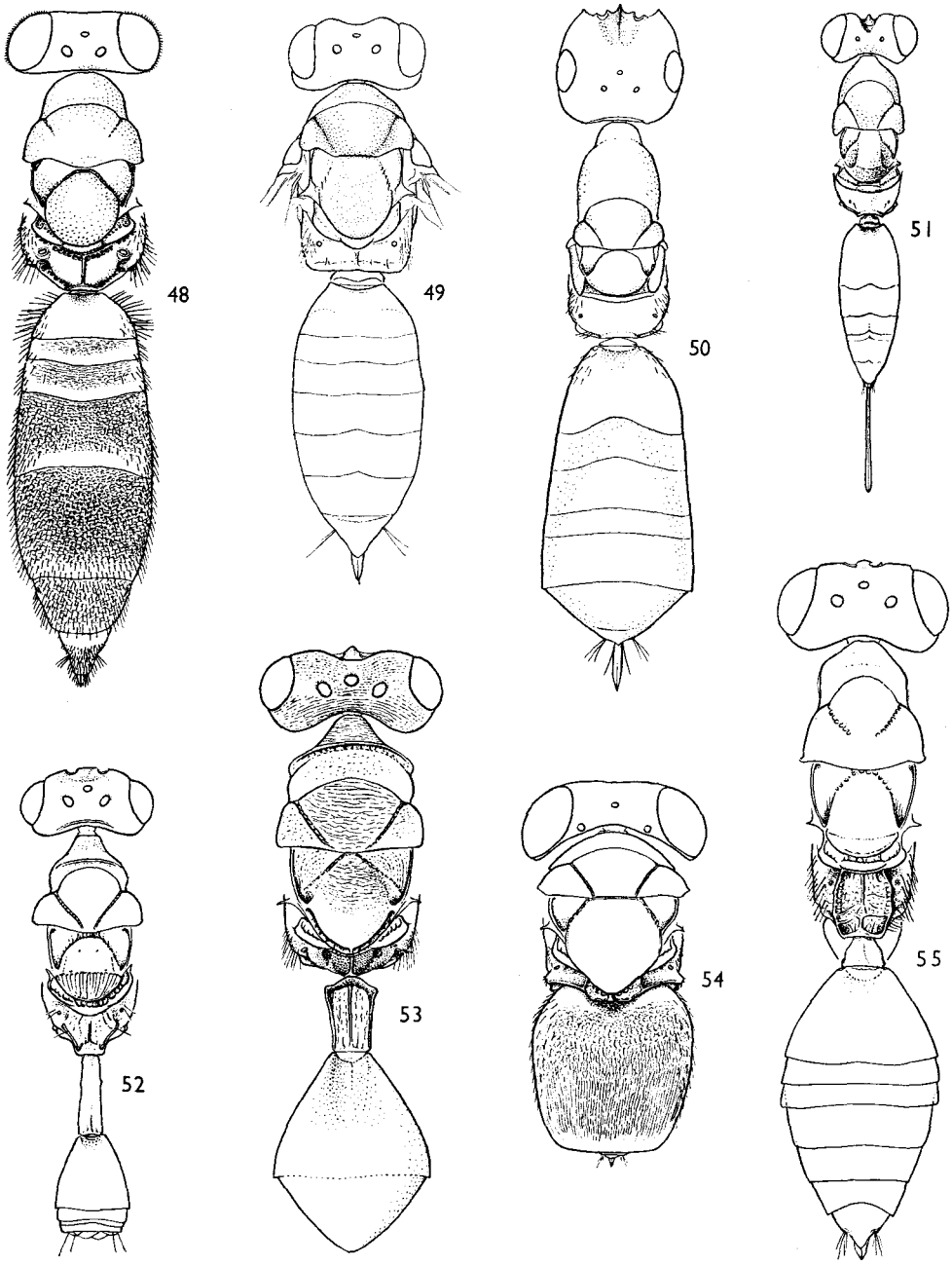
20 (19) Body either brown to black and non-metallic ; or else the head and thorax at least partly yellow to reddish 21

– Body at least slightly metallic ; head and thorax without yellow or reddish markings 22

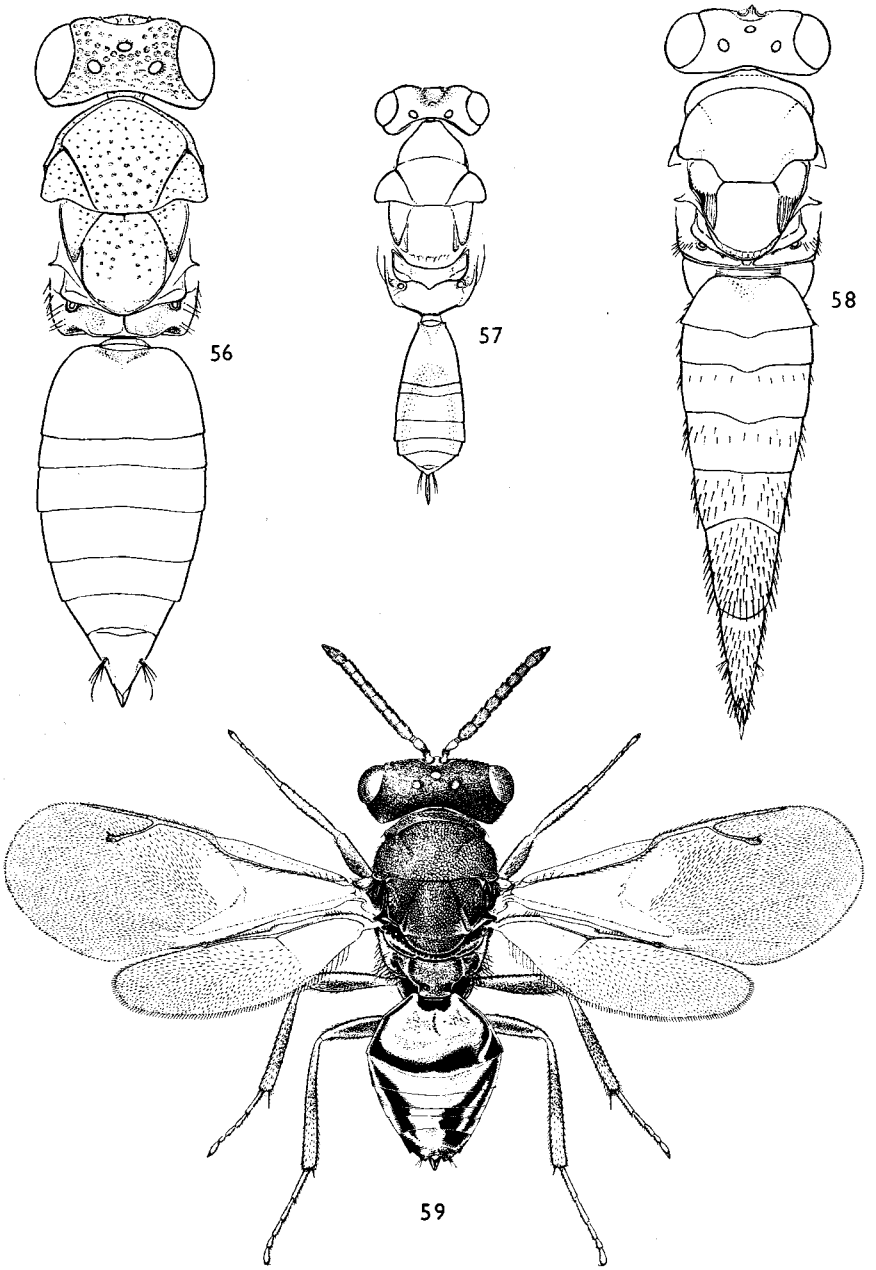
21 (20) Pronotum short, in dorsal view with its sides converging strongly forwards (a few Ormocerini ; some exotic Brachyscelidiphagini) **MISCOGASTERINAE** (part) (p. 95)

– Pronotum long, in dorsal view appearing subrectangular, or having its sides at most slightly convergent . . . . . **TORYMIDAE** (part)

22 (20) Genae with a sharp edge or border which extends well up the temples ; occiput also margined. Pronotum (Text-fig. 75) large and subrectangular.



FIGS. 48–55. Body, excluding appendages. 48, *Cleonymus laticornis* Walker, ♀ ; 49, *Macromesus amphiretus* Walker, ♀ ; 50, *Theocolax formiciformis* Westwood, ♀ ; 51, *Cea pulicaris* Walker, ♀ ; 52, *Dipara petiolata* Walker, ♂ ; 53, *Chrysolampus thenae* (Walker), ♀ ; 54, *Eunotus cretaceus* Walker, ♀ ; 55, *Panstenon oxylus* (Walker), ♀.



FIGS. 56–59. 56, *Semiotellus mundus* (Walker), ♀, body, excluding appendages ; 57, *Pirene chalybea* Haliday, ♀, body, excluding appendages ; 58, *Colotrechnus subcoeruleus* Thomson, ♀, body excluding appendages ; 59, *Pteromalus puparum* (L.), ♀, whole insect.

Antennae inserted below level of ventral edge of eyes, 11263 or 11173 **ASAPHINAE** (part) (p. 77)

– Genae without a sharp edge except sometimes near the mandibles, in which case the occiput is not margined, while the pronotum is shorter and not subrectangular, and the antennae are inserted higher on the head . . 23

23 (22) Postmarginal vein of fore wing shorter than the marginal vein ; antennae inserted well below the level of the ventral edge of the eyes, 11263 in male, 11353 in female. Anterior margin of clypeus without teeth (*Bairamlia*) **ASAPHINAE** (part) (p. 77)

– Either the postmarginal vein of the fore wing is at least slightly longer than the marginal vein ; or else the antennae are inserted level with or above the ventral edge of the eyes. Antennal formula sometimes otherwise. Anterior margin of clypeus often with a tooth or teeth 24

24 (23) Antennae lacking clearly differentiated anelli, or with only one anellus . . 25

– Antennae with two or more anelli 26

25 (24) Males only : either petiole and base of gaster reddish ; or pedicellus (Text-fig. 42) with a comb of outstanding hairs beneath, and genae with some conspicuously long hairs. Scutellum tapering forwards to a point . . 49

– Females, or males not having the above characters [Brachyelatus (p. 92) ; some male Torymidae, and some non-European Miscogasterinae (Brachyscelidiphagini)]

26 (24) Fore wing with postmarginal vein at least slightly longer than the marginal vein 27

– Fore wing with postmarginal vein not longer than the marginal vein . . 29

27 (26) Postspiracular sclerite narrow ; clypeus wholly strigose [Only a very few species would run out here] . . . **PTEROMALINAE** (part) (p. 352)

– Postspiracular sclerite large and broad ; clypeus either mainly to entirely reticulate, or smooth 28

28 (27) Occiput margined, at least medially 50

– Occiput not margined . . . . **MISCOGASTERINAE** (part) (p. 95)

29 (26) Anterior margin of clypeus with three asymmetric teeth (Text-fig. 44), or with two teeth of which the left-hand one is more or less bifid (Text-fig. 43) **MISCOGASTERINAE** (part) (p. 95)

– Anterior margin of clypeus either edentate or, if teeth are present, they are neither asymmetrically placed nor bifid 30

30 (29) Petiole of gaster strongly sculptured, reticulate or strigose, often more or less rectangular, or longer than broad . . **MISCOGASTERINAE** (part) (p. 95)

– Petiole of gaster smooth or nearly so, usually more or less transverse though sometimes as long as broad 31

31 (30) Antennae inserted low down, their toruli not or hardly above the level of the ventral edge of the eyes, 11263. Clypeus without, or with at most some vague, striae . . . . . **MISCOGASTERINAE** (part) (p. 95)

– Either the antennae are inserted distinctly above the level of the ventral edge of the eyes ; or else their formula is 11353 ; or the clypeus has numerous radiating striae 32

32 (31) Either the clypeus is mainly striate ; or its anterior margin has a tooth, or two lobes . . . . . **PTEROMALINAE** (part) (p. 352)

– Clypeus not striate, its anterior margin without teeth 52

33 (1) Face and/or frons with a crest or tubercle on each side (see Text-fig. 47) ; or the outer edges of the deep antennal scrobes are raised to form crests . . 47

– Face and frons without crests or tubercles, the interantennal tubercle, which is sometimes carinate, is not counted ; outer edges of antennal scrobes not crested, the scrobes often shallow 34

34 (33) Inner orbits of eyes (Text-fig. 41) diverging strongly ventrad, at an angle of 20° to 45° to the vertical axis of the head. Antennae either with one anellus and seven funicular segments ; or without anelli but having eight funicular segments 49

– Inner orbits of eyes parallel or diverging only slightly. Antennae almost always with two or three anelli, and rarely more than six funicular segments ; if there are seven or eight funicular segments, then nearly always two anelli are present. 35

35 (34) Brachypterous or apterous species (some *Callitula, Meraporus, Leptomeraporus, Arthrolytus, Nasonia, Platypteromalus and Eupteromalus*) **PTEROMALINAE** (part) (p. 352)

– Macropterous species 36

36 (35) Antennae 10-, 11-, or 12-segmented 37

– Antennae 13-segmented 38

37 (36) Antennae without anelli or with only one anellus ; clava neither acutely pointed nor with an apical process, two- or three-segmented **MISCOGASTERINAE** (part) (p. 95)

– Antennae with two or three anelli ; clava (Text-figs. 299–301) acutely pointed, acuminate, or with an apical process, usually solid or indistinctly segmented (*Callitula, Merisus ;* some *Homoporus, Norbanus* and *Picroscytoides* would run here) . . . . . **PTEROMALINAE** (part) (p. 352)

38 (36) Axillae (Text-fig. 58) produced forwards far in advance of the scutellar base, the latter broad. Fore wing (Text-fig. 46) with stigmal vein very short, the stigma almost sessile, marginal vein three to four times as long as the stigmal vein, postmarginal vein relatively short. Hind tibiae (Text-fig. 45) somewhat compressed, their posterior edge with a row of spines, two strong apical spurs present of which the second is only slightly shorter than the first ; hind coxae very long, at least three quarters as long as their femora, the latter compressed. Spiracles of propodeum touching the metanotum, the latter often covering the front part of the spiracular rim. Last two or three segments of female gaster clothed with dark bristles. Antennal formula 11263 in female, 11353 in male **COLOTRECHNINAE** (p. 850)

– Axillae very rarely produced so far in advance of the scutellar base, if so then the latter is narrower. Venation of fore wing usually quite unlike the above, if somewhat similar then the hind tibiae have no spines along their posterior edge, and have only one apical spur, whilst the hind coxae are relatively shorter and the propodeal spiracles are at least slightly separated from the metanotum 39

39 (38) Antennae inserted high on the head, their toruli nearer to the median ocellus than to the anterior margin of the clypeus 40

– Antennae inserted at a lower level, their toruli either midway between the median ocellus and the anterior margin of the clypeus, or nearer to the latter 41

40 (39) Marginal vein of fore wing 4 to 4·5 times as long as the stigmal vein ; costal cell narrow, 12 to 20 times as long as its maximum breadth **PANSTENONINAE** (p. 92)

– Marginal vein of fore wing less than three times as long as the stigmal vein ; costal cell relatively broader than in the above 41

41 (40) Marginal vein of fore wing (Text-figs. 285, 286, 291, 323, 324) conspicuously thickened, either throughout or in its proximal half **PTEROMALINAE** (part) (p. 352)

– Marginal vein of fore wing not conspicuously thickened 42

42 (41) Anterior margin of clypeus with three asymmetric teeth (Text-fig. 44) **MISCOGASTERINAE** (part) (p. 95)

– Anterior margin of clypeus either edentate, or if with teeth or lobes, then these are not asymmetric 43

43 (42) Petiole of gaster conspicuous, sculptured, reticulate or strigose, usually more or less elongate, rarely transverse 44

– Petiole of gaster smooth or nearly so, usually more or less transverse and relatively inconspicuous, rarely somewhat longer than broad 45

44 (43) Anterior margin of clypeus bi- or tridentate **MISCOGASTERINAE** (part) (p. 95)

– Anterior margin of clypeus without teeth. **PTEROMALINAE** (part) (p. 352)

45 (43) Anterior margin of clypeus (cf. Text-figs. 170, 685) with two slightly projecting sharp teeth 46

– Anterior margin of clypeus not of this form ; often more or less emarginate (Text-figs. 346, 394, 496, 510, 514, 526, 529, 566, 655, 658–660) or incised (Text-figs. 361, 393, 528, 654) but then the angles on either side of the emargination are blunt . . **PTEROMALINAE** (most species) (p. 352)

46 (45) Antennae inserted low on the head, not or hardly above the level of the ventral edge of the eyes ; axillae meeting or nearly meeting, so that the scutellum touches the mesoscutum only on a narrow base or at a point (as in Text-figs. 130, 141, 143, 169) ; clypeus reticulate or smooth **MISCOGASTERINAE** (part) (p. 95)

– Antennae inserted higher, distinctly above the level of the ventral edge of the eyes ; axillae (cf. Text-figs. 316, 317, 511) widely separated, so that the scutellum touches the mesoscutum on a broad base ; clypeus most often striate . . . . . **PTEROMALINAE** (part) (p. 352)

47 (33) Antennae with three anelli and five funicular segments (*Nikolskayana* only) **PTEROMALINAE** (part) (p. 352)

– Antennae with one anellus, or without anelli ; with seven or eight funicular segments 48

48 (47) Head (Text-fig. 47) massive, in female much, in male somewhat, broader than thorax ; clypeus with strong radiating striae which extend some distance up the face and genae ; inner orbits of eyes virtually parallel. Head and thorax without conspicuous piliferous punctures. Antennal formula 11083 (anelli not clearly differentiated) . . . **CRATOMINAE** (p. 848)

– Head less massive, not much broader than thorax ; clypeus without strong radiating striae (nearly always reticulate without any striae) ; inner orbits of eyes usually diverging ventrad, sometimes strongly so. Head and thorax sometimes with conspicuous piliferous punctures ; antennae often with an anellus 49

49 (48) Males only. *Either* the pedicellus has a comb of outstanding hairs beneath (Text-fig. 42) ; *or* the coxae, gastral petiole, and base of gaster are all more or less red, the propodeal spiracles are small, circular, and separated by much more than their own diameter from the hind margin of the metanotum **EUPELMIDAE** (part)

– *Either* females ; *or* males in which the antennal pedicellus lacks a comb of outstanding hairs beneath, the coxae petiole and base of gaster are not simultaneously red, and the propodeal spiracles are not more than their own diameter from the hind margin of the metanotum **CLEONYMINAE** (p. 35)

50 (28) Antennae with two or more anelli 51

– Antennae with only one anellus (11173) 54

51 (50) Either the hind femora beneath have a tooth, some teeth, or fine serrations ; or else the occiput is margined . . . . . **TORYMIDAE** (part)

– Hind femora without teeth or serrations ; occiput not margined . . . 52
52 (32) Antennae with two anelli . . . . . **TORYMIDAE** (part)
– Antennae with three or more anelli 53
53 (52) Proximal segments of antennal flagellum increasing gradually in size, so that there is no very clear distinction between anelli and funicular segments **TORYMIDAE** (part)
– Antennae with three anelli which are obviously smaller than any of the succeeding funicular segments (antennal formula 11353) **PTEROMALINAE** (part)
54 (50) Anterior margin of metapleuron not sinuate ; ventral edge of hind femora without teeth or serrations ; occiput not margined **EUPELMIDAE** (part)
– Either the anterior margin of the metapleuron is sinuate (Text-fig. 15) ; or the ventral edge of the hind femora has a tooth, teeth, or fine serrations ; or the occiput is margined . . . . . **TORYMIDAE** (part)

CLEONYMINAE

Head in frontal view (Text-fig. 41) with the inner orbits diverging strongly in their lower part, at an angle of 20° to 45° to the vertical. Antennae either with one anellus and seven funicular segments ; or without anelli but with eight funicular segments ; clava solid, two-segmented, or three-segmented. Mandibles bi- or tridentate. Pronotum relatively large, its median length from nearly half, to as great as, that of the mesoscutum. Mesoscutal notauli complete or incomplete. Postspiracular sclerite relatively large, sometimes pilose. Hind tibiae with two apical spurs.

The concept of this group has changed considerably since its proposal by Walker (1833 : 370). His diagnosis is very vague, and it is not clear from his later work what he supposed the limits of the group to be. Förster (1856 : 46–47) brought together a heterogeneous assemblage of genera under the family name Cleonymoidae; these genera are now referred to three different families of Chalcidoidea. Thomson (1878 : 3–4) treated the group as a subtribe Cleonymides of his tribe Pteromalina, including in it 5 genera, 4 of which are now referred to Pteromalinae. Ashmead (1904 : 280–286) redefined a family Cleonymidae, to some extent following Förster's and Thomson's ideas but adding others of his own. His Cleonymidae includes several genera which are currently referred to Pteromalinae. Schmiedeknecht (1909 : 149–169) adopted Ashmead's concepts, except that he reduced the group to the rank of a subfamily. Kerrich & Graham (1957 : 265–311) followed to a large extent the arrangement proposed by Ashmead, simply for reasons of convenience, although they had realized the diversity of the elements composing his group. Bouček's study of Cleonyminae (1958 : 353–386) was a great advance on earlier ideas. After removing a number of genera which had no connection with *Cleonymus* and its allies, Bouček succeeded in defining Cleonyminae (ibid. : 354) in a very satisfactory manner. He gave sound reasons for regarding the group as merely a subfamily of Pteromalidae, and divided it into several tribes. My own views are in close agreement with his, the only point regarding which I feel some doubt being the systematic position of the genus *Oodera* Westwood. In the above paper Bouček transferred this genus from Eupelmidae to Pteromalidae Cleonyminae. I would myself prefer to keep it in Eupelmidae, although I admit that Bouček has some valid

reasons for his view. The genus in fact forms a link between Eupelmidae and Cleonyminae, having some characters peculiar to both. These two groups must I think have originated from a common stock. Their respective females have in most cases diverged considerably in structure, their males on the whole less so. The latter fact makes it difficult to separate Eupelmidae from Pteromalidae by a set of characters which will apply consistently to both sexes. Much further research upon exotic Cleonyminae will be necessary before a solution to this difficulty can be found.

Chalcedectinae, a group most highly developed in South America and Australia, are distinguished from Cleonyminae by their greatly swollen hind femora, which are armed beneath with teeth or serrations, much as in Chalcididae. Bouček regards this group as a separate subfamily of Pteromalidae. Except in the characters of the hind femora they certainly appear to be very close to Cleonyminae, but are perhaps better kept separate for the present. Typical Chalcedectinae are not known from Europe. Steffan (1964 : 104–106) has described a new genus and species from France, *Agrilocida ferrierei*, of which only the male is known. This has the hind femora strongly swollen and serrate beneath as in Chalcedectinae, but differs in some other characters from typical members of that subfamily. Perhaps it should form a subfamily of its own. Meanwhile it is placed provisionally in Cleonyminae, from all other European members of which it may be distinguished by the characteristic hind femora.

Cleonyminae are better represented in subtropical and tropical regions, where some very large and striking forms occur, than in the temperate zones.

Key to European Genera

1 Wings rudimentary, not reaching beyond level of propodeal spiracles . . ***PANNONIELLA*** Erdős (p. 40)

Wings fully developed 2

2 (1) Fore wing with base of parastigma much thickened and forming a callus which bears a group of black bristles. Scrobes deep, their sides with a sharp edge, at least ventrally. Fore femora, except in dwarfs, with teeth or serrations beneath.

Females with last segment of antennal funicle of normal shape, symmetrical and without a process ; clava without a terminal stylus ; ovipositor sheaths distinctly exserted . . ***HEYDENIA*** Förster (p. 39)

– Fore wing with base of parastigma not thickened, without a group of black bristles. Scrobes shallow or very shallow, their sides not sharply defined. Fore femora without teeth or serrations beneath.

Females with last segment of antennal funicle asymmetrical, ventrally (Text-fig. 60) produced into a process which lies along the basal part of the clava, the latter apically acuminate or with a stylus ; ovipositor sheaths not, or only very slightly, exserted 3

3 (2) Fore wing almost wholly pilose, without a speculum. Propodeum (medially) shorter than the scutellum. Head, and dorsum of thorax excluding propodeum, thickly and conspicuously pilose ; eyes densely, though sometimes shortly, pilose. Antennal flagellum of *male* without branches ***CLEONYMUS*** Latreille (p. 37)

– About the basal third of the fore wing bare or nearly so. Propodeum (medially) as long as the scutellum. Head, and dorsum of thorax often with sparse or

less conspicuous hairs ; eyes sometimes with inconspicuous pubescence. Antennal flagellum of *male* with five or six branches 4

4 (3) *Females* with the three basal tergites of the gaster subequal in length ; head in dorsal view less than twice as broad as its maximum length ; its length in the middle about equal to the distance between the eyes ; propodeum with a complete median carina. *Males* with antennal flagellum with five branches . . . . . ***NOTANISUS*** Walker (p. 41)

– *Females* with second tergite of gaster extremely short, transversely linear ; head in dorsal view fully twice as broad as its maximum length ; its length in the middle less than the distance between the eyes ; median carina present only at the front of the propodeum, or at least not reaching its hind margin. *Males* with antennal flagellum with six branches ***PANNONIELLA*** Erdös (p. 40)

CLEONYMUS Latreille

Cleonymus Latreille, 1809 : 29. Type-species : *Diplolepis depressa* Fabricius, 1804, by designation of Latreille, 1810 : 436.
Cleonymus Latreille ; Walker, 1837 : 349.
Cleonymus Latreille ; Thomson, 1878 : 4.
Cleonymus Latreille ; Schmiedeknecht, 1909 : 155, 156, 160.
Cleonymus Latreille ; Nikol'skaya, 1952 : 210.
Cleonymus Latreille ; Kerrich & Graham, 1957 : 267–270.
Cleonymus Latreille ; Ferrière & Kerrich, 1958 : 22, 25.
Cleonymus Latreille ; Bouček, 1958 : 363, 369.
Cleonymus Latreille ; Peck *et al.*, 1964 : 42.

Two European species were recognized as a result of the revision by Kerrich (*in* Kerrich & Graham, 1957).

Key to European Species

(Males)

1 Head, and dorsum of thorax with strong bronze, brassy, or coppery reflections. Fore wing with distinct fuscous markings, a usually broad transverse band across the stigmal vein, often another below the parastigma, the two bands sometimes joined by a curved dark streak. Malar space at least a little more than half the length of an eye. Eyes separated by their own length or even very slightly more ***laticornis*** Walker (p. 38)

– Head, and dorsum of thorax dull green to blue-green, with at most faint brassy reflections. Fore wing immaculate or with only a faint transverse fuscous band across the stigmal vein. Malar space slightly less than half, or barely half, the length of an eye. Eyes slightly larger than in *laticornis*, separated by about 0·9 times their length . . . . . ***obscurus*** Walker (p. 39)

(Females)

1 Head, and dorsum of thorax, with strong brassy to coppery reflections. Fore wing with sharply-defined fuscous markings (as in male, q.v.). Gaster 2·7 to 3·1 times as long as broad. Malar space at least very slightly more than half the length of an eye, nearly two thirds in one specimen. Eyes separated by 0·9 to 1 times their own length . . . . . ***laticornis*** Walker (p. 38)

– Head and dorsum of thorax dull green or blue-green, without or with at most weak brassy reflections. Fore wing with fuscous markings more indefinite, the transverse bands not joined, sometimes faint. Gaster about 2·5 times as long as broad. Malar space approximately half the length of an eye. Eyes separated by 0·8 to 0·85 times their own length . . . . . ***obscurus*** Walker (p. 39)

Cleonymus laticornis Walker
(Text-figs. 41, 48)

Ichneumon depressus Fabricius, 1798 : 231, no. 220 [♀] [*nec* Gmelin 1790].
Ichneumon depressus Fabricius ; Coquebert, [?1798] 1799 : 21, pl. 5, fig. 5 [♀].
Diplolepis depressa Fabricius, 1804 : 151.
Cleonymus depressus (Fabricius) Westwood, 1828 : 16, pl. 2, fig. 1, ♀.
Cleonymus depressus (Fabricius) Walker, 1837 : 350, ♂ ♀.
Cleonymus laticornis (Haliday MS.) Walker, 1837 : 351, ♂.
Cleonymus depressus (Fabricius) Kerrich & Graham, 1957 : 267–270, ♂ ♀.
Cleonymus depressus (Fabricius) Ferrière & Kerrich, 1958 : 25, ♂ ♀.

Type material. *Ichneumon depressus* Fabricius. The original record given by Fabricius (1798 : 231) is " Habitat Parisiis Dom. Bosc." The species was later figured in colour by Coquebert (1799, pl. 5, fig. 5), whose work comprises illustrations of the insects in the Paris Museum which had been described by Fabricius. From these two references one might expect the type or types of *depressus* to be in the collection of Bosc d'Antic which is still preserved in the Musée d'Histoire naturelle, Paris. In 1962 I examined the Bosc collection but was unable to find any specimen of *depressus* ; it may have been subsequently lost. Coquebert's figure agrees very well indeed with the female of *Cleonymus depressus* as generally understood. In the private collection of Fabricius (Kiel University) there is one specimen, attached to the pin of which is a piece of paper on which is written (in a handwriting probably that of Fabricius himself) " depressus ". This specimen lacks the head and gaster but is clearly a female of *Cleonymus depressus* in the generally accepted sense. If no material is subsequently discovered in Paris, then the Kiel specimen should be taken as lectotype.

The name *Ichneumon depressus* Fabricius is twice a primary homonym, being preoccupied by *I. depressus* Gmelin *in* Linnaeus, 1790, *Syst. Nat.*, ed. 13, 1 : 2687, and by *I. depressus* Gmelin *in* Linnaeus, 1790, *op. cit.* : 2706.

Cleonymus laticornis Walker. Type (probably holotype) male in Haliday collection (no. 68) ; it bears a white ticket numbered " 583 ", also a pink label " laticornis " in Haliday's handwriting. The species was placed in synonymy with *depressus* (F.) by Kerrich & Graham (1957 : 268). The type of *laticornis* differs from all the other British males I have seen in its very dark legs ; the coxae are black with a metallic tinge, the femora blackish except at their tips ; and the tibiae are fuscous, pale only at their bases and tips ; the wing-markings are less strong than usual.

Widely distributed in EUROPE.

Biology. Parasitic on xylophagous Coleoptera ; reared in England from *Molorchus minor* L. (Cerambycidae), see Kerrich & Graham (1957 : 269). On

sunny days in May and June, females may be seen searching for their hosts on the boles and branches of old trees (particularly *Salix* and *Corylus*) attacked by beetles. I have watched females marching to and fro, rather slowly and deliberately, their antennae tapping on the wood ; after walking a few inches they turn abruptly (like a sentry on duty) and proceed in the opposite direction. May–June ; some records for July and August.

Westwood (1839, *Introd. Mod. Class. Ins.*, **1** : 272) stated that *depressus* had been reared as a parasite of the larvae of *Ochina hederae* [Müll.; = *ptinoides* Marsh.] (Col., Anobiidae) on a crab-tree covered with ivy. Lichtenstein (1919 : 273) recorded it in France as having emerged in October from branches of a nut-tree in which there were numerous larvae of *Gracilia minuta* F. (Col., Cerambycidae), and stated that he had also been given a specimen which had emerged from branches of " ronce " [*Rubus*] which were similarly attacked by *Gracilia*. Thompson (1946 : 269) wrongly cited the above host as " Gracilaria " [Lep.]!

Cleonymus obscurus Walker

Cleonymus obscurus Walker, 1837 : 352, ♂.
Cleonymus depressus Thomson, 1878 : 5–6, ♀. [*nec* Fabricius, 1798].
Cleonymus thomsoni Erdös, 1957 : 361 [n. n. for *depressus* Thomson *nec* Fabricius].
Cleonymus obscurus Walker ; Kerrich & Graham, 1957 : 269–270, ♂ ♀.
Cleonymus obscurus Walker ; Ferrière & Kerrich, 1958, : 25, ♂ ♀.

Type material. *Cleonymus obscurus* Walker. Lectotype (possibly holotype) ♂ recognized by Kerrich & Graham (1957 : 270) ; it bears a Waterhouse label, and is indexed as Type Hym. 5. 1627.

BRITAIN, FRANCE, SWEDEN, CZECHOSLOVAKIA.

Biology. Reared in France from *Scolytus scolytus* F. (Kerrich & Graham, 1957 : 270) ; Bouček (1958 : 369) considered that a female reared in Czechoslovakia from *Hylesinus toranio* Bern. probably belonged to *obscurus*. Imagines July–Aug.

HEYDENIA Förster

Heydenia Förster, 1856 : 46, 48, 49. Type-species : *H. pretiosa* Förster, by monotypy.
Heydenia Förster ; Schmiedeknecht, 1909 : 154, 156, 158.
Heydenia Förster ; Nikol'skaya, 1952 : 209.
Heydenia Förster ; Heqvist, 1957*a* : 39–48.
Heydenia Förster ; Bouček, 1958 : 365–369.
Heydenia Förster ; Peck *et al.*, 1964 : 29.

Heqvist (1957*a*) revised the world species of this genus. In Europe only one species is known to occur.

Heydenia pretiosa Förster

Heydenia pretiosa Förster, 1856 : 49, ♂ ♀.
Heydenia excellens Wachtl, 1889 : 89–91, ♂ ♀.
Lycisca Silvestrii Russo, 1939 : 195–205, ♂ ♀.

Heydenia pretiosa Förster ; Heqvist, 1957*a* : 40–43, ♂ ♀.
Heydenia silvestrii (Russo) Heqvist, 1957*a* : 47–48, ♂ ♀.
Heydenia pretiosa Förster ; Bouček, 1958 : 368–369, ♂ ♀.
Heydenia pretiosa Förster ; Hedqvist, 1963 : 53–54, ♂ ♀.

Type material. Types of *Heydenia pretiosa* Förster, *H. excellens* Wachtl, and *Lycisca silvestri* Russo, re-examined by Bouček (1958 : 365–366). *H. excellens* Wachtl was placed in synonymy with *pretiosa* Förster by Heqvist (1957 : 40) and this synonymy was confirmed as correct by Bouček (1958 : 365). *Lycisca silvestrii* Russo was transferred to *Heydenia* by Heqvist (1957*a* : 47) who remarked that it appeared to be very near *pretiosa* Förster ; later Bouček (1958 : 368) synonymized *silvestrii* with *pretiosa*.

The variation of *pretiosa* is discussed by Bouček (1958 : 365–368) and is particularly evident in the structure of the fore femora in males, a range of variations being illustrated by the same author (1958, figs. 10–24).

FRANCE, SWEDEN, FINLAND, GERMANY, AUSTRIA, CZECHOSLOVAKIA, HUNGARY, ITALY, U.S.S.R.

Biology. Parasite of various Ipidae, especially *Myelophilus minor* Htg., but also *Ips acuminatus* Gyll. and *I. typographus* L.; and of *Scolytus ratzeburgi* Jans. It has been reared in Italy from olive-branches together with species of Scolytidae (*Phloeotribus scarabaeoides* Bern., *Leperesinus fraxini* (Pz.) and *Hylesinus toranio* Bern.) ; in Slovakia from fir branches with *Pityokteines vorontzovi* Jac. and from elm branches with *Scolytus pygmaeus* F., *S. multistriatus* (Marsh.), *Magdalis armigera* (Geoffr.) and species of Cerambycidae ; for details see Bouček (1958 : 368) and Hedqvist (1963 : 54). Imagines mainly in June (single records for March, Aug. and Dec.).

PANNONIELLA Erdös

Pannonica Erdös, 1946 : 131. Type-species : *P. sexramosa* Erdös, by original designation [generic name pre-occupied by *Pannonica* Loerenthey, 1895, *Földtani közlöny*, **25** : 392].
Pannonica Erdös, 1957 : 61.
Pannonica Erdös ; Boucek, 1958 : 371.
Pannoniella Erdös, 1960 : 306 [n. n. for *Pannonica* Erdös *nec* Loerenthey].
Pannoniella Erdös ; Peck *et al.*, 1964 : 29.

Only one species is known.

Pannoniella sexramosa (Erdös)

Pannonica sexramosa Erdös, 1946 : 132–133, ♂.
Pannonica sexramosa Erdös, 1957 : 361, ♀.
Pannonica sexramosa Erdös ; Bouček, 1958 : 371, figs. 25–26, ♂ ♀.
Pannoniella sexramosa (Erdös) ; Erdös, 1960 : 306.

Type material. Holotype ♂, Hungary, Högyész, 26.vi.1946 (*Erdös*) in coll. Erdös.

FRANCE, AUSTRIA, CZECHOSLOVAKIA, HUNGARY, BULGARIA, U.S.S.R.

Biology. Parasite of *Tetramesa* species (Eurytomidae) in culms of Gramineae ; Bouček (1958 : 371) records having reared it in Bohemia from *Tetramesa* [=*Harmolita*] *calamagrostidis* (Hed.) in culms of *Calamagrostis*. Imagines Apr.–July.

According to Bouček (1958 : 371) most females have rudimentary wings, the form with fully developed wings being comparatively rare.

NOTANISUS Walker

Notanisus Walker, 1837 : 352. Type-species : *N. versicolor* Walker, by monotypy.
Notanisus Walker ; Schmiedeknecht, 1909 : 155, 164.
Notanisus Walker ; Nikol'skaya, 1952 : 210–211.
Notanisus Walker ; Kerrich, 1957 : 270, figs. 6-8.
Notanisus Walker ; Bouček, 1958 : 363, 369–371.
Notanisus Walker ; Bouček, 1961*b* : 471–474.
Notanisus Walker ; Peck *et al.*, 1964 : 30.

The generic characters of *Notanisus* are discussed by Bouček (1961*b*). Two species are now known.

Key to European Species

(Females)

The following key is adapted from that of Bouček (1961*b* : 474).

1 Petiole of gaster about 1·5 times as long as broad, its length more than half the median length of the propodeum. Disc of propodeum, except the median crenulated double groove, smooth. Scutellum moderately convex, its reticulation sharp and deep, with the bottom of the individual areolae shiny. Fore wing with hyaline band between the fuscous fasciae equally wide throughout ; postmarginal vein longer than the stigmal vein. Antenna with anellus transverse ; flagellum relatively less slender . . . . . ***versicolor*** Walker (p. 41)

– Petiole of gaster transverse, its length only about one quarter the median length of the propodeum. Disc of propodeum distinctly reticulate. Scutellum weakly convex and quite dull, its reticulation extremely dense, much denser than that of the mesoscutum. Fore wing with hyaline band constricted in the middle ; postmarginal vein about as long as the stigmal vein. Antenna with anellus quadrate ; flagellum relatively more slender . . . . . ***clavatus*** Bouček (p. 42)

Notanisus versicolor Walker

Notanisus versicolor Walker, 1837 : 352–353, ♀.
Notanisus versicolor Walker ; Haliday, 1841–1842 : v, pl. A. fig. 3, ♀.
Notanisus versicolor Walker ; Kerrich, 1957 : 270, figs. 6–8, ♀.
Notanisus versicolor Walker ; Bouček, 1958 : 369–371, fig. 27, ♂ ♀.
Notanisus versicolor Walker ; Bouček, 1961*b* : 474, ♂ ♀.

Type material. One female, designated as type by Kerrich (1957 : 270) ; it bears a Waterhouse label.

France, Czechoslovakia, Jugoslavia, Georgia, Italy, Spain, Algeria.

Biology. Unknown. Fulmek (1957 : 172, 174) mentions it as an Aphid parasite but Bouček (1958 : 371) thinks that it probably parasitizes insects living in grasses, as does *Pannoniella*. Imagines June–Aug.

Notanisus clavatus Bouček

Notanisus clavatus Bouček, 1961*b* : 471–474, ♀.

Type material. Holotype ♀, Transcaucasia, Georgia, Lisic ozero near Tbilisi, vi.1957 (*J. Dlabola*) in Národní Museum, Prague (Cat. no. 2912).

The male of *clavatus* is unknown.

GEORGIA.

Biology. Unknown.

MACROMESINAE

Antennae of male 13-segmented (formula 11173), of female 12-segmented (formula 11172). All tarsi of male five-segmented ; tarsi of female heteromerous, fore and hind tarsi five-, mid tarsi four-segmented ; first segment of mid tarsi in female very long. Head somewhat Eupelmoid in facies ; inner orbits of eyes diverging rather strongly in their lower part ; face, between malar sulcus and antennal torulus, usually with a supplementary longitudinal impressed line ; both mandibles with three teeth. Notauli complete. Hind margin of propodeum almost truncate (Text-fig. 65). Postspiracular sclerite absent, or imperfectly developed and marked off from the mesopleuron by a superficial groove only. Fore wing (Text-fig. 66) venation characteristic : basal vein indicated by an oblique pigmented spur which projects from the parastigma. Other characters of the genus *Macromesus* are listed by Graham (1959*a* : 77).

The only known representative of this group, *Macromesus* Walker, was originally described as being possibly allied to the Eupelmidae. It was not captured again for nearly a century, and the characters attributed to it by Ashmead (1904) and Schmiedeknecht (1909) were not based on personal observation but drawn from Walker's description ; they placed the genus in Cleonymidae and in Cleonyminae respectively. In 1943 Kryger captured *Macromesus* and described it under the name *Wesenbergia* ; he did not place it in any of the recognized families, although he noted certain characters in which it appeared to resemble Torymidae (= Callimomidae). *Macromesus amphiretus* Walker, the type-species, was recognized by Graham (1959*a*) who erected a new subfamily of Pteromalidae, Macromesinae, for its reception. Later in the same year Szczepański added some further information on the structure and biology of the genus, but proposed for it a tribe Macromesini in the subfamily Tridyminae. It seems to me, however, to have little in common with any Tridymine, and I prefer to retain for it the subfamily Macromesinae. Bouček (1961 : 57) suggested that its nearest relations appeared to be the genera *Cea* and *Spalangiopelta*. There are certainly some resemblances between these two genera and *Macromesus*, but more study is needed before it can be assumed that a real affinity exists between them.

MACROMESUS Walker

Macromesus Walker, 1848 : 106, 161. Type-species : *N. amphiretus* Walker, by monotypy.
Macromesus Walker ; Schmiedeknecht, 1909 : 168.
Wesenbergia Kryger, 1943 : 360. Type-species : *W. occulta* Kryger, by monotypy and original designation.
Crossotomoria Delucchi, 1956 : 173. Type-species : *C. filicornis* Delucchi, by monotypy.

Macromesus Walker ; Graham, 1959*a* : 73–78.
Macromesus Walker ; Szczepański, 1959 : 97–104.
Macromesus Walker ; Heqvist, 1960 : 140–143.
Macromesus Walker ; Bouček, 1961 : 57.
Macromesus Walker ; Ghesquière, 1963 : 81–90.

The genus *Macromesus* remained unrecognized after its description until 1959, when I redescribed it on the basis of fresh material compared with Walker's description, the type of its single included species being apparently lost. Later I found the type specimen, which confirmed the correctness of my interpretation (see below under *amphiretus*). Heqvist subsequently (1960 : 140) placed *Wesenbergia* Kryger in synonymy with *Macromesus*. *Crossotomoria* Delucchi was synonymized with *Macromesus* by Ghesquière (1963 : 82, 85). I am not sure whether the genus *Crossotomoria* is valid ; it was named but not described, whilst no formal description of a type-species was given, the single included species *C. filicornis* was, however, fully described.

Macromesus has already proved to be widely distributed. Besides the European species *amphiretus* Walker, Heqvist (1960) has described a new species *americanus* from the U.S.A. ; in 1956 Delucchi described another new species (as *Crossotomoria filicornis*) from the Belgian Congo ; and Ghesquière (1963 : 86–89) a fourth species *africanus* from Morocco. I have examined additional material from Corsica, India, and New Zealand, which may represent other (undescribed) species. Ghesquière (1963 : 89–90) has given a key to the described species. The species are parasites of Scolytidae and Curculionidae on coniferous trees.

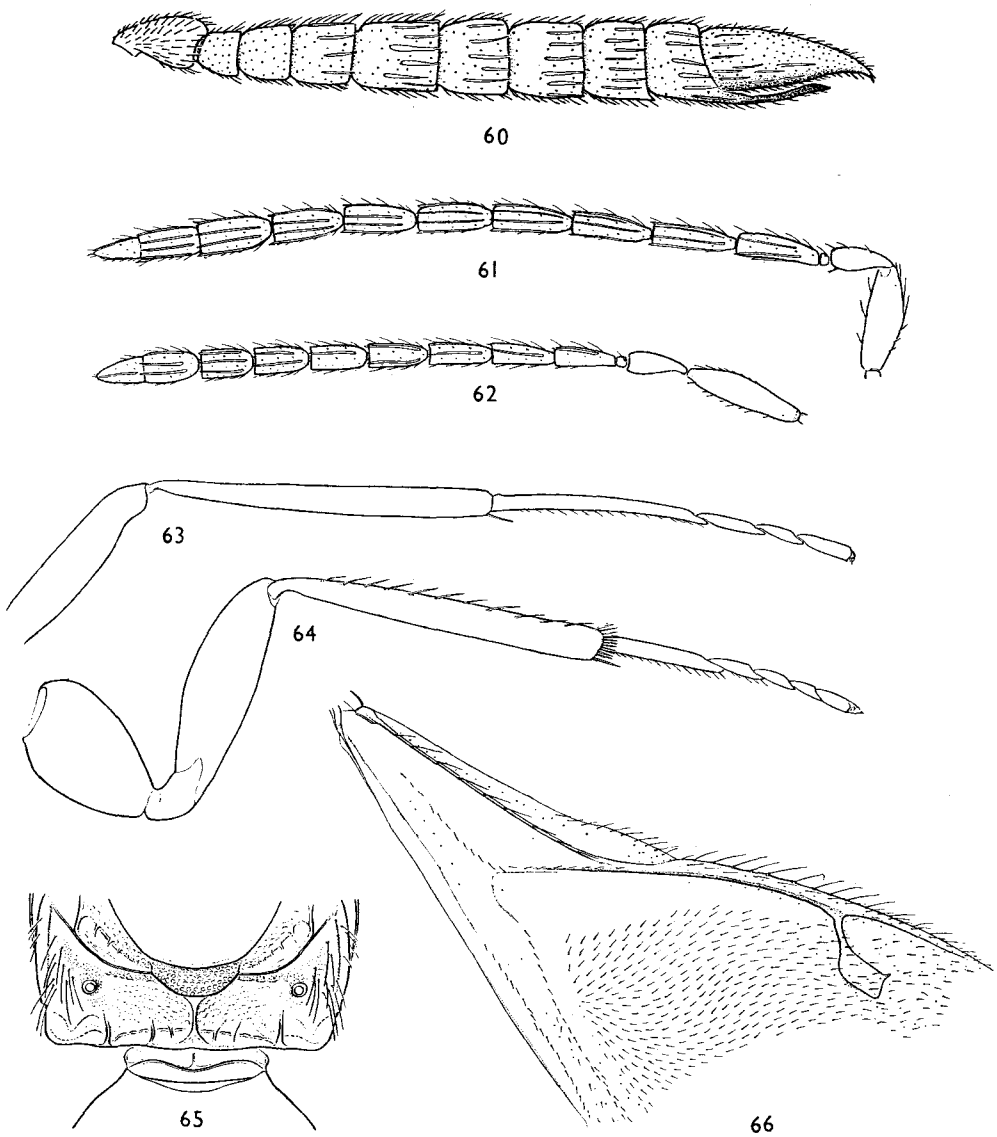
Macromesus amphiretus Walker
(Text-figs. 40, 61–66)

Macromesus amphiretus Walker, 1848 : 106, 162, ♀.
Wesenbergia occulta Kryger, 1943 : 362–363, ♂ ♀.
Macromesus amphiretus Walker ; Graham, 1959*a* : 73–78, ♂ ♀.
Macromesus amphiretus Walker ; Szczepański, 1959 : 97–104.
Macromesus amphiretus Walker ; Heqvist, 1960 : 142, ♂ ♀.
Macromesus amphiretus Walker ; Ghesquière, 1963 : 85, 89–90.

Type material. *Macromesus amphiretus* Walker. In a previous paper (1959*a* : 73) I stated that the type-material of *amphiretus* appeared to be lost. In 1961, however, I found in the BM(NH) a female specimen in a drawer not incorporated with the main collection. This agrees well with the description and is undoubtedly a Walker specimen ; it bears a printed label MACROMESUS and is now designated LECTOTYPE of *amphiretus*. It also agrees with my redescription of the genus (1959*a* : 77) and with the diagnosis of *amphiretus* given by Heqvist (1960 : 142). The species has been redescribed by Szczepański (1959).

Wesenbergia occulta Kryger. Syntypes, not seen by the writer, 1 ♂ and 1 ♀, mounted on separate slides, in Universitetets Zoologiske Museum, Copenhagen. Denmark, North Sealand, Strødam, ♂ 10.v.1931, ♀ 4.v.1930 (*Kryger*).

BRITAIN, DENMARK, SWEDEN, FINLAND, POLAND, CZECHOSLOVAKIA.



FIGS. 60–66. 60, *Cleonymus laticornis* Walker, ♀, antenna, excluding scape ; 61, *Macromesus amphiretus* Walker, ♂, left antenna ; 62, same, ♀, left antenna ; 63, same, ♀, right mid leg ; 64, same, ♀, right hind leg ; 65, same, ♀, metanotum and propodeum ; 66, same, ♀, fore wing, part.

Biology. Recorded as a parasite of the bark-beetle *Phthorophloeus spinulosus* Rey in Sweden, by Heqvist (1960 : 140) ; of *Pityophthorus micrographus* (L.) and *Polygraphus* sp. on *Picea excelsa* Link. in Poland, by Szczepański (1959 : 103) ; and of *Pityogenes* (*Pityoceragenes*) *bistridentatus* Eich. in Slovakia (Ghesquière, 1963 : 85). Imagines May and Oct.–Nov.

CEINAE

The type-genus of this group, *Cea* Walker, was originally placed in the vicinity of other genera which are for the most part now referred to Eupelmidae and Cleonyminae. Förster (1856 : 46, 47–48) placed it in his family Cleonymoidae, which was an unnatural assemblage of genera which belong to three different families according to modern concepts. Förster's view was followed by Ashmead (1904) and Schmiedeknecht (1909). Bouček, however (1952 : 157–160) considered the group including *Cea* Walker and *Spalangiopelta* Masi to be a relatively isolated one showing some affinities with Diparinae (= Lelapinae), Cerocephalinae, and Spalangiinae. Later (1961 : 55, 57) he established the tribal name Ceini for this group ; and in his Key to the Czechoslovak Pteromalidae (*in* Peck *et al.*, 1964 : 29) he raised it to the rank of a subfamily. I had independently come to the conclusion that the latter represented appropriate status for the group.

Key to European Genera

(*Note:* macropterous and brachypterous forms occur in both genera.)

1 Hind margin of mesopleuron raised above the level of the metapleuron and partly covering it. Fore wing in macropterous forms with at most a fuscous cloud in the middle. Antennae of female with at least some of the funicular segments distinctly less than twice as long as broad . ***SPALANGIOPELTA*** Masi (p. 46)

– Mesopleuron lying in virtually the same plane as the metapleuron, and not overlapping it. Fore wing in macropterous forms with two fuscous clouds, one below the base of the marginal vein, the other below the stigma. Antennae of female with the funicular segments about twice as long as broad . . ***CEA*** Walker (p. 45)

CEA Walker

Cea (Haliday MS.) Walker, 1837 : 355. Type-species : *C. pulicaris* Walker, by monotypy.
Cea Walker, 1851 : 213.
Cea Walker ; Förster, 1856 : 46, 47–48.
Cea Walker ; Schmiedeknecht, 1909 : 154, 155, 157–158.
Cea Walker ; Jansson, 1945 : 44–50.
Cea Walker ; Nikol'skaya, 1952 : 209.
Cea Walker ; Bouček, 1952 : 157–160.
Cea Walker ; Kerrich, *in* Kerrich & Graham, 1957 : 276.
Cea Walker ; Ferrière & Kerrich, 1958 : 22, 25.

Cea pulicaris Walker
(Text-fig. 51)

Cea pulicaris Walker, 1837 : 356, ♀.
Cea pulicaria Haliday, 1841–1842 : vi, pl. O, figs. 4, 4a, ♀.

Cea Irene Walker, 1851 : 213, ♀.
Cea pulicaria Haliday ; Förster, 1856 : 48.
Cea pulicaris Walker ; Jansson, 1945 : 48, ♂, fig. 2, ♀.
Cea Irene Walker ; Jansson, 1945 : 48, fig. 3, ♀.
Cea pulicaris Walker ; Bouček, 1952 : 158, 159, 160, ♂ ♀.
Cea pulicaris Walker ; Kerrich & Graham, 1957 : 276.
Cea pulicaris Walker ; Ferrière & Kerrich, 1958 : 25.
Cea pulicaris Walker ; Bouček, 1961 : 55–56.

Type material. *Cea pulicaris* Walker. Type (probably holotype) ♀, Ireland, Co. Down, Holywood (*Haliday*) in Haliday coll. ; it was mounted on a card and the pin bears a green label " pulicaris " in Haliday's handwriting, also a white one " 587 "; I have given the specimen the serial number (Haliday coll. 11). In 1954 I examined the type which was in perfect condition except that the clava was missing from both antennae ; the figures in *Entomologist* **1** (pl. O, figs. 4, 4a) which were drawn by Haliday himself, show the antennal clava as missing, so that the illustrations must have been made from the type female. Unfortunately the type has since been broken off the card by some person and lost.

Cea irene Walker. Type (probably holotype) ♀ (Ireland) in Haliday coll. ; it is mounted on a card and bears a label " Cea Irene " in Walker's handwriting ; I have given it the serial number (Haliday coll. 10). When first examined by the writer only the wings and legs of the type remained, the rest had been broken off sometime before 1922, when Blood noted its damaged condition in his manuscript.

Jansson (1945 : 44–50) recorded having taken, in the vicinity of Örebro in Sweden, females of both *pulicaris* and *irene*, as well as winged males which he referred to *pulicaris*. He captured all his specimens in the same locality and concluded that *pulicaris* and *irene* were respectively the brachypterous and macropterous forms of one species, *pulicaris* Walker. The characters of the male of *pulicaris* were diagnosed, and its antenna figured, by Bouček (1952 : 160, fig. 4).

BRITAIN, IRELAND, SWEDEN, GERMANY, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Bouček (1961 : 55–56) examined a female of *pulicaris* from northern Germany, which had been reared from a mine of *Phytomyza pauliloewi* Hend. (Dipt., Agromyzidae), 9.vii.1927 (Prof. *M. Hering*). Imagines July–August.

SPALANGIOPELTA Masi

Spalangiopelta Masi, 1922*c* : 169–174. Type-species : *S. brachyptera* Masi, by monotypy.
Spalangiopelta Masi ; Bouček, 1952 : 158, 160–163.
Spalangiopelta Masi ; Erdös, 1956 : 193–194.

The differences between *Spalangiopelta* and *Cea* were noted by Bouček (1952) who described a new species of the former genus and gave a key to the European species. Another species was described by Erdös (1956) who gave a revised key to the European species. I have since described a fourth species.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Wings vestigial, the fore wing not reaching the level of the middle of the propodeum. Ovipositor sheaths only slightly exserted. Antennal scape, pedicellus, and legs including the coxae, testaceous. Funicular segments of antenna only slightly longer than broad . . ***brachyptera*** Masi (p. 47)

– Wings well-developed, the fore wing reaching the tip of the gaster or beyond it. Either the ovipositor sheaths are quite strongly exserted ; or the legs are mainly blackish 2

2 (1) Fore wings reaching about level with tip of gaster, relatively narrow, strongly infumate. Ovipositor sheaths only slightly exserted. Body relatively squat. Antennae with funicular segments relatively long, the first nearly twice, the fifth 1·5 to 1·6 times, as long as broad. Legs mainly blackish ***alata*** Bouček (p. 47)

– Fore wings reaching distinctly beyond tip of gaster. Ovipositor sheaths more strongly exserted, length of their exserted portion two fifths to nearly half that of the hind tibia. Body squat or slender. Antennae with funicular segments rather shorter, the fifth hardly longer than broad . . . 3

3 (2) Antennal scape and pedicellus, and the tibiae, testaceous or brownish testaceous. Eyes slightly larger, malar space slightly less than half the length of an eye. Antennal scape not longer than an eye. Thorax more squat, 1·5 to 1·6 times as long as broad ; scutellum as broad as long, only moderately convex in the transverse axis . . . ***dudichi*** Erdös (p. 48)

– Antennae fuscous to black ; tibiae mainly fuscous. Eyes slightly smaller, malar space fully half the length of an eye. Antennal scape slightly longer than an eye. Thorax slender, 1·9 to 2 times as long as broad ; scutellum slightly longer than broad, strongly convex in the transverse axis ***procera*** Graham (p. 48)

The males of *Spalangiopelta* are not sufficiently well known for a key to be provided at present.

Spalangiopelta brachyptera Masi

Spalangiopelta brachyptera Masi, 1922*c* : 170–174, ♀.
Spalangiopelta brachyptera Masi ; Bouček, 1952 : 158, 160, ♀.
Spalangiopelta brachyptera Masi ; Bouček, 1961 : 57.

Type material. Syntypes, 2 ♀, Italy, Isle of Giglio, March 1902 ; Province of Salerno, Vallo Lucano, June 1904, in Museo Civico di Storia naturale, Genoa ; no lectotype has yet been designated.

FRANCE, ITALY, HUNGARY, RUMANIA.

Biology. Unknown.

Spalangiopelta alata Bouček

Spalangiopelta alata Bouček, 1952 : 159, 160–163, ♀.
Spalangiopelta alata Bouček, 1961 : 56.

Type material. Holotype ♀, North-eastern Bohemia, Týniště nad Orlicí, in forest humus, 5.xi.1943 (*Bouček*), in Národní Museum, Prague.

The male has not yet been described.

SWEDEN, GERMANY, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Bouček (1961 : 56) examined a female from northern Germany which had been reared 10.viii.1926 from a mine of *Scaptomyza flaveola* Mg. (Dipt., Drosophilidae) on *Cakile maritima* Scop., by O. Hering. Imagines Aug. and November.

Spalangiopelta dudichi Erdös

Spalangiopelta dudichi Erdös, 1956 : 193–194, fig. 2, ♀.
Spalangiopelta dudichi Erdös ; Graham, 1966 : 188, ♀.

Type material. Syntypes, Hungary, 14 ♀ from several localities, in coll. Erdös and in Hungarian Natural History Museum, Budapest.

CZECHOSLOVAKIA, HUNGARY, MOLDAVIAN S.S.R.

Biology. Unknown ; the specimens so far taken have been captured between October and March, in one case under moss.

Note. The figure of *dudichi* given by Erdös in his paper of 1956 is Fig. 2, which is labelled [in error, see corrigenda to his paper] " *Pseudotorymus semicarinatus* ".

Spalangiopelta procera Graham

Spalangiopelta procera Graham, 1966 : 187–188, ♀.

Type material. Holotype ♀, England, Berkshire, Wytham Wood, 23.ix.1960, in Hope Department, University Museum, Oxford.

BRITAIN, IRELAND, SWEDEN.

Biology. Unknown. Imagines in Sept.

SPALANGIINAE

Includes only a single genus, *Spalangia* Latreille. It is a very distinct group and may be worthy of family rank (for a discussion of this question, see Bouček, 1963 : 431–433).

SPALANGIA Latreille

Spalangia Latreille, 1805 : 227–228. Type-species : *S. nigra* Latreille, by monotypy.
Spalangia Latreille ; Haliday, 1833 : 268, 333–335.
Spalangia Latreille ; Curtis, 1839 : folio 740.
Spalangia Latreille ; Förster, 1850 : 505–518.
Spalangia Latreille ; Förster, 1851 : 1–5.
Spalangia Latreille ; Thomson, 1878 : 207, 214–215.
Spalangia Latreille ; Ashmead, 1904 : 334.
Spalangia Latreille ; Schmiedeknecht, 1909 : 386–387.
Prospalangia Brèthes, 1915 : 314. Type-species : *P. platensis* Brèthes, by original designation.
Spalangia Latreille ; Nikol'skaya, 1952 : 250–253.
Spalangia Latreille ; Bouček, 1963 : 429–512.

Bouček's excellent monograph on *Spalangia* (1963) includes a key to, and full descriptions of, all the described Holarctic species, illustrated by admirable figures.

With his kind permission I include here a transcript (very slightly altered) of his key. The rest of my account is mainly a condensed version of the information already given in Dr. Bouček's paper, the only original contributions being a few remarks on some of the synonymy.

A detailed redescription of the genus is given by Bouček (1963 : 433), who also synonymized *Prospalangia* Brèthes with it.

Key to Holarctic Species

1		Pronotum with an isolated transverse line, composed of closely-set piliferous punctures, near its hind margin ; disc of collar more or less smooth and impunctate at least down the middle 2
–		Pronotum without any distinct isolated transverse line of piliferous punctures, though sometimes with a transverse impression in which the punctures are deeper and denser than elsewhere 7
2	(1)	Front edge of pronotal collar with a fine margin or ridge, best seen with the light coming from behind 3
–		Front edge of pronotal collar rounded off 4
3	(2)	Surface of pronotal collar nearly flat between its front edge and the posterior transverse line of punctures. *Females* with all funicular segments of antennae usually longer than broad, the distal segments rarely quadrate ; head in frontal view about 1·25 times as high as broad . ***nigroaenea*** Curtis (p. 52)
–		Surface of pronotal collar distinctly arched. *Females* with distal segments of antennal funicle subquadrate ; head in frontal view hardly 1·1 times as high as broad . . . . . ***slovaka*** Bouček (p. 52)
4	(2)	Antero-lateral parts of pronotal collar rugulose, or densely rugulosely punctate ; a discal triangle on the collar smooth, sometimes with a shallow longitudinal groove . . . . . ***cameroni*** Perkins (p. 53)
–		Antero-lateral parts of pronotal collar punctate, with wide or narrow smooth interspaces between the punctures 5
5	(4)	Pronotal collar very convex, its piliferous punctures sparse, separated by much more than their own diameter, and rather regularly distributed ; posterior transverse line of punctures often slightly angulate forwards in the middle. Distal funicular segments of female slightly transverse, of male quadrate ***endius*** Walker (p. 53)
–		Pronotal collar less convex, its piliferous punctures closer together, at least some of them separated by their own diameter or less, tending to be more irregularly distributed ; posterior transverse line of punctures curved, not angulate 6
6	(5)	Head and pronotum with very dense puncturation, except sometimes a small triangular area on the disc of the pronotal collar; pronotum subpentagonal; body and wings very hairy . . . . . [see *nigra*, couplet 9]
–		Head and pronotum with less dense puncturation, some of the interspaces wider than the punctures ; pronotal collar appearing almost semicircular in dorsal view, its sides strongly curved ; body and wings less hairy [see *slovaka*, couplet 3]
7	(1)	Pronotum, and head, very densely punctate or rugose-punctate, the interspaces much narrower than the punctures themselves, sometimes virtually absent 8
–		Pronotum sparsely punctate, with at least most of the interspaces as wide as or wider than the punctures themselves 10

8 (7) Surface of antennal scape dull, with granulate sculpture. Head and pronotum with irregular, extremely densely distributed punctures which often leave no interspaces, in places the sculpture may be rugose-punctate ***rugulosa*** Förster (p. 51)

– Surface of antennal scape, at least on its inner aspect, more or less shiny. Punctures of head and pronotum more regular and less crowded, leaving at least some narrow smooth interspaces 9

9 (8) Antennal scape longitudinally striate-reticulate. Pronotal collar with circular or subcircular piliferous punctures . . ***nigra*** Latreille (p. 51)

– Antennal scape having its outer aspect finely granulate, its inner aspect nearly smooth. Pronotal collar with most of the piliferous punctures irregular in shape [Near East] . . . . . ***irregularis*** Bouček (p. 51)

10 (7) Piliferous punctures of pronotum and head subcircular and fairly regularly distributed, the interspaces smooth and on the average about as wide as the diameter of the punctures, on the head sometimes slightly less wide ; pronotal collar semicircular. *Females* with head about as high as broad ; distal segments of antennal funicle transverse. Mid and hind tarsi in both sexes black . . . . . ***nigripes*** Curtis (p. 53)

– Piliferous punctures of pronotum and head more widely-spaced, at least some of the interspaces wider than the diameter of the punctures ; the interspaces on the pronotum sometimes with traces of alutaceous sculpture, or rugulose. *Females* with head often higher than broad ; distal segments of funicle sometimes not transverse 11

11 (10) Body, including the head, strongly depressed, flattened, not more than 1·8 mm. in length. Scutellum without a transverse line, or with this indicated only laterally by one or two punctures. *Females* with head in profile about three times as high as thick ; antennal scape very short ; second segment of funicle much smaller than the third, almost anelliform. *Males* with flagellum clothed with hairs whose length is about equal to the breadth of the segments that bear them ; first funicular segment about four times as long as the pedicellus. [North and Central America] ***drosophilae*** Ashmead

– Body not remarkably flattened ; length sometimes greater. Scutellum with or without a transverse punctate line. The other characters not agreeing with the above 12

12 (11) Pronotal collar more or less rugulose, with at least a transverse band of longitudinal rugae near the hind margin, this band indistinct in some small specimens. Transverse punctate line of scutellum complete. Tarsi usually testaceous at least proximally (occasionally wholly black in *erythromera*). *Females* with distal segments of antennal funicle transverse 13

– Pronotal collar without rugae, the interspaces between the scattered punctures smooth or finely alutaceous. Transverse line of scutellum in smaller specimens interrupted or absent. Tarsi mainly dark. Larger *females* with the distal segments of the antennal funicle not or hardly transverse . . 14

13 (12) Myrmecophilous species associated with *Lasius fuliginosus*. *Females* with legs and antennae unusually thick ; antennal flagellum very compact, third funicular segment about 1·5 times as broad as long ; gaster broad, its tergites smooth ; pronotal collar often with indications of a median longitudinal rugose groove ; only the first segment of the tarsi pale ***crassicornis*** Bouček (p. 54)

– Species not myrmecophilous. Legs and antennae not unusually thick or compact ; third funicular segment in female relatively less transverse ; gaster less broad, the tergites in most specimens with some delicate

alutaceous sculpture ; pronotal collar without a median longitudinal groove ***erythromera*** Förster (p. 54)

14 (12) *Females* with antennal flagellum in dorsal view very slender, with the first funicular segment about twice as long as broad, the distal segments subquadrate to slightly longer than broad ; transverse line of scutellum usually complete. *Males*. Length 2·1 to 2·7 mm. ; funicular segments two to seven longer than broad [Europe] . . ***subpunctata*** Förster (p. 55)

– *Females* with antennal flagellum relatively less slender, with the first funicular segment relatively shorter, the distal segments at least slightly transverse ; transverse line of scutellum usually absent or broadly interrupted in the middle, rarely complete (if so, very faint). *Males*. Length 1·3 to 2 mm. ; funicular segments two to seven subquadrate or, if longer than broad, then North American species 15

15 (14) *Females* with antennae longer, first funicular segment longer than broad, the following segments subquadrate, distal segments slightly transverse. *Males* with funicular segments two to seven longer than broad. Length 2 mm. or slightly more. Scutellum usually weakly convex. Tarsi often pale proximally. [North America] . . ***haematobiae*** Ashmead (p. 55)

– *Females* with antennae shorter, first funicular segment subquadrate, the following segments transverse, distal segments 1·5 to 2 times as broad as long. *Males* with funicular segments two to seven subquadrate. Length 1·3 to 2 mm. Scutellum flat. Tarsi black. [Europe] ***fuscipes*** Nees (p. 56)

Spalangia rugulosa Förster

Spalangia rugulosa Förster, 1850 : 507–509, ♂.
Spalangia rugulosa Förster ; Bouček, 1963 : 438, 439–440, ♂ ♀.

Type material. Lectotype ♂ in Förster coll., designated by Bouček (1963 : 439).

EUROPE (Britain, France, Germany, Switzerland, Czechoslovakia, Jugoslavia) ; CENTRAL ASIA. New to Britain, England : Berkshire, Wytham Wood, 1 ♀, 9.iv.1952 (*Graham*).

Biology. Reared in Uzbekistan from *Muscina stabulans* (Fln.) (Dipt., Muscidae); see Bouček, 1963 : 440.

Spalangia irregularis Bouček

Spalangia irregularis Bouček, 1963 : 438, 442–443, ♂ ♀.

Type material. Holotype ♂, Israel, Kirjat Anawim, 20.v.1931 (*Bodenheimer*), in Národní Museum, Prague (Cat. no. 25403).

ISRAEL, CYPRUS.

Biology. Unknown.

Spalangia nigra Latreille

Spalangia nigra Latreille, 1805 : 228.
Spalangia hirta Haliday, 1833 : 334, ♀.
Spalangia rugosicollis Ashmead, 1894 : 35, 36, ♀.
Spalangia nigra Latreille ; Bouček, 1963 : 438, 443–448, ♂ ♀.

For a detailed discussion of the identity of *nigra*, and designation of a lectotype, see Bouček (1963, 443–445).

Type material. *Spalangia hirta* Haliday was placed in synonymy with *nigra* by Bouček (1963 : 443, 445) on the basis of information supplied by the writer, who had examined Haliday's material. As no lectotype of *hirta* has been formally designated, this may now be done. Haliday's collection contains only one specimen actually labelled as *hirta*, a female which is indicated as Irish [Haliday's record states " Taken in England "] and which does not fit the description. Immediately below this specimen stands another which agrees well with the description of *hirta* and is now designated LECTOTYPE ; it bears a white original label " 592 " and a modern one " See R.C.L.P. [R. C. L. Perkins] in litt. to A.W.S. [A. W. Stelfox] 5/2/24 ". The number 592 is a serial number such as Haliday used to attach to specimens when sending them to Walker and other correspondents.

Spalangia rugosicollis Ashmead. Placed in synonymy with *nigra* Latreille by Bouček (1963 : 443) who examined specimens compared with the type of *rugosicollis* by A. B. Gahan.

Widely distributed in EUROPE (including Britain) ; NORTH AMERICA (Canada, U.S.A.) ; HAWAII.

Biology. Confirmed hosts include species of Muscidae, Anthomyiidae and Trypetidae (for details see Bouček, 1963: 448).

Spalangia nigroaenea Curtis

Spalangia nigroaenea Curtis, 1839 : folio 740, ♂.
Spalangia homalaspis Förster, 1850 : 505–507, ♂.
Spalangia astuta Förster, 1850 : 1–2, ♀.
Spalangia muscidarum Richardson, 1913 : 38–39, ♂ ♀.
? Spalangia abenabooi Girault, 1932 : 1.
Spalangia sundaica L. F. Graham, 1932 : 22, 24, ♂ ♀.
? Spalangia mors Girault, 1933 : 1.
Spalangia nigroaenea Curtis ; Bouček, 1963 : 437, 448–453, ♂ ♀.

Type material. For a full discussion of the synonymy, designation of lectotypes, and redescription of the species, see Bouček (1963 : 449–450).

EUROPE (widely distributed, including Britain), CENTRAL ASIA, AFRICA, AUSTRALIA, NORTH and SOUTH AMERICA.

Biology. Hosts chiefly various species of Muscidae, Calliphoridae and Sarcophagidae (for a full list see Bouček, 1963 : 452).

Spalangia slovaka Bouček

Spalangia slovaka Bouček, 1963 : 437, 453–454, ♀.

Type material. Holotype ♀, Czechoslovakia, S.E. Slovakia, Turna nad Bodvou, 12.viii.1948 (*Bouček*) in Národní Museum, Prague (Cat. no. 25402).

CZECHOSLOVAKIA.

Biology. Unknown.

Spalangia cameroni Perkins

Spalangia cameroni Perkins, 1910 : 656, ♂ ♀.
Spalangia melanogastra Masi, 1940 : 295–297, ♂.
Spalangia atherigonae Risbec, 1951 : 361–363, ♂ ♀.
Spalangia cameroni Perkins ; Bouček, 1963 : 437, 454–457, ♂ ♀.

Type material. *Spalangia cameroni* Perkins. Types, Oahu, Hawaii, Molokai ; not seen by Bouček or the writer, presumed to be in Bernice P. Bishop Museum, Honolulu. Bouček's interpretation of the species was based on material from Fiji identified as *cameroni* by Dr. Ch. Ferrière.

Spalangia melanogastra Masi. Holotype ♂, Italy, Villagio Duca degli Abruzzi, 1930 (*Russo*), in Museo Civico di Storia naturale, Genoa (not seen by Bouček or the writer). Viggiani (1967 : 3) found a specimen in the above museum which agreed with the description of *melanogastra* and bore the correct data ; he designated it lectotype, though presumably it is the holotype, and confirmed Bouček's surmise that it was the same as *cameroni* Perkins.

Spalangia atherigonae Risbec. Lectotype ♀, M'Bambey, Senegal, in Muséum Nationale d'Histoire Naturelle, Paris (designated by Bouček, 1963 : 454).

EUROPE (including Britain), CENTRAL and SOUTHERN ASIA, AFRICA, AUSTRALIA, PACIFIC ISLANDS, CENTRAL and SOUTH AMERICA. In some of these localities (Fiji Islands, possibly Hawaiian Islands) it has been introduced.

Biology. Hosts, various species of Muscidae, Sarcophagidae and Trypetidae (for a full list see Bouček, 1963 : 457).

Spalangia endius Walker

Spalangia endius Walker, 1839*a* : 96, ♂.
Spalangia muscidarum var. *stomoxysiae* Girault, 1916 : 37–38, ♀.
Spalangia philippinensis Fullaway, 1917 : 292, ♂ ♀.
Spalangia orientalis L. F. Graham, 1932 : 21.
Spalangia endius Walker ; Bouček, 1963 : 438, 458–461, ♂ ♀.

Type material. For a full discussion of the synonymy (which was worked out by Bouček) and designation of lectotype for *endius* Walker, see Bouček (1963 : 458–459).

EUROPE (Czechoslovakia, Cyprus), ASIA, AFRICA, AUSTRALIA, PACIFIC ISLANDS, NORTH AMERICA, BRITISH WEST INDIES, SOUTH AMERICA.

Biology. Hosts, various species of Muscidae, Calliphoridae, Sarcophagidae and Trypetidae (see Bouček, 1963 : 460).

Spalangia nigripes Curtis

Spalangia nigripes Curtis, 1839 : folio 740, ♀.
Spalangia hyaloptera Förster, 1850 : 509–511, ♂ ♀.
Spalangia formicaria Kieffer, 1905 : 1–2, ♀.
Spalangia muscarum Girault, 1920*a* : 213–214, ♀.
Spalangia nigripes Curtis ; Bouček, 1963 : 438, 461–464, ♂ ♀.

Type material. For designation of lectotypes see Bouček (1963 : 461–462) who established the above synonymy.

Widely distributed in EUROPE (including Britain) ; LEBANON and CENTRAL ASIA ; NORTH AMERICA (U.S.A.). Bouček (1963 : 464) considers that it is probably a primarily European species which has been introduced into other regions.

Biology. Hosts, species of Muscidae and Calliphoridae (see Bouček, 1963 : 464).

Spalangia crassicornis Bouček

Spalangia crassicornis Bouček, 1963 : 438, 464–466, ♂ ♀.

Type material. Holotype ♀, Czechoslovakia : Řevnice near Prague, vii.1952, taken in company with *Lasius fuliginosus* (Latr.) (*L. Masner*) in Národní Museum, Prague (Cat. no. 25401).

EUROPE (Britain, France, Holland, Luxembourg, Germany, Sweden, Czechoslovakia, Jugoslavia).

Biology. Hosts, myrmecophilous Diptera associated with the ant *Lasius fuliginosus* Latr., e.g., *Milichia ludens* Wahl. and *Phyllomyza lasiae* Collin (Milichiidae). For further details concerning the biology see Bouček (1963 : 466).

Spalangia erythromera Förster

(Text-figs. 32, 33)

Spalangia nigra Haliday, 1833 : 334 *et auctt. plur.* [*nec* Latreille, 1805].
Spalangia erythromera Förster, 1850 : 512–513, ♀.
Spalangia umbellatarum Förster, 1850 : 513–515, ♂ ♀.
Spalangia spuria Förster, 1850 : 515–516, ♀.
Spalangia erythromera Förster ; Bouček, 1963 : 439, 466–471, ♂ ♀.

Type material. For designation of lectotypes see Bouček (1963 : 466–468). This author established the synonymy cited above ; he also redescribed the species (ibid. : 468–470) and gave a valuable account of its variation.

The species for long erroneously regarded as *nigra* Latreille by British authors such as Haliday, Curtis, Walker, and Westwood, was in fact primarily *erythromera* Förster, as suggested by Bouček (1963 : 445), although Walker regarded *nigripes* Curtis and *nigroaenea* Curtis as " varieties " of " *nigra* " [= *erythromera*]. Bouček (1963 : 445) suggested that Haliday's description (1833 : 334–335) of supposed *nigra* seemed to fit rather *erythromera* Förster, in particular his statement " tolerably abundant . . . in pastures and marshes . . . ". I can confirm this from an examination of Haliday's collection, which contains several specimens of *erythromera* one of which bears his label " nigra ". *S. erythromera* is in fact the commonest species of the genus in the British Isles, as judged from collections and my own experience. Bouček (1963 : 470–472) discussed the variation of *erythromera*, which is considerable. Amongst other features he mentioned (ibid. : 470) that the tarsi of specimens from some regions, e.g., Northern Europe, may be black instead of partly testaceous. In British material I find a predominance of forms having the

first segment of the tarsi bright or reddish testaceous, the second and third segments more brownish, the fourth and fifth dark ; in some only the first segment is pale, whilst in a few the tarsi are entirely black.

Bouček (1963 : 468–470) showed by a detailed study that *erythromera* can be split on morphological characters into two forms which he regards as subspecies. The nominotypical form *erythromera erythromera* Förster, has the head of the female clearly longer than broad, the genae converging moderately, the first funicular segment longer than broad, size larger (1·7–3·2 mm.) ; whilst the male has the funicular segments clearly longer than broad, size 1·9–2·7 mm. In the form *erythromera brachyceps* Bouček, the female has the head hardly longer than broad, the genae converging strongly, the first funicular segment subquadrate, size less, rarely exceeding 2·3 mm. ; the male has the funicular segments hardly longer than broad, size relatively less. The geographical distribution of the two forms appears to be the same. This is a most interesting case and merits further study, particularly from the biological point of view.

EUROPE (widely distributed) ; ? CANADA ; ? U.S.A.

Biology. Until recently there were host records only for *erythromera brachyceps* ; I am now able to include one for *erythromera erythromera.*

S. erythromera erythromera. Dr. R. A. Beaver reared specimens of this form from puparia of *Lonchaea cariecola* Cz. collected at Wytham Wood, Berkshire, England, in June 1963. Bouček (1963 : 470–471) says that in Munich, Germany it " was taken in numbers on windows of a room where carcasses of various animals were prepared for conservation in the collections. In Czechoslovakia I often found it on windows of sties or near dung heaps . . . Males often fly on flowering umbellifers ". This agrees with my own collecting experience in England, where I have taken *erythromera erythromera* in places where cattle or other farm stock were present, and at the edge of sewage works and silos ; I have also frequently captured both sexes on the flowers of umbellifers, especially *Angelica sylvestris* L.

S. erythromera brachyceps. Bouček (1963 : 472) recorded as hosts the Muscid flies *Phorbia cinerea* Fln. and *Pegomyia* sp. in Germany ; *Phorbia platura* (Mg.) (= *cilicrura* Rond.) in Switzerland. He also mentioned that it was found associated with horse droppings in Bulgaria.

Spalangia subpunctata Förster

Spalangia leptogramma Förster, 1850 : 511–512, ♀.
Spalangia subpunctata Förster, 1850 : 516–518, ♀.
? Spalangia haematobiae Ashmead, 1894 : 35, 37, ♀.
Spalangia subpunctata Förster ; Bouček, 1963 : 439, 473–475, ♂ ♀.

Type material. For designation of lectotypes of Förster species see Bouček (1963 : 473). This author established the above synonymy and also redescribed the species. He mentioned the small differences between *subpunctata* and *haematobiae* Ashmead and suggested that the latter might eventually prove to be a form of *subpunctata.* He also (ibid. : 474–475) described the considerable variation that exists in *subpunctata.*

EUROPE (widely distributed ; including Britain), CENTRAL ASIA, NORTH AFRICA.

Biology. Bouček (1963 : 475) lists as hosts *Syritta pipiens* L. (Dipt., Syrphidae) in the Caucasus region and *Physiphora demandata* F. (Ulidiidae) in Uzbekistan ; he records that in Czechoslovakia most specimens were found associated with sheep and cattle droppings in pastures.

Spalangia fuscipes Nees

Spalangia fuscipes Nees, 1834 : 270, ♂ ♀.
Spalangia fuscipes Nees ; Bouček, 1963 : 439, 476–479, ♂ ♀.

Type material. Original material presumed lost ; Bouček (1963 : 476) discussed the question and erected as plesiotype of *fuscipes* a female from Förster's collection. This author also redescribed the species and gave notes on its variation.

EUROPE (not recorded from the British Isles) ; ASIA MINOR, NORTH AFRICA.

Biology. The only host record regarded as certain by Bouček (1963 : 477) is that of *Oscinella frit* (L.) (Dipt., Chloropidae) in the European U.S.S.R., Bulgaria, and (probably) Germany.

CEROCEPHALINAE

This subfamily appears to approach more closely to Spalangiinae than to any other subfamily in Pteromalidae. Förster (1856) placed *Cerocephala*, together with *Spalangia*, in his family Spalangoidae. Thomson (1878) included it with *Theocolax*, *Spalangia*, and other genera, in his tribe Spalangiina. Ashmead (1904) placed *Cerocephala*, *Paralaesthia*, and the *Spalangia*-group of genera in Pteromalidae, as a subfamily Spalangiinae. L. F. Gahan (1946) proposed a new subfamily Cerocephalinae, to include *Choetospila*, *Theocolax*, *Cerocephala*, *Theocolaxia*, *Paralaesthia*, *Acerocephala*, *Neosciatherus*, and *Sciatherellus* ; he gave a detailed diagnosis of the subfamily and listed the characters by which it differed from Spalangiinae. Peck (1963 : 599) accepted the limits of the group as defined by Gahan, but regarded it as a tribe of Sphegigasterinae. Bouček (*in* Peck *et al.*, 1964 : 28) accepted Cerocephalinae as a subfamily of Pteromalidae. With the latter view I agree.

KEY TO EUROPEAN GENERA

In all the European genera the fore wing in macropterous forms has a tuft of blackish bristles on the parastigma.

1 Antennae of female inserted about level with, of male above, the ventral edge of the eyes. Head in frontal view as broad as or slightly broader than high, its sides not subparallel.
Antennal funicle of female with six, of male with seven, segments. Propodeum reticulate, rather dull. Gastral petiole of female transverse ; of male as long as or longer than broad. ***CEROCEPHALA*** Westwood (p. 57)

– Antennae of both sexes inserted distinctly below the ventral edge of the eyes. Head in frontal view slightly higher than broad, its sides tending to be subparallel (Text-fig. 34) 2

2 (1) Antennal funicle of female with five, of male with six, segments. Propodeum reticulate, rather dull. Gastral petiole of female slightly transverse ; of male as long as or slightly longer than broad
CHOETOSPILA (Westwood) (p. 61)

– Antennal funicle of female with six, of male with seven, segments. Propodeum posteriorly rather shiny with weak sculpture. Gastral petiole of female strongly transverse ; of male slightly so. Body of ♀, Text-fig. 50
THEOCOLAX (Westwood) (p. 62)

CEROCEPHALA Westwood

Cerocephala Westwood, 1832 : pl. 4. Type-species : *C. cornigera* Westwood, by monotypy.
Epimacrus Walker, 1833 : 368. Type-species : *E. rufus* Walker, by monotypy.
Sciatherus Ratzeburg, 1848 : 209. Type-species : *S. trichotus* Ratzeburg, by monotypy.
Cerocephala Westwood ; Thomson, 1876 : 207, 210–212.
Cerocephala Westwood ; Ashmead, 1904 : 334.
Cerocephala Westwood ; Schmiedeknecht, 1909 : 385, 386.
Parasciatherus Masi, 1917 : 189. Type-species : *Cerocephala* (*Parasciatherus*) *caelebs* Masi, 1917, by monotypy.
Proamotura Girault, 1920 : 143. Type-species : *P. aquila* Girault, by monotypy.
Cerocephala Westwood ; Gahan, 1946 : 357–363.
Cerocephala Westwood ; Nikol'skaya, 1952 : 250, 255–257.
Cerocephala Westwood ; Peck *et al.*, 1964 : 28.

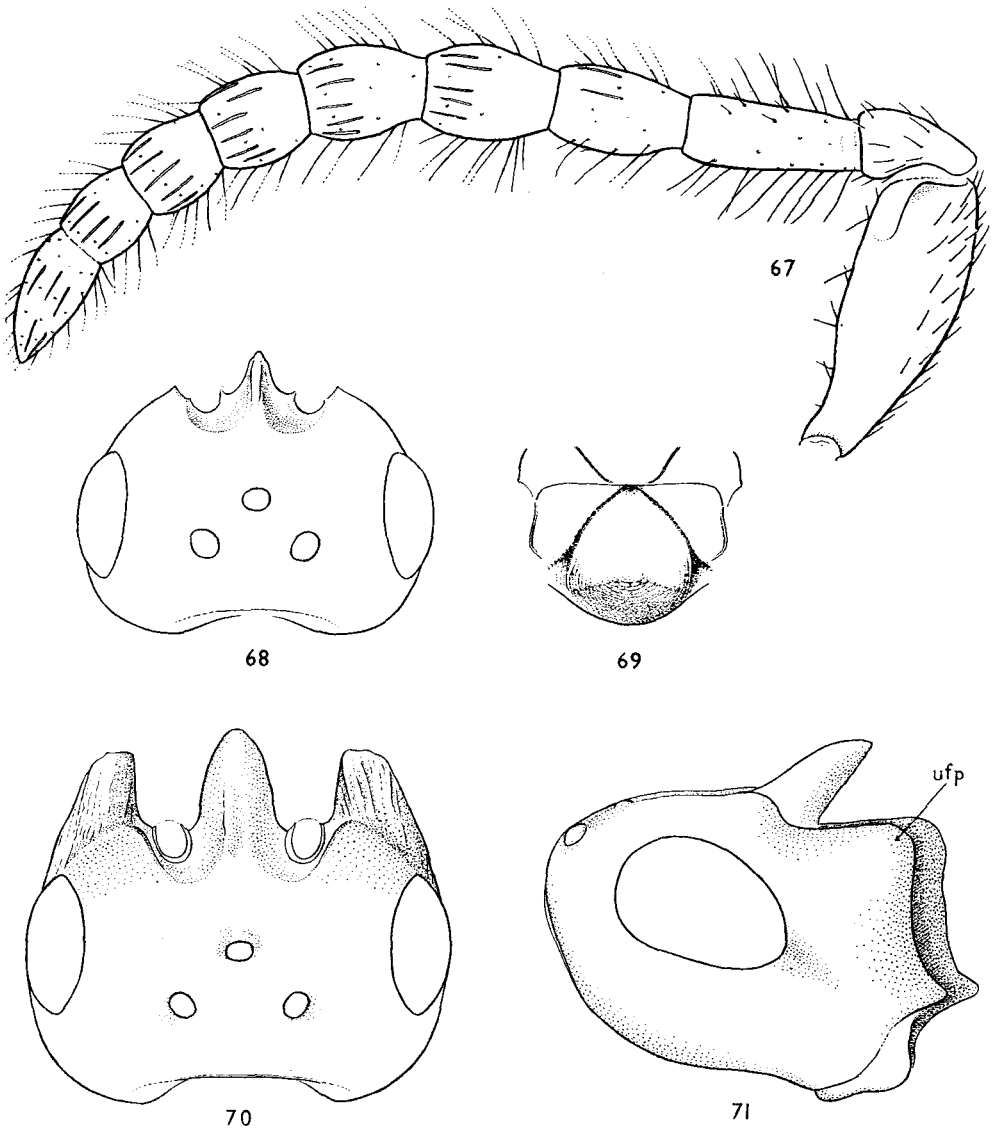
Epimacrus was synonymized with *Cerocephala* by Walker (1834 : 148). *Sciatherus* Ratzeburg was synonymized with *Cerocephala* by Förster (1856 : 41). *Parasciatherus* Masi and *Proamotura* Girault were placed in synonymy with *Cerocephala* Westwood by Gahan (1946 : 358).

Key to European Species

(Males)

1 Head in dorsal view (Text-fig. 69) appearing strongly tridentate ; the lateral processes of the face forming prongs which are almost as long as the eyes, and have their outer edges converging only slightly forwards. Interantennal crest strongly developed, in profile (Text-fig. 71) forming a pointed spike which is longer than its basal breadth ; in profile the dorsal and front edges of the upper facial process (Text-fig. 71, ufp.) form about a right angle. Face between the lateral crests strongly concave, without a median carina. Antennal scape (Text-fig. 67) thick and considerably expanded distally. Scutellum (cf. Text-fig. 69) narrowing forwards almost to a point ; frenum indicated by an area of delicate alutaceous sculpture . . . . . ***cornigera*** Westwood (p. 59)

– Head in dorsal view (Text-fig. 68) very weakly tridentate, the lateral processes of the face hardly developed, hence the sides of the head converge strongly forwards. Interantennal crest less strongly developed, in profile less projecting and not longer than its basal breadth, often obtuse ; in profile the dorsal and front edges of the upper facial process form an obtuse angle with each other. Face between the lateral crests weakly concave, usually with a distinct median longitudinal carina. Antennal scape rather more slender and less expanded distally. Scutellum more rounded at its base ; frenum not marked off, except sometimes at the sides, usually smooth like the rest of the scutellum, at most alutaceous at the sides and posteriorly . . . . . ***rufa*** (Walker) (p. 60)



FIGS. 67–71. *Cerocephala* spp. 67, *cornigera* Westwood, holotype ♂, antenna (dotted part of hairs restored conjecturally) ; 68, *rufa* (Walker), ♂, head ; 69, *cornigera* Westwood, ♀, scutellum, axillae, and hinder part of mesoscutum ; 70, same, holotype ♂, head ; 71, same, profile.

(FEMALES)

1 Interantennal crest in profile appearing like an acute spike (though rather less developed than that of the male, cf. Text-fig. 71). Antennal scape relatively stouter, 3·3 to 3·5 times as long as its maximum breadth. Scutellum (Text-fig. 69) narrowing forwards almost to a point ; frenum indicated by an area of delicate alutaceous sculpture, anteriorly often marked off at the sides by a weak impressed line. Larger species, 2·5 to 3·4 mm. Infuscate cloud below the stigmal vein usually weak, sometimes absent . . . . . ***cornigera*** Westwood (p. 59)

– Interantennal crest in profile appearing right-angled or slightly obtuse-angled, less prominent than in *cornigera*. Antennal scape relatively less stout, about four times as long as its maximum breadth. Scutellum more rounded at base ; frenum not indicated, smooth like the rest of the scutellum or with at most traces of extremely weak sculpture. Smaller species, 2 to 3 mm. Infuscate cloud below the stigmal vein usually stronger and extending well across the wing ***rufa*** (Walker) (p. 60)

The BM(NH) collection contains specimens of a *Cerocephala* (some determined as *eccoptogastri* Masi, others as *cornigera* Westwood) from Turkey, Palestine, and Egypt, which resemble *rufa* (Walker) in size and in the structure of the scutellum. The females differ from those of *rufa* in having the interantennal crest acute in profile, the upper lateral processes of the face forming small though distinct pointed teeth, these are hardly developed, and obtuse, in *rufa* ; the antennal scape is also rather stouter than in *rufa*. The males differ from those of *rufa* in having the interantennal crest appearing like an acute spike in profile, as in male *cornigera*, the upper lateral process of the face in profile forms an acute tooth, in *cornigera* and *rufa* it does not form a tooth ; the malar space is more than three quarters the length of an eye, in *rufa* it is three quarters or rather less. These specimens may well be *eccoptogastri* Masi, the types of which I have not seen ; if not, then they must represent a new species.

Cerocephala cornigera Westwood

Genus 172 (746), species 5351, *cornigera*, Stephens, 1829 : 394 [nom. nud.].
Cerocephala cornigera Westwood, 1832 : pl. 4, ♂.
Cerocephala cornigera Westwood ; Walker 1834 : 149, *ex parte* [Stephens record].
Cerocephala cornigera Westwood ; Stephens, 1846 : 6, pl. 45, fig. 1, ♂.
Sciatherus trichotus Ratzeburg, 1848 : 209, pl. 3, fig. 1.
Cerocephala cornigera Westwood ; Gahan, 1946 : 358–360, *ex parte*.
Cerocephala trichotus (Ratzeburg) Szczepański, 1960 : 415, 420, figs. 2, 4.

Type material. *Cerocephala cornigera* Westwood. Holotype ♂ in BM(NH), pinned to an oblong card and bearing the following labels : " Stephens' Coll. 53.46 "; " Cerocephala cornigera Steph." [*sic*] ; " cornigera *mihi* "; " CEROCEPHALA " (the latter label handwritten).

Gahan (1946 : 359) reported " . . . during a visit to the Hope Museum at Oxford, England, I saw the type of *Cerocephala cornigera* Westwood . . . ". The specimen in the Hope Department is not, however, the type of *cornigera* ; the label bears data which disagree with that originally given by Westwood, moreover the specimen does not fit the description. The label states that it was captured by R. Lewis in St.

James's Park, London, in the spring of 1832 ; whereas Westwood (1832 : classe IX) explicitly stated " Mon ami J. Stephens . . . a trouvé un seul individu de ce joli insecte près du village de Ripley, dans le comté de Surrey en Angleterre, au mois de juillet, 1827 . . . ". This supposed type in Oxford is a male of *rufa* (Walker) ; see below.

Sciatherus trichotus Ratzeburg. The type ♀ is presumed to be destroyed. It was, however, examined in 1927 by Gahan who later (1946 : 358–359) published some notes upon it. He concluded that it was conspecific with the male in the Hope Department, University Museum, Oxford, which he regarded [erroneously, as I have shown above] as the type of *cornigera*. This male belongs, not to *cornigera* Westwood, but to *rufa* (Walker) so that if Gahan was right in regarding it as conspecific with the type of *trichotus* Ratzeburg then the latter would be a synonym of *rufa*. Gahan's published notes on the type female of *Sciatherus trichotus*, however, suggest to me that it must have been conspecific with the true *cornigera* of Westwood. This view would also agree with the interpretation of *trichotus* expressed by Szczepański (1960).

The species described in detail by Russo (1938 : 206–215, ♂ ♀) is not *cornigera* Westwood, as supposed by Russo ; it is also probably not the same as *rufa* (Walker) but may be either *eccoptogastri* Masi or an undescribed species.

BRITAIN, FRANCE, DENMARK, SWEDEN, POLAND, CENTRAL EUROPE, U.S.S.R.

Biology. Several hosts have been recorded for *cornigera*, e.g., by Nikol'skaya (1952 : 256), but because *cornigera* has been misidentified by several authors, these records need to be confirmed. One record which certainly refers to the true *cornigera* recorded under the name " *trichotus* Ratz.", in Poland in tunnels of *Leperesinus orni* (Fuchs) (Col., Scotylidae). Probably *cornigera* will prove to be parasitic on several species and genera of Scolytidae.

Cerocephala rufa (Walker)

Epimacrus rufus Walker, 1833 : 369–370, ♀.
Cerocephala cornigera Walker, 1834 : 149, *ex parte* [*nec* Westwood, 1832].
Cerocephala cornigera Szczepański, 1960 : 417–418, 420–421, figs. 1, 3 [*nec* Westwood, 1832].
Cerocephala rufa (Walker) Graham, 1967*a* : 77–78.

Type material. Lectotype (probably holotype) ♀ in G. T. Rudd coll., Yorkshire Museum, York, England ; it stands below a label " 588[b] CEROCEPHALA *West.*" and above another label " 2 cornigera *West.* rufus *Walk.*". Walker (1833 : 370) stated that *Epimacrus rufus* had been " taken near Stockton-upon-Tees, by the Rev. G. T. Rudd " but did not state whether Rudd had more than one specimen ; it seems likely, however, that the one designated lectotype is the holotype.

Walker (1834 : 149) placed *rufus* in synonymy with *Cerocephala cornigera* Westwood, mentioning, incidentally that *cornigera* had been taken " by Mr. Lewis, near London " ; this undoubtedly refers to the male in the Hope Department which was erroneously supposed by Gahan to be the type of *cornigera*. This synynomy was subsequently accepted without comment until I rediscovered the missing type of *rufus* and showed that it represented a valid species.

I have only been able to make a critical examination of specimens of *rufa* from BRITAIN and CZECHOSLOVAKIA ; probably, however, the species will prove to be quite widely distributed in Northern and Central Europe.

Biology. Some of the published host-records for "*cornigera*" may actually refer to *rufa* but this cannot be checked without an examination of the material on which the records are based. Dr. Bouček has shown me material of *rufa* from Central Europe which he said were reared from Anobiidae, *Agrilus* and *Xylocleptes*. Szczepański's (1960 : 417–418, 421) notes on the biology of the species he calls *cornigera* almost certainly refer to *rufa* (Walker) ; he states that his observations indicate that it attacks *Anobium punctatum* (DeG.), very probably as a secondary parasite through *Spathius exarator* (L.) (Braconidae).

Cerocephala sp. indet.

? Cerocephala eccoptogastri Masi, 1922 : 189–193, ♂ ♀.
? Cerocephala cornigera Russo, 1938 : 206–215, ♂ ♀ [*nec* Westwood]

Specimens of this species from Turkey, Palestine, and Egypt, are contained in the BM(NH) ; some are determined as *eccoptogastri* Masi, others as *cornigera* Westwood. I have mentioned the characters by which it differs from *rufa* (Walker) in the addendum to my key above. It may well be *eccoptogastri* Masi, the types of which I have not seen. It may also be identical with the species described, erroneously as *cornigera*, by Russo (1938) and recorded from Italy and Sicily as a parasite of several Scolytidae.

CHOETOSPILA Westwood

Choetospila Westwood, 1874 : 137. Type-species : *Ch. elegans* Westwood, by monotypy.
Spalangiomorpha Girault, 1913 : 333. Type-species : *S. fasciatipennis* Girault, by original designation.
Choetospila Westwood ; Waterston, 1921 : 19–21.
Choetospila Westwood ; Gahan, 1946 : 352.
Chaetospila [*sic*] Westwood ; Nikol'skaya, 1952 : 250–255.
Choetospila Westwood ; Peck *et al.*, 1964 : 28.

Spalangiomorpha Girault was placed in synonymy with *Choetospila* Westwood by Girault himself (1917*d* : 37). Both Waterston (1921 : 25) and Gahan (1946 : 352) accepted this synonymy.

Several species of *Choetospila* are known ; *Ch. elegans* Westwood, which is parasitic on weevils in stored grain, has been transported to many parts of the world in shipments of stored products and is now cosmopolitan.

Choetospila elegans Westwood

Choetospila elegans Westwood, 1874 : 157, pl. 25, fig. 10 [♀].
Spalangiomorpha fasciatipennis Girault, 1913 : 334, ♀.
Spalangia metallica Fullaway, 1913 : 286–287, ♀.
Choetospila elegans Westwood ; Waterston, 1921 : 25, fig. 13.
Choetospila elegans Westwood ; Gahan, 1946 : 353, pl. 47, figs. 1, 1*a*.

Spalangia rhizoperthae Risbec, 1951 : 365–366, ♂ ♀.
Choetospila elegans Westwood ; Peck, 1963 : 599.

Type material. *Choetospila elegans* Westwood. For a long time I could not locate the types in the Hope Department, University Museum, Oxford, as no specimen bore this name. Recently, however, I found a group of 7 females which are certainly syntypes of *elegans*. They are mounted on rectangular cards and all except two bear a distinctive blue lozenge-shaped label, on which is written in Westwood's handwriting " W/India com corn Raddon Africa " [the word " corn " has been rather badly written in the first instance, and has been scored out and rewritten ; the letter " W " is Westwood's monogram, which he often attached to the labels of his specimens]. The mandibles, palpi, and antennae of one specimen are dissected off and gummed on the card ; evidently Westwood's figures of these structures (pl. 25, figs. 10a, 10b, 10d) were made from this specimen. I designate as LECTOTYPE another specimen which is in perfect condition and fits the description and figure best of all ; it bears a lozenge-shaped label as described above, also my lectotype label.

Spalangiomorpha fasciatipennis Girault. Types (not seen by the writer) from Port Douglas, Nelson, and Cooktown, Queensland, Port Darwin, Northern Territory, Australia : in Queensland Museum. The species was placed in synonymy with *Choetospila elegans* by Waterston (1921 : 20) whose conclusion was accepted by Gahan (1946 : 353).

Spalangia metallica Fullaway. Holotype ♀ (not seen) in U.S.N.M. ; Gahan (1946 : 353) examined it and stated that it differed in no way from typical *Choetospila elegans*.

Spalangia rhizoperthae Risbec. Type, Africa, Senegal, M'Bambey, in Muséum Nationale d'Histoire Naturelle, Paris. It was re-examined by Steffan (see Bouček, 1963 : 505 ; this author synonymized the species with *Choetospila elegans*).

In both sexes of *elegans* macropterous, brachypterous and apterous forms occur.

Cosmopolitan.

Biology. Recorded as a parasite of various beetles associated with stored grain. Gahan (1946 : 353) stated that its most common host is apparently the rice weevil, *Sitophilus oryza* (L.). For a complete host-list see Peck (1963 : 599). There are also records of *elegans* having been reared from Scolytidae on certain trees in British Honduras and the Panama Canal zone (see Gahan, 1946 : 353).

THEOCOLAX Westwood

Theocolax Westwood, 1832*a* : 127. Type-species : *Th. formiciformis* Westwood, by monotypy.
Laesthia Haliday, 1833 : 335. Type-species : *L. vespertina* Haliday, by monotypy.
Theocolax Westwood ; Thomson, 1876*a* : 207, 212–213.
? Cerocephala Ashmead, 1904 : 334, *ex parte*.
Theocolax Westwood ; Gahan, 1946 : 355.
Theocolax Westwood ; Nikol'skaya, 1952 : 250, 253–255.
Theocolax Westwood ; Peck *et al.*, 1964 : 28.

The respective type-species of *Theocolax* Westwood and *Laesthia* Haliday (*formi-*

ciformis Westwood and *vespertina* Haliday) were synonymized by Walker (1834 : 149) and this synonymy has been generally accepted. It cannot be confirmed because the syntypes of *vespertina* have not been identified as such ; but there is little doubt that Walker's conclusion was correct.

Only one European species is known.

Theocolax formiciformis Westwood

(Text-fig. 50, ♀)

Theocolax formiciformis Westwood, 1832*a* : 127.
Laesthia vespertina Haliday, 1833 : 336, ♂ ♀.
Cerocephala formiciformis (Westwood) Walker, 1834 : 149, ♂ ♀.
Cerocephala formiciformis [Westwood] Haliday, 1841–1842 : vi, pl. N, fig. 4, ♀.
Theocolax formiciformis Westwood, 1874 : 138, pl. 25, fig. 11, ♀.
Theocolax formiciformis Westwood ; Gahan, 1946 : 356–357, pl. 47, figs. 3, 3a, pl. 48, figs. 1, 1a, 1b, ♂ ♀.

Type material. *Theocolax formiciformis* Westwood. There are several specimens in Westwood's collection but some of them were taken later than 1832 or are otherwise disqualified from being syntypes. I choose as LECTOTYPE a female mounted on a rectangular card and bearing a pink label reading (in Westwood's handwriting) " formiciformis Westw.".

Laesthia vespertina Haliday. The only *Theocolax* which I can find in Haliday's collection appears to be a Walker specimen and bears a label possibly in his handwriting ; it cannot therefore be a syntype of *vespertina*. Perhaps the missing syntypes may yet turn up because some parts of Haliday's collection have not been thoroughly examined. Haliday's excellent description, however, leaves no doubt that *vespertina* must be the same as *formiciformis* ; probably his specimens of *vespertina* were taken in Ireland (his MS. catalogue of Irish insects lists the species as taken at Holywood, Co. Down).

Most individuals of *formiciformis* are micropterous, the fore wings being reduced to short stubs which are hardly twice as long as the tegulae. In macropterous individuals the fore wing has a tuft of black hairs on the parastigma, and a fuscous cloud just beyond the middle.

WESTERN and CENTRAL EUROPE (but probably more widely distributed) ; NEW ZEALAND.

Biology. *T. formiciformis* is well known as a parasite of *Anobium* species (Col.). It has also been said to attack *Leperesinus fraxini* (Panz.) but this may be erroneous (see Waterston, 1921 : 12). The adult insect is rarely seen in the daytime, its habits apparently being crepuscular (see, e.g., Haliday, 1833 : 336) ; January–July.

DIPARINAE

The first described genus of this group, *Dipara* Walker, was originally placed by the latter in Miscogasteridae (1833 : 371). Förster (1856 : 46) placed *Tricoryphus* [the female sex of *Dipara*] in his family Cleonymidae, whilst (op. cit. : 51) he placed

the male of *Dipara* in Miscogastroidae. Similarly Thomson (1876*a* : 207) put *Tricoryphus* in Spalangiina, and later (1878 : 175) referred male *Dipara* to another group, his subtribe Diparides, in which he also included the genus *Panstenon*. Ashmead (1904 : 334) elevated Thomson's tribe Diparides to the rank of a subfamily. *Tricoryphus* was transferred from Spalangiinae to Lelapinae (= Diparinae) by Gahan (1946 : 375). Only recently Novitzky concluded that *Tricoryphus* Förster was the female sex of *Dipara* Walker, of which only males were known, and that *Hispanolelaps* Mercet was the same as *Tricoryphus* ; his conclusions were published by Domenichini (1953 : 80). As a result of this synonymy, Bouček (1954 : 54) put the subfamily name Lelapinae in synonymy with Diparinae. In the same paper (p. 52) he made Diparinae a more homogeneous group by excluding from it the genus *Panstenon*. In his key to the Czechoslovak Pteromalidae (*in* Peck *et al.*, 1964 : 28) Bouček redefined Diparinae in a more satisfactory way. In the present work I have employed much the same set of characters as those used by him. In doing so I have taken into account a number of exotic species as well as the European. The subfamily would appear to be better represented in subtropical and tropical areas, particularly in Africa and South America.

KEY TO EUROPEAN GENERA

1 *Female* antennae with three anelli and five funicular segments. Wings rudimentary. *Male* unknown . . . . ***TRIMICROPS*** Kieffer (p. 66)

– *Female* antennae with one anellus and seven funicular segments. Wings rudimentary or developed. *Male* wings fully developed ; antennae with one anellus, followed by ten flagellar segments which are not differentiated into funicle and clava ; body entirely or mainly black 2

2 (1) *Female* wings fully developed or somewhat shortened, fore wing with two fuscous spots, one below the marginal vein, the other in the distal part of the wing ; body squat, the thorax only about 1·5 times as long as broad, gaster ovate ; gastral petiole broader than long ; body mainly testaceous. *Males* with segments of flagellum closely compacted, cylindrical, with extremely short pubescence ; gastral petiole broader than long, dark ; coxae black, legs otherwise mainly fuscous ; body squat ***NETOMOCERA*** Bouček (p. 66)

– *Female* wings rudimentary ; body slender, thorax about twice as long as broad, gaster (Text-fig. 39) lanceolate ; gastral petiole about as long as broad ; body reddish with dark markings. *Males* with segments of flagellum suboval and separated by distinct constrictions, clothed with bristly hairs whose length is greater than the breadth of the segments ; gastral petiole (Text-fig. 52) about three times as long as broad, reddish ; coxae, and remainder of legs mainly to entirely, reddish testaceous ***DIPARA*** Walker (p. 64)

DIPARA Walker

Dipara Walker, 1833 : 371, 373. Type-species : *D. petiolata* Walker, by monotypy.
Tricoryphus Förster, 1856 : 46, 47. Type-species : *T. fasciatus* Thomson, 1878, by subsequent reference.
Tricoryphus Förster ; Thomson, 1876*a* : 209–210.
Dipara Walker ; Thomson, 1878 : 177–178.

Apterolelaps Ashmead, 1901 : 312. Type-species : *A. nigriceps* Ashmead, by monotypy and orginal designation.
Dipara Walker ; Ashmead, 1904 : 335.
Dipara Walker ; Schmiedeknecht, 1909 : 366, 367.
Hispanolelaps Mercet, 1927 : 60. Type-species : *H. coxalis* Mercet, by monotypy.
Dipara Walker ; Nikol'skaya, 1952 : 241–242.
Dipara Walker ; Bouček, 1954 : 53–54.
Trichoryphus [*sic*] Förster ; Delucchi, 1958*a* : 56–57.
Afrolelaps Hedqvist, 1963 : 47. Type-species : *A. maculata* Hedqvist, by original designation.
Dipara Walker ; Peck *et al.*, 1964 : 28.

Only one species is known in Europe. The male is fully winged, the female micropterous, whilst they differ considerably in other respects, so much so that until recently they were placed in different subfamilies!

Tricoryphus Förster and *Hispanolelaps* Mercet were recognized as synonyms of *Dipara* Walker by Novitzky, whose discovery was published by Domenichini (1953 : 80, footnote). Later Delucchi (1958*a* : 56) synonymized *Apterolelaps* Ashmead with *Tricoryphus* Förster. *Afrolelaps* Hedqvist is stated to differ from *Dipara* in having 11-segmented antennae and notaulices which meet in the middle of the mesoscutum ; but the antennae of *Afrolelaps* do not appear to me essentially different from those of *Dipara,* whilst the relative convergence of the notauli is hardly of generic value.

Dipara petiolata Walker
(Text-figs. 39, 52)

Dipara petiolata Walker, 1833 : 373, ♂.
Dipara cinetoïdes Walker, 1834 : 166, ♂.
Dipara petiolata Walker ; Haliday, 1841–1842 : vi, pl. J., fig. 1, ♂.
Tricoryphus fasciatus Thomson, 1876*a* : 210, ♀.
Dipara petiolata Walker ; Thomson, 1878 : 177–178, ♂.
Hispanolelaps coxalis Mercet, 1927 : 62, ♀.
Dipara petiolata Walker ; Bouček, 1954 : 53–54, ♂, ♀ (fig. 2).

Type material. *Dipara petiolata* Walker. One male, LECTOTYPE (possibly it is holotype) : it bears a Waterhouse label " *Dipara petiolata* Walker " and a modern label " Type ♂ C. F." [C. Ferrière].

Dipara cinetoides Walker. One male (probably holotype) in G. T. Rudd coll., Yorkshire Museum, York, bearing a label " 3 ". Placed in synonymy with *petiolata* by Graham (1967*a* : 78) who recognized the type.

Tricoryphus fasciatus Thomson. Coll. Thomson, 2 specimens, but one cannot be a syntype as Thomson (1876*a* : 210) expressly stated that he had only one. I identify as the holotype a female labelled " Tkv " [Torekov]. Placed in synonymy with *Dipara petiolata* by Domenichini (1953 : 80 [footnote]) on the authority of Novitzky.

Hispanolelaps coxalis Mercet. Holotype ♀, Spain, La Pedriza de Manzares, 19.v.1922, in Instituto Español de Entomología, Madrid (not seen). Placed in synonymy with *D. petiolata* by Domenichini (1953 : 80, footnote) where the species name is incorrectly spelt " *casalis* ".

BRITAIN, SWEDEN, SPAIN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R. ; probably more widely distributed in Europe.

Biology. Unknown. Imagines May–July ; one record for August.

NETOMOCERA Bouček

Netomocera Bouček, 1954 : 49. Type-species : *N. setifera* Bouček, by original designation.

Netomocera setifera Bouček

Netomocera setifera Bouček, 1954 : 50–53, ♂, ♀.

Type material. Holotype ♀, Southern Moravia, Pouzdřany, 3.vi.1941 (*A. Hoffer*) in Národní Museum, Prague (Cat. no. 3001).

CZECHOSLOVAKIA, MOLDAVIAN S.S.R., SOUTHERN EUROPE.

Biology. Unknown. Imagines June–July.

TRIMICROPS Kieffer

Trimicrops Kieffer, 1906 : 142. Type-species : *T. claviger* Kieffer, by monotypy.
Trimicrops Kieffer ; Ferrière, *in* Beier, 1930 : 401–403.
Trimicrops Kieffer ; Bouček, 1954 : 52.
Trimicrops Kieffer ; Peck *et al.*, 1964 : 28.

This genus was originally described as belonging to the family Ceraphronidae of Proctotrupoidea ; it was correctly referred to Lelapinae (= Diparinae) by Ferrière, *in* Beier (1930) and Bouček (1954).

Trimicrops claviger Kieffer

Trimicrops claviger Kieffer, 1906 : 142, ♀.
Trimicrops claviger Kieffer ; Ferrière *in* Beier, 1930 : 401–403, figs. 3, 4, ♀.

Type material. Syntypes, Italy : several localities, in Museo Civico di Storia Naturale, Genoa ; one example from Rumania, location unknown, but possibly in coll. Kieffer (not seen). Lectotype not yet selected.

ITALY, RUMANIA, HERZEGOVINA, DALMATIA, CORFU.

Biology. Unknown. Imagines in autumn and spring.

NEODIPARINAE

The type-genus of this group, *Neodipara*, was originally placed by Erdös (1955 : 296) in his new subfamily Panstenoninae, together with the genus *Panstenon*. *Neodipara*, however, has little connexion with *Panstenon*, as Bouček (1961 : 66) remarked. Bouček (1961 : 66) erected for it a new tribe Neodiparini which he placed in the subfamily Tridyminae. The affinities of *Neodipara* are difficult to decide ; it does not seem to be very closely related to any of the other subfamilies

of Pteromalidae. The females of *Neodipara* are unknown ; when discovered they may help to solve the question of the relationships of the genus. As the latter appears relatively isolated, I propose to treat the group provisionally as a subfamily.

NEODIPARA Erdös

Neodipara Erdös, 1955 : 296–297. Type-species : *N. perbella* Erdös, by monotypy and original designation.

Two species of the genus have been described, but only in the male sex.

Key to European Species

(Males)

1 Less slender species ; thorax about 1·75 times as long as broad ; scutellum a little broader than long. Gaster forming a relatively shorter oval ; hind margin of basal tergite weakly curved. Distal segments of antennal funicle strongly transverse. Legs yellowish with fore and mid coxae dark ; fore and mid femora slightly infuscate . . . . . ***perbella*** Erdös (p. 67)

– More slender species ; thorax about twice as long as broad ; scutellum as long as broad. Gaster long-oval ; hind margin of basal tergite quite strongly curved. Distal segments of antennal funicle only moderately transverse. All coxae, femora, and tibiae, except their articulations, black . . ***masneri*** Bouček (p. 67)

Neodipara perbella Erdös

Neodipara perbella Erdös, 1955 : 297, ♂.
Neodipara perbella Erdös ; Bouček, 1961 : 64, ♂.

Type material. Syntypes, Hungary, Tompa (Zsiroskuti erdö), 4 ♂, in coll. Erdös.

Hungary.

Biology. Unknown. Imagines in June.

Neodipara masneri Bouček

Neodipara masneri Bouček, 1961 : 64–65, ♂.

Type material. Holotype ♂, Czechoslovakia, Bohemia, Břehyně near Doksy, 8.x.1957 (*Masner*) in Národní Museum, Prague (Cat. no. 2968).

Czechoslovakia.

Biology. Unknown.

EUNOTINAE

This group is easily recognized by the squat shape of the body and the characters of the head (see key to subfamilies).

The type-genus of this group, *Eunotus*, was placed in Pteromalidae by Walker (1834) and Förster (1856, as *Megapelte*). Motschulsky (1863 : 69–70) coined the name Muscidides for some members of the group, but it has not been accepted.

Thomson (1876–8) apparently did not know the group at all. Ashmead (1904 : 312–325) proposed a subfamily of Pteromalidae which he named Eunotinae. Most of the genera which he included in the subfamily are still regarded as belonging to it; but he excluded *Epicopterus*, which is currently placed in Eunotinae. Ashmead's concept of the group has in the main been generally accepted, though its scope has been extended to include *Epicopterus* and some related genera ; but authors differ in their views on the status of the group, some regarding it as a subfamily, others as merely a tribe. I consider it sufficiently distinct, both in the structure and biology of its members, to be regarded as a subfamily.

KEY TO EUROPEAN GENERA

1 *Females* with antennae with two anelli and five funicular segments (formula 11253) ; fore wing with front edge of costal cell strongly curved inwards at apex, so that the wing appears excised at this point. *Males* with antennal formula 11263. Both sexes with head not sharp-edged at the junction of vertex and occiput ; antennae inserted at least slightly above level of ventral edge of eyes ; both mandibles with four teeth ; fore wing with marginal vein thickened, only three to six times as long as broad, post-marginal vein much longer than the marginal vein

EPICOPTERUS Westwood (p. 69)

– *Females* with antennae without anelli, or if one is present, it is invisible in dried specimens ; with four or five funicular segments ; fore wing with front edge of costal cell straight or less strongly curved. *Males* with antennae without anelli, with four or five funicular segments. Both sexes with head (Text-figs. 38, 54) with a sharp edge at the junction of vertex and occiput ; antennae inserted below level of ventral edge of eyes ; mandibles with two or three teeth ; fore wing with marginal vein not, or relatively less strongly, thickened 2

2 (1) Propodeum, medially, about half as long as the scutellum and strongly produced beyond the bases of the hind coxae. Sculpture of scutellum tending to form longitudinal striae ; mesoscutum and scutellum with relatively few but long bristles. Fore wing with basal half almost bare ; submarginal vein strongly sinuate before its apex. Head at least partly reddish. Basal tergite of gaster with a tuft of pale hairs on either side at extreme base

MORANILA Cameron (p. 70)

– Propodeum sometimes concealed beneath the scutellum, but when exposed clearly less than half as long as the scutellum ; medially not or hardly produced beyond the bases of the hind coxae. Sculpture of scutellum composed of ordinary reticulation ; mesoscutum and scutellum densely pilose. Fore wing with basal half at least fairly extensively, usually mainly, pilose ; submarginal vein not or hardly sinuate apically. Head black with a metallic tinge. Basal tergite of gaster without tufts of hairs at its base 3

3 (2) Scutellum very large, fully twice or more than twice as long as mesoscutum, covering the propodeum and overlapping the gaster to a greater or less extent. Mandibles with three teeth, the inner tooth obtuse

SCUTELLISTA Motschulsky (p. 75)

– Scutellum (Text-fig. 54) less than twice as long as mesoscutum, not covering the propodeum, and not overlapping the gaster. Mandibles with two acute teeth . . . . . ***EUNOTUS*** Walker (p. 71)

EPICOPTERUS Westwood

Epicopterus Westwood, 1833*b* : 418. Type-species : *E. choreiformis* Westwood, by monotypy.
Simopterus Förster, 1851 : 22, pl. 1, fig. 8. Type-species : *S. venustus* Förster, by monotypy.
Epicopterus Westwood ; Ashmead, 1904 : 274, 275.
Epicopterus Westwood ; Schmiedeknecht, 1909 : 275, 276, 280.
Simopterus Förster ; Kurdjumov, 1913 : 9.
Simopterus Förster ; Masi, 1928 : 318–323.
Epicopterus Westwood ; Kryger, 1943 : 68–72.
Epicopterus Westwood ; Nikol'skaya, 1952 : 239.
Epicopterus Westwood ; Graham, 1964 : 45–51.
Epicopterus Westwood ; Peck *et al.*, 1964 : 31.

Epicopterus was not recognized either by Förster (1851) or Thomson (1876–8). Ashmead placed it in Tridyminae ; he did not recognize *Simopterus*. Kurdjumov (1913) and Masi (1928) correctly referred *Simopterus* to Eunotinae, but made no mention of *Epicopterus*. Kryger (1943) recognized *Epicopterus* as a Eunotine and synonymized *Simopterus* with it.

Kryger (1943 : 72, fig. 1) described and figured the hind tibia of *Epicopterus* as having 2 apical spurs, a long and a short one. I can detect only one spur ; Masi (1928 : 319) also stated that *Simopterus* had one spur.

Epicopterus choreiformis Westwood
(Text-figs. 37, 72–74)

Epicopterus choreiformis Westwood, 1833*b* : 418, ♀.
Ormocerus Borges Walker, 1839 : 208, ♂.
Simopterus venustus Förster, 1851 : 23–24, pl. 1, fig. 8, ♀.
Epicopterus choreiformis Westwood ; Kryger, 1943 : 72–74, ♀.
? Simopterus Solarii Masi, 1928 : 320–323, ♀.
Epicopterus choreiformis Westwood ; Graham, 1964 : 48–50, ♂ ♀.

Type material. *Epicopterus choreiformis* Westwood. Lectotype ♀ designated by Graham (1964 : 50).

Ormocerus borges Walker. Lectotype ♂ designated by Graham (1964 : 50), who placed *borges* in synonymy with *choreiformis*.

Simopterus venustus Förster. Syntypes, Germany, near Aachen, and Veen, 3 ♀, presumably in Naturhistorisches Museum, Vienna (not seen). The species was synonymized with *Epicopterus choreiformis* Westwood by Kryger (1943 : 72).

Simopterus solarii Masi. Holotype ♀, Italy, near Genoa (*F. Solari*), in Museo Civico di Storia Naturale, Genoa (not seen). I have compared the lectotype of *choreiformis* Westwood with Masi's description of *solarii*, which it fits almost exactly, except that the antennae and legs of the lectotype are a little darker, but this might be expected in a British specimen. I believe that *solarii* must be identical with *choreiformis*, which Masi did not mention and evidently did not know.

The above synonymy (except *solarii*) was discussed fully by Graham (1964 : 48–50).

BRITAIN, DENMARK, GERMANY, ? ITALY.

Biology. Unknown. Kryger (1943 : 71) considered that *choreiformis* might be parasitic on Coccids occurring on fir-trees, from his observations in Denmark. The hosts suggested seem not unlikely, although the species is probably not always associated with fir-trees ; in England I have taken it in marshy places where no coniferous trees were present in the vicinity. Imagines appear in July and August.

MORANILA Cameron

Tomocera Howard, 1881 : 368. Type-species : *T. californica* Howard, by monotypy. [Preoccupied by *Tomocera* Desmarest, 1858].
Moranila Cameron, 1883 : 188. Type-species : *M. testaceipes* Cameron, by monotypy.
Dilophogaster Howard, 1886 : 98 [n. n. for *Tomocera* Howard *nec* Desmarest].
Tomocera Howard ; Schmiedeknecht, 1909 : 368, 369.
Eunotomyia Masi, 1917 : 297. Type-species : *E. festiva* Masi, by monotypy.
Tomocera Howard ; Mercet, 1924 : 422–426.
Tomocera Howard ; Masi, 1928*a* : 56–58.
Tomocera Howard ; Smith & Compere, 1928 : 317–321.
Tomocera Howard ; Nikol'skaya, 1952 : 236.
Moranila Cameron Burks, *in* Krombein, 1958 : 75.
Moranila Cameron ; Peck, 1963 : 631–632.
Moranila Cameron ; Peck *et al.*, 1964 : 31.

Mercet (1924 : 422) suggested that *Tomocera* Howard might be the same as *Moranila* Cameron. Smith and Compere (1928 : 317) considered them to be identical, but adopted the name *Tomocera*. *Eunotomyia* was synonymized with *Tomocera* by Masi himself (1928*a* : 56–57). In 1958 Burks (*in* Krombein) adopted the name *Moranila* Cameron, placing *Tomocera*, *Dilophogaster*, and *Eunotomyia* in synonymy with it.

Moranila californica (Howard)

Tomocera californica Howard, 1881 : 352, 368–369, ♂ ♀.
Moranila testaceipes Cameron, 1883 : 188–189.
Tomocera californica Howard ; Mercet, 1924 : 424–426, ♀.
Tomocera californica Howard ; Masi, 1928*a* : 57.
Tomocera californica Howard ; Smith & Compere, 1928 : 317–321.
Moranila californica (Howard) Burks, *in* Krombein, 1958 : 75.
Moranila californica (Howard) ; Peck, 1963 : 631–632.
Moranila californica (Howard) ; Peck *et al.*, 1964 : 31.

For a complete list of references, see Peck (1963).

Type material. *Tomocera californica* Howard. Syntypes, U.S.A., California, Los Angeles, in U.S.N.M. (not seen).

Moranila testaceipes Cameron. Described from Oahu, Hawaiian Islands. A female in BM(NH) is taken to be the type ; it is labelled " Cameron 99–30 " ; " testaceipes Cam." (possibly in Cameron's handwriting) ; and " Moranila " (in handwritten print). The species was apparently recognized as being identical with *californica* (Howard) by Howard himself (1896 : 165). This synonymy was accepted by Smith and Compere (1928), Burks *in* Krombein (1958) and Peck (1963).

Masi (1928*a* : 57) remarked that his *Eunotomyia festiva* was probably only a variety of *Tomocera californica*. The holotype female of *festiva* is in BM(NH) under Type Hym. 5. 655 ; it is labelled " Percy Sladen Trust Exped. B.M. 1913–170 "; " *Eunotomyia festiva* Masi ♀ " and pinned to a piece of cork on which is written " Mahe, ' 08–09 Seychelles Exp." It appears to be very similar to *californica* and might even be the same.

Cosmopolitan ; in EUROPE only in the south. It has been introduced into some areas. Smith and Compere (1928 : 317) stated that it probably originated from AUSTRALIA and that it was probably introduced into the U.S.A. and HAWAII along with the black scale.

Biology. Parasitic on scale-insects, particularly Coccidae such as *Saissetia* and *Ceroplastes* spp. ; rarely hyperparasitic through Encyrtid species. For a list of hosts see Peck (1963 : 632).

EUNOTUS Walker

Eunotus Walker, 1834 : 297. Type-species : *E. cretaceus* Walker, by monotypy.
Tritypus Ratzeburg, 1848 : 227. Type-species : *T. areolatus* Ratzeburg, by monotypy.
Megapelte Förster, 1856 : 63 [n. n. for *Eunotus* Walker, supposedly pre-occupied].
Eunotus Walker ; Schmiedeknecht, 1909 : 304, 306.
Eunotus Walker ; Masi, 1931 : 423–438.
Eunotus Walker ; Nikol'skaya, 1952 : 236.
Eunotus Walker ; Peck *et al.*, 1964 : 31–32.

The European species of *Eunotus* are badly in need of revision. The writer has not seen the types of the majority of them and so is not in a position to prepare a revision. At present the most useful paper for identification purposes is that of Masi (1931).

PROVISIONAL KEY TO SOME EUROPEAN SPECIES

(FEMALES)

The following key is adapted from that of Masi (1931 : 424). Although some of the characters used by him will undoubtedly continue to be useful, additional ones should be sought for more accurate delimitation of some of the species.

1		Antennae with five funicular segments, the first segment sometimes smaller than the second but always quite distinct (sgen. *Eunotus* Walker) . .	2
–		Antennae with four funicular segments (sgen. *Eunotellus* Masi) . . .	5
2	(1)	Basal tergite of gaster (Text-fig. 54) mainly to entirely alutaceous. Marginal vein of fore wing 1·7 to 1·8 times as long as the stigmal vein ; hind margin of wing nearly straight in its distal part, just before the apex of the wing ***cretaceus*** Walker (p. 72)	
–		Basal tergite of gaster entirely, or almost entirely, smooth. Marginal vein of fore wing sometimes relatively shorter ; hind margin of wing more evenly curved in its distal part	3
3	(2)	Fore wing with marginal vein only slightly longer than the stigmal vein. Propodeum with the raised crest formed by the anterior part of the median carina, when seen in profile, jutting out somewhat beyond the level of the tip of the scutellum. Antenna with funicle (except proximally) testaceous, clava mainly fuscous to black . . . . ***nigriclavis*** Förster (p. 73)	

–		Fore wing with marginal vein from nearly twice, to slightly more than twice, as long as the stigmal vein. Propodeum with the raised crest formed by the anterior part of the median carina hardly projecting beyond the level of the tip of the scutellum 4
4	(3)	Antenna with flagellum moderately clavate, fuscous or brown with at most the funicle testaceous beneath ; clava as long as 3 to 3·5 of the preceding funicular segments together. Length 1·1 to 1·6 mm. ? ***areolatus*** (Ratzeburg) (p. 73)
–		Antenna with flagellum strongly clavate ; antenna yellowish with the pedicellus black and the base of the funicle slightly darkened ; clava about as long as the four preceding funicular segments together. Length 1 mm. ***merceti*** Masi (p. 74)
5	(1)	Fore wing with marginal vein from nearly twice, to slightly more than twice, as long as the stigmal vein. Antennal clava hardly longer than the three preceding funicular segments together . . . ***aquisgranensis*** Masi (p. 74)
–		Fore wing with marginal vein only about 1·5 times as long as the stigmal vein. Antennal clava about as long as the whole funicle . . ***parvulus*** Masi (p. 74)

Two other species, *subcyaneus* Erdös and *acutus* Kurdjumov, are not included in the above key ; for further information on these, their original descriptions should be consulted.

EUNOTUS (EUNOTUS) Walker

Eunotus (Eunotus) cretaceus Walker

Eunotus cretaceus Walker, 1834 : 298, "♂" [*recte* ♀], "♀".
Eunotus cretaceus Walker ; Haliday, 1841–1842 : v, pl. A, fig. 4, "♂" [*recte* ♀].
Eunotus festucae Masi, 1928*b* : 128, ♂ ♀.
Eunotus cretaceus Walker ; Masi, 1931 : 426–428, ♂ ♀.

Type material. *Eunotus cretaceus* Walker. One female, LECTOTYPE ; "Isle of Wight" and Waterhouse label "Eunotus cretaceus Walker". Walker's Latin diagnosis and description apply well to the lectotype, the sex of which he mistook. His "female", which he described solely as "aptera", must have been something different. He further says "I found one specimen of the female in the same situation, but have since lost it".

Eunotus festucae Masi. Types (not seen) presumably in Museo Civico di Storia Naturale, Genoa. From Masi's description there is no doubt that it is the same as *cretaceus*. It was placed in synonymy with that species by Masi himself (1931 : 426, 428) after Ferrière had compared a specimen of *festucae* with the type female of *cretaceus* and recognized that the two were identical.

Widely distributed in EUROPE.

Biology. In Oxford, Professor Varley has recently studied *cretaceus* in relation to one of its hosts, *Eriopeltis* ? *strelkovi* Borchsenius. He states (personal communication) that the *Eunotus* larva is predatory and eats the eggs of the *Eriopeltis*. A few of the *Eunotus* imagines may emerge from one host ovisac. Imagines June–August.

Eunotus (Eunotus)? areolatus (Ratzeburg)

? Tridymus (Tritypus) areolatus Ratzeburg, 1848 : 227, ♀, figs. [not numbered].
Eunotus cretaceus Förster, 1856 : 66 [*nec* Walker, 1834].
Eunotus obscurus Masi, 1931 : 482, ♂ ♀.

Type material. *Tridymus areolatus* Ratzeburg. Types presumed lost. Ratzeburg's description and figures apply very well to the present species.

Eunotus obscurus Masi. Syntypes in Muséum Nationale d'Histoire Naturelle, Paris, coll. Giraud (two labelled " Megapelte obscura var." and " éx Cocco crataegi crista galli ") ; and in Naturhistorisches Museum, Vienna, coll. Förster (3 ♀ labelled " Aachen, Förster " and " Eunotus cretaceus det. Förster "; 1 ♀ labelled " Ex Coccus vitis ").

FRANCE, GERMANY, ITALY, SPAIN.

Biology. Reared in Italy by Masi from *Parthenolecanium* (= *Lecanium*) *persicae* (F.) ; Masi also mentions several specimens collected by earlier authors and labelled with the names of other hosts, the identity of which is rather uncertain (recorded under *Eunotus obscurus*).

Eunotus (Eunotus) nigriclavis Förster

Eunotus nigriclavis Förster, 1856 : 66 [♀].
Eunotus nigriclavis Förster ; Masi, 1931 : 431, ♀.

Type material. Holotype ♀ (lacking head) in Förster coll., Naturhistorisches Museum, Vienna ; labelled " Eun. nigriclavis Förster—Type " and " Aachen, Förster ".

GERMANY, ITALY. May also occur in ENGLAND but this is not certain (see Bouček, 1965*d* : 83).

Biology. Unknown.

Eunotus (Eunotus) acutus Kurdjumov

Eunotus acutus Kurdjumov, 1912 : 330–331, fig. 1, A-D, ♂ ♀.
Eunotus acutus Kurdjumov ; Masi, 1931 : 430–431.

Type material. Syntypes, 5 ♀ and 1 ♂ reared from *Eriococcus greeni* Newstead on *Agropyron repens* at Poltava Experimental Station, Ukraine, Russia ; location of types not known to the writer.

This may be a valid species, but the question can only be settled by an examination of the types. According to Kurdjumov's description, the marginal vein is only slightly longer than the stigmal vein ; in this respect *acutus* resembles *nigriclavis* (Förster) more than any other European species of *Eunotus* (*Eunotus*). Masi (1931 : 431) examined two males, collected in Austria by Ruschka, which agreed with the description of *acutus* ; from this he considered that *acutus* was similar to *obscurus* Masi, but differing in its shorter marginal vein and the form of the propodeum.

U.S.S.R.
Biology. See above, under type material.

Eunotus (Eunotus) merceti Masi

Eunotus merceti Masi, 1931 : 433–435, ♀.

Type material. Holotype ♀, Spain, El Pardo, presumably in Instituto Español de Entomología, Madrid. Male unknown.

SPAIN.
Biology. Unknown.

Eunotus (Eunotus) subcyaneus Erdös

Eunotus subcyaneus Erdös, 1953 : 222–223, fig. 1, ♀.

Type material. Holotype ♀ (not seen), Hungary, Kelebia, 19.iv.1950, from foliage of *Pinus nigra* Arn. (*Erdös*) in coll. Erdös, Tompa, Hungary.

HUNGARY.
Biology. Unknown.

EUNOTUS (EUNOTELLUS) Masi

Eunotus sgen. *Eunotellus* Masi, 1931 : 424. Type-species : *E.* (*E.*) *aquisgranensis* Masi, by present designation.

Eunotus (Eunotellus) parvulus Masi

Eunotus (*Eunotellus*) *parvulus* Masi, 1931 : 435–437, ♂ ♀.

Type material. Type ♂ and paratypes (1 ♀, 3 ♂) in Naturhistorisches Museum, Vienna (not seen) ; the type male was captured in Bohemia.

CZECHOSLOVAKIA, AUSTRIA.
Biology. Unknown.

Eunotus (Eunotellus) aquisgranensis Masi

Eunotus (*Eunotellus*) *aquisgranensis* Masi, 1931 : 437, ♀.

Type material. Holotype ♀ in coll. Förster, Naturhistorisches Museum, Vienna ; labelled " Aachen—Juli—17/171 ".

BRITAIN ; new, Dorset, South Haven Peninsula, 1 ♀, 30.vi.1935 (*C. D. Day*) ; GERMANY.
Biology. Unknown.

SCUTELLISTA Motschulsky

Scutellista Motschulsky, 1859 : 172, 177. Type-species : *S. cyanea* Motschulsky, by monotypy.
Aspidocoris Costa, 1863 : 25. Type-species : *A. cyaneus* Costa, by monotypy.
Enargopelte Förster, 1878 : 62–63. Type-species : *E. obscura* Förster, by monotypy.
Scutellista Motschulsky ; Ashmead, 1904 : 325, 326.
Euargopelte [*sic*] Förster ; Ashmead, 1904 : 326.
Scutellista Motschulsky ; Schmiedeknecht, 1909 : 304, 305.
Euargopelte Förster ; Schmiedeknecht, 1909 : 304, 305–306.
Scutellista Motschulsky ; Kurdjumov, 1912 : 331–332.
Enargopelte Förster ; Masi, 1931 : 443–452.
Scutellista Motschulsky ; Masi, 1931 : 456–459.
Enargopelte Förster ; Kryger, 1943 : 78–81.
Scutellista Motschulsky ; Nikol'skaya, 1952 : 234.
Scutellista Motschulsky ; Peck, 1963 : 633–636.
Scutellista Motschulsky ; Peck *et al.*, 1964 : 32.

I do not think that the differences between the species of *Scutellista* and *Enargopelte* are great enough for these two entities to be regarded as distinct genera, although they are treated as such by Peck *et al.* (1964 : 32). The two have more recently been united by Bouček (1966 : 35). The European species need revision ; but not having seen their types I am unable to do so.

Provisional key to European species

(Females)

This key is partly adapted from Masi's key to *Enargopelte* (1931 : 445).

1 Fore wing with a subtriangular bare area about in the middle of its hind margin ; postmarginal vein distinctly shorter than the stigmal vein. Scutellum about 2·5 times as long as the mesoscutum, overlapping about half of the gaster. Length 1·5 to 4 mm. Antennal flagellum yellow (*Scutellista* Mots., s.str.) . . . . . ***cyanea*** Motschulsky (p. 76)

– Fore wing wholly pilose except for a narrow line below the cubital vein ; postmarginal vein usually almost as long as the stigmal vein. Scutellum at most twice as long as the mesoscutum, usually overlapping less than half the gaster. Length 1 to 1·8 mm. Antennal flagellum yellowish, brown, or black (*Enargopelte* Förster) 2

2 (1) Antenna with first funicular segment as long as the second and about 1·5 times as long as broad ; clava nearly as long as the whole funicle. Fore wing with marginal vein about three times as long as the stigmal vein. Antennal flagellum yellowish with the clava slightly darker above ***hispanica*** (Masi) (p. 77)

– Antenna with first funicular segment slightly shorter than the second, quadrate to slightly transverse ; clava not or only slightly longer than the three preceding funicular segments together. Fore wing with marginal vein about twice as long as the stigmal vein. Antennal flagellum usually brown to black, sometimes paler proximally 3

3 (2) Vertex and upper part of frons with numerous distinct piliferous punctures amongst the reticulation. Length about 1 mm. ***obscura*** (Förster) (p. 76)

– Vertex and frons with indistinct, weakly-impressed piliferous punctures amongst the reticulation. Length 1·5 to 1·8 mm. or (f. *minor*) about 1 mm. . . . . ***nigra*** (Mercet) (p. 77)

Scutellista cyanea Motschulsky

Encyrtus caeruleus Fonscolombe, 1832 : 304, [♀], **syn.n.**
Scutellista cyanea Motschulsky, 1859 : 172–173.
Aspidocoris cyaneus A. Costa, 1863 : 24–26.
Scutellista cyanea Motschulsky ; Cockerell, 1898 : 65.
Scutellista cyanea Motschulsky ; Howard, 1898 : 19.
Scutellista cyanea Motschulsky ; Masi, 1907 : 266–269.
Scutellista cyanea Motschulsky ; Smith & Compere, 1928 : 322–333.
Scutellista cyanea Motschulsky ; Masi, 1931 : 457–459.
Scutellista cyanea Motschulsky ; Peck, 1963 : 633–636.

There are so many references to *cyanea* in the literature that only a few are cited here ; a full list is given by Peck (1963).

Type material. *Encyrtus caeruleus* Fonscolombe. Location of type unknown (possibly in Muséum Nationale d'Histoire Naturelle, Paris). In Westwood's foreign collection in Oxford there is a female labelled " Aspidocoris caeruleus Fonscolombe ". Fonscolombe's description of *caeruleus*, especially his reference to the long scutellum, applies very well to *Scutellista cyanea* Motschulsky, and I have no hesitation in synonymizing the two. The name *cyanea* is so well known that Fonscolombe's name should be rejected even though it has priority. I propose to submit an application for the retention of the name *Scutellista cyanea* to the International Commission on Zoological Nomenclature.

Scutellista cyanea Motschulsky. Type (not seen) in Zoological Museum, Leningrad.

Aspidocoris cyaneus Costa. Location of type not known. In Westwood's collection in Oxford there is a specimen donated by Haliday and labelled " *Costa* Acad. aspir. Nat. Napoli . . . reared from Aspidiotus myrti by A. H. Haliday & from Coccus of orange by Costa, 1863. A. H. Haliday "; it is a female of *Scutellista cyanea*. Although it is not a syntype, it is a useful indication because Haliday saw Costa's original specimens, as the latter mentions in his paper. The species was synonymized with *Scutellista cyanea* by Masi (1907 : 266).

FRANCE, SPAIN, ITALY, GREECE ; PALESTINE, INDIA, CEYLON, CHINA, JAPAN, HAWAII ; NORTH and SOUTH AFRICA, ERITRAEA, KENYA, UGANDA ; U.S.A., PERU ; AUSTRALIA. It was introduced into the U.S.A. from Italy, for the purpose of biological control, in 1895.

Biology. Parasite of various species and genera of Coccoidea (chiefly Pseudococcidae and Coccidae) ; a host-list and full references are given by Peck (1963). An important paper is that of Smith & Compere (1928) which includes an account of *S. cyanea* as a parasite of the black scale, *Saissetia oleae* (Bern.), of citrus fruit.

Scutellista obscura (Förster)

Enargopelte obscura Förster, 1878 : 62–63, ♂ ♀.
Enargopelte obscura Förster ; Masi, 1931 : 446–448, ♂ ♀.
Enargopelte obscurus Förster ; Kryger, 1943 : 80–81, ♂ ♀.

Type material. Syntypes (France) presumably in Naturhistorisches Museum, Vienna.

FRANCE, GERMANY, ITALY, CZECHOSLOVAKIA ; ? U.S.S.R.

Biology. Masi (1931 : 448) identified as *obscura* specimens reared from an unidentified Coccid on *Pistacia*, but suggested that *obscura* is probably polyphagous. Kryger (1943 : 81) records having taken a male and a female in Denmark, on *Salix repens* L. infested by scale-insects.

Scutellista aenea Kurdjumov

Scutellista aenea Kurdjumov, 1912 : 331–332, ♂ ♀.
Scutellista aenea Kurdjumov ; Masi, 1931 : 446, 448.

Type material. Syntypes, one ♀, one ♂, reared from *Eriococcus greeni* Newstead on *Agropyron repens* L., at Poltava Experimental Station, Ukraine, U.S.S.R., possibly in Zoological Museum, Leningrad.

Masi (1931 : 446) cited *aenea* as a doubtful synonym of *obscura* Förster. The description of *aenea* does not allow one to form a definite conclusion ; it is necessary to examine Kurdjumov's types in order to decide whether *aenea* falls within the range of variation of *obscura*.

U.S.S.R.

Biology. See above.

Scutellista nigra Mercet

Scutellista cyanea var. *nigra*, Mercet, 1910 : 185–190.
Enargopelte nigra Masi, 1931 : 448, ♂ ♀.
Enargopelte nigra forma *minor* ?, Masi, 1931 : 450–451, ♂ ♀.

Type material. Holotype ♀ and allotype ♂ in Instituto Español de Entomología, Madrid.

SPAIN, ALGERIA.

Biology. Masi (1931 : 450) recorded the form *minor* as having been reared in Spain from *Lecanodiaspis sardoa* Targ. on *Cistus ladaniferus* L.

Scutellista hispanica (Masi)

Enargopelte hispanica Masi, 1931 : 451, ♀.

Type material. Holotype ♀, Spain, Arenas de San Pedro (*Mercet*), in Instituto Español de Entomología, Madrid.

SPAIN.

Biology. Unknown.

ASAPHINAE

The type-genus of this group, *Asaphes* Walker, was placed by Förster (1856 : 53, under the name *Isocratus*) in his family Miscogastroidae. Thomson (1876*a* : 207)

transferred it to his tribe Spalangiina. Ashmead (1904 : 328) placed it, as a tribe in his subfamily Sphegigasterinae, in the family Pteromalidae. This was followed by Peck (*in* Muesebeck *et al.*, 1951 : 536) who included also *Hyperimerus* Girault in the same tribe. Bouček (1955 : 313) regarded *Asaphes* and *Parasaphodes* as forming a tribe Asaphini of Pteromalidae ; and *in* Peck *et al.* (1964 : 36) he maintained this view but included in Asaphini a third genus, *Mespilon* Graham [= *Hyperimerus* Girault]. The group appears to me distinct enough to be regarded, at least provisionally, as a subfamily.

Key to European Genera

In all three genera the spur of the mid tibia is unusually weak, its length not greater than the maximum breadth of the tibia.

Bairamlia in some respects is very unlike the other two genera, but seems best placed in Asaphinae.

1 Fore wing with marginal vein about 2·5 times as long as the stigmal vein ; postmarginal vein not or only slightly longer than the stigmal vein. Occiput not margined. Mesopleuron mainly reticulate, only the subtriangular area below the base of the hind wing being smooth. Dorsal surface of hind coxae bare in the basal half. Both mandibles with four teeth. Anterior margin of clypeus slightly curved forwards. Temples and genae terete. Second tergite of gaster very short. Antennal formula 11353 in female, 11263 in male . . . . . ***BAIRAMLIA*** Waterston (p. 84)

– Fore wing with marginal vein at most 1·3 times as long as the stigmal vein ; postmarginal vein longer than the marginal vein. Occiput margined. Mesopleuron mainly smooth or with subobsolete sculpture. Dorsal surface of hind coxae hairy in the basal half. Left mandible with two teeth, right mandible with three. Anterior margin of clypeus truncate. Genae and temples sometimes sharp-edged. Second tergite of gaster at least half as long as first. Antennal formula 11263 or 11173 2

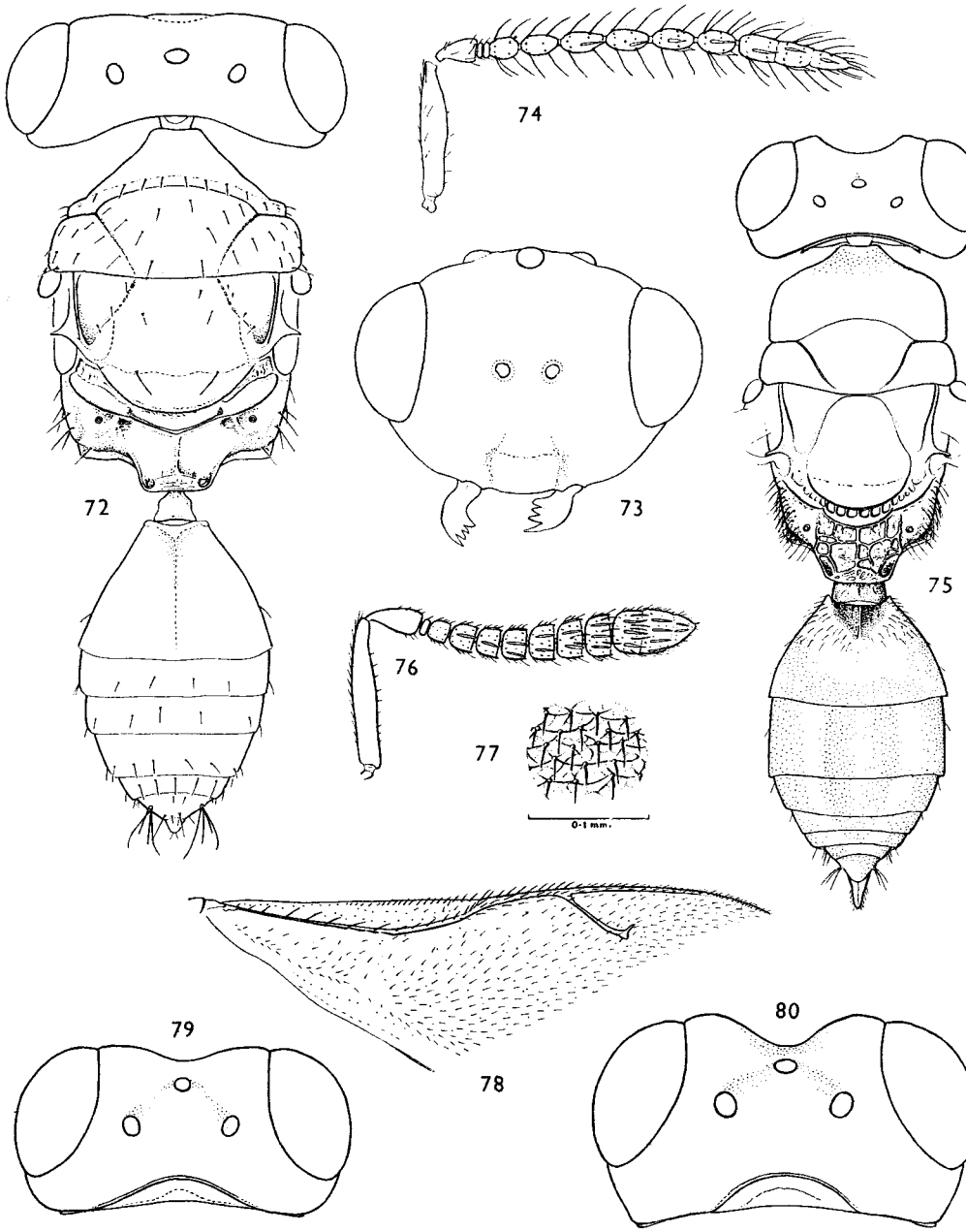
2 (1) Genae bordered by a strong carina which extends some distance up the temples. Frenal line (furrow) of scutellum strongly impressed. Gaster with petiole quadrate or slightly longer than broad ; basal tergite with only a very few hairs, at base, on either side of the petiolar insertion ***ASAPHES*** Walker (p. 78)

– Genae compressed but not bordered by a sharp carina. Frenal furrow of scutellum weakly impressed. Gaster with petiole broader than long ; basal tergite in female extensively pilose in its anterior half. Structure of body and appendages, Text-figs. 75–78 . . ***HYPERIMERUS*** Girault (p. 83)

ASAPHES Walker

Asaphes Walker, 1834 : 151. Type-species : *A. vulgaris* Walker, by monotypy.
Isocratus Förster, 1856 : 53, 58–59 [n. n. for *Asaphes* Walker, supposedly pre-occupied].
Isocratus Förster ; Thomson, 1876*a* : 207–208.
Asaphes Walker ; Ashmead, 1904 : 328.
Asaphes Walker ; Schmiedeknecht, 1909 : 368, 369, 370–371.
Asaphes Walker ; Nikol'skaya, 1952 : 245–246.
Asaphes Walker ; Peck, 1963 : 601–604.
Asaphes Walker ; Peck *et al.*, 1964 : 36.

Hitherto only one species of the genus (*vulgaris* Walker) has been generally



FIGS. 72–80. 72, *Epicopterus choreiformis* Westwood, ♂, body, excluding appendages ; 73, same, head ; 74, same, antenna ; 75, *Hyperimerus pusillus* (Walker), ♀, body excluding appendages ; 76, same, antenna ; 77, same, sculpture of mesoscutum ; 78, same, fore wing, part ; 79, *Asaphes suspensus* (Nees), ♀, head ; 80, *Asaphes vulgaris* Walker, ♀, head.

recognized in Europe ; in the present paper a second species (*suspensus* (Nees)) is regarded as valid. Other species have been described from North America ; some of these might prove to be synonymous with *suspensus*.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Head in dorsal view (Text-fig. 80) with temples rather straight, only moderately convergent, forming an angle with the occipital edge of the head ; speculum of fore wing well-defined ; femora mainly fuscous to black, tibiae at least slightly brownish, usually mainly fuscous to almost wholly black . ***vulgaris*** Walker (p. 80)

– Head in dorsal view (Text-fig. 79) with temples curved and rather strongly convergent, not angulate posteriorly ; speculum of fore wing indistinct or absent ; legs, not counting the coxae, testaceous with the femora sometimes more or less infuscate proximally, rarely the tibiae with a dark ring . . . ***suspensus*** (Nees) (p. 82)

(MALES)

1 Antennal scape more slender, 5·5 to 6 times as long as broad ; second anellus, at most 1·5 times as broad as long ; funicular segments one to two (sometimes also three) only slightly transverse ; pedicellus and flagellum brown to fuscous, or at most testaceous beneath . . . . . ***vulgaris*** Walker (p. 80)

– Antennal scape stouter, only about 4·5 times as long as broad ; second anellus nearly twice as broad as long, all funicular segments distinctly transverse ; at least the antennal clava testaceous, but more often the whole flagellum more or less so, sometimes also the pedicellus . . . . . ***suspensus*** (Nees) (p. 82)

Asaphes vulgaris Walker

(Text-fig. 80)

Asaphes vulgaris Walker, 1834 : 152, ♂ ♀.
Eurytoma aenea Nees, 1834 : 42, ♀.
Pteromalus petiolatus Zetterstedt, 1838 : 432, ♀,
Chrysolampus aeneus Ratzeburg, 1848 : 185, ♀.
Isocratus vulgaris (Walker) Thomson, 1876*a* : 208, *ex parte*.
Asaphes vulgaris Walker ; Kurdjumov, 1913 : 24, *ex parte*.
Asaphes vulgaris Walker ; Dunn, 1949 : 104–105.
Asaphes vulgaris Walker ; Bakkendorf, 1955 : 138, 144.
Asaphes vulgaris Walker ; Peck, 1963 : 603–604.

A number of other references are given by Peck (1963), but the species to which some of these refer may not be the true *vulgaris*.

Type material. *Asaphes vulgaris* Walker. One specimen that stands under this name in the British collection of BM(NH) is not original material. In the foreign section of this collection there are 11 specimens standing under the name *Asaphes vulgaris* Walker, and these are clearly syntypes which have been misplaced. They have been remounted on card-points, and all are labelled " Asaphis [sic] aenea Nees. Stood under this name in the old B.M. collection. C. Waterhouse ". Walker himself (1846 : 23) placed *vulgaris* in synonymy with [*Eurytoma*] *aenea* Nees and, incidentally mispelt the generic name as " *Asaphis* ". He also noted (op. cit.: 24) that specimens

were in the British Museum collection at that time. The above syntypes comprise 10 ♀ and 1 ♂ ; the female standing ninth in the series is now designated LECTOTYPE of *Asaphes vulgaris* Walker and has been so labelled.

The description of *Asaphes vulgaris* Walker was published in April 1834, that of *Eurytoma aenea* Nees probably not before October 1834 at the earliest, according to the records of library accessions. Walker's name therefore has priority, and has, moreover, been generally accepted. The holotype female of *Eurytoma aenea* Nees is lost, but there is no doubt that it was the same as *Asaphes vulgaris* Walker.

Chrysolampus suspensus Nees, 1834, was placed in synonymy with *Asaphes vulgaris* Walker by Reinhard (1857 : 76). In the present work *suspensus* is regarded as a valid species.

Pteromalus petiolatus Zetterstedt. One female, presumed to be the holotype, is in Zetterstedt's collection ; it is placed on the same pin as the type of his *Pteromalus violaceus*, and their common label reads " P. violaceus ♀. P. petiolatus ♀. Wittang ". The type of *petiolatus* is the same as *vulgaris* Walker.

Chrysolampus aeneus Ratzeburg. This was evidently considered as a new species, since Ratzeburg does not mention the Neesian species *Eurytoma aenea*. Ratzeburg later (1852 : 229) mentioned that he no longer possessed the holotype ♀ of his *aeneus*. From his description it must certainly have been the same as *vulgaris* (Walker), with which Reinhard (1857 : 76) synonymized it.

Bouček (1964*b* : 672) reported that he had found a specimen labelled as *Chrysolampus aeneus* in the remnants of Ratzeburg's collection recently discovered in Eberswalde. He stated that this specimen, a female, agreed with Ratzeburg's description and was labelled " C. pomor. [*Curculio Pomorum*] ", " *aeneus* Rtz." and " Chryso-lampus Spin.". Bouček was unwilling to designate this specimen as lectotype because Ratzeburg, as mentioned above, had stated in 1852 that he no longer possessed the holotype. It is remarkable, however, that the above specimen has the correct data ; Ratzeburg (1848 : 185) stated " Ich erzog ein Stück aus *Curculio Pomorum* ". I consider that it could be regarded as the holotype ; it might not have been lost, but only mislaid, when Ratzeburg wrote in 1852.

In addition to those given in my key, *vulgaris* has the following characters :

♀. Head, thorax and gastral petiole varying through bronze, or bronze with a greenish or bluish tinge, to nearly black ; the scutellum is often more conspicuously tinged with bronze than the rest of the thorax ; gaster black or virtually so. Length 1·2 to 2·3 mm. Head and thorax with more numerous bristles than in *suspensus*. Ocelli disposed in a triangle of about 110°. Antennal scrobes (Text-fig. 80) deeply excavated. Pronotal collar with shoulders rather prominent. Antennal pedicellus nearly twice as long as broad.

♂. Head, thorax, gastral petiole, and coxae, varying from dark to bright green, blue-green, or blue ; remainder of legs testaceous with the hind femora infuscate at least proximally ; sometimes the fore and mid femora are slightly infuscate, occasionally the hind tibiae are slightly darkened. Length 1·1 to 1·5 mm. Bristles of head and thorax, antennal scrobes, and pronotal collar, much as in the female. Ocelli disposed in a triangle of 110° to 115°.

A widely distributed and very common species. EUROPE (probably the whole continent), ICELAND, GREENLAND ; ? CANADA, ? U.S.A., ? ARGENTINA (the New World records need checking).

Biology. This was discussed by Dunn (1949 : 104–105) who stated that *vulgaris* is an extremely common and polyphagous species. It is said to be hyperparasitic on many species of aphids through various Aphidiinae (Braconidae). Peck (1963 : 603–604) gives a list of recorded hosts, some of which he regards as doubtfully correct ; he states (ibid. : 603) " Nearctic records of this species, except those from Greenland, probably should be placed elsewhere ". There are several host-records, from Europe, North Africa, and Israel, listed in *Entomophaga* (1956, **1** : 320, 331 ; 1961, **6** : 215, 320 ; 1963, **8** : 342, 370 ; 1966, **11** : 119, 133, 138, 150). Many of the foregoing records are doubtless correct but need checking in view of the fact that *vulgaris* s. lat. in Europe is now shown to comprise two species. Probably *vulgaris* has at least two generations per annum ; in Britain I have captured imagines in every month of the year.

Asaphes suspensus (Nees)

(Text-fig. 79)

Chrysolampus suspensus Nees, 1834 : 127, ♀.
Chrysolampus altiventris Nees, 1834 : 127, *ex parte*.
Pteromalus petioliventris Zetterstedt, 1838 : 429 [*recte* 427], ♂, **syn. n.**
? Colax aphidii Curtis, 1842 : 60.
Chrysolampus aphidiphagus Ratzeburg, 1844*a* : 181, **syn. n.**
Chrysolampus aphidiphagus Ratzeburg, 1848 : 184.
Asaphes aphidiphagus (Ratzeburg) Kurdjumov, 1913 : 24.

Type material. *Chrysolampus suspensus* Nees. One female in coll. Westwood, ex coll. Nees ; it bears a small pink square with the number " 8 ", and is labelled " D. Div. 1 B, i. α (Podagrion Spin.) 48 suspensus mihi. 2 [? Sept.] 12 " (in the handwriting of Nees) and " Chrysolampus suspensus Es. 2. 127. E. Mus. Esenb.", in Westwood's handwriting. I designate this specimen LECTOTYPE of *suspensus*.

Chrysolampus altiventris Nees. One female in coll. Westwood, ex coll. Nees ; it bears a small pink square with the number " 8 ", also a label in the handwriting of Nees " B. β. interm. inter altiventris et suspensus. 28 [? Sept.] 12 ". The label implies that the specimen represents a varietal form, moreover the date of capture does not correspond with that given by Nees (1834 : 127). The specimen agrees very well, however, with his description of the female and may be taken as an indication of the identity of *altiventris*.

Pteromalus petioliventris Zetterstedt. One pinned specimen, which is clearly the type, stands in Zetterstedt's collection ; it is labelled (in his handwriting) " P. petioliven = tris. ♀. Moly Ro ". Although described as female, it is actually a male.

Colax aphidii Curtis. I do not know whether the types still exist. The description suggests that *aphidii* was the same as *suspensus* (Nees).

Chrysolampus aphidiphagus Ratzeburg. Holotype (lacking head) presumed lost. The species was synonymized with *Asaphes vulgaris* Walker by Kurdjumov (1913). It is certainly correctly placed in *Asaphes*, but from the original description I consider it to have been the same as *suspensus* (Nees) ; Ratzeburg stated that it had wholly yellow legs, excluding the coxae.

Note. *Asaphes lucens* (Provancher) (= *Euplectrus lucens* Provancher, 1887 : 206–207) ; *A. fletcheri* (Crawford) (= *Megorismus Fletcheri* Crawford, 1909 : 98, ♂ ♀) ; and *A. americana* Girault (1914 : 114–115, ♂ ♀) might all prove to be synonyms of *A. suspensus* (Nees), to judge by their respective descriptions. The latter, however, are short, and I would not propose a definite synonymy without having seen the type material of the North American species.

Besides the characters given in my key, *suspensus* also differs from *vulgaris* as follows :

♀. Head and thorax more brightly metallic, dark to bright green or blue, the propodeum and petiole less bright. Head and thorax with rather less numerous bristles. Ocelli forming a slightly less obtuse triangle (about 100°). Antennal scrobes rather less deeply excavated (Text-fig. 79). Pronotal collar with the shoulders rather more rounded. Antennal pedicellus relatively a little shorter.

♂. Head and thorax tending to be a brighter green or blue ; legs, not counting the coxae, yellow to testaceous, rarely with the hind femora slightly brownish-tinged. Bristles of head and thorax, disposition of ocelli, antennal scrobes, and pronotal collar, as in female (see above).

I have examined material which can be referred to *suspensus* from BRITAIN, SWEDEN, GERMANY and CENTRAL EUROPE. In Britain the species appears to be much less common than *vulgaris*.

Biology. Apparently similar to that of *vulgaris*. I have seen a number of specimens reared from parasitized aphids on several species of plants but I consider that the data is not sufficiently precise for inclusion here. Imagines July–August.

HYPERIMERUS Girault

Hyperimerus Girault, 1917*a* : 5. Type-species : *H. corvus* Girault, by original designation.
Mespilon Graham, 1957 : 406. Type-species : *M. exiguum* Graham, by original designation.
Mespilon Graham ; Peck *et al.*, 1964 : 36.

When describing *Mespilon* I compared the type-species with the description of *Hyperimerus*, which I thought must be different. Bouček (1965*b* : 549) states that he received specimens of *Hyperimerus corvus* Girault from Burks, compared these with *Mespilon exiguum*, and concluded that the two were congeneric.

Hyperimerus pusillus (Walker) **comb. n.**
(Text-figs. 75–78)

Cyrtogaster pusilla Walker, 1833 : 383, ♀.
Mespilon exiguum Graham, 1957 : 406–408, ♀, **syn. n.**
Mespilon exiguum Graham ; Bouček, 1961 : 67, ♂ ♀.

Type material. *Cyrtogaster pusilla* Walker. One female (LECTOTYPE), bearing a Waterhouse label. Delucchi (1955*a* : 175) wrongly stated it to be an *Asaphes*.

Mespilon exiguum Graham. Holotype ♀, England, Berkshire, Farmoor, 11.vi. 1955, from nest of *Passer domesticus* (L.) (*J. K. Bates*) in Hope Dept., University Museum, Oxford.

BRITAIN, SWEDEN, CZECHOSLOVAKIA, JUGOSLAVIA.

Biology. Unknown. Imagines mainly Aug.–Oct. (some records for June and July).

Hyperimerus corvus Girault (N. America) differs from *pusillus* (Walker) chiefly in having an exserted ovipositor, also in having a more finely scupltured propodeum and denser whitish pubescence on some parts of the body (see Bouček, 1956*b* : 549) ; it is a hyperparasite of *Pseudococcus citri* Risso.

BAIRAMLIA Waterston

?Parasaphes Ashmead, 1904 : 328 [*nec* Candèze, 1882]. Type-species : *P. iceryae* Ashmead, by monotypy and original designation.
? Parasaphes Ashmead ; Schmiedeknecht, 1909 : 368, 369, 371.
? Parasaphodes Schulz, 1906 : 146 [n. n. for *Parasaphes* Ashmead *nec* Candèze].
? Amiscogaster Girault, 1917*e* : 144, 145. Type-species : *A. ruskini* Girault, by monotypy.
Bairamlia Waterston, 1929 : 103. Type-species : *B. fuscipes* Waterston, by monotypy.
Bairamlia Waterston ; Ferrière, 1934 : 85, 87, 89–90.
Parasaphodes Schulz ; Bouček, 1955 : 310–311.
Bairamlia Waterston ; Peck *et al.*, 1964 : 36.

The valid name for this genus may be *Parasaphodes* Schulz. Bouček (1955 : 311) redescribed *Parasaphodes*, but from European material since he had not seen the original specimens of *P. iceryae* Ashmead (the type-species). Until the types of *iceryae* have been re-examined and definitely shown to be congeneric with the type-species of *Bairamlia*, it seems advisable to adopt the latter name, following Peck *et al.* (1964).

Parasaphes was placed by Ashmead, together with *Asaphes*, *Tomocera*, and some other genera, in a tribe Asaphini of Sphegigasterinae. *Bairamlia* was originally described in Miscogasteridae (Tridyminae), but was transferred by Ferrière (1934) to Pteromalidae subfamily Pireninae. Bouček, who discussed its systematic position (under the name *Parasaphodes*), considered it to belong to Asaphini and remarked that this tribe was near to Spalangiinae and Diparinae. He retained the genus in Asaphini later (1964, *in* Peck *et al.* : 36). I agree with Bouček that *Bairamlia* has no connexion with Pireninae but should be placed near *Asaphes*.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Head in dorsal view 1·9 to 2 times as broad as long ; POL 1·35 to 1·5 OOL
nidicola Ferrière (p. 85)

– Head in dorsal view about 1·75 times as broad as long ; POL about 1·25 OOL
fuscipes (Waterston) (p. 85)

I cannot see any other good differences between the above. Smaller females of *nidicola* tend to have the funicular segments, especially segments 1–3, rather strongly transverse, larger females have these segments only slightly transverse. In the type specimens of *fuscipes* they are rather strongly transverse.

Bairamlia fuscipes Waterston

Bairamlia fuscipes Waterston, 1929 : 104–106, ♂ ♀.
Bairamlia fuscipes Waterston ; Ferrière, 1934 : 87, 90.

Type material. Holotype ♀, allotype ♂, and paratypes, in BM(NH), the holotype indexed as Type Hym. 5. 669 ; paratypes, ♂ and ♀, in U.S.N.M. Described from a series bred from cocoons of *Ceratophyllus wickhami* Baker taken from a squirrel's nest at Gerrard's Cross, Buckinghamshire, England (*E. K. Sikes*). The holotype ♀ has the head (in dorsal view) only about 1·75 times as broad as long, with the temples only moderately convergent ; POL 1·25 times OOL.

BRITAIN.

Biology. Parasite of the flea *Ceratophyllus wickhami* Baker (= *Orchopeas howardi* (Baker)) in dreys of the American Grey Squirrel (*Sciurus carolinensis* Gmel.) (Waterston, 1929 : 106) ; this Nearctic flea was introduced into Britain with its host.

Bairamlia nidicola Ferrière

Bairamlia nidicola Ferrière, 1934 : 89–90, ♂ ♀.
Parasaphodes atrovirens Bouček, 1955 : 311–313, figs. 2a–c, ♂ ♀.

Type material. *Bairamlia nidicola* Ferrière. Syntypes in BM(NH). LECTOTYPE ♀, Type Hym. 5.670, Wales, Pembrokeshire, Tenby, 29.viii.1932, reared (*T. Warwick*), from nest of Sand-Martin.

The lectotype of *nidicola* differs from that of *fuscipes* Waterston in having the head (in dorsal view) more transverse, twice as broad as long, with the temples converging more strongly, POL about 1·5 times OOL. Other British material that I have examined agrees in these respects with the type of *nidicola*. If these differences are valid then *nidicola* is specifically distinct from *fuscipes*. Ferrière (1934 : 90) notes some differences between *nidicola* and *fuscipes* in the relative proportions of the antennal segments, the sculpture of the mesoscutum, and the relative length of the basal tergite of the gaster ; these characters appear to be variable and I cannot appreciate any valid differences in these respects between *nidicola* and *fuscipes*.

Parasaphodes atrovirens Bouček. Holotype ♀, Central Bohemia, Říčany, reared April–May 1955 from a nest of *Sturnus vulgaris* L. (*M. Bouchner*) in Národní Museum, Prague (Cat. no. 3019). The species was synonymized with *Bairamlia nidicola* Ferrière by Bouček (1958*a*: 401).

Note. A specimen in the BM(NH) supposed to be the type of *Entedon glabrio* Walker is a female of *Bairamlia nidicola* Ferrière. The description of *Entedon glabrio* (1846*a* : 184, ♂) disagrees with the above specimen in several respects, e.g., the structure of the antennae, colour of the legs, although it agrees in some ways. Either the description is faulty, or some mistake was made in labelling the specimen. I am reluctant to accept the latter as the type of *glabrio*.

BRITAIN, SWEDEN, CZECHOSLOVAKIA ; probably widely distributed in Europe.

Biology. The species has been reared from the nests of *Sturnus vulgaris* L., *Riparia riparia* (L.) and *Aegithalos caudatus rosaceus* Matth. (Aves) (see Ferrière, 1934 : 90).

Some females of *nidicola* captured in a nest of *Riparia riparia* (L.) near Oxford, on 2.x.1955 (*J. K. Bates*), had their wings bitten off at about the level of the junction of the parastigma with the marginal vein. It looks as though the female does this in in order to facilitate her movements in the nest. So far as I know, this interesting phenomenon has not been observed in any other Chalcidoid, though it is well known that female ants do it when going underground. Granger (1944 : 91) found it in some numbers in hens' nests infested by the flea *Ceratophyllus gallinae* Schr. at Chartrettes, France, on 18.viii.1937 and it was also found in hens' nests near Oxford (*J. K. Bates*). Imagines Aug.–October.

CHRYSOLAMPINAE

This group has most often been placed in Perilampidae but Peck (*in* Muesebeck, Krombein & Townes, 1951 : 539) transferred two of its component genera, *Chrysolampus* and *Elatus*, to Pteromalidae (subfamily Sphegigasterinae, tribe Lamprotatini). In my opinion this action was correct. *Chrysolampus* (including *Elatus*), *Chrysomalla*, and *Brachyelatus* appear to me to have no real connexion with Perilampidae, although superficially they resemble them in many respects. These genera, however, do not have the characteristic thoracic structure of Perilampidae, the pronotum in particular, being free and not immovably co-adapted to the mesopleuron. A study of the biology of these genera is very desirable, particularly of the eggs and larvae. The known larvae of true Perilampidae are peculiar in being planidial in their earliest stage, whereas this type of larvae is unknown in Pteromalidae. Meanwhile I regard the Chrysolampinae as being fairly close to Miscogasterinae (= Lamprotatinae) though sufficiently distinct to warrant their separation as a subfamily.

KEY TO EUROPEAN GENERA

In all the genera, both mandibles have two teeth.

1 Gastral petiole (Text-fig. 53) longer than broad, its dorsal surface nearly flat, reticulate, with three or five longitudinal carinae (one median, two lateral, sometimes two submedian) ; basal tergite of gaster dorsally subconnate with the second tergite, nearly as in *Perilampus*. Thorax sometimes with coarse punctures. . . . . ***CHRYSOLAMPUS*** Spinola (p. 87)

– Gastral petiole at least slightly transverse, weakly sculptured, without longitudinal carinae ; hind margin of basal tergite of gaster overlapping the second tergite. Thorax without coarse punctures 2

2 (1) Fore wing with marginal vein with several rather long outstanding bristles along its front edge ; postmarginal vein approximately as long as the stigmal vein ; wing with a yellowish discal cloud. Pronotal collar sharply margined. Axillae approximated, the scutellum therefore narrowing strongly towards its base. Gaster with second tergite distinctly longer than the third ;

hind margin of basal tergite entire. Funicular segments of antenna less transverse than in *Brachyelatus* . . . . ***CHRYSOMALLA*** Förster (p. 91)

– Fore wing with marginal vein with only short fine hairs along its front edge ; postmarginal vein distinctly longer than the stigmal vein ; wing hyaline. Pronotal collar not margined. Axillae not approximated, the base of the scutellum therefore broad. Gaster with second tergite not longer than the third ; hind margin of basal tergite slightly incised medially. Funicular segments of antenna strongly transverse, those of the female about twice as broad as long ; the middle segments in the male about three times as broad as long . . . . . ***BRACHYELATUS*** Hoffer & Nowicky (p. 92)

CHRYSOLAMPUS Spinola

Chrysolampus Spinola, 1811 : 147, no. 6. Type-species : *Diplolepis splendidula* Spinola, by monotypy.
Elatus Walker, 1848 : 104, 153. Type-species : *E. thenae* Walker, by monotypy.
Lamprostylus Förster, 1856 : 42. Type-species : *L. punctatus* Förster [included by Förster, 1859 : 113].
Lamprostylus Förster ; Schmiedeknecht, 1909 : 81, 84–85.
Elatus Walker ; Schmiedeknecht, 1909 : 81, 85.
Chrysolampus Spinola ; Ruschka, 1924*a* : 93–95.
Elatus Walker ; Ruschka, 1924*a* : 95–96.
Chrysolampus Spinola ; Nikol'skaya, 1952 : 198–199.
Elatus Walker ; Nikol'skaya, 1952 : 199–200.
Chrysolampus Spinola ; Bouček, 1956 : 97–98.
Chrysolampus Spinola ; Kerrich, 1958 : 82–84.
Chrysolampus Spinola ; Ferrière & Kerrich, 1958 : 18, 20, 21.
Chrysolampus Spinola ; Peck *et al.*, 1964 : 26.

Lamprostylus Förster was placed in synonymy with *Chrysolampus* Spinola by Crawford (1914 : 74). *Elatus* Walker was united with *Chrysolampus* by Bouček (1956).

Key to European Species

1 Anterior margin of pronotal collar with two teeth. Gastral petiole, dorsally, with five longitudinal carinae (median, two submedian, two lateral). Thorax shiny and nearly smooth. Body violet-black ***dentatus*** (Bouček) (p. 88)

– Anterior margin of pronotal collar (Text-fig. 53) without teeth. Gastral petiole with three longitudinal carinae (median, two lateral). Thorax distinctly sculptured, green to blue, or partly copper to bronze 2

2 (1) Whole surface of pronotal collar, mesoscutum, and scutellum with a coarse honeycomb sculpture formed of large coalescent piliferous punctures, relatively dull.

Thorax blue to blue-green, with the pronotal collar green to golden or copper ; lateral angles of pronotal collar nearly rectangular. Last segment of antennal funicle in *female* about twice as broad as long. Large species, 3 to 4·5 mm. . . . . ***splendidulus*** (Spinola) (p. 88)

– Thorax with at least the disc of the scutellum devoid of coarse punctures ; at least some parts of the pronotal collar and mesoscutum with their piliferous punctures either small or, if large, then not coalescent ; often the whole thorax has relatively finer sculpture, which is sometimes partly composed of strigosity 3

3 (2) Thorax having coarse piliferous punctures, or rugose-punctate, on the following areas : a broad stripe behind the carina of the pronotal collar, the middle of the mesoscutum and along the notauli, the scutellum except its disc. Length 3 to 4 mm. 4

– Thorax without coarse punctures, or with at most some small and sparsely distributed punctures on the areas mentioned above. Length 1·6 to 3 mm. 5

4 (3) Coarse punctures of thorax very dense ; the interspaces on the middle part of the mesoscutum very narrow and transversely rugulose ; scutellum anteriorly and laterally very densely coarsely punctate ; side-lobes of mesoscutum (along thneo tauli) with more than one row of coarse punctures ***punctatus*** Förster (p. 89)

– Coarse punctures of thorax rather sparse ; interspaces on the most densely punctate parts about as wide as the punctures themselves ; side-lobes of mesoscutum (along the notauli) with only one row of coarse punctures ***prominens*** (Ruschka) (p. 89)

5 (3) Propodeum, on either side of the median carina, irregularly sculptured, nearly always with one to four transverse carinulae crossing the median carina ; the area between the basal pits and the spiracles very shiny, smooth or nearly so. Gastral petiole of *female* 2·1 to 2·4 times as long as its apical breadth. Fore wing usually more or less infumate discally. Length 3 to 3 mm. . . . . ***rufitarsis*** (Förster) (p. 90)

– Propodeum, on either side of the median carina, uniformly or nearly uniformly reticulate (rarely with just a trace of one or two transverse carinulae), the reticulation becoming gradually finer towards the spiracles but not disappearing completely. Gastral petiole of *female* 1·75 to 1·9 times as long as its apical breadth. Fore wing hyaline or (sometimes) whitish hyaline. Length 1·6 to 2·5 mm. . . . . ***thenae*** (Walker) (p. 89)

Chrysolampus dentatus (Bouček)

Elatus dentatus Bouček, 1955 : 327–329, ♂.
Chrysolampus dentatus Bouček, 1956 : 97.

Type material. Holotype ♂, Czechoslovakia, Bohemia, Velký Vřešťov, in a mixed wood, 9.vii.1954 (*Bouček*), in Národní Museum, Prague (Cat. no. 3067).

The female is unknown.

CZECHOSLOVAKIA.

Biology. Unknown.

Chrysolampus splendidulus (Spinola)

Diplolepis splendidula Spinola, 1808 : 223–224.
Chrysolampus splendidulus (Spinola) Spinola, 1811 : 147.
Lamprostylus auricollis Förster, 1859 : 114–115, ♀.
Chrysolampus cyaneus (Fabricius) Dalla Torre, 1898 : 163 [*nec Ichneumon cyaneus* Fabricius, 1798].
Chrysolampus splendidulus (Spinola); Ruschka, 1924*a* : 93–94.
Chrysolampus splendidulus (Spinola); Bouček, 1956 : 97.

Type material. *Diplolepis splendidula* Spinola. Types (Italy " prope Novas ") presumably in Spinola coll. (not seen).

Lamprostylus auricollis Förster. Type ♀, neighbourhood of Aachen, Germany, in Naturhistorisches Museum, Vienna. The species was synonymized with *splendidulus* Spinola by Ruschka (1924*a* : 93). Dalla Torre (1898) listed *splendidulus* as a synonym of *Ichneumon cyaneus* Fabricius (1798 : 231). Peck (*in* Muesebeck *et al.*, 1951 : 539) also cites *splendidula* Spinola and *cyaneus* Fabricius as being synonymous. Steffan (1952 : 73) pointed out that this was incorrect, and synonymized *Ichneumon cyaneus* Fabricius with *Perilampus ruficornis* (F.). I have myself seen the type of *cyaneus* in the Bosc collection in Paris, and can confirm Steffan's statement.

SWEDEN, GERMANY, CENTRAL and SOUTHERN EUROPE, NORTH AFRICA.
Biology. Unknown. Imagines in May and June.

Chrysolampus punctatus Förster

Lamprostylus punctatus Förster, 1859 : 113–114, "♂" [*recte* ♀].
Chrysolampus punctatus (Förster) Ruschka, 1924*a* : 93–94, ♀.
Chrysolampus punctatus (Förster); Bouček, 1956 : 97.

Type material. Holotype ♀, Köln am Rheinufer, in Naturhistorisches Museum, Vienna ; it was described as a male, but Ruschka (1924*a* : 94) pointed out that it was a female.

GERMANY, CENTRAL EUROPE, U.S.S.R.
Biology. Unknown. Imagines in May and June.

Chrysolampus prominens (Ruschka)

Elatus prominens Ruschka, 1924*a* : 95, 96, ♂ ♀.
Chrysolampus prominens (Ruschka) Bouček, 1956 : 97.

Type material. Syntypes, ♂ and ♀, Trieste (Graeffe) in Naturhistorisches Museum, Vienna.

ISTRIA.
Biology. Unknown. Imagines May–June.

Chrysolampus thenae (Walker)

(Text-fig. 53, ♀)

Elatus Thenae Walker, 1848 : 104, 154, ♂.
Perilampus obscurus Walker, 1874 : 314, "♂" [*recte* ♀].
Elatus thenae Walker ; Ruschka, 1924*a* : 95, ♂ ♀.
Elatus thenae Walker ; Nikol'skaya, 1952 : 199.
Chrysolampus thenae (Walker) Bouček, 1956 : 98.
Chrysolampus thenae (Walker); Kerrich, 1958 : 83.
Chrysolampus thenae (Walker); Ferrière & Kerrich, 1958 : 20, ♂ ♀.

Type material. *Elatus thenae* Walker. Type ♂ (probably holotype), Type Hym. 5. 1685, bearing a Waterhouse label, also another " Type Gahan, 1927 ".
Perilampus obscurus Walker. One ♀, Type Hym. 5. 396, labelled " Amurland.

Coll. F. Walker 1913-71 " and, in Walker's handwriting, " Perilampus obscurus ". *P. obscurus* was placed in synonymy with *Chrysolampus thenae* (Walker) by Kerrich (1958 : 83).

BRITAIN, SWEDEN, GERMANY, AUSTRIA, CZECHOSLOVAKIA, ? HUNGARY, U.S.S.R., SIBERIA.

Biology. Reared in Britain as a parasite of *Meligethes pedicularius* (Gyll.) by Dr. A. M. Easton (1963 : 11). Dr. Easton stated that mature host larvae collected from *Stachys officinalis* (L.) Trev. from Flintshire and Denbighshire were allowed to enter soil placed in tubes. Several days later a few of the larvae which had failed to pupate were seen to have a minute ectoparasite lying transversely across their ventral surface. These grew extremely rapidly and, when the host was consumed, entered upon a winter diapause. Imagines emerged the following spring. Only one parasite was found on each host larva. Of two batches of the host larvae, 5 out of 19, and 4 out of 25 respectively, were infested by the parasite. If the earliest stage of the larvae of *thenae* can be studied, this may provide an answer to the question of the systematic position of the genus *Chrysolampus*. Imagines April–July in Britain.

Chrysolampus rufitarsis (Förster)

Elatus rufitarsis Förster, 1859 : 111–113, ♂ ♀.
Elatus rufitarsis Förster ; Ruschka, 1924*a* : 95, 96, ♂ ♀.
Chrysolampus rufitarsis (Förster) Bouček, 1956 : 97.
Chrysolampus rufitarsis (Förster) ; Kerrich, 1958 : 83, ♂ ♀.
Chrysolampus rufitarsis (Förster) ; Ferrière & Kerrich, 1958 : 21, ♂ ♀.

Type material. Syntypes, ♂ from Aachen, ♀ from Tyrol, in coll. Förster (Naturhistorisches Museum, Vienna) re-examined by Ruschka, but not apparently since then. It will be necessary to select a lectotype.

BRITAIN, GERMANY, AUSTRIA, CZECHOSLOVAKIA, ? U.S.S.R.

Biology. Unknown. Imagines May–July in Britain.

Chrysolampus shurik (Nikol'skaya)

Elatus shurik Nikol'skaya, 1952 : 200.
Elatus shurik Nikol'skaya ; Bouček, 1956 : 97.
Chrysolampus shurik (Nikol'skaya) Kerrich, 1958 : 82, 83, 84.

Type material. Type (European part of U.S.S.R.) presumably in Zoological Museum, Leningrad (not seen). Bouček (1956) suggested that *shurik* was probably the same as *rufitarsis* Förster, but later he regarded it as a valid species (see Kerrich, 1958 : 82). Kerrich (ibid. : 83) listed some characters for distinguishing *rufitarsis* and *shurik*. Dr. Bouček, who has had his material of *shurik* confirmed by Dr. Nikol'skaya, tells me that the species can easily be separated from *thenae* by having much more distinct transverse rugae on the pronotum and mesoscutum, and by its colour.

CENTRAL EUROPE, U.S.S.R.
Biology. Unknown.

Note. The identity of the genus *Acroclisis* Förster (1878 : 43) is problematic. It was described from Germany with a single included species, *nigricornis* Förster (ibid. : 44) ; the type-material of this species does not appear to have been located. Subsequent references to *Acroclisis*, e.g., in Ashmead (1904) and Schmiedeknecht (1909) were based partly on the original description, and partly on a North American species *A. carolinensis* Ashmead which has since been removed to the Miscogasterine genus *Bubeckia* (by Peck, *in* Muesebeck *et al.*, 1951 : 538). In his key to the Czechoslovak genera of Pteromalidae Bouček (*in* Peck *et al.*, 1964 : 37) includes *Acroclisis*, but evidently his diagnosis of it is based on the original description only. Recently, when re-reading Förster's description of *Acroclisis*, I was struck by the fact that in most respects it agreed extremely well with the characters shown by species of the *thenae*-group (*Elatus* Walker) of the genus *Chrysolampus*. His statement " An den Vorderflügeln der Randabschnitt [marginal vein] . . . wenigstens fünf mal so lang wie der Radialabschnitt [stigmal vein] . . . " fits the above-mentioned *Chrysolampus* species very well ; moreover, there appears to be no other genus of Pteromalidae which has such a long marginal vein, and at the same time fits the other characters mentioned in Förster's description. Förster himself knew two species of the *thenae*-group of *Chrysolampus* and in 1859 had described a new one, *rufitarsis* (q.v., *supra*). It seems remarkable (though not perhaps impossible) that he should have forgotten this when he described *Acroclisis* in 1878.

CHRYSOMALLA Förster

Chrysomalla Förster, 1859 : 115. Type-species : *Ch. roseri* Förster, by monotypy.
Chrysomalla Förster ; Schmiedeknecht, 1909 : 81, 82.
Chrysomalla Förster ; Ruschka, 1924*a* : 93.
Chrysomalla Förster ; Nikol'skaya, 1952 : 196–198.
Chrysomalla Förster ; Erdös, 1955*b* : 39 *ex parte*.
Chrysomalla Förster ; Peck *et al.*, 1964 : 26.

Chrysomalla roseri Förster

Chrysomalla Roseri Förster, 1859 : 116–117, ♂.
Chrysomalla roseri Förster ; Ruschka, 1924*a* : 93, ♂.
Chrysomalla roseri Förster ; Erdös, 1955*b* : 39.

Type material. Holotype ♂, Germany, Würtemberg (*von Roser*) in Naturhistorisches Museum, Vienna (not seen by the writer).

GERMANY, CZECHOSLOVAKIA, HUNGARY, southern U.S.S.R., KAZAKHSTAN.

Biology. Erdös (1955*b* : 39) gave some biological notes on *roseri* ; I wish to thank the Director, and Miss Gombrich, of the Commonwealth Forestry Bureau, Oxford, for the following translation of the Hungarian text : "It was bred from the curculionid beetle *Tychius flavus* Beck. It has been found in Germany, the southern part of the Soviet Union and locally in Kazakhstan. It was collected

on sand in the environs of Budapest, at Siofok and Böny in late June and early July and subsequently in places with *Gypsophila arenaria* in greater numbers ".

BRACHYELATUS Hoffer & Nowicky

Brachyelatus Hoffer & Nowicky, 1954 : 110. Type-species : *B. viridis* Hoffer & Nowicky, by monotypy and original designation.
Brachyelatus Hoffer & Nowicky ; Peck *et al.*, 1964 : 26.

This genus was united with *Chrysomalla* Förster by Erdös (1955*b* : 39) but I think it might be considered distinct.

Brachyelatus viridis Hoffer & Nowicky

Brachyelatus viridis Hoffer & Nowicky, 1954 : 110–111, ♂ ♀.

Type material. Holotype ♀, Czechoslovakia, Moravia, Čečj, 1940 (*A. Hoffer*), ? in coll. Hoffer, Prague (not seen).

CZECHOSLOVAKIA, AUSTRIA.
Biology. Unknown. Imagines June–August.

PANSTENONINAE

PANSTENON Walker

Panstenon Walker, 1846 : 29. Type-species : *Miscogaster oxylus* Walker, 1839, by monotypy.
Caudonia Walker, 1850 : 125–126. Type-species : *C. agylla* Walker, by monotypy.
Panstenon Walker ; Förster, 1856 : 52, 58.
Panstenon Walker ; Thomson, 1878 : 175–177.
Panstenon Walker ; Ashmead, 1904 : 334, 335.
Panstenon Walker ; Schmiedeknecht, 1909 : 366–367.
Panstenon Walker ; Nikol'skaya, 1952 : 242.
Panstenon Walker ; Graham, *in* Kerrich & Graham, 1957 : 276–280.
Caudonia Walker ; Graham, ibid.
Panstenon Walker ; Ferrière & Kerrich, 1958 : 22, 26.
Panstenon Walker ; Bouček, 1961 : 71–72.

The genus *Panstenon* was recognized correctly by Förster (1856) and Thomson (1878) and has been in general use since then. Originally placed by Walker in Pteromalidae, it was transferred by Förster (1856) to his family Miscogastroidae. Thomson (1878) placed it, together with *Dipara* Walker, in his subtribe Diparides of Pteromalina. Ashmead (1904) put these two genera in the subfamily Diparinae of Pteromalidae. Schmiedeknecht (1909) followed Ashmead, except that he regarded Diparini as a tribe. Kerrich & Graham (1957) included *Panstenon* in their study of Cleonymidae, although in this paper Graham suggested that its affinities lay rather with Miscogasterinae [= Lamprotatinae]. Erdös had already (1955 : 296)

proposed a new subfamily Panstenoninae, in which he included *Panstenon* Walker and *Neodipara* Erdös. The latter genus has no connexion with *Panstenon* and must be excluded from the present subfamily.

Caudonia was described by Walker without his placing it in any of the recognized subfamilies, although he remarked that it was " allied to *Trigonoderus, Heteroxys* and *Notanisus* ". Förster (1856 : 47) included it in his key to the genera of Cleonymoidae, although he had not seen the genus. Later Walker (1872 : 80) accepted this view without comment. The genus remained in Cleonymidae until 1957, when Graham synonymized it with *Panstenon* Walker.

Key to European Species

1 Eyes smaller ; malar space from two thirds, to nearly three quarters, the length of an eye. Pronotal collar sharply margined anteriorly ; notauli, and frenal line of scutellum strongly impressed. Gaster of *female* usually convex dorsally and usually with at least some trace of a red band in the middle ; petiole with one to two hairs on each side . . . . . ***agylla*** (Walker) (p. 93)

– Eyes larger ; malar space about two fifths the length of an eye. Pronotal collar weakly margined, or immarginate ; notauli tending to be less strongly impressed ; frenal line of scutellum fine and weak. Gaster of *female* usually sunken dorsally, rarely red-marked dorsally though sometimes red beneath in the basal half ; petiole without hairs. Body of ♀, Text-fig. 55 . . . . ***oxylus*** (Walker) (p. 94)

Panstenon agylla (Walker)

Caudonia Agylla Walker, 1850 : 125, ♀.
Panstenon agylla (Walker) Graham, *in* Kerrich & Graham, 1957 : 276–280, ♀.
Panstenon agylla (Walker) ; Bouček, 1961 : 71–72, ♂ ♀.

Type material. Holotype ♀, Scotland, Duddingston Loch, near Edinburgh, between June 27 and June 30, 1825 (*J. C. Dale*) in Hope Dept., Oxford ; it is gummed on an octagonal card and bears a printed label " Dale ".

Britain, Czechoslovakia ; apparently very local and rare.

Biology. Unknown. Bouček (1961 : 72) suggested that it might be parasitic on some host living in a species of marsh grass. I believe it might be associated with *Phragmites* in old fens. On 9th June 1963 I captured a female amongst *Phragmites* at Wood Walton Fen, Huntingdonshire (a relict of ancient fen). There are also large reed-beds at the edge of Duddingston Loch, where Dale took the holotype of *agylla* ; I looked for the latter in these reeds some years ago, but the weather was bad and I had no success. Imagines found in Britain in June, in Czechoslovakia in August (Bouček, 1961). Cameron (1935 : 300) recorded having reared *agylla* from puparia of *Agromyza* [= *Melanagromyza*) *aeneiventris* (Fln.) found in stems of *Senecio jacobaea* L. in several localities to the west of London ; the specimens appear to be lost, but it seems likely that the parasite was wrongly determined (see Kerrich & Graham, 1957 : 277).

Panstenon oxylus (Walker)

(Text-fig. 55)

? Pteromalus assimilis Nees, 1834 : 116–117, ♀.
Miscogaster Oxylus Walker, 1839 : 196, ♂ ♀.
Pteromalus omissus Förster, 1841 : 30, ♀.
Panstenon oxylus Walker, 1846 : 29.
Panstenon Pidius Walker, 1850 : 132, ♂, **syn. n.**
Panstenon oxylus (Walker) ; Reinhard, 1858 : 17.
Panstenon assimilis (Nees) Thomson, 1878 : 176–177, ♂ ♀.
Panstenon oxylus (Walker) ; v. Rosen, 1956 : 1–72 (*passim*).
Panstenon oxylus (Walker) ; Kerrich & Graham, 1957 : 280.
Panstenon oxylus (Walker) ; Ferrière & Kerrich, 1958 : 26.
Panstenon assimilis (Nees) ; Bouček, 1961 : 72.

Type material. *Pteromalus assimilis* Nees. Type lost. Thomson (1878) considered it apparently the same as *oxylus*, and Bouček accepted this synonymy. Nees' description of *assimilis* (" nigro-aeneus . . . *metathorace* laevi, nitido, tricarinato . . . ") leaves some doubt, however.

Miscogaster oxylus Walker. There are 4 Walker specimens in the BM(NH) but only two (in the British collection) can be considered syntypes ; they are 2 ♂. One of these is designated LECTOTYPE ; it is card-pointed (remounted) and bears a Waterhouse label " Panstenon Oxylus Walker ".

Pteromalus omissus Förster. Type ♀ presumably in Naturhistorisches Museum, Vienna. Reinhard (1858 : 17) synonymized it with *oxylus*. The original description of *omissus* certainly suggests that it is identical with *oxylus*.

Panstenon pidius Walker. In Haliday's collection there are two males having narrow wings ; both are presumably syntypes of *pidius*. One (Hal. coll. no. 100) is designated LECTOTYPE ; it is mounted on a card, and the pin which carries it has its head coated with green sealing-wax (one of Haliday's methods of indicating Irish origin) ; it bears a label in Walker's handwriting " Panstenon Pidius ". The lectotype has very narrow wings. The wings in *oxylus* vary considerably in their proportions (especially in males) and I have intergrades between the typical form and the form *pidius*. The body in the forms with narrow wings is sometimes more slender than usual, and in the most extreme specimens appears slightly deformed. These variations are probably caused by pressure during the development of the pupa.

BRITAIN, IRELAND, DENMARK, SWEDEN, FINLAND, GERMANY, AUSTRIA, CENTRAL EUROPE.

Biology. See von Rosen (1956 : 1–72, *passim*). This author states that the larva of *oxylus* lives as a predator on the eggs of *Javesella* (= *Delphacodes*) *pellucida* (F.) (Hem., Delphacidae) in the internodes of various grasses ; he figures the egg, larva, and adult, and summarizes the life-history on p. 65 of the above paper. Walker (1850 : 132) recorded " *Panstenon Oxylus*, reared by Mr. Haliday from the pupa of a Dipterous insect (*Agromyza pisi*, Kaltenbach) on the pea ". In Haliday's collection there is a female of *oxylus*, labelled as such, mounted upon a card on which

he has written " pea "; to the right of the specimen is mounted a Dipterous puparium ; this must be the specimen to which Walker referred. It seems unlikely that Haliday, who was an outstanding Dipterologist, made a mistake about his rearing of *oxylus*, but it would be interesting to have a confirmation of this host record. Imagines May to September in Britain.

MISCOGASTERINAE

Miscogasteridae was originally proposed as a family-group name by Walker (1833 : 370). Förster (1856 : 51) used it (as Miscogastroidae) to include a number of genera some of which are currently referred to Pteromalinae. Thomson (1878 : 216) emended the name to Mischogastrides, which he regarded as a subtribe of his tribe Pteromalina. Ashmead (1904 : 270) again raised Miscogasteridae to family rank; his concept of the limits of the group (with some exceptions) makes some approach to that adopted in the present work. More recently the view has gained support that the group is of tribal, or at most of subfamily, rank within the family Pteromalidae. Thus it is regarded as a tribe of Sphegigasterinae by Peck (1963 : 606); and as a subfamily by Peck *et al.* (1964 : 36). My own concept of the subfamily Miscogasterinae is somewhat similar to the view of the latter authors, except that I exclude Asaphinae as being a separate subfamily, but include Pirenini and Tridymini, which they place together with Eunotini to form a separate subfamily Tridyminae. At present I recognize 8 tribes within Miscogasterinae: Micradelini, Pirenini, Termolampini, Ormocerini (=Tridymini), Brachyscelidiphagini, Trigonoderini, Sphegigasterini, and Miscogasterini, of which the Brachyscelidiphagini is not represented in Europe. At an earlier stage of my work I sought to define some of these tribes as subfamilies, but found the limits between them so slight, even when only the European fauna was considered, that the attempt proved impracticable. For example, some Pirenini approach extremely closely to Ormocerini through the genus *Gastrancistrus;* some Ormocerini (e.g., *Ormocerus*) are near to certain Miscogasterini; whilst some of the latter are not far removed from such genera of Sphegigasterini as *Polycystus* and *Toxeuma*. *Halticoptera* and some other genera have often been regarded as constituting a separate tribe or even subfamily; but I have been forced to unite them with Miscogasterini because of the existence of intermediate forms. In this connection it is interesting to note that Peck (1963) regards Halticopterini as a separate tribe, but places *Bubeckia*, a genus which I consider extremely close to *Halticoptera*, in the tribe Miscogasterini.

Brachyscelidiphagini, a tribe not dealt with here, is better represented in the southern hemisphere where (especially in Australasia) there are some very aberrant forms. The group is very difficult to define and its characters need to be re-assessed ; it appears to come nearest to Ormocerini. Gahan & Ferrière who revised this tribe (1947 : 271–302) stated (ibid. : 272) " It is not easy to define this group. While the various forms have a common habitus somewhat different from other Chalcidoids and by which they can usually be recognized at sight, there appears to be no structural character common to all of them which is not duplicated somewhere else

in the Chalcidoidea. They differ from other lamprotatines chiefly by the more compact form of the thorax, the bidentate mandibles and the fact that the scutellum is usually without a transverse groove." Their biology presents some interesting features. Several species are known to be gall-makers, though some are probably true parasites. Perhaps some of the genera now included in this tribe should be transferred to Ormocerini; for example some species currently placed in Brachyscelidiphagini but which do not conform to Gahan & Ferrière's diagnosis of that tribe because they have distinctly tridentate mandibles.

The number of apical spurs on the hind tibiae is not a satisfactory character for distinguishing tribes within Miscogasterinae. The number sometimes varies even within the limits of a single genus, and is to some extent correlated with absolute size; for example, in *Halticoptera*, large species have two very distinct spurs, very small species may have only one.

KEY TO TRIBES (EUROPEAN)

1		Antennae (Text-figs. 103–109, 118–121, 142, 144, 145, 156, 157, 165–168, 172, 176–185) 13-segmented : either with two distinct anelli and six or seven funicular segments, or (less often) with three anelli and five funicular segments	6
–		Antennae (Text-figs. 187–194, 199–200, 209–211, 221, 223–225, 229, 239–247, 257, 268, 275–280) with 10 to 12 segments : either with only one anellus visible in dried specimens ; or if with two anelliform segments, then rarely having more than five funicular segments ; if with three anelliform segments, then only two funicular segments	2
2	(1)	Postmarginal vein of fore wing 1·7 to 2 times as long as the marginal vein ; speculum absent, the fore wing almost entirely pilose ; mandibles bidentate, separated even when closed (Text-fig. 186) from the clypeal margin by a space, in which the labrum is usually visible ; head, and dorsum of thorax excluding the propodeum, thickly though shortly pilose ; eyes conspicuously hairy ; body black, non-metallic . . . ***MICRADELINI*** (p. 247)	
–		Postmarginal vein of fore wing rarely longer than the marginal vein and then only slightly so ; speculum most often present ; mandibles with three or four teeth, when closed not leaving a space between their upper edge and the clypeus ; body most often more or less metallic, if black without metallic tinge, then either the head and thorax are more sparsely pilose or the eyes are nearly bare	3
3	(2)	Antennae (Text-figs. 275–280) 10-segmented ; with only five segments, one to four of which may be anelliform, between the pedicellus and the clava ; usually at most four of these segments have sensilla ***PIRENINI*** (part) (p. 328)	
–		Antennae (Text-figs. 189–194, 199–200, 209–211, 221, 223–225, 229, 239–247, 257, 268) 11- or 12-segmented : with six or seven segments (one or two of which are anelliform) between the pedicellus and the clava ; five or six of these segments have sensilla	4
4	(3)	*Females* with tip of hypopygium situated nearly or quite level with tip of gaster. Both sexes with antennal toruli touching the clypeus ; mesoscutum and scutellum sparsely pilose ; body black or weakly metallic ***PIRENINI*** (part) (p. 328)	
–		*Females* with tip of hypopygium nearly always remote from tip of gaster, if nearly level with it then the antennal toruli are separated by at least their	

own diameter from the clypeus, while the mesoscutum and scutellum are thickly pilose ; body usually metallic. *Males* with body usually conspicuously metallic, at least in part ; if black or nearly so, then the antennal toruli are separated by at least their own diameter from the clypeus, and the mesoscutum is usually more thickly pilose 5

5 (4) Notauli incomplete, indicated at front of mesoscutum only.
Antennal formula 11253. Head and thorax with irregular, unusually deep and fine reticulation. Anterior margin of clypeus truncate
TERMOLAMPINI (p. 249)

– Notauli complete, nearly always deep throughout, rarely rather superficial posteriorly . . . . . ***ORMOCERINI*** (most) (p. 250)

6 (1) Anterior margin of clypeus edentate or with only one tooth or angular projection 7

– Anterior margin on clypeus with two or three projections (teeth or, rarely, rounded lobes) 11

7 (6) Postmarginal vein of fore wing at least slightly longer than the marginal vein 8

– Postmarginal vein of fore wing not longer than the marginal vein . . . 9

8 (7) Pronotum either long, in dorsal view more than half the length of the mesoscutum, or else with a sharply margined collar ; petiole of gaster smooth or nearly so, subconical, usually transverse, occasionally slightly longer than broad . . . . . ***TRIGONODERINI*** (part) (p. 98)

– Pronotum in dorsal view less than half as long as the mesoscutum, the collar not defined but rounded off anteriorly 9

9 (8) Petiole of gaster conspicuous, reticulate, often longer than broad though occasionally transverse ; pronotal collar more or less distinctly margined
SPHEGIGASTERINI (part) (p. 123)

– Petiole of gaster inconspicuous, smooth or virtually so, transverse ; pronotal collar not margined, rounded off anteriorly 10

10 (9) Anterior margin of clypeus with a median tooth or tubercle
MISCOGASTERINI (part) (p. 149)

– Anterior margin of clypeus without a tooth or tubercle, truncate or curved forwards (*Ormocerus, Meromalus*) . . . ***ORMOCERINI*** (part) (p. 250)

11 (6) Anterior margin of clypeus with (Text-fig. 128) three asymmetric teeth, or (Text-fig. 127) three curved lobes . . ***MISCOGASTERINI*** (part) (p. 149)

– Anterior margin of clypeus either with two teeth ; or, if with three, then they are sharp and symmetrically placed 12

12 (11) Pronotum viewed dorsally, about two thirds as long as the mesoscutum ; petiole of gaster small, subconical, smooth ; postmarginal vein of fore wing slightly longer than the marginal vein . ***TRIGONODERINI*** (part) (p. 98)

– Pronotum usually sloping quite steeply and, in dorsal view, appearing less than half as long as the mesoscutum ; if longer than this, then either the gastral petiole is conspicuous and sculptured, or else the postmarginal vein is not longer than the marginal vein 13

13 (12) Hind margin of basal tergite of gaster not broadly emarginate, at most weakly sinuate laterally ; anterior margin of clypeus bidentate (Text-fig. 170) or at most (Text-fig. 43) with the left-hand tooth slightly notched or weakly bifid . . . . . ***MISCOGASTERINI*** (part) (p. 149)

– Hind margin of basal tergite of gaster (Text-figs. 95, 96, 100) broadly emarginate, except in *Novitzkyanus*, which has three symmetrically-placed teeth on the anterior margin of the clypeus, and the basal tergite of the gaster very large, almost covering the rest . . ***SPHEGIGASTERINI*** (part) (p. 123)

TRIGONODERINI

Trigonoderus Westwood and *Plutothrix* Förster were included by the latter in his family Cleonymoidae (1856 : 46, 47). Thomson also placed the species belonging to the two above genera, together with *Platygerrhus* and *Photismus*, in his " subtribe " Cleonymides. The same genera were also placed in Cleonymidae, together with several diverse elements, by Ashmead (1904) and Schmiedeknecht (1909). For some years Dr. Bouček and I had considered that the *Trigonoderus*-group had no close connection with Cleonyminae; Bouček referred to this in his study of the latter (1958 : 355). Later (*in* Peck *et al.*, 1964 : 35) he treated *Trigonoderus* and allied genera as a tribe Trigonoderini. My own view (reached independently) agrees with his. I consider this tribe to come nearest to Miscogasterini; certain features in Trigonoderini seem to suggest this, for example the structure of the thorax, the relatively long postmarginal vein, the antennae, and the well-defined clypeus. The latter in *Trigonoderus* and *Plutothrix* has its front margin angulate ; it is interesting to note that this angulation is very slightly asymmetric and not placed exactly in the median line. This recalls the asymmetric teeth on the clypeus of many Miscogasterini, the only other group of Pteromalidae known to me in which such asymmetric teeth occur. Trigonoderini and Miscogasterini appear to be well-defined biologically, the former being parasites of Coleoptera, the latter of Diptera, especially of Agromyzidae.

KEY TO EUROPEAN GENERA

1		Anterior margin of clypeus bidentate. Postspiracular sclerite without an oblique carina ; scutellar frenum marked off by an impressed line . . . ***ERDOESIA*** Bouček (p. 123)
–		Anterior margin of clypeus either (Text-figs. 92, 93) with one submedian tooth; or edentate 2
2	(1)	Anterior margin of clypeus without teeth, truncate or shallowly emarginate ; postspiracular sclerite uniformly reticulate, without an oblique carina. *Female* with hind margin of basal tergite of gaster not emarginate or incised medially 3
–		Anterior margin of clypeus with a submedian tooth or angulation ; postspiracular sclerite with an oblique carina which marks off a triangular upper area. *Female* with hind margin of basal tergite of gaster nearly always more or less incised or emarginate medially 5
3	(2)	Scutellum (Text-figs. 86, 88) without a frenum, flattened or weakly convex, with reticulation composed of more or less elongated areoles ***PLATYGERRHUS*** Thomson (p. 108)
–		Scutellum with a frenum, marked off by an impressed line, more strongly convex, its reticulation composed of nearly isodiametric areoles . . 4
4	(3)	*Female* with hind margin of basal tergite of gaster not produced in the middle ; pronotum shorter, its median length at most about half its breadth, in dorsal view ; fore wing immaculate in European species. *Male* with petiole of gaster not longer than broad ; funicular segments of antenna not nodulose, with hairs only moderately outstanding ***JANSSONIELLA*** Kerrich (p. 106)
–		*Female* with hind margin of basal tergite of gaster produced into a rounded lobe ; pronotum longer, its median length more than half its breadth ; fore wing nearly always with fuscous markings. *Male* with petiole of gaster

at least slightly longer than broad ; funicular segments of antenna with numerous small nodules from which strongly outstanding hairs arise
GASTRACANTHUS Westwood (p. 122)

5 (2) Fore wing with a moderately large speculum ; upper triangle of postspiracular sclerite shiny, weakly sculptured or smooth . ***PLUTOTHRIX*** Förster (p. 102)

– Fore wing without, or with at most a rudimentary speculum ; upper triangle of postspiracular sclerite distinctly reticulate
TRIGONODERUS Westwood (p. 99)

TRIGONODERUS Westwood

Trigonoderus Westwood, 1832*a* : 127. Type-species : *T. princeps* Westwood, by monotypy.
Trigonoderus Westwood ; Walker, 1837 : 15, *ex parte*.
Pterolycus Ratzeburg, 1848 : 208. Type-species : *Pteromalus* (*Pterolycus*) *brandtii* Ratzeburg, by designation of Gahan & Fagan, 1923.
Trigonoderus Westwood ; Thomson, 1878 : 7, *ex parte*.
Trigonoderus Westwood ; Schmiedeknecht, 1909 : 156, 157, 166–167, *ex parte*.
Trigonoderus Westwood ; Nikol'skaya, 1952 : 212, *ex parte*.
Trigonoderus Westwood ; Novitzky, 1955 : 26–34.
Trigonoderus Westwood ; Kerrich & Graham, 1957 : 285–293.
Trigonoderus Westwood ; Ferrière & Kerrich, 1958 : 26–27.
Trigonoderus Westwood ; Peck *et al.*, 1964 : 35.

The European species were revised by Kerrich & Graham (1957) ; three being recognized as valid. In the following account four species are recognized, *T. pulcher*, previously placed in synonymy with *princeps* Westwood, being considered to be a valid species. Consequently there are some alterations in the synonymy.

Key to European Species

(Females)

1 Fore wing with two fuscous clouds, one below the base of the marginal vein, the other lying across the stigmal vein. Postmarginal vein not strongly curved, ending remote from the tip of the wing. Gaster reddish at base, at least beneath . . . . . ***cyanescens*** (Förster) (p. 102)

– Fore wing with at most one fuscous cloud, below the stigma. Either the postmarginal vein is strongly curved and almost reaches the tip of the wing, or else the gaster is not distinctly reddish at the base 2

2 (1) Fore wing with postmarginal vein strongly curved and almost reaching the tip of the wing. Gaster reddish at base, at least beneath ; hypopygium short, extending one third or hardly one third along the gaster. Temples converging quite strongly behind eyes. Femora and tibiae reddish testaceous. Fuscous cloud of fore wing normally very well-defined, extending from the stigma in a direction approximately at right angles to the costal margin
filatus Walker (p. 101)

– Fore wing with postmarginal vein less strongly curved and not nearly reaching the tip of the wing. Gaster not distinctly reddish at base ; hypopygium longer, extending two fifths along gaster, or rather more. Temples converging less strongly behind eyes. Femora often infuscate, tibiae occasionally so. Fore wing sometimes immaculate ; the fuscous cloud, when present, tending to be diffuse and to curve towards the base of the wing . 3

3 (2) Combined length of pedicellus and flagellum 1·5 to 1·65 times the breadth of the head. Dorsellum with 3 to 12 hairs. Malar space from barely two fifths, to slightly less than half, the length of an eye. Fore wing with parastigma usually as long as or longer (rarely slightly shorter) than the marginal vein. Gaster 3·2 to 4·5 times as long as broad, 1·2 to 1·4 times as long as head plus thorax. Vertex nearly always bright to dark blue ***princeps*** Westwood (p. 100)

– Combined length of pedicellus and flagellum 1·3 to 1·35 times the breadth of the head. Dorsellum bare. Malar space approximately half the length of an eye. Fore wing with parastigma usually slightly shorter than, occasionally as long as, the marginal vein. Gaster 2·3 to 3·2 times as long as broad, not more than 1·2 times as long as head plus thorax. Vertex usually greenish . . . . . ***pulcher*** Walker (p. 101)

(MALES)

1 Antennal flagellum having all its segments distinctly separated, not differentiated into funicle and clava . . . . ***cyanescens*** (Förster) (p. 102)

– Antennal flagellum with six funicular segments and a three-segmented clava 2

2 (1) Postmarginal vein of fore wing strongly curved and almost reaching the tip of the wing . . . . . ***filatus*** Walker (p. 101)

– Postmarginal vein less strongly curved and not nearly reaching the tip of the wing . . . . . ***princeps*** Westwood (p. 100) ***pulcher*** Walker (p. 101)

It is not possible at present to distinguish the males of *princeps* and *pulcher*.

Trigonoderus princeps Westwood

Trigonoderus princeps Westwood, 1832*a* : 127.
Pteromalus invenustus var. *β* Walker, 1836*a* : 11, ♂.
Trigonoderus obscurus Walker, 1836*a* : 21, ♀.
Trigonoderus atrovirens Walker, 1836*a* : 22, ♀.
Pteromalus hirtipes Zetterstedt, 1838 : 422, "♂? " [*recte* ♀].
Trigonoderus obscurus Walker ; Haliday, 1841–1842 : v, pl. E, fig. 1, ♀.
Pteromalus Lichtensteinii Ratzeburg, 1844*a* : 188, ♀.
Trigonoderus princeps Westwood ; Kerrich & Graham, 1957 : 287.

Type material. For a full discussion of the synonymy, and designation of lectotypes, see Kerrich & Graham (1957 : 287–292). In that paper *Trigonoderus pulcher* Walker, *T. tristis* Walker, and *T. contemptus* Walker were all placed in synonymy with *princeps* Westwood ; I now regard *pulcher* as a valid species, with *tristis* and *contemptus* as synonyms (see below).

BRITAIN, SWEDEN, GERMANY, CZECHOSLOVAKIA, ?MOLDAVIAN S.S.R.

Biology. Reared in Sweden from *Scolytus ratzeburgi* Jans., by A. Jansson (see Kerrich & Graham, 1957 : 292). The record of its having been reared in the U.S.S.R. (W. Caucasus, Sotchi) from *Parmena balteus* L. (Col., Lamiidae) by S. Novitzky (Kerrich & Graham, ibid.) needs confirmation ; the specimen there referred to might in my opinion prove to be distinct from *princeps*. Imagines May–September.

Trigonoderus pulcher Walker

Trigonoderus pulcher Walker, 1836*a* : 16, ♀.
? Trigonoderus tristis Walker, 1836*a* : 17, ♀.
Trigonoderus contemptus Walker, 1836*a* : 22, ♀, **syn. n.**
Trigonoderus Lichtensteini (Ratzeburg) Thomson, 1878 : 10 [*ex parte*].
? Trigonoderus sokanowskii ssp. *pseudoprinceps* Novitzky, 1955 : 31.
Trigonoderus princeps Westwood ; Kerrich & Graham, 1957 : 287–293 [*ex parte*].
Trigonoderus princeps Westwood ; Ferrière & Kerrich, 1958 : 27 [*ex parte*].

Type material. *Trigonoderus pulcher* Walker. Lectotype designated by Kerrich & Graham (1957 : 290) and the species placed in synonymy with *princeps* Westwood (ibid. : 287). I have re-examined the lectotype and now consider it to represent a valid species.

T. tristis Walker. Type female recognized by Kerrich & Graham (1957 : 290) and the species placed in synonymy with *princeps* Westwood (ibid. : 287). On examining the type again I think it may be a rather aberrant example of *pulcher* Walker.

T. contemptus Walker. Type female recognized by Kerrich & Graham (1957 : 290), the species being then placed in synonymy with *princeps* Westwood (ibid. : 289). After re-examining the type female of *contemptus* I consider it to be the same as *pulcher* Walker.

Kerrich & Graham (1957 : 290–292) discussed some wing-characters by which Novitzky had sought to divide *princeps* Westwood (s. lat.) into two species, but found them to be too variable to provide a satisfactory criterion. Since then I have re-examined all the material available, from which I conclude that two species (*princeps* Westwood and *pulcher* Walker) may in fact be recognized, though the characters which I use to separate them (see key to females) are somewhat different.

BRITAIN, SWEDEN, CZECHOSLOVAKIA.

Biology. Unknown. Imagines May–June.

Trigonoderus filatus Walker

Trigonoderus filatus Walker, 1836*a* : 17, ♀.
? Cleonymus occultus Förster, 1841 : 33, ♂.
Cleonymus signatus Förster, 1841 : 34, ♀.
Pteromalus Brandtii Ratzeburg, 1844*a* ; 188, ♀.
Trigonoderus filatus Walker ; Novitzky, 1955 : 29.
Trigonoderus filatus Walker ; Kerrich & Graham, 1957 : 286.
Trigonoderus filatus Walker ; Ferrière & Kerrich, 1958 : 26, 27, ♂ ♀.

Type material. For designation of lectotype for *filatus* Walker see Kerrich & Graham (1957 : 286). *Pteromalus brandtii* Ratzeburg (type now destroyed, but previously seen by Novitzky) was synonymized with *filatus* by Novitzky (1955 : 29). That author also stated (ibid.) that *Cleonymus occultus* Förster (type not found in Vienna) might be another synonym ; also that *Cleonymus signatus* Förster (type female in Vienna) was the same as *filatus*.

BRITAIN, FRANCE, SWEDEN, GERMANY.

Biology. Reared in Sweden from *Pogonocherus hispidus* L. (Col., Lamiidae), see Kerrich & Graham (1957 : 287). One female reared " from beetle burrow in apple twig," England, Bedfordshire, Leighton Buzzard, v. 1906 (*H. Donisthorpe*). Imagines May–August.

Trigonoderus cyanescens (Förster)

Cleonymus cyanescens Förster, 1841 : 31, ♀.
Trigonoderus pedicellaris Thomson, 1878 : 8, ♂ ♀.
Hetroxys Gribodoi van Vollenhoven, 1878 : 176, pl. 11, fig. 5, ♀, **syn. n.**
Trigonoderus cyanescens (Förster) Novitzky, 1955 : 26–33.
Trigonoderus cyanescens (Förster); Kerrich & Graham, 1957 : 285–286.
Trigonoderus cyanescens (Förster); Ferrière & Kerrich, 1958 : 26, 27, ♂ ♀.

Type material. For designation of lectotypes for *Cleonymus cyanescens* Förster and *Trigonoderus pedicellaris* Thomson, see Kerrich & Graham (1957 : 285–286). These two were synonymized by Novitzky (1955 : 27).

Hetroxys gribodoi van Vollenhoven. Syntypes, 2 ♀, taken in the north of Italy by J. Gribodo of Turin (location of types unknown, perhaps in Rijksmuseum van Natuurlijke Historie, Leiden). From Vollenhoven's description and his coloured figure of the female, I have no doubt that *gribodoi* is the same as *cyanescens* (Förster).

BRITAIN, FRANCE, SWEDEN, AUSTRIA, CZECHOSLOVAKIA, MOLDAVIAN S.S.R., POLAND, ITALY.

Biology. Unknown. Imagines May–August.

Species incorrectly placed in *Trigonoderus:*

Trigonoderus contractus Walker (1872 : 85, ♀) was listed by Kerrich & Graham (1957 : 299) as a doubtful species because the type could not be located. I have since found the type : a female labelled " Marshall coll. 1904–120 " ; "contractus Walk " ; " In BM (1938) as Trigonoderus contractus ". It is a female of *Calosota acron* (Walker) in Eupelmidae (**syn. n.**).

PLUTOTHRIX Förster

Plutothrix Förster, 1856 : 46, 49. Type-species : *P. försteri* Mayr, 1904, by subsequent reference.
Trigonoderus Westwood ; Thomson, 1878 : 11–13 [*ex parte*].
Anoglyphis Förster, 1878 : 49. Type-species : *A. nubilosa* Förster, by monotypy and original designation.
Plutothrix Förster ; Mayr, 1904 : 586–588.
Trigonoderus Westwood ; Schmiedeknecht, 1909 : 156, 157, 166–167 [*ex parte*].
Plutothrix Förster ; Nikol'skaya, 1952 : 212.
Plutothrix Förster ; Kerrich & Graham, 1957 : 284–299.
Plutothrix Förster ; Ferrière & Kerrich, 1958 : 27–28.
Plutothrix Förster ; Peck *et al.*, 1964 : 35.

The European species were first revised by Kerrich & Graham (1957) and keys for their identification were provided by Ferrière & Kerrich (1958). Three species were recognized in these two papers ; a fourth has since been described by Hedqvist, and is included here.

Key to European Species

(Females)

1 Gaster usually conspicuously red at the base, at least beneath, if hardly so, then fore wing with three fuscous clouds. Fore wing either with more than one cloud or, if only one, then this does not proceed from the stigma ; basal part of stigmal vein forming an angle of 35° to 40° with the postmarginal vein. Combined length of pedicellus and flagellum 1·25 to 1·35 times the breadth of the head ; proximal segments of funicle relatively long, the first two to three times as long as broad 2

– Gaster not, or only very obscurely, red at base. Fore wing either immaculate, or with one fuscous cloud which proceeds from the stigma ; basal part of stigmal vein forming an angle of about 45° with the postmarginal vein. Combined length of pedicellus and flagellum from 1·05 to hardly 1·2 times the breadth of the head ; proximal segments of funicle relatively short, the first 1·5 to 1·8 times as long as broad 3

2 (1) Fore wing trifasciate, the middle fascia arising from the stigma and usually joining the proximal fascia on the disc of the wing. Basal tergite of gaster with its hind margin deeply incised medially . ***trifasciatus*** (Thomson) (p. 104)

– Fore wing not trifasciate ; occasionally immaculate, but nearly always with a fuscous discal cloud, often with a second cloud near the tip of the wing. Basal tergite of gaster with its hind margin weakly to moderately deeply incised medially . . . . . ***scenicus*** (Walker) (p. 104)

3 (1) Scutellar frenum rather more coarsely reticulate than the disc of the scutellum. Genae (Text-fig. 93) less buccate. Lower edge of antennal toruli about level with the ventral edge of eyes. Metapleuron more strongly reticulate. Fore wing usually with a fuscous cloud proceeding from the stigma ***coelius*** (Walker) (p. 105)

– Scutellar frenum not more coarsely, or even rather more finely, reticulate than the disc of the scutellum. Genae (Text-fig. 92) strongly buccate. Lower edge of antennal toruli slightly above the level of the ventral edge of the eyes. Metapleuron more weakly reticulate. Fore wing immaculate or with a faint cloud proceeding from the stigma . ***cisae*** Hedqvist (p. 106)

(Males)

1 Antennae with seven funicular segments and a two-segmented clava ; flagellum slender, rather sparsely clothed with whorls of long hairs (the length of the hairs about twice the breadth of the segments that bear them) which stand out at an angle of 70° to 80° ; scape rather long, reaching to about level of vertex, rather more than three quarters the length of an eye, about four times as long as broad, hardly dilated above the middle ***trifasciatus*** (Thomson) (p. 104)

– Antennae with six funicular segments and a three-segmented clava ; flagellum rather thickly clothed with hairs whose length is at most slightly greater than the breadth of the segments that bear them, and which stand out less strongly ; scape shorter, reaching at most to about level of middle of median ocellus 2

2 (1) Antenna : combined length of pedicellus and flagellum twice or rather more than twice the breadth of the head ; funicular segments elongate (the first 3 to 3·5 times, the sixth 2·2 to 3 times, as long as broad) ; scape only about two thirds as long as an eye, about three times as long as broad, distinctly dilated above the middle and with a large shiny boss. Stigmal vein of fore wing forming a relatively acute angle with the postmarginal vein ***scenicus*** (Walker) (p. 104)

– Combined length of pedicellus and flagellum at most 1·5 times the breadth of the head ; funicular segments relatively shorter (the first 1·72 to 2, the sixth 1 to 1·3 times, as long as broad) ; scape fully three quarters as long as an eye, hardly dilated above the middle, with only a short and indistinct shiny area subapically. Stigmal vein forming a less acute angle with the postmarginal vein 3

3 (2) Antennal flagellum stouter, at least slightly stouter than the pedicellus when the latter is seen in dorsal view. Genae moderately buccate. Scutellar frenum distinctly more coarsely reticulate than the disc of the scutellum. Femora at least slightly infuscate, tibiae sometimes slightly so ***coelius*** (Walker) (p. 105)

– Antennal flagellum more slender, not stouter than the pedicellus when the latter is seen in dorsal view. Genae strongly buccate. Scutellar frenum not more coarsely, or even rather more finely, reticulate than the disc of the scutellum. Femora and tibiae testaceous . . ***cisae*** Hedqvist (p. 106)

Plutothrix trifasciatus (Thomson)

Trigonoderus trifasciatus Thomson, 1878 : 11, ♂ ♀.
Plutothrix Försteri Mayr, 1904 : 586–587, ♂.
Plutothrix trifasciatus (Thomson) Novitzky, 1955 : 31, ♂ ♀.
Plutothrix trifasciatus (Thomson); Kerrich & Graham, 1957 : 293.
Plutothrix trifasciatus (Thomson); Ferrière & Kerrich, 1958 : 28, ♂ ♀.

Type material. For designation of lectotype for *Trigonoderus trifasciatus* Thomson see Kerrich & Graham (1957 : 293). *Plutothrix foersteri* was synonymized with *trifasciatus* by Ferrière & Novitzky (see Novitzky, 1955 : 31).

BRITAIN, ?DENMARK, SWEDEN, CZECHOSLOVAKIA, MOLDAVIAN SSR.

Biology. Unknown. Imagines June–Sept.

Plutothrix scenicus (Walker)

? Diplolepis bicolorata Spinola, 1808 : 221.
Pteromalus scenicus Walker, 1836*a* : 10, ♂ ♀.
Pteromalus invenustus Walker, 1836*a* : 11, ♂.
Pteromalus praepileus Walker, 1836*a* : 12, ♀.
Hetroxys scenicus (Walker) Haliday, 1841–1842 : v, pl. G, fig. 1, ♀.
Trigonoderus vittiger Thomson, 1878 : 12, ♂ ♀.
Trigonoderus apicalis Thomson, 1878 : 12, ♂ ♀.
Plutothrix scenicus (Walker) Kerrich & Graham, 1957 : 293–296.
Plutothrix scenicus (Walker) ; Ferrière & Kerrich, 1958 : 28, ♂ ♀.

Type material. *Diplolepis bicolorata* Spinola. Kerrich & Graham (1957 : 294) reported that the type of this species could not be located and stated that the original description was insufficient to justify the adoption of the name. Walker himself queried *bicolorata* as a synonym of *scenicus* (1846 : 50). After reading Spinola's description again I think that *bicolorata* may well have been the same as *scenicus*. Spinola's mention that he had often seen *bicolorata* at rest beneath leaves of *Corylus* might apply to several species but is rather interesting, because on more than one occasion I have observed *scenicus* doing this.

For designation of lectotypes for the above Walker and Thomson species, see Kerrich & Graham (1957 : 293–295).

BRITAIN, IRELAND, SWEDEN, FINLAND, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Reared, together with *Anobium punctatum* DeG. (Col., Anobiidae) from stems of gorse (*Ulex*) in the Isles of Scilly, by O. W. Richards (see Kerrich & Graham, 1957 : 295). Imagines May–August.

Plutothrix coelius (Walker)

Pteromalus Coelius Walker, 1839 : 272, ♀.
Pteromalus Eleuthera Walker, 1848 : 125, 193, ♀.
Pteromalus Coelius Walker, 1848 : 126, 211, ♀.
Anoglyphis nubilosa Förster, 1878 : 49, ♀.
Trigonoderus acuminatus Thomson, 1878 : 11, ♀.
Pteromalus britannicus Morley, 1910 : 47 [n. n. for *P. coelius* Walker, 1848, *nec* 1839].
Trigonoderus tristis Walker ; Lyngnes, 1956 : 368–375 [misidentified].
Plutothrix coelius (Walker) Kerrich & Graham, 1957 : 296–299.
Plutothrix coelius (Walker); Ferrière & Kerrich, 1958 : 27, 28, ♂ ♀.
Plutothrix coelius (Walker); Lyngnes, 1960 : 122–134, *passim*.

Type material. The designations of lectotypes for the above species, given by Kerrich & Graham (1957 : 296–298) are not sufficiently precise in some respects, hence the following notes are added :

Pteromalus coelius Walker, 1839.—" Found by Mr. Haliday, at Holywood, near Belfast, Ireland ". (Walker, 1839 : 273). The type female (Type Hym. 5. 1638), bears a small green ticket (indicating Irish origin and also showing that it is a Haliday specimen) and a Waterhouse label.

Pteromalus coelius Walker, 1848.—The type locality cited (Walker, 1848 : 126) is " *a*. England. From Mr. Walker's collection ", and the species is described on p. 211 of the same work. Kerrich & Graham (1957 : 297) thought it likely that the two descriptions of *coelius* by Walker (1838 and 1848) referred to the same species and incidently to the same type specimen. However, the type localities cited for the two are different, also further specimens have been found which confirms that *coelius* Walker (1848) was described from different material from that which formed the basis for his description of *coelius* (1839). Recently I found two female *Plutothrix* standing amongst the Walker series of *Rhopalicus tutela*. One of these is labelled " 38. 8. 13. 64 ", a serial number which is listed in the old BM register of accessions as " Pteromalus near London (May) " ; it agrees very well with the description of *Pteromalus coelius* Walker, 1848, and is now designated LECTOTYPE.

Pteromalus eleuthera Walker. Type designated by Kerrich & Graham (1957 : 279–298) ; it bears the serial number Type Hym. 5. 1639.

BRITAIN, IRELAND, NORWAY, SWEDEN, GERMANY, MOLDAVIAN S.S.R.

Biology. Reared in England and Norway from *Anobium punctatum* DeG. (see Kerrich & Graham, 1957 : 298–299). Lyngnes (1956) gave an account (under the name *Trigonoderus tristis*) of its egg-laying apparatus, copulation, and life history; in

1960 he described the structure and function of its ovipositor. Imagines usually in May and June, in Britain sometimes also in July and August.

Plutothrix cisae Hedqvist

Plutothrix cisae Hedqvist, 1966 : 197–198, ♂ ♀.

Type material. Holotype ♀, Sweden, Upland, Uppsala, 15.xi.1963, reared from *Polyporus* sp. infested with *Cis boleti* (Scop.) (*T. Palm*), and paratypes, ♂ ♀, in coll. Hedqvist ; two paratypes in Institute of Agricultural and Forest Zoology, University of Helsinki. Mr. Hedqvist kindly sent the holotype and some paratypes for examination.

This species is very close to *coelius* (Walker) but may be distinguished by the characters given in my key to species; in addition the head and thorax in the specimens seen are brighter in colour, tending towards bright green, whilst the legs are paler, both femora and tibiae testaceous, or at most the fore and mid femora slightly brownish beneath and the hind femora broadly brownish in the middle.

ENGLAND [new record] : Buckinghamshire, Hell Coppice, near Oakley, 1♂, 18. viii. 1961 (*Graham*); SWEDEN; CANADA.

Biology. Probably a parasite of *Cis boleti* (Scop.) (Col., Ciidae).

JANSSONIELLA Kerrich

Janssoniella Kerrich, *in* Kerrich & Graham, 1957 : 303. Type-species : *J. caudata* Kerrich, by original designation.
Janssoniella Kerrich ; Ferrière & Kerrich, 1958 : 24, 30.
Janssoniella Kerrich ; Peck *et al.*, 1964 : 35.

Five species of the genus are now known, including one described from Japan by Kamijo (1960 : 101–102).

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Larger species, length 6·5 mm. in the single known ♀. Propodeum medially slightly more than one third as long as the scutellum. Ovipositor sheaths less exserted, the length of their projecting portion hardly half that of the last tergite ***major*** Kerrich (p. 107)

– Smaller species, length 3 to 4·5 mm. Propodeum medially one third or a little less than one third as long as the scutellum. Ovipositor sheaths on the average rather more exserted, the length of their projecting portion from slightly more than half, to more than two thirds, the length of the last tergite 2

2 Combined length of antennal pedicellus and flagellum at least about 1·75 times the breadth of the head ; funicular segments relatively longer (the first nearly three times, the sixth nearly twice, as long as broad) ; scape 0·97 the length of an eye ***caudata*** Kerrich (p. 107)

– Combined length of antennal pedicellus and flagellum 1·5 to 1·6 times the breadth of the head (Text-fig. 90) ; funicular segments relatively shorter (the first 2·0 to 2·5 times, sixth 1·5 to 1·7 times, as long as broad) ; scape 0·8 to 0·89 the length of an eye. Head, Text-fig. 91 . . . . . ***ambigua*** sp. n. (p. 107)

The males of *Janssoniella* need further study before a key can be provided. The male of *major* has the antennal scape slightly expanded above the middle, with a shiny elongate boss on its front edge, extending about half way down. The probable male of *ambigua* has the scape hardly at all expanded, and a boss is not distinctly developed. I am not sure if the true male of *caudata* has yet been recognized.

Note. Hedqvist has recently described (1968, *Ent. Tidskr.*, **89** : 57, 58) a new species *Jannsoniella intermedia*, from material captured in Finland and Canada. I have seen a ♀ paratype, which agrees with the type of *caudata* in antennal characters, but is much larger, with a longer propodeum. It does not appear to be identical with *major* but I cannot now compare it with the type of that species.

Janssoniella major Kerrich

Janssoniella major Kerrich, *in* Kerrich & Graham, 1957 : 305, ♂ ♀.

Type material. Holotype ♀, Sweden, Södermanland, Väsbyön, 24.vi.1949 (*A. Jansson*), in coll. A. Jansson.

SWEDEN.

Biology. Unknown. Imagines in June.

Janssionella caudata Kerrich

Janssoniella caudata Kerrich, *in* Kerrich & Graham, 1957 : 304, ♂ ♀.
Janssoniella caudata Kerrich ; Ferrière & Kerrich, 1958 : 30.

Type material. Holotype ♀, Sweden, Skåne, Ringsjö, in coll. Thomson, Lund.

BRITAIN, SWEDEN, GERMANY, CZECHOSLOVAKIA, CANADA, U.S.A.

Biology. Reared from *Polyporus* spp., including *versicolor* (L.) Fries, in Czechoslovakia and the U.S.A. (see Kerrich & Graham, 1957 : 304). Imagines June–August in Europe; one recorded in U.S.A. for March.

Janssoniella ambigua sp. n.

Janssoniella caudata Kerrich, *in* Kerrich & Graham, 1957 : 304–305 [*ex parte*], ♀.

♀. Length 3·0 to 3·7 mm.

Extremely close to the ♀ of *caudata* Kerrich, and differs from it only in its distinctly shorter antennal flagellum, slightly shorter funicular segments and scape (see key to species). The corresponding characters noted for *caudata* in my key are taken from the holotype ♀ ; this is a small specimen, which might be expected to have relatively shorter funicular segments if it were conspecific with *ambigua* sp.n., instead of having them longer. I therefore regard the specimens here included under *ambigua* to be outside the range of variation of *caudata*.

The shape of the head in ♀ *Janssoniella* varies somewhat, the relative depth of the scrobes and of the occipital excavation being rendered deeper in some specimens by shrinkage of the head. Therefore the difference in the shape of the head between *caudata* and *major* as given by Kerrich (1957 : 304–305 and figs. 18, 21) may not be a reliable character.

♂. Unknown.

Holotype ♀. England : unlocalized, Cooke coll., BM(NH).

Paratypes. ENGLAND : Berkshire, Wytham Wood, 1 ♀, 29.viii.1962 ; Buckinghamshire, Hell Coppice, near Oakley, 1 ♀, 27.viii.1959 (*Graham*), coll. Graham. CZECHOSLOVAKIA : Bohemia, Hradec Králové, 1 ♀ (*J. Gekina*) ; Praha-Revnice, 1 ♀ reared from *Polyporus*, vii.1953 (*L. Masner*), (BM(NH)).

Biology. Unknown.

PLATYGERRHUS Thomson

Platygerrhus Thomson, 1878 : 4, 13. Type-species : *P. gracilis* Thomson, by monotypy.
Platygerrhus Thomson ; Ashmead, 1904 : 284, 285.
Platygerrhus Thomson ; Schmiedeknecht, 1909 : 156, 157, 169.
Platygerrhus Thomson ; Nikol'skaya, 1952 : 213.
Platygerrhus Thomson ; Bouček, 1954 : 67.
Platygerrhus Thomson ; Kerrich & Graham, 1957 : 300–303.
Platygerrhus Thomson ; Ferrière & Kerrich, 1958 : 30.
Platygerrhus Szczepański, 1961 : 3–11.
Platygerrhus Thomson ; Peck, 1963 : 750.
Platygerrhus Thomson ; Peck *et al.*, 1964 : 35.

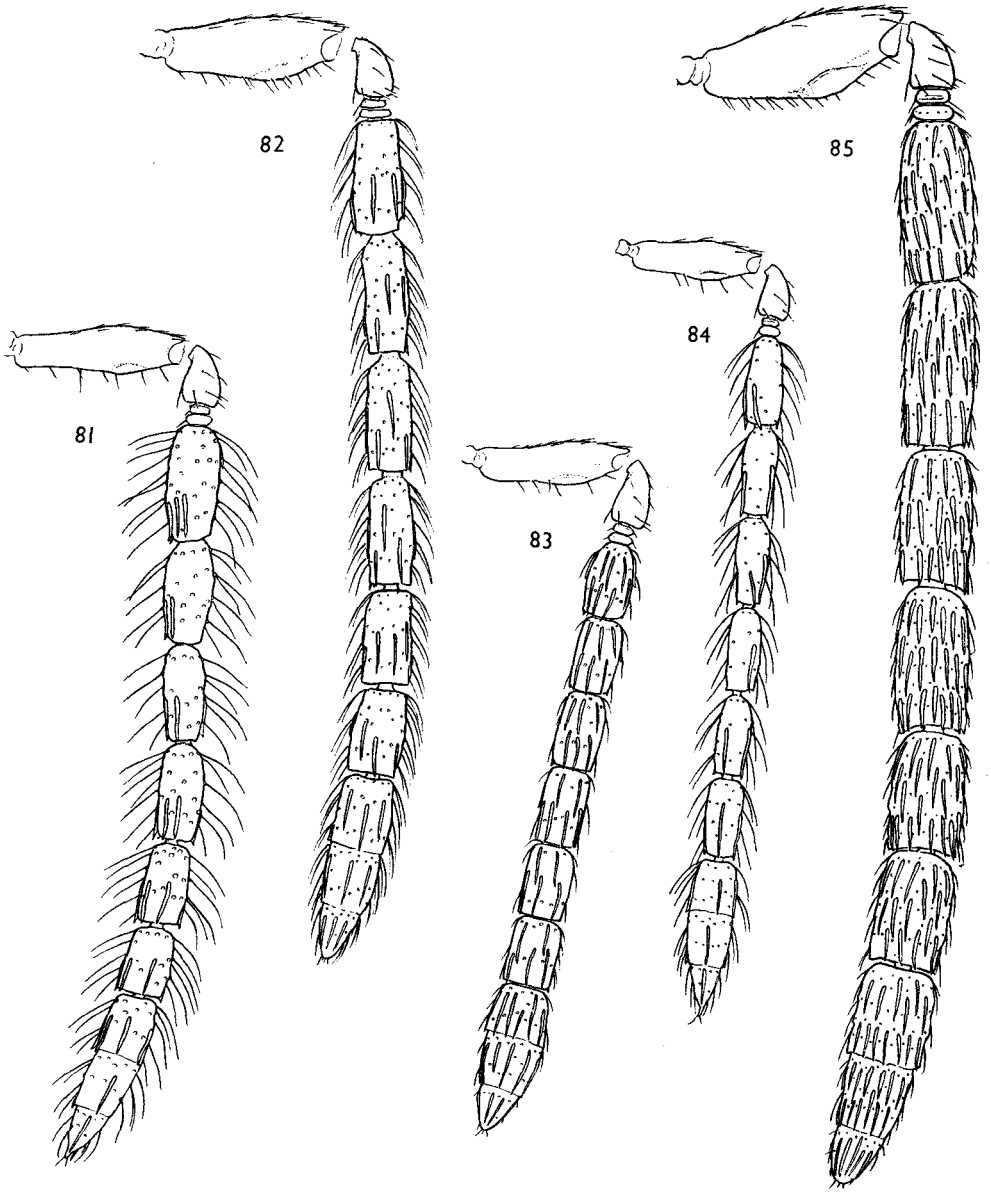
Kerrich & Graham (1957 : 300) recognized only two European species of *Platygerrhus*, viz., *dolosus* (Walker) and *ductilis* (Walker). Even at that time I had some reservations regarding the number of species, which I felt might well be greater. Since then I have studied much new material, as a result of which I now recognize more species and have to make some changes in the synonymy. Although the females of *Platygerrhus* are in general rather difficult to separate, the males often show good characters in their antennae. In some cases, however, recognizably distinct males have not yet been associated with any female. Hence it is very desirable to breed the species carefully in order to correlate the sexes in all of them ; if any worker could perform this task it would be an invaluable contribution to knowledge of this group.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Propodeum between the spiracles, the callus, and the metapleuron, with strong raised reticulation (hence relatively dull) ; all these parts green to blue. Metapleuron with three to ten hairs. Gena often smooth in the neighbourhood of the malar sulcus. Fore wing sometimes with a fuscous cloud below the stigmal vein ; basal cell open below in at least its proximal half ; row of hairs on lower surface of costal cell often incomplete. (Species-group of *maculatus* Erdös) 2

– Propodeum between the spiracles with sculpture which is weaker than that of the callus and metapleuron, and green to blue in colour ; callus and metapleuron varying from bronze to coppery and violet, area around each spiracle nearly always blue to violet. Metapleuron most often bare, very occasionally with one or two hairs. Gena entirely reticulate, or with at most a very narrow smoother strip running along the malar sulcus. Fore wing immaculate ; basal cell closed below except sometimes at extreme base ; row of hairs on lower surface of costal cell always complete . . 4



FIGS. 81–85. *Platygerrhus* spp., ♂ antennae. 81, *dolosus* (Walker) ; 82, *longigena* sp. n. ; 83, *unicolor* sp. n. ; 84, *subglaber* sp. n. ; 85, *ductilis* (Walker).

2 (1) Malar space only one third the length of an eye or even slightly less. Length of antennal scape slightly less than the transverse diameter of an eye. Fore wing with proximal half of costal cell virtually bare (Text-fig. 87).
Dorsellum distinctly reticulate. Gaster 1·1 to 1·2 times as long as head plus thorax. Clypeus, lower face, and genae, purplish bronze
subglaber sp. n. (p. 115)

– Malar space somewhat more than one third the length of an eye. Length of antennal scape equal to or slightly greater than the transverse diameter of an eye. Fore wing with lower surface of costal cell with at least some hairs in the proximal half, sometimes with a complete row.
Gaster 1·1 to 1·4 times as long as head plus thorax 3

3 (2) Fore wing with row of hairs on lower surface of costal cell at least narrowly broken in the middle ; basal cell open below except at apex. Clypeus, genae, and at least the lower part of the face, purplish bronze
maculatus Erdös (p. 114)

– Fore wing with row of hairs on lower surface of costal cell complete, sometimes partly double ; basal cell closed below in its distal half. Head entirely greenish . . . . . ***unicolor*** sp.n. (p. 116)

4 (1) Hypopygium shorter, its tip situated at one third the length of the gaster or slightly more. Slender species. Gaster elongate, 1·3 to 1·5 times as long as head plus thorax and 3·5 to 4 times as long as broad ; last tergite 1·7 to 2 times as long as its basal breadth. Length of eye 1·85 to 2·2 times the malar space 5

– Hypopygium longer, its tip situated at or nearly at half the length of the gaster, the latter at most 1·25 times as long as head plus thorax. Species sometimes more squat or with the malar space relatively shorter . . 6

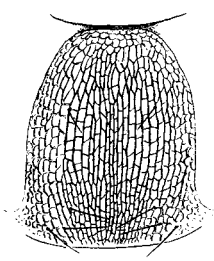
5 (4) Basal cell of fore wing (Text-fig. 89) quite extensively pilose (less so in very small specimens). Legs, except coxae and sometimes the mid and hind femora, testaceous. Funicular segments relatively long (the first 1·9 to 2·3 times as long as broad, 1·4 to 2 times as long as the pedicellus). Length 3·5 to 5·1 mm. . . . . ***ductilis*** (Walker) (p. 117)

– Basal cell of fore wing less extensively pilose. Legs dark, femora mainly fuscous to black ; at least the hind tibiae infuscate medially. Funicular segments relatively shorter (the first 1·5 to 1·6 times as long as broad) not or only slightly (up to 1·2 times) longer than the pedicellus. Length 2·8 to 3·4 mm.
May be only an abnormally dark small form of *ductilis* (q.v.)
*?**ductilis*** f. ***linearis*** (Walker) (p. 118)

6 (4) Length of eye 1·8 to 2·1 times the malar space. Funicular segments relatively short, the first quadrate to 1·6 times as long as broad ; sixth usually quadrate to slightly transverse, occasionally slightly longer than broad. Legs very dark ; femora mainly fuscous or black, at least the hind tibia more or less infuscate, sometimes the legs are mainly black. (Species-group of *dolosus* Walker) 9

– Length of eye 2·3 to 3 times the malar space. Funicular segments relatively longer, the first 1·6 to 2·4 times as long as broad ; sixth nearly always at least slightly longer than broad, rarely quadrate. Legs almost always paler ; tibiae usually testaceous, occasionally the hind ones slightly infuscate 7

7 (6) Scutellum moderately strongly convex ; a broad strip running down its middle is not distinctly striate-reticulate, most of the areoles being hardly longer than broad. Gaster only 2·1 to 2·2 times as long as broad, not longer than head plus thorax ; only the basal tergite tinged with green or



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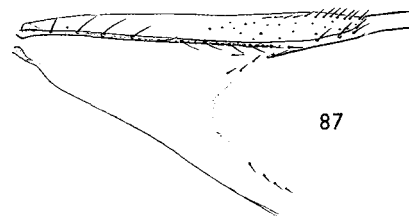

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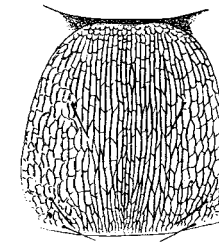

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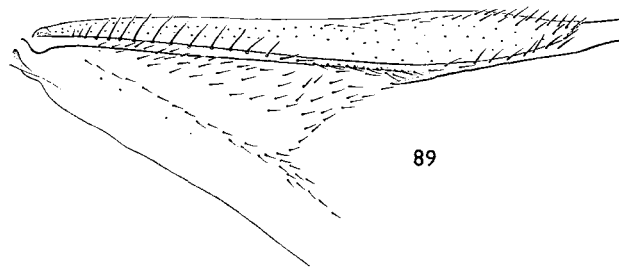

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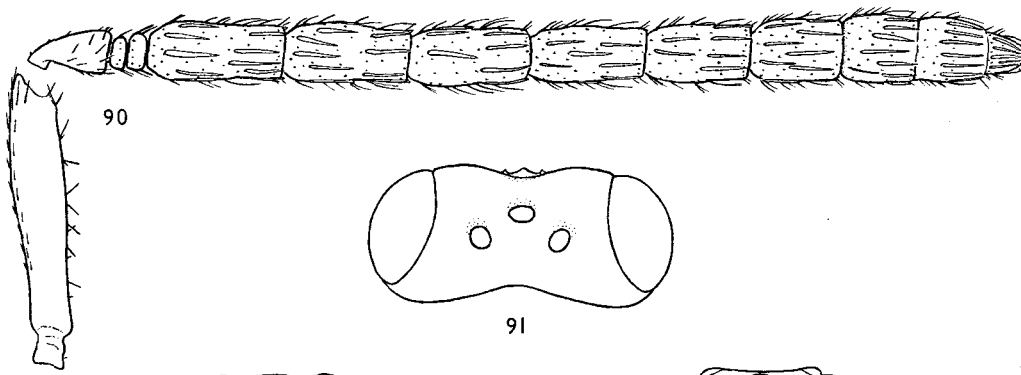

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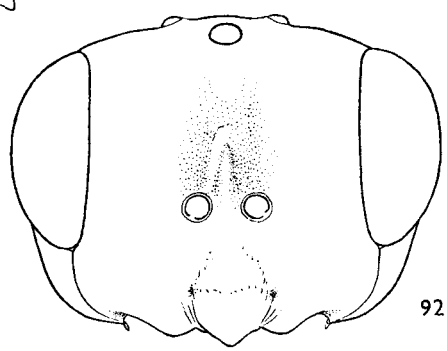

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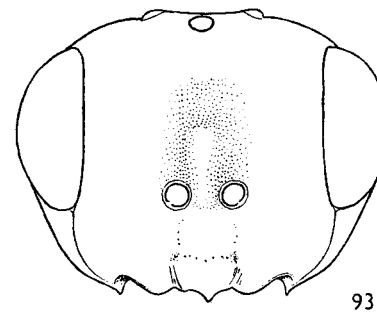

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FIGS. 86–93. 86, *Platygerrhus longigena* sp. n., ♂, scutellum ; 87, *P. subglaber* sp. n., ♀, fore wing, part ; 88, *P. dolosus* (Walker), ♀, scutellum ; 89, *P. ductilis* (Walker), ♀, fore wing, part ; 90, *Janssoniella ambigua* sp. n., ♀, antenna ; 91, same, head ; 92, *Plutothrix cisae* Hedqvist, ♀, head ; 93, *Plutothrix coelius* (Walker), ♂, head.

blue, the rest purplish black. Scape not or hardly more than three quarters as long as an eye . . . . . *?tarrha* (Walker) (p. 122)

– Scutellum weakly convex to nearly flat ; a strip running down the middle has striate-reticulate sculpture, most of the areoles being distinctly longer than broad. Gaster 2·2 to 4 times as long as broad, from as long, to 1·25 times as long, as head plus thorax. Scape most often somewhat more than three quarters the length of an eye 8

8 (7) Gaster 2·2 to 2·8 times as long as broad . . . ***affinis*** (Walker) (p. 118)

– Gaster 3 to 4 times as long as broad . . ***millenius*** Szczepański (p. 119)

9 (6) Scutellum reticulate with elongate areoles, but these do not give the appearance of strigosity. Propodeum usually without a purplish or violet zone around each spiracle . . . . . ***longigena*** sp. n. (p. 120)

– Scutellum (Text-fig. 88) very finely and regularly strigose, at least over its middle third. Propodeum nearly always with a purplish or violet zone around each spiracle . . . . . ***dolosus*** (Walker) (p. 120)

(MALES)

1 Antennal flagellum (Text-figs. 81, 82, 84) with outstanding hairs, whose length is about as great as the breadth of the funicular segments ; sensilla sparse, arranged in one, sometimes slightly irregular, row situated in the distal half of each funicular segment 2

– Antennal flagellum (Text-figs. 83, 85) with subdecumbent hairs, whose length is at least somewhat less than the breadth of the funicular segments ; sensilla most often numerous and arranged in two to three rows on each funicular segment, sometimes even four rows on the proximal segments . 6

2 (1) Propodeum between the spiracles as strongly reticulate as the callus and metapleuron ; all these areas blue or greenish. Scutellum reticulate with little tendency towards striation. Fore wing with row of hairs on lower surface of costal cell often broken medially ; basal cell sometimes partly or entirely open below 3

– Propodeum between the spiracles more weakly reticulate and more shiny than the callus and metapleuron ; the former area blue or green, the two latter most often bronze or coppery bronze. Scutellum sometimes partly strigose. Fore wing with row of hairs on lower surface of costal cell complete ; basal cell closed below 4

3 (2) Antenna (Text-fig. 84) with funicle slender, proximally hardly as stout as the pedicellus ; its first segment about 2·5 times, the sixth nearly twice, as long as broad. Dorsellum with distinct, raised reticulation ***subglaber*** sp. n. (p. 115)

– Antenna with funicle stouter (proximally as stout as or rather stouter than the pedicellus), its first segment hardly twice as long as broad, the sixth only slightly longer than broad. Dorsellum with relatively weaker sculpture ***?maculatus*** Erdös (p. 114)

4 (2) Antennal scape (Text-fig. 81) reaching slightly above the level of the vertex, its length fully equal to or slightly greater than the transverse diameter of an eye. About the middle third of the scutellum has very regular striate sculpture whose areoles are for the most part three times as long as broad or more, the sculpture even more regular than that of the female (cf. Text-fig. 88) . . . . . ***dolosus*** (Walker) (p. 120)

– Antennal scape reaching only to about the level of the middle of the median ocellus, its length hardly equal to the transverse diameter of an eye. Scutellum with more reticulate sculpture with little tendency towards striation (Text-fig. 86) ; over its middle third most of the areoles are less than three times as long as broad 5

5 (4) Antenna with hairs of flagellum standing out strongly ; scape 3·5 to 3·7 times as long as broad, only slightly expanded above the middle, where its front edge has a small boss which extends hardly half way down the scape. Scutellum moderately convex . . . . . ***tarrha*** (Walker) (p. 122)

– Antenna (Text-fig. 82) with hairs of flagellum standing out only moderately ; scape 2·9 to 3·1 times as long as broad, more distinctly expanded above the middle, its front edge with a larger boss. Scutellum weakly convex ***longigena*** sp. n. (p. 120)

6 (1) Propodeum between the spiracles as strongly reticulate as the callus and metapleuron ; all these parts greenish or bluish. Gena, just behind the malar sulcus, shiny and nearly smooth. Antennal scape (Text-fig. 83) hardly expanded above the middle, the boss on its front edge very indistinct and only slightly smoother than the rest of the scape . ***unicolor*** sp. n. (p. 116)

– Propodeum between the spiracles less strongly reticulate than the callus and metapleuron ; the former area green to blue, the latter areas normally bronze to coppery. Gena usually reticulate or alutaceous all over, sometimes narrowly shiny along the malar sulcus. Antennal scape with a distinct shiny boss on its front edge 7

7 (6) Antenna with first funicular segment 1·5 to 1·8 times as long as broad, 1·3 to 1·8 times as long as the pedicellus ; flagellum appearing rather rougher than in the following species. Legs relatively dark : normally all the femora are mainly fuscous to black, the hind ones often wholly so ; tibiae (at least the hind ones) usually infuscate medially ; sometimes the legs are mainly blackish. Length 1·7 to 2·7 mm.

Head shaped as in *ductilis*. Basal cell of fore wing usually with only one row of hairs below the submarginal vein, sometimes two. Eye 2·3 to 2·7 times the malar space . . . . . ?***ductilis*** f. ***linearis*** (Walker) (p. 118)

– Antenna (Text-fig. 85) with first funicular segment 2 to 2·5 times as long as broad, 1·8 to 2·6 times as long as the pedicellus ; flagellum appearing relatively smooth. Legs relatively paler ; mid femora often testaceous, sometimes also the fore femora ; tibiae most often testaceous, sometimes the hind ones infuscate. Length 2·5 to 4 mm. 8

8 (7) Head in dorsal view 2·15 to 2·25 times as broad as long. Fore wing with basal cell usually with two or even three rows of hairs below the submarginal vein, rarely only one row in small specimens ; stigma tending to be subcircular, its lower edge evenly curved. Eye 2·25 to 2·5 times as long as the malar space . . . . . ***ductilis*** (Walker) (p. 117)

– Head in dorsal view 2·35 to 2·4 times as broad as long. Fore wing with basal cell usually with only one row of hairs below the submarginal vein, sometimes two rows ; stigma tending to be longer than high, its lower edge often straight in the middle. Eye 2·7 to 2·9 times as long as the malar space ***affinis*** (Walker) (p. 118)

The *MACULATUS*-Group

The three forms included here are characterized by their very strongly and coarsely reticulate propodeum, and by the similar colour of the propodeum and metapleuron (see key to species). At first I believed that all three forms might belong to one variable species; but the discovery of three male forms having different antennae negatived this view. The differences between the respective females are small, but this seems to be the rule in *Platygerrhus ;* however, they work out consistently in the material studied. It will be interesting to see whether they prove to

be valid after a study of further material. The presence of a fuscous cloud on the fore-wing is not diagnostic for this species-group, as it is absent in some specimens ; such a cloud does not, however, occur in the other species-groups of *Platygerrhus*.

Trigonoderus algonquinia Girault (1917, *Ent. News* **28** : 396–397) belongs to the *maculatus*-group of *Platygerrhus* according to Hedqvist (1968, *Ent. Tidskr.* **89** : 36). I have not seen its type, which must be re-examined to see how it differs from the three species here placed in the group.

Platygerrhus maculatus Erdös

Platygerrhus maculatus Erdös, 1957 : 362–363, ♀.

Type material. Holotype ♀, Hungary, Budapest, Hüvösvölgy, 22.ix.1929 (*Biró*) and paratype, same locality, 23. ix. 1928 (*Biró*) in Hungarian National Museum, Budapest.

Dr. L. Moczár and Dr. Erdös at my request kindly looked for the holotype of *maculatus* but reported that they were unable to find it ; however, they sent the paratype to me for examination. Some discrepancies between the characters shown by the paratype and those mentioned in the original description suggest the possibility that it and the holotype may not have been conspecific. However, unless the latter is found, this cannot be ascertained. Therefore I assume that the two original specimens were in fact the same and base my interpretation on the paratype.

The ♀, as thus interpreted, has the following characters :

Whole face, including the clypeus, purplish bronze. Clypeus very shiny, alutaceous dorsally but smooth over about its anterior half ; anterior tentorial pits notably large, separated by hardly their own diameter ; genae smooth behind the malar sulcus, sometimes also in front of it ; malar space about two fifths the length of an eye. Antennal scape fully equal to or very slightly greater than the transverse diameter of an eye, reaching the level of the vertex ; pedicellus in profile about twice as long as broad, about as long as the first funicular segment ; funicle slightly clavate, proximally hardly stouter than the pedicellus, its first segment nearly twice as long as broad, sixth segment about 1·3 times as long as broad ; clava slightly broader than the funicle, slightly longer than the two preceding funicular segments together ; sensilla relatively sparse, in one row on each segment, slightly irregular on the proximal segments of the funicle.

Thorax similar to that of *subglaber* sp. n. Metapleuron with about six hairs. Fore wing with lower surface of costal cell with a row of hairs which is broken in the middle, and with scattered hairs in the distal third, its upper surface bare except for a row of hairs in the distal third ; basal vein with three to six hairs ; basal cell virtually bare, both it and the speculum open below ; an oval fuscous cloud below the stigmal vein in the specimens examined.

Gaster lanceolate, 3 to 3·5 times as long as broad, 1·25 to 1·4 times as long as head plus thorax ; otherwise much as in *subglaber* sp.n.

♂. A ♂ determined as *maculatus* by Dr. Erdös and which probably belongs to the above female, resembles the latter but differs as follows :

Antennae similar to those of *subglaber* sp. n., but with the flagellum rather stouter, proximally as stout as or slightly stouter than the pedicellus, its first segment hardly twice as long as broad, sixth segment only slightly longer than broad. Dorsellum smoother. Row of hairs on lower surface of costal cell only very narrowly broken in the middle, the speculum partly closed below ; the wing immaculate.

CZECHOSLOVAKIA, HUNGARY. A female from Czechoslovakia, in the collection of Dr. Bouček, agrees with the paratype of *maculatus*.

Biology. Unknown. The imagines examined were captured in April (♂), July and September (♀♀).

Platygerrhus subglaber sp. n.

(Text-figs. 84, 87)

♀. Head green to blue-green ; clypeus, lower face, and genae, purplish bronze ; dorsum of thorax including the propodeal callus green to blue-green, the pronotum with a blue or violet spot on each side ; sides and venter of thorax with more obscure greenish reflections, but the metapleuron sometimes green like the propodeal callus ; gaster dull bronze, laterally and ventrally greenish, and with the whole of the first tergite, except its hind margin narrowly, green to blue-green ; mandibles brownish with darker teeth ; antennal scape testaceous, darkened at the tip dorsally ; pedicellus brownish, testaceous beneath ; flagellum fuscous ; fore coxae blackish with a metallic tinge, their inner aspect sometimes pale ; mid and hind coxae testaceous, their outer aspect (except apically) fuscous ; legs otherwise testaceous with only the fifth tarsal segment brownish, the femora are deeper in colour, whilst the tarsi proximally are very pale, almost whitish testaceous ; tegulae testaceous ; wings hyaline, venation testaceous or brownish testaceous. Length, 2·7 to 3·2 mm.

Clypeus mainly or entirely smooth and polished ; anterior tentorial pits large and very deep, subcircular, separated by about their own diameter ; genae on both sides of the malar sulcus very shiny and virtually without sculpture, the edge of the oral fossa between clypeus and genae also polished ; remainder of head with reticulation which is distinctly raised above the general surface ; eyes large, separated by barely 1·1 times their length ; malar space very short, one third the length of an eye or slightly less. Antennal scape barely reaching level with the vertex, about four times as long as broad, its length slightly less than the transverse diameter of an eye ; pedicellus in profile nearly twice as long as broad, from two thirds to slightly less than the length of the first funicular segment ; funicle filiform, slightly stouter than the pedicellus, its first segment 1·7 to 2 times, sixth segment 1·25 to 1·5 times, as long as broad ; clava hardly broader than the funicle, 2·5 to nearly 3 times as long as broad, its length about equal to that of the two preceding funicular segments together, its first segment occupying nearly half of the total length ; sensilla fairly numerous, in the larger specimens forming two irregular rows on each funicular segment, though in a small specimen the number in the proximal row is reduced.

Thorax weakly arched dorsally, so that the dorsellum and propodeum are only gently declived. Pronotum, mesoscutum, and axillae with strong raised reticulation. Scutellum weakly convex in its longitudinal axis, relatively strongly sculptured ; along a narrow strip down the middle the sculpture is engraved with strongly elongated areoles, elsewhere the sculpture is slightly raised with the areoles only slightly elongated. Dorsellum slightly shiny, but with distinct, slightly raised reticulation. Propodeum including the calli, and the metapleura, with strong and distinctly raised reticulation, relatively dull for the genus ; metapleuron with three to eight hairs in its apical half ; mesepimeron moderately shiny, with delicate alutaceous (engraved) sculpture except ventrally where the sculpture is a little raised. Fore wing (Text-fig. 87) with costal cell with its lower surface bare or virtually bare in the proximal half but with scattered hairs in the distal half, its upper surface bare except for a row of hairs in the distal third ; basal vein with a few hairs ; the basal cell virtually bare, both it and the speculum open below.

Gastral petiole about 2·5 times as broad as long. Gaster lanceolate, 3 to 3·3 times as long as broad, slightly (1·1 to 1·2 times) longer than head plus thorax, nearly as broad as the thorax ; hind margin of first tergite slightly curved ; last tergite about as long as its basal breadth ; hypopygium extending slightly less than half way along the gaster.

The female differs from those of *maculatus* Erdös and *unicolor* sp. n. in the characters given in my key to species.

♂. Differs from the female as follows :

Length 1·7 to 2 mm. Antennal scape (except proximally) more brownish tinged ; pedicellus darker than in the female ; clypeus, genae, and lower face greenish with only a slight bronze tinge.

Antennae (Text-fig. 84) with scape not quite reaching the level of the median ocellus, slightly more than three times as long as broad, its length somewhat less than the transverse diameter of an eye, only very slightly expanded just above the middle, where there is a small shiny boss on its anterior margin ; combined length of pedicellus and flagellum about 1·8 times the breadth of the head ; pedicellus rather shorter (1·6 to 1·7 times as long as broad) ; funicle proximally slender, hardly as stout as the pedicellus in profile, but thickening slightly distad, its first segment about 2·5 times, sixth segment about twice, as long as broad ; clava about three times as long as broad, slightly broader than the sixth funicular segment, its length about equal to that of the two preceding funicular segments together ; flagellum with few sensilla, which are relatively long but placed in a single row in the distal part of each segment ; funicle clothed with long bristly hairs which stand out at an angle of about 30°, their length being somewhat greater than the breadth of the segments which bear them ; on the clava the hairs are similar but decrease somewhat in length.

Metapleuron with only two to six hairs. Lower surface of costal cell of fore wing in one specimen with three to four hairs in the proximal third.

Gastral petiole about as long as broad, about two thirds as long as the propodeum. Gaster oblong-sublinear, as long as but somewhat narrower than the thorax, ventrally concave with a median plica.

Holotype ♀. ENGLAND : Norfolk, 10.vii.1955, reared from logs of *Alnus glutinosa* L. (*G. H. Thompson*), BM(NH).

Paratypes. ENGLAND: Norfolk, 1 ♂, 7.vii.1955, 1 ♀, 10.vii.1955, reared from logs of *Alnus glutinosa* L. (*G. H. Thompson*), BM(NH).

The holotype ♀ is labelled " Alnus glutinosa Cage No. : 21 10 July 1955 " ; " England G. H. Thompson B.M. 1956–194 " ; and " Platygerrhus ductilis Walk. ♀ " July form " G. J. Kerrich det. 1955 ".

Biology. Unknown.

Platygerrhus unicolor sp. n.

♀. Differs from that of *subglaber* sp. n. as follows :

Lower part of head not tinged with purplish bronze. Fore wings immaculate in the British specimens, but in the Czechoslovak female with a fuscous cloud anterior to the stigmal vein. Clypeus alutaceous, only its anterior margin polished ; genae sculptured, except for a strip immediately behind the malar sulcus ; malar space longer, somewhat more than one third the length of an eye. Antennal scape reaching the level of the vertex, its length very slightly greater than the transverse diameter of an eye.

Dorsellum rather more shiny and less strongly sculptured, its hind margin smooth. Metapleuron with seven to ten hairs scattered over its surface. Mesepimeron with rather stronger, slightly raised, sculpture. Fore wing with lower surface of costal cell with a complete, even partially double, row of hairs extending to its base, also with more numerous scattered hairs in the distal half ; basal cell closed below in about its distal half by a line of hairs on the cubital vein, and with a few hairs below the submarginal vein.

Gaster a little longer, 3·5 times as long as broad and about 1·3 times the length of head plus thorax. The vertex, mesoscutum, axillae and scutellum are of a duller more bronze-green, whilst the scape and pedicellus are slightly darker than in *subglaber* sp. n.

The female differs from that of *maculatus* Erdös in the characters mentioned in my key to species (q.v.).

♂. Differs from the female in the structure of its antennae and gaster, also in its slightly darker colour. The antennae are blackish with only the base of the scape narrowly pale ; the trochanters and femora are brownish, the tibiae are brownish along their outer edge ; and the tegulae are fuscous.

The antenna (Text-fig. 83) is quite different from that of *subglaber* sp.n. in its broadened scape and thicker flagellum with numerous sensilla and subadpressed hairs.

Length of antennal scape about equal to the transverse diameter of an eye ; funicle rather stout, distinctly broader than the pedicellus in profile, its segments relatively shorter, the first hardly twice, the sixth hardly 1·5 times, as long as broad ; clava slightly broader ; funicular segments with numerous sensilla which are grouped in two rows upon each segment, the clava also with numerous sensilla which are arranged in one row on each segment ; the hairs of the flagellum are shorter than the breadth of the segments which bear them, and stand out only very slightly.

Holotype ♀. ENGLAND : Norfolk, 17.vi.1955, reared from logs of *Alnus glutinosa* L. (*G. H. Thompson*), BM(NH). The holotype is labelled " Alnus glutinosa Cage No.: 21 17 June 1955 " ; " England G. H. Thompson. B.M. 1956–194 " ; and " Platygerrhus ductilis Walk. ♀ intermediate G. J. Kerrich det. 1955 " .

Paratypes. 1 ♂, same data as holotype, 1.vi.1955, BM(NH) ; CZECHOSLOVAKIA : Praha-okolf. Krč, 1 ♀, 22.vi.1957, on *Pinus* (*Bouček*), in coll. Bouček.

Biology. Unknown.

THE *DUCTILIS*-GROUP

The species of this group have the propodeum weakly sculptured, and have the callus and metapleuron differently coloured from the middle part of the propodeum. Females have the funicular segments relatively longer, the malar space relatively shorter, and the legs paler, than those of the *dolosus*-group. The known males differ from those of the *dolosus*-group in having the hairs of the antennal flagellum subdecumbent.

Platygerrhus ductilis (Walker)

Trigonoderus ductilis Walker, 1836 : 17, ♂ ♀.
? Trigonoderus linearis Walker, 1836 : 19, ♀.
Trigonoderus figuratus Walker, 1836 : 20, ♂.
? Trigonoderus deductor Walker, 1836 : 20, ♂.
? Trigonoderus Lappa Walker, 1848 : 128, 216, ♂.
Platygerrhus ductilis (Walker) Kerrich & Graham, 1957 : 300–302, [*ex parte*].

Type material. Kerrich & Graham (1957 : 300) placed *Trigonoderus affinis* Walker, *T. amabilis* Walker, and *Platygerrhus gracilis* Thomson, in synonymy with *ductilis*. I now consider *affinis* to be a valid species, with *amabilis* and *gracilis* as synonyms (see below).

For designation of lectotypes, and discussion of the synonymy of the other species (except *lappa*) see Kerrich & Graham (1957 : 300–302).

Trigonoderus linearis is a small slender form with very dark legs ; it may be a form of *ductilis*, though I have found small differences which suggest that it might be a valid species. Further study of the range of variation in *ductilis* is necessary to settle this question.

Trigonoderus lappa Walker. Lectotype ♂ designated by Kerrich & Graham (1957 : 303), who placed it in synonymy with *dolosus* (Walker). It has the striate sculpture of the scutellum rather similar to that of male *dolosus* but its antennae are quite different. It certainly belongs either to *ductilis* or to *affinis*.

BRITAIN, SWEDEN, ?CZECHOSLOVAKIA.

Biology. Because *ductilis* (Walker) and *affinis* (Walker), regarded by Kerrich & Graham as forms of one species, are now considered to be distinct, it is difficult to be sure which host-records apply to the true *ductilis* without re-examining the specimens. The record given by Kerrich & Graham (1957 : 301) under forma *deductor* refers to true *ductilis* (England, Berkshire, Windsor Forest, 19.iv.1933, a female taken from burrows of *Ips* (=*Tomicus*) *suturalis* Gyll. in spruce bark). Szczepański (1961 : 5) recorded *ductilis* as a parasite of *Scolytus ensifer* Eichh. in Poland ; but his species was probably not the true *ductilis*. Walker (1836 : 18) recorded *ductilis* as occurring " May and June ; on posts and beams of wood perforated by *Anobium*, etc. " During May 1963, in my garden in Oxford, I observed males and females of *ductilis* walking about trellis-work made of old *Corylus* twigs which were heavily infested by *Anobium punctatum* DeG. ; it seems very likely that they were parasitizing this beetle. On 29.v.1968, at Southgate, Middlesex (which is probably the type-locality for this species) I captured a ♀ *ductilis* as it was investigating holes made by *Anobium*, on the bole of a decaying *Salix fragilis*. Imagines appear in May and June.

Platygerrhus affinis (Walker) agg.

Trigonoderus affinis Walker, 1836 : 19, ♀.
Trigonoderus amabilis Walker, 1836 : 20, ♀, **syn. n.**
? Pteromalus (*Pterolycus*) *Gravenhorstii* Ratzeburg, 1852 : 245, ♀.
Platygerrhus gracilis Thomson, 1878 : 14, ♀, **syn. n.**
Trigonoderus ductilis f. *affinis* (Walker) Kerrich & Graham, 1957 : 300, 301.
? Platygerrhus millenius Szczepański, 1961 : 5–10, ♂ ♀.

Type material. For designation of lectotypes for the above species, and discussion of synonymy, see Kerrich & Graham (1957). In that paper the names here cited under *affinis* were regarded as synonyms of *ductilis* (Walker).

Pteromalus (*Pterolycus*) *gravenhorstii* Ratzeburg. Types presumed destroyed. The species was thought by Novitzky to be a *Platynocheilus*, but in an earlier paper (Graham, 1963, *Trans. Soc. Brit. Ent.* **15** (9) : 169–170) I gave my reasons for thinking

that his view was incorrect and that *gravenhorstii* may have been a *Platygerrhus*. Of the species of that genus, the description seems to fit *affinis* best.

Platygerrhus millenius Szczepański. Holotype ♀, Poland, Hajnówka County, Bialowieza National Park, 31.viii.1959, in coll. Szczepański ; allotype♂, same locality, 8.ix.1959, in Forest Entomology Section of Central Agricultural College, Warsaw. Thanks to the kindness of Dr. Szczepański, I have been able to examine the holotype ; it may fall within the limits of variation of *affinis* (but see below).

I refer to the entity now being discussed as *affinis* aggregate, since it contains two forms which might be distinct species. The aggregate comes very close to *ductilis* (Walker) but may be distinguished as follows :

♀. Hypopygium extending nearly or quite half way along the gaster ; the latter on the average shorter than in *ductilis*, especially in large specimens, only as long as head plus thorax in some specimens, but up to 1·4 times as long in occasional smaller ones. Malar space relatively shorter (length of eye 2·3 to 3 times the malar space, as against 2·05 to 2·2 times in *ductilis*). Basal cell of fore wing with fewer hairs, usually only one row below the submarginal vein, two rows in large specimens ; lower margin of stigma less evenly and strongly curved, sometimes nearly straight in the middle, the stigma more oblong in shape, usually subcircular in *ductilis*.

There is considerable variation within the limits of the *affinis*-aggregate. *P. millenius* Szczepański falls within these limits and may be a form of *affinis*, the differences between them being only very small and possibly inconstant. Females of the aggregate, however, seem to fall into two groups : (1) *affinis* s. str., with gaster 2·2–2·8 times as long as broad, (2) *millenius* with gaster 3–4 times as long as broad. There is considerable variation in the length of the malar space, but no correlation between this and the relative length of the gaster appears to exist. The range of variation in the ratio of length to breadth of the gaster seems rather great for a single species, for which reason I treat *millenius* as a doubtful synonym of *affinis*. Further research is needed to show whether these two forms are specifically distinct or not.

The males which I have associated with *affinis* differ from those of *ductilis* only in a few very small characters (see key to males).

BRITAIN, SWEDEN, CZECHOSLOVAKIA, POLAND.

Biology. The specimens reared in England from *Anobium punctatum* DeG (*O. W. Richards*), and referred to as *ductilis* f. *affinis* by Kerrich & Graham (1957 : 301) belong here. In Britain I have captured imagines of f. *affinis* from August to November ; those of f. *millenius* in May, June and August.

THE *DOLOSUS*-GROUP

Females have the characters of the propodeum and metapleuron as in the *ductilis*-group, from which they differ in having the funicular segments relatively short, the malar space relatively longer, and the legs darker. Males differ from those of the *ductilis*-group in having the hairs of the antennal flagellum more or less outstanding.

Platygerrhus dolosus (Walker)

Trigonoderus dolosus Walker, 1836*a* : 23, ♀ (nec ♂).
Trigonoderus hirticornis Walker, 1836*a* : 23, ♂, **syn. n.**
Platygerrhus dolosus (Walker) Kerrich & Graham, 1957 : 303, ♂ ♀.
Platygerrhus dolosus (Walker) ; Ferrière & Kerrich, 1958 : 30.

Type material. *Trigonoderus dolosus* Walker. Lectotype ♀ designated by Kerrich & Graham (1957 : 303).

Trigonoderus hirticornis Walker. Two specimens stand under this name. One is labelled " hirticornis? Moncreaff " and cannot be a syntype ; it is a ♂ *Eupelmella vesicularis*. The other, bearing a Waterhouse label " *Trigonoderus hirticornis* ", is represented by the wings and one mid tarsus only ; these remains indicate that it was also a ♂ *Eupelmella*. I have not seen any ♂ of the latter which would fit the description of *hirticornis*. On the other hand the description fits some small males of *Platygerrhus dolosus* extremely well, so that I feel justified in synonymizing *hirticornis* with *dolosus*. Walker (1836*a* : 23) described what he supposed to be the ♂ of his *dolosus* but his identification was wrong since the ♂ syntype of *dolosus* (the only ♂ standing under that name) does not belong to that species, but possibly to *longigena* sp. n.

Trigonoderus lappa Walker, 1848, placed in synonymy with *dolosus* by Kerrich & Graham (1957 : 303) does not belong to that species, but probably to *ductilis* (see below).

BRITAIN, SWEDEN, CZECHOSLOVAKIA.

Biology. Reared in England as an external parasite of *Laemophloeus ater* (Oliv.) (Col., Cucujidae), a predator of *Phloephthorus rhododactylus* (Marsh.) (Col., Scolytidae) on broom, *Sarothamnus scoparius* (L.) Wimmer (*M. R. Smith*) ; see Ferrière & Kerrich, 1958 : 30. Imagines Apr.–May and Aug.–Sept.

Note. Whilst this paper was in proof, Hedqvist (1968, *Ent. Tidskr.* **89** : 38) described a new species *Platygerrhus americanus*, which he compared particularly with *dolosus*. I have seen a paratype ♀ of *americanus*, which differs from ♀ *longigena* in having the costal cell of the fore wing very narrow (length : breadth about 15 : 1), its upper surface virtually bare, lower surface (and the rest of the wing) more sparsely pilose ; base of costal and basal cells broadly infuscate ; middle of propodeum wholly violet.

Platygerrhus longigena sp. n.

(Text-figs. 82, 86)

♂. Head and dorsum of thorax deep bluish green, the scutellum mainly bronze, mesoscutum and axillae partly tinged with the same colour; sides of thorax with weaker greenish and bronze reflections ; propodeum including the spiracular regions bluish or greenish, except the calli which are bronze or purplish bronze ; gaster black with a weak violet tinge, the basal tergite partly blue-green. Mandibles reddish. Antennae black ; scape slightly metallic. Coxae concolorous with sides of thorax ; trochanters partly fuscous, partly testaceous ; femora blackish with a metallic gloss, except their tips very narrowly, and a stripe on the mid femur, which

are testaceous ; fore tibiae testaceous to fuscous, mid and hind tibiae fuscous with their bases and tips narrowly pale, or testaceous with a median infuscate band ; tarsi pale testaceous proximally, darkening gradually to brown distally, the fore tarsi darker than the others. Tegulae fuscous. Wings slightly greyish ; venation brownish testaceous. Length 2·3 to 2·5 mm.

Clypeus alutaceous, its anterior margin with a smooth strip. Tentorial pits as in *subglaber* sp.n. Genae and face wholly reticulate. Eyes separated by 1·2 to 1·3 times their length ; eye-length 2·2 to 2·7 times the malar space. Antenna (Text-fig. 82) with scape 2·8 to 3 times as long as broad, not reaching above the level of the middle of the median ocellus, expanded above the middle, its outer surface with vague indications of a boss ; combined length of pedicellus and flagellum 1·7 to 1·9 times breadth of head ; funicle slightly stouter than the pedicellus, but only when the latter is seen in profile, its first segment 1·8 to 2 times, sixth 1·4 to 1·6 times, as long as broad ; clava 3 to 3·5 times as long as broad, slightly longer than the two preceding funicular segments together ; flagellum fairly thickly clothed with hairs which stand out at 30° to 45°, the length of these hairs about equal to the breadth of the segments that bear them ; sensilla relatively sparse, arranged in one irregular row on each segment, or in two rows on some of the segments.

Scutellum (Text-fig. 86) with sculpture of about middle third engraved, with elongate areoles, though not quite so elongate as in male *dolosus* ; elsewhere the sculpture is very slightly raised above the general surface, with the areoles only moderately (some hardly) elongate. Dorsellum polished, smooth or virtually so. Propodeum (except the calli) moderately shiny, with fine reticulation which is only very slightly raised ; calli a little less shiny, with their sculpture slightly more raised. Metapleuron bare, sculptured much like the calli. Mesepimeron with sculpture like that of the main part of the propodeum. Fore wing : costal cell moderately broad (8·5 to 9 times as long as broad), its front edge slightly curved outwards, its lower surface with a complete, sometimes partly double, row of hairs, plus some scattered ones in the distal third, its upper surface with a single row in the distal third ; basal vein pilose ; basal cell closed below except at base, and with one to two irregular rows of hairs below the submarginal vein ; speculum closed below.

Closely resembles the male of *dolosus* (Walker), but has the antennal scape shorter and broader, not reaching the vertex, flagellum with somewhat less outstanding hairs ; sculpture of scutellum rather less fine and less obviously striate ; propodeum not tinged with violet or purple behind the spiracles (as it often is in *dolosus*).

♀. Differs from the ♂ as follows:

Head, and thorax dorsally, green to blue-green, the side-lobes of the mesoscutum bluish discally ; axillae and scutellum somewhat duller than the rest of the thorax (tending towards bronze). Antennal scape sometimes more or less testaceous proximally. Malar space longer (length of eye 1·8 to 2·1 malar space). Antenna with scape reaching level of vertex or (usually) a little above it, slightly more than three quarters as long as an eye, and its length slightly to very distinctly greater than the transverse diameter of an eye ; combined length of pedicellus and flagellum 1·3 to 1·35 times breadth of head ; pedicellus 1·7 to 1·8 times as long as broad, slightly shorter than the first funicular segment ; flagellum subclavate ; funicle proximally distinctly a little stouter than the pedicellus, thickening very slightly distad, its first segment 1·55 to 1·8 times as long as broad, sixth quadrate or very slightly transverse ; clava as long as, or somewhat longer than, the two preceding funicular segments together ; hairs of flagellum standing out only very slightly ; sensilla not very numerous, sometimes in one irregular (distal) row on each segment, but usually with a partial second (proximal) row on at least the proximal segments of the funicle. Scutellum flatter and broader, rather less finely sculptured. Fore wing with costal cell 10 to 12 times as long as broad, sometimes slightly infuscate basally. Gaster slightly longer than head plus thorax, 2·3 to 2·7 times as long as broad, about as broad as the thorax ; last tergite about as long as its basal breadth ; hypopygium extending half, or a little more than half, way along the gaster.

The female is very close to that of *dolosus* (Walker), which differs in having the side-lobes of the

mesoscutum blue, almost always with a violet discal spot ; spiracular areas of propodeum more or less violet or purplish ; scutellum more regularly sculptured, with the striations more extensive.

Holotype ♂. IRELAND : Co. Wicklow, The Glen of the Downs, 23.viii.1954 (*Graham*), in Graham collection.

Paratypes. ENGLAND : Oxfordshire, Otmoor, 1 ♀, 2.vi.1956, 1 ♀, 6.viii.1956 (*Graham*) ; IRELAND : North Kerry, Headley Bridge, 1 ♂, 28.vi.1934 (*A. W. Stelfox*), in Graham collection. Unlocalized, but probably IRELAND : 1 ♂ in Haliday collection (No. 874).

Biology. Unknown.

Platygerrhus tarrha (Walker) **comb. n.**

Trigonoderus Tarrha Walker, 1848 : 128, 217, ♂.
Trigonoderus tarrha Walker ; Kerrich & Graham, 1957 : 299.

Type material. Listed by Kerrich & Graham (1957 : 299) as a doubtful species. The single male standing under this name is now designated LECTOTYPE ; it is represented only by the antennae, wings, and parts of the legs. From these remains it is clearly a *Platygerrhus*, whilst the antennae are distinctive and agree exactly with those of a recently caught male in my collection. Hence I feel confident that I can identify the lectotype, which represents a valid species. So far I have not been able to associate any females with this male.

BRITAIN : " England " (Walker, 1848 : 128) ; Oxfordshire, Otmoor, 1 ♂, 29.viii 1956 (*Graham*).

Biology. Unknown.

GASTRACANTHUS Westwood

Gastracanthus Westwood, 1833 : 121. Type-species : *G. pulcherrimus* Westwood, by monotypy.
Hetroxys Westwood, 1833*c* : 495 [n. n. for *Gastracanthus*, supposedly pre-occupied].
Photismus Thomson, 1878 : 4, 15.
Photismus Thomson ; Schmiedeknecht, 1909 : 156, 157, 165–166.
Photismus Thomson ; Nikol'skaya, 1952 : 212.
Gastracanthus Westwood ; Kerrich & Graham, 1957 : 281–284.
Gastracanthus Westwood ; Ferrière & Kerrich, 1958 : 24–25, 29.
Gastracanthus Westwood ; Kamijo, 1960*a* : 102–106.
Gastracanthus Westwood ; Peck *et al.*, 1964 : 35.

Gastracanthus was misinterpreted until Kerrich & Graham (1957) recognized its true position. *Hetroxys* Westwood had earlier been wrongly identified by Thomson (1878 : 48, 86, as " *Etroxys* ") as a Pteromaline genus.

Photismus Thomson was placed in synonymy with *Gastracanthus* by Kerrich & Graham (1957 : 281).

The genus is widely distributed in the northern hemisphere ; one species is known in Europe, others in North America (see Kerrich & Graham, 1957 : 283) and in Japan (Kamijo, 1960*a* : 102–106).

Gastracanthus pulcherrimus Westwood

Gastracanthus pulcherrimus Westwood, 1833 : 121, ♀.
Pteromalus pulcherrimus (Westwood) Walker, 1836*a* : 9–10, ♀.
Pteromalus macromerus Walker, 1836*a* : 11, ♂.
Trigonoderus elegans Walker, 1836*a* : 21, ♂.
Cleonymus transversus Förster, 1841 : 33, ♂.
Photismus nubilosus Thomson, 1878 : 15–16, ♂ ♀.
Gastracanthus pulcherrimus Westwood ; Kerrich & Graham, 1957 : 281–283, 284, pl. 2, ♂ ♀.
Gastracanthus pulcherrimus Westwood ; Ferrière & Kerrich, 1958 : 29.

Type material. The types of *pulcherrimus* Westwood appear to be lost ; for designation of lectotypes for the other species mentioned in the above synonymy, see Kerrich & Graham (1957 : 281–282). The same authors were responsible for the synonymy.

BRITAIN, SWEDEN, FINLAND, GERMANY, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Otten (1940 : 187–188) stated that he had reared a female of *Photismus nubilosus* in Germany from an imago of *Byrrhus fasciatus* (Förster) (Col., Byrrhidae) found 20.viii.1939, under stones ; but I do not know if the parasite was correctly identified. Females of this species may often be found on the foliage of hazel (*Corylus avellana* L.). Imagines chiefly May–June and Aug.–Sept. (one record for July).

ERDOESIA Bouček

Erdoesia Bouček, 1957*a* : 157. Type-species : *E. tessellata* Bouček, by original designation.
Erdoesia Bouček ; Peck *et al.*, 1964 : 35.

Erdoesia tessellata Bouček

Erdoesia tessellata Bouček, 1957*a* : 159, ♀.

Type material. Holotype ♀, Bohemia, Hradec Králové, Nov. 1916 (*J. Sekera*), in Národní Museum, Prague (Cat. No. 3014).

GERMANY, CZECHOSLOVAKIA, HUNGARY.

Biology. Unknown. Imagines in June, Aug. and November.

SPHEGIGASTERINI

KEY TO EUROPEAN GENERA

In all the genera, both mandibles have four teeth.

1 Pronotal collar either not margined or, if slightly so, then the anterior margin of the clypeus is bidentate and the second gastral (fourth abdominal) tergite (Text-figs. 96, 100) is large, in the female as long as or longer than the basal tergite.
Pronotal collar often with front edge waved or with teeth 2

– Pronotal collar sharply margined anteriorly, at least in the middle but usually throughout ; anterior margin of clypeus tridentate, edentate, or with a median tubercle ; second gastral (fourth abdominal) tergite at least slightly shorter than the basal tergite, sometimes wholly concealed beneath it . 3

2 (1) Anterior margin of clypeus bidentate. Gena with a large fovea above base of mandible. Mesoscutal notauli incomplete. Second tergite of gaster (fourth abdominal) large, in female (Text-figs. 96, 100) as long as or longer than the basal tergite . . . ***SPHEGIGASTER*** Spinola (p. 124)

– Anterior margin of clypeus tridentate. Gena with at most a very narrow fovea along oral edge above base of mandible. Notauli usually traceable nearly or quite to hind margin of mesoscutum, though very superficial posteriorly. Second tergite of gaster (fourth abdominal) much shorter than the basal tergite . . . . . ***SYNTOMOPUS*** Walker (p. 137)

3 (1) Scutellum with a discal fovea.
Basal tergite of gaster very large, as in *Cryptoprymna*. Anterior margin of clypeus edentate, almost truncate . . ***NOTOGLYPTUS*** Masi (p. 140)

– Scutellum without a discal fovea. The other characters rarely present in combination 4

4 (3) Basal tergite of gaster very large, at least slightly longer than broad, strongly convex, concealing or almost concealing the remaining segments, its hind margin straight or nearly so. Anterior margin of clypeus either produced and shallowly emarginate, or tridentate 5

– Basal tergite of gaster not longer than broad, not nearly concealing the remaining segments, except very rarely in some *Toxeuma*, which have the anterior margin of the clypeus truncate ; the hind margin of the tergite often broadly emarginate 6

5 (4) Anterior margin of clypeus produced and shallowly emarginate medially. Gastral petiole reticulate, in female about twice, in male more than twice, as long as broad . . . . . ***CRYPTOPRYMNA*** Förster (p. 140)

– Anterior margin of clypeus tridentate. Gastral petiole longitudinally striate, in female not longer than broad, in male at most 1·5 times as long as broad ***NOVITZKYANUS*** Bouček (p. 141)

6 (4) Anterior margin of clypeus without teeth or with at most a very small median tubercle. Hind margin of basal tergite of gaster straight or weakly bisinuate. Palpi in male normal . . . ***TOXEUMA*** Walker (p. 144)

– Anterior margin of clypeus tridentate. Hind margin of basal tergite of gaster broadly, almost semicircularly emarginate. Maxillary palpi of male with the terminal segment, or the penultimate segment, strongly swollen to form a metallic bladder-like structure 7

7 (6) Fore wing with a distinct speculum ; at least the proximal third of the basal cell bare. Maxillae of male with penultimate segment of palpus strongly swollen, the terminal segment small and clavate or subclavate ; stipites not enlarged . . . . . ***CYRTOGASTER*** Walker (p. 141)

– Fore wing without a speculum ; basal cell wholly pilose. Maxillae of male with terminal segment of palpus strongly swollen ; stipites also swollen ***POLYCYSTUS*** Westwood (p. 144)

SPHEGIGASTER Spinola auctt.

Sphegigaster Spinola, 1811 : 149, no. 11. Type-species : *Diplolepis pallicornis* Spinola, 1808, by designation of Ashmead, 1904 : 330.

Merismus Walker, 1833 : 371, 375, 377, *ex parte* [Divisions 1, 3].

Sphegigaster Spinola ; Förster, 1856 : 53, 57 [*ex parte*].
Sphegigaster Spinola ; Thomson, 1878 : 17, 20.
Trigonogastra Ashmead, 1904 : 330, 331. Type-species : *T. aurata* Ashmead, by monotypy and original designation.
Sphegigaster Spinola ; Ashmead, 1904 : 330, 332.
Trigonogastra Ashmead ; Schmiedeknecht, 1909 : 374, 375, 378.
Sphegigaster Spinola ; Schmiedeknecht, 1909 : 375, 376, 378.
Sphegigaster Spinola ; Nikol'skaya, 1952 : 248.
Sphegigaster Spinola ; Peck *et al.*, 1964 : 40.

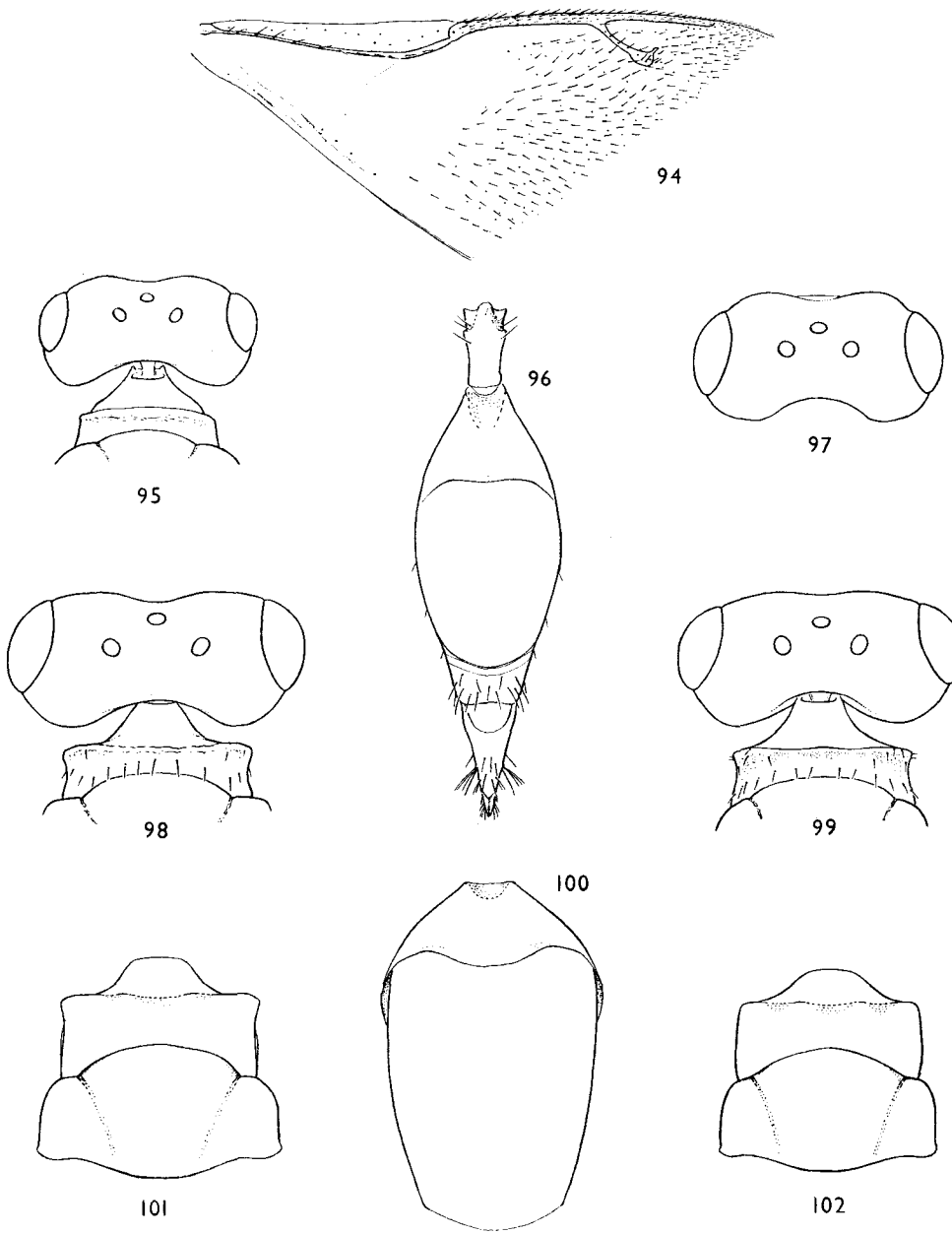
The identity of *Sphegigaster* is not absolutely certain, since the original material of the type-species, *Diplolepis pallicornis* Spinola, has not been located. However, there is nothing in Spinola's very brief diagnosis to suggest that it is not the present genus and in this sense it has been generally accepted since the time of Walker.

Trigonogastra Ashmead was placed in synonymy with *Sphegigaster* Spin. auctt. by Delucchi (1958*a* : 56) ; he stated that the type-species of *Trigonogastra* (*aurata* Ashmead) resembled *Sphegigaster mutica* Thomson in the form of its pronotum but did not consider the structure of the pronotum in these two species a sufficient reason for regarding them as generically distinct from the rest of *Sphegigaster*.

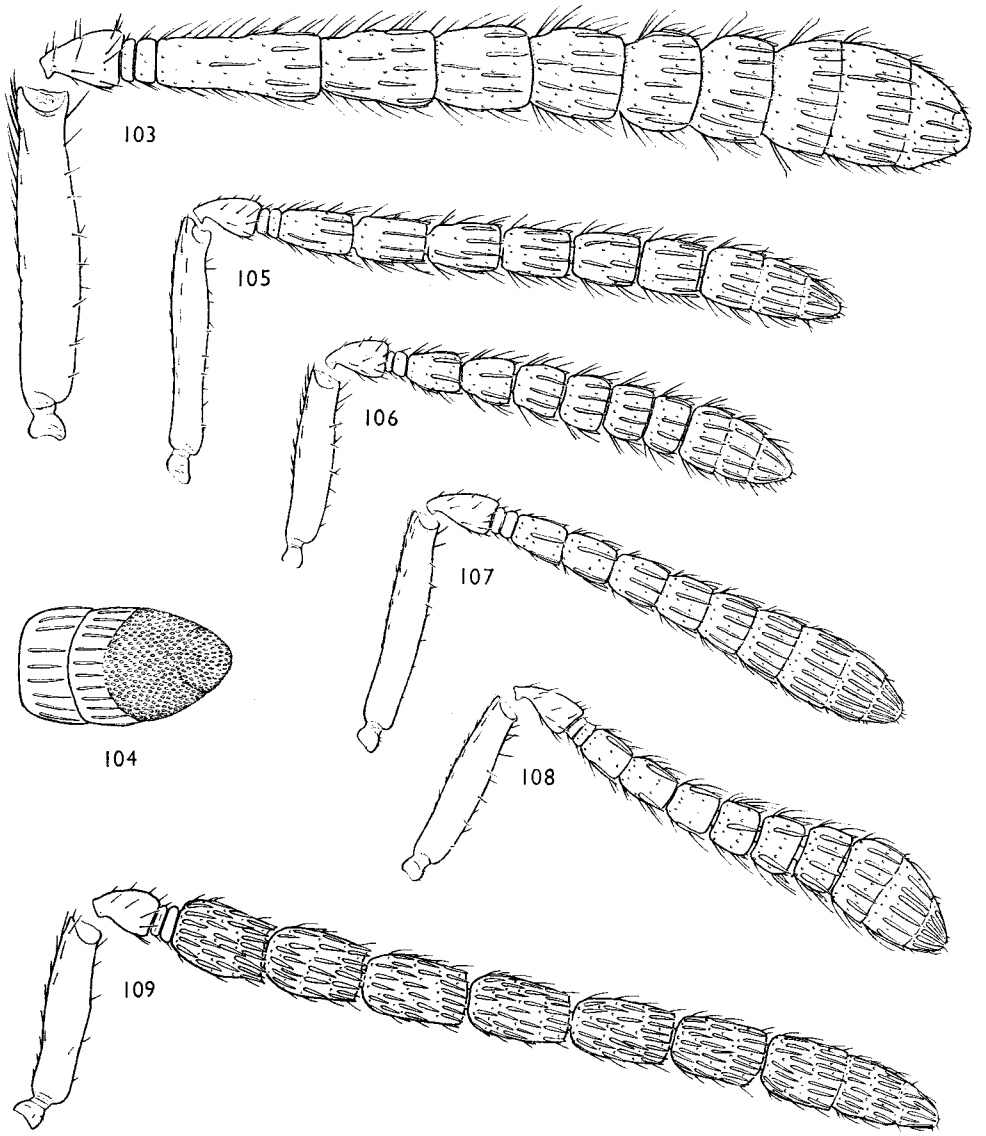
Key to European Species

(Females)

1		Hind margin of basal tergite of gaster (Text-fig. 96) with its middle portion truncate or virtually so 2
–		Hind margin of basal tergite of gaster (Text-fig. 100) with its middle portion at least slightly curved 9
2	(1)	Antennal funicle with all its segments slightly transverse, the first segment obviously shorter than the pedicellus. Small species, 1·6 to 2 mm., with head and thorax dark bluish green to bluish, legs relatively dark, femora mainly so, tibiae more or less infuscate ; gaster oval, shorter than the thorax ; the petiole nearly three times as long as broad. (Central Europe and Algeria) . . . . . ***stepicola*** Bouček (p. 130)
–		Antennal funicle with at least its first and second segments quadrate or longer than broad. Species often larger, head and thorax often brighter green to blue, legs sometimes relatively paler ; gaster often ovate-lanceolate or lanceolate 3
3	(2)	Fore wing (Text-fig. 94) with costal cell with only one irregular row of hairs on its lower surface ; basal vein bare ; speculum extending as a bare strip below the marginal vein right to the stigmal vein ; radial cell, on upper surface of wing, mainly bare ; disc of wing beyond speculum sparsely pilose. Antennal flagellum (Text-fig. 107) with almost decumbent bristles. Gaster ovate . . . . . ***glabrata*** sp. n. (p. 133)
–		Fore wing with lower surface of costal cell with at least a partial second row of hairs in the distal half, sometimes three rows ; basal vein usually pilose ; speculum usually not extending far below the marginal vein ; radial cell mainly pilose ; disc of wing beyond the speculum relatively more thickly pilose. Antennal flagellum (Text-figs. 103, 105, 106) with at least slightly outstanding bristles. Gaster ovate-lanceolate or lanceolate 4
4	(3)	Antenna (Text-figs. 103, 104) with clava with its sutures oblique as seen in profile, with a large area of micropilosity which extends nearly two thirds of the length of the clava ; first funicular segment nearly twice as long as the



FIGS. 94–102. 94, *Sphegigaster glabrata* sp. n., ♀, fore wing, part ; 95, *Sphegigaster mutica* Thomson, ♀, head and front of thorax ; 96, *S. truncata* Thomson, ♀, petiole and gaster ; 97, same, head ; 98, *S. glabrata* sp. n., ♀, head and pronotum ; 99, *S. nigricornis* (Nees), ♀, head and pronotum ; 100, *S. flavicornis* (Walker), ♀, basal and second tergites of gaster ; 101, *Syntomopus incurvus* Walker, ♂, pronotum and mesoscutum ; 102, *Syntomopus thoracicus* Walker, ♂, pronotum and mesoscutum.



FIGS. 103–109. *Sphegigaster* spp., antennae. 103, *mutica* Thomson, ♀ ; 104, same (clava only) ; 105, *nigricornis* (Nees), ♀ ; 106, *truncata* Thomson, ♀ ; 107, *glabrata* sp. n., ♀ ; 108, *obliqua* sp. n., ♀ ; 109, *glabrata* sp. n., ♂.

pedicellus. Head in dorsal view (Text-fig. 95) hardly twice as broad as long, with temples not strongly convergent ; POL slightly less than OOL ***mutica*** Thomson (p. 130)

– Antenna (Text-figs. 105, 106) with clava with its sutures not or hardly oblique, with a smaller area of micropilosity which extends at most slightly more than one third the length of the clava ; first funicular segment not, or only slightly, longer than the pedicellus 5

5 (4) Head in dorsal view (Text-fig. 97) slightly less than twice as broad as long ; POL slightly less than OOL. Antennal flagellum (Text-fig. 106) with rather strongly outstanding bristles ; third funicular segment quadrate to slightly transverse, segments four to six slightly transverse ***truncata*** Thomson (p. 130)

– Head in dorsal view (Text-figs. 98, 99) twice or slightly more than twice as broad as long ; POL about equal to, or slightly greater than, OOL. Antennal flagellum (Text-fig. 105) with rather less outstanding bristles ; third funicular segment sometimes longer than broad, segments four to six sometimes not transverse 6

6 (5) Antenna with combined length of pedicellus and flagellum slightly less than breadth of head. Body dark green or blue-green. Antennal scape hardly reaching the median ocellus . . . . . ***intersita*** sp. n. (p. 131)

– Antenna (Text-fig. 105) with combined length of pedicellus and flagellum equal to or slightly greater than breadth of head. Either the body is a brighter green or blue ; or else the antennal scape reaches to or above the median ocellus 7

7 (6) Antenna with pedicellus, in dorsal view, nearly twice as long as broad ; proximal segments of funicle slightly constricted basally. Pronotal collar with a transverse ridge anteriorly, but with very weak teeth. Antennal scape, and legs except coxae, entirely or nearly entirely reddish . . sp. indet.

– Antenna with pedicellus relatively shorter ; segments of funicle not constricted basally. Pronotal collar with more distinct teeth. Antennal scape mainly to entirely black with a metallic tinge ; femora infuscate at least basally 8

8 (7) Petiole of gaster 2 to 2·3 times as long as broad. Head, thorax, and gaster mainly bright green to blue. Median carina of propodeum indicated at least by a blunt ridge . . . . . ***aculeata*** Walker (p. 131)

– Petiole of gaster 2·8 to 3·3 times as long as broad. Body dark green or dark blue. Median carina of propodeum absent, or indicated at base only. Head, text-fig. 99 ; antenna, text-fig. 105 . . ***nigricornis*** (Nees) (p. 132)

9 (1) Fore wing with distal half to two-thirds of basal cell with scattered hairs except just above the cubital vein. Petiole of gaster hardly 1·5 times as long as broad. Mesoscutum nearly or quite twice as broad as long. Gaster 2·3 to 2·5 times as long as broad, about as long as head plus thorax. Pronotal collar almost rounded off anteriorly . . ***brevicornis*** (Walker) (p. 135)

– Fore wing with basal cell bare, at most the basal vein pilose. Petiole of gaster at least nearly twice as long as broad. Mesoscutum often relatively less transverse. Gaster sometimes relatively shorter. Pronotal collar at least very slightly margined 10

10 (9) Antenna (Text-fig. 108) with flagellum slender proximally, not stouter than the pedicellus but broadening strongly from the third or fourth funicular segment onwards ; clava fully twice as broad as first funicular segment, in profile appearing strongly asymmetrical, only about 1·5 times as long as broad . . . . . ***obliqua*** sp. n. (p. 135)

– Antennal flagellum less strongly clavate, becoming only gradually thicker from the first funicular segment to the clava ; the latter much less than twice as

broad as the first funicular segment, in profile not noticeably asymmetrical, nearly twice as long as broad 11

11 (10) Hind margin of basal tergite of gaster (Text-fig. 100) more distinctly curved in the middle. Antennal flagellum less slender, with bristles more outstanding; distal segments of funicle slightly transverse. Disc of fore wing rather densely pilose . . . . . ***flavicornis*** (Walker) (p. 136)

Hind margin of basal tergite of gaster only slightly curved in the middle. Antennal flagellum more slender, with bristles less outstanding ; segments of funicle at least slightly longer than broad, except the sixth which is subquadrate. Disc of fore wing less densely pilose ***cuscutae*** Ferrière (p. 136)

(MALES)

1 Hind margin of basal tergite of gaster truncate or very slightly concave in the middle 2

– Hind margin of basal tergite of gaster slightly to very distinctly curved backwards in the middle 7

2 (1) Antenna with combined length of pedicellus and flagellum more than twice the breadth of the head ; flagellum very slender, hardly as stout as the pedicellus, clothed with hairs whose length is twice the breadth of the segments that bear them, and which stand out at an angle of about 60° ; funicular segments very long, the first more than four times, the sixth about three times, as long as broad. Antennal scape, and legs except the coxae, mainly to entirely testaceous . . . . . ? ***truncata*** Thomson (p. 130)

– Combined length of pedicellus and flagellum at most about 1·5 times the breadth of the head ; flagellum stouter, clothed with hairs which are shorter than the breadth of the segments, and usually stand out less strongly, or are even subadpressed ; funicular segments relatively short, at most twice as long as broad. Antennal scape and legs usually darker 3

3 (2) Antennae testaceous with the pedicellus infuscate, sometimes also the flagellum slightly so dorsally, the flagellum with subadpressed hairs ; funicular segments subequal in length, each 1·6 to 2 times as long as broad . . ***glabrata*** sp. n. (p. 133)

– Antennal scape and pedicellus (at least mainly) black with a metallic tinge ; distal segments, or all the segments, sometimes relatively shorter . . 4

4 (3) Antennal funicular segments quadrate, or at most some of the middle segments slightly longer than broad, the first segment not longer than the pedicellus ; flagellum with subadpressed hairs . . . ***stepicola*** Bouček (p. 130)

– Antennal funicular segments longer than broad, or at most some of the distal ones quadrate, the first segment at least slightly longer than the pedicellus 5

5 (4) Combined length of pedicellus and flagellum barely 1·2 times the breadth of the head . . . . . ? ***intersita*** sp. n. (p. 134)

– Combined length of pedicellus and flagellum 1·3 to 1·5 times the breadth of the head 6

6 (5) Petiole of gaster at most about three times as long as its maximum breadth. Body bright green to blue. Teeth of pronotal collar strong. Median carina of propodeum indicated in the middle by at least a slight ridge, its basal portion usually very sharp . . . . . ***aculeata*** Walker (p. 131)

– Petiole of gaster about 3·5 times as long as broad. Body relatively darker in colour. Teeth of pronotal collar weaker. Median carina of propodeum absent except at extreme base . . . . . ***nigricornis*** (Nees) (p. 132)

7 (1) Antennal flagellum, sometimes also the scape more or less, testaceous to yellowish, with pale, only slightly outstanding hairs, Legs, except coxae, entirely or mainly testaceous . . . ***flavicornis*** (Walker) (p. 136)

– Antennal flagellum fuscous to black ; scape and pedicellus often mainly to entirely black ; hairs of flagellum often standing out more strongly. Legs sometimes relatively darker 8

8 (7) Fore wing with distal third to half of basal cell with scattered hairs. Combined length of pedicellus and flagellum of antenna barely 1·5 times the breadth of the head ; funicular segments relatively shorter, the first at most slightly more than twice, the sixth about 1·5 times, as long as broad. Pronotal collar rounded off anteriorly, without teeth ***brevicornis*** (Walker) (p. 135)

– Fore wing with basal cell bare, or at most with a few scattered hairs at apex. Combined length of pedicellus and flagellum 1·75 to 1·8 times the breadth of the head ; funicular segments relatively longer, the first 3 to 3·7 times, the sixth 2 to 2·6 times, as long as broad. Pronotal collar with a transverse ridge, or distinct teeth, anteriorly 9

9 (8) Pronotal collar with distinct teeth. Hairs of antennal flagellum about as long as the breadth of the segments that bear them, standing out at an angle of about 45° . . . . . ***cuscutae*** Ferrière (p. 136)

– Pronotal collar with indistinct teeth. Hairs of flagellum a little longer than the breadth of the segments that bear them, standing out at about 60° sp. indet.

Sphegigaster mutica Thomson

Sphegigaster muticus Thomson, 1878 : 22, ♀.

Type material. One female, LECTOTYPE (may actually be holotype), labelled " Sm " [Småland], " Bhn " [Boheman] and " muticus Ths ".

SWEDEN ; only the type female known to me.

Biology. Unknown.

Sphegigaster truncata Thomson

Sphegigaster truncatus Thomson, 1878 : 21, ♀.

Type material. Syntypes, 2 ♀. LECTOTYPE labelled " Gl " [Gottland], " Bhn " and "truncatus Ths ".

SWEDEN ; only the syntypes known to me. Bouček (1965*e* : 8) recorded the species from MOLDAVIAN S.S.R. ; his identification is no doubt correct but I have not seen these specimens.

Biology. Unknown.

Sphegigaster stepicola Bouček

Sphegigaster stepicola Bouček, 1965*e* : 12–14, ♂ ♀.

Type material. Holotype ♀, Czechoslovakia, Bohemia, Hazmburk Hill, 26.vii. 1948 (*Bouček*), in Národní Museum, Prague (Cat. No. 26.006).

AUSTRIA, CZECHOSLOVAKIA, MOLDAVIAN S.S.R., ALGERIA.

Biology. Reared in Austria from *Phytomyza albiceps* Mg. on *Cirsium arvense* (L.) Scop. (Bouček, 1965 : 13). Imagines May–August.

Sphegigaster aculeata (Walker)

Merismus aculeatus Walker, 1833 : 375, ♂ ♀.
? Merismus flavicornis Haliday, 1841–1842 : v, pl. C, fig. 1, ♀ [nec Walker].

Type material. Syntypes, 4 ♂. One, bearing a Waterhouse label, is selected as LECTOTYPE.

BRITAIN, SWEDEN ; no doubt widely distributed in Europe.

Biology. Reared in England from *Melanagromyza lappae* Lw. (*K. A. Spencer*). Cameron (1935 : 300) recorded having reared *aculeata* from puparia of *Agromyza aeneiventris* Fln. in stems of *Senecio jacobaea* L. ; I have not located his specimens, but the record seems likely to be correct. Imagines appear in the field May–July.

Sphegigaster intersita sp. n.

♀. Head mainly, thorax, petiole and gaster, a rather dark green or blue-green ; vertex more or less, occiput, and pronotal neck bluish black. Mandibles testaceous or reddish with darker teeth. Antennal scape and pedicellus black with a metallic tinge, flagellum fuscous. Coxae, trochanters partly, and femora except their tips, black with a green or blue-green gloss ; tibiae testaceous or reddish, paler at base and apex, sometimes slightly infuscate medially ; fore tarsi fuscous, reddish basally ; mid and hind tarsi pale or whitish testaceous basally, gradually darkening to brown, and to fuscous at their tips. Tegulae brown. Wings hyaline ; venation testaceous, the parastigma and stigma sometimes brownish. Length 2·5 to 2·9 mm.

Head in dorsal view 2·1 times as broad as long ; temples converging rather strongly and slightly more than one third as long as the eyes ; POL 1·0 to 1·2 OOL. Eyes about 1·6 times as long as broad, separated by about 1·25 times their length. Malar space about one third the length of an eye ; hollow of gena moderate-sized, extending slightly more than half way towards the eye. Antennae inserted distinctly above the ventral edge of the eyes ; scape not quite reaching the lower edge of the median ocellus, but its length is greater than the transverse diameter, and nearly three quarters the length, of an eye ; combined length of pedicellus and flagellum slightly less than the breadth of the head ; pedicellus slightly less than twice as long as broad, as long as or slightly longer than the first funicular segment ; funicle proximally slightly stouter than the pedicellus in profile, becoming a little stouter distad ; its first segment 1·2 to 1·5 times as long as broad, second quadrate to very slightly elongate, third and fourth subquadrate, or fourth slightly transverse, fifth and sixth slightly transverse ; clava 1·7 to 1·8 times as long as broad, a little broader than the sixth funicular segment, its length about equal to two and a half of the preceding funicular segments ; sensilla in one (sometimes irregular) row on each segment, numerous on the claval and distal funicular segments but less so on the proximal funicular segments ; hairs of flagellum slightly outstanding (about as in *nigricornis* (Nees), Text-fig. 105).

Pronotum as in *nigricornis*, the lateral angles of the collar forming blunt teeth ; on the front edge of the collar there are three other rather weak teeth (a median and two sublaterals). Mesoscutum nearly twice as broad as long, moderately finely reticulate discally, finely elsewhere. Scutellum as broad as long, rather flat discally, finely reticulate. Propodeum about three quarters the length of the scutellum ; its median area (except the nucha) rather less finely reticulate than the scutellum, especially laterally ; median carina absent, or showing at most a trace. Fore wing with lower surface of costal cell with a complete row of hairs, and some scattered ones in the distal third, its upper surface bare ; basal vein with three to five hairs ; basal cell bare, open below ; speculum open below, the wing beyond it moderately thickly haired ; marginal vein twice as long as the stigmal vein and very slightly (about 1·1 times)

longer than the postmarginal. Legs not stout ; spur of mid tibia half or virtually half as long as the first tarsal segment.

Gastral petiole about 1·3 times as long as the propodeum, 2·7 to 3 times as long as broad, reaching well beyond the tips of the hind coxae, reticulate, broadest slightly in front of the middle and constricted very slightly behind the middle, with one to two inconspicuous hairs on each side. Gaster lanceolate-elliptical, as long as or a little longer than the thorax, slightly narrower than the latter, 2·7 to 2·9 times as long as broad ; basal tergite occupying hardly one third of the total length, its hind margin virtually straight medially (as in Text-fig. 96) ; next tergite (fourth abdominal) nearly 1·5 times as long as broad, about 1·5 times as long as the basal tergite ; following tergites strongly retracted, except the last which is about as long as broad.

♂. Not definitely associated. A male which possibly belongs to this species resembles the female except in its antennae and gaster. It has the flagellum slightly shorter than in the male of *aculeata* (Walker), the combined length of the pedicellus and flagellum being barely 1·2 times the breadth of the head (1·3 to 1·45 times in male *aculeata*).

The female of *intersita* sp. n. is very close to that of *aculeata* (Walker), which differs as follows:

Antennal scape reaching about to the middle of the median ocellus ; combined length of pedicellus and flagellum equal to or very slightly greater than the breadth of the head ; segments of funicle tending to be rather longer (one to four at least slightly elongate, five quadrate or slightly elongate, six quadrate or very slightly transverse). Teeth of pronotal collar more distinct. Propodeal carina indicated by an obtuse ridge, sometimes by a fairly sharp one especially at the base. Spur of mid tibia finer, like the hind tibial spur, and shorter, its length approximately one third that of the first tarsal segment, and hardly greater than the breadth of the tibia. Gastral petiole shorter, 2 to 2·3 times as long as broad, only slightly longer than the propodeum, and reaching only a little beyond the tips of the hind coxae. The body of *aculeata* is typically bright green to blue.

Holotype ♀. ENGLAND : Surrey, Box Hill, 17.vi.1954, bred (*K. A. Spencer*) from *Melanagromyza aeneiventris* (Fln.), in Hope Dept., University Museum, Oxford.

Paratypes. ENGLAND : Surrey, Betchworth, 2 ♀, 2.v.1956, bred from *Melanagromyza sativae* Spencer (*K. A. Spencer*), in Hope Dept., University Museum, Oxford ; Berkshire, Wytham, 1 ♀, 27.vii.1960, 2 ♀, 15.vii.1961, on flowers of *Pastinaca sativa* L. (*Graham*) ; Bucks., Hell Coppice, near Oakley, 3 ♂, 1 ♀, 17.vii.1962, on flowers of Umbelliferae (*Graham*), in Graham coll.

Sphegigaster nigricornis (Nees) **comb. n.**

Chrysolampus nigricornis Nees, 1834 : 133, ♀.

♀. Very close to that of *intersita* sp. n. but differs as follows:

Antennae (Text-fig. 105) with scape longer, reaching to the middle of the median ocellus or even to the vertex ; flagellum longer, combined length of pedicellus and flagellum one to 1·1 times the breadth of the head ; funicular segments on the average slightly longer, 1 to 3 slightly elongate, four slightly elongate or quadrate, five and six usually quadrate, in one large female all the funicular segments are slightly longer than broad. Spur of mid tibia slightly shorter.

The female differs from that of *aculeata* (Walker) as follows :

Body dark green or blue, the head and propodeum sometimes bluish or greenish black. Teeth of pronotal collar weaker. Propodeum with median carina absent, or indicated at extreme base only. Spur of mid tibia slightly longer. Gastral petiole longer, 2·8 to 3·3 times as long as broad, reaching far beyond the tips of the hind coxae. Size slightly less (2·6 to 3·2 mm., as against 3·5 to 4 mm.).

♂. Differs from the female as follows :

Legs paler, the fore and mid femora testaceous with only a dark stripe beneath the latter. Antennal scape fully three quarters the length of an eye ; pedicellus relatively shorter, about 1·5 times as long as broad and about two thirds as long as the first funicular segment ; combined length of pedicellus and flagellum about 1·5 times the breadth of the head ; flagellum subcylindrical, slightly stouter than the pedicellus ; funicular segments subequal in length, 1·7 to 1·8 times as long as broad ; clava nearly three times as long as broad, about equal in length to the two preceding funicular segments together ; flagellum clothed with hairs whose length is about half the breadth of the segments which bear them, and which stand out at an angle of about 30° ; sensilla fairly numerous, in two rows on each segment, on some segments irregular, almost forming three rows.

The male differs from that of *aculeata* in having the metallic colour of the body darker ; the gastral petiole rather longer and more slender, fully 3·5 times as long as broad ; the teeth of the pronotal collar less strong ; the median carina of the propodeum absent except at the extreme base. The antennal flagellum is perhaps rather more slender and has rather less outstanding hairs, than in male *aculeata* (also in the latter the proximal funicular segments tend to be slightly longer than the distal ones ; in average-sized specimens the first funicular segment is about 1·8 times, the sixth 1·5 to 1·6 times, as long as broad).

LECTOTYPE ♀ in Westwood coll. (ex coll. Nees), Hope Department, University Museum, Oxford. It is pinned and bears the following labels (the handwriting on each is noted in square brackets) : (1) " 8 " on a pink square [Westwood] ; (2) " ♀ 11.(?)Sept 12 " [Nees] ; (3) " Chrysolampus pedunculiventris Esenb. 2. 134. Sphegigaster p. Spin. Class. 7. 149. E Mus. Esenbeck " [Westwood]. I think that Westwood was mistaken in referring it to *pedunculiventris*, although it may have been placed with Nees' series of that species (see his remarks, 1834 : 135), because it agrees much better with the description of *nigricornis*.

Additional material examined. ENGLAND : Berkshire, Wytham, 1 ♀, 14.vi.1952, 1 ♀, 10.x.1963 (*Graham*) ; Lancashire South, Freshfield, 1 ♀, 23.vi.1962 (*Graham*) ; Middlesex, Scratch Wood, 3 ♀ bred in June 1955 from *Melanagromyza dettmeri* Hering (*K. A. Spencer*) ; Northamptonshire, Salcey Forest, 1 ♀, 6.vii.1954 (*Graham*) ; Surrey, Bookham, 1 ♀, 10.v.1956, reared from *Melanagromyza sativae* Spencer (*K. A. Spencer*).

ENGLAND, GERMANY.

Sphegigaster glabrata sp. n.

(Text-figs. 94, 98, 107, 109)

♀. Head and thorax mainly, petiole, and coxae, dark bluish green ; occiput and pronotal neck bluish black ; pronotal collar, mesoscutum, axillae and scutellum brighter green ; gaster black with greenish reflections. Mandibles testaceous with reddish teeth. Antennal scape brown, testaceous at base ; pedicellus and flagellum fuscous, testaceous beneath. Legs (apart from coxae) testaceous, the hind femora reddish medially ; fifth tarsal segment of all legs fuscous. Tegulae and wing-venation testaceous, wings hyaline. Length 2·2 mm.

Head unusually transverse, in dorsal view about 2·25 times as broad as long ; temples converging very strongly and only slightly more than one quarter the length of the eyes ; POL about 1·25 OOL. Eyes long-oval, 1·5 times as long as broad, separated by about 1·35 times their own length. Malar space one third the length of an eye ; hollow of gena large, extending about three quarters of the way towards the eye. Antenna (Text-fig. 107) inserted well above

the ventral edge of the eyes ; scape just reaching the median ocellus, its length slightly greater than the transverse diameter of an eye ; combined length of pedicellus and flagellum 0·85 times the breadth of the head ; pedicellus nearly twice as long as broad, nearly equal to the anelli plus the first funicular segment ; funicle proximally not stouter than the pedicellus but thickening distad, with segments one to three slightly elongate, four quadrate, five and six slightly transverse ; clava 1·75 times as long as broad, slightly broader than the funicle, its length about equal to two and a half of the preceding funicular segments ; flagellum with very short, mostly subadpressed hairs, so that it has an unsually smooth appearance ; sensilla in one row on each segment, sparsely distributed on the proximal segments of the funicle, numerous on the distal segments and clava.

Pronotum (Text-fig. 98): collar with its lateral angles slightly toothed, its anterior edge slightly ridged with just a trace of three teeth. Mesoscutum nearly twice as broad as long, finely reticulate. Scutellum as broad as long, slightly convex, sculptured as the mesoscutum; the frenum, which is marked off by a very fine line, slightly more coarsely. Propodeum about three quarters the length of the scutellum ; its median area with sculpture like that of the scutellum, but that of the nucha rather finer ; median carina vaguely indicated in the middle by some stronger sculpture ; spiracles rather small, oval, separated by nearly their own length from the metanotum ; callus alutaceous. Metapleuron finely though strongly reticulate ; mesepimeron rather less strongly. Fore wing (Text-fig. 94) relatively short (about 2·1 times as long as broad), relatively sparsely haired ; lower surface of costal cell with a single row of hairs, partly double in the distal quarter, its upper surface bare ; basal vein bare or with a single hair ; basal cell bare, both it and the speculum open below ; on the upper surface of the wing the speculum large and extended as a bare strip below the proximal half of the marginal vein, whilst there is also a nearly bare triangular area between the postmarginal and stigmal veins ; disc of wing beyond the speculum relatively sparsely haired ; marginal vein about 2·2 times the length of the stigmal vein and 1·4 times the length of the postmarginal vein. Legs not very slender ; spur of mid tibia about half as long as the first tarsal segment.

Gastral petiole about 1·3 times as long as the propodeum and reaching well beyond the tips of the hind coxae, nearly three times as long as broad, finely reticulate, its sides converging very slightly posteriorly ; there are two hairs on each side. Gaster ovate, shorter and narrower than the thorax, about 1·8 times as long as broad ; basal tergite occupying more than one third the total length, its hind margin truncate medially ; following tergite slightly longer than broad, about 1·3 times as long as the basal tergite ; remaining tergites retracted.

♂. Differs from the ♀ as follows:

Antennal scape testaceous ; flagellum testaceous, only slightly darker dorsally. Scape (Text-fig. 109) not reaching the median ocellus, its length distinctly less than the transverse diameter of an eye ; combined length of pedicellus and flagellum about 1·25 times the breadth of the head ; flagellum practically cylindrical, the first funicular segment a little stouter than the others, distinctly stouter than the pedicellus, its segments subequal in length and 1·6 to 2 times as long as broad ; clava about three times as long as broad, its length about equal to that of the two preceding funicular segments together ; flagellum with short, whitish, subadpressed hairs ; sensilla very numerous, in three rows on each segment. Scutellum slightly more convex and slightly elongate. Fore wing rather less sparsely haired, there being a few hairs between the base of the postmarginal vein and the stigmal vein ; the basal vein has nought to two hairs. Gastral petiole with three to four hairs on each side. Gaster very much shorter and narrower than the thorax ; fifth and following abdominal tergites more or less retracted.

The characters which distinguish *glabrata* from the other described European species of the genus are given in the accompanying keys to males and females.

Holotype ♂. Sweden : Halland, Enslöv, 27.vi.1952, reared from galls of *Melanagromyza simplicoides* Hendel, (Dipt., Agromyzidae) on *Populus tremula* L. (*Hugo*

Andersson), in Universitetets Zoologiska Institutionen, Lund. Mr. Andersson told me in a letter that he had bred the Dipterous host from *Salix* sp. in the same area.

Paratypes. Same locality as holotype, 1 ♂, 16.vi.1952, 2 ♂, 27.vi.1952 ; in Universitetets Zoologiska Institutionen, Lund. ENGLAND : Buckinghamshire, Hell Coppice, near Oakley, 1 ♀, 11.viii.1958, swept from foliage of *Salix* sp. (either *cinerea* L. or *aurita* L.) (*Graham*), in Graham collection.

Sphegigaster brevicornis (Walker) comb. n.

Dicyclus brevicornis Walker, 1833 : 456, ♀.

Type material. Syntypes, 2 ♀. LECTOTYPE, the first specimen, bearing a Waterhouse label, also another in C. Ferrière's handwriting " Type CF ".

BRITAIN, apparently rare ; near London (*Walker*) ; IRELAND, Co. Kildare, Grand Canal, 1 ♂, 12.vi.1954 (*A. W. Stelfox*).

Biology. Unknown.

Sphegigaster obliqua sp. n.

(Text-fig. 108)

♀. Head, thorax mainly, gastral petiole, and coxae, bluish black ; mesoscutum, axillae and scutellum olive-green ; gaster black with weak bronze and bluish reflections, most distinct at the base of the first tergite. Mandibles reddish with darker teeth. Antennae fuscous to blackish, the clava brownish, the scape proximally more or less testaceous. Legs (apart from coxae) brownish or fuscous ; femora reddish at their tips, or more or less striped with reddish ; tibiae more or less reddish at their apices, and in one specimen also narrowly at their bases, the fore tibiae in one specimen reddish ; mid and hind tarsi more or less reddish proximally. Tegulae fuscous. Wings subhyaline ; venation brownish testaceous. Length 2·2 to 2·5 mm.

Head (in dorsal view) about 2·1 times as broad as long, shaped much as in *nigricornis* (Text-fig. 99) ; temples converging strongly and only about one quarter as long as the eyes ; POL 1·2 to 1·3 OOL. Eyes separated by nearly 1·3 times their length. Malar space slightly more than one third the length of an eye (14 : 37) ; genae with the hollow above the mandibular base rather small, extending hardly half way to the eye. Antennae (Test-fig. 108) with scape reaching the level of the vertex, its length slightly less than the transverse diameter of an eye. Combined length of pedicellus and flagellum about 0·9 the breadth of the head ; pedicellus virtually twice as long as broad, almost equal to anelli plus first funicular segment ; funicle proximally very slender, not stouter than the pedicellus in profile but thickening distad so that the flagellum is strongly clavate, its first segment 1·3 to 1·4 times as long as broad, second slightly elongate, third and fourth subquadrate, fifth and sixth more or less transverse, sixth strongly so ; clava in profile appearing obliquely truncate, only about 1·5 times as long as broad, its length slightly less than that of the three preceding funicular segments together ; flagellum with moderately conspicuous, slightly outstanding hairs ; sensilla in one row on each segment, sparse on the funicular segments but numerous on those of the clava.

Pronotum : collar region with its shoulders nearly rectangular, its front edge without teeth but with a trace of a margin over the middle third. Mesoscutum and scutellum moderately finely, strongly reticulate. Mesoscutum 1·5 to 1·6 times as broad as long. Scutellum convex, very slightly broader than long ; frenal line subobsolete. Propodeum slightly more than three quarters the length of the scutellum, its median area with sculpture like that of the scutellum, except the nucha, which is more finely reticulate, especially posteriorly where it is nearly smooth; median carina vaguely indicated by a ridge. Fore wing with costal cell with a complete partly double row of hairs on its lower surface, plus some scattered hairs in the distal quarter, its upper

surface bare ; basal vein with three to four hairs only ; basal cell bare or with one to two isolated hairs, open below ; speculum open below, the wing beyond it moderately thickly haired ; marginal vein 2·3 to 2·35 times as long as the stigmal vein and about 1·15 times as long as the postmarginal vein. Legs fairly slender ; spur of mid tibia somewhat more than half as long as the first tarsal segment.

Gastral petiole slightly longer than the propodeum, about 2·5 times as long as its median breadth, finely reticulate ; its sides subparallel, with prominent teeth subbasally, and with two hairs on each side. Gaster ovate, 1·6 to 1·75 times as long as broad, somewhat shorter than but about as broad as the thorax ; basal tergite occupying slightly more than one third the total length, its hind margin sinuate with the middle portion very distinctly curved backwards ; next tergite somewhat broader than long, nearly as long as the first ; following tergites much retracted, except the last which is slightly shorter than its basal breadth.

♂. Unknown.

The female of this species is close to that of *brevicornis* (Walker) which differs as follows :

Distal half to two thirds of basal cell of fore wing with scattered hairs. Mesoscutum nearly or quite twice as broad as long. Gastral petiole barely 1.5 times as long as broad ; gaster relatively longer, 2·3 to 2·5 times as long as broad, about as long as head plus thorax.

Holotype ♀. ENGLAND : Berkshire, Wytham, 13.v.1959, swept from foliage of *Salix cinerea* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. ENGLAND : Berkshire, Cothill, 1 ♀, 19.v.1957, swept from foliage of *Salix* sp. (*Graham*) ; Oxfordshire, Otmoor, 1 ♀, 6.vii.1956, swept from foliage of *Salix fragilis* L. (*Graham*), in Graham collection.

Biology. Unknown.

Sphegigaster flavicornis (Walker)

? *Diplolepis pallicornis* Spinola, 1808 : 227–228, ♂.
Merismus flavicornis Walker, 1833 : 377, ♂.
Sphegigaster flavicornis (Walker) Thomson, 1878 : 20, ♂ ♀.
Sphegigaster flavicornis (Walker) ; Ferrière, 1959 : 97, 99, ♂ ♀.

Type material. *Diplolepis pallicornis* Spinola. I have not ascertained whether the holotype male still exists ; if it does, and subsequently proves to be the same as *flavicornis* (Walker), then the latter name will be replaced by Spinola's.

Merismus flavicornis Walker. Four males in the series (one possibly not an original specimen). One, bearing a Waterhouse label, " Sphegigaster flavicornis Walker ", is selected as LECTOTYPE.

BRITAIN, IRELAND, SWEDEN ; probably widely distributed in Europe.

Biology. A common parasite of *Phytomyza ilicis* Curt., on *Ilex aquifolium* L. A detailed account of its biology is given by Cameron (1959 : 192–197). I have also seen a female reared in England, Middlesex, Scratch Wood, 2.viii.1955 from *Phytomyza ramosa* Hend. (*K. A. Spencer*). Imagines appear in the field from May until September, probably more than one generation.

Sphegigaster cuscutae Ferrière

Sphegigaster cuscutae Ferrière, 1959 : 98–99, ♂ ♀.

Type material. Syntypes, 4 ♀, 5 ♂, Germany, Giessen, 1956, reared from puparia of *Melanagromyza cuscutae* Her. (*H. Scherf*), in Museum d'Histoire naturelle, Geneva.

GERMANY, MOLDAVIAN S.S.R.

Biology. See above.

Sphegigaster orobanchiae Kurdjumov

Sphegigaster orobanchiae Kurdjumov, 1912 : 233–234, ♂ ♀.
Sphegigaster orobanchiae Kurdjumov ; Ferrière, 1959 : 99.

Type material. Syntypes 3 ♀, and 1 ♂, Russia, Kursk and in province of Charkov, reared 1907–1908 from *Phytomyza orobanchiae* Kalt., ; location not known to the writer (? in Zoological Museum, Leningrad).

I do not know this species, which appears to be very near *cuscutae* Ferrière. Ferrière (1959) says that *orobanchiae* differs from *cuscutae* chiefly in having the antennae shorter with the sixth funicular segment transverse, in having the scape green, and the body coppery green with the propodeum and the petiole bluish. In the female of *cuscutae* the antennae have the sixth funicular segment fully as long as broad, whilst the scape is testaceous and the body is black with obscure green reflections on the head and thorax.

CENTRAL EUROPE, U.S.S.R.

Biology. Parasite of *Phytomyza orobanchiae* Kalt. in Russia (Kurdjumov, 1912).

SYNTOMOPUS Walker

Syntomopus Walker, 1833 : 371, 372. Type-species : *S. thoracicus* Walker, by designation of Westwood, 1839 : 69.
Syntomopus Walker ; Förster, 1856 : 52, 56.
Syntomopus Walker ; Thomson, 1878 : 17, 23.
Syntomopus Walker ; Ashmead, 1904 : 330, 331.
Syntomopus Walker ; Schmiedeknecht, 1909 : 374, 375, 376–377.
Syntomopus Walker ; Nikol'skaya, 1952 : 247–248.
Syntomopus Walker ; Peck *et al.*, 1964 : 40.

KEY TO EUROPEAN SPECIES

1 *Female* with head fully as high as broad, in frontal view appearing almost subrectangular, with genae strongly buccate ; eyes separated by hardly more than their own length ; POL about twice OOL ; all funicular segments of antenna strongly transverse ; hind margin of basal tergite of gaster entire. *Male* with POL about twice OOL ; genae obviously buccate ***oviceps*** Thomson (p. 138)

– *Female* with head broader than high, in frontal view appearing oval, with genae less buccate and converging towards the oral fossa ; eyes separated rather more widely ; POL at most 1·5 OOL ; first funicular segment of antenna at most slightly transverse ; hind margin of basal tergite of gaster often incised. *Male* with POL at most 1·7 OOL ; genae only slightly buccate 2

2 (1) Median carina of propodeum sharp over at most the anterior quarter of the sclerite, behind this effaced and sometimes replaced by a shallow longitudinal furrow ; gastral petiole twice or slightly more than twice as long as broad, tending to narrow slightly caudad ; body dark blue.

Male antennae with funicular segments, except sometimes the sixth, quadrate to slightly longer than broad.

Female with first funicular segment quadrate, second only slightly transverse . . . . . ***incisus*** Thomson (p. 139)

– Median carina of propodeum most often complete, sometimes very sharp throughout ; if somewhat effaced in the middle, then the gastral petiole is rather less than twice as long as broad and has more parallel sides (*males* with incomplete propodeal carina have funicular segments three to six of the antenna transverse). Body of *male* usually more or less tinged with greenish ; that of *female* usually with a slight greenish tinge in places, sometimes quite extensively greenish on the thorax 3

3 (2) *Male* with scutellum distinctly longer than broad, convex ; mesoscutum rather strongly convex in front ; lateral angles of pronotum not prominent ; flagellum not pale beneath ; funicular segments, except sometimes the sixth, quadrate to slightly longer than broad. *Female* unknown . sp. indet.

– *Males* and *females* with scutellum nearly or quite as broad as long, nearly flat discally ; mesoscutum weakly convex or rather flat ; lateral angles of pronotum sometimes prominent ; flagellum sometimes pale beneath ; distal segments of funicle sometimes transverse 4

4 (3) *Male* has antennal funicle with at most the sixth segment slightly transverse, the other segments quadrate (or one to three slightly longer than broad) ; flagellum often reddish beneath ; marginal vein of fore wing 2 to 2·5 times as long as the stigmal vein ; lateral angles of pronotum (Text-fig. 101) more or less prominent except in some dwarf specimens ; tibiae usually testaceous or at most slightly infuscate medially, more heavily so in some dwarfs. *Female* with first segment of antennal funicle quadrate, second at most very slightly transverse ; fore wing with marginal vein 2·3 to 2·5 times as long as the stigmal vein ; tibiae testaceous, or with a moderately broad infuscate band before the middle ; femora usually broadly pale distally ; lateral angles of pronotum tending to be slightly prominent ***incurvus*** Walker (p. 139)

– *Male* with antennal funicle with the first, and sometimes the second, segment quadrate, the remaining segments slightly transverse : flagellum not pale beneath ; marginal vein 1·6 to 1·9 times as long as the stigmal vein ; lateral angles of pronotum not prominent (Text-fig. 102) ; tibiae heavily infuscate medially, often mainly black. *Female* with first segment of antennal funicle slightly, the remaining segments progressively more distinctly, transverse ; marginal vein 1·9 to 2·2 times as long as the stigmal vein ; tibiae heavily infuscate medially, often mainly black, femora black with at most their tips narrowly pale ; lateral angles of pronotum not prominent ***thoracicus*** Walker (p. 139)

Syntomopus oviceps Thomson

Syntomopus oviceps Thomson, 1878 : 24, ♀.

Type material. Syntypes, 6 specimens. LECTOTYPE ♀ labelled " Ld " [Lund], " ♀ ", and " oviceps Ths ".

BRITAIN, SWEDEN, local.

Biology. Reared in England from *Phytomyza flavicornis* Fln. on *Urtica dioica* L. (*K. A. Spencer* and *G. C. D. Griffiths*). Imagines May–August.

Syntomopus incisus Thomson

Syntomopus incisus Thomson, 1878 : 23, ♂ ♀.

Type material. Syntypes on 24 pins. LECTOTYPE ♀ labelled " Hg " [Hälsingborg] on a pale green label.

BRITAIN, SWEDEN, not uncommon.

Biology. Reared in England from *Melanagromyza lappae* (Lw.) on *Arctium vulgare* (Hill) Evans, from *M. dettmeri* Her., and *M. aeneiventris* (Fln.) (*K. A. Spencer*). I have also examined a female which emerged from a stem of *Cirsium eriophorum* (L.) Scop., on 30.vii.1952, at Wytham, Berkshire. Imagines occur in the field in May and July–August.

Syntomopus incurvus Walker

Syntomopus incurvus Walker, 1833 : 372, ♀.
Miscogaster Dirce Walker, 1839 : 195, ♂, **syn. n.**
Lamprotatus Phylander Walker, 1848 : 111, 168, ♂, **syn. n.**

Type material. *Syntomopus incurvus* Walker. Syntypes, 2 ♀ ; one, bearing a Waterhouse label, is selected as LECTOTYPE.

Miscogaster dirce Walker. No material found in BM(NH). In Haliday's collection there is a male which agrees quite well with the description and is designated LECTOTYPE ; it is labelled " Dirce " in Walker's handwriting. I have given it the serial number 845.

Lamprotatus phylander Walker. One male, with the head missing, obviously the holotype ; it bears a Waterhouse label.

BRITAIN, SWEDEN, local.

Biology. Reared in England from *Melanagromyza dettmeri* Her. and *M. tripolii* Spencer (*K. A. Spencer*). Imagines May and July–August.

Syntomopus thoracicus Walker

Syntomopus thoracicus Walker, 1833 : 372, ♂.
? Syntomopus thoracicus Walker; Haliday, 1841–1842 : vi, pl. J. fig. 3, ♀.

Type material. Syntypes, 2 ♂. One, bearing a Waterhouse label, is designated LECTOTYPE.

BRITAIN, GERMANY, SWEDEN ; fairly common.

Biology. A male reared from *Melanagromyza eupatorii* Spencer, Germany, Heidelberg, 5.v.1956 (*K. A. Spencer*) appears to belong to this species. Cameron (1935 : 300) recorded having reared it from puparia of *Agromyza* (=*Melanagromyza*)

aeneiventris (Fln.) in stems of *Senecio jacobaea* L. ; but the specimens on which his record was based appear to be lost, and I cannot check the determination of the parasite. Imagines of *thoracicus* appear May–Sept.

NOTOGLYPTUS Masi

Notoglyptus Masi, 1917 : 181. Type-species : *N. virescens* Masi, by designation of Gahan & Fagan, 1923 : 98.
Notoglyptus Masi ; Peck *et al.*, 1964 : 36.

Only one species is known from Europe ; the type-species *N. virescens* was described from the Seychelles.

Notoglyptus niger Masi

Notoglyptus niger Masi, 1917 : 181, ♂.
Notoglyptus niger Masi ; Erdös, 1948 : 38, ♀.
Notoglyptus niger Masi ; Bouček, 1961 : 67, ♂ ♀.

Type material (not seen). Holotype ♂, Italy, Liguria, in Museo Civico di Storia Naturale, Genoa.

CZECHOSLOVAKIA, HUNGARY, ITALY.
Biology. Unknown. Imagines June–Sept.

CRYPTOPRYMNA Förster

Prosodes Walker, 1833 : 371, 374. Type-species : *P. ater* Walker, by monotypy [pre-occupied by *Prosodes* Eschscholz, 1829].
Cryptoprymna Förster, 1856 : 52, 56 [n. n. for *Prosodes* Walker *nec* Eschscholz].
Cryptoprymnus [*sic*] Förster ; Thomson, 1878 : 17, 22 [invalid emendation].
Cryptoprymna Förster ; Ashmead, 1904 : 330, 332.
Cryptoprymna Förster ; Schmiedeknecht, 1909 : 375, 376, 380.
Cryptoprymna Förster ; Nikol'skaya, 1952 : 248.
Cryptoprymna Förster ; Bouček, 1961 : 71.
Cryptoprymna Förster ; Peck *et al.*, 1964 : 40.

Peck *et al.* (1964 : 40) stated that there are two species of *Cryptoprymna* in Europe. Although my available material shows a fair degree of variation, this seems to be within the range of one species, *atra* (Walker).

Cryptoprymna atra (Walker)

Prosodes ater Walker, 1833 : 375, ♂.
Prosodes ater Walker ; Haliday, 1841–1842 : v, pl. C, fig. 3, ♀.
Cryptoprymnus cavigena Thomson, 1878 : 22, ♂ ♀.
Cryptoprymna atra (Walker) Bouček, 1961 : 71.

Type material. *Prosodes ater* Walker. In the BM(NH) three specimens stand under this name ; two are Stephens specimens and not syntypes, whilst the third

[a *Psilocera*] does not agree with the description. In Westwood's collection there is a Walker male which stands below a label " Prosodes " and bears a label " ater ", both in Walker's handwriting ; it agrees well with the description and is designated LECTOTYPE. There are also several *Prosodes* in Haliday's collection, 3 ♀ of which are labelled as *ater* ; one of these may have been that figured by Haliday (1841–1842 : pl. C, figs. 3, 3a).

Cryptoprymnus cavigena Thomson. Syntypes, 5 specimens ; LECTOTYPE, a ♀ labelled " Hlm " [Holmiae=Stockholm].

BRITAIN, IRELAND, SWEDEN, CZECHOSLOVAKIA ; uncommon.

Biology. Unknown ; the species may be associated with some host on coniferous trees, as it has been taken in Czechoslovakia on *Abies* (Bouček, 1961 : 71) and I have swept it in Britain from foliage of *Pinus sylvestris* L. Imagines June–August.

The species recorded as " *Cryptoprymna ater* Walker " from Iceland and Greenland by Bakkendorf (1955 : 146, figs. 7, 21, 35) clearly belongs to some other genus.

NOVITZKYANUS Bouček

Novitzkyanus Bouček, 1961 : 68. Type-species : *N. cryptogaster* Bouček, by original designation.

Only one species known in Europe ; another (*N. tridentatus* Delucchi) has been described from Morocco (Delucchi, 1962 : 118).

Novitzkyanus cryptogaster Bouček

Novitzkyanus cryptogaster Bouček, 1961 : 70–71, ♂ ♀.

Type material. Holotype ♀, Southern France, Department of Var, Agay, v. 1927 (*Obenberger*) in Národní Museum, Prague (Cat. no. 2969).

FRANCE, ISLE OF RHODES, U.S.S.R.

Biology. Unknown. Bouček (1961: 71) suggests that it might be a parasite of mining insects in stems of cruciferous plants. Imagines April–May and August–September.

CYRTOGASTER Walker

Cyrtogaster Walker, 1833 : 371, 381. Type-species : *C. rufipes* Walker, by designation of Westwood, 1839 : 68.
Dicormus Förster, 1841 : 38. Type-species : *D. aquisgranensis* Förster, by monotypy.
Cyrtogaster Förster, 1856 : 52, 53, 54–55.
Cyrtogaster Walker ; Thomson, 1878 : 18, 25.
Cyrtogaster Walker ; Ashmead, 1904 : 331, 332.
Cyrtogaster Walker ; Schmiedeknecht, 1909 : 375, 376, 382–383 [*ex parte*].
Cyrtogaster Walker ; Nikol'skaya, 1952 : 248.
Cyrtogaster Walker ; Peck *et al.*, 1964 : 38.
Cyrtogaster Walker ; Askew, 1965 : 179–195.

The genus *Dicormus* was synonymized with *Cyrtogaster* by Förster himself (1856 : 55). The species of *Cyrtogaster* have recently been revised by Askew (1965).

KEY TO EUROPEAN AND NORTH AMERICAN SPECIES

(FEMALES)

1 Mesoscutum with notauli usually incomplete, sometimes traceable as far as the hind margin but then very superficial posteriorly. Occiput finely ridged transversely at least behind the ocelli. Basal tergite of gaster smooth. Fore wing with basal cell pilose over at most its distal third ***vulgaris*** Walker (p. 142)

– Mesoscutal notauli complete, distinct throughout. Occiput not ridged. . 2

2 (1) Thorax weakly arched dorsally. Vertex moderately strongly reticulate, duller. Fore wing with speculum closed below ; distal half or more of basal cell pilose. Basal tergite of gaster alutaceous at least anteriorly. (Europe) . . . . . ***britteni*** Askew (p. 143)

– Thorax strongly arched dorsally. Vertex alutaceous, shiny. Fore wing with speculum open below ; about the distal third of basal cell pilose. Basal tergite of gaster smooth. (North America) . . ***glasgowi*** Crawford (p. 143)

(MALES)

1 Mid tarsi black, their fifth segment enlarged and subcordiform. Terminal segment of maxillary palpi distinctly clavate. Notauli usually incomplete, sometimes traceable as far as the hind margin of the mesoscutum but then very superficial posteriorly. Occiput with a fine transverse ridge at least behind the ocelli . . . . . ***vulgaris*** Walker (p. 142)

– Mid tarsi at least mainly testaceous, their fifth segment not enlarged. Terminal segment of maxillary palpi hardly clavate. Notauli complete, distinct throughout. Occiput not ridged 2

2 (1) Thorax weakly arched dorsally. Fore wing with speculum closed below. Vertex more strongly sculptured . . . . ***britteni*** Askew (p. 143)

– Thorax strongly arched dorsally. Fore wing with speculum open below. Vertex less strongly sculptured . . . . ***glasgowi*** Crawford (p. 143)

Cyrtogaster vulgaris Walker

Cyrtogaster vulgaris Walker, 1833 : 382, ♂ ♀.
Cyrtogaster thoracica Walker, 1833 : 382, ♀.
Cyrtogaster rufipes Walker, 1833 : 383, ♂ ♀.
Cyrtogaster tenuis Walker, 1833 : 384, ♀.
Cyrtogaster cingulipes Walker, 1833 : 384, ♀.
Dicormus aquisgranensis Förster, 1841 : 38, ♂.
? Cyrtogaster Poesos Walker, 1848 : 107, 164, ♀.
Lamprotatus Acarnas Walker, 1848 : 111, 168, ♀, **syn. n.**
Cyrtogaster biglobus Förster, 1861 : 33, ♂.
Sphegigaster degener Walker, 1872*b* : 117, ♀, **syn. n.**
Cyrtogaster vulgaris Walker ; Askew, 1965 : 179–180, 184, ♂ ♀.

Type material. *Cyrtogaster vulgaris* Walker. Syntypes, 6 ♀, 4 ♂. None of the females agrees perfectly with the description. LECTOTYPE, a ♂ (tenth in series), bearing a Waterhouse label.

Cyrtogaster thoracica Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen, bearing a Waterhouse label.

Cyrtogaster rufipes Walker. Syntypes, 7 ♀, 2 ♂. LECTOTYPE, a ♂, bearing a Waterhouse label.

Cyrtogaster tenuis Walker. One ♀, designated LECTOTYPE (but possibly holotype), bearing a Waterhouse label ; it is a small specimen of *vulgaris*. Placed in synonymy with *vulgaris* by Askew (1965 : 180).

Cyrtogaster cingulipes Walker. One ♀, LECTOTYPE (possibly holotype), bearing a Waterhouse label.

Cyrtogaster poesos Walker. Type not located.

Lamprotatus acarnas Walker. One ♀, LECTOTYPE, bearing a Waterhouse label.

The types of *Dicormus aquisgranensis* Förster and *Cyrtogaster biglobus* Förster have not been examined by me. These species were placed in synonymy with *vulgaris* by Delucchi (1955*a* : 174–5) and I accepted his opinion.

Sphegigaster degener Walker. One ♀, LECTOTYPE, labelled " Madeira Is. Northern Dezerta Wollaston " and (in Walker's handwriting) " *Sphegigaster degener*". It is the form with red legs.

Cyrtogaster scotica Walker (1833 : 382, ♀) was placed in synonymy with *vulgaris* by Askew (1965 : 180–181). I doubt whether this synonymy is correct. Walker's description (1833 : 382–3) includes the statement " pedes fusci, tibiis apice tarsisque nigris " and I have not seen any female *Cyrtogaster* in which the tibiae are darker at their apices than elsewhere. There is no specimen in Walker's collection under the name *Cyrtogaster scotica ;* but I have found elsewhere a female which may be the type (see below under *Seladerma tarsale*).

Widely distributed and very common in EUROPE. Females may be found in every month of the year ; they pass the winter concealed amongst the foliage of coniferous trees, *Buxus*, in débris lodged between sprouts on the boles of oak-trees, in haystacks and similar situations.

Biology. Several Agromyzidae are recorded as hosts ; see Askew (1965 : 185–186). I have also examined specimens reared from *Phytomyza atricornis* Mg. on *Aster* sp., from *Phytomyza crassiseta* Zett. on *Veronica officinalis* L., and from *Phytobia sonderupi* Her. on *Carex* sp. (material reared in England (*G. C. D. Griffiths*) and now in BM(NH)). Flies belonging to Chloropidae and Lonchopteridae have also been cited as hosts ; these records need confirmation.

Cyrtogaster britteni Askew

Cyrtogaster britteni Askew, 1965 : 180–182, 184, ♂ ♀.

Type material. Holotype ♀ in Hope Department, University Museum, Oxford, paratypes in the Manchester Museum and in my own collection.

BRITAIN : Berkshire, Cheshire, Cumberland ; Inverness-shire.

Biology. Unknown. Imagines captured in August, females also in February and March (probably hibernating specimens).

Cyrtogaster glasgowi Crawford

Cyrtogaster glasgowi Crawford, 1914*a* : 36, ♂ ♀.

U.S.A.

Biology. Originally reared from *Brachydeutera argentata* (Walk.) (Dipt., Ephydridae). This species is mentioned only because of its close affinity with *britteni*].

POLYCYSTUS Westwood

Polycystus Westwood, 1839 : 68. Type-species : *P. matthewsii* Westwood, by monotypy and original designation.
Polycystus Westwood ; Thomson, 1878 : 18, 26.
Polycystus Westwood ; Ashmead, 1904 ; 331, 332.
Polycystus Westwood ; Schmiedeknecht, 1909 : 375, 376, 380–381.
Polycystus Westwood ; Graham, 1956*b* : 261.
Polycystus Westwood ; Peck *et al.*, 1964 : 38.
Polycystus Westwood ; Askew, 1965 : 183–184.

As Askew (1965 : 184) remarked, *Polycystus* is very close to *Cyrtogaster*, of which it may eventually be regarded as a subgenus. Until the Pteromalid fauna has been surveyed over a much wider region, however, I prefer to keep the two as separate genera.

Polycystus clavicornis (Walker)

Cyrtogaster clavicornis Walker, 1833 : 383, ♀.
Cyrtogaster obscura Walker, 1833 : 383, ♀.
Polycystus Matthewsii Westwood, 1839 : 68, ♂.
Polycystus scapularis Thomson, 1878 : 26, ♂ ♀.
Polycystus clavicornis (Walker) Graham, 1956*b* : 261.
Polycystus clavicornis (Walker); Askew, 1965 : 183–184, ♂ ♀.

Type material. Lectotypes of *Cyrtogaster clavicornis* Walker, *C. obscura* Walker, and *Polycystus matthewsii* designated by Graham (1956*b* : 261).

Polycystus scapularis Thomson. Syntypes on 19 pins. LECTOTYPE, a female labelled " Ld 8/6 " ; " ♀ "; and " scapularis Ths ". The species was synonymized with *clavicornis* (Walker) by Burghele (1959 : 124) on the authority of Bouček.

BRITAIN, IRELAND, SWEDEN, DENMARK, CZECHOSLOVAKIA, RUMANIA, MOLDAVIAN S.S.R. Locally common ; in damp meadows and marshy places.

Biology. Reared in Rumania by Burghele, from puparia of *Hydropota* (*Hydrellia*) *griseola* (Fln.) ; from *Hydropota* (*Hydrellia*) *nasturtii* (Collin) in Algeria (*M. Delassus*) (see Askew, 1959). Henriksen (1919 : 164–165) cited Ephydridae and *Lonchoptera* as hosts of *Polycystus scapularis* and stated that a single parasite was reared from each parastitized host puparium. Imagines May–July.

TOXEUMA Walker

Toxeuma Walker, 1833 : 371, 378 : Type-species. *T. fuscicornis* Walker, by designation of Westwood, 1839 : 68.
Toxeuma Walker; Förster, 1856 : 53, 58.
Toxeuma Walker; Thomson, 1876*a* : 220, 243–245.
Toxeuma Walker; Ashmead, 1904 : 278.

Toxeuma Walker; Schmiedeknecht, 1909 : 291, 296.
Toxeuma Walker; Nikol'skaya, 1952 : 246.
Toxeuma Walker; Delucchi, 1955 : 7, 91.
Toxeuma Walker; Graham, 1959 : 101–106.
Toxeuma Walker; Peck *et al.*, 1964 : 37.

The species were revised by Graham (1959).

Key to European Species

(Males and Females)

1 Gaster (Text-figs. 115, 116) alutaceous except for the major part of the basal tergite ; that of the *female* usually lanceolate, about three times as long as broad and at least as long as head plus thorax, occasionally only twice as long as broad in one uncommon form, with the basal tergite occupying at most one third of the total length. Pronotal collar (Text-fig. 110) less prominent at the shoulders ; mesoscutum and scutellum with relatively finer sculpture ; head and thorax usually bright green, blue-green, or golden green. Petiole of gaster in *female* nearly twice as broad as long . 2

– Gaster mainly smooth and shiny, only the last two tergites are more or less alutaceous ; that of the *female* (Text-figs. 111, 112) ovate, at most twice as long as broad, not longer than the thorax, with the basal tergite occupying at least half the total length. Both sexes with the shoulders of the pronotal collar (Text-fig. 113) prominent and subrectangular ; mesoscutum and scutellum with relatively coarser sculpture. Petiole of gaster varying from longer than broad to slightly transverse. 3

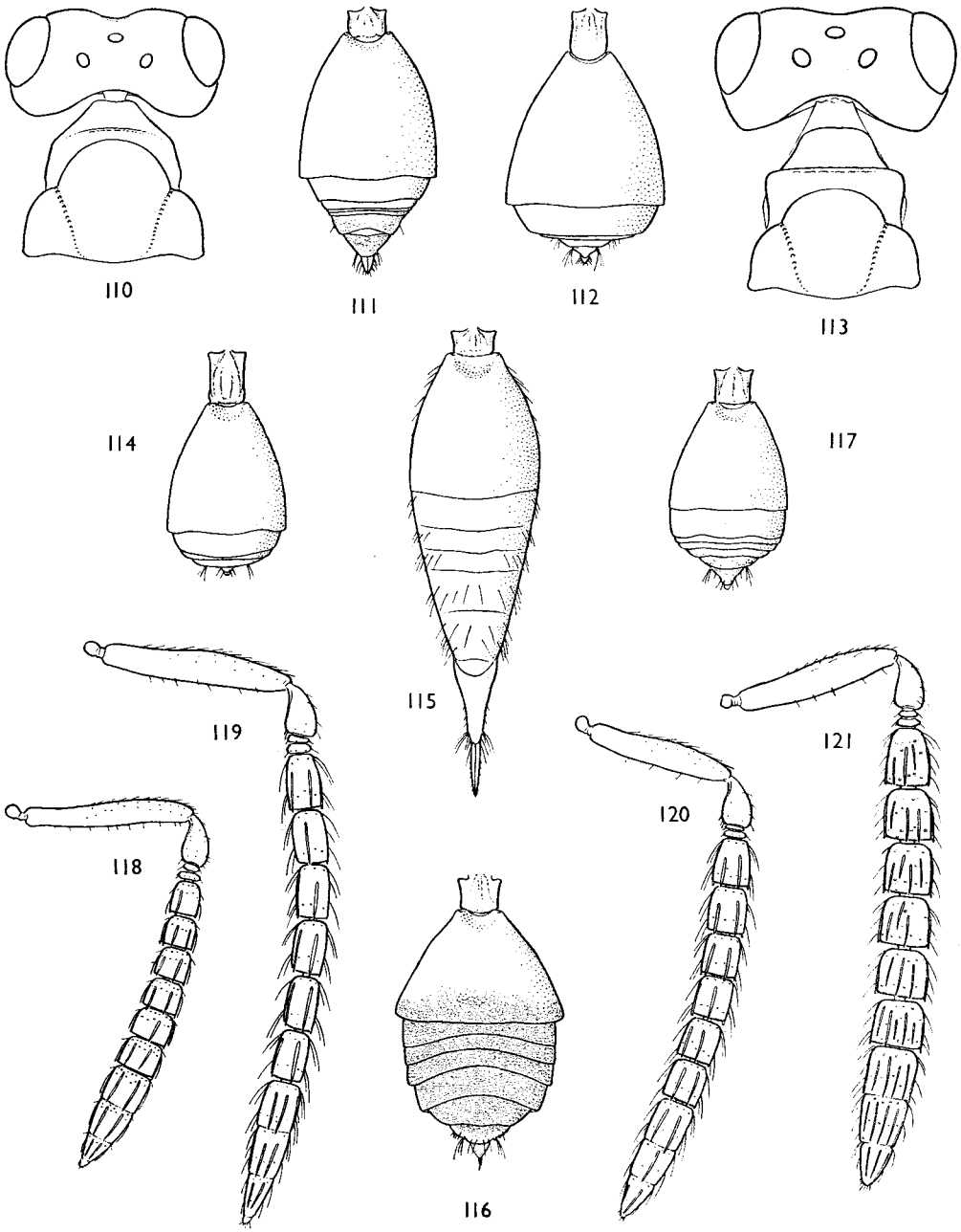
2 (1) Gaster of *female* (Text-fig. 115) lanceolate, at least slightly longer than head plus thorax, 2·9 to 3·5 times as long as broad ; last tergite 1·6 to 2 times as long as its basal breadth. Gaster of *male* as in Text-fig. 116 ***fuscicorne*** Walker (p. 147)

– Gaster of *female* ovate to lanceolate-ovate, somewhat shorter than or barely as long as head plus thorax, 2 to 2·7 times as long as broad ; last tergite at most 1·2 times as long as (sometimes not longer than) its basal breadth. *Male* not distinguished from that of *fuscicorne*, of which it is perhaps only a form . . . . . sp. indet. (p. 148)

3 (1) Sculptured part of petiole (Text-figs. 112, 114) longer than broad and almost as long as the propodeum. Gaster of ♀ (Text-fig. 112) slightly more than half as long as the thorax, hardly 1·5 times as long as broad, with basal tergite occupying about three quarters of its total length. Head (Text-fig. 113) larger, almost 1·5 times as broad as the mesoscutum, with temples longer and converging in a relatively straight line behind the eyes. ♂ antenna, text-fig. 121 . . . . . ***subtruncatum*** Graham (p. 148)

– Sculptured part of petiole quadrate to slightly transverse, much shorter than the propodeum. Gaster of ♀ (Text-fig. 111) normally about three quarters as long (sometimes as long) as the thorax, and 1·5 to 2·0 times as long as broad, with basal tergite occupying about half its total length or slightly more. Head 1·2 to 1·25 times as broad as the mesoscutum, with temples shorter and slightly more rounded off behind the eyes 4

4 (3) Legs mainly metallic, at most the trochanters partly, the knees, tips of the tibiae, and base of the tarsi, testaceous. Mandibles mainly fuscous. General colour of head and thorax dark blue-green. ♀ only : antennal funicle (Text-fig. 118) with at most segments one to three quadrate, four slightly transverse, five and six distinctly so ; scape metallic. ♂ only :



FIGS. 110–121. *Toxeuma* spp. 110, *fuscicorne* Walker, ♀, head, pronotum and mesoscutum ; 111, *acilius* (Walker), ♀, petiole and gaster ; 112, *subtruncatum* Graham, petiole and gaster ; 113, same, ♀, head, pronotum and mesoscutum ; 114, same, ♂, petiole and gaster ; 115, *fuscicorne* Walker, ♀, petiole and gaster ; 116, same, ♂, petiole and gaster ; 117, *paludum* Graham, ♂, petiole and gaster ; 118, same, ♀, antenna ; 119, *acilius* (Walker), ♂, antenna ; 120, *paludum* Graham, ♂, antenna ; 121, *subtruncatum* Graham, ♂, antenna.

flagellum (Text-fig. 120) stouter, black ; funicular segments quadrate or only a little longer than broad . . . . . ***paludum*** Graham (p. 148)

– Legs, except the coxae and tips of the tarsi, reddish testaceous, in one specimen the hind femur is slightly darkened medially. Mandibles mainly reddish testaceous. General colour of head and thorax bright green. ♀ only: antennal funicle either with all its segments quadrate, or at most with the sixth slightly transverse ; scape usually reddish testaceous basally, rarely wholly metallic. ♂ only : flagellum (Text-fig. 119) more slender, mainly reddish testaceous ; funicular segments 1·5 times as long as broad or more ***acilius*** (Walker) (p. 148)

Toxeuma fuscicorne Walker

Toxeuma fuscicorne Walker, 1833 : 378, ♀.
Toxeuma Ericae Walker, 1833 : 379, ♀.
Toxeuma ericae Walker, Haliday, 1841–1842 : v, pl. D, fig. 1, ♀.
Gastrancistrus Accia Walker, 1848 : 105, 156, ♀.
Toxeuma fuscicorne Walker, Delucchi, 1955 : 91 [*ex parte*].
Toxeuma fuscicorne Walker, Graham, 1959 : 101–102, 106, ♂ ♀.

Type material. *Toxeuma fuscicornis* Walker. In the BM(NH) collection there is only one male in the British section, and this is clearly not an original specimen. In the foreign section there is a series of 9 Walker specimens (which have been remounted) standing as " Toxeuma ericae ". Since Walker later (1846 : 28) placed *fuscicornis* as a "variety " of *ericae*, I conclude that the syntypes of both were combined into one series which is represented by the 9 specimens mentioned above. From the latter I designate the fourth specimen, a female, as LECTOTYPE of *fuscicornis*. As regards *ericae*, only one female stands under that name in the British section of the collection and it is not original material. I select as LECTOTYPE of *ericae* the seventh specimen (a female) in the series of 9 previously mentioned.

Gastrancistrus accia Walker. One female, designated LECTOTYPE ; it bears a printed label [GASTRANCIS] " TRUS ACCIA ", also a Waterhouse label. The species was placed in synonymy with *Toxeuma fuscicorne* Walker by Graham (1959 : 101).

Miscogaster lugubris Walker (1833 : 462, ♂) was placed in synonymy with *Toxeuma ericae* by Walker himself (1846) : 28). There is now no separate label for *Miscogaster lugubris* in Walker's collection ; probably, however, he would have placed the type or types of *lugubris* with his series of *ericae* when he made the synonymy. His series of *ericae* contains three males, which I thought might represent the missing *lugubris*, since he described only the females of *ericae* and *fuscicorne*. Unfortunately none of these three agrees well enough with the description of *lugubris* to be regarded as its type. Possibly Walker's synonymy was wrong because the description of the colour of the legs in *lugubris* suggests a species of *Seladerma* (=*Telepsogos*) and not a *Toxeuma*.

BRITAIN, IRELAND, SWEDEN, GERMANY, SWITZERLAND, HUNGARY.

Biology. Reared from seeds of the grasses *Avena elatior* [=*Arrhenatherum elatius* (L.) Beauv.], *A.* (=*Helictotrichon*) *pubescens* (Huds.) Pilger and *A.* (=*H.*) *pratensis*

(L.) Pilger (*von Rosen*) (1966 : 81). Imagines June and July in Britain ; earlier in Switzerland (see Delucchi, 1955 : 93).

Toxeuma sp. indet.

ENGLAND : Oxfordshire, Bald Hill, near Lewknor, a few ♂♂ and ♀♀, swept amongst *Helictotrichon* (Gramineae), 18.vi.1958 (*Graham*).

Females of this form (or species) differ from those of *fuscicorne* in their distinctly shorter gaster (see key to species). Both sexes are rather larger and darker than typical *fuscicorne*. I have examined the ♂ genitalia and ♀ hypopygium of both forms but find no obvious distinctions. Until the biology of *fuscicorne* and of the present form are properly known, one cannot say whether the two are distinct species or forms of one.

Toxeuma acilius (Walker)

Lamprotatus acilius Walker, 1848 : 111, 169, ♂.
Toxeuma acilius (Walker); Graham, 1959 : 104, 106, ♂ ♀.

Type material. Lectotype designated by Graham (1959 : 104).

BRITAIN, SWEDEN.
Biology. Unknown. Imagines June–Aug. (the latter month in Scotland).

Toxeuma paludum Graham

Toxeuma paludum Graham, 1959 : 102–104, 106, ♂ ♀.

Type material. Holotype ♀ in Hope Department, University Museum, Oxford.

ENGLAND, IRELAND ; very local, in marshy places.
Biology. Unknown. Imagines July–Aug.

Toxeuma subtruncatum Graham

Toxeuma subtruncatum Graham, 1959 : 105, 106, ♂ ♀.

Type material. Holotype ♂ in the Hope Department, University Museum, Oxford.

ENGLAND, very local; the specimens so far taken have been captured in woodland.
Biology. Unknown. Imagines May–July.

SELIMNUS Walker

Selimnus Walker, 1842 : 335. Type-species : *S. diores* Walker, by monotypy.

Selimnus diores Walker

Selimnus Diores Walker, 1842 : 335, ♀.

Type material. Type ♀, Switzerland, neighbourhood of Geneva (*de Romand*), not found (returned to de Romand coll. by Walker and subsequently destroyed, see below).[2]

This species, and consequently the identity of the genus *Selimnus*, has not been recognized by any subsequent author. When described it was not placed in any of the recognized families. In his annotated copy of his 1846 *List of Hymenopterous Insects in the British Museum. Part* 1. *Chalcidites* (which is in my possession) Walker has entered *Selimnus* on the interleaf between pages 28 and 29, i.e., between the genera of the Sphegigasterine group and *Lamprotatus*, as if he thought this might be its correct position. The original description suggests to me that *Selimnus* may have been a genus near to, or identical with, *Elatoides* Nikol'skaya (1952 : 189, 200). Nikol'skaya placed *Elatoides* in Perilampidae, but it probably belongs to Pteromalidae (Sphegigasterini, or near this).

MISCOGASTERINI

Most of the genera, (*Seladerma* to *Skeloceras* inclusive, and *Merismus*) which I include in this tribe, were dealt with by Delucchi in his study of the European Lamprotatinae (1955 : 1–97). *Toxeuma*, which Delucchi included in that subfamily, I have transferred to Sphegigasterini. In the above paper Delucchi made considerable advances in the taxonomy of this group, particularly in defining the genera in a more satisfactory manner, and arranging both genera and species in a natural way. His treatment of the species was less satisfactory because often he did not take their variation into account. In the case of several previously described species, only the types were studied ; whilst a number of his new species were apparently described from single specimens. He neglected a number of Walker's species chiefly on the ground that the types could not easily be identified because of the way they had been prepared. Fortunately I have been able to collect a large number of British Miscogasterini (both reared and swept specimens) with the aid of which I have tried to assess the variation of many species. Since my material came from the same country as the Walker species (and often from near the type-localities), it has been possible to identify most of these by direct comparison of the fresh material with the types. In working out the species I have made a large number of measurements, both on my own material and on the types. I believe that this study will therefore provide a reasonably sound account of the British (and some other) species. It must be admitted that some of these are not easy to distinguish. Where special problems of identification occur I have discussed them below. Most of these

[2] Since writing the above I discovered the following statement by Walker in a letter to Haliday dated 9th March 1868 : " I described long ago a few species of Chal*de* found near Geneva and in the collection of De Romand and since in that of de Saussure and since annihilated. One of them is the genus *Selimnus* which I believe is one of the *Sphegigasterini*, tho' it has the colour and quadrate prothorax of the Eurytomini– perhaps another specimen of it may come in sight before long ".

problems will certainly be resolved by critical rearing of the species concerned; students of Diptera (particularly Agromyzidae) can assist materially by preserving any Miscogasterini reared from accurately determined hosts, as indeed Mr. K. A. Spencer and Mr. G. C. D. Griffiths have already done.

Some species of Miscogasterini described by Delucchi, and mentioned in the text below, are omitted from the keys to species because I have not seen their types or any other material.

KEY TO EUROPEAN GENERA

1		Pronotal collar not margined	2
–		Pronotal collar at least slightly margined in the middle, sometimes sharply so throughout	11
2	(1)	Postmarginal vein of fore wing shorter than, or at most as long as, the marginal vein	3
–		Postmarginal vein of fore wing at least slightly longer than the marginal vein	8
3	(2)	Antennae with three anelli and five funicular segments. Maxillary palpi of *male* with stipites enlarged and the two terminal segments of the palpi coalesced to form a swollen yellow sac . ***HALTICOPTERINA*** Erdös (p. 166)	
–		Antennae with two anelli and six funicular segments. Maxillary palpi of *male* (except in *Halticoptera*) unmodified	4
4	(3)	Petiole of gaster either virtually smooth, or else strongly transverse	5
–		Petiole of gaster reticulate, at most slightly transverse but usually as long as or longer than broad	7
5	(4)	Panels of median area of propodeum shiny, weakly sculptured or smooth	7
–		Panels of median area of propodeum strongly reticulate, often also with some rugosity	6
6	(5)	Petiole of gaster reticulate, at most about twice as broad as long ; marginal vein of fore wing 2·5 to 2·8 times as long as the stigmal vein	7
–		Petiole of gaster at least partly smooth, about three times as broad as long ; marginal vein of fore wing at most twice as long as the stigmal vein	11
7	(6)	Fore wing with postmarginal vein at least slightly shorter than the marginal vein, the latter 2 to 3·5 times as long as the stigmal vein. Antennae inserted low on head, the lower edge of toruli level with or slightly below ventral edge of eyes. *Male* with maxillary palpi modified, their two terminal segments coalesced to form a more or less swollen yellow sac ; stipites often enlarged . . . ***HALTICOPTERA*** Spinola (p. 155)	
–		Postmarginal vein not shorter than the marginal vein. Either the marginal vein is at least slightly less than twice as long as the stigmal vein ; or else the lower edge of the antennal toruli is somewhat above the level of ventral edge of eyes. *Male* with maxillary palpi not thus modified	8
8	(7)	Mesoscutal notauli complete, sharply (and usually deeply) impressed throughout ; postmarginal vein of fore wing at least slightly longer than the marginal vein	16
–		Either the notauli are superficial posteriorly (or incomplete) ; or the postmarginal vein of the fore wing is not longer than the marginal vein	9
9	(8)	Stigma of fore wing rather large, tending to be subcircular (as in Text-fig. 164)	21
–		Stigma of fore wing small	10
10	(9)	Petiole of gaster conspicuous, rectangular, as long as broad, reticulate ; propodeum with complete plicae, the area between these shiny and weakly reticulate or partly smooth ; scutellar frenum indistinctly marked off except just at the sides ; small (up to 1·7 mm). species with dark body and extensively infuscate legs . . . . ***THINODYTES*** Graham (p. 167)	

– Either the gastral petiole is inconspicuous, transverse, and weakly and irregularly sculptured ; or the propodeal plicae are at most partly developed, and the median area is strongly reticulate and dull. Scutellar frenum distinctly marked off. Species usually larger and with more brightly metallic body and paler legs 11

11 (10) Petiole of gaster inconspicuous, smooth or nearly so, subconical, at least slightly transverse. Pronotal collar at most weakly and irregularly margined . . . . . ***RHICNOCOELIA*** Graham (p. 168)

– Petiole of gaster conspicuous, strongly reticulate, usually as long as or longer than broad, if transverse then nearly rectangular 12

12 (11) Fore wing (Text-fig. 146) entirely pilose except for the speculum which is reduced to a small area below the parastigma . . ***ARDILEA*** Graham (p. 179)

– Fore wing with a large speculum which extends down to the cubital vein ; basal cell at least mainly bare 13

13 (12) Postspiracular sclerite with an oblique carina, which cuts off a smooth or weakly and irregularly sculptured upper triangle. Antennal clava of *female* with a long strip of micropilosity extending nearly to the base ***MERISMUS*** Walker (p. 171)

– Postspiracular sclerite uniformly reticulate, without an oblique carina. Antennal clava of *female* with a small area of micropilosity on the third segment only 14

14 (13) Panels of median area of propodeum strongly reticulate. Anterior margin of clypeus with three asymmetric teeth (see Text-fig. 44). Left mandible with three teeth, right mandible with four . ***CALLIMERISMUS*** Graham (p. 176)

– Panels of median area of propodeum weakly sculptured or smooth, shiny. Anterior margin of clypeus with two teeth, the left one occasionally a little larger than the other or (Text-fig. 43) weakly notched. Both mandibles with four teeth [this needs confirming in *Schimitschekia*] . . 15

15 (14) Pronotal collar weakly margined. *Female* antenna with at most the distal segments of the funicle slightly transverse. *Male* with maxillary palpi modified, the two terminal segments coalesced to form a swollen yellow sac ; stipites enlarged . . . . . ***HALTICOPTERA*** (part) (p. 155)

– Pronotal collar sharply margined. *Female* antenna with all the segments of the funicle transverse. *Male* unknown. ***SCHIMITSCHEKIA*** Bouček (p. 166)

16 (8) Antennae (Text-fig. 132) 11353, with three strongly transverse anelli. Anterior margin of clypeus (Text-fig. 131) with three rounded lobes. Fore wing, Text-fig. 133 . . . . . ***TRICYLOMISCHUS*** Graham (p. 167)

– Antennae 11263, rarely the first funicular segment is smaller than the following one, but in that case it is at least as long as broad and is provided with sensilla 17

17 (16) Anterior margin of clypeus with a median tooth or tubercle only . . . 18

– Anterior margin of clypeus with two or three teeth (Text-figs. 128, 170) or (rarely) with three small lobes or tubercles (Text-fig. 127) . . . 19

18 (17) Scutellum, not counting the axillulae, subquadrangular with sides nearly parallel, almost flat. Anterior margin of clypeus subtruncate with a median tooth (Central Europe, Algeria) . . ***KSENOPLATA*** Bouček (p. 180)

– Scutellum not subquadrangular, its sides converging forwards, convex. Anterior margin of clypeus slightly curved forwards, with a median tubercle 31

19 (17) Antennal formula 11272, the first claval segment separated from the others by a short peduncle or very deep constriction, and thus appearing like a funicular segment. Petiole of gaster distinctly sculptured, with a sharp

transverse ridge anteriorly. Other characters as in *Lamprotatus* (see below) except that stigma of fore wing is sometimes large
SKELOCERAS Delucchi (p. 241)

– Antennal formula 11263, the three claval segments closely approximated, separated by at most shallow constrictions 20

20 (19) Fore wing with speculum, at least on upper surface of wing, moderately broad and extending to the basal vein ; basal cell sometimes mainly bare . . 21

– Fore wing with speculum either absent, or represented only by a narrow bare line outside the basal vein, or reduced to a small oval patch which lies below the parastigma but does not reach the basal vein ; basal cell mainly or wholly pilose 26

21 (20) Lower edge of mandible (Text-fig. 123) rather deeply excised ; stigma of fore wing rather large, subcircular (as in Text-fig. 164) ; gastral petiole as long as or longer than broad, reticulate.
Anterior margin of clypeus (Text-fig. 170) bidentate
GLYPHOGNATHUS Graham (p. 208)

– Lower edge of mandible usually at most weakly sinuate, if excised (*Seladerma scaea*, Text-fig. 147) then the stigma of the fore wing is smaller and more oval, whilst the gastral petiole is slightly transverse and nearly smooth . 22

22 (21) Petiole of gaster as long as or longer than the median length of the propodeum ; usually longer than (occasionally only as long as) broad 23

– Petiole of gaster at least slightly shorter than the propodeum, rarely longer than broad and often more or less transverse 25

23 (22) Basal tergite of gaster (Text-fig. 122) slightly emarginate in the middle of its hind margin 24

– Hind margin of basal tergite of gaster entire 25

24 (23) Basal vein of fore wing (Text-fig. 124) very distinct, pigmented throughout from the level of the bottom of the speculum to its junction with the parastigma ; costal cell of hind wing nearly always with some hairs basad of the level of the basal cross-vein (as in Text-fig. 125) ; scutellar frenum most often relatively shiny and with some longitudinal costulae, rarely almost uniformly reticulate ; both mandibles with four teeth
MISCOGASTER Walker (p. 226)

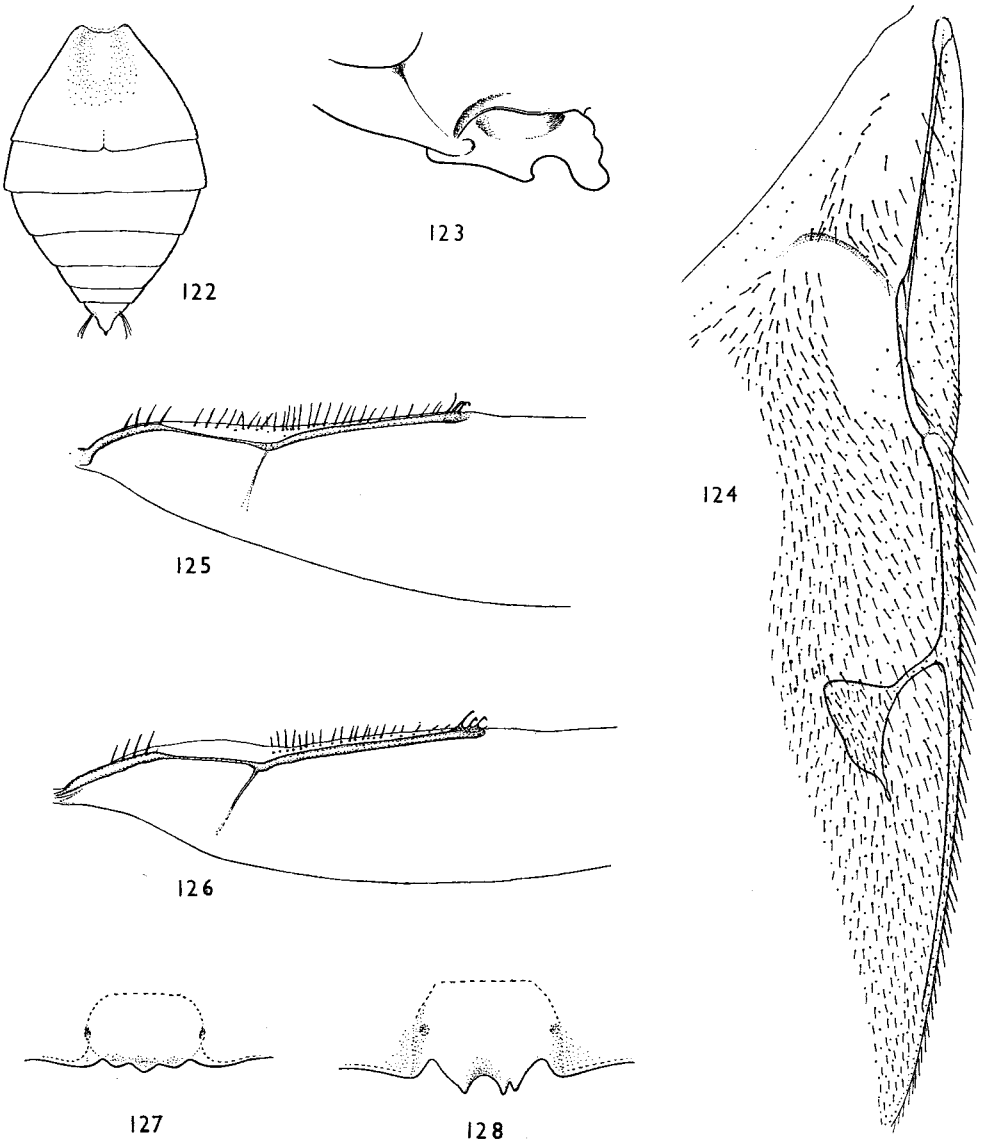
– Basal vein of fore wing distinctly coloured only in about its lower half ; costal cell of hind wing bare as far as the level of the basal cross-vein (Text-fig. 126) ; scutellar frenum uniformly reticulate ; left mandible, or both mandibles, with three teeth 25

25 (24) Stigma of fore wing (Text-fig. 164) relatively large, separated by less than twice its height from the costal edge of the wing. Either the gastral petiole is finely and relatively uniformly reticulate ; or else the petiole is at least slightly longer than broad and the scutellar frenum is uniformly reticulate. Notauli sometimes superficial posteriorly ***GITOGNATHUS*** Thomson (p. 209)

– Stigma of fore wing (Text-figs. 152–155, 158) smaller, separated by at least twice its height from the costal edge of the wing. Gastral petiole not longer than broad and most often transverse, usually smooth or weakly and irregularly sculptured ; if uniformly reticulate then the scutellar frenum has some longitudinal costulae. Notauli sharply impressed throughout . . 28

26 (20) Petiole of gaster reticulate, at most slightly transverse and usually as long as or longer than broad ; stigma of fore wing large or moderately large ; hind margins of gastral tergites not excised medially ; postspiracular sclerite most often with an oblique carina . . ***STICTOMISCHUS*** Thomson (p. 216)

– Either the gastral petiole is virtually smooth, and obviously transverse ; or the stigma of the fore wing is smaller ; or the hind margin of at least the



FIGS. 122–128. 122, *Miscogaster elegans* Walker, ♀, gaster ; 123, *Glyphognathus umbelliferae* Graham, ♀, right mandible and gena ; 124, *Miscogaster elegans* Walker, ♀, fore wing, part ; 125, *Stictomischus obscurus* (Walker), ♀, hind wing, basal part ; 126, *Gitognathus grandiclava* Thomson, ♀, hind wing, basal part ; 127, *Nodisoplata diffinis* (Walker), ♀, clypeus ; 128, *Seladerma breve* Walker, ♀, clypeus.

basal tergite of the gaster is excised medially. Postspiracular sclerite without an oblique carina 27

27 (26) Hind margin of basal tergite of gaster excised medially, sometimes also the hind margin of second and third tergites. *Female* gaster not or only slightly longer than thorax, at most slightly more than twice as long as broad ; antennal clava with micropilosity on third segment only ***XESTOMNASTER*** Delucchi (p. 232)

– Hind margins of gastral tergites not excised. *Female* gaster as long as head plus thorax, at least 2·5 times as long as broad ; antennal clava with micropilosity on all the segments, or at least on the second and third ***THEKTOGASTER*** Delucchi (p. 207)

28 (25) Scutellar frenum marked off by a strongly impressed line, and with some longitudinal costulae, which are often strong, but most often with little or no fine reticulation. Petiole of gaster usually distinctly, even if irregularly, sculptured, often with a transverse crest anteriorly. Antennal funicle usually with numerous short sensilla arranged in two to four rows on each segment, rarely in only one irregular row 29

– Scutellar frenum marked off by a finer line, relatively uniformly and finely reticulate. Petiole of gaster most often nearly smooth ; without a transverse crest. Antennal funicle of *female* often with fewer and longer sensilla arranged in only one row on each segment 30

29 (28) Either the gastral petiole has strong rugulosity or irregular sculpture, usually with a transverse crest anteriorly ; or else the basal cell of the fore wing is open below. Basal vein of fore wing distinctly pigmented, nearly or quite to its junction with the parastigma (as in Text-fig. 124) ; speculum most often open below. Scutellum with at least some trace of a longitudinal impressed line at its base. Left mandible with three or four teeth, right mandible with four . . . . . ***LAMPROTATUS*** Westwood (p. 233)

– Gastral petiole with at most some very fine reticulation, or transverse aciculation, without a transverse crest anteriorly ; basal cell of fore wing closed below in at least the distal half ; speculum closed below. Basal vein usually less distinctly pigmented. Scutellum usually without an impressed line at its base. Left mandible, or both mandibles, with three teeth . . 30

30 (29) *Females* with gaster as long as head plus thorax ; antennal clava with micropilosity on second and third segments ; sensilla arranged in two or three rows on all segments of the funicle ; left mandible with three teeth, right mandible with four ; basal vein of fore wing pigmented nearly or quite throughout. *Males* not accurately known . . ***THEKTOGASTER*** Delucchi (p. 207)

– *Females* with gaster rarely as long as head plus thorax, if so then antennal clava has micropilosity on its third segment only, the sensilla are arranged in one row on at least the distal segments of the funicle, and the basal vein is not pigmented throughout. Both mandibles with three teeth, ♂♀ . . 31

31 (30) Anterior margin of clypeus (Text-fig. 127) with a median lobe or tubercle, and usually a smaller one on either side of it. Combined length of pedicellus and flagellum in *female* less than, in *male* at most equal to, the breadth of the head . . . . . ***NODISOPLATA*** gen.n. (p. 180)

– Anterior margin of clypeus either bidentate, or with three asymmetric teeth (Text-fig. 128). Combined length of pedicellus and flagellum nearly always at least slightly greater than breadth of head, only about equal to it in some females 32

32 (31) *Females* with antennal flagellum very stout proximally, nearly twice as broad as the pedicellus in profile, but tapering a little distad ; scape only about half as long as an eye ; funicle with numerous short sensilla arranged in

two to three irregular rows on each segment ; dorsal surface of hind coxa with a few hairs in the basal half . . . ***TELEPSOGINA*** Heqvist (p. 207)

– *Females* with antennal flagellum less stout, filiform or clavate ; scape somewhat more than half as long as an eye ; funicle often with relatively long sensilla arranged in one row on each segment ; dorsal surface of hind coxa sometimes bare in the basal half . . . . ***SELADERMA*** Walker (p. 182)

HALTICOPTERA Spinola

Halticoptera Spinola, 1811 : 148, no. 9. Type-species : *Diplolepis flavicornis* Spinola, 1808, by designation of Ashmead, 1904 : 376.
Pachylarthrus Westwood, 1832*a* : 127. Type-species : *P. insignis* Westwood, 1832, by monotypy.
Phagonia Curtis, 1832 : folio 427. Type-species : *Diplolepis flavicornis* Spinola, by original designation.
Dicyclus Walker, 1833 : 371, 455. Type-species : *D. aeneus* Walker, by designation of Westwood, 1839 : 68.
Phacostomus Nees, 1834 : 121. Type-species : *Diplolepis patellana* Dalman, 1818, by monotypy.
Megorismus Walker, 1846 : 29. Type-species : *Miscogaster daiphron* Walker, 1839, by monotypy.
Tityros Walker, 1848 : 108, 164, **syn. n.** Type-species : *T. poreia* Walker, by monotypy.
Pachylarthrus Westwood ; Förster, 1856 : 52, 53, 55.
Tityros Walker ; Förster, 1856 : 53, 58.
Halticoptera Spinola ; Thomson, 1876*a* : 221, 245.
Halticoptera Spinola ; Ashmead, 1904 : 277.
Dicyclus Walker ; Ashmead, 1904 : 277 [*ex parte*].
Halticoptera Spinola ; Schmiedeknecht, 1909 : 298–299.
Dicyclus Walker ; Schmiedeknecht, 1909 : 298, 300, *ex parte*.
Halticoptera Spinola ; Nikol'skaya, 1952 : 249.
Halticoptera Spinola ; Peck *et al.*, 1964 : 41.

Remarks on generic synonymy. *Halticoptera* Spinola. Whether this is really the genus to which we currently apply the name is problematic. Spinola's brief diagnosis would apply to many genera of Pteromalidae, and the original material of his type-species (if it still exists) has not been examined. However, the name has been applied to the present genus for many years and is therefore retained in this sense. If Spinola's type material should be located and prove to represent something different, then the valid name for the present genus would be *Pachylarthrus*.

Tityros Walker. This is now recognized with certainty following my discovery of the type specimen of *poreia* Walker, the type-species. Ashmead (1904 : 277) placed *Tityros* with a query as the male of *Dicyclus* Walker.

Key to European Species

(Females)

1 Malar space about equal to transverse diameter of eye, and about two thirds as long as an eye. Vertex slightly elevated in middle, behind the ocelli ; temples about half as long as eyes. Median area of propodeum strongly reticulate. Gastral petiole as long as or (usually) slightly longer than broad, reticulate . . . . . ***smaragdina*** (Curtis) (p. 159)

Malar space less than transverse diameter of eye. Vertex not distinctly elevated behind the ocelli ; temples most often distinctly less than half as

long as eyes, if nearly or quite half as long then gastral petiole strongly transverse or smooth. Median area of propodeum sometimes weakly sculptured or smooth. Gastral petiole often transverse 2

2 (1) Thorax 1·8 to 2 times as long as broad, somewhat flattened ; scutellum in profile appearing flat or virtually so. Gaster lanceolate, slightly longer than head plus thorax, 2·8 to 3·2 times as long as broad ; last tergite as long as or somewhat longer than its basal breadth. Median area of propodeum strongly reticulate and relatively dull . . . ***collaris*** (Walker) (p. 159)

– Thorax less elongate, more arched dorsally ; scutellum in profile appearing at least slightly convex. Gaster at most 2·5 times as long as broad ; if as elongate as this, then the median area of the propodeum is weakly sculptured and shiny 3

3 (2) Gastral petiole slightly longer than broad, reticulate, with nearly parallel sides, with three to six hairs on each side. Antennae with funicular segments quadrate, or the proximal ones very slightly longer than broad. Median area of propodeum with distinct reticulation ***patellana*** (Dalman) Thomson (p. 160)

– Gastral petiole usually bare at the sides ; if with one or two hairs then the petiole is either transverse, or subconical and nearly smooth. At least some of the funicular segments transverse. Median area of propodeum shiny ; with weaker reticulation, or mainly to entirely smooth 4

4 (3) Gastral petiole (Text-fig. 129) smooth or with some very weak sculpture, subconical, as broad as or slightly broader than long. Lower edge of antennal toruli distinctly above level of ventral edge of eyes.

Flagellum distinctly stouter than the pedicellus, hardly clavate ; funicular segments, except sometimes the first, at least very slightly transverse. Gaster rhomboid, slightly longer than the thorax. Large species, 2·5 to 3 mm. . . . . ***hippeus*** (Walker) (p. 161)

– Gastral petiole either wholly reticulate, or else about twice as broad as long ; usually with subparallel sides (this feature is not so obvious in species with strongly transverse petiole). Lower edge of antennal toruli at or hardly above level of ventral edge of eyes 5

5 (4) Gaster 2 to 2·5 times as long as broad, about as long as head plus thorax ; antennal funicle with proximal segments subquadrate, distal segments only slightly transverse ; gastral petiole slightly broader than long ***laevigata*** Thomson (p. 160)

– Either the gaster is less than twice as long as broad, and not longer than the thorax ; or all the funicular segments are transverse, the distal ones strongly so. Gastral petiole varying from strongly transverse to slightly longer than broad 6

6 (5) Gastral petiole distinctly (up to 2·5 times) broader than long, distinctly shorter than the median length of the propodeum. Gaster often about twice as long as broad or rather more, usually longer than the thorax . . . 7

– Gastral petiole quadrate to somewhat longer than broad, not or hardly shorter than the median length of the propodeum. Gaster less than twice as long as broad, not longer than the thorax 11

7 (6) Gaster 1·5 to 1·7 times as long as broad, not longer than the thorax. Antennal flagellum distinctly clavate, proximally hardly stouter than the pedicellus but thickening distad. Small species, 1·3 to 1·8 mm. ***poreia*** (Walker) (p. 162)

– Gaster 1·85 to 2·5 times as long as broad, longer than the thorax, sometimes as long as head plus thorax. Antennal flagellum hardly clavate, proximally at least slightly stouter than the pedicellus. Species usually larger (size 1·8 to 4 mm.) 8

8 (7) Smaller species (1·8 to 2·2 mm.). Antennal scape as long as an eye. Gaster with pygostylar bristles subequal in length . . ***polita*** (Walker) (p. 162)

– Usually larger (1·8 to 4 mm.) but if less than 2·4 mm., then the antennal scape is distinctly shorter than an eye. Usually one bristle of each pygostyle is somewhat longer than the others 9

9 (8) Antennal scape about three quarters as long as an eye or slightly more. Length 2·3 mm. Head in dorsal view with temples slightly more than one quarter as long as eyes . . . . . ***mustela*** (Walker) (p. 161)

– Antennal scape nearly or quite as long as an eye. Length 2·5 to 4 mm. . 10

10 (9) Head in dorsal view with temples about half as long as eyes, subparallel for a short distance behind the eyes. Scutellar frenum marked off by a rather strong impressed line. Length three to four mm. (Amurland) ***nobilis*** (Walker) (p. 161)

– Head in dorsal view with temples about one third as long as eyes, converging slightly even immediately behind the eyes. Length 2·5 to 3·3 mm. (Europe) . . . . . ***brevicornis*** Thomson (p. 161)

11 (6) Fore wing with apex of basal cell with a patch of several hairs. Pronotal collar slightly margined anteriorly ; behind this with a broad, shiny and weakly-sculptured strip . . . . . ***aenea*** (Walker) (p. 164)

– Fore wing with apex of basal cell bare or with only a very few hairs. Pronotal collar rounded off anteriorly, reticulate with at most a very narrow shiny strip along its hind margin . . . . . ***circulus*** (Walker) (p. 163)

(MALES)

1 Malar space slightly greater than transverse diameter of eye, and fully three quarters as long as an eye. Vertex slightly elevated in middle, behind the ocelli ; temples more than half as long as eyes. Maxillary stipites very large. Median area of propodeum strongly reticulate. Gastral petiole as long as or (usually) slightly longer than broad, reticulate ***smaragdina*** (Curtis) (p. 159)

– Malar space at least slightly less than transverse diameter of eye. Vertex not distinctly elevated behind ocelli ; temples one quarter to slightly more than half as long as eyes. Maxillary stipites large or small. Median area of propodeum sometimes weakly reticulate or smooth. Petiole sometimes transverse 2

2 (1) Thorax 1·8 to 2 times as long as broad, somewhat flattened ; scutellum in profile appearing flat or virtually so. Maxillary stipites very small, virtually unmodified. Median area of propodeum strongly reticulate and relatively dull . . . . . ***collaris*** (Walker) (p. 159)

– Thorax less elongate, more arched dorsally ; scutellum in profile appearing at least slightly convex. Maxillary stipites large or small. Median area of propodeum sometimes shiny and weakly sculptured 3

3 (2) Gastral petiole slightly longer than broad, reticulate, with three to six hairs on each side, the sides nearly parallel. Antennae with funicular segments, except the sixth, slightly longer than broad. Median area of propodeum with distinct reticulation. Maxillary stipites rather small ***patellana*** (Dalman) Thomson (p. 160)

– Gastral petiole usually bare at the sides ; rarely with one or two hairs, in which cases the petiole is either transverse, or else subconical and nearly smooth. Antennae either with all funicular segments quadrate or transverse ; or with at most the proximal segments slightly longer than broad. Median area of propodeum more shiny, with weaker reticulation, or mainly to entirely smooth 4

4 (3) Gastral petiole smooth or with only some very weak sculpture, subconical, as broad as or slightly broader than long. Antennal flagellum stout, distinctly stouter than the pedicellus, hardly clavate, with all the funicular segments (except sometimes the first) at least very slightly transverse. Maxillary stipites large, reaching up to near the vertex ; last two segments of maxillary palpi forming a moderately large sac which is about 1·5 times as long as broad and subelliptical. Large species, 2·5 to 3 mm. ***hippeus*** (Walker) (p. 161)

– Gastral petiole either wholly reticulate, or else about twice as broad as long ; usually with subparallel sides though this feature is not so obvious when the petiole is strongly transverse. Antennal flagellum sometimes different in form. Species sometimes smaller 5

5 (4) Maxillary palpi only slightly dilated apically, the sac formed by the two terminal segments elliptic and about three times as long as broad. Antennae with proximal segments of funicle quadrate to slightly longer than broad, distal segments hardly transverse. Maxillary stipites large. Antennae, and legs except coxae, yellow. Gastral petiole as long as broad ***laevigata*** Thomson (p. 160)

– Either the maxillary palpi are strongly dilated apically, with the sac formed by the two terminal segments subglobose ; or if the sac is more elongate and elliptic, then the distal segments of the funicle are strongly transverse. Maxillary stipites sometimes small. Gastral petiole often transverse . 6

6 (5) Gastral petiole distinctly (up to 2·5 times) broader than long, distinctly shorter than the median length of the propodeum 7

– Gastral petiole quadrate to somewhat longer than broad, not or hardly shorter than the median length of the propodeum 11

7 (6) Maxillary stipites small, practically unmodified ; palpi not much swollen, the sac formed by the two terminal segments elliptic and slightly longer than broad. Antennal scape, all femora, and sometimes the tibiae, more or less infuscate. Small species, 1·3 to 1·8 mm. . . ***poreia*** (Walker) (p. 162)

– Maxillary stipites large, reaching up to near the vertex ; the sac formed by the two terminal segments of the palpi elliptic or subglobose. Species usually larger (size 1·8 to 3·5 mm.) 8

8 (7) Smaller species, 1·8 to 2·2 mm. Sac formed by the two terminal segments of the maxillary palpi subglobose . . . . ***polita*** (Walker) (p. 162)

– Usually larger (1·8 to 3·5 mm.). Sac formed by the two terminal segments of the maxillary palpi 1·5 to 2 times as long as broad 9

9 (8) Head in dorsal view with temples fully half as long as eyes, parallel for a short distance behind the eyes. Length about three mm. Sac formed by the two terminal segments of the maxillary palpi about 1·5 times as long as broad (Amurland) . . . . . ***nobilis*** (Walker) (p. 161)

– Head in dorsal view with temples one third as long as eyes or slightly less, converging slightly even just behind the eyes. Species either smaller, or else with the sac formed by the two terminal segments of the maxillary palpi relatively longer 10

10 (9) Sac formed by the two terminal segments of the maxillary palpi about twice as long as broad. Scutellar frenum marked off by a fine line. Length 2·5 to 3 mm. . . . . ***brevicornis*** Thomson (p. 161)

– Terminal sac of maxillary palpi somewhat less than twice as long as broad. Scutellar frenum marked off by a very distinctly impressed line. Length hardly 2 mm. . . . . ***mustela*** (Walker) (p. 161)

11 (6) Maxillary stipites large, reaching up to near vertex, and clearly visible when the head is seen in dorsal view. Apex of basal cell of fore wing with a patch

of several hairs. Pronotal collar slightly margined anteriorly
aenea (Walker) (p. 164)

– Maxillary stipites small, reaching only to level of top of foramen magnum, not visible when the head is seen in dorsal view. Apex of basal cell of fore wing bare or with only a very few hairs. Pronotal collar not margined but rounded off anteriorly . . . . . ***circulus*** (Walker) (p. 163)

Halticoptera collaris (Walker)

Pteromalus collaris Walker, 1836 : 427, ♀.
Halticoptera planiscuta Thomson, 1876*a* : 248, ♀.
Halticoptera collaris (Walker) Graham, 1956*b* : 255.

Type material. *Pteromalus collaris* Walker. Syntypes, 2 ♀. LECTOTYPE, the first specimen, which bears a Waterhouse label and a green-bordered Type label.

Halticoptera planiscuta Thomson. Syntypes on 10 pins. LECTOTYPE, a female labelled " Yd " [Yddingen] on a pink label, and " Scan ". Placed in synonymy with *collaris* (Walker) by Graham (1956*b* : 255).

BRITAIN, SWEDEN ; probably widely distributed in Europe.

Biology. Unknown. In England I have most often captured *collaris* upon bracken (*Pteridium aquilinum* L.) so it may be associated with a host upon this plant. Imagines appear May–June.

Halticoptera smaragdina (Curtis)

Phagonia smaragdina Curtis, 1832 : folio 427, ♂.
Pachylarthrus insignis Westwood, 1832*a* : 127, ♂.
Halticoptera flavicornis Spinola ; Thomson, 1876*a* : 248, ♂ ♀.

Type material. *Phagonia smaragdina* Curtis. Described by Curtis from material " In the Cabinet of Mr. F. Walker ". There is only one specimen, a male, now standing under this name in Walker's collection, with a Waterhouse label " Pachylarthrus smaragdinus Walker " ; it is designated LECTOTYPE (possibly it is a holotype).

Pachylarthrus insignis Westwood. One male, LECTOTYPE. It is pinned, the pin thrust through a rectangular card ; it bears a tiny white ticket, also two labels in Westwood's handwriting, a pink one reading " insignis Westw. " and a white one " Dipl. patellana Dalm.".

This species may be [*Diplolepis*] *flavicornis* Spinola, as Thomson thought. The type material of *flavicornis* has not been located, so that the application of the name is a matter of opinion.

BRITAIN, IRELAND, SWEDEN ; fairly common.

Biology. Reared in England from *Philophylla heraclei* (L.) on parsnip, celery, and *Smyrnium olusatrum* L. (*A. H. Hamm*). In Sweden Jansson (1952 : 7) recorded as hosts of " *flavicornis* Thomson " the flies *Scaptomyzella flava* Mg. (Drosophilidae) and *Liriomyza strigata* (Mg.) (Agromyzidae). Imagines in June and Aug.–Sept.

Halticoptera patellana (Dalman), *sensu* Thomson

? Diplolepis Patellana Dalman, 1818 : 80–81 [♂].
Phagonia flavicornis Curtis, 1832 : folio 427 (? *nec Halticoptera flavicornis* Spinola, 1811).
Pachylarthrus smaragdinus (Curtis) Walker, 1833 : 457, " ? ♀ " [*nec* ♂].
Miscogaster Aeratus Walker, 1839 : 202 " ♀ " [*recte* ♂], **syn. n.**
Ormocerus Pisuthrus Walker, 1839 : 207, ♀, **syn. n.**
Halticoptera patellana (Dalman) Thomson, 1876*a* : 246, ♂ ♀.

Type material. *Diplolepis patellana* Dalman. I could not find any specimens in Dalman's collection. The males of most of the species mentioned in the present paper are ruled out because they disagree with Dalman's description ; the only males which agree well are those of *smaragdina* (Curtis) and *patellana* (Dalman) *sensu* Thomson, of which the latter seems to agree best. Thomson is more likely than anyone else to have seen the type (possibly now misplaced or lost). That he was familiar with Dalman's material seems clear from the fact that he used Dalman manuscript names for other species (e.g., *festiva, brevicornis* and *laevigata*). Peck (1963 : 623) has used *patellana* as the valid name for the species which I call *circulus* (Walker) in the present work. I do not know his reasons for this usage ; my remarks above will show that it is unlikely to be correct.

Miscogaster aeratus Walker. One male, LECTOTYPE, labelled " Aeratus " in Walker's handwriting.

Ormocerus pisuthrus Walker. One female, LECTOTYPE, bearing a Waterhouse label, also another in the handwriting of C. Ferrière " Halticoptera sp. ♀ ".

BRITAIN, SWEDEN ; probably widely distributed in Europe.

Biology. Reared in England from *Spilographa zoe* (Mg.) (Dipt., Trypetidae) on *Senecio*, and from an undetermined host on bracken (*Pteridium aquilinum* L.) (*A. H. Hamm*). Jansson (1952 : 5) recorded as hosts in Sweden *Agromyza reptans* Fln., *Phytomyza lappae*, R.–D. [=*lappina* Gour.], *Liriomyza congesta* (Becker), and *Phytomyza sedicola* Hering. In Britain the species is commonest where bracken occurs. Imagines June–August.

Halticoptera laevigata Thomson

Halticoptera laevigata (Dalmas MS.) Thomson, 1876*a* : 253, ♀.
Halticoptera levigata Dalla Torre, 1898 : 198 (emendation).

Type material. Syntypes, 8 specimens. I have not yet selected a lectotype.

BRITAIN, SWEDEN, GERMANY ; uncommon.

The characters by which the hitherto undescribed male may be recognized are given in my key to males (q.v.).

Biology. I have seen males reared in Germany, Berlin-Dahlem, 5–11.iii.1954, from *Anomoia* (=*Phagocarpus*) *permunda* (Harris) (Dipt., Trypetidae) in fruits of *Cotoneaster multiflora* Bge. (Prof. *E. M. Hering*) ; and both sexes reared in England (Surrey, Ranmore Common, 17.vii.1939) from the same host on *Crataegus monogyna* L. (*M. Niblett*). Imagines (in Britain) occur in the field July–October.

Halticoptera hippeus (Walker) **comb. n.**

Miscogaster Hippeus Walker, 1839 : 203, ♂.
Miscogaster Eurybia Walker, 1839 : 203, ♀, **syn. n.**
Miscogaster Tyrrhoeus Walker, 1839 : 204 "♀" [*recte* ♂], **syn. n.**
Halticoptera crassipes Thomson, 1876*a* : 252, ♀, **syn. n.**

Type material. *Miscogaster hippeus* Walker. One male, LECTOTYPE, labelled " Hippeus " in Walker's handwriting, also bearing a label " Halticoptera sp. ♂ Ch. Ferrière det.".

Miscogaster eurybia Walker. Two females (one possibly not original material). LECTOTYPE bearing a Waterhouse label " Pachylarthrus Eurybia Walker ".

Miscogaster tyrrhoeus Walker. Two males. LECTOTYPE, the first specimen, labelled " Tyrrhoeus " and with a BM(NH) Type label.

Halticoptera crassipes Thomson. Syntypes, 6 specimens. LECTOTYPE, a female labelled " Bås " [Båstad].

BRITAIN, SWEDEN ; uncommon.

Biology. Unknown. Imagines June and July.

Halticoptera brevicornis Thomson

Halticoptera brevicornis (Dalman MS.) Thomson, 1876*a* : 251, ♂ ♀.

Type material. Syntypes on 25 pins. LECTOTYPE, a female labelled " Ar " [Arrie] and " Scan ".

BRITAIN, IRELAND, SWEDEN. In southern England I have found this species to be common on chalk downland.

Biology. Unknown.

Halticoptera nobilis (Walker) **comb. n.**

Lamprotatus nobilis Walker, 1874 : 314, ♀.
Pachylarthrus promerus Walker, 1874 : 316, ♂, **syn. n.**

Type material. *Lamprotatus nobilis* Walker. LECTOTYPE, ♀ Type Hym. 5. 807, labelled " Amurland. Coll. F. Walker 1913–71 " and (in Walker's handwriting) " Lamprotatus nobilis ".

Pachylarthrus promerus Walker. LECTOTYPE, ♂ Type Hym. 5. 849, labelled " Amurland. Coll. F. Walker 1913–71 " and (in Walker's handwriting) " Pachylarthrus promerus ".

ASIA : Amurland.

Biology. Unknown.

Halticoptera mustela (Walker) **comb. n.**

Pachylarthrus Mustela Walker, 1839 : 194, ♂.
Pachylarthrus Elyces Walker, 1839 : 195, ♀, **syn. n.**

Type material. *Pachylarthrus mustela* Walker. LECTOTYPE (?holotype) ♂,

Type Hym. 5. 848, labelled " 38. 8. 13. 77 " ; "Fontainbleau " ; " Pachylarthrus Mustela Walker " ; " Type CF " [C. Ferrière].

Pachylarthrus elyces Walker. One female, Type Hym. 5. 847, designated LECTOTYPE (possibly holotype), bearing a Waterhouse label.

FRANCE ; only the type material known to me.

Biology. Unknown.

Halticoptera poreia (Walker) **comb. n.**

? Ormocerus Aletes Walker, 1848 : 107, 163, ♀.
Tityros poreia Walker, 1848 : 108, 165, ♂.
Pteromalus Cercaphrus Walker, 1848 : 125, 191, ♂, **syn. n.**

Type material. *Ormocerus aletes* Walker. None found. The original description accords well with the female of *Halticoptera poreia* except that the size mentioned (" Length of the body 1¼ line ") is too great. Walker might have had an unusually large specimen.

Tityros poreia Walker. I could not locate the type in the main collection in the BM(NH) and for a long time thought it was lost. Eventually, in a drawer apart from the main collection I found a male which agrees well with the description and is designated LECTOTYPE ; it bears a printed label " Poreico " [*sic*]. This is the type-species of *Tityros*, which is now established as a synonym of *Halticoptera*.

Pteromalus cercaphrus Walker. One male, LECTOTYPE (possibly holotype), bearing a Waterhouse label.

BRITAIN, rare ; " England " (Walker, 1848 : 108) ; Oxfordshire, Otmoor, 1 ♂, 1 ♀, 21.viii.1955, 1 ♂, 1 ♀, 28.viii.1955 (*Graham*).

Biology. Unknown. Imagines in August in damp or marshy ground.

Halticoptera polita (Walker) **comb. n.**

Eutelus politus Walker, 1834 : 369, ♀.
Ormocerus Mandrocles Walker, 1839 : 206, ♀, **syn. n.**
Halticoptera festiva (Dalman MS.) Thomson, 1876*a* : 250, ♂, ♀, **syn. n.**

Type material. *Eutelus politus* Walker. Syntypes, 2 ♀. The second specimen, bearing a Waterhouse label, is designated LECTOTYPE.

Ormocerus mandrocles Walker. One female, LECTOTYPE, bearing a Waterhouse label, also another reading " Halticoptera sp. ♀ Ch. Ferrière det.".

Halticoptera festiva Thomson. Syntypes on 22 pins. LECTOTYPE, a male labelled " Lund " and " festiva Dalm.".

BRITAIN, SWEDEN ; uncommon.

Biology. Unknown. Imagines May–July (rarely in Aug.).

Halticoptera circulus (Walker) **comb. n.**

Dicyclus circulus Walker, 1833 : 456, ♀.
Dicyclus fuscicornis Walker, 1833 : 456, ♀, **syn. n.**
Pteromalus palpigerus Zetterstedt, 1838 : 425 "♀?", **syn. n.**
Pteromalus brevicornis Zetterstedt, 1838 : 426 "♂ ? ", **syn. n.** [*nec* Walker, 1835].
Miscogaster Daiphron Walker, 1839 : 198, ♀, **syn. n.**
Miscogaster Crius Walker, 1839 : 201, ♀, **syn. n.**
Miscogaster Suilius Walker, 1839 : 202 "♀" [*recte* ♂], **syn. n.**
Halticoptera petiolata Thomson, 1876*a* : 250 [*ex parte*].
Pteromalus lapponicus Dalla Torre, 1898 : 131 [n. n. for *P. brevicornis* Zetterstedt *nec* Walker].
Halticoptera fuscicornis (Walker) Imms, 1930 : 13–19, figs. 1–3, ♂ ♀.
Halticoptera aenea Gahan, 1933 : 116–121, ♂ ♀ [nec *Dicyclus aeneus* Walker, 1833].
Halticoptera patellana Peck, 1963 : 623–625 [nec *Diplolepis patellana* Dalman, 1818].

Type material. *Dicyclus circulus* Walker. Syntypes, 2 ♀. LECTOTYPE, one bearing a Waterhouse label and another in C. Ferrière's handwriting " Type CF ".

Dicyclus fuscicornis Walker. Syntypes, 2 ♀. LECTOTYPE, the first specimen, bearing a Waterhouse label.

Pteromalus palpigerus Zetterstedt. One male, LECTOTYPE, labelled in Zetterstedt's handwriting " Pt. palpi-gerus. ♀ ?Talvig ". The head and gaster are missing but from the remains I consider it the same as *circulus* (Walker).

Pteromalus brevicornis Zetterstedt. One male, LECTOTYPE (but probably holotype), labelled in Zetterstedt's handwriting " P. brevicornis ♂. Kengis ".

Miscogaster daiphron Walker. One female, accepted as TYPE ; Waterhouse label, also one " Type Gahan 1927 ".

Miscogaster crius Walker. Syntypes, in BM(NH), one female ; and in Haliday collection, two females (nos. 681, 684), of which one is labelled " Crius " in Walker's handwriting, while the other bears a green label indicating Irish origin. LECTOTYPE, the female in BM (NH), which is labelled " Crius " in Walker's handwriting.

Miscogaster suilius Walker. Syntypes, 2 ♂. LECTOTYPE, the first specimen, bearing a Waterhouse label.

The species identified by Gahan (1933) as *Halticoptera aenea* (Walker) was evidently not *aenea*, but *circulus* (Walker). In the same paper Gahan cited *fuscicornis* (Walker) as a synonym of the supposed *aenea;* he identified *fuscicornis* on the basis of American specimens which had been compared with the types of *fuscicornis*, and on a probable syntype of that species sent to him, by Waterston. He also stated (1933 : 119) that he had later seen the type female of *aenea*, and concluded that it was the same species as *fuscicornis*. Moreover, he cited (ibid. : 116) *fuscicornis* as interpreted by Imms (1930) as being the same as *aenea*. In his redescription of the supposed *aenea*, Gahan mentioned (ibid. : 117) that the pronotal collar of the female is not margined, and that the fore wing is bare basally except for a few hairs in the costal cell. Further he stated (ibid. : 120) that the maxillary stipes of the male is not greatly enlarged and is not visible from above. All these features indicate that the species he had before him was *circulus* and not *aenea*. Gahan also cited (ibid. : 116) the names of five other North American species which he considered to be

synonyms of " *aenea* ". I have not seen the types of these species but if, as I assume, Gahan was correct in regarding them as conspecific, then all of them must be synonyms of *circulus* (Walker).

Peck (1963) used *patellana* [Dalman] as the valid name for *aenea* (Walker) *sensu* Gahan, 1933 (=*circulus* Walker, nec *aenea* Walker); I do not, however, believe that the true *patellana* of Dalman was the same as *circulus* (for my reasons see above (p. 160) under *patellana*).

BRITAIN, IRELAND, SWEDEN, GERMANY, MOLDAVIAN S.S.R. ; CANADA, U.S.A.

Biology. Reared in England from *Phytomyza petoi* Hering (Dipt., Agromyzidae) on *Mentha spicata* L. (*G. C. D. Griffiths*) (material in BM(NH). One female reared 24.vii.1955 from *Phytomyza atricornis* Mg., on *Sonchus oleraceus* L., Oxford district (*K. G. V. Smith*). The species redescribed and figured under the name *fuscicornis* (Walker) by Imms (1930) as an endoparasite of the larvae of *Oscinella frit* (L.) in Britain, was certainly *circulus* (Walker). Imms unfortunately did not mention any of the characters which would enable one to decide whether his species was *circulus* (Walker) or *aenea* (Walker); but he did not state that the pronotal collar was margined, whilst his figure 1 of the female shows the basal cell of the fore wing to be virtually bare, features which make it pretty certain that he had *circulus* before him. Gahan (1933) also recorded it (under the name *aenea* Walker) as an unimportant parasite of the frit fly ; he cited several other hosts, most of which are Agromyzidae and may be correct, but in view of the confusion between *aenea* and *circulus*, it is desirable to have them confirmed.

Halticoptera aenea (Walker)

Dicyclus aeneus Walker, 1833 : 456, ♀.
Dicyclus tristis Walker, 1833 : 456, ♀, **syn. n.**
Pachylarthrus patellanus (Dalman) *sensu* Walker, 1833 : 458.
Miscogaster cinctipes Walker, 1833 : 462, ♀, **syn. n.**
Miscogaster nigro-aenea Walker, 1833 : 462, ♀, **syn. n.**
Pteromalus Sophron Walker, 1839 : 270, ♂, **syn. n.**
Halticoptera petiolata Thomson, 1876*a* : 250, ♂ [lectotype], ♀ [*ex parte*], **syn. n.**
?*Halticoptera patellana* Dalman ; Ferrière, 1952 : 172.

Type material. *Dicyclus aeneus* Walker. Four females now stand under this name but two are probably not original material. LECTOTYPE, the first specimen, bearing a Waterhouse label, and another in C. Ferrière's handwriting " Type C.F.".

Dicyclus tristis Walker. Three specimens now stand here (but one is the lectotype of *Miscogaster tristis* Walker, 1833). LECTOTYPE, the third specimen, bearing a Waterhouse label.

Miscogaster cinctipes Walker. One female, LECTOTYPE, bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type CF ".

Miscogaster nigroaenea Walker. Syntypes, 2 ♀ ; LECTOTYPE, the first specimen, bearing a Waterhouse label " Dicyclus nigroaeneus Walker ". The species was transferred to *Dicyclus* by Walker (1846 : 27).

Pteromalus sophron Walker. One male, LECTOTYPE, bearing a Waterhouse label ; it is clearly a Haliday specimen, mounted on a hexagonal card which is itself gummed to a rectangular card.

Halticoptera petiolata Thomson. Syntypes on 39 pins, a mixed series including males and female of both *circulus* (Walker) and *aenea* (Walker). LECTOTYPE, a maled labelled " L-d " [Lund] and " petiolata m.".

Ferrière (1952) recorded a species under the name *Halticoptera patellana* Dalman (citing *aeneus* Walker as a synonym) from the neighbourhood of Venice. According to the lectotype of *aeneus* selected by Ferrière himself and which I have validated above, that species is the same as *patellana* in his opinion. However, he gave no reasons for his view, and I prefer to follow Thomson's (1876) interpretation of *patellana*. Peck (1963 : 623) followed Ferrière's interpretation of *patellana*, although most of the North American records which he cited under that name probably refer to a different species (*circulus* Walker, q.v.). Thus the situation is very confused, chiefly because hitherto no lectotypes have been validated for any of the species-names involved.

EUROPE (widely distributed), Canadian and U.S. records of *aenea* presumably refer to *circulus* (Walker).

Biology. A parasite of Diptera (Drosophilidae and Agromyzidae). In Britain it has been reared from *Phytomyza plantaginis* R.–D. on *Plantago coronopus* L. and from *Scaptomyza graminum* Fln. on *Spergularia rupicola* LeJ. (*G. C. D. Griffiths*) (material in BM(NH)). Imagines (in Britain) June–November, evidently therefore more than one generation per annum. The North American records of *aenea* need checking because at least some of them refer to *circulus* (Walker) and not to the true *aenea*.

Notes on other species which belong to *Halticoptera* but have not been investigated in detail :

1. *European species :*

Halticoptera citritibius (Rondani)

Chrysolampus citritibius Rondani, 1877 : 170–171, pl. 4, figs. 132–137.
Halticoptera citritibius (Rondani) Delucchi, 1955*a* : 174.

Type material in Museum " La Specola ", Florence. It was examined by Delucchi who stated (1955) that the species belonged to *Halticoptera*, but did not mention any further details.

2. *Extra-limital species (Types in BM(NH)) :*

Halticoptera arduine (Walker) **comb. n.**

Dicyclus Arduine Walker, 1843*a* : 115, ♀.

Type Hym. 5. 854, ♀.
Type locality. Near Lima.

Halticoptera cleodoxa (Walker) **comb. n.**

Pachylarthrus Cleodoxa Walker, 1843*a* : 116, ♂.

Type Hym. 5.852, ♂.

Type locality. Near Lima.

Halticoptera sariaster (Walker)

Pachylarthrus Sariaster Walker, 1842*a* : 271, ♂ ♀.
Pachylarthrus Sariaster Walker ; Spinola, *in* Gay, 1851 : 459, ♂.

LECTOTYPE, Type Hym. 5.851, ♀.

Type locality. Valdivia.

The species was referred to *Halticoptera* by Dalla Torre (1898 : 199).

SCHIMITSCHEKIA Bouček

Schimitschekia Bouček, 1965*e* : 14. Type-species : *S. populi* Bouček, by original designation.

I have not seen the type-species of this genus, which is evidently extremely close to *Halticoptera*. It contains only one species.

Schimitschekia populi Bouček

Schimitschekia populi Bouček, 1965*e* : 16, ♀.

Type material. Holotype ♀, W. Germany, Lorsch,viii.1961 (*Nieman*), in Národní Museum, Prague (Cat. no. 26.008).

GERMANY, MOLDAVIAN S.S.R. Male unknown.

Biology. Reared from *Phytagromyza populi* (Kalt.) Bouček, 1965*e*. Imagines July and August.

HALTICOPTERINA Erdös

Halticopterina Erdös, 1946 : 160. Type-species : *H. triannulata* Erdös, by original designation.
Halticopterina Erdös ; Peck *et al.*, 1964 : 40.

Peck *et al.* (1964) remark that *Halticopterina* might be better placed as a subgenus of *Halticoptera*. This may well be so, but as I have seen neither of the two species included in *Halticopterina*, I cannot give a definite opinion. The detailed descriptions of these two species should be sufficient for their recognition. The female of *H. moczari* is unknown.

Halticopterina triannulata Erdös

Halticopterina triannulata Erdös, 1946 : 161–162, ♂ ♀.

Type material. Syntypes, Hungary, Kiskörös, 8,vii.1943 (*Erdös*), in coll. Erdös.

HUNGARY, MOLDAVIAN S.S.R.

Biology. Unknown ; the original material swept from *Medicago sativa L.*

Halticopterina moczari Erdös

Halticopterina moczari Erdös, 1954 : 153–154, ♂.

Type material. Holotype ♂, Hungary, Ólcsa 10.vii.1953 (*Móczár*), in Hungarian National Museum, Budapest.

HUNGARY.

Biology. Unknown ; the holotype ♂ was swept from *Medicago sativa* L.

I have seen females of a species from Czechoslovakia which appear to belong to *Halticopterina* but not to either of the described species; they have the gastral petiole strongly transverse and almost smooth, whereas the petiole of *triannulata* is said to be quadrate and strongly punctate, and that of *moczari* male slightly transverse and punctate.

THINODYTES Graham

Dicyclus Thomson, 1876*a* : 221, 253 [*nec* Walker, 1833].
Thinodytes Graham, 1956*b* : 261. Type-species : *Miscogaster cyzicus* Walker, 1839, by original designation.
Thinodytes Graham ; Peck *et al.*, 1964 : 41.

Thinodytes cyzicus (Walker)

Miscogaster Cyzicus Walker, 1839 : 200, ♂ ♀.
Syntomopus cyzicus Walker, 1846 : 28.
Dicyclus circulus Thomson, 1876*a* : 253 [*nec* Walker, 1833].

Type material. Lectotype designated by Graham (1956*b* : 262).

BRITAIN, IRELAND, SWEDEN, GERMANY, CZECHOSLOVAKIA, MOLDAVIAN SSR ; rather uncommon.

Biology. Unknown. Imagines July–August.

TRICYCLOMISCHUS Graham

Tricyclomischus Graham, 1956 : 80. Type-species : *T. celticus* Graham, 1956, by original designation.

Tricyclomischus celticus Graham

(Text-figs. 130–133)

Tricyclomischus celticus Graham, 1956 : 80, ♂ ♀.

Type material. Holotype ♀ in my own collection (*ex* coll. Stelfox).

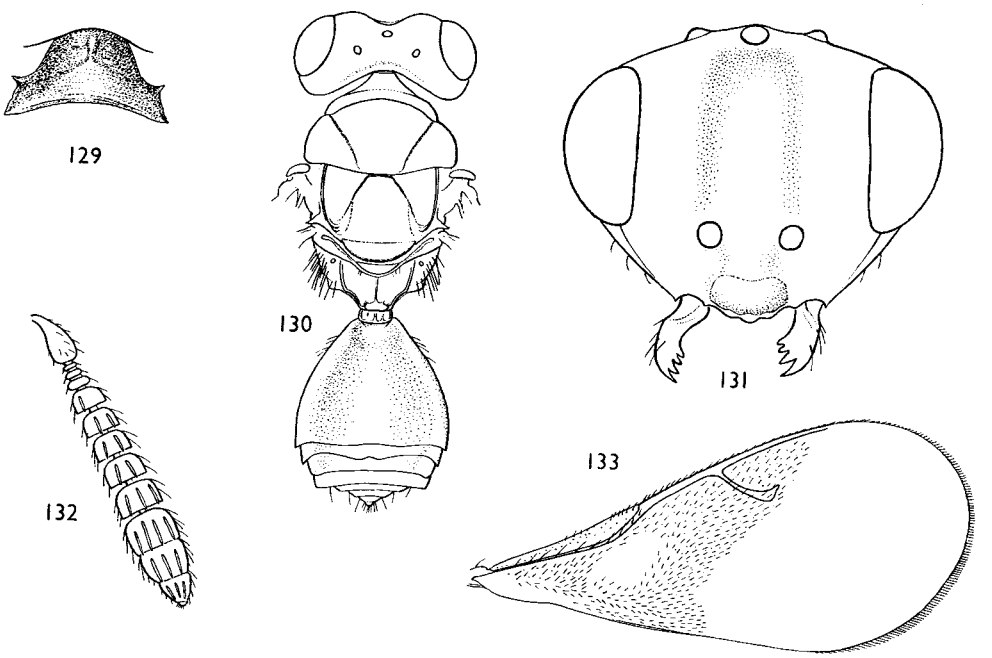
BRITAIN, IRELAND, very local or rare.

Biology. Unknown. Imagines captured in July and September ; females also in winter, Mr. Stelfox beat some from foliage of *Araucaria* at Killakee Park, Dublin, on 7.ii.1956.

RHICNOCOELIA Graham

Megorismus Thomson, 1876*a* : 220, 240 [*nec* Walker, 1846].
Rhicnocoelia Graham, 1956*b* : 262. Type-species : *Pteromalus constans* Walker, 1836, by original designation.
Doghmiella Delucchi, 1962*a* : 7, **syn. n.** Type-species : *D. viridis* Delucchi, 1962, by original designation.
Rhicnocoelia Graham, Peck *et al.*, 1964 : 35, 38.

The question of speciation in *Rhicnocoelia* requires careful study. Some of the following are not easy to distinguish, in particular the complex of *constans* and *impar* ; whilst I have no difficulty in referring the majority of specimens of the complex to one or other of these two, a few are less easy to place. Possibly *constans* and *impar* may be forms of a single polymorphic species, but the information at present available is insufficient for providing an answer to this question.



FIGS. 129–133. 129, *Halticoptera hippeus* (Walker), ♀, gastral petiole ; 130, *Tricyclomischus celticus* Graham, ♀, body ; 131, same, ♂, head ; 132, same, ♀, antennae excluding scape ; 133, same, ♀, fore wing.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Head in dorsal view about 2·2 times as broad as long. Head and thorax mainly dark blue. Antennal flagellum rather strongly clavate ; fourth funicular segment slightly transverse, fifth and sixth about 1·5 times as broad as long. Legs very stout ; hind femur (excluding trochantellus) hardly more than three times as long as broad. (Czechoslovakia) sp. indet. (p. 171)

– Head in dorsal view 1·9 to 2·05 times as broad as long. Head and thorax some tint of green, blue-green, or bronze-green 2

2 (1) Antennal flagellum more strongly clavate ; third funicular segment very slightly transverse, fourth slightly so, fifth and sixth 1·5 times as broad as long. Rather squat species ; thorax about 1·75 times as long as broad. Fore wing with marginal vein 1·7 to 1·75 times as long as the stigmal vein. Legs stout . . . . . ***coretas*** (Walker) (p. 172)

– Antennal flagellum less strongly clavate ; as a rule only the sixth funicular segment is somewhat transverse, occasionally the fifth is slightly so, rarely the fourth very slightly transverse. More slender species ; thorax 1·8 to 2 times as long as broad 3

3 (2) Gaster 1·75 to 2 times as long as broad, not or hardly longer than the thorax ; tip of hypopygium situated at two thirds to three quarters the length of the gaster. Marginal vein of fore wing 1·8 to 2 times as long as the stigmal vein. Femora and tibiae red, usually with at most a black stripe on the external aspect of the fore femora ; occasionally with a dark stripe on the mid femora beneath, rarely with a dark stripe on the hind femora in some specimens from northern Britain . . . . ***constans*** (Walker) (p. 169)

– Gaster 2·2 to 2·7 times as long as broad, distinctly longer than the thorax ; tip of hypopygium situated only slightly beyond half the length of the gaster. Marginal vein of fore wing 2 to 2·2 times as long as the stigmal vein. Femora and tibiae sometimes red, but often all the femora are partly to mainly infuscate, whilst some or all of the tibiae may be partly so ***impar*** (Walker) (p. 170)

I am unable to provide a key to males at present.

Rhicnocoelia constans (Walker)

Pteromalus constans Walker, 1836 : 468, ♀.
Pteromalus cliens Walker, 1836 : 469, ♀.
? Pteromalus Vindalius Walker, 1839 : 256, ♂.
? Pteromalus Archidemus Walker, 1839 : 259–260, ♂.
? Pteromalus Orsippus Walker, 1839 : 260, ♂.
? Lamprotatus Labaris Walker, 1848 : 111, 170, ♂.
? Pteromalus Phalasarna Walker, 1848 : 126, 206, ♀.
Megorismus chloris (Dalman MS.) Thomson, 1876*a* : 241, ♂ ♀.
Rhicnocoelia constans (Walker) Graham, 1956*b* : 263.

Type material. *Pteromalus constans* Walker. Syntypes, 6 specimens. Lectotype designated by Graham (1956*b* : 263).

Pteromalus cliens Walker. Type Hym. 5. 1697, lectotype designated by Graham (1956*b* : 263), who synonymized the species with *constans*.

Pteromalus vindalius Walker. Syntypes, 2 ♂. LECTOTYPE, the first, bearing a Waterhouse label.

Pteromalus archidemus Walker. One male, LECTOTYPE ; Waterhouse label. It probably belongs to *constans*.

Pteromalus orsippus Walker. One male, LECTOTYPE, bearing a Waterhouse label.

Lamprotatus labaris Walker. One male, LECTOTYPE, bearing a Waterhouse label.

Pteromalus phalasarna Walker. One female, LECTOTYPE, bearing a Waterhouse label.

Megorismus chloris Thomson. Syntypes on 15 pins. LECTOTYPE, a female labelled " Bås " [Båstad]. The species was synonymized with *constans* by Graham (1956).

BRITAIN, IRELAND, SWEDEN ; probably widely distributed in Europe. In the British Isles it is most frequent in damp places, on moorland and the coast.

Biology. Unknown. Imagines July–September.

Rhicnocoelia impar (Walker)

Pteromalus impar Walker, 1836 : 469, ♀.
? Pteromalus brevivitta Walker, 1836 : 470, ♀.
Pteromalus Crotopus Walker, 1839 : 258, ♂, **syn. n.**
? Trigonoderus Alebion Walker, 1848 : 128, 127, ♂.

Type material. *Pteromalus impar* Walker. Syntypes, 1 ♀, 2 ♂. LECTOTYPE, the female, bearing a Waterhouse label.

Pteromalus brevivitta Walker. Syntypes, 2 ♀. LECTOTYPE, the first specimen, bearing a Waterhouse label. The other specimen appears to be var. γ.

Pteromalus crotopus Walker. One male, LECTOTYPE, bearing a Waterhouse label.

Trigonoderus alebion Walker. One male, Type Hym. 5. 1640, designated lectotype by Kerrich & Graham (1957 : 299).

BRITAIN, IRELAND ; less frequent than *constans*.

Biology. Unknown. Imagines June–Sept.

Rhicnocoelia viridis (Delucchi) **comb. n.** (=*Doghmiella viridis* Del., 1962*a* : 8, ♀), described from Morocco, is probably very near *impar* (Walker).

Rhicnocoelia coretas (Walker) **comb. n.**

Lamprotatus coretas Walker, 1848 : 111, 173, ♂.
Rhicnocoelia coretas (Walker) Graham, 1956*b* : 263, ♂.

Type material. One male, LECTOTYPE (possibly holotype), bearing a Waterhouse label.

BRITAIN, rare : " England " (Walker, 1848 : 111) ; Scotland, Perthshire, Ben Lawers, 1 ♀, 1.vii.1952 (*Graham*).

Biology. Unknown.

Rhicnocoelia sp. indet.

Amongst some material kindly given to me by my friend Dr. Augustin Hoffer I found a female *Rhicnocoelia* which is rather distinct and must certainly represent a new species. It was captured by him in Czechoslovakia (Karlstejn, 9.v.1959). I think it advisable, however, to await the capture of additional material before describing the species.

MERISMUS Walker

Merismus Walker, 1833 : 371, 375 [Divisions 4, 5]. Type-species : *M. rufipes* Walker, by designation of Westwood, 1839 : 68.
Sphegigaster Spinola; Förster, 1856 : 53, 57 [*ex parte*].
Merismus Walker ; Thomson, 1878 : 17, 18–20.
Merismus Walker ; Schmiedeknecht, 1909 : 374, 375, 377.
Merismus Walker ; Nikol'skaya, 1952 : 245.
Kentema Delucchi, 1953*a* : 218. Type-species : " *Lamprotatus ovatus* Walker " [recte *Miscogaster ovata* Walker!], by original designation.
Merismus Walker ; Graham, 1956 : 77–78.
Merismus Walker, Peck *et al.*, 1964 : 37.

Kentema Delucchi was placed in synonymy with *Merismus* Walker by Graham (1956 : 77).

Five European species of *Merismus* (one of them described as new) are recognized in the present work.

Key to European Species

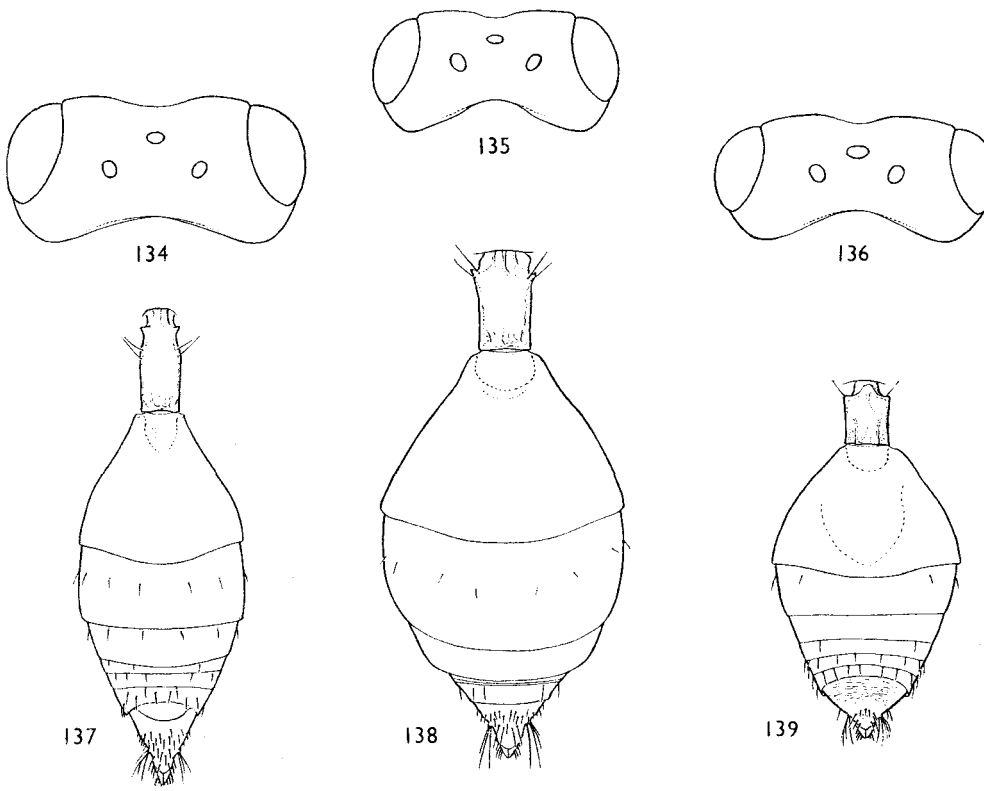
(Males and Females)

1 Petiole of gaster (Text-figs. 137, 138) without a raised transverse crest near its base. Mesoscutal notauli complete, sharply impressed throughout. Fore wing with postmarginal vein slightly to considerably longer than the marginal vein ; speculum closed below. Reticulation of lower face, on either side of clypeus, tending towards transverse strigosity ; genae, just behind the malar sulcus, shiny and nearly smooth. Scutellar frenum irregularly wrinkled or with some longitudinal carinulae, sometimes nearly smooth apart from the latter. *Females* with antennal clava without a spine at its tip ; second gastral (fourth abdominal) tergite (Text-figs. 137, 138) relatively large. (Species-group of *megapterus* Walker = *Merismus* s. str.) 2

– Petiole of gaster (Text-fig. 139) with a strongly raised transverse crest near its base. Mesoscutal notauli superficial posteriorly, sometimes not reaching the hind margin. Fore wing with postmarginal vein not, or only slightly longer than the marginal vein ; speculum usually at least partly open below, rarely completely closed. Reticulation of lower face forming more nearly circular areoles ; genae wholly reticulate. Scutellar frenum with relatively uniform reticulation, much like that of the rest of the scutellum though rather coarser. *Female* with antennal clava with a short black spine at its tip ; second gastral (fourth abdominal) tergite (Text-fig. 139) relatively smaller. (Species-group of *rufipes* Walker = *Stylomerismus* **sgen. n.**) . 3

2 (1) *Female* with mesoscutum not very shiny, the reticulation of its mid lobe distinctly raised above the general surface, its areoles with thick walls and tending to be subcircular ; inner angle of each axilla with slightly raised reticulation ; petiole of gaster as long as or slightly longer than the propodeum, 2 to 2·7 times as long as broad. *Male* with sculpture of mid lobe of mesoscutum and axillae much as in female ; antennal scape hardly or only just reaching lower edge of median ocellus, its length hardly equal to transverse diameter of eye . . . . ***megapterus*** Walker (p. 173)

– *Female* with mesoscutum shiny, the reticulation of its mid lobe only very slightly raised above the general surface, its areoles with thinner walls and tending to be rhomboidal or irregular in shape ; axillae with engraved reticulation ; petiole of gaster slightly shorter than the propodeum, 1·4 to 1·8 times as long as broad. *Male* with sculpture of mid lobe of mesoscutum and axillae much as in female ; antennal scape reaching middle of median ocellus, its length virtually or quite equal to transverse diameter of eye ***splendens*** sp. n. (p. 174)



FIGS. 134–139. *Merismus* spp. 134, *splendens* sp. n., ♀, head ; 135, *rufipes* Walker, ♀, head ; 136, *nitidus* (Walker), ♀, head ; 137, *megapterus* Walker, ♀, gastral petiole and gaster ; 138, *splendens* sp.n., ♀, petiole and gaster ; 139, *lasthenes* (Walker), ♀, petiole and gaster.

3 (1) Eyes separated by 1·5 to 1·55 times their length ; POL 1·0 to 1·2 OOL. Head in dorsal view (Text-fig. 136) with temples straighter and converging more strongly. *Female* with antennal flagellum more strongly clavate ; at most the fifth and sixth funicular segments slightly transverse. Left mandible with three teeth, right mandible with four . . ***nitidus*** (Walker) (p. 176)

– Eyes separated by 1·25 to 1·35 times their length ; POL 1·3 to 1·4 OOL. Head in dorsal view (Text-fig. 135) with temples more rounded. *Female* with antennal flagellum less strongly clavate ; funicular segments four to six transverse (sixth strongly so). Mandibular formula 3.4 or 4.4 . . . 4

4 (3) *Female* with gastral petiole (Text-fig. 139) only 1·25 to 1·35 times as long as broad, distinctly shorter than the propodeum ; femora mainly dark, tibiae sometimes more or less brownish. *Male* with gastral petiole slightly shorter than the propodeum. *Both sexes* with both mandibles with four teeth ; median area of propodeum tending to be finely wrinkled, sometimes reticulate, without distinct median carina or costula . ***lasthenes*** (Walker) (p. 176)

– *Female* with gastral petiole 1·5 to 1·8 times as long as broad, virtually or quite as long as propodeum ; legs (not counting coxae) usually wholly reddish testaceous, occasionally the hind femora, rarely also the mid ones, partly infuscate. *Male* with gastral petiole about as long as the propodeum. *Both sexes* with left mandible with three teeth, right mandible with four ; median area of propodeum with several coarse wrinkles, some of which indicate a median carina and costula . ***rufipes*** (Walker) (p. 176)

Sgen. *MERISMUS* s.str.

Merismus (Merismus) megapterus Walker

Merismus megapterus Walker, 1833 : 377, ♂ ♀.
Merismus clavicornis Walker, 1833 : 377, ♀, **syn. n.**
? Miscogaster tenuicornis Walker, 1833 : 462, ♀.
Miscogaster ovata Walker, 1833 : 462, ♀, **syn. n.**
Sphegigaster Agriope Walker, 1848 : 108, 165, ♂, **syn. n.**
Merismus megalopterus Schulz, 1906 : 143 [emendation].
? Kentema viride Delucchi, 1955 : 94, 96, ♂ ♀.

Type material. *Merismus megapterus* Walker. Syntypes, 4 specimens. LECTOTYPE, a male bearing a Waterhouse label.

Merismus clavicornis Walker. No specimens under this name. Under *Merismus flavicornis* Walker there is a series of 2 ♂ and 1 ♀ ; Walker, however, described no female of *flavicornis*. The female in his series of *flavicornis* agrees well with the description of *clavicornis* and is designated LECTOTYPE of the latter (it is probably the holotype). It could easily have been transposed due to confusing the two similar names.

Miscogaster tenuicornis Walker. No specimen under this name ; none found elsewhere. In his annoted copy of his *List* of 1846 (in my library) Walker has written on the interleaf opposite page 28 "*Spheg. megapterus=Miscogaster tenuicornis* E.M.2. 462. M. C. I. 287". I therefore examined the syntypes of *megapterus* to see whether any fitted the description of *tenuicornis*, but found that none did. I have not seen any ♀♀ of *megapterus* which have the scape and legs dark enough to

fit Walker's description of *tenuicornis* (1833) or his redescription (1839 : 287), though some Scottish ♀♀ approach the required condition. Possibly Walker's synonymy was correct, though it seems rather doubtful.

Miscogaster ovata Walker. Lectotype ♀ designated by Graham (1956 : 77).

Sphegigaster agriope Walker. Syntypes, 2 ♂. LECTOTYPE, the first, bearing a Waterhouse label.

Kentema viride Delucchi. I have not seen the type, which is in Dr. Delucchi's collection ; but from the description *viride* seems likely to be a form of *megapterus*. I have dwarf specimens of *megapterus* which fit the description of *viride ;* the characters used for distinguishing the latter from *ovatum* Walker [=*megapterus* Walker] by Delucchi (1955 : 94) do not seem to be constant.

BRITAIN, IRELAND, SWEDEN. Not uncommon in Britain.

Biology. Reared in England from *Phytobia pygmaea* (Mg.) on *Brachypodium sylvaticum* (Huds.) Beauv. and on *Deschampsia caespitosa* (L.) Beauv. ; from *Phytobia incisa* (Mg.) on *Phalaris arundinacea* L. (*G. C. D. Griffiths*) (material in BM(NH)). Imagines taken in June and August–October.

Merismus (Merismus) splendens sp. n.

♀. Body and coxae bright green to blue-green. Antennae blackish ; scape more or less testaceous in its proximal half. Legs except coxae bright testaceous with the fifth segment of all tarsi brown ; sometimes the rest of the fore tarsi is brown, whilst the mid tibia is sometimes brownish. Tegulae testaceous, or partly infuscate. Wings hyaline ; venation fusco-testaceous. Length 2·15 to 2·7 mm.

Head in dorsal view (Text-fig. 134) twice or hardly more than twice as broad as long ; temples rounded off, usually converging only slightly, rather less than half as long as eyes ; POL about 1·3 times OOL. Eyes 1·3 times as long as broad, separated by about 1·35 times their length. Malar space very slightly more than one third the length of an eye. Clypeus polished, nearly smooth. Left mandible with three teeth, right mandible with four. Head with reticulation only very slightly raised above the general surface ; genae, immediately behind the malar sulcus, shiny and smooth or virtually so ; lower face (on either side of clypeus) tending to have the areoles of the reticulation slightly elongated in the transverse axis. Antennae inserted well above the level of the ventral edge of the eyes ; scape nearly reaching the level of the vertex, its length about equal to the transverse diameter of an eye, and equal to or slightly greater than the length of the clava ; combined length of pedicellus and flagellum 1·25 to 1·3 times breadth of head ; pedicellus nearly twice as long as broad, from a little shorter than, to 1·4 times as long as, the first funicular segment ; funicle proximally slightly stouter than the pedicellus, thickening only very slightly distad ; first funicular segment 1·3 to 1·7 times as long as broad, following segments slightly longer than broad, except the sixth which is quadrate ; clava hardly broader than the sixth funicular segment, 2·7 to 2·9 times as long as broad, nearly or fully as long as the three preceding funicular segments together, without a terminal spine ; sensilla numerous, in one (sometimes slightly irregular) row on each funicular segment.

Pronotal collar with a very sharp, rather strongly raised anterior carina, behind this nearly smooth except for some alutaceous sculpture at the shoulders. Mesoscutum about 1·8 times as broad as long, with strong, complete, punctate notauli ; its surface shiny, the reticulation only slightly raised above the general surface and with rather thin walls, somewhat coarse on the mid lobe, very fine on the lateral lobes, the areoles composing it tending to be rhomboidal or

irregular in shape. Axillae with very fine engraved reticulation. Scutellum about as long as broad, convex ; its reticulation similar to that of the mesoscutum but finer (especially laterally) ; frenum marked off by a strong punctate line, very shiny, with a few irregular longitudinal carinulae between which there is some weak alutaceous sculpture. Dorsellum shiny, nearly smooth. Propodeum about three quarters as long as scutellum ; median area very coarsely rugose, except the nucha which is extremely finely reticulate or nearly smooth ; median carina more or less indicated in the basal half by some of the rugosites ; plicae strong but irregular ; spiracular sulci smooth, crossed by three to four strong costulae ; spiracles oval, slightly less than twice as long as broad. Fore wing with lower surface of costal cell with a complete single or partly double row of hairs and with some additional hairs scattered over the distal third or more, upper surface bare except for a row of hairs extending over about the distal third ; basal vein pilose ; basal cell bare or with a few hairs distally, open below except apically ; speculum closed below ; marginal vein 1·9 to 2·2 times as long as the stigmal vein ; postmarginal vein 1·2 to 1·3 times as long as the marginal ; surface beyond the speculum thickly pilose. Legs rather slender ; spur of mid tibia about half as long as the first tarsal segment.

Gastral petiole (Text-fig. 138) 1·4 to 1·8 times as long as broad, slightly shorter than the propodeum, reaching hardly beyond the tips of the hind coxae, without a transverse carina near its base, mainly finely reticulate but often with some longitudinal wrinkles at base and apex, its sides subparallel. Gaster ovate, slightly shorter than but almost as broad as the thorax, 1·5 to 1·8 times as long as broad, convex dorsally ; basal tergite occupying about half the total length, its hind margin curved ; second tergite (fourth abdominal) slightly transverse and about two thirds as long as the basal tergite ; last tergite slightly shorter than its basal breadth.

♂. Differs from the female as follows :

Mid tibia sometimes with a fuscous subbasal ring. Antennae with scape reaching to middle of median ocellus, its length virtually or quite equal to transverse diameter of eye ; combined length of pedicellus and flagellum nearly twice breadth of head ; pedicellus only 1·6 to 1·7 times as long as broad and about half as long as the first funicular segment ; flagellum filiform, hardly stouter than the pedicellus ; first funicular segment 2·7 to 3 times, sixth 1·9 to 2 times, as long as broad ; clava not broader than the funicle, 4 to 4·5 times as long as broad, about as long as the two preceding funicular segments together, tapering to a point ; flagellum clothed with hairs which stand out at an angle of 35° to 45°, the length of these hairs slightly less than the breadth of the flagellar segments.

Gastral petiole slightly longer than the propodeum, 2·4 to 2·6 times as long as broad ; gaster very much shorter than the thorax, bluntly pointed apically.

Holotype ♀. ENGLAND : Surrey, Ash Vale, reared 18.ix.1960 from *Agromyza albipennis* Mg. on *Phalaris arundinacea* L. (*G. C. D. Griffiths*), BM(NH).

Paratypes. Same data as holotype, males and females, 23.ix.1960, 30.ix.1960, 5.x.1960 ; IRELAND : Co. Sligo, shore of Lough Gill, 2 ♀, 23.vi.1959 (*A. W. Stelfox*). In BM(NH) and author's collection.

This species closely resembles *megapterus* Walker, which differs as follows :

♀. Mesoscutum less shiny, the reticulation of its mid lobe strong, distinctly raised above the general surface, its areoles with relatively thick walls and tending to be more subcircular in shape, the reticulation also rather finer than in *splendens*. Axillae having some of their reticulation, at least at the inner angles, slightly raised. Scutellum also less shiny and rather more strongly sculptured. Genae, immediately behind the malar sulcus, not quite smooth but with some very delicate alutaceous sculpture. Temples, in dorsal view of head, rather more strongly convergent. Gastral petiole (Text-fig. 137) as long as or slightly longer than the propodeum, 2 to 2·7 times as long as broad, reaching slightly beyond tips of hind coxae ; gaster often relatively longer (1·8 to 2·25 times as long as broad), the basal tergite sometimes occupying rather less than half the total length.

♂. Antennae with scape slightly shorter, not quite or only just reaching the lower edge of the median ocellus ; hairs of flagellum slightly longer, length about equal to breadth of flagellar segments, and tending to stand out a little more strongly. Mid lobe of mesoscutum less shiny, with stronger sculpture (as in ♀). Temples, in dorsal view of head, converging more strongly.

STYLOMERISMUS sgen. n.

(Derivation : Greek στυλοξ, a pillar or pale, + *Merismus*. Gender : Masculine).

Type-species. *Merismus rufipes* Walker, 1833.

Merismus (Stylomerismus) lasthenes (Walker) comb. n.

Sphegigaster Lasthenes Walker, 1848 : 108, 165, ♀.

Type material. One female, LECTOTYPE, bearing a Waterhouse label.

BRITAIN, rare : " England " (Walker, 1848 : 108) ; Scotland, Perthshire, Lawers, 19.vii.1954 (*Graham*).

Biology. Unknown.

Merismus (Stylomerismus) rufipes (Walker)

Merismus rufipes Walker, 1833 : 378, ♀.

Type material. Three Walker specimens (2♂, 1♀) stand under this name but I am not sure that all are original specimens. Lectotype, the female (designated by Graham, 1956 : 77).

BRITAIN, local : Isle of Wight (Walker, 1833 : 378) ; Cornwall, Marazion, 7.vii. 1955 ; Oxfordshire, Otmoor, 18.ix.1956 (*Graham*). My specimens were all captured in marshy places.

Biology. Unknown. Imagines July–Sept.

Merismus (Stylomerismus) nitidus (Walker) comb. n.

Miscogaster nitida Walker, 1833 : 462, ♂ ♀.

Type material. Two ♂, 1 ♀. LECTOTYPE, the female, bearing a Waterhouse label.

BRITAIN, IRELAND, local.

Biology. Unknown. Imagines Aug.–November.

CALLIMERISMUS Graham

Callimerismus Graham, 1956 : 78. Type-species : *Merismus fronto* Walker, 1833, by original designation.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Body bright green to blue. Head (Text-fig. 141) less transverse, hardly twice as broad as long ; eyes larger, separated by only about 1·1 times their own length ; malar space about one quarter the length of an eye. Antennal flagellum (Text-fig. 142) slightly stouter and rather more clavate. Thorax more elongate ; pronotum (Text-fig. 141) longer, its collar relatively less transverse and with its sides subparallel ; mesoscutum 1·3 to 1·5 times as broad as long. Fore wing with marginal vein about twice as long as the stigmal vein. Petiole of gaster at most about 1·6 times as long as broad, obviously shorter than the propodeum ***fronto*** (Walker) (p. 177)

– Body dull green. Head (Text-fig. 140) more transverse, slightly more than twice as broad as long ; eyes smaller, separated by 1·4 times their own length ; malar space rather more than one third the length of an eye. Antennal flagellum slightly more slender and rather less clavate. Thorax less elongate ; pronotum (Text-fig. 140) shorter, its collar more transverse and with its sides converging slightly towards the front ; mesoscutum about 1·8 times as broad as long. Fore wing with marginal vein about 1·75 times as long as the stigmal vein. Petiole of gaster twice as long as broad and almost as long as the propodeum ***suecicus*** sp. n. (p. 179)

Callimerismus fronto (Walker)

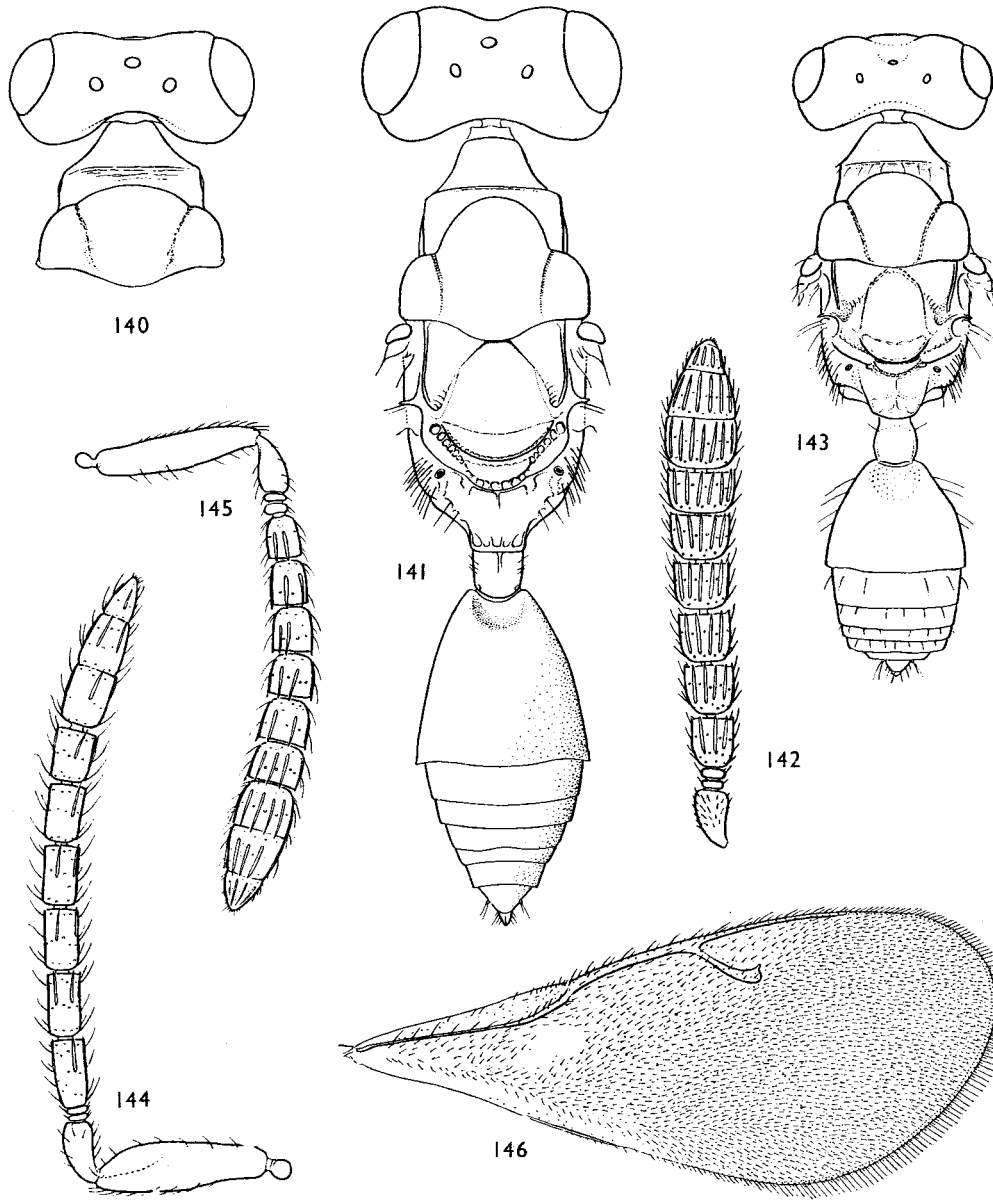
Merismus fronto Walker, 1833 : 376, ♀.
Miscogaster breviventris Walker, 1833 : 462, ♂, **syn. n.**
Miscogaster breviventris Walker, 1839 : 286.
Miscogaster breviventris Walker, 1846 : 34.
Callimerismus fronto (Walker) Graham, 1956 : 78–80, ♂ ♀.
Miscogaster breviventris Walker ; Graham & Claridge, 1965 : 308–309.

Type material. *Merismus fronto* Walker. Lectotype ♀ designated by Graham (1956 : 80).

Miscogaster breviventris Walker. Graham (*in* Graham & Claridge, 1965 : 309) regarded *breviventris* as a *species dubia* because no specimen so labelled had been found in Walker's collection in the BM(NH). Walker (1846 : 34) had synonymized *breviventris* with *Isocyrtus laetus ;* but as pointed out by Graham (ibid.) the only male standing under the latter name disagrees with the description of *breviventris*. Recently, when looking over the Dale collection in the Hope Department (which contains many Walker specimens), I noticed a male specimen standing as *Isocyrtus laetus*. This male agrees very well with the description of *Miscogaster breviventris*, and is a Walker specimen which was sent by him to Dale in 1847 ; I therefore designate it LECTOTYPE of *breviventris*. At a time when the concept of types was not in vogue, Walker could easily have disposed of what perhaps was his only specimen, regarding it as a duplicate after he had synonymized the species with *Isocyrtus laetus*. The lectotype is labelled " Isocyrtus laetus Walk. Name in Dale Coll. " ; and " e Coll. J. C. Dale. C. W. Dale pres. 1906. C.W.D."

BRITAIN, local ; in rough grassy places.

Biology. The only record of a host for *fronto* is that of Walker (1848*a* : 77) where he stated that it " destroys a subcutaneous insect in *Sinapis arvensis*, charlock " ;



FIGS. 140–146. 140, *Callimerismus suecicus* sp. n., ♀, head, pronotum and mesoscutum ; 141, *Callimerismus fronto* (Walker), ♀, body excluding appendages ; 142, same, ♀, antenna, excluding scape ; 143, *Ardilea convexa* (Walker), ♀, body, excluding appendages ; 144, same, ♂, antenna ; 145, same, ♀, antenna ; 146, same, ♂, fore wing.

the material on which this record was based has not been located, so that it cannot be confirmed. Imagines appear mostly in June and July (one record for August).

Callimerismus suecicus sp. n.

♀. Head and thorax dull green with some golden reflections here and there ; clypeus, lower face, and pronotal collar, brassy-tinged ; gaster with green and bluish green reflections (which are less intense than in *fronto* Walker). Mandibles mainly testaceous ; palpi brownish. Antennal scape and pedicellus black with a greenish tinge ; flagellum black. Coxae concolorous with the thorax ; trochanters mainly black, trochantelli testaceous ; femora black with a greenish tinge, their tips testaceous ; tibiae testaceous with a fuscous stripe (most pronounced on the mid tibiae) along their outer aspect, this stripe not reaching their bases or apices ; tarsi fuscous, the mid and hind ones testaceous basally. Tegulae fusco-testaceous. Wings hyaline ; venation testaceous, the parastigma and stigma of the fore wing brown. Length 1·85 mm.

Structurally resembles the female of *fronto* (Walker), but differs in the characters indicated in the key, which may be supplemented as follows :

Head in dorsal view (Text-fig. 140) slightly more transverse (breadth to maximum length as 2·15 : 1, about 1·9 : 1 in *fronto*). Antennal scape relatively longer, its length slightly greater, instead of slightly less, than the transverse diameter of an eye. Propodeum, medially, rather less produced beyond the bases of the hind coxae. Basal tergite of gaster distinctly shorter than its maximum breadth, in *fronto* about as long or only slightly shorter than its breadth. The gaster proper in *suecicus* forms a short ellipse in dorsal view, about 1·25 times as long as broad, whilst in *fronto* it is long-elliptic, 1·7 to 1·9 times as long as broad, but this difference might be due to abnormal retraction of the posterior segments in *suecicus*. The sculpture of the head and thorax in *suecicus* is slightly more irregular than in *fronto* ; that of the scutellum and propodeum is also slightly coarser.

♂. Unknown.

Holotype ♀. SWEDEN : Skåne, Falsterbo, 27.vii.1959, swept from vegetation in a marshy place on the edge of the sand dunes (*Graham*), in my own collection.

Biology. Unknown.

ARDILEA Graham

Ardilea Graham, 1959 : 97–98. Type-species : *Miscogaster convexa* Walker, 1833, by original designation.

Ardilea convexa (Walker)
(Text-figs. 143–146)

Miscogaster convexa Walker, 1833 : 463, ♂.
Pteromalus pubicornis Zetterstedt, 1838 : 426, ♂, **syn. n.**
Ardilea convexa (Walker) Graham, 1959 : 98–101, ♂ ♀.

Type material. *Miscogaster convexa* Walker. Lectotype ♂ designated by Graham (1959 : 101).

Pteromalus pubicornis Zetterstedt. One male, LECTOTYPE (probably holotype), labelled in Zetterstedt's handwriting " Pt. pubicornis ♂. Keng." [*sic*]. The type locality cited was " Karesuand " but " Keng." [Kengis] on the label is doubtless a

lapsus. Both fore wings are missing, but the type is certainly the same as *convexa* (Walker).

BRITAIN, IRELAND, SWEDEN (Lapland), ICELAND, GREENLAND ; very local, so far found only in coastal areas.

Biology. Unknown. Imagines July–Sept.

KSENOPLATA Bouček

Ksenoplata Bouček, 1965 : 373–374. Type-species : *K. quadrata* Bouček, by original designation.

Two species known (for their distinguishing characters, see Bouček, 1965).

Ksenoplata quadrata Bouček

Ksenoplata quadrata Bouček, 1965 : 374–376, ♂ ♀.

Holotype ♀. SLOVAKIA : Banská Štiavnica, 19.vii.1959 (*Bouček*) and paratypes in Národní Museum, Prague (holotype, cat. no. 25.603).

CZECHOSLOVAKIA, BULGARIA.

Biology. Unknown.

Ksenoplata medicaginis Bouček

Ksenoplata medicaginis Bouček, 1965 : 376, ♀.

Holotype ♀. ALGERIA : le Hamiz, near Alger (*Y. de Luca*), in the Identification Centre of C.I.L.B., Geneva-Villereuse).

ALGERIA.

Biology. Reared from *Bruchidius bimaculatus* Ol. (Col., Chrysomelidae) on *Medicago lappacea* (see Bouček, 1965).

NODISOPLATA gen. n.

Type-species : *Lamprotatus diffinis* Walker, 1874.

(Derivation : a compound of the generic name *Isoplata* with the Greek νοδός, toothless. Gender : feminine).

Anterior margin of clypeus (Text-fig. 127) curved forwards, with a median tooth or tubercle, usually also a smaller tubercle on either side (occasionally these are nearly obsolete). Both mandibles with three teeth in the type-species (in *viridipes* not seen). Antennae inserted slightly above level of ventral edge of eyes, 11263 ; combined length of pedicellus and flagellum in female less than, in male at most equal to, the breadth of the head ; flagellum in female clavate, in male subclavate ; funicular segments in female not longer than broad, sensilla numerous but in one row on each segment ; clava with a small area of micropilosity on third segment only.

Thorax quite strongly arched dorsally. Pronotum without a collar. Mesoscutum and scutellum convex, with very fine reticulation which is hardly raised above the general surface and, on the disc of the scutellum, sometimes engraved. Notauli complete, deep. Scutellum nearly ovate, its base very narrow because the scutello-axillar sutures converge strongly ; without, or

with a very short, longitudinal impressed line at the base ; frenum reticulate, separated from the rest of the scutellum by a fine impressed line. Dorsellum large, about as long as scutellar frenum, convex, weakly sculptured, sloping steeply with respect to the dorsal surface of the scutellum. Propodeum sloping at about the same angle as the dorsellum, medially somewhat longer than the latter, only slightly produced beyond the bases of the hind coxae, lightly reticulate ; median carina straight, usually distinct ; plicae absent or indicated only posteriorly ; nucha represented by a shiny, transversely-lunate strip ; supracoxal flanges very narrow, sublinear ; spiracles circular, close to metanotum, spiracular sulci shallow. Postspiracular sclerite reticulate, without an oblique carina. Mesosternal mesolcus distinctly impressed. Mesepimeron marked off from mesepisternum. Legs rather stout ; dorsal surface of hind coxae bare ; hind tibia with two spurs. Fore wing with basal cell with some hairs distally on the upper surface ; basal vein more or less pigmented, but in its lower half only ; speculum moderate-sized, extending as far as the base of the marginal vein ; marginal vein at most 1·5 times as long as the stigmal vein ; postmarginal at least slightly longer than the marginal ; stigmal vein rather strongly curved, but not forming a very acute angle with the postmarginal vein ; stigma small to moderate-sized.

Gastral petiole inconspicuous, transverse, nearly smooth. Gaster of female ovate, about as long as thorax ; hind margin of basal tergite entire or at most very shallowly emarginate medially.

Nodisoplata is very close to *Seladerma* Walker, which differs as follows:

Anterior margin of clypeus with three asymmetric teeth. Combined length of pedicellus and flagellum in female equal to or greater than breadth of head, in male at least slightly greater than breadth of head.

Key to Species

(Males)

1 Marginal vein of fore wing 1·4 to 1·5 times as long as the stigmal vein, stigma small. Combined length of pedicellus and flagellum slightly less than breadth of head ; pedicellus distinctly longer than first segment of funicle, sometimes nearly twice as long. Malar space about one third the length of an eye. (Europe) ***diffinis*** (Walker) (p. 181)

– Marginal vein of fore wing hardly longer than the stigmal vein, stigma moderate-sized. Combined length of pedicellus and flagellum almost equal to breadth of head ; pedicellus not longer than first segment of funicle. Malar space hardly more than one quarter the length of an eye. (Amurland) . ***viridipes*** (Walker) (p. 182)

(Females)

1 Marginal vein of fore wing 1·4 to 1·5 times as long as the stigmal vein. Combined length of pedicellus and flagellum distinctly less than breadth of head ; pedicellus distinctly longer than first segment of funicle ; funicular segments transverse, the first only slightly, the distal segments rather strongly so . ***diffinis*** (Walker) (p. 181)

The female of *viridipes* (Walker) is unknown.

Nodisoplata diffinis (Walker) **comb. n.**

Lamprotatus diffinis Walker, 1874 : 314, ♂ [nec *Miscogaster diffinis* Walker, 1833].
Lamprotatus curvus Thomson, 1876*a* : 228, ♂ ♀, **syn. n.**
Lamprotatus Amurensis Dalla Torre, 1898 : 187 **syn. n.** (n. n. for *Lamprotatus diffinis* Walker, 1874).
Telepsogos curvus (Thomson) Delucchi, 1955 : 34, 36–38, ♂ ♀.

Type material. *Lamprotatus diffinis* Walker. One male (Type Hym. 5. 810), LECTOTYPE, labelled " Amurland. Coll. F. Walker, 1913–71 ", " 142 ", and (in Walker's handwriting) " Lamprotatus diffinis ".

Lamprotatus curvus Thomson. Syntypes in Möller coll., Göteborg Museum (1 specimen) ; and in Thomson coll., Lund (10 specimens). Of the specimens in Thomson's collection, only two bear the correct locality data, the type localities being Tvedora and Dalarne ; from these I select as LECTOTYPE a male labelled " Dlc alp " [Dalecarlia (=Dalarne) alpina] and " Bhn " [Boheman]. The other specimens are conspecific with it.

BRITAIN, IRELAND, SWEDEN, ICELAND. It occurs commonly upon *Salix* species (*cinerea* L., *caprea* L., *aurita* L., *repens* L.) in spring and early summer (imagines Apr.–July, the latter month in northern Britain).

Biology. Unknown.

Nodisoplata viridipes (Walker) **comb. n.**

Lamprotatus viridipes Walker, 1874 : 315, ♂.

Type material. One male, LECTOTYPE (Type Hym. 5. 808), bearing a Waterhouse label.

ASIA: Amurland (Walker).

Biology. Unknown

SELADERMA Walker

Seladerma Walker, 1834 : 288. Type-species : *S. laetum* Walker, by designation of Westwood, 1839 : 70.
Seladerma Walker; Westwood, 1839 : 70.
Isoplata Förster, 1856 : 60, 62, **syn.n.** Type-species : *I. geniculata* Förster, by monotypy.
Selaoderma Förster, 1856 : 67 [invalid emendation].
Lamprotatus Thomson, 1876*a* : 221–232 [*ex parte*].
Seladerma Walker ; Schmiedeknecht, 1909 : 290, 291, [*ex parte*].
Isoplata Förster ; Schmiedeknecht, 1909 : 364, 365.
Isoplata Förster ; Erdös, 1946 : 155–157.
Isoplata Förster ; Nikol'skaya, 1952 : 238.
Lamprotatus Nikol'skaya, 1952 : 244 [*ex parte*].
Seladerma Walker ; Nikol'skaya, 1952 : 246.
Telepsogos Delucchi, 1955 : 7, 32–46, **syn. n.**
Seladerma Walker ; Delucchi, 1955 : 7, 46–55.
Isoplata Förster ; Delucchi, 1955 : 6, 63–66.
Isoplata Förster ; Peck *et al.*, 1964 : 34, 38.
Seladerma Walker ; Peck *et al.*, 1964 : 38.
Telepsogos Delucchi; Peck *et al.*, 1964 : 38.
Isoplata Förster; Bouček, 1965*b* : 549.

The type-species of *Isoplata* (*geniculata* Förster) differs from the species of *Telepsogos* in little more than the flattened form of the thorax. This might have been

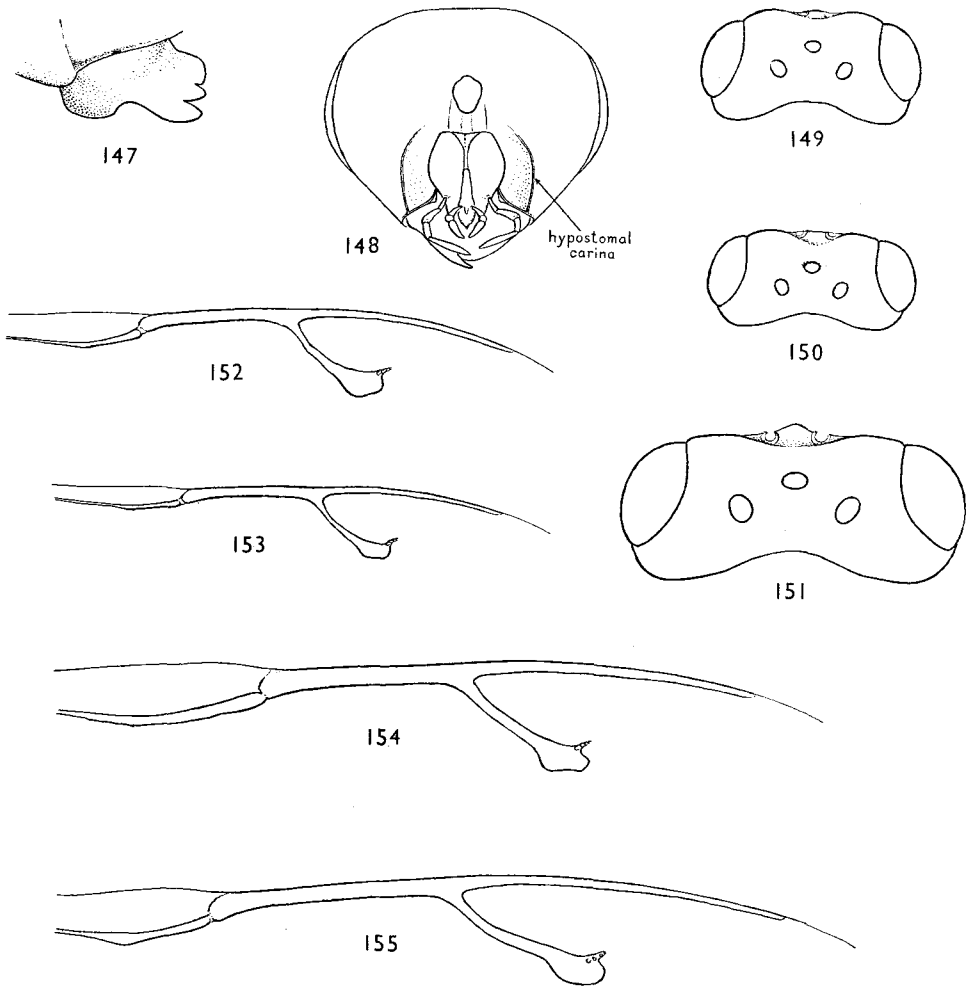
enough to allow the two genera to be kept distinct, but I have now found a species which is intermediate as regards the flattening of the thorax between *Isoplata geniculata* and normal species of *Telepsogos*. Hence I am uniting the two genera. There are similar difficulties in distinguishing *Telepsogos* from *Seladerma*. The type-species of *Seladerma* (and some other species of the genus) have the stigmal vein of the fore wing curved and forming a relatively acute angle with the post-marginal vein (Text-fig. 155), whilst the body is large and robust and the antennal flagellum has relatively numerous sensilla. The type-species of *Telepsogos* (and most other species of the genus) have the stigmal vein forming a relatively less acute angle, whilst the body is relatively smaller and the antennal flagellum has relatively sparse sensilla. These distinctions, however, do not work out consistently. *Seladerma convexum* Walker, which in most respects is very like the type-species *S. laetum*, has the stigmal vein at a less acute angle than usual ; whereas *S. saurus* Walker, which in most respects is a typical *Telepsogos*, often has the stigmal vein forming an angle as acute as in the type-species of *Seladerma*. As other distinguishing characters appear to be lacking, I have decided to unite *Telepsogos* with *Seladerma*. *Seladerma*, in the sense used in the present paper, may be divided into several species-groups.

Key to British and Swedish Species

(Females)

1		Spur of mid tibia weak, its length hardly equal to the maximum breadth of the tibia. Antenna with combined length of pedicellus and flagellum hardly greater than breadth of head ; funicular segments short, with numerous sensilla arranged in one row on each segment. Thorax strongly arched dorsally, scutellum in profile appearing convex	
		simplex (Thomson) (p. 194)	
–		Spur of mid tibia stronger, its length at least slightly greater than the breadth of the tibia. Antenna with combined length of pedicellus and flagellum usually at least slightly greater than breadth of head, if hardly greater than the thorax is weakly arched dorsally and the scutellum in profile appears virtually flat	2
2	(1)	Postspiracular sclerite with a more or less distinct oblique carina which marks off a triangular upper area	3
–		Postspiracular sclerite without an oblique carina	4
3	(2)	Either the scutellar frenum has some longitudinal carinulae ; or else the stigmal vein (Text-fig. 155) forms a relatively acute angle with the postmarginal vein. Gaster about twice as long as broad, usually slightly narrower than the thorax	28
–		Scutellar frenum reticulate, without longitudinal carinulae ; stigmal vein forming a relatively less acute angle with the postmarginal vein. Gaster ovate, rather less than twice as long as broad, about as broad as the thorax .	4
4	(3)	Stigmal vein of fore wing (Text-fig. 155) strongly curved and forming an angle of only 35° to 40° with the postmarginal vein ; sensilla arranged in two rows on at least some of the funicular segments ; scutellum (not counting the frenum) and axillae, with engraved sculpture ; hind coxae bare dorsally ; gaster not longer than head plus thorax ; large species, 2·7 to 3·6 mm.	30

– Stigmal vein forming a slightly less acute angle with the postmarginal, except in some *saurus*, in which the sensilla are arranged in one row on each of the funicular segments, the scutellum and axillae have at least some of the walls forming their reticulation slightly raised above the general surface, the hind coxa has some hairs on its dorsal surface, and the gaster is slightly longer than head plus thorax. Species often smaller than the above, if as large then the hind coxa nearly always has some hairs on its dorsal surface 5



FIGS. 147–155. *Seladerma* spp. 147, *scaea* (Walker), ♂, right mandible and lower part of gena ; 148, *genale* (Thomson), ♀, head, ventral ; 149, *antennatum* (Walker), ♀, head ; 150, *tarsale* (Walker), ♀, head ; 151, *breve* (Walker), ♀, head ; 152, *diffine* (Walker), ♀, fore wing venation ; 153, *tarsale* (Walker), ♀, fore wing venation ; 154, *convexum* (Walker), ♀, fore wing venation ; 155, *gelanor* (Walker), ♀, fore wing venation.

5 (4) Thorax weakly arched dorsally : in profile the scutellum appears virtually flat or at most weakly convex. Axillae and scutellum with delicate, engraved reticulation. All funicular segments, except sometimes the first, transverse (*Isoplata* Förster) 6

– Thorax moderately to strongly arched dorsally : in profile the scutellum appears distinctly convex. Axillae and scutellum nearly always having their reticulation at least slightly raised above the general surface. At least some of the funicular segments are quadrate or longer than broad . 7

6 (5) Scutellum about as broad as long, in profile appearing virtually flat. Propodeum strongly transverse, about five times as broad as its median length ***geniculatum*** (Zetterstedt) (p. 193)

– Scutellum slightly longer than broad, in profile appearing slightly convex. Propodeum only about four times as broad as its median length . . 7

7 (6) Scutellum weakly convex, in profile appearing only slightly curved ; scutellum and axillae with delicate, engraved reticulation. Propodeum medially less than half as long as the scutellum, about four times as broad as long. Otherwise much like *geniculatum* . . . . . sp. indet. A. (p. 193)

– Scutellum moderately to strongly convex ; scutellum and axillae nearly always with at least some of their reticulation slightly raised above the general surface. Propodeum rarely less than half as long as the scutellum and rarely so strongly transverse as in the above 8

8 (7) Lower edge of mandible (Text-fig. 147) excised in the middle, and with a conspicuous lobe at the base. Malar space almost half the length of an eye. Length about 1·8 mm. ; similar in general facies to *alpestre* (Ruschka) ***scaea*** (Walker) (p. 198)

– Lower edge of mandible at most shallowly emarginate in the middle, and without a conspicuous lobe at the base. Malar space nearly always relatively shorter 9

9 (8) Ventral opening of oral fossa (Text-fig. 148) large : the hypostomal carinae curving strongly, the greatest distance between them more than one third the breadth of the head. In a ventral view of the head the hypostomal carinae are clearly visible even when the maxillae and labium are *in situ* . 10

– Ventral opening of oral fossa smaller, hypostomal carinae not curving strongly, the greatest distance between them at most one third the breadth of the head. In a ventral view of the head, the hypostomal carinae lie close to the maxillae and labium and are not readily visible 13

10 (9) Marginal vein of fore wing only about 1·15 to 1·2 times as long as the stigmal vein. Antennal scape reaching virtually to lower edge of median ocellus. Breadth of oral fossa (Text-fig. 148) about 2·35 times the malar space, the latter slightly more than one third as long as an eye ***genale*** (Thomson) (p. 197)

– Marginal vein 1·4 to 1·65 times as long as the stigmal vein. Antennal scape not reaching the median ocellus 11

11 (10) Combined length of pedicellus and flagellum 1·3 to 1·35 times the breadth of the head, flagellum relatively less stout ; proximal segments of funicle slightly longer than broad . . . . . sp. indet.

– Combined length of pedicellus and flagellum 1·1 to 1·2 times the breadth of the head, flagellum relatively stouter ; proximal segments of funicle quadrate 12

12 (11) Breadth of oral fossa about twice the malar space . ***scoticum*** (Walker) (p. 196)

– Breadth of oral fossa about 2·5 times the malar space . . . . sp. indet.

13 (9) Gaster distinctly longer than head plus thorax, 2·2 to 3·3 times as long as broad 14

– Gaster at most as long as head plus thorax, often less than twice as long as broad 15

14 (13) Legs (not counting coxae and last segment of tarsi) testaceous. Head in dorsal view 2·1 to 2·15 times as broad as long, with temples converging strongly. Antennal scape reaching the median ocellus ; flagellum slender, proximally not stouter than the pedicellus ; funicular segments on the average longer, the sixth quadrate or slightly longer than broad. Fore wing with marginal vein 1·6 to 1·85 times as long as the stigmal vein, the latter forming an angle of 35° to 40° with the postmarginal . . . ***saurus*** (Walker) (p. 197)

– All femora at least broadly infuscate at their bases, often mainly black ; tibiae sometimes more or less infuscate. Head in dorsal view at most 2·05 times as broad as long, with temples converging less strongly (Text-fig. 149). Antennal scape not reaching the median ocellus ; flagellum stouter, proximally at least slightly stouter than the pedicellus in profile ; funicular segments on the average shorter, the sixth quadrate or slightly transverse. Fore wing with marginal vein 1·47 to 1·65 times as long as the stigmal vein, the latter forming an angle of about 45° with the postmarginal . . . 16

15 (13) Head in dorsal view (Text-fig. 149) only 1·8 to 2·05 times as broad as long ; temples converging less strongly, more rounded. Gaster 2 to 3·3 times as long as broad, at least somewhat longer than the thorax. Propodeum medially hardly produced beyond the bases of the hind coxae. Antennal scape not reaching the median ocellus. Head, thorax, and gaster mainly, blue-green or green 16

Head in dorsal view (Text-figs. 150, 151) 2·2 to 2·4 times as broad as long ; temples converging more strongly. Gaster often relatively shorter. Propodeum medially usually slightly produced backwards beyond the bases of the hind coxae. Antennal scape often reaching the median ocellus. Head, thorax, and gaster sometimes bronze-green or bronze . 18

16 (15) Propodeum, medially, slightly more than half as long as the scutellum ; head in dorsal view only 1·85 times as broad as its maximum length. Gaster not quite as long as head plus thorax . . . . . sp. indet.

– Propodeum, medially, at most half as long as the scutellum ; head in dorsal view 2 to 2·05 times as broad as its maximum length 17

17 (16) Gaster not quite as long as head plus thorax, 2 to 2·3 times as long as broad ; propodeum, medially, nearly or just half as long as the scutellum ***caledonicum*** sp. n. (p. 195)

– Gaster distinctly longer than head plus thorax, 2·4 to 3·3 times as long as broad ; propodeum, medially, somewhat less than half as long as the scutellum . . . . . ***antennatum*** (Walker) (p. 194) and ***sabbas*** (Walker) (p. 194)

18 (15) Gaster as long as head plus thorax, nearly 2·5 times as long as broad ; flagellum stout, in profile distinctly stouter than the pedicellus ; sixth segment of funicle slightly transverse . . . . . sp. indet.

– Gaster at least slightly shorter than head plus thorax ; at most twice as long as broad, but nearly always less than twice. If the gaster is twice as long as broad, then the antennal flagellum is slender, hardly stouter than the pedicellus 19

19 (18) Antennal scape entirely testaceous, or with at most its distal third dark. Malar space almost half the length of an eye (14 : 30). Gaster about twice as long as broad, slightly longer than the thorax ; basal tergite occupying only about one third the total length.

Antennal funicle slender, proximally hardly stouter than the pedicellus ; first funicular segment about twice as long as broad, sixth slightly longer

than broad. Marginal vein about 1·6 times as long as the stigmal vein ; stigma small . . . . . ? ***berani*** (Delucchi) (p. 198)

– Antennal scape usually mainly to entirely dark, if extensively testaceous then the malar space is only about two fifths the length of an eye. Gaster at least slightly less than twice as long as broad, usually not longer than the thorax (occasionally slightly so) 20

20 (19) Antennae with sensilla of funicle relatively short, arranged in two irregular rows on each segment, sometimes three rows on the first segment ; flagellum filiform or virtually so. Relatively large species, 2·4 to 3 mm. Gastral petiole 1·5 to 2·2 times as broad as long 26

– Antenna with sensilla of funicle relatively long, arranged in one (sometimes slightly irregular) row on each segment ; flagellum usually subclavate, if virtually filiform then smaller species not more than 2·2 mm. in length. Gastral petiole often relatively less transverse 21

21 (20) Thorax short, in dorsal view only 1·25 to 1·35 times as long as broad, strongly arched dorsally so that the dorsellum and propodeum slope nearly or quite vertically to the plane of the mesoscutum. Malar space slightly more than one third the length of an eye. Stigma of fore wing rather small (slightly larger than in *tarsale*, cf. Text-fig. 153). Gaster 1·5 to 1·6 times as long as broad, as long as or slightly longer than the thorax ***parviclava*** (Thomson) (p. 199)

– Thorax longer, in dorsal view 1·5 to 1·75 times as long as broad, usually less strongly arched dorsally with the dorsellum and propodeum sloping less steeply ; if the thorax is only 1·5 times as long as broad and is nearly as strongly arched as in *parviclava*, then the malar space is only about one third the length of an eye, and the stigma of the fore wing is larger . . 22

22 (21) Malar space approximately one third the length of an eye. Thorax 1·5 to 1·6 times as long as broad. Gaster not or only slightly (up to 1·2 times) longer than broad, slightly shorter than the thorax ; basal tergite occupying from two fifths to slightly more than half the total length. Fore wing with stigma moderate-sized (much as in *diffine*, cf. Text-fig. 152). Thorax, excluding propodeum, usually dull bronze, often suffused with violet especially on the mesoscutum and scutellum . . ***aeneum*** (Walker) (p. 199)

– Malar space at least slightly more than one third the length of an eye. Thorax 1·6 to 1·75 times as long as broad. Gaster 1·3 to 1·6 times as long as broad, usually as long as or a little longer than the thorax ; basal tergite sometimes relatively shorter. Thorax varying from olive-green to bright green or blue ; occasionally the scutellum and axillae tinged with bronze . 23

23 (22) Stigma of fore wing relatively smaller (Text-fig. 153), separated by 2·5 to 3·8 times its height from the costal edge of the wing ; first funicular segment of antenna most often slightly shorter than the pedicellus, funicle proximally tending to be rather slender . . . . ***tarsale*** (Walker) (p. 201)

– Stigma of fore wing on the average larger (Text-fig. 152), separated by 2 to 2·5 times its height from the costal edge of the wing ; first funicular segment usually as long as, or slightly longer than, the pedicellus ; funicle proximally tending to be slightly stouter than the pedicellus 24

24 (23) Antenna with combined length of pedicellus and flagellum only 1·1 to 1·15 times breadth of head ; flagellum stout, filiform or virtually so. Gastral petiole 1·6 to 1·8 times as broad as long. Length 2·1 to 2·4 mm. ***euroto*** (Walker) (p. 204)

– Antenna with combined length of pedicellus and flagellum 1·3 to 1·4 times breadth of head ; flagellum subclavate, rather more slender proximally. Gastral petiole 1·1 to 1·5 times as broad as long. Length 1·5 to 2 mm. . 25

25 (24) Gastral petiole 1·1 to 1·2 times as broad as long, slightly more than half as long as the propodeum . . . . . ***diffine*** (Walker) (p. 200)

– Gastral petiole 1·4 to 1·5 times as broad as long, hardly half as long as the propodeum . . . . . ***alpestre*** (Ruschka) (p. 200)

26 (20) Eye 1·25 to 1·27 times as long as broad. Antennal scape reaching to about middle of median ocellus or slightly above this level. Body bronze-green sp. indet.

– Eye 1·3 to 1·37 times as long as broad. Antennal scape not or hardly reaching the lower edge of the median ocellus. Body blue-green or blue . . . 27

27 (26) Antenna with combined length of pedicellus and flagellum 1·1 to 1·15 times breadth of head. Smaller, 2·1 to 2·4 mm. . . ***euroto*** (Walker) (p. 204)

– Antenna with combined length of pedicellus and flagellum 1·25 to 1·35 times breadth of head. Larger, 2·4 to 3·2 mm. . ***breve*** (Walker) (p. 203)

28 (3) Postspiracular sclerite with a distinct oblique carina which marks off a triangular upper area. Hind coxae with some hairs on their dorsal surface. Stigmal vein (Text-fig. 154) forming a relatively less acute angle with the postmarginal. Antennal clava with micropilosity on third segment only. Median area of propodeum (except sometimes on either side of the median carina) rather strongly reticulate . . . ***convexum*** (Walker) (p. 206)

– Postspiracular sclerite without an oblique carina except sometimes a trace of one in *laetum*, but in this species the hind coxa is bare dorsally, the stigmal vein forms a more acute angle with the postmarginal, and the antennal clava has micropilosity on the second and third segments (Species-group of *laetum* Walker = *Seladerma* s. str.) 29

29 (28) Stigmal vein forming a relatively less acute angle with the postmarginal vein. Hind coxae usually with some hairs on the dorsal surface. Antennal clava with micropilosity on its third segment only. Gaster rather less than twice as long as broad . . . . . ***breve*** (Walker) (p. 203)

– Stigmal vein (Text-fig. 155) strongly curved and forming a more acute angle with the postmarginal vein. Hind coxae bare dorsally. Antennal clava sometimes with micropilosity on its second and third segments. Gaster (except in *gelanor*) twice as long as broad 30

30 (29) Gaster shorter than thorax, 1·5 to 1·6 times as long as broad ; basal tergite occupying about two fifths of the total length ; mid femora, not counting the trochantellus, more slender than fore femora, about five times as long as broad, their ventral edge nearly straight ; clava with micropilosity on third segment only . . . . . ***gelanor*** (Walker) (p. 205)

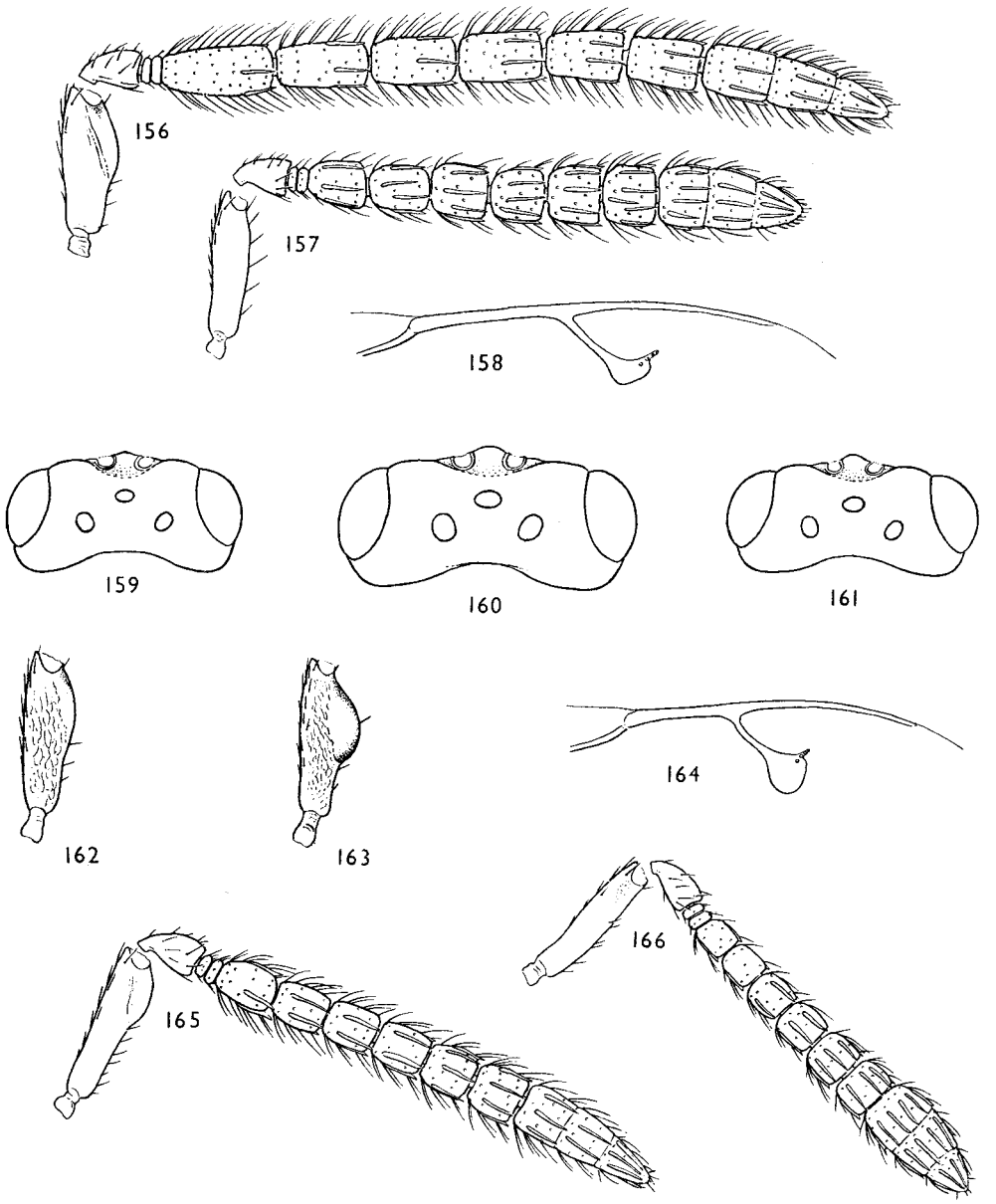
– Gaster as long as or slightly longer than thorax, 2 to 2·3 times as long as broad ; basal tergite occupying about one third of the total length ; mid femora stout like the fore femora, only about four times as long as broad, their ventral edge curved 31

31 (30) Antennal clava with micropilosity on its second and third segments ; POL 1·3 to 1·5 OOL ; all femora usually infuscate at least proximally, rarely the hind femora wholly testaceous ; antennal scape at least infuscate dorsally at apex, sometimes mainly so ; head and thorax most often green or bronze-green, occasionally blue . . . ***laetum*** (Walker) (p. 204)

– Antennal clava with micropilosity on its third segment only ; POL hardly greater than OOL ; all femora bright testaceous, scape at least mainly so ; head and thorax tending towards blue-green or blue ***bicolor*** Walker (p. 206)

KEY TO SOME MALES

1 Spur of mid tibia weak, its length hardly equal to the maximum breadth of the tibia. Antennal flagellum with very short subdecumbent pubescence ;



FIGS. 156–166. 156, *Seladerma caledonicum* sp. n., ♂, antenna ; 157, same, ♀, antenna ; 158, same, ♂, fore wing venation ; 159, same, ♂, head ; 160, *Seladerma breve* (Walker), ♂, head ; 161, *Seladerma diffine* (Walker), ♂, head ; 162, *Seladerma tarsale* (Walker), ♂, scape ; 163, *Seladerma diffine* (Walker), ♂, scape ; 164, *Gitognathus microstolus* sp. n., ♂, fore wing venation ; 165, same, ♂, antenna ; 166, same, ♀, antenna.

combined length of pedicellus and flagellum only about 1·2 times breadth of head ; funicular segments five and six quadrate . ***simplex*** (Thomson) (p. 194)

– Spur of mid tibia stronger, its length at least slightly greater than the maximum breadth of the tibia. Antennal flagellum with longer hairs, their length at least fully half the breadth of the segments that bear them 2

2 (1) Postspiracular sclerite with a more or less distinct oblique carina which marks off a triangular upper area 3

– Postspiracular sclerite without an oblique carina 4

3 (2) Either the scutellar frenum has some longitudinal carinulae ; or else the stigmal vein (Text-fig. 155) forms a relatively acute angle with the post-marginal vein 18

– Scutellar frenum reticulate, without longitudinal carinulae ; stigmal vein forming a relatively less acute angle with the postmarginal vein . . 4

4 (3) Stigmal vein of fore wing (Text-fig. 155) forming an angle of only 35° to 40° with the postmarginal vein. Antennal scape not nearly reaching the median ocellus, distinctly expanded above the middle, where there is a large shiny boss on the outer surface 5

– Stigmal vein of fore wing forming a less acute angle with the postmarginal. Antennal scape sometimes reaching the median ocellus, sometimes hardly expanded or with a smaller boss 6

5 (4) Scutellum, not counting the frenum, and axillae with engraved sculpture ; hind coxae bare dorsally ; relatively large species, 2 to 3·5 mm. . . 19

– Scutellum, not counting the frenum, and axillae with at least some of the walls forming their reticulation slightly raised above the general surface ; hind coxae with some hairs upon their dorsal surface . ? ***saurus*** (Walker) (p. 197)

6 (4) Thorax weakly arched dorsally ; in profile the scutellum appears only weakly convex. Axillae and scutellum with delicate, engraved reticulation ***geniculatum*** (Förster) (p. 193)

– Thorax moderately to strongly arched dorsally ; in profile the scutellum appears distinctly, sometimes quite strongly, convex. Axillae and scutellum nearly always having their reticulation at least slightly raised above the general surface 7

7 (6) Lower edge of mandible (Text-fig. 147) excised in the middle, and with a conspicuous lobe at the base. Malar space almost half the length of an eye. Similar in general facies to *alpestre* (Ruschka) . ***scaea*** (Walker) (p. 198)

– Lower edge of mandible at most shallowly emarginate in the middle, and without a conspicuous lobe at the base. Malar space nearly always relatively shorter 8

8 (7) Ventral opening of oral fossa (cf. Text-fig. 148) large ; the hypostomal carinae curving strongly, the greatest distance between them more than one third the breadth of the head; in a ventral view of the head, the hypostomal carinae are clearly visible even when the maxillae and labium are *in situ* 9

– Ventral opening of oral fossa smaller ; hypostomal carinae not curving strongly, the greatest distance between them at most one third the breadth of the head; in a ventral view of the head, the hypostomal carinae lie close to the maxillae and labium, and are not readily seen 12

9 (8) Antennal scape distinctly expanded on its front edge above the middle, with a large shiny boss which extends nearly half way down the scape ; funicle less slender than in the following species, proximally almost or quite as thick as the pedicellus in profile . . . . . ***scoticum*** (Walker) (p. 196)

– Antennal scape not expanded above the middle, with only an inconspicuous shiny area on its front edge ; funicle slender, especially proximally where it is much less stout than the pedicellus 10

10 (9) Propodeum medially hardly half as long as the scutellum, sloping at a steep angle (about 60°) relative to the plane of the mesoscutum and scutellum ; its hind margin virtually truncate, not counting the petiolar foramen. Combined length of pedicellus and flagellum about 1·45 times breadth of head. Marginal vein of fore wing 1·4 to 1·5 times as long as the stigmal vein. Thorax in dorsal view about 1·65 times as long as broad
? ***parviclava*** (Thomson) (p. 199)

– Propodeum medially from fully half, to nearly two-thirds, as long as the scutellum, sloping at an angle of 45° to 50° relative to the plane of the mesoscutum and scutellum ; its hind margin very slightly produced in the middle beyond the bases of the hind coxae. Combined length of pedicellus and flagellum 1·35 to 1·4 times breadth of head 11

11 (10) Marginal vein of fore wing 1·4 to 1·5 times as long as the stigmal vein. Thorax in dorsal view about 1·65 times as long as broad . ? ***genale*** (Thomson) (p. 197)

– Marginal vein of fore wing 1·65 to 1·8 times as long as the stigmal vein. Thorax in dorsal view about 1·75 times as long as broad . . . . . sp. indet.

12 (8) Thorax short, in dorsal view barely 1·6 times as long as broad. Malar space approximately one third the length of an eye. Antennal scape reaching the median ocellus ; the smooth shiny area on the distal part of its outer aspect poorly-defined and extending hardly half way down. Thorax, excluding propodeum, dull bronze, varied with violet especially on the mesoscutum and scutellum . . . . . ***aeneum*** (Walker) (p. 199)

– Thorax longer, in dorsal view 1·75 to 2 times as long as broad. Malar space at least slightly more than one third the length of an eye. Antennal scape sometimes not reaching the median ocellus, sometimes with a large shiny boss on its outer surface. Thorax most often some tint of green or blue . . 13

13 (12) Malar space nearly or quite half the length of an eye. Antennal scape (Text-fig. 162) 3·5 to 3·8 times as long as broad, reaching (unless the head is distorted) to the middle or top of the median ocellus, only slightly expanded above the middle, its external aspect with only a very small boss (*b*) which extends at most half way down. Stigma of fore wing relatively small, separated by 2·5 to 3 times its height from the costal edge of the wing. Antennal flagellum slender, its hairs sparser and tending to stand out less strongly than in the following species . ***tarsale*** (Walker) (p. 201)

– Malar space two fifths the length of an eye or slightly less. Antennal scape (Text-figs. 156, 163) 2·5 to 3 times as long as broad, reaching at most to the lower edge of the median ocellus, distinctly expanded above the middle, its external aspect with a conspicuous shiny boss which often extends more than half way down. Stigma of fore wing tending to be relatively larger. Antennal flagellum with its hairs tending to be more numerous and standing out more strongly 14

14 (13) Antenna : combined length of pedicellus and flagellum only 1·4 to 1·45 times breadth of head ; first funicular segment at most twice, sixth at most 1·5 times, as long as broad. Head in dorsal view only 2·05 to 2·15 times as broad as long. Mid tarsi with their first, and sometimes also the second, segment wholly testaceous, the rest brownish ; mid tibia usually extensively infuscate . . . . . ***sabbas*** (Walker) (p. 194)

– Antenna : combined length of pedicellus and flagellum 1·6 to 1·75 times breadth of head ; first funicular segment 2 to 2·5, sixth 1·5 to 1·8 times, as long as broad. Head sometimes relatively more transverse. Mid tarsi, except in some *alpestre*, blackish with only the base of their first segment pale ; mid tibiae usually brown or black at their tips, sometimes more extensively infuscate 15

15 (14) Larger species, 2·4 to 3·3 mm. ; head in dorsal view (Text-fig. 160) 2·2 to 2·4 times as broad as long. Combined length of pedicellus and flagellum about 1·6 times breadth of head. Thorax 1·85 to 2 times as long as broad ***breve*** Walker (p. 203)

– Smaller species, mostly 1·5 to 2·2 mm. ; rarely (some *caledonicum*) as much as 2·4 mm., in which case the head in dorsal view (Text-fig. 159) is only 2·05 to 2·1 times as broad as long, and the combined length of pedicellus and flagellum is 1·65 to 1·75 times breadth of head 16

16 (15) Head in dorsal view (Text-fig. 159) only 2·05 to 2·1 times as broad as long, with temples about one third as long as eyes . ***caledonicum*** sp. n. (p. 195)

– Head in dorsal view (Text-fig. 161) about 2·2 times as broad as long, with temples only about one quarter as long as eyes 17

17 (16) Antennal scape (Text-fig. 163) more strongly expanded distally, the shiny boss extending about two thirds down the scape ; hairs of flagellum standing out at an angle of 45° to 60° . . . . . ***diffine*** (Walker) (p. 200)

– Antennal scape less strongly expanded distally, the shiny boss extending only about half way down ; hairs of flagellum standing out rather less strongly than in *diffine* . . . . . ***alpestre*** (Ruschka) (p. 200)

18 (3) Antennal scape only slightly expanded distally, the shiny boss indistinct ; combined length of pedicellus and flagellum only about 1·45 times breadth of head ; flagellum rather stout, sixth funicular segment about 1·3 times as long as broad. Hind coxae with some hairs on their dorsal surface. Postspiracular sclerite often with a distinct oblique carina which marks off a triangular upper area. Stigmal vein of fore wing only very slightly curved, forming an angle of about 45° with the postmarginal ***convexum*** (Walker) (p. 206)

– Antennal scape distinctly expanded distally, the shiny boss large and extending from fully half, to two thirds, down the scape ; combined length of pedicellus and flagellum 1·6 to 1·75 times breadth of head ; sixth funicular segment 1·5 to 1·8 times as long as broad. Hind coxae (except in some *breve*) bare dorsally. Postspiracular sclerite most often without an oblique carina (occasionally a trace of one). Stigmal vein usually distinctly curved, and usually forming a more acute angle with the postmarginal . . 19

19 (18) Mid tibiae blackish at apex ; mid tarsi blackish with only the base of their first segment pale. Antennal flagellum relatively slender. Median carina of propodeum usually irregular. Hind coxae usually with a few hairs on their dorsal surface . . . . . ***breve*** Walker (p. 203)

– Mid tibiae testaceous, or at most indefinitely brownish at apex ; mid tarsi usually mainly testaceous, fuscous in some *laetum*, which has the antennal flagellum relatively stouter. Median carina of propodeum usually straight and sharp, rarely irregular. Hind coxae bare dorsally 20

20 (19) Mid femora less slender, about 4·5 times as long as broad. Antennal flagellum rather stouter ; first funicular segment 2 to 2·3 times as long as broad. Scutellum usually with at least a short median longitudinal impressed line at the base. . . . . ***laetum*** Walker (p. 204)

– Mid femora more slender, about five times as long as broad. Antennal flagellum rather more slender ; first funicular segment 2·2 to 2·5 times as long as broad. Scutellum usually without (occasionally with an extremely short) median line at the base . . . . ***gelanor*** (Walker) (p. 205)

THE *GENICULATUM*-GROUP
(= ***ISOPLATA*** Förster)
Seladerma geniculatum (Zetterstedt) **comb. n.**

Pteromalus parvulus Zetterstedt, 1838 : 423, ♀, **syn. n.**
Entedon geniculatus Zetterstedt, 1838 : " 430 " [*recte* 428] ♂.
Pteromalus celer Förster, 1841 : 14, ♀.
Pteromalus platynotus Förster, 1841 : 27, ♂, **syn. n.**
Isoplata geniculata Förster, 1856 : 62, ♂ ♀.
Ormocerus vernalis Thomson, 1876*a* : 242, ♂ ♀ [*nec* Walker, 1834].
Isoplata geniculata Förster ; Delucchi, 1955 : 6, 63–66, ♂ ♀.
Isoplata geniculata (Zetterstedt) Bouček, 1965*b* : 549.

Type material. *Pteromalus parvulus* Zetterstedt. One female, LECTOTYPE, labelled in Zetterstedt's handwriting " P. parvulus. ♀. Bossekop ".

Entedon geniculatus Zetterstedt. One male. LECTOTYPE, labelled in Zetterstedt's handwriting " E. geni=culatus ♂ Bossekop ". Transferred to *Isoplata* by Bouček (1965 : 549).

Pteromalus celer Förster. Syntypes, 2 ♀ in Förster coll., Vienna [not seen] ; a lectotype has been selected by Delucchi (1955*a* : 172). The species was synonymized with *geniculata* (Zetterstedt) by Bouček (1965*b* : 549).

Pteromalus platynotus Förster. Type male in Naturhistorisches Museum, Vienna, a damaged specimen lacking head ; it was recognized as being identical with *Isoplata geniculata* Förster by Delucchi (1955*a* : 172).

Isoplata geniculata Förster. I have examined syntypes from Förster's collection but have not selected a lectotype.

The specimens in Thomson's collection " Ormocerus vernalis " are actually *Seladerma geniculatum* (Zett.). The species recorded from Iceland by Bakkendorf (1955 : 139, figs, 1, 15, 28) as *Ormocerus vernalis*, is also certainly *geniculatum*.

By a curious coincidence Zetterstedt and Förster both chose the name *geniculatum* for this species. The name *Pteromalus parvulus* Zetterstedt actually has page priority over *Entedon geniculatus* but I am adopting the latter so that the species name may be unchanged.

Isoplata geniculata Girault (1913 : 312) was proposed by him because he thought Förster's species and generic names were *nomina nuda*. Girault's genus is said to have 4 teeth in both mandibles and must be different from *Isoplata* Förster.

BRITAIN, IRELAND, SWEDEN, ICELAND, GERMANY.

Biology. I reared a male of *geniculatum* on 5.vi.1948, from a puparium of *Phytomyza varipes* Macq. in seeds of *Rhinanthus* collected the previous year on the North Bull, Dublin (*E. O'Mahony*). On 8.vii.1955 I swept numerous males and females on a coastal sward where *Rhinanthus minor* Ehrh. was abundant, at Marazion, Cornwall. Imagines June-August.

Seladerma sp. indet. A

SCOTLAND : Perthshire, Lawers, 1♀, 12.vii.1952 (*Graham*).

This species, which differs from *geniculatum* in the characters given in my key to species, is probably undescribed ; it forms a link between *Isoplata* and the species of *Seladerma*.

Species sola

Seladerma simplex (Thomson) **comb. n.**

Lamprotatus simplex Thomson, 1876*a* : 227, ♂ ♀.
Telepsogos simplex (Thomson) Delucchi, 1955 : 34, 38–39, ♂ ♀.
Telepsogos simplex (Thomson) ; Graham, 1967 : 75–76, ♂ ♀.

Type material. Syntypes, 5 specimens, of which 2 have wrong locality data. LECTOTYPE, a female (lacking head) labelled " O.G." [Oster Gottland] ' Bhn ' and " simplex Ths ".

BRITAIN, DENMARK, SWEDEN.

Biology. Parasite of *Phytomyza krygeri* Hering on *Aquilegia* spp. (see Graham, 1967). Imagines June–July.

This species may be recognized by the short apical spur of the mid tibia.

THE *ANTENNATUM*-GROUP

Seladerma antennatum (Walker) **comb. n.**

Miscogaster antennata Walker, 1833 : 460, ♀.

Type material. Syntypes, 2 ♀. LECTOTYPE, the second specimen, bearing a Waterhouse label. It is extremely close to the type ♀ of *sabbas* (Walker) but has the gaster rather shorter, the propodeum sloping a little more steeply. The two might prove to be conspecific but for the present I prefer to keep them separate.

BRITAIN, rare.

Biology. Unknown.

Seladerma sabbas (Walker) **comb. n.**

Ormocerus Sabbas Walker, 1848 : 106, 162, ♀.
Lamprotatus gracilis Thomson, 1876*a* : 231, ♂ ♀.
Telepsogos sabbas (Walker) Delucchi, 1955 : 34, 39–40, ♂ ♀.

Type material. *Ormocerus sabbas* Walker. One female, LECTOTYPE (possibly holotype), bearing a Waterhouse label.

Lamprotatus gracilis. Syntypes, several specimens. LECTOTYPE, a female labelled " Lund " and " ♀ ".

BRITAIN, SWEDEN, very local. Imagines in May.

Jansson (1952 : 6) gave several host records for *gracilis* Thomson, amongst which is *Phytomyza krygeri* Hering ; the latter record may refer in fact to *Seladerma simplex* (Thoms.) and needs checking.

Anoglyphis transdanuviana Erdös (1946 : 158–160, ♀ ♂) cannot belong to that genus but is perhaps a *Seladerma*. From the description it might be near *sabbas* (Walker). Types (not seen) in coll. Erdös (Tompa, Hungary). Delucchi, however, suggested (1955 : 60) that *transdanuviana* might belong to his genus *Thektogaster*.

Seladerma caledonicum sp. n.

(Text-figs. 156–159)

♀. Body blue-green ; hind margins of the gastral segments sometimes narrowly tinged with dull bronze. Mandibles chestnut-brown, their base, teeth, and transverse ridge fuscous. Antennae black ; scape with a distinct blue-green metallic gloss, pedicellus weakly metallic. Coxae, and femora except their tips, concolorous with the body ; trochanters partly fuscous, partly reddish ; tips of femora, tibiae more or less, and bases of mid and hind tarsi, reddish testaceous (the fore tibiae have a fuscous stripe externally) ; the mid and hind tibiae may have only their tips blackish, though often there is also a subbasal infuscate ring, or the tibiae may be dark with only their bases and apices pale ; usually only the first segment of the mid and hind tarsi is more or less pale, while the remaining segments become progressively darker. Tegulae blackish with a metallic tinge. Wings slightly greyish ; venation fuscous. Length 1·8 to 2·4 mm.

Head about 1·2 times the breadth of the mesoscutum, in dorsal view 2 to 2·05 times as broad as long ; temples rounded off and hardly one-third as long as the eyes ; POL 1·4 to 1·5 OOL. Eyes about 1·35 times as long as broad, separated by 1·3 to 1·35 times their length. Malar space slightly more than one third the length of an eye. Breadth of oral fossa about 2·5 times the malar space. Clypeus weakly alutaceous, its anterior margin with three strong teeth placed asymmetrically. Mandibles not large, their lower margin weakly sinuate, without a lobe at the base. Hypostomal carinae normal, i.e., the distance separating the outermost part of their curvature less than one third the breadth of the head. Antennae (Text-fig. 157) with scape about 3·5 times as long as broad, its length slightly less than the transverse diameter of an eye, hardly reaching the level of the median ocellus ; combined length of pedicellus and flagellum about 1·25 times the breadth of the head ; pedicellus (in profile) 1·6 to 1·7 times as long as broad, approximately equal in length to the first funicular segment ; funicle fairly stout, proximally slightly stouter than the pedicellus in profile, thickening slightly distad, its first and second, sometimes also third, segments a little longer than broad, the fourth and fifth about quadrate, sixth tending to be slightly transverse ; clava 2·1 to 2·3 times as long as broad, its length equal to about two and a half of the preceding funicular segments, with a patch of micropilosity on its last segment only ; sensilla of flagellum fairly numerous in large specimens, less so in small ones.

Thorax fairly elongate (length : breadth 1·7–1·8 : 1), rather strongly arched dorsally, the dorsellum and propodeum sloping at an angle of 45° to 55° relative to the tangential plane to the mesoscutum and scutellum. Mesoscutum 1·6 to 1·7 times as broad as long, its mid lobe moderately convex. Scutellum almost as long as the mesoscutum, distinctly longer than broad, strongly convex ; frenum with uniform, delicately reticulate sculpture like that of the rest of the scutellum, and marked off by a fine weak impressed line. Dorsellum slightly shorter than the scutellar frenum, shiny, weakly alutaceous. Propodeum medially slightly more than half as long as the scutellum, its median part hardly produced backwards, only a little behind the level of the hinder edge of the supracoxal flanges, which are rather narrow ; surface between the spiracles moderately finely, irregularly reticulate, the sculpture slightly raised ; median carina complete and strong, usually slightly broken just before its middle by a short transverse crest. Legs neither unusually short nor stout ; hind coxae strongly though finely reticulate externally, their dorsal surface with a few hairs ; spur of mid tibia slightly more than half as long as the first tarsal segment, the length of the spur distinctly greater than the apical breadth of the tibia.

Fore wing with costal cell with a row of hairs on its upper surface, extending over about the distal half of the cell, the lower surface with one complete row of hairs plus two or partial rows in the distal half ; basal cell, on upperside of wing, closed below except proximally by a line of hairs on the cubital vein, also with its distal quarter or so hairy ; speculum closed below, on the lower surface of the wing partly effaced by several hairs below the parastigma ; disc of wing rather thickly haired ; marginal vein 1·55 to 1·7 times as long as the stigmal vein, the latter slightly curved, not forming a very acute angle with the postmarginal vein ; stigma moderate-sized, oval.

Petiole of gaster small, subconical, about 1·5 times as broad as long, with some weak sculpture posteriorly, otherwise smooth.

Gaster long-ovate, as long as or usually somewhat longer than the thorax, but barely as broad as the latter, acutely pointed, 2·0 to 2·4 times as long as broad ; first tergite usually occupying about one third of the total length, occasionally slightly more ; last tergite a little shorter than its basal breadth ; ovipositor sheaths slightly exserted ; ventrally the gaster is keeled, the tip of the hypopygium situated about half way along. After death the dorsal surface of the gaster tends to remain convex, though sometimes it is slightly sunken discally.

♂. Differs from the female as follows:

Antennal (Text-fig. 156) scape broader, 2·6 to 2·9 times as long as broad, its outer aspect with a smoother and somewhat shiny boss in the upper part, extending half or slightly more than half way down ; pedicellus hardly longer than broad ; combined length of pedicellus and flagellum 1·6 to 1·75 times the breadth of the head ; first funicular segment 1·8 to 3 times as long as broad, and 1·5 to 1·8 times as long as the pedicellus, sixth segment 1·5 to 1·7 times as long as broad ; clava 3·5 to 4 times as long as broad, somewhat longer than the combined length of the two preceding funicular segments ; flagellum clothed with hairs whose length is nearly or quite as great as the breadth of the segments, and which stand out at an angle of 45° to 50°.

Gaster oblong, about as long as but narrower than the thorax, subobtuse apically, with a ventral plica.

The female of *caledonicum* sp. n. is distinguished from those of *antennatum* (Walker) and *sabbas* (Walker) primarily by the characters given in the key ; also the propodeum of *caledonicum* slopes rather less steeply than in those species.

I am unable at present to distinguish the male of *caledonicum* from those of *antennatum* and *sabbas*.

Holotype ♀. SCOTLAND : Mid Perth, Lawers, 29.vi.1952, swept amongst mixed scrub near the shore of Loch Tay (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 2 ♂, 1 ♀, 29.vi.1952, 1 ♀, 28.vi.1953, 1 ♀, 29.vi.1953 (*Graham*) ; West Inverness, Isle of Rhum, Kinloch, 1 ♂, 30.vii.1962, 1 ♀, 9.vi.1963, 1 ♂, 1 ♀, 28.vi.1963 (*Graham*), in the author's collection.

Biology. Unknown.

THE *SCOTICUM*-GROUP

Seladerma scoticum (Walker) comb. n.

Miscogaster scotica Walker, 1833 : 461, ♂.
? Lamprotatus niger Delucchi, 1953*a* : 205, ♀.
? Telepsogos niger Delucchi, 1955 : 35, 41, ♀.

Type material. *Miscogaster scotica* Walker. The series contains a female and

two males (but the female is not a syntype, though possibly the type of *Cyrtogaster scotica* Walker, q.v.). LECTOTYPE, the second male, bearing a Waterhouse label.

Lamprotatus niger Delucchi. Type ♀, Lower Austria, Puchberg in Wienerwald, 13.viii.1915, in Naturhistorisches Museum, Vienna, not seen, but the description suggests that it may be the same as *scoticum*.

BRITAIN, IRELAND ; ? AUSTRIA. In the British Isles the species is very local ; I have captured it on coastal sand dunes, also on moorland in inland situations.

Biology. Unknown. Imagines June–August.

Seladerma genale (Thomson) **comb. n.**

Lamprotatus genalis Thomson, 1876*a* : 231, ♀.

Type material. One female (lacking the gaster), the holotype ; labelled " Sm " [Småland], " Bhn " [Boheman] and " genalis Ths ".

SWEDEN : Småland (holotype ♀). I have taken a male *Seladerma* in Britain which may be that of *genale* and have mentioned its characters in my key to males (q.v.).

Seladerma helveticum (Delucchi) **comb. n.**

Telepsogos helveticus Delucchi, 1955 : 35, 41, ♀.

Type material. Type (?holotype) ♀, Switzerland, Valais, Saas Fee, 16.vii.1953, in coll. Delucchi (not seen).

SWITZERLAND.

Biology. Unknown.

From the description it seems likely that *helveticus* belongs to the species-group of *scoticum* (Walker).

THE *SAURUS*-GROUP

Seladerma saurus Walker

Seladerma Saurus Walker, 1844*a* : 338, ♀.

Type material. One female (Type Hym. 5.794) with Waterhouse label ; it is formally designated LECTOTYPE though in fact it may be holotype.

BRITAIN, NORWAY (Alten), apparently rare. New records : Scotland, Perthshire, Lawers, ♀♀, 29.vi.1952 (*Graham*).

Biology. Unknown. Imagines in June.

Seladerma diutinum (Delucchi) **comb. n.**

Telepsogos diutinus Delucchi, 1955 : 35, 41–42, ♂ ♀.

Type material. Type, sex not mentioned, Germany, München-Forstenried, 27.i.1952 (*F. Groschke*), in coll. Delucchi (not seen).

GERMANY.

Biology. Parasite of *Phytomyza crassiseta* Zett. on *Veronica* (Delucchi, 1955 : 42).

From the description this species might belong to the species-group of *saurus* (Walker).

Seladerma longulum (Delucchi) **comb. n.**

Lamprotatus longulus Delucchi, 1953*a* : 204, ♀.
Telepsogos longulus Delucchi, 1955 : 35, 42, ♀.

Type material. Type (? holotype) ♀, Lapland, Abisko, viii.1948 (*Pfeffer*), in Naturhistorisches Museum, Vienna (not seen).

SWEDEN (Lapland).

Biology. Unknown.

THE *DIFFINE*-GROUP

(= ***TELEPSOGOS*** Delucchi s. str.)

Seladerma berani (Delucchi) **comb. n.**

Lamprotatus berani Delucchi, 1953*a* : 202, ♂ ♀.
Telepsogos berani Delucchi, 1955 : 35, 42, ♂ ♀.

Type material (not seen) described from localities in Germany, Austria, and Bohemia ; Delucchi (1953*a* : 202) stated that the type was in his personal collection but did not mention from which locality it came.

? BRITAIN ; GERMANY, AUSTRIA, CZECHOSLOVAKIA, HUNGARY. A female, which I hope is correctly identified, was captured in England (Lancashire, Freshfield, 19.ix.1959 (*A. Brindle*).

Biology. Reared from *Phytomyza nervi* Groschke on *Lonicera alpigena* L. ; from *Phytomyza atricornis* Mg. ; and from a Dipterous miner on *Anemone hepatica* L. (see Delucchi, 1955 : 42).

Seladerma scaea (Walker) **comb. n.**

Lamprotatus Scaea Walker, 1844*a* : 335, ♂.

Type material. One male, now designated LECTOTYPE (possibly holotype) (Type Hym. 5.805, bearing a Waterhouse label).

BRITAIN, IRELAND, NORWAY (Alten), rare. New records : Britain, Scotland, Perthshire, Killin, 1 ♀, 21.vi.1962 (*A. W. Stelfox*) ; the specimen was kindly presented to me. IRELAND, Co. Clare, Mullagh More, 1 ♂, 19.iii.1966 (*G. C. D. Griffiths*).

Biology. The Irish male recorded above was reared from *Phytomyza calthophila* Hering on *Caltha palustris* L., by Mr. Griffiths.

This species is easily recognized by the form of the mandibles in both sexes.

Seladerma parviclava (Thomson) **comb. n.**

Lamprotatus parviclava Thomson, 1876*a* : 230, ♀ (*?nec* ♂).
Telepsogos parviclava (Thomson), Delucchi, 1955 : 35, 44–45.

Type material. Syntypes on 19 pins. Lectotype, a female labelled " Hbg " [Hälsingborg] and " parviclava Ths " ; this is probably the specimen figured by Delucchi (1955 : figs. 52–54). The male described by Thomson may not belong to this species, according to Delucchi (1955 : 45). In my key to males (q.v.) I have included one which may belong to *parviclava*.

BRITAIN, SWEDEN, uncommon. New record : England, Lincolnshire, Coningsby, 1 ♀, 27.vii.1951 (*Graham*).
Biology. Unknown. Imagines in July.

Seladerma icelos (Walker) **comb. n.**

Lamprotatus Icelos Walker, 1844*a* : 337, ♂.

Type material. Syntypes, 2 ♂. LECTOTYPE, Type Hym. 5. 800*b*, with a Waterhouse label.

NORWAY (Alten) ; only the type specimens known.
Biology. Unknown.
The type male of *icelos* resembles that of *aeneum* (Walker), particularly in its squat thorax and rather flattened mesoscutum ; but it has a longer malar space (malar space 11, length of eye 30), rather longer stigma, and slightly more strongly expanded antennal scape, which has its distal boss extending nearly half-way down. Probably therefore it is a distinct species.

Seladerma aeneum (Walker) **comb. n.**

Miscogaster aenea Walker, 1833 : 461, ♂ ♀.
Miscogaster nitidipes Walker, 1833 : 462, ♂, **syn. n.**

Type material. *Miscogaster aenea* Walker. Syntypes, 3 ♀, 1 ♂. LECTOTYPE, a female with a Waterhouse label, another " Lamprotatus aeneus ", and one in C. Ferrière's handwriting " Type CF ".
Miscogaster nitidipes Walker. One male, LECTOTYPE, bearing a Waterhouse label.

BRITAIN, rather uncommon.
Biology. Reared in England from cocoons of *Stigmella* sp. (*regiella* (H.-S.) or *pygmaeella* (Haw.) ; of *Stigmella centifoliella* (Zett.) or *anomalella* (Goeze) ; of *Stigmella atricapitella* (Haw.) or *ruficapitella* (Haw.) (Lep., Stigmellidae) ; all reared (*E. G. R. Waters*), material in Hope Dept., University Museum, Oxford. These reared specimens emerged in February and March, but under natural conditions would certainly have emerged later. I have captured specimens in the field in August and September.

Seladerma globosum (Delucchi) **comb. n.**

Lamprotatus globosus Delucchi, 1953*a* : 203, ♀.
Telepsogos globosus Delucchi, 1955 : 35, 42, ♀.

Type material. Type (? holotype) ♀, Germany, München-Obermenzingen, iv.1950 (*Groschke*), in coll. Delucchi (not seen).

GERMANY.

Biology. Parasite of *Dizygomyza verbasci* (Bouché) on Scrophulariaceae (Delucchi, 1953*a* : 203).

From the description this species appears to be near *aeneum* (Walker).

Seladerma diffine (Walker) **comb. n.**

? Miscogaster lucida Walker, 1833 : 460, ♂.
Miscogaster diffinis Walker, 1833 : 460, ♂.
Miscogaster viridis Walker, 1833 : 461, ♀, **syn. n.**
Lamprotatus Mazoeus Walker, 1844*a* : 333, ♀, **syn. n.**
Lamprotatus Amulius Walker, 1848 : 111, 169, ♀, **syn. n.**

Type material. *Miscogaster lucidus* Walker. Syntypes, 6 specimens. LECTOTYPE, a male with Waterhouse label " Lamprotatus lucidus Walker ", also one in C. Ferrière's handwriting " Type CF ". It is very close to the type of *diffinis* Walker but shows some small differences which make me doubtful if it is really conspecific with it.

Miscogaster diffinis Walker. Syntypes, 4 specimens. LECTOTYPE, a male with Waterhouse label " Lamprotatus diffinis Walker ", also another " Type CF ".

Miscogaster viridis Walker. Syntypes, 5 specimens. LECTOTYPE, a female bearing a rectangular label " 1049 " and another " Type CF ".

Lamprotatus mazoeus Walker. LECTOTYPE (possibly holotype) ♀, Type Hym. 5. 801, with a Waterhouse label.

Lamprotatus amulius Walker. LECTOTYPE (possibly holotype) ♀ bearing a green-bordered type label, also a Waterhouse label " Lamprotatus Amulius Walker".

BRITAIN, not uncommon.

Biology. I have examined the following reared material of *diffine* :—England, Berkshire, Bagley Wood, males and females reared in September and October 1931 from *Phytomyza conyzae* Hendel on *Inula conyza* DC. (*A. H. Hamm*). Imagines appear in the field May–October (probably therefore there is more than one generation).

Seladerma alpestre (Ruschka) **comb. n.**

Lamprotatus alpestris Ruschka, 1912 : 242, ♂ ♀.
Telepsogos alpestris (Ruschka) Delucchi, 1955 : 35, 43–44, ♂ ♀ [redescr.].

Type material. Syntypes 1 ♂, 1 ♀, in Naturhistorisches Museum, Vienna, pinned to a block of pith and bearing the following labels : (1) " e Phytomyza asclepiadeae

Hdl " ; (2) " leg. 18/8.1891 Schneealpe " [following word illegible] ; (3) " Lamprotatus alpestris type ♂ ♀ " ; (4) " alpestris Ruschka det. Ruschka " ; (5) " Genot." ; (6) a red label " TYPE " ; (7) " TELEPSOGOS alpestris R. V. Delucchi det.". LECTOTYPE, the male specimen.

AUSTRIA (Schneealpe).

Biology. Reared from *Phytomyza asclepiadae* Hend. (*Ruschka*).

Seladerma annulipes (Walker) **comb. n.**

Miscogaster annulipes Walker, 1833 : 461, ♂ ♀.
? Miscogaster dissimilis Walker, 1833 : 463, ♂ ♀.
? Lamprotatus Venilia Walker, 1846*a* : 113, ♂.

Type material. *Miscogaster annulipes* Walker. Four specimens, two of which are possibly not original material. None fits the description completely but the third specimen agrees best on the whole and is designated LECTOTYPE ; it is a male, labelled " Walker coll. 1904–120 " and (in Walker's handwriting) " Lamprotatus annulipes ".

Miscogaster dissimilis Walker. Syntypes, 1 ♀, 2 ♂. LECTOTYPE, a male bearing a Waterhouse label " Lamprotatus dissimilis Walker ".

Lamprotatus venilia Walker. One male, LECTOTYPE (possibly holotype), with a Waterhouse label.

BRITAIN.

Biology. Unknown.

Seladerma tarsale (Walker) **comb. n.**

? Cyrtogaster scotica Walker, 1833 : 382, ♀.
Miscogaster tarsalis Walker, 1833 : 461, ♂ ♀.
Miscogaster apicalis Walker, 1833 : 463, ♀, **syn. n.**
Miscogaster tristis Walker, 1833 : 463, ♀, **syn. n.**
Miscogaster semiaurata Walker, 1833 : 463, ♂ ♀, **syn. n.**
Miscogaster costalis Walker, 1833 : 463, ♂, **syn. n.**
Miscogaster philochortoides Walker, 1833 : 463, ♂, **syn. n.**
Miscogaster brevis Walker, 1833 : 464, ♂, **syn. n.**
Miscogaster cyanea Walker, 1833 : 463, ♂, **syn. n.**
Miscogaster contigua Walker, 1833 : 464, ♂, **syn. n.**
Miscogaster linearis Walker, 1833 : 464, ♂, **syn. n.**
Miscogaster filicornis Walker, 1833 : 464, ♂ ♀, **syn. n.**
? Miscogaster femorata Walker, 1833 : 464, ♀.
Lamprotatus Brises Walker, 1844*a* : 333, ♀, **syn. n.**
Lamprotatus Cleta Walker, 1844*a* : 334, ♂, **syn. n.**
Lamprotatus Leucon Walker, 1844*a* : 335, ♀, **syn. n.**
Lamprotatus Oebares Walker, 1848 : 111, 167, ♀, **syn. n.**
Lamprotatus Bolgius Walker, 1848 : 111, 171, ♀, **syn. n.**
Lamprotatus pilicornis Thomson, 1876*a* : 229, ♂ ♀ [*ex parte* (lectotype)].
Telepsogos pilicornis (Thomson) Delucchi, 1955 : 35, 45, ♂ ♀.

Type material (unless otherwise stated, each lectotype bears a Waterhouse label with the name of the species).

Cyrtogaster scotica Walker. There is no specimen under this name. Under *Miscogaster scotica*, however, there is a series of 2 ♂ and 1 ♀ ; the female clearly does not belong there because no female of *Miscogaster scotica* was described. It agrees reasonably well with the description of *Cyrtogaster scotica* and could be its type. The fact that the species-name is the same in each case could have led to misplacement during rearrangement. In view of the slight doubt I am not adopting the name *scotica* for the present species.

Miscogaster tarsalis Walker. A series of 6 specimens of which one is probably not original material. LECTOTYPE, the third, a male.

Miscogaster apicalis Walker. One female, which is designated LECTOTYPE, though agreement with the description is poor.

Miscogaster tristis Walker. One female, LECTOTYPE.

Miscogaster semiaurata Walker. 5 specimens (the fifth an *Omphale!*) LECTOTYPE, the third, a male.

Miscogaster costalis Walker. One male, designated LECTOTYPE (possibly holotype).

Miscogaster philochortoides Walker. One female, 5 ♂. LECTOTYPE, one of the males.

Miscogaster cyanea Walker. One male, LECTOTYPE (possibly holotype).

Miscogaster brevis Walker. Syntypes, 2 ♂. The first is designated LECTOTYPE.

Miscogaster contigua Walker. One male, LECTOTYPE (possibly holotype).

Miscogaster linearis Walker. Two males, one of which is designated LECTOTYPE.

Miscogaster filicornis Walker. Three males, the second designated LECTOTYPE.

Miscogaster femorata Walker. Types not located.

Lamprotatus brises Walker. One female, Type Hym. 5. 804, designated LECTOTYPE.

Lamprotatus cleta Walker. Two males, one female (but the female was described with a query). LECTOTYPE male, Type Hym. 5. 802c.

Lamprotatus leucon Walker. Two females. LECTOTYPE, Type Hym. 5. 803a.

Lamprotatus oebares Walker. One female, designated LECTOTYPE.

Lamprotatus bolgius Walker. Two females. The first specimen is designated LECTOTYPE. The other one is a *Cyrtogaster vulgaris*.

Lamprotatus pilicornis Thomson. Syntypes on 17 pins. The fifth pin in the series carries 2 ♀ and 1 ♂ and a label " Lund "; the uppermost female is designated LECTOTYPE.

BRITAIN, IRELAND, SWEDEN ; no doubt widely distributed in Europe. In the British Islands, it is the commonest species of the genus and may be found almost everywhere, even in large cities (in parks and other suitable places).

Biology. I have examined the following reared material :—England : Surrey, Bookham, ♂ em. 21–23.vii.1955 from *Phytomyza nigra* Mg. on *Holcus lanatus* L. (*G. C. D. Griffiths*); Middlesex, Hampstead, ♂ em. v.1955 from *Phytomyza sonchi* R.-D. (*K. H. Spencer*); Oxfordshire, Marston, ♀ em. 12.iv.1926 from *Phytomyza* sp.

on *Salix* (*A. H. Hamm*). Probably the species is polyphagous. Imagines captured in the field May–September (probably more than one generation).

[*Seladerma diaeus* (Walker) **comb. n.**

Lamprotatus Diaeus Walker, 1844 : 16, ♀.

Type material. One female, designated LECTOTYPE (Type Hym. 5. 822), labelled " Bred from pupa of Vanessa cardui " and " Martin's Falls ".

CANADA : Ontario, Martin's Falls, Albany River, Hudson's Bay (*G. Barnston*).

The host data given on the label attached to the specimen is erroneous. Walker's record of *Vanessa cardui* (1844 : 16) actually refers to *Pteromalus puparum* (L.), a redescription of which was given immediately below that of *Lamprotatus diaeus*. This host record has found its way into the current catalogues (e.g., that of Peck, 1963 : 607). The true host will probably prove to be an Agromyzid.]

Seladerma meracum (Delucchi) **comb. n.**

Lamprotatus meracus Delucchi, 1953*a* : 204–205, ♀.
Telepsogos meracus Delucchi, 1955 : 35, 44, ♀.

Type material. Type ♀ (locality unknown), in Naturhistorisches Museum, Vienna (not seen).

Distribution and biology unknown.

THE *BREVE*-GROUP

Seladerma breve Walker

Seladerma breve Walker, 1834 : 290, ♀.
Scladerma [sic] *Lalage* Walker, 1845 : 263, ♀, **syn. n.**
Pteromalus Lalage Walker, 1846*b* : 272, ♀.
Scladerma [sic] *Lalage* Walker, 1846*c* : 161, ♀.
? Lamprotatus Pycnos Walker, 1848 : 111, 172, ♂.
Telepsogos lalage (Walker) Graham, 1963 : 72, ♂ ♀.

Type material. *Seladerma breve* Walker. One female, designated LECTOTYPE ; it bears a Waterhouse label, a printed label " breve ", and a green-bordered type label.

Lamprotatus pycnos Walker. Syntypes, 2 ♂. LECTOTYPE, the first specimen, bearing a Waterhouse label. It fits the males which I believe to belong to *breve*.

Seladerma lalage Walker. Two females, LECTOTYPE, one labelled " Lalage " in Walker's handwriting.

BRITAIN, not uncommon.

Biology. Unknown. Imagines June–July.

Seladerma euroto (Walker) **comb. n.**

Miscogaster Euroto Walker, 1839 : 198 "♂" [*recte* ♀].

Type material. Syntypes, 1 ♀ in BM(NH), Walker coll., ex coll. Haliday ; 1 ♀ in coll. Haliday (no. 729). LECTOTYPE, the female in coll. Haliday, labelled " Euroto " in Walker's handwriting. The two syntypes are conspecific, but the BM(NH) female (which is larger) disagrees in colour with the description of the nominotypical form (it is probably var. β). Both females have the apex of the gaster eaten off, leaving the yellowish ovipositor projecting ; if this damage had already occurred when Walker saw the specimens, it would account for his having mistaken their sex.

S. euroto is very close to *breve* and might be the same ; but it has the funicular segments of the antenna (females) shorter than in any of my specimens of *breve*, also there is a slight difference in the venation of the fore wing. I have no fresh material which exactly fits the syntypes of *euroto* and consider it advisable to regard it provisionally as a valid species.

IRELAND : Co. Down, Holywood (*A. H. Haliday*).
Biology. Unknown.

THE *LAETUM*-GROUP

(= ***SELADERMA*** Walker, s. str.)

Seladerma laetum Walker

Seladerma laetum Walker, 1834 : 289, ♀.
? Miscogaster Dryops Walker, 1839*b* : 31, ♂.
Seladerma laetum Walker, Delucchi, 1955 : 47, 51–53, ♂ ♀.

Type material. *Seladerma laetum* Walker. Syntypes, 3 specimens. LECTOTYPE, a female bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type C.F. ".

Miscogaster dryops Walker. One male (probably holotype) in coll. Greville, Edinburgh, labelled " Miscog. Dryops, Wk. n. sp. Fide Wk. Edinb." and " Greville 1936–50. 287 ". This seems to fit the male of *laetum*, but the males of some species of this group are not easy to distinguish.

BRITAIN, IRELAND, SWEDEN, GERMANY, MOLDAVIAN S.S.R. ; probably more widely distributed in Europe. Common in Britain and Ireland.

Biology. Reared from *Amaurosoma armillatum* (Zett.) (Dipt., Scatophagidae) (*J. J. F. X. King*), Scotland, Glasgow, 5–7.vi.1934. Also recorded as a parasite of *Amaurosoma flavipes* (Fln.) and *A. armillatum* (Zett.) in Sweden (Secrétariat, etc. 1957 : 321, 330). Imagines June–July.

Seladerma violaceum Delucchi

Seladerma violaceum Delucchi, 1955 : 47, 49–50, ♀.

Type material. Type (? holotype) in coll. Förster, Naturhistorisches Museum, Vienna (not seen). From the description there seems a possibility that it might be an abnormal specimen of *laetum* Walker.

Probably GERMANY.
Biology. Unknown.

Seladerma nobile Delucchi

Seladerma nobile Delucchi, 1955 : 47, 51, ♀.

Type material. Type (? holotype), in coll. Förster, Naturhistorisches Museum, Vienna (not seen).

Delucchi (1955 : 47) in his key to the species of *Seladerma* (s. str.) separated *nobile* from *laetum* Walker on the basis of characters which I find to be variable in *laetum*. *S. nobile* is said to have the sixth funicular segment subtransverse, the basal cell of the fore wing nearly closed below, the trochanters and hind femora fulvous, and the propodeum in profile evenly convex. *S. laetum* (female) is said to have the sixth funicular segment subelongate, the basal cell of the fore wing open below except apically, the trochanters dark brown, the hind femora infuscate, and the propodeum in profile strongly convex and nearly pointed in the middle. The above characters noted for *laetum* hold good for many specimens ; but I have some in which the basal cell of the fore wing is completely closed below, and one in which the hind femora are wholly fulvous. The sixth funicular segment in female *laetum* varies from quadrate to slightly longer than broad ; the propodeum in profile is most often as described by Delucchi, though sometimes it is evenly curved as described for *nobile*. Thus, whilst *nobile* may be a valid species, it cannot be satisfactorily distinguished by the characters which Delucchi mentions.

Distribution. Not certain, but the type female probably came from Germany.
Biology. Unknown.

Seladerma gelanor (Walker)

Miscogaster Gelanor Walker, 1839*b* : 31, ♂.
Seladerma gelanor (Walker) Graham, 1963 : 72, ♀.

Type material. One male (probably holotype) in coll. Greville, Edinburgh, labelled " Miscog. Gelanor Wk. n. sp. Fide Wk. Edinb." and " Greville 1936–50. 288."

BRITAIN : local, apparently a northern species ; I have records only from Scotland, Greville coll. ; Perthshire, Lawers, 17.vii.1952 (*Graham*) ; and Yorkshire, Malham, 17.viii.1955 (*W. D. Hincks*), see Graham (1963 : 72).
Biology. Unknown.

Seladerma bicolor Walker

Seladerma bicolor Walker, 1834 : 289, ♀.
? Seladerma luteolum Delucchi, 1955 : 53, ♀.

Type material. *Seladerma bicolor* Walker. One female in BM(NH), LECTOTYPE, bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type CF ". There is a female in the Greville collection but probably this is not a syntype.

Seladerma luteolum Delucchi. Type ♀ (not seen) in coll. Förster, Naturhistorisches Museum, Vienna. Delucchi's description of *luteolum* suggests that it might be the same as *bicolor* Walker.

BRITAIN : England, near London (*Walker*) ; Scotland (probably near Edinburgh), one female in coll. Greville ; ? Germany (coll. Förster). Apparently rare.

Biology. Unknown.

Seladerma coeruleovirens (Förster)

Lamprotatus coeruleovirens Förster, 1861 : 34, "♂" [*recte* ♀].
Seladerma coeruleovirens (Förster) Delucchi, 1955 : 49, 54, ♀.

Type material. Type (? holotype) ♀ in coll. Förster, Naturhistorisches Museum, Vienna ; Delucchi (1955 : 54) pointed out that Förster had mistaken its sex. I have not seen the specimen.

SWITZERLAND : Oberengadin, Rosegtal.

Biology. Unknown.

Seladerma convexum Walker

Seladerma convexum Walker, 1834 : 290, ♀.

Type material : one female, designated LECTOTYPE (possibly holotype), bearing a Waterhouse label and a green-bordered type label.

BRITAIN, local : near London (*Walker*) ; Berkshire, Wytham, 9.vi.1962, females and male swept on calcareous grassland (*Graham*).

Biology. Unknown.

It is possible that *S. agreste* Delucchi (1953*a* : 216, ♀) might be the same as *convexum* Walker ; I have not seen the type ♀ of *agreste* and Delucchi does not mention some distinctive characters which are present in *convexum*, hence I am uncertain.

Species belonging to *Seladerma* but whose specific identity is uncertain :—

Lamprotatus Phlegias Walker, 1844*a* : 332, ♂ (Lapland). LECTOTYPE (possibly holotype) ♂, Type Hym. 5. 798, bearing a Waterhouse label. This must belong to the group of *diffine* (Walker), i.e., to *Telepsogos* s. str., but it does not quite fit the known males of any of the species listed above. It may therefore represent a valid species.

TELEPSOGINA Hedqvist

Telepsogina Heqvist [Hedqvist], 1958 : 58. Type-species : *T. adelognathi* Hedqvist, by original designation.

This genus is very close to *Seladerma* Walker but may be kept separate for the present. The antennae of the type-species are unlike those of any species of *Seladerma*, though in other respects it is very similar to some species of that genus.

Telepsogina adelognathi Hedqvist

Telepsogina adelognathi Heqvist [Hedqvist], 1958 : 59–60, ♀.

Type material. Holotype ♀, Sweden, Dalarne, Älvdalen, Mossiberg, reared from a batch of cocoons of *Adelognathus tetracinctorius* (Thunb.) (*K. H. Forsslund*), in coll. Hedqvist, Stockholm. I have examined the holotype.

BRITAIN, SWEDEN. Britain (new record) : Oxfordshire, Otmoor, 1 ♀, 17.viii.1957 (*Graham*).

Biology. See above. Imagines appear in August.

THEKTOGASTER Delucchi

Thektogaster Delucchi, 1955 : 59. Type-species : *Lamprotatus abdominalis* Delucchi, 1953, by original designation.
Thektogaster Delucchi ; Peck *et al.*, 1964 : 39.

The species were revised by Delucchi (1955) who recognized two. In the present work three species are considered to be valid. Their females only are known.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Costal cell of hind wing bare up to the level of beginning of marginal vein. Scutellar frenum with some longitudinal costulae. Speculum of fore wing reaching the basal vein. Gaster about 3·5 times as long as broad and about 1·5 times as long as the thorax.
Antennal clava with micropilosity on its second and third segments only ***abdominalis*** Delucchi (p. 208)

– Costal cell of hind wing with a row of hairs extending nearly to its base. Scutellar frenum either reticulate, or if with some longitudinal costulae as well, then the speculum of the fore wing is reduced to an oval area lying below the parastigma and does not reach the basal vein. Gaster 2·5 to 2·8 times as long as broad 2

2 (1) Antennal clava with micropilosity on its second and third segments. Fore wing with speculum, on upper surface of wing, extending as far as the basal vein. Scutellar frenum finely reticulate with at most some indistinct longitudinal striae. Hypopygium reaching about half way along gaster ***subvirescens*** (Zetterstedt) (p. 208)

– All three segments of the antennal clava with micropilosity. Fore wing with speculum reduced to an oval area lying below the parastigma, and not reaching the basal vein. Scutellar frenum with longitudinal striae. Hypopygium reaching hardly one third along the gaster . . ***chrysis*** (Förster) (p. 208)

Thektogaster subvirescens (Zetterstedt) **comb. n.**

Pteromalus subvirescens Zetterstedt, 1838 : 424, ♀.
Lamprotatus elevatus Thomson, 1876*a* : 227, ♀, **syn. n.**

Type material. *Pteromalus subvirescens* Zetterstedt. One female, LECTOTYPE (probably holotype), labelled in Zetterstedt's handwriting " P. subvi=rescens ♀. Karesuand ".

Lamprotatus elevatus Thomson. No specimens under this name. Amongst Thomson's series of *L. ungularis* I found a female specimen which agrees very well with the description of *L. elevatus* and is now designated LECTOTYPE ; it is labelled " Lpl " and " ♀ ".

SWEDEN (Lapland) ; only the above type-specimens known.
Biology. Unknown.

Thektogaster chrysis (Förster)

Lamprotatus chrysis Förster, 1861 : 34, ♂ ♀.
Thektogaster chrysis (Förster) Delucchi, 1955 : 61–63, ♂ ♀.

Type material. Holotype ♀, Switzerland, Oberengadin, Rosegtal, taken in July, in coll. Förster, Naturhistorisches Museum, Vienna (not seen by the writer).

SWITZERLAND, AUSTRIA, SWEDEN, ? JUGOSLAVIA.
Biology. Unknown. Imagines in July.

Thektogaster abdominalis (Delucchi)

Lamprotatus abdominalis Delucchi, 1953*a* : 201, ♀.
Thektogaster abdominalis Delucchi, 1955 : 61, 63, ♀.

Type material. Type ♀, Austria, Steiermark, Hochschwab, 12.iii.1951, in Naturhistorisches Museum, Vienna (not seen by the writer).

AUSTRIA.
Biology. Unknown.

GLYPHOGNATHUS Graham

Glyphognathus Graham, 1956 : 81. Type-species : *G. umbelliferae* Graham, by original designation.
Glyptognathus Bouček, 1961 : 67 [*lapsus*].

KEY TO EUROPEAN SPECIES

1 Fore wing with stigma larger, separated by only slightly more than its own height from the lower edge of the postmarginal vein, as high as long. Propodeum (Text-fig. 169) with median area reticulate ; plicae usually developed in at most the hinder half of the sclerite, rarely extending somewhat farther basad.
Structure of body and antennae (Text-figs. 167–170) ***umbelliferae*** Graham (p. 209)

– Fore wing with stigma smaller, separated by distinctly more than its own height from the lower edge of the postmarginal vein, distinctly longer than high. Propodeum with median area virtually smooth ; plicae traceable nearly to the base of the sclerite . . . . . ***flammeus*** (Delucchi) (p. 209)

Glyphognathus umbelliferae Graham

? Stictomischus convexus Delucchi, 1953*a* : 210, ♀.
Glyphognathus umbelliferae Graham, 1956 : 82–83, ♂ ♀.
Glyptognathus [*sic*] *umbelliferae* Graham ; Bouček, 1961 : 67.

Type material. *Stictomischus convexus* Delucchi. Type ♀ (not seen), Upper Austria, Weyer, 5.ix.1918, in Naturhistorisches Museum, Vienna. Delucchi makes no mention of the excised mandible in his description but in other respects this agrees well with *umbelliferae*. It will be necessary to re-examine the type of *convexus*.

Glyphognathus umbelliferae Graham. Holotype ♀ in Hope Department, Oxford, England, Berkshire, Bagley Wood, em. 23.vii.1927 from *Phytomyza sphondylii* R.–D. on *Heracleum* (*A. H. Hamm*).

BRITAIN, IRELAND, ? AUSTRIA, CZECHOSLOVAKIA.

Biology. Reared in England from *Phytomyza sphondylii* R.–D. on *Heracleum ; Ph. pastinacae* Hend. ; *Ph. solidaginis* Hend. on *Solidago virgaurea* L.

Glyphognathus flammeus (Delucchi) **comb. n.**

Stictomischus flammeus Delucchi, 1953*a* : 211, 212, ♀.
Gitognathus flammeus Delucchi, 1955 : 68, figs. 93, 94, ♀.

Type material in Naturhistorisches Museum, Vienna (Delucchi, 1953*a* : 212). Delucchi cited two localities, Böhlerwerk an der Ybbs (Niederösterreich) (*S. Novicky*) ; Högyész (Ungarn), 27.6.1946 (*J. Erdös*) but did not designate a type specimen. I have not seen the syntypes ; however, my British specimen agrees so well with Delucchi's description that I am convinced it must be *flammeus ;* he does not mention the form of the mandibles, which would decide the question.

BRITAIN, AUSTRIA, HUNGARY. New record : England, Oxfordshire, Otmoor, 21.viii.1955, one female taken on a flower-head of *Angelica sylvestris* L. (*Graham*).

Biology. Unknown.

GITOGNATHUS Thomson

? Sphaeripalpus Förster, 1841 : 38. Type-species : *S. viridis* Förster, 1841, by monotypy.
Gitognathus Thomson, 1876*a* : 220, 232. Type-species : *G. grandiclava* Thomson, by designation of Delucchi (1955 : 67).
Gitognathus Thomson ; Schmiedeknecht, 1909 : 291, 295–296.
Gitognathus Thomson ; Delucchi, 1955 : 6, 66–74.
Gitognathus Thomson ; Peck *et al.*, 1964 : 38.
? Xestognathus Kamijo, 1960*b* : 118.

The generic name *Sphaeripalpus* Förster has priority over *Gitognathus* Thomson ;

the latter author rejected the name *Sphaeripalpus* on grounds not now considered valid, giving the genus a new name. Delucchi (1955 : 66) stated that the type material of *Sphaeripalpus viridis* Förster, the type-species of the genus, could not be found in Vienna and appeared to be lost ; consequently he adopted provisionally the name *Gitognathus* Thomson. Reinhard (1858*a* : 318, pl. 3, fig. 1c) described and figured the maxilla and palpi of the male of *Sphaeripalpus viridis* Förster, but there is no evidence that he actually saw Förster's types. If Reinhard correctly identified *S. viridis*, then that species would appear to be the same as *Gitognathus grandiclava* Thomson. The question must remain an open one until Förster's type of *viridis* is discovered.

Key to most European Species

(Females)

1 Gastral petiole smooth or mainly so. Mesoscutal notauli weak or even absent posteriorly. Antennal clava with micropilosity on third segment only ; sensilla arranged in one row on each segment of the funicle. Both mandibles with three teeth 2

– Gastral petiole, not counting the small basal stalk, wholly reticulate. Mesoscutal notauli distinct throughout. Antennal clava with micropilosity on the second and third segments, sometimes even extending on to part of the first segment ; sensilla usually arranged in two rows on all the funicular segments, occasionally in one irregular row on some of the segments. Mandibular formula 3.3 or 3.4 4

2 (1) Gastral petiole about 1·5 times as broad as long, subconical. Combined length of pedicellus and flagellum approximately equal to breadth of head ; flagellum (Text-fig. 166) distinctly clavate ; proximal segments of funicle subquadrate ; distal segments transverse. Upper surface of costal cell of fore wing bare except for a row of two to four hairs at its apex ***microstolus*** sp. n. (p. 213)

– Gastral petiole slightly to distinctly (up to 1·6 times) longer than broad, its sides in the hinder half nearly parallel. Combined length of pedicellus and flagellum distinctly greater than breadth of head ; flagellum almost filiform ; all funicular segments, except sometimes the sixth, at least slightly longer than broad. Upper surface of costal cell of fore wing with a row of several hairs, extending over the distal third or more 3

3 (2) Antenna with combined length of pedicellus and flagellum 1·35 to 1·4 times breadth of head ; sixth funicular segment at least slightly longer than broad, the other funicular segments distinctly longer than broad. Head in dorsal view about 2·15 times as broad as long. Gastral petiole 1·5 to 1·6 times as long as broad. Body usually dull green often suffused with bronze or purplish dorsally ; occasionally bright green ***laevis*** (Delucchi) (p. 212)

Antenna with combined length of pedicellus and flagellum about 1·25 times breadth of head ; sixth funicular segment subquadrate, segments two to five only very slightly longer than broad. Head in dorsal view about 2·05 times as broad as long. Gastral petiole 1·3 to 1·4 times as long as broad. Body mainly bright blue-green . . . . . ***laevigatus*** (Delucchi) (p. 213)

4 (1) Fore wing with speculum, on lower surface of wing, with at most a few (up to five) scattered hairs in the middle. Postspiracular sclerite with a weak oblique carina, or without one. Length of eye 2·8 to 3 times the malar space ***grandiclava*** Thomson (p. 211)

– Fore wing with speculum, on lower surface of wing, with more numerous hairs in the middle. Postspiracular sclerite with a more distinct oblique carina. Length of eye 3·2 to 3·35 times the malar space . ***fuscipes*** (Walker) (p. 211)

(MALES)

1 Gastral petiole smooth or mainly so. Mesoscutal notauli weak or even absent posteriorly. Both mandibles with three teeth. Maxillary stipites not modified 2

– Gastral petiole, not counting the basal stalk, wholly reticulate. Mesoscutal notauli distinct throughout. Mandibular formula 3.3 or 3.4. Maxillary stipites sometimes swollen 3

2 (1) Antenna with combined length of pedicellus and flagellum only slightly greater than breadth of head ; flagellar hairs (Text-fig. 165) standing out only slightly ; funicular segments subquadrate, or the proximal ones very slightly longer than broad. Fore wing with upper surface of costal cell bare except for a short row of two to four hairs at its apex ***microstolus*** sp. n. (p. 213)

– Antenna with combined length of pedicellus and flagellum distinctly greater than breadth of head ; flagellar hairs standing out moderately strongly ; all funicular segments longer than broad. Fore wing with upper surface of costal cell with a row of several hairs extending over the distal third or more ***laevis*** (Delucchi) (p. 212)

3 (1) Maxillary stipites swollen to form a large black sac. Antenna with hairs of flagellum standing out only slightly . . ***grandiclava*** Thomson (p. 211)

– Maxillary stipites normal, not swollen. Antenna with hairs of flagellum standing out at an angle of about 45° . . . ***fuscipes*** (Walker) (p. 211)

Gitognathus grandiclava Thomson

Lamprotatus Zipoetes Walker, 1848 : 111, 167, ♀, **syn. n.**
Gitognathus grandiclava Thomson, 1876*a* : 233, ♂ ♀.
Gitognathus grandiclava Thomson ; Delucchi, 1955 : 68, 73–74, ♂ ♀.

Type material. *Lamprotatus zipoetes* Walker. One female, LECTOTYPE, bearing a Waterhouse label. Agreement with the description is poor, hence I adopt the name *grandiclava*, which has already been recognized and which is represented by a type specimen in good condition. An application for the conservation of the name *Gitognathus grandiclava* Thomson is being submitted to the International Commission on Zoological Nomenclature.

Gitognathus grandiclava Thomson. Syntypes on 20 pins. LECTOTYPE, a female labelled " L–d " [Lund] and " ♀ ".

BRITAIN, SWEDEN.

Biology. Unknown. Imagines in June, Aug.–Sept.

Gitognathus fuscipes (Walker) **comb. n.**

Miscogaster fuscipes Walker, 1833 : 460, ♂.
? Chrysolampus punctulatus Förster, 1841 : 36–37, ♀.
Lamprotatus Rubrius Walker, 1846*a* : 111, ♂, **syn. n.**
Lamprotatus Babilus Walker, 1846*a* : 112, ♂, **syn. n.**
? Stictomischus sericeus Thomson, 1876*a* : 236, ♀.

Type material. *Miscogaster fuscipes* Walker. Syntypes, 3 specimens. LECTOTYPE, the first specimen, a male bearing a Waterhouse label.

Lamprotatus rubrius Walker. A male and a female stand under this name, but no female was described. LECTOTYPE, the male, bearing a green-bordered type label, also a Waterhouse label.

Lamprotatus babilus Walker. Syntypes. 2 specimens. LECTOTYPE, the second specimen, bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type CF.".

Stictomischus sericeus Thomson. One female and two males stand under this name, but Thomson did not mention the male. LECTOTYPE, the female specimen; this lacks the head and fore wings but may be the same as *fuscipes* (Walker).

Note. *Chrysolampus punctulatus* Förster was transferred to *Gitognathus* and regarded as a valid species by Delucchi (1955 : 68, 71—72). Delucchi also cited *Lamprotatus babilus* Walker as a synonym of *punctulatus*. I have not seen the types of *punctulatus*, which are in Förster's collection in Vienna, but from Delucchi's redescription of the species (1955 : 71–72) it seems likely to be a synonym of *fuscipes* (Walker). The differences which Delucchi mentions in his key to *Gitognathus* species (1955 : 68) as existing between *punctulatus* Förster and *sericeus* Thomson appear to be based on variable and therefore unreliable characters. Thus in a series which I believe to represent only a single species [*fuscipes* (Walker)] the last segment of the antennal funicle varies from slightly transverse to slightly longer than broad ; the median carina of the propodeum may be complete and sharp, incomplete, or partly replaced by a furrow ; whilst the oblique carina of the postspiracular sclerite (prepectus of Delucchi) may be distinct, weak, or virtually absent.

BRITAIN, SWEDEN ; uncommon.

Biology. Unknown. Otten (1942 : 227) recorded *Stictomischus sericeus* Thomson as a parasite of *Agromyza rufipes* Mg. on *Echium vulgare*, but his determination of the parasite was probably wrong. Imagines appear June–August.

Gitognathus laevis (Delucchi)

Stictomischus laevis Delucchi, 1953*a* : 213, ♀.
Gitognathus laevis Delucchi, 1955 : 69, ♀.

Type material. Holotype ♀, Hungary, Köszegi, 22.v.1944 (*Erdös*), in Hungarian Natural History Museum, Budapest ; it is labelled " Köszegi h 1944.v.22 dr. Erdös " ; " rét " ; " ♀ " ; " 14." ; and " Stictomischus laevis n. V. Delucchi det.".

BRITAIN, HUNGARY. New records :—England : Oxfordshire, Bald Hill, near Lewknor, 2 ♀, 4 ♂, 18.vii.1957 (*Graham*) ; see other records under biology below.

Biology. One female reared 17.ix.1954, from *Phytomyza solidaginis* Hend. on *Solidago virgaurea* L. collected at Eynsford, Kent ; one female reared 28.x.1954, from the same host and plant collected at Westerham, Kent (*G. C. D. Griffiths ;* material in BM(NH). The records cited suggest that two broods occur in the season.

Gitognathus laevigatus (Delucchi)

Stictomischus laevigatus Delucchi, 1953*a* : 212–213, ♀.
Gitognathus laevigatus Delucchi, 1955 : 69, 74, ♀.

Type material. Holotype ♀, Hungary, Foktö, 13.viii.1943 (*Erdös*), in Hungarian Natural History Museum, Budapest ; it is labelled " Foktö 1943 viii.13 dr. Erdös " ; " ♀ " ; " 17." ; and " Stictomischus laevigatus n. V. Delucchi det.". I have seen no other material. *G. laevigatus* is very close to *laevis ;* their respective females may be distinguished by the characters given in my key. The structure of the median carina of the propodeum, and the colour of the tibiae, characters used by Delucchi (1955) are variable in *laevis* and therefore of little value. Another character mentioned by him, the presence in *laevis* of a fine longitudinal carina on each side of the petiole, and its absence in *laevigatus*, appears to have some value although it is slightly variable. In *laevis* the carinae are usually traceable from the base to the apex of the petiole, but they are not always very distinct throughout. In the holotype of *laevigatus* the carinae are not completely absent, but are traceable in the basal half of the petiole. In *laevigatus* the head and thorax are green ; in *laevis* they are most often suffused with bronze or purplish bronze.

HUNGARY.

Biology. Unknown.

This species and *laevis* probably belong to the genus *Xestognathus* Kamijo (1960*a* : 118), described from Japan.

Gitognathus microstolus sp. n.

♀. Head and dorsum of thorax green to blue-green ; sides and ventral part of thorax with less intense metallic tints which tend towards bronze, especially on the mesepimeron ; gaster tinged with greenish and bronze. Mandibles reddish with darker teeth. Antennae black, the scape and pedicellus with a metallic gloss. Legs mainly blackish, the coxae, femora and parts of the tibiae with a greenish or bronze tinge ; trochanters partly, knees, and tarsi except their tips, testaceous ; the fore tibiae have a testaceous stripe on their inner aspect, or are wholly testaceous ; the hind tibiae sometimes have a reddish stripe along their flexor surface. Tegulae black with a metallic gloss. Wings hyaline ; venation brown. Length 1·8 to 2 mm.

Head hardly 1·2 times as broad as the mesoscutum, in dorsal view twice as broad as long or very slightly more, with temples converging somewhat and hardly one quarter the length of the eyes, POL about 1·4 OOL, the hind ocelli separated by about twice their own length from the eyes. Head in front view oval, about 1·3 times as broad as high, the genae converging moderately strongly and having a slightly curved outline ; eyes separated by 1·25 times their own length ; malar space only about one quarter the length of an eye ; breadth of oral fossa somewhat more than three times the malar space ; clypeus alutaceous, anteriorly with a shiny depression, its anterior margin with a bifid tooth on the left side and a large simple tooth on the right side, separated by a deep incision. Mandibles similar in shape, moderately large, their lower margin sinuate, both with three teeth of which the inner one is broadly rounded or subtruncate. Antennae (Text-fig. 166) inserted distinctly above the ventral edge of the eyes ; scape not nearly reaching the median ocellus, its length about equal to the transverse diameter of an eye ; combined length of pedicellus and flagellum virtually equal to the breadth of the head ; pedicellus nearly twice as long as broad, about equal in length to the anelli plus the first funicular segment ; funicle proximally not or hardly stouter than the

pedicellus, but thickening distad, its first segment quadrate, the second and third subquadrate, the fourth usually very slightly transverse, the fifth and sixth slightly transverse ; clava slightly more than twice as long as broad, its length about equal to that of the three preceding funicular segments together ; sensilla long, in a single row on each segment, sparse on the proximal segments but rather more numerous on the distal ones and on the clava.

Thorax hardly more than 1·5 times as long as broad, very strongly arched dorsally so that the dorsellum and propodeum descend at an angle of nearly 90° relative to the plane of the mesoscutum and scutellum. Pronotum with sides converging strongly forwards, the shoulders not prominent. Mesoscutum about 1·6 times as broad as long, moderately convex, its hind margin very strongly sinuate, moderately finely reticulate discally where the sculpture is distinctly raised, finely on the side lobes where the sculpture is almost alutaceous ; notauli deep only in front, otherwise superficial. Scutellum almost as long as the mesoscutum, slightly longer than broad, strongly convex, with fine reticulation which is hardly raised above the general surface ; frenum marked off by a fine impressed line ; the grooved lines which separate the scutellum from the axillae become deep anteriorly. where they curve round and join, so that the scutellum touches the mesoscutum only at a point. Dorsellum nearly smooth, slightly shorter than the frenum. Propodeum medially about half as long as the scutellum, almost truncate posteriorly ; area between the spiracles shiny, finely reticulate with its sculpture only slightly raised ; median carina fine, complete or slightly broken medially ; nucha a polished, lunate strip ; spiracles subcircular, close to the metanotum ; spiracular sulci shallow, alutaceous ; callus polished externally, otherwise with numerous hairs arising from small tubercles. Metapleuron shiny, alutaceous; mesepisternum with a polished triangular area below the hind wing, otherwise (including the mesepimeron) finely reticulate with slightly raised sculpture ; mesosternum shiny, weakly alutaceous, mesolcus fine but distinctly impressed. Postspiracular sclerite reticulate, finely below and more coarsely above, but without, or with only traces of, an oblique carina. Legs somewhat short and stout ; hind coxae with a few hairs on their dorsal surface. Fore wing twice as long as broad ; upper surface of costal cell bare or with two to three hairs at its apex, its lower surface with a complete row of hairs plus some scattered ones in the distal half ; basal cell bare except for a few hairs just below the submarginal vein, open below ; basal vein pilose ; speculum closed below, on the upper surface of the wing extending to the base of the marginal vein, on its lower surface with some scattered hairs ; marginal vein 1·25 to 1·35 times the length of the stigmal vein ; postmarginal vein 1·4 to 1·5 times as long as the marginal ; stigmal vein weakly curved, thickening slightly towards the stigma which is subcircular and large, its height about two-thirds the distance separating it from the front edge of the wing.

Gastral petiole almost cordiform, about two thirds the length of the propodeum, slightly (up to 1·5 times) broader than long, nearly smooth except posteriorly where it has a few very fine weak transverse striae. Gaster ovate, slightly longer than and about as broad as the thorax, 1·8 to 2 times as long as broad ; dorsally hardly sunken ; the basal tergite occupying about one third of the total length, with a large basal fovea, and having its hind margin sometimes weakly emarginate medially ; last tergite slightly broader than long ; ovipositor sheaths hardly exserted ; ventrally convex, the hypopygium not visible but probably extending about half way along.

♂. Differs from the female as follows :

Antenna (Text-fig. 165). Scape slightly shorter, its length somewhat less than the transverse diameter of an eye, only about three times as long as its maximum breadth, slightly expanded in its upper half, where there is an oblong, oblique shiny boss (on the outer aspect of the scape) which extends nearly half way down ; combined length of pedicellus and flagellum slightly greater than the breadth of the head ; pedicellus very slightly shorter, not or hardly longer than the first funicular segment ; flagellum only very slightly clavate, proximal funicular segments slightly elongate, the first about 1·5 times as long as broad, the fifth and sixth subquadrate ; clava about three times as long as broad, tapering to a sharper point ; flagellum

clothed with whitish hairs most of which stand out only slightly, the whorl at the base of each segment more outstanding, at an angle of about 40°.

Fore wing with speculum, on lower surface of wing, with more numerous scattered hairs ; marginal vein slightly shorter relative to the stigmal vein.

Petiole about as long as broad, only slightly shorter than the propodeum. Gaster oval, shorter and narrower than the thorax, with a ventral plica.

The female of *microstolus* sp. n. differs from that of *laevis* (Delucchi) as follows :

Colour of head and thorax brighter (green, instead of greenish varied with bronze and purplish) ; tibiae more or less infuscate. Head slightly less transverse, temples slightly less convergent ; malar space slightly shorter. Combined length of pedicellus and flagellum shorter, in *microstolus* barely equal to, in *laevis* distinctly greater than, the breadth of the head ; flagellum rather more slender proximally but thickening distinctly distad, so as to be clavate ; funicular segments shorter, in *laevis* all the segments, except sometimes the sixth, are longer than broad ; the first segment is about 1·5 times as long as broad, and about equal in length to the pedicellus. Thorax rather more strongly arched.

Fore wing with upper surface of costal cell with fewer hairs, in *laevis* there is a row extending over the distal half of the cell ; basal cell with fewer hairs, in *laevis* the cell has a few hairs apically near the basal vein, and is partly closed below ; stigma as high as long, in *laevis* tending to be very slightly longer than high.

Gastral petiole shorter, in *laevis* about as long as the propodeum and about 1·5 times as long as broad ; gaster longer, in *laevis* shorter than the thorax.

Holotype ♀. ENGLAND : Oxfordshire, Otmoor, 28.viii.1955, on *Angelica* (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. ENGLAND : Oxfordshire, Radcot, 2 ♀, 5.ix.1954, on flowers of *Angelica sylvestris* ; Otmoor, 2 ♂, 1 ♀, 27.viii.1955, in a marshy place with much *Angelica*. 3 ♂, 28.viii.1955, on *Angelica* ; Berkshire, Wytham, 1 ♀, 5.ix.1959, in a marshy place between Wytham Wood and the River Thames. Paratypes in author's collection. All the above specimens were captured by the writer.

Biology. Unknown.

I have not seen the types of the three following species, which are omitted from my key to species. They should be recognizable from the characters given by Delucchi in his key to the species (1955).

Gitognathus nitidus Delucchi

Gitognathus nitidus Delucchi, 1955 : 68, 69–70, ♀.

Type material. Holotype ♀, Germany, Wolfratshausen, iv.1950 (*F. Groschke*), in coll. Delucchi (not seen).

GERMANY.

Biology. Reared from *Phytomyza obscurella* Fln. on *Aegopodium* (Delucchi, 1955 : 70).

This appears to be a valid species. From the description it might come near the species I have assigned to the genus *Glyphognathus*.

Gitognathus gibberosus Delucchi

Gitognathus gibberosus Delucchi, 1955 : 68, 71, ♀.

Type material. Type ♀ (Hungary, locality not stated) in Hungarian National Museum, Budapest (not seen).

HUNGARY.

Biology. Unknown.

Gitognathus kerrichi (Delucchi)

Lamprotatus kerrichi Delucchi, 1953*a* : 203–204, ♀.
Gitognathus kerrichi, Delucchi, 1955 : 68, 74, ♀.

Type material. Type ♀ (locality unknown) in Naturhistorisches Museum, Vienna (not seen).

Distribution and biology unknown.

STICTOMISCHUS Thomson

Stictomischus Thomson, 1876*a* : 220, 234. Type-species : *S. scaposus* Thomson, by designation of Ashmead, 1904 : 278.
Stictomischus Thomson ; Schmiedeknecht, 1909 : 291, 296.
Stictomischus Thomson ; Delucchi, 1955 : 6, 75–90.
Stictomischus Thomson ; Kamijo, 1960 : 28–37.
Stictomischus Thomson ; Peck *et al.*, 1964 : 38.

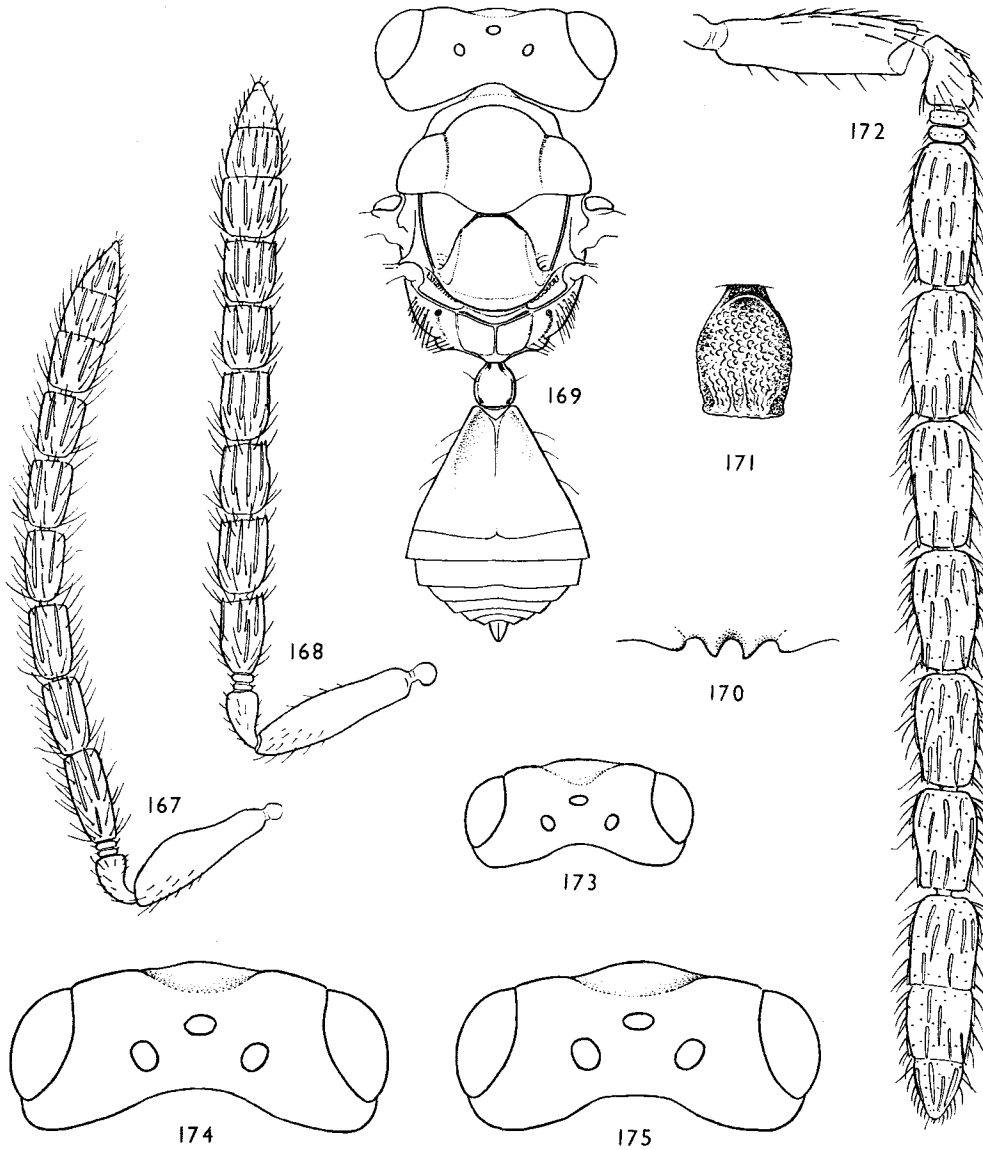
KEY TO NORTH-WEST EUROPEAN SPECIES

(FEMALES)

1 Antennal clava with micropilosity extending over the whole length of its second and third segments, and on to the distal half of the first segment. Scutellar frenum shiny, with some longitudinal carinulae, otherwise often nearly smooth. Postspiracular sclerite : oblique carina weak and irregular, or sometimes absent. Fore wing with stigma longer than high, moderate-sized ; wing without a speculum, or with an isolated bare spot below the parastigma. Both mandibles with four teeth . ***obscurus*** (Walker) (p. 224)

– Antennal clava with micropilosity either present on third segment only, or else extending at most some way along the second segment as well. Scutellar frenum finely reticulate, with or without longitudinal carinulae. Post-spiracular sclerite : oblique carina often strong and sharp. Fore wing with stigma sometimes differently shaped, or large ; wing never with an isolated bare spot below the parastigma, though most often with a narrow bare line just outside the basal vein. Left mandible sometimes with three teeth . 2

2 (1) Gaster 2·3 to 3 times as long as broad ; fully as long as, or slightly longer than, head plus thorax ; basal tergite occupying at most one third of the total length ; petiole 1·2 to 1·6 times as broad as long, subcordiform. Combined length of pedicellus and flagellum hardly greater than breadth of head ; sixth funicular segment quadrate or slightly transverse. Head and thorax black with a very weak bluish or bronze tinge ; antennal scape at least mainly testaceous . . . . . ***longiventris*** Thomson (p. 220)



FIGS. 167–175. 167, *Glyphognathus umbelliferae* Graham, ♂, antenna ; 168, same, ♀, antenna ; 169, same, ♀, body, excluding appendages ; 170, same, ♀, clypeus ; 171, *Stictomischus scaposus* Thomson, ♀, gastral petiole ; 172, *Stictomischus lamprosomus* sp. n., ♀, antenna ; 173, *Stictomischus tumidus* (Walker), ♂, head ; 174, *Stictomischus gibbus* (Walker), ♂, head ; 175, *Stictomischus lamprosomus* sp. n., ♂, head.

– Gaster at most twice as long as broad, not or hardly longer than the thorax ; if as much as twice as long as broad, then basal tergite occupying nearly or quite half the total length, and petiole not transverse. Combined length of pedicellus and flagellum 1·15 to 1·5 times breadth of head ; sixth funicular segment usually longer than broad, rarely quadrate. Head and thorax varying from bronze-green through green to violet-blue. Gastral petiole usually as long as or longer than broad, only occasionally transverse. . 3

3 (2) Both mandibles with four teeth. Antenna with first funicular segment not or hardly longer than the pedicellus, the latter (in dorsal view) 1·6 to 1·7 times as long as broad ; scape entirely blackish, or at most pale at the extreme base. POL slightly greater than OOL. Gastral petiole 1·7 to 2 times as long as broad, its sides virtually parallel. Small species, 2·2 mm. or less ; legs relatively dark, the tibiae usually more or less infuscate, sometimes almost entirely so. Gaster shorter than thorax, 1·1 to 1·5 times as long as broad. Stigma of fore wing nearly as high as long, tending to be subcircular or subrectangular in shape . . . ***tumidus*** (Walker) (p. 221)

Left mandible with three teeth, right mandible with four. Antenna with first funicular segment distinctly longer than the pedicellus, the latter usually less than 1·6 times as long as broad ; scape at least broadly pale at base, sometimes wholly pale. POL about equal to, or even a little less than, OOL. Species often larger ; tibiae often wholly pale, rarely heavily infuscate. Gaster sometimes rather longer. Stigma of fore wing sometimes differently shaped 4

4 (3) Gastral petiole (Text-fig. 171) with the main, sculptured portion raised above the basal stalk, and bounded anteriorly by an arcuate crest. Large species, 2·7 to 3·6 mm. Stigma of fore wing at least slightly longer than high, tending to be subtriangular in shape. Scutellar frenum more coarsely sculptured than the rest and usually with some longitudinal carinulae ***scaposus*** Thomson (p. 220)

– Gastral petiole with the main, sculptured portion not bounded anteriorly by a raised crest. Species sometimes relatively smaller, or with stigma differently shaped 5

5 (4) Gastral petiole about twice as long as broad, reaching to level of tips of hind coxae. Thorax only moderately arched dorsally ; metanotum and propodeum sloping at an angle of 45° or less relative to the plane of the mesoscutum and scutellum ; propodeum medially weakly sculptured and shiny. Antenna (Text-fig. 172) with combined length of pedicellus and flagellum 1·5 times breadth of head ; funicular segments relatively long (the first 2 to 2·2, the sixth 1·6 to 1·75 times, as long as broad) ***lamprosomus*** sp. n. (p. 222)

– Gastral petiole at most 1·7 times as long as broad, at least not quite reaching the level of the tips of the hind coxae. Thorax more strongly arched dorsally ; metanotum and propodeum sloping more steeply. Antenna with combined length of pedicellus and flagellum 1·15 to 1·25 times breadth of head ; funicular segments relatively shorter (the first 1·6 to 1·9, the sixth 1 to 1·5 times, as long as broad) 6

6 (5) Fore wing with stigma fully as high as long, tending to be subrectangular or subcircular in shape. Large species, 2·7 to 3·2 mm. Scutellar frenum reticulate, without evident longitudinal carinulae . ***gibbus*** (Walker) (p. 220)

– Fore wing with stigma at least slightly longer than high, often more subtriangular in shape. Smaller species, at most 2·5 mm. Scutellar frenum less uniformly sculptured, most often with some longitudinal carinulae as well as reticulation . . . . . ***groschkei*** Delucchi agg. (p. 221)

(MALES)

1 Scutellar frenum shiny, with some longitudinal carinulae, but otherwise weakly reticulate or nearly smooth. Postspiracular sclerite with oblique carina weak and irregular, or absent. Fore wing with stigma longer than high, moderate-sized ; no bare line just outside the basal vein, but sometimes an isolated bare spot a little below the parastigma. Both mandibles with four teeth 2

– Scutellar frenum not very shiny, finely reticulate, with or without longitudinal carinulae. Postspiracular sclerite with oblique carina usually strong and sharp. Fore wing with stigma sometimes as high as long, sometimes large ; often a bare line just outside the basal vein, but no isolated bare spot below the parastigma. Left mandible with three teeth except in *tumidus*, which has a very sharp oblique carina on the postspiracular sclerite . . . 3

2 (1) All femora, tibiae, and tarsi except their tips, yellow. Mesoscutum mainly with delicate engraved sculpture. Sculptured part of gastral petiole somewhat broader than long . . . . . ***lesches*** (Walker) (p. 225)

– Femora infuscate at least proximally. Mesoscutum, at least mainly, with scaly-reticulate sculpture which is slightly raised above the general surface. Sculptured part of gastral petiole as long as or longer than broad ***obscurus*** (Walker) (p. 224)

3 (1) Gastral petiole with the main, sculptured portion raised above the basal stalk, and bounded anteriorly by an arcuate crest. Antennal scape at least mainly testaceous. Left mandible with three teeth, right mandible with four. Hairs of flagellum standing out only slightly ***scaposus*** Thomson (p. 220)

– Gastral petiole with the main, sculptured part not delimited anteriorly by a crest. Antennal scape at most broadly testaceous basally . . . 4

4 (3) POL slightly greater than OOL ; head in dorsal view (Text-fig. 173) only 2·2 to 2·25 times as broad as long, with temples rounded posteriorly. Both mandibles with four teeth. Antenna with hairs of flagellum standing out at an angle of about 45°. Small species, not more than 2·2 mm., with relatively dark legs. Fore wing with stigma tending to be subcircular or subrectangular . . . . . ***tumidus*** (Walker) (p. 221)

– POL about equal too, or even a little less than, OOL ; head in dorsal view (Text-figs. 174, 175) rather more transverse, or with the temples rather more prominent. Left mandible with three teeth, right with four. Species sometimes with hairs of flagellum standing out less strongly, or larger, or with stigma differently shaped 5

5 (4) Antenna with combined length of pedicellus and flagellum about 1·75 times breadth of head ; hairs of flagellum standing out at an angle of about 45° ; scape slightly expanded above its middle, its outer surface with a shiny boss which extends nearly half way down. Large species, 2·5 to 3·3 mm. Thorax not strongly arched dorsally ; metanotum and propodeum sloping at an angle of about 45° relative to the plane of the mesoscutum and scutellum. Propodeum shiny medially, on either side of the median carina ***lamprosomus*** sp. n. (p. 222)

– Antenna with either combined length of pedicellus and flagellum at most 1·6 times breadth of head ; or hairs of flagellum standing out only slightly, and size at most 2·3 mm. Thorax usually more strongly arched dorsally with metanotum and propodeum sloping at a steeper angle . . . 6

6 (5) Fore wing with stigma fully as high as long, tending to be subcircular or subrectangular in shape. Large species, 2·7 to 3·2 mm. Scutellar frenum reticulate, without any obvious longitudinal carinulae. Antenna with

scape slightly expanded above the middle, its outer surface with a shiny boss which extends fully half way down ; hairs of flagellum standing out only very slightly.
Head, Text-fig. 174 . . . . . ***gibbus*** (Walker) (p. 220)

– Fore wing with stigma at least slightly longer than high, often tending to be subtriangular in shape. Smaller species, at most 2·5 mm. Scutellar frenum less uniformly sculptured and often with some distinct longitudinal carinulae 7

7 (6) Antenna with hairs of flagellum standing out at angle of about 45° ; external surface of scape with a relatively indistinct boss which extends less than half way down. Gastral petiole at most about 1·5 times as long as broad. Fore wing with speculum represented by a (sometimes narrow) bare line just outside the basal vein ; stigma tending to be subtriangular in shape ***groschkei*** Delucchi (p. 221)

– Antenna with hairs of flagellum standing out only slightly ; external surface of scape with a distinct boss which extends about half-way down. Gastral petiole 1·6 to 2 times as long as broad. Fore wing with speculum absent ; stigma subrectangular in shape . . . . ?***miniatus*** Delucchi (p. 225)

Stictomischus longiventris Thomson

Stictomischus longiventris Thomson, 1876*a* : 237, ♀.
Stictomischus longiventris Thomson ; Delucchi, 1955 : 77, 79, 81, ♀.

Type material. There are 8 specimens in Thomson's collection but only one bears the correct locality-data. This specimen is designated LECTOTYPE ; it is labelled " Sm Bhn " [Småland, Boheman] and (in Thomson's handwriting) " longiven=tris Ths ". The male is unknown.

SWEDEN, GERMANY ; ? AUSTRIA.
Biology. Unknown.

Stictomischus scaposus Thomson

Stictomischus scaposus Thomson, 1876*a* : 235, ♂ ♀.
Stictomischus scaposus Thomson ; Delucchi, 1955 : 78, 86–88, ♂ ♀.

Syntypes, 5 specimens. LECTOTYPE, a female labelled " Scan camp " and " scaposus Ths ". Thomson published no locality for *scaposus* but in his own hand-copy of his " Hymenoptera Scandinaviae " he wrote against *scaposus* a pencilled note : " Sallsynt, funnen i Skåne vid Lindholmen Yddinge och in Småland ".

BRITAIN, IRELAND, SWEDEN, GERMANY, AUSTRIA, RUMANIA, U.S.S.R. Not uncommon in the British Isles ; I sweep it most often from foliage of bracken (*Pteridium aquilinum* L.).

Biology. Reared in England as parasite of *Phytobia* (=*Dizygomyza*) *hilarella* (Zett.) (*R. R. Askew*) ; this fly mines the fronds of *Pteridium* and other ferns.

Stictomischus gibbus (Walker)

Miscogaster gibba Walker, 1833 : 459, ♀.
Chrysolampus sublaevis Förster, 1841 : 37, ♂.

Chrysolampus phyllochlorus Förster, 1841 : 37, ♀.
Stictomischus pleuralis Thomson, 1876*a* : 236, ♀.
Stictomischus gibbus (Walker) ; Delucchi, 1955 : 77, 81–83, ♂ ♀.

Type material. *Miscogaster gibba* Walker. One female, LECTOTYPE (but possibly holotype), bearing a Waterhouse label.

Stictomischus pleuralis Thomson. Syntypes, 4 specimens. LECTOTYPE, a female labelled " Sthm " [Stockholm] and " pleuralis Ths ".

Chrysolampus sublaevis Förster and *Ch. phyllochlorus* Förster were placed in synonymy with *gibbus* (Walker) by Delucchi (1955 : 81). I have not seen the types of Förster's species but accept Delucchi's opinion.

BRITAIN, SWEDEN ; rather uncommon.

Biology. Recorded from Sweden as a parasite of *Amaurosoma flavipes* (Fln.) and *A. armillatum* Zett. (Dipt., Scatophagidae) (Secrétariat, etc., 1957 : 321, 330). Otten (1942 : 226) recorded *Stitomischus pleuralis* Thomson from Germany as a parasite of *Chylizisoma vittata* Mg. on *Listera ovata* L., but I agree with Delucchi who considered (1955 : 83) that Otten's determination of the parasite was probably wrong. Imagines June–July.

Stictomischus tumidus (Walker)

Miscogaster tumida Walker, 1833 : 463, ♀.
Stictomischus rugicollis Thomson, 1876*a* : 236, ♂ ♀, **syn. n.** [*nec* Delucchi, 1955].
Stictomischus tumidus (Walker) Delucchi, 1955 : 78, 84–85, ♂ ♀.

Type material. *Miscogaster tumida* Walker. A male and a female stand under this name. The female is designated LECTOTYPE ; it bears a Waterhouse label, also one in C. Ferrière's handwriting " Type CF ".

Stictomischus rugicollis Thomson. Syntypes, 8 specimens. The only type localities which Thomson specifically mentions are Tvedora, Båstad, and Lund. A female labelled " Ld 8/6 " and " L–d " [Lund] is designated LECTOTYPE. Delucchi (1955 : 88) treated *rugicollis* as a distinct species. However, the only specimen in Thomson's collection which agrees with Delucchi's description of supposed *rugicollis* is the first in the series ; it was taken at Ringsjö and therefore cannot be the type, moreover it disagrees with Thomson's description, which Delucchi can hardly have consulted. Delucchi's supposed *rugicollis* is evidently very near, and might be the same as, *groschkei* Del.

BRITAIN, SWEDEN, GERMANY, AUSTRIA, CZECHOSLOVAKIA. Rather uncommon ; in England I have swept it from the foliage of *Quercus robur* and *Q. petraea*.

Biology. Unknown. Imagines captured in May, July and August.

Stictomischus ? groschkei Delucchi

? Stictomischus groschkei Delucchi, 1953*a* : 212, ♂ ♀.
? Stictomischus groschkei Delucchi, 1955 : 78, 83, ♂ ♀.

Type material (not seen). Type ♀, from material reared from *Phytomyza*

aconitophila Hendel, Preisberg near Berchtesgaden, Germany (*F. Groschke*), in coll. Delucchi.

? BRITAIN ; GERMANY.

Delucchi's original host-record was *Phytomyza aconitophila* Hend. on *Aconitum*. The British specimens presumed to be *groschkei* were reared from *Agromyza spiraeae* Kalt. on *Filipendula ulmaria* (L.), *Phytomyza sphondylivora* Spencer, and *Calycomyza artemisiae* (Kalt.) on *Eupatorium cannabinum* L. (*G. C. D. Griffiths*) ; material in BM(NH)). Imagines June–August.

Stictomischus lamprosomus sp. n.

(Text-figs. 172, 175)

♀. Body green, more or less tinged with golden in places, especially on the vertex and the sides of the mesoscutum. Mandibles reddish to brown, with fuscous teeth and base. Antennal scape testaceous, its tip fuscous ; pedicellus and flagellum blackish. Coxae concolorous with the body ; rest of legs testaceous, with the fore femora broadly banded with blackish medially, the mid and hind femora slightly brownish medially in one specimen, the fifth segment of the mid and hind tarsi and the pretarsi of all the legs, brown. Tegulae blackish with a metallic gloss. Wings subhyaline ; venation brownish, with the submarginal vein, parastigma and stigma fuscous. Length 3 to 3·2 mm.

Head about 1·25 times the breadth of the mesoscutum ; in dorsal view about 2·25 times as broad as long with temples converging rather strongly behind the eyes, and from hardly one fifth to nearly one quarter the length of the eyes, POL approximately equal to OOL ; head in front view subtrapeziform with the genae converging in straight lines towards the mouth ; eyes separated by about 1·35 times their length, their inner orbits virtually parallel ; malar space virtually one third the length of an eye ; breadth of oral fossa three times the malar space ; clypeus shiny, nearly smooth, its anterior margin deeply incised medially, with a double tooth on the left side and a large single tooth on the right side of the incision, the clypeus above the incision with a median depression ; mandibles rather large, their lower margin sinuate, the left with three and the right with four teeth, the outer tooth of each acute, the inner one truncate, the intervening ones subobtuse ; the head apart from the clypeus is very finely reticulate, the sculpture slightly raised above the surface ; antennal toruli separated from eyes by about 1·5 times their distance apart. Antennae (Text-fig. 172) inserted well above the level of the ventral edge of the eyes ; scape short, its length somewhat more than half the length, and less than the transverse diameter of an eye, not reaching the median ocellus ; combined length of pedicellus and flagellum about 1·5 times the breadth of the head ; pedicellus in profile barely 1·5 times as long as broad, about half the length of the first funicular segment ; funicle slender, proximally slightly stouter than the pedicellus, filiform or even tapering very slightly distad, its first segment 2 to 2·2 times, the sixth 1·6 to 1·75 times, as long as broad ; the funicular segments are distinctly separated from each other while each is a little swollen proximally and tapers slightly distad ; clava hardly broader than the sixth funicular segment, slightly more than three times as long as broad, its length about equal to that of the two preceding funicular segments together, its first segment distinctly elongate and somewhat less than half the total length of the clava ; there is a patch of micropilosity on the third claval segment, and a few hairs of the same type on the distal part of the second segment ; sensilla numerous, relatively short, arranged in three irregular rows on each funicular segment, and in two rows on each claval segment.

Thorax about 1·8 times as long as broad, therefore relatively elongate for the genus, only moderately arched dorsally, the dorsellum and propodeum sloping at an angle of about 45° to the tangential plane of the mesoscutum and scutellum. Pronotum narrowing forwards, not

prominent at the shoulders. Mesoscutum about 1·6 times as broad as long, somewhat glittering, with very fine slightly raised scaly-reticulation, and with numerous hairs which arise from minute tubercles ; mid and side lobes convex, notauli deeply impressed ; hind margin of mesoscutum strongly sinuate. Scutellum only moderately convex, slightly longer than broad, slightly shorter than the mesoscutum, separated from the latter by a broad sculptured depression, with very fine engraved reticulation, with a short median longitudinal groove at the base ; frenum marked off by a distinct line, sculptured much like the rest of the scutellum but with in addition some longitudinal costulae. Dorsellum large, only about twice as broad as long, slightly shorter than the frenum, shiny and nearly smooth. Propodeum not strongly transverse, long, medially about two thirds as long as the scutellum, its sides converging posteriorly, the nuchal area distinctly produced backwards beyond the bases of the hind coxae ; area between the spiracles nearly smooth medially, alutaceous laterally ; median carina fine, complete (in one specimen, double), plicae sharp over hinder half of the sclerite ; along the base of the propodeum there are several short longitudinal costulae ; nucha a convex, almost semicircular, polished boss ; spiracles subcircular, separated by slightly less than their diameter from the metanotum ; spiracular sulci strongly impressed, punctate ; supracoxal flanges broad, oblique but only slightly curved ; callus with numerous bristles ; also several bristles between each plica and the corresponding spiracular sulcus. Metapleuron and mesepimeron with fine, slightly raised reticulation, the mesepimeron marked off anteriorly by a curved punctate line. Postspiracular sclerite finely reticulate, its lateral panel, marked off by a strong oblique carina, forming a shiny, nearly smooth, and almost equilateral triangle. Fore wing with costal cell (lower surface) with scattered hairs which are more numerous distad, upper surface with two to three rows of hairs in the distal half ; basal cell hairy except for a longitudinal strip in its lower half ; basal vein pigmented except in its upper third ; speculum absent on both surfaces of the wing : marginal vein about 1·7 times as long as the stigmal vein ; postmarginal vein about 1·25 times as long as the marginal ; stigmal vein curved, stigma large, separated by only about 1·5 times its height from the costal edge of wing, slightly longer than high, subtrapeziform (slightly higher basally than apically).

Petiole of gaster about as long as the propodeum and reaching level with the tips of the hind coxae, 1·8 to 2 times as long as broad, with very fine but raised reticulation, its sides subparallel except in the proximal quarter where they converge to the junction with the propodeum. Gaster ovate, convex dorsally and ventrally, slightly shorter than the thorax, about 1·7 times as long as broad ; basal tergite occupying somewhat less than half the total length, its hind margin entire but strongly curved ; tip of hypopygium situated about half way along the gaster.

♂. Differs from the female as follows :

Antennal scape black with a metallic tinge. All femora blackish medially (the mid pair only beneath). Antennal scape slightly shorter, 2·7 to 2·9 times as long as broad, narrowest proximally and expanding slightly distad, its outer surface with a small shiny boss in the upper half, otherwise alutaceous ; combined length of pedicellus and flagellum 1·75 to 1·8 times the breadth of the head ; funicular segments more elongate, the first about three times as long as broad and about 2·5 times the length of the pedicellus, the sixth about 2·5 times as long as broad ; clava 4·3 to 4·6 times as long as broad, more pointed apically, a little shorter than the two preceding funicular segments together ; hairs of flagellum longer, their length nearly two thirds the breadth of the segments which bear them, and standing out at an angle of about 45° ; sensilla sparser. Gastral petiole with its sides slightly curved. Gaster narrower than the thorax, widening gradually from its base to near the apex, which is ± obtuse ; basal tergite occupying half or rather more than half the total length, its hind margin nearly straight.

The combination of long and slender flagellum, elongate and not strongly arched thorax, shiny propodeum, and elongate petiole, makes this a very distinct species. In the general shape of the thorax, the deep notauli, and the flagellum, it somewhat resembles *obscurus* (Walker), but it differs from it greatly in other respects. Neither is it at all near any of the other European species. It is, however, evidently very close to the Japanese species *elongatus*

described by Kamijo (1960 : 30). According to the description, the female of *elongatus* has the malar space slightly more than one quarter the length of an eye, whereas in *lamprosomus* it is virtually one third ; the stigma of the fore wing in *elongatus*, according to Kamijo's figure (1960, fig. 3B) is somewhat smaller than that of *lamprosomus*, being separated by about 1·8 times its height from the costal edge of the wing (in *lamprosomus* by only about 1·5 times its height). In some other small details *lamprosomus* does not quite fit the description of *elongatus* and therefore I presume it to be a valid species. I have not had an opportunity of examining the type of *elongatus*.

Holotype ♀. ENGLAND : Berkshire, Cothill, 19.v.1957 (*Graham*), in the Hope Department, University Museum, Oxford.

Paratypes. SCOTLAND : Wester Ross, Arisaig, Sunisletter, 1 ♂, 1 ♀, 2.vii.1961, swept in a marshy place near a small wood composed of oak, birch and sallow (*Salix aurita* L.) ; 1 ♂, 5.vii.1961, beaten either from *Betula* or *Salix aurita* near Kinloid farm (*Graham*), in the author's collection.

Biology. Unknown.

Stictomischus obscurus (Walker)

Miscogaster obscura Walker, 1833 : 459, ♂ ♀.
Miscogaster obscuripennis Walker, 1833 : 460, ♂ ♀.
Miscogaster chrysochlora Walker, 1833 : 461, ♂ ♀.
Chrysolampus splendens Förster, 1841 : 37, ♀.
Chrysolampus subquadratus Förster, 1841 : 37, ♀.
Lamprotatus Mallius Walker, 1848 : 111, 166, ♂.
Stictomischus obscurus (Walker) Delucchi, 1955 : 79, 89–90, ♂ ♀.

Type material. *Miscogaster obscura* Walker. Of the specimens standing under this name only 5 appear to be original material. One of these, a female bearing a Waterhouse label, is designated LECTOTYPE.

Miscogaster obscuripennis Walker. Syntypes, 3 specimens. LECTOTYPE, a female bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type CF ".

Miscogaster chrysochlora Walker. Syntypes, 3 specimens. LECTOTYPE, the first, a female with Waterhouse label, also one in C. Ferrière's handwriting " Type CF ".

Lamprotatus mallius Walker. One male, LECTOTYPE, bearing a Waterhouse label.

I have not seen the types of *Chrysolampus splendens* Förster and *Ch. subquadratus* Förster but accept Delucchi's synonymy (Delucchi, 1955 : 89).

BRITAIN, IRELAND, FRANCE, SWEDEN, GERMANY, SWITZERLAND, AUSTRIA, CZECHOSLOVAKIA, U.S.S.R. Common in Britain.

Biology. Cameron (1935 : 299) recorded having reared *obscurus* from puparia of *Pegohylemyia seneciella* Meade (Dipt., Anthomyiidae) in capitula of *Senecio jacobaea* L. in Britain ; the specimens have not been seen, and confirmation of the record is desirable. Imagines appear June–July.

Stictomischus lesches (Walker) **comb. n.**

Lamprotatus Lesches Walker, 1844*a* : 336, ♂.

Syntypes, 2 ♂. LECTOTYPE, the first specimen (Type Hym. 5. 799a), bearing a Waterhouse label.

This is very close to *obscurus* (Walker) but differs from all the specimens of that species which I have seen in the characters given in my key. No material other than the types has been seen.

NORWAY, Alten (type-locality) ; taken by F. Walker [during his visit in the summer of 1836].

Biology. Unknown.

Stictomischus cumatilis Delucchi

Stictomischus cumatilis Delucchi, 1953*a* : 210–211, ♀.
Stictomischus cumatilis Delucchi, 1955 : 77, 81, ♀.

Type material. Type (? holotype) ♀, Austria, Böheimkirchen, 1910 (*J. Fahringer*), in Naturhistorisches Museum, Vienna (not seen).

AUSTRIA.

Biology. Parasite of a mining Dipteron on *Aruncus silvester* Kostel (Delucchi, 1953*a* : 211).

Stictomischus maculatus Delucchi

Stictomischus maculatus Delucchi, 1953*a* : 213–214, ♀.
Stictomischus maculatus Delucchi, 1955 : 77, 81, ♀.

Type material. Type (? holotype) ♀, Austria, neighbourhood of Vienna, viii.1919 (*J. Fahringer*), in Naturhistorisches Museum, Vienna (not seen).

AUSTRIA.

Biology. Parasite of *Phytomyza angelicae* Kalt. (Delucchi, 1953*a* : 214).

Stictomischus miniatus Delucchi

Stictomischus miniatus Delucchi, 1953*a* : 214, ♀.
Stictomischus miniatus Delucchi, 1955 : 78, 83, ♀.

Type material. Type ♀ (locality unknown) in Naturhistorisches Museum, Vienna (not seen).

GERMANY.

Biology. Reared in Germany from *Phytomyza actaeae* Hendel on *Actaea* (*F. Groschke*) ; the type female also from a mining Dipteron on *Actaea* (probably the host cited above).

Stictomischus nitentis Delucchi

Stictomischus nitentis Delucchi, 1955 : 90, ♂.

Type material. Type (? holotype) ♂, Germany, Wolfratshausen, 19.vii.1951 (*F. Groschke*), in coll. Delucchi (not seen).

GERMANY.

Biology. Parasite of *Chylizosoma* [= *Parallelomma*] sp. (Dipt., Scatophagidae) on *Majanthemum* (Delucchi, 1955 : 90).

MISCOGASTER Walker

Miscogaster Walker, 1833 : 371, 458. Type-species : *M. hortensis* Walker, by designation of Ashmead, 1904 : 278, 381.
Mischogaster Walker ; Thomson, 1876*a* : 220, 239 [invalid emendation].
Miscogaster Walker ; Ashmead, 1904 : 278, 279.
Miscogaster Walker ; Schmiedeknecht, 1909 : 291, 295, [*ex parte*].
Miscogaster Walker ; Nikol'skaya, 1952 : 244–245.
Miscogaster Walker ; Delucchi, 1953*a* : 214–215.
Miscogaster Walker ; Delucchi, 1955 : 7, 55–59.
Miscogaster Walker ; Peck *et al.*, 1964 : 38.

Delucchi's account of *Miscogaster* (1955) is unsatisfactory. He misinterpreted *M. elegans* Walker (hence the synonymy which he listed under that species is incorrect) ; and in his key to the species (1955 : 56) he used some characters which are variable and not reliable (shape of gastral petiole, pilosity of antennal clava, plicae of propodeum). I have constructed a new key based on a study of the types of the species involved and of much British and foreign material compared with the types. Some of the species are not easy to distinguish ; I believe that others, as yet undescribed, exist on the Continent of Europe.

KEY TO SPECIES

(FEMALES)

1 Antennal scape not reaching the median ocellus, its length only slightly greater than half that of an eye, and distinctly less than the transverse diameter of an eye. All tibiae, trochanters, and femora testaceous ***elegans*** Walker (p. 228)

Antennal scape reaching at least to the level of the lower edge of the median ocellus, its length about two thirds that of an eye, and from nearly as great, to slightly greater than, the transverse diameter of an eye. In most specimens at least the mid tibiae have a dark spot at their tips, or else the tibiae are more extensively infuscate ; femora and trochanters sometimes more or less infuscate 2

2 (1) Antenna (Text-fig. 176) with first funicular segment 2 to 2·3 times as long as broad, and 1·6 to 1·9 times as long as the pedicellus ; sixth segment 1·6 to 2 times as long as broad ; clava slightly shorter than, or at most as long as, funicular segments five plus six ; flagellum virtually filiform ; only the second and third segments of the clava with micropilosity. Eye 3·5 to 4·4 times as long as malar space. Large species, 2·2 to 3 mm. ***rufipes*** Walker (p. 230)

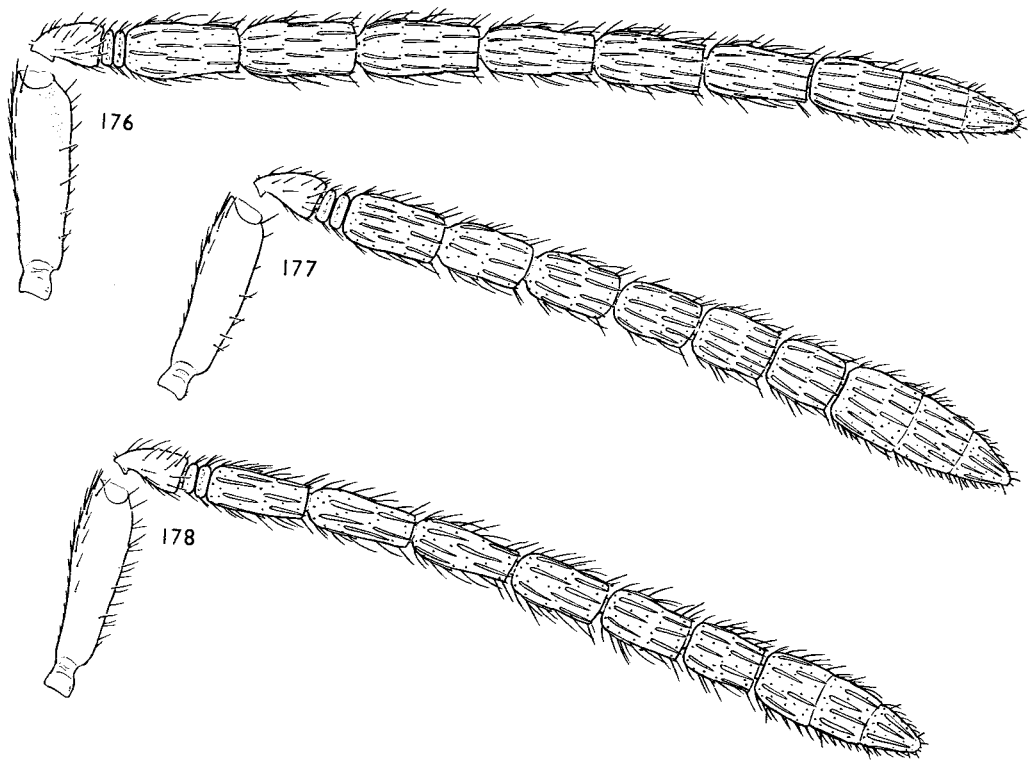
– Antennae (Text-figs. 177, 178): *either* the funicular segments are relatively shorter, the first 1·61 to 1·85 times, sixth 1·3 to 1·5 times, as long as broad, and the clava is at least slightly longer than funicular segments five plus six ; *or* the first funicular segment is at most 1·4 times as long as the pedicellus. Flagellum often slightly clavate. Micropilosity of clava usually extending at least a little way on to the first segment. Species often smaller (length 1·6 to 2·5 mm.) 3

3 (2) Legs relatively stouter, especially the hind femora which, excluding the trochantellus, are only 3·8 to 4·5 times as long as broad. Antennal flagellum (Text-fig. 177) relatively stouter, proximally slightly broader than the pedicellus in profile. Gastral petiole tending to be short (1·5 to 1·8 times as long as broad). Body almost always bright green or blue-green

hortensis Walker (p. 230)

– Legs relatively more slender, especially the hind femora which, excluding trochantellus, are about five times as long as broad. Antennal flagellum (Text-fig. 178) relatively more slender, proximally not or hardly stouter than the pedicellus in profile. Gastral petiole tending to be relatively longer. Body varying from bright green or blue to dull bronze

maculata Walker (p. 231)



FIGS. 176–178. *Miscogaster* spp., ♀, antennae. 176, *rufipes* Walker ; 177, *hortensis* Walker ; 178, *maculata* Walker.

(MALES)

1 Antennal flagellum (Text-fig. 179) noticeably hairy, its hairs standing out at an angle of about 45° and relatively long ; scape not expanded distally, about three times as long as broad, hardly more than half as long as an eye, its external surface wholly reticulate. Legs (except coxae) yellowish testaceous, with the fifth tarsal segment usually fuscous, occasionally segments two to four of the hind tarsi dusky above. Eye rather more than four times as long as malar space . . . . . ***elegans*** Walker (p. 228)

– Antennal flagellum (Text-figs. 180–182) not noticeably hairy, its hairs subadpressed (or at most a few of them outstanding) and relatively short ; scape sometimes expanded distally, distinctly more than half as long as an eye, its outer surface with at least a small smooth boss at the distal end. At least the mid tibiae slightly infuscate at their tips ; mid tarsi blackish with at most their first segment pale ; sometimes the hind tibiae, the tarsi, and the femora, are more or less infuscate 2

2 (1) Antennal scape (Text-figs. 180, 181) strongly expanded in its distal half, only 2 to 2·6 times as long as broad, the smooth boss on the outer surface extending at least half way down the scape 3

– Antennal scape (Text-fig. 182) only slightly expanded distally, the smooth boss extending at least slightly less than half way down 4

3 (2) Eye 4·1 to 6 times as long as the malar space. Mid tarsi black with only the proximal half to two thirds of their first segment pale or whitish-testaceous. Segments of antennal funicle often with four rows of sensilla (Text-fig. 180) ***rufipes*** Walker (p. 230)

– Eye 3·1 to 3·4 times as long as the malar space. Mid tarsi black with their first segment wholly or mainly testaceous. Segments of antennal funicle with three rows of sensilla (Text-fig. 181) . . . . . sp. indet.

4 (2) Hind femora, excluding trochantellus, stout, hardly more than four times as long as broad. Antennal flagellum (Text-fig. 182) relatively stouter ; funicular segments shorter, the first hardly or only just twice as long as broad, the middle segments 2 to 2·25 times as long as broad ***hortensis*** Walker (p. 230)

– Hind femora more slender, excluding the trochantellus, 4·8 to 5·7 times as long as broad. Antennal flagellum relatively more slender ; funicular segments longer, the first 2·2 to 2·25 times as long as broad, the middle segments 2·5 to 2·8 times as long as broad . . ***maculata*** Walker (p. 231)

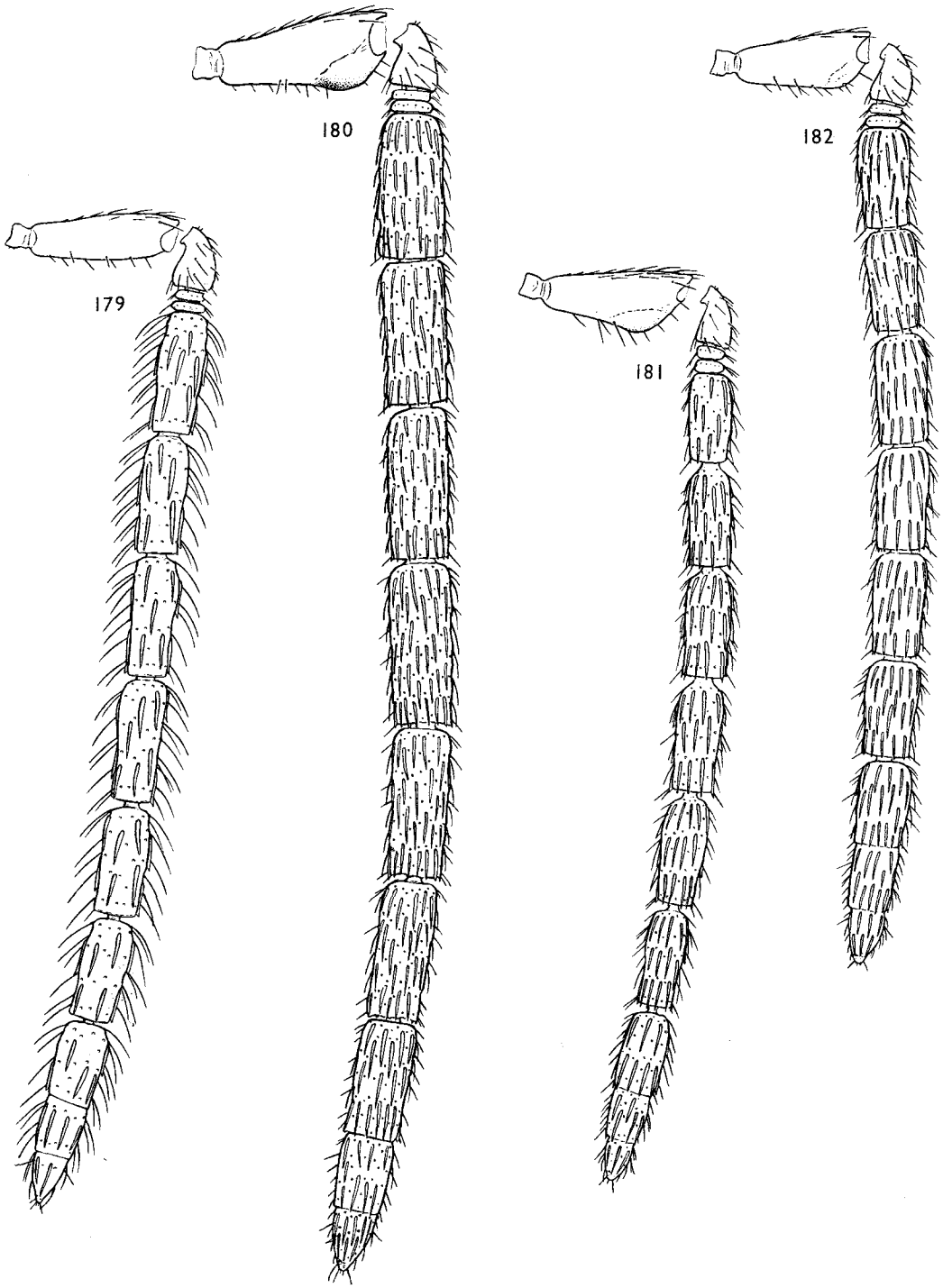
Miscogaster elegans Walker

Miscogaster elegans Walker, 1833 : 459, ♂ ♀.
? Chrysolampus punctiger Nees, 1834 : 131, ♀.
Lamprotatus Helenor Walker, 1846*a* : 111, ♂, **syn. n.**
Miscogaster gracilipes Thomson, 1876*a* : 239, ♀ [*ex parte*].
? Stictomischus discedens Otten, 1942 : 227, pl. 4, figs. 3, 4, ♀.

Type material. *Miscogaster elegans* Walker. Syntypes, 5 specimens. LECTOTYPE ♀, the second in the series, bearing a Waterhouse label.

Chrysolampus punctiger Nees. Types destroyed.

Lamprotatus helenor Walker. One male, which has the gastral petiole abnormally short (teratological) ; Walker is hardly likely to have had more than one specimen showing such an abnormality, therefore this male is presumed to be the holotype.



FIGS. 179–182. *Miscogaster* spp., ♂, antennae. 179, *elegans* Walker ; 180, *rufipes* Walker ; 181, sp. indet. ; 182. *hortensis* Walker.

Stictomischus discedens Otten. Types not seen ; it seems possible that the species might be a form of *elegans*. Otten's material was reared from a Dipterous mine on *Pulmonaria* sp.

BRITAIN, SWEDEN, GERMANY, CENTRAL EUROPE. Common in Britain.

Biology. Chiefly a parasite of *Agromyza reptans* Fln. on *Urtica dioica* L. ; but also parasitizes *A. anthracina* Mg. on the same plant ; *Phytomyza symphyti* Hend. on *Symphytum officinale* L. ; and *Phytobia labiatarum* (Hend.) on *Teucrium scorodonia* L. (British records, material bred by *G. C. D. Griffiths* and *K. A. Spencer*). Imagines May–June and Sept.–Nov.

Miscogaster rufipes Walker

Miscogaster rufipes Walker, 1833 : 459, ♂ ♀.
Miscogaster gracilipes Thomson, 1876*a* : 239, [*ex parte* (♂)].
? Miscogaster fulgens Delucchi, 1953*a* : 214, ♂ ♀.
Miscogaster rufipes Walker ; Bouček, 1965*e* : 7.

Type material. *Miscogaster rufipes* Walker. Syntypes, 1 ♀, 2 ♂. LECTOTYPE, the female specimen, bearing a Waterhouse label and another in Ch. Ferrière's handwriting " Type C.F.".

Miscogaster gracilipes Thomson. Thomson's description of the male (1876 : 240) applies well to the male of *rufipes* Walker and there is a male of this in his series.

Miscogaster fulgens Delucchi. Type, Germany, Mindelheim, 10.v.1952, from *Agromyza reptans* Fln. (*Groschke*) in coll. Delucchi (not seen by the writer). From the description it may well be the same as *rufipes* Walker.

BRITAIN, IRELAND, SWEDEN, ? Germany.

Biology. In Britain this species has been reared from *Agromyza reptans* Fln. on *Urtica dioica* L. ; also from *A. rufipes* Mg. on *Echium vulgare* L., *Cynoglossum officinale* L., *Borago officinalis* L., *Lycopsis arvensis* L., and *Myosotis* sp. ; and from *Phytomyza symphyti* Hend. on *Symphytum officinale* L. (*G. C. D. Griffiths* and *A. H. Hamm*) ; material in BM(NH), and Hope Dept., Oxford. On 28.vi.1959 I observed females ovipositing in mines of *Phytomyza atricornis* Mg. (agg.) in leaves of *Echium vulgare* L. in my garden ; females were also seen on the leaves in July. Imagines (in Britain) May–July and Sept.–Nov.

Miscogaster hortensis Walker

Miscogaster hortensis Walker, 1833 : 460, ♂ ♀.
Miscogaster gracilipes Thomson, 1876*a* : 239, ♀ [*ex parte* (lectotype)], **syn. n.**

Type material. *Miscogaster hortensis* Walker. Syntypes, 4 specimens. LECTOTYPE, a female bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type CF ".

Miscogaster gracilipes Thomson. Syntypes on 28 pins, a mixed series containing specimens of *elegans* Walker, *rufipes* Walker, *hortensis* Walker and *maculata* Walker.

I found it rather difficult to select a lectotype that agreed with all points of Thomson's description ; on the whole the female standing tenth in the series fits best and I designate it LECTOTYPE. It is a female *hortensis*.

BRITAIN, SWEDEN. In Britain this species seems to be most common in open habitats (rough pastures, downland, etc.).

Biology. A female bred in England from *Agromyza genistae* Hendel (*G. C. D. Griffiths*), seems to be *hortensis*. Imagines appear in the field June–August.

Note. Miscogaster lucens Delucchi (1953*a* : 215, ♀), which was described from material (number of specimens not stated) taken probably in Sweden, appears to be very near *hortensis* Walker ; I have specimens of the latter from Scotland which much resemble *lucens* in the shape of the gastral petiole, which is said to be characteristic of *lucens*. However, I have not seen the type of *lucens* (in Naturhistorisches Museum, Vienna) and in view of the difficulty of distinguishing the females of some *Miscogaster* species, I hesitate to synonymize it with *hortensis*.

Miscogaster maculata Walker

Miscogaster maculata Walker, 1833 : 459, ♂ ♀.
Miscogaster fuscipennis Walker, 1833 : 459, ♂ ♀, **syn. n.**
Miscogaster notata Walker, 1833 : 459, ♂, **syn. n.**
? Miscogaster maculipes Walker, 1833 : 460, ♀.
Miscogaster Methymna Walker, 1848 : 111, 171, ♂ ♀, **syn. n.**
Miscogaster elegans Delucchi, 1955 : 58–59, [*ex parte, nec* Walker, 1833].
Miscogaster maculata Walker ; Bouček, 1965*e* : 7.

Type material. *Miscogaster maculata* Walker. Syntypes, 7 specimens. LECTOTYPE, a female bearing a rectangular label " 1047 ".

Miscogaster fuscipennis Walker. Syntypes, 1 ♀, 2 ♂. LECTOTYPE, the female, bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type CF ".

Miscogaster notata Walker. Syntypes, 5 specimens. LECTOTYPE, the first, a male bearing a Waterhouse label.

Miscogaster maculipes Walker. The series of 5 specimens under this name are all males, whereas only the female was described. It seems likely that *maculipes* was the same as *maculata*, because there are three females of *maculata* (probably Walker specimens) in the old Hope-Westwood collection, labelled as *maculipes* by Walker himself.

Miscogaster methymna Walker. Syntypes, 1 ♀, 2 ♂. LECTOTYPE, the female, bearing a Waterhouse label.

BRITAIN, SWEDEN ; no doubt widely distributed in Europe. In the British Isles *maculata* is a very common species which occurs in a variety of habitats, both in woods and on open ground. Specimens tend to fall into two rather distinct colour-forms : one having the body greenish and the legs relatively paler, the other having the body bronze and the legs very dark. At one time I thought that two species might be involved, but the two forms may be taken together and intermediates occur.

Biology. I have seen British material reared from many different Agromyzid hosts on a variety of host-plants, chiefly Scrophulariaceae. At least two generations appear to occur during the year and the species may be captured in the field from April until November. In Britain *maculata* has been reared from the following hosts : *Phytomyza ranunculi* (Schr.) on *Ranunculus acris* L. ; *Ph. petoi* Her. on *Mentha* sp. ; *Ph. symphyti* Hend. on *Myosotis* sp. ; *Ph. fallaciosa* Br. ; *Napomyza glechomae* (Kalt.) on *Glechoma hederacea* L. ; *Phytobia* (*Dizygomyza*) *labiatarum* Hend. on *Stachys palustris* L. and *Lamium album* L. (specimens reared by *G. C. D. Griffiths* and *K. A. Spencer*). A. H. Hamm reared specimens from *Phytomyza* ? *milii* Kalt. on grass and from *Agromyza* ? *nigripes* Mg. on *Phragmites communis* Trin. ; these records need confirmation. In Sweden, Jansson (1952 : 6, 7) records several hosts for " *Miscogaster gracilipes* Th. " ; these need to be checked in view of the fact that *gracilipes* is a species-complex. Imagines appear in Britain chiefly May–July and Sept.–Oct.

Note. *Stictomischus phytomyzae* Ghesquière (1949 : 566–568, figs. 1, 2) appears from the description and figures to be a *Miscogaster*, perhaps near *hortensis* (Walker) or *rufipes* (Walker). The mandibles are described as " tridentées ", but as the type specimens were mounted on microscope slides, the innermost tooth might have been concealed. Syntypes (not seen), 2 ♀, France, Seine, Bois de Clamart, 20.x.1897, parasites emerged 20.iv.1898 (*P. Marchal*), in Laboratoire d'Entomologie coloniale, Muséum Nationale d'Histoire Naturelle, Paris (mounted on a slide). The species was originally recorded (as *S. phytomyzae* Ashmead MS.) by Marchal (1900 : 106) as having been reared at Fontenay-aux-Roses from larvae of *Phytomyza xylostei* [Kalt.] on *Lonicera xylostea*.

XESTOMNASTER Delucchi

Xestomnaster Delucchi, 1955 : 7, 30. Type-species : *Lamprotatus mirificus* Delucchi, 1953, by original designation.
Xestomnaster Delucchi ; Peck *et al.*, 1964 : 39.

Key to European Species

(Males and Females)

1 Fore wing with stigma small, separated by rather more than twice its height from the lower edge of the postmarginal vein ; marginal vein 1·8 to 1·85 times as long as the stigmal vein . . . . . ***mazares*** (Walker) (p. 233)
– Fore wing with stigma larger, separated by somewhat less than twice its height from the lower edge of the postmarginal vein ; marginal vein 1·27 to 1·4 times as long as the stigmal vein . . . . . ***chrysochlorus*** (Walker) (p. 232)

Xestomnaster chrysochlorus (Walker) **comb. n.**

Lamprotatus chrysochlorus (Haliday MS.) Walker, 1846 : 30, 90, ♂ ♀ [nec *Miscogaster chrysochlora* Walker, 1833 : 461].
Lamprotatus mirificus Delucchi, 1953*a* : 205, ♂ ♀, **syn. n.**
Lamprotatus parkeri Delucchi, 1953*a* : 206–207, ♀, **syn. n.**
Lamprotatus smaragdus Delucchi, 1953*a* : 209, ♀, **syn. n.**

Xestomnaster mirificus Delucchi, 1955 : 32, ♀.
Xestomnaster smaragdus Delucchi, 1955 : 32, ♀.
Xestomnaster parkeri Delucchi, 1955 : 32, ♀.

Type material. *Lamprotatus chrysochlorus* Walker. In the BM(NH) there are 3 specimens under this name but they are clearly the syntypes of *Miscogaster chrysochlora* Walker, 1833 ; the two species-names evidently having been confused. In Haliday's collection there is a female (No. 796) labelled " chrysochlorus " ; it agrees with the description and is designated LECTOTYPE of *Lamprotatus chrysochlorus* Walker, 1846.

The differences said by Delucchi (1955 : 32) to exist between his *mirificus, parkeri,* and *smaragdus* do not work out consistently ; I believe these all represent forms of one species, *chrysochlorus* (Walker).

BRITAIN, IRELAND, GERMANY. Not uncommon in Britain.

Biology. Reared in Germany as parasite of *Trypeta zoe* Mg. on *Adenostyles* (Delucchi, 1953*a* : 207) ; reared from *Acidia cognata* (Wied.) in England (*A. H. Hamm*) ; and from a Dipteron (possibly *Phytomyza atricornis* Mg.) (*R. R. Askew*). Imagines chiefly June–July, occasionally also Sept.–Oct.

Xestomnaster mazares (Walker) **comb. n.**

Seladerma Mazares Walker, 1844 : 337, ♂ ♀.
Selaoderma Mazares Walker ; Förster, 1856 : 67, ♂.

Syntypes, 1 ♂, 1 ♀. LECTOTYPE ♀ (Type Hym. 5. 793b).

NORWAY, Alten (type locality) ; IRELAND (new record), South Kerry, Caragh Lake, 1 ♂, 17.ix.1953 (*R. C. Faris*). There is a female, without locality data (but probably from near Edinburgh or else Northumberland) in the Greville collection (Royal Scottish Museum, Edinburgh).

Biology. Unknown.

LAMPROTATUS Westwood

Lamprotatus Westwood, 1833 : 121. Type-species : *L. splendens* Westwood, by monotypy.
Lamprotatus Westwood ; Thomson, 1876*a* : 221, [*ex parte*].
Lamprotatus Westwood ; Schmiedeknecht, 1909 : 291, 292–294, [*ex parte*].
Lamprotatus Westwood ; Nikol'skaya, 1952 : 244, [*ex parte*].
Lamprotatus Westwood ; Delucchi, 1955 : 7, 8–20.
Lamprotatus Westwood ; Peck *et al.*, 1964 : 38.

KEY TO NORTH-WEST EUROPEAN SPECIES

(FEMALES)

1 Antenna with length of flagellum, not counting the pedicellus, not or only just equal to breadth of head ; sixth funicular segment subquadrate or even very slightly transverse. Gastral petiole without, or with only a weak, transverse crest 2

– Antenna with length of flagellum, not counting the pedicellus, slightly to (usually) distinctly greater than breadth of head ; sixth funicular segment most often longer than broad. Gastral petiole often with a sharp transverse crest, which forms the front edge of its main sculptured portion . . 4

2 (1) Gaster much shorter than thorax, 1 to 1·5 times as long as broad, obtuse apically ; basal tergite occupying half or slightly more than half the total length. Propodeum with spiracular sulci distinctly impressed, reaching as far as the supracoxal flanges. Antenna with third segment of clava very small, its length at most about one fifth that of the whole clava. Mandibular formula 3.4 . . . . . ***picinervis*** Thomson (p. 240)

– Gaster not or only slightly shorter than the thorax, 1·5 to 2·15 times as long as broad, pointed apically ; basal tergite occupying at least slightly less than half the total length. Propodeum with spiracular sulci shallow and poorly-defined. Antenna with third segment of clava occupying fully one quarter of the total length 3

3 (2) Both mandibles with four teeth. Propodeum with median carina often irregular or incomplete, sometimes straight and sharp ; panels of median area most often with some fine carinulae or rugosities as well as the reticulation ***brevicornis*** Thomson (p. 240)

– Left mandible with three teeth, right mandible with four. Propodeum with median carina complete, straight and sharp ; panels of median area relatively uniformly reticulate, without or with few rugosities ***simillimus*** Delucchi (p. 241)

4 (1) Antenna with length of flagellum, not counting the pedicellus, only very slightly (1.05 times) greater than breadth of head ; sixth funicular segment quadrate or at most 1·2 times as long as broad, not or hardly longer than first segment of clava ; clava 2 to 2·5 times as long as broad, all its segments closely compacted, the third segment occupying one fifth or less of the total length of the clava. Gastral petiole without a distinct anterior transverse crest, its main portion transversely aciculate ***picinervis*** Thomson (p. 240)

– Antenna with length of flagellum, not counting the pedicellus, 1·2 to 1·4 times the breadth of the head ; sixth funicular segment 1·5 to 1·8 times as long as broad, often distinctly longer than the first segment of the clava ; clava 3 to 3·5 times as long as broad, with a deep suture between at least its first and second segments, the third segment occupying one quarter to one third of the total length of the clava. Gastral petiole often with a distinct anterior transverse crest 5

5 (4) Malar space fully one-third the length of an eye. Legs extensively testaceous as in *crassipes* (q.v.), but femora less stout. Sculptured part of gastral petiole about twice as broad as long . . . . . sp. indet.

– Either (*crassipes*) malar space about one quarter the length of an eye or slightly more, sculptured part of petiole at most 1·5 times as broad as long, and femora very stout ; or legs relatively darker 6

6 (5) Mid femora pale, or with at most a small dark streak beneath ; fore femora pale, or with at most their proximal third dark ; femora stout, especially the hind ones, which are, excluding the trochantellus, only 3·2 to 3·5 times as long as broad. Sculptured part of gastral petiole varying from quadrate to 1·5 times as broad as long . . . ***crassipes*** Thomson (p. 238)

– Mid femora with at least a bold dark streak beneath ; fore femora with at least rather more than their proximal half dark ; hind femora less stout, excluding the trochantellus 3·7 to 5 times as long as broad. Sculptured part of petiole varying from quadrate to three times as broad as long . . 7

7 (6) Sculptured part of gastral petiole quadrate or at most very slightly transverse, slightly more than half as long as the propodeum ; its front edge with a sharp transverse carina. Mid femora more slender, excluding the trochantellus, about five times as long as broad. Combined length of pedicellus and flagellum about 1·5 times breadth of head ; flagellum rather more slender than in *splendens* . . . . . ***annularis*** (Walker) (p. 237)

– Sculptured part of petiole 1·6 to 3 times as broad as long, less than half as long as the propodeum ; its front edge sometimes with a sharp transverse carina, sometimes without. Mid femora rather stouter, excluding the trochantellus, 4 to 4·5 times as long as broad. Combined length of pedicellus and flagellum 1·3 to 1·4 times breadth of head ; flagellum rather stouter ***splendens*** Westwood (p. 238)

(MALES)

1 Antenna (Text-fig. 184) with pedicellus longer than the scape, greatly swollen ; flagellum subclavate ; first funicular segment shorter and narrower than the second. Hind margin of basal tergite of gaster distinctly, that of the two following tergites slightly, emarginate in the middle ***pschorni*** Delucchi (p. 241)

– Antennae with pedicellus much shorter than the scape, not swollen ; flagellum filiform, or even tapering very slightly distad ; first funicular segment slightly longer than, and as broad as, the second. Hind margins of gastral tergites often entire 2

2 (1) Antenna (Text-fig. 183) with flagellum with subdecumbent hairs ; clava relatively short, 2 to 2·8 times as long as broad ; scape about three times as long as broad, two thirds or slightly more than two thirds as long as an eye. Gastral petiole without a distinct anterior crest . ***picinervis*** Thomson (p. 240)

– Antennal flagellar hairs standing out at an angle of 30° to 60° ; clava 3 to 3·5 times as long as broad ; scape 2·3 to 2·5 times as long as broad and, except in *crassipes*, not or only slightly more than half as long as an eye. Gastral petiole sometimes with a sharp transverse anterior crest . . 3

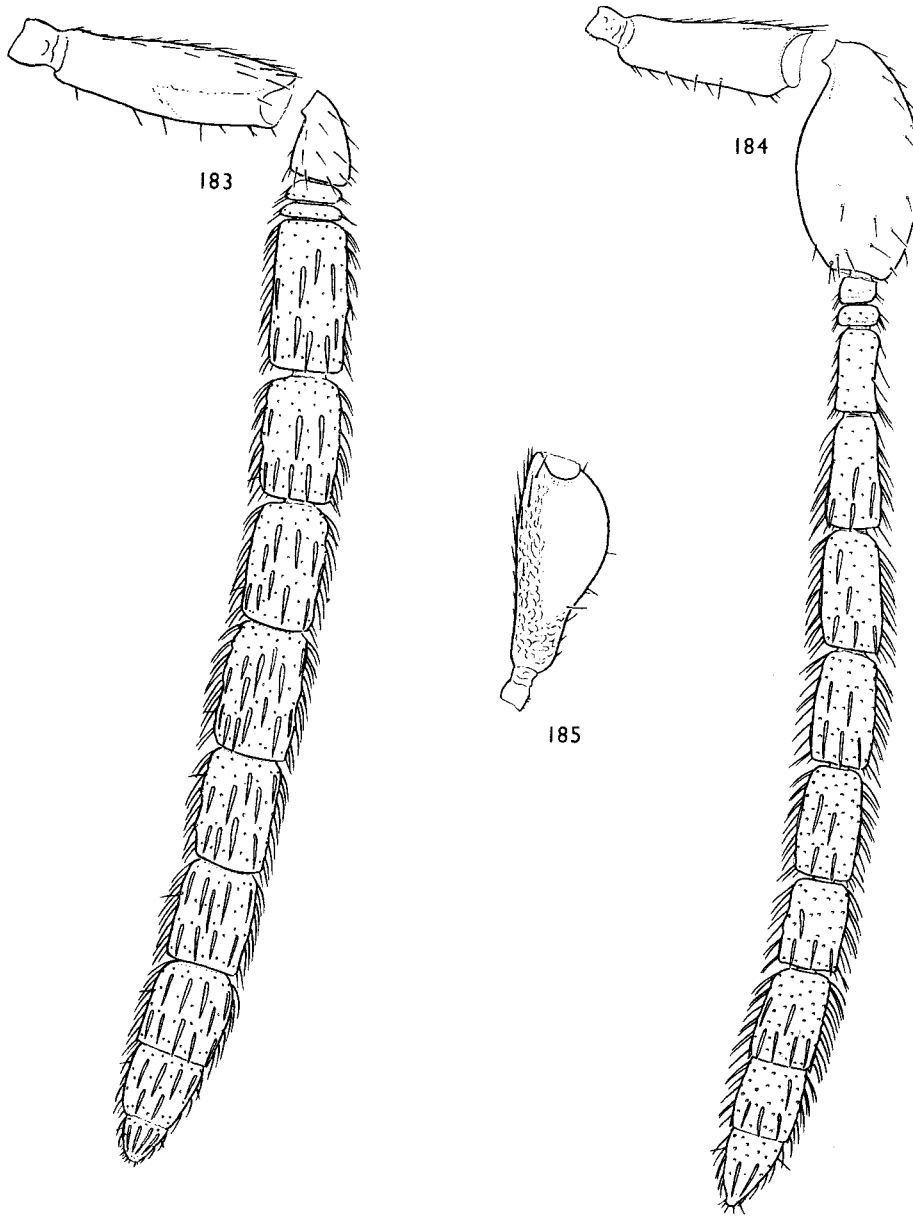
3 (2) Antenna : outer surface of scape with a large shiny boss in its upper part, extending about two thirds down ; combined length of pedicellus and flagellum 1·9 to 2 times breadth of head ; hairs of flagellum standing out at an angle of 45° to 60°, their length at least two thirds the breadth of the segments that bear them. Sculptured part of gastral petiole about as long as broad, its front edge raised to form a sharp transverse crest ***annularis*** (Walker) (p. 237)

– Antennae : outer surface of scape without a shiny boss, or with at most a small one which extends less than half way down ; combined length of pedicellus and flagellum 1·3 to 1·7 times breadth of head ; hairs of flagellum tending to stand out less strongly. Sculptured part of gastral petiole very often distinctly transverse, sometimes without a distinct anterior crest . 4

4 (3) Sculptured part of gastral petiole having its front edge raised to form a sharp transverse crest, which is usually curved 5

– Sculptured part of gastral petiole without, or with at most a weak and irregular transverse crest anteriorly 6

5 (4) Hind femora very stout, excluding the trochantellus, only 3 to 3·5 times as long as broad ; usually only partly, rarely mainly, infuscate ; fore and mid femora pale, or with at most a small dark streak beneath. Antenna with hairs of flagellum standing out at an angle of 30° to 40°. Sculptured part of gastral petiole varying from quadrate to 1·3 times as broad as long ; its front edge raised to form a sharp transverse crest ***crassipes*** Thomson (p. 238)



FIGS. 183–185. 183, *Lamprotatus picinervis* Thomson, ♂, antenna ; 184, *Lamprotatus pschorni* (Delucchi), ♂, antenna ; 185, *Skeloceras novickyi* Delucchi, ♂, scape.

– Hind femora rather less stout than in *crassipes*, with at most their distal quarter pale ; at least the proximal two thirds of the fore and mid femora black with a metallic tinge. Antennae with hairs of flagellum standing out rather more strongly, most of them at about 45°. Sculptured part of gastral petiole 1·5 to 2 times as broad as long, its front edge with a less sharp and conspicuous transverse crest . . . ***splendens*** Westwood (p. 238)

6 (4) Sculptured part of gastral petiole 1·5 to 2 times as broad as long, without hairs at the sides. Median area of propodeum nearly always with a transverse costula, or some coarse wrinkles. Antennal sixth funicular segment 1·6 to 1·9 times as long as broad. Large species, 2·8 to 4 mm. ***splendens*** Westwood (p. 238)

– Sculptured part of petiole 2·5 to 3 times as broad as long, often with one to three hairs on each side. Median area of propodeum without a transverse costula, without coarse wrinkles, though sometimes with fine oblique carinulae. Either the sixth funicular segment is at most 1·5 times as long as broad ; or size is at most 2·6 mm. 7

7 (6) Both mandibles with four teeth. Combined length of pedicellus and flagellum 1·3 to 1·4 times breadth of head ; sixth funicular segment 1·3 to 1·5 times as long as broad . . . . . ***brevicornis*** Thomson (p. 240)

– Left mandible with three teeth, right mandible with four. Combined length of pedicellus and flagellum about 1·5 times breadth of head ; sixth funicular segment 1·4 to 1·8 times as long as broad . ***simillimus*** Delucchi (p. 241)

Lamprotatus annularis (Walker)

Ichneumon nigricornis Fabricius, 1793 : 185, no. 216, **syn. n.** [pre-occupied].
Diplolepis nigricornis (Fabricius), 1804 : 150, **syn. n.**
Miscogaster annularis Walker, 1833 : 461, ♂ ♀.
Pteromalus mandibularis Zetterstedt, 1838 : 424, ♂.
Lamprotatus petiolaris Thomson, 1876*a* : 224, ♂ ♀, **syn. n.**
Lamprotatus annularis (Walker) Delucchi, 1955 : 16–18, ♂ ♀.

Type material. *Ichneumon nigricornis* Fabricius. Three specimens stand under this name in the private collection of Fabricius in Kiel, and one in the Lund collection in Copenhagen. The original description contains the words " Habitat Hafniae Dom. Lund ", and the specimen in the Lund collection agrees with the description and is designated LECTOTYPE. The specimens in Kiel are *Torymus* (one which I have examined critically being a female of the overwintering form of *T. auratus* Fourcroy) and do not agree with the description. The name *Ichneumon nigricornis* Fabricius is twice pre-occupied, by *I. nigricornis* Retzius (1783, *Gen. Sp. Ins.* : 70) and *I. nigricornis* Gmelin (1790, *Linn. Syst. Nat.*, ed. 13, **1** (5) : 2719), and therefore falls into synonymy. The lectotype of *nigricornis* Fabricius bears three labels, (1) an original label of the Lund-Sehested collection, " D. nigricornis ", (2) a red label " TYPE ", (3) one reading " *Lamprotatus nigricornis* (F.) det. K.–J. Hedqvist 1962.".

Miscogaster annularis Walker. Syntypes 3 ♀. LECTOTYPE, the first specimen, bearing a Waterhouse label, also another label in C. Ferrière's handwriting " Type CF ".

Pteromalus mandibularis Zetterstedt. Type (presumably holotype) ♂ (Lapland,

Björkvik) in coll. Zetterstedt, labelled in his handwriting " P. mandi=bularis ♂ Björkvik " ; also labelled by Ch. Ferrière " Lamprotatus annularis Walk."

Lamprotatus petiolaris Thomson. Syntypes, 4 specimens. LECTOTYPE, a male labelled " Hma " [Holmeja], " Scan ", and " petiolaris Ths.".

BRITAIN, IRELAND, SWEDEN. Fairly common in Britain.

Biology. Reared in England from a Dipterous host on *Stellaria media* (L.) (Delucchi, 1955 : 18). Imagines May–Sept. (? possibly two generations).

Lamprotatus crassipes Thomson

Lamprotatus crassipes Thomson, 1876*a* : 224, ♂ ♀.
Lamprotatus crassipes Thomson ; Delucchi, 1955 : 12, 20, ♂ ♀.

Type material. Syntypes on 8 pins. LECTOTYPE female labelled " L–d " [Lund] and " crassipes Ths." ; the specimen has been remounted by A. Jansson.

In a small series of specimens, all of which appear to belong to *crassipes*, there is the following variation :

Fore femora pale, or with a dark subbasal streak, rarely the basal third darkened ; mid femora usually pale, rarely with a small dark streak beneath ; hind femora typically with a dark mark basally on their external aspect, occasionally with the dark colour somewhat more extensive. Gastral petiole varying from copper through golden-green to bronze. Propodeum with panels of median area reticulate, or obliquely strigose-reticulate ; median carina strong to rather weak, either complete and straight, or slightly irregular, or interrupted, or forked in its anterior half ; plicae present in about the posterior half of the propodeum. Raised sculptured part of gastral petiole varying from quadrate to about 1·5 times as broad as long.

BRITAIN, SWEDEN, CZECHOSLOVAKIA ; apparently uncommon.

Biology. Unknown.

Lamprotatus flavus Delucchi

Lamprotatus flavus Delucchi, 1953*a* : 203, ♀.
Lamprotatus flavus Delucchi, 1955 : 12, 20, ♀.

Type material. Type (? holotype) ♀, Austria, Innsbruck, 20.v.1923 (*E. Clément*), in Naturhistorisches Museum, Vienna (not seen).

The characters given by Delucchi (1955 : 12) for separating this species from *crassipes* do not work satisfactorily (compare them with my notes on the apparent variation of *crassipes* above). It will be necessary to reassess the status of *flavus*.

Lamprotatus splendens Westwood

Lamprotatus splendens Westwood, 1833 : 121, fig. 12*b*, ♂.
Lamprotatus splendens Westwood ; Delucchi, 1955 : 12, 18–19, ♂ ♀.

LECTOTYPE ♂ in coll. Westwood, the specimen pinned and the pin thrust through a rectangular card ; it bears a tiny yellow ticket, also a label in Westwood's handwriting " LAMPROTATUS splendens Westw. Mag. Nat. Hist.". Westwood

mentioned three type-localities (" Surrey, Oxford and Hertford ") but I can find only the above male in his collection.

BRITAIN, IRELAND, SWEDEN, SWITZERLAND, AUSTRIA ; no doubt widely distributed in Europe. Common in Britain.

Biology. Reared from *Pegomyia nigritarsis* Zett. (Delucchi, 1955 : 19) ; Jansson (1952 : 7) recorded *Pegomyia albimargo* Pand. and *Pegomyia* sp. as hosts in Sweden. Claridge (1958*a* : 227) recorded it as a solitary internal parasite of larvae of *Pegomyia nigritarsis* (Zett.) on *Rumex* sp. Cameron (1935 : 299) recorded it as parasitizing puparia of *Hylemyia seneciella* Meade in England, but I have not been able to check the specimens. Imagines May–Sept. (perhaps more than one generation).

Lamprotatus rusticus Delucchi

Lamprotatus rusticus Delucchi, 1953*a* : 208, ♀.
Lamprotatus rusticus Delucchi, 1955 : 12, 20, ♀.

Type material. Type ♀ (provenance unknown), in Naturhistorisches Museum, Vienna (not seen).

Distribution and biology unknown.

Delucchi (1955 : 12) distinguishes the female of *rusticus* from those of *ornatus* and *splendens* by its more strongly transverse gastral petiole, twice as broad as long, whilst the petiole of *ornatus* and *splendens* is said to be less than 1·5 times as broad as long ; and by the sculpture of the propodeum, which is said in *ornatus* and *splendens* to have the median carina, if present, never bifurcate, whilst in *rusticus* it is described as bifurcate. These characters undoubtedly vary considerably. I have females which I consider to be *splendens* that have the petiole about twice as broad as long, as described for *rusticus*, yet they do not agree with the description of the latter in other respects. The status of *rusticus* needs re-investigation.

Lamprotatus ornatus Delucchi

Lamprotatus ornatus Delucchi, 1953*a* : 206, ♀.
Lamprotatus ornatus Delucchi, 1955 : 12, 18, ♀.

Type material. Type (? holotype) ♀, Austria : Piesting bei Wien, Tschek, in Naturhistorisches Museum, Vienna (not seen).

In his key to the species of *Lamprotatus* Delucchi (1955 : 12) gives some characters, relating to the sculpture of the propodeum and petiole, for distinguishing the female of *ornatus* from that of *splendens*. I find these characters to be very variable in *splendens*, for example the median carina of the propodeum may be strong and straight, or weak, or irregular and partly resolved into oblique carinulae. The type of *ornatus* should be examined to see if better characters exist for distinguishing it from *splendens*.

AUSTRIA.

Biology. Unknown.

Lamprotatus cupreus Delucchi

Lamprotatus cupreus Delucchi, 1953*a* : 202–203, ♀.
Lamprotatus cupreus Delucchi, 1955 : 12, 18, ♀.

Type material. Type ♀, Czechoslovakia, Moravia, Weisskirchen, in Naturhistorisches Museum, Vienna.

I have not seen the type of this species, which would appear from the characters mentioned in the original description, and in Delucchi's key to the species of *Lamprotatus* (1955 : 12) to be valid. No other material which fits the description is available.

CZECHOSLOVAKIA.

Biology. Unknown.

Lamprotatus picinervis Thomson

Lamprotatus picinervis Thomson, 1876*a* : 224, ♂ ♀.
? Lamprotatus montanus Delucchi, 1955 : 10, 12–14, ♀.

Type material. *Lamprotatus picinervis* Thomson. Syntypes, 11 specimens. LECTOTYPE, the fourth in the series, a male labelled " L–d " [Lund]. The only female with locality data has the flagella broken off, but is undoubtedly conspecific with the lectotype. It is quite satisfactory to have a male as lectotype because that sex has some distinctive characters, particularly the subadpressed pubescence of the flagellum (Text-fig. 183), which Thomson mentioned. Delucchi overlooked *picinervis* when writing his revision (1955).

L. montanus Delucchi. Holotype ♀, Switzerland, Valais, Saas Fee, 1800m., 15.vii.1953, in coll. Delucchi. I have examined the specimen, which is probably the same as the British females which I have identified as *picinervis* (see below).

In some respects, e.g., the relatively short antennal flagellum of the female, and the shape of the petiole, this species is intermediate between the species-group of *splendens* and that of *brevicornis*.

ENGLAND : Oxford, University Parks, 1 ♀, 23.iv.1920, 2 ♀, 26.iv.1920, 2 ♀, 11.iv. 1921, 1 ♀, 13.iv.1921, all reared from a *Pegomyia* species (Dipt., Anthomyiidae) on dock (*Rumex* sp.) (*A. H. Hamm*).

SWEDEN : Skåne, Lund, 6 ♂, 1 ♀ (coll. Thomson).

Lamprotatus brevicornis Thomson

Lamprotatus brevicornis Thomson, 1876*a* : 226, ♂ ♀.
Lamprotatus brevicornis Thomson, Delucchi, 1955 : 10, 14–16, ♂ ♀.

Syntypes, 9 specimens. LECTOTYPE, a female labelled " Lpl " and " brevicornis Ths ".

BRITAIN, SWEDEN. Not uncommon on the foliage and catkins of *Salix* spp. (especially of the *cinerea*-group) in spring.

Biology. Unknown. Imagines April–May.

Lamprotatus simillimus Delucchi

Lamprotatus simillimus Delucchi, 1953*a* : 208, ♀.
Lamprotatus simillimus Delucchi, 1955 : 10, 14, ♀.

I have not seen the type of this species but hope I have interpreted it correctly. Type (? holotype) ♀, Austria, Bisamberg near Vienna, in Naturhistorisches Museum, Vienna.

BRITAIN, AUSTRIA. In Britain it is locally common and occurs on the foliage and catkins of *Salix* spp. (*cinerea* L., *aurita* L., *repens* L., etc.) in spring and early summer (imagines April–June).

Biology. Unknown.

Lamprotatus pschorni Delucchi

(Text-fig. 184)

Lamprotatus pschorni Delucchi, 1953*a* : 207, ♂ ♀.
Telepsogos pschorni Delucchi, 1955 : 35, 46, ♂ ♀.

Type material. Type, sex not mentioned, Austria, Waidhofen an der Ybbs, iv.1949–1950 (*S. Novitzky*), in Naturhistorisches Museum, Vienna (not seen).

AUSTRIA ; ? BRITAIN ; ? CZECHOSLOVAKIA.

Biology. Unknown.

I am adopting the name *pschorni* for a species in which the antennal pedicellus of the male (Text-fig. 184) is enormously swollen. Dr. Bouček has specimens which he showed to Dr. Delucchi, who thought they belonged to *pschorni*. The original description does not, however, emphasize the extremely large pedicellus. I had originally considered the species under discussion to be new ; it does not belong to *Telepsogos* (=*Seladerma*) but to *Lamprotatus*.

SKELOCERAS Delucchi

Skeloceras Delucchi, 1953*a* : 216. Type-species *S. seiunctum* Delucchi, by original designation.
Skeloceras Delucchi, 1955 : 6, 20–30.
Skeloceras Delucchi ; Kamijo, 1960 : 37–41.
Skeloceras Delucchi ; Peck *et al.*, 1964 : 38.

This genus differs from *Lamprotatus* Westwood only in having the first segment of the clava separated from the others by a deep constriction, so that the funicle has 7 segments. However, this character is easily seen [though rather less obvious in *socium* (Zett.)] and results in a very natural division of the species.

Kamijo (1960) has given a very good account of the Japanese species of this genus.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Sculptured part of gastral petiole as long as, or slightly longer than, broad ; its front edge raised to form a sharp curved transverse carina. Stigma of

fore wing large and subtriangular, as in *Miscogaster*, separated by at least slightly less than twice its height from the costal edge of the wing. Costal cell of hind wing with hairs scattered over at least its distal half. Hind femora usually testaceous, sometimes slightly infuscate medially, rarely (some very dark British specimens) with their proximal two thirds dark
clavigerum (Thomson) (p. 243)

– Sculptured part of gastral petiole transverse ; its front edge sometimes indistinctly carinate. Stigma of fore wing moderate-sized or rather small, not subtriangular, separated by at least slightly more than twice its height from the costal edge of the wing. Costal cell of hind wing usually bare, occasionally with some scattered hairs in its distal half. Hind femora blackish at least proximally, sometimes wholly so except their tips . . 2

2 (1) Mesoscutum and vertex with numerous and very distinct piliferous punctures ; mid lobe of mesoscutum with hairs scattered over its whole surface. Antennal seventh funicular segment quadrate, not so very distinctly separated from the clava. Propodeum, just on either side of the median carina, with obsolescent sculpture, hence shiny . . ***socium*** (Zetterstedt) (p. 244)

– Mesoscutum and vertex with fewer and rather indistinct piliferous punctures ; mid lobe of mesoscutum most often lacking hairs down its middle part. Antennal seventh funicular segment at least slightly longer than broad, very distinctly separated from the clava. Panels of median area of propodeum distinctly reticulate and often with strong wrinkles as well . . 3

3 (2) Antennal scape distinctly shorter than the transverse diameter of an eye, 2·6 to 2·7 times as long as broad. Sculptured part of gastral petiole nearly always with one to three (or four) hairs on each side, its front edge raised to form a sharp curved transverse carina 4

– Antennal scape nearly or quite as long as the transverse diameter of an eye, 3 to 3·5 times as long as broad. Sculptured part of gastral petiole without hairs at the sides, its front edge usually having a less regular, and sometimes weak, transverse carina 5

4 (3) Malar space slightly more than two fifths the length of an eye ; breadth of oral fossa about 2·6 times the malar space. Propodeum with a pair of straight submedian longitudinal carinae present, the median carina straight and strong ; costula strong throughout. Mid and hind femora more extensively pale, only about the proximal third of the hind femora dark
triangulare (Thomson) (p. 244)

– Malar space about one third the length of an eye ; breadth of oral fossa about 3·5 times the malar space. Propodeum without straight submedian longitudinal carinae, though sometimes irregular oblique carinae are present ; median carina irregular, or forked from its base ; costula tending to be irregular and sometimes weak. Mid and hind femora with at least their proximal two thirds blackish . . . . ***mirabile*** Delucchi (p. 245)

5 (3) Antennal seventh funicular segment 1·5 to 1·8 times as long as broad. Cubital vein, on lower surface of fore wing, with at least some hairs
novickyi Delucchi (p. 245)

– Antennal seventh funicular segment about 1·35 times as long as broad. Cubital vein, on lower surface of fore wing, bare ? ***glaucum*** Delucchi (p. 246)

(MALES)

1 Antennal pedicellus strongly swollen, as long as anelli plus first funicular segment. In other respects similar to the male of *socium* (see couplet 3 below), but piliferous punctures of vertex and mesoscutum less distinct,

median area of propodeum more coarsely sculptured with several strong wrinkles (Ireland) . . . . . sp. indet.

– Antennal pedicellus not swollen, much shorter than anelli plus first funicular segment 2

2 (1) Sculptured part of gastral petiole fully as long as, or slightly longer than, broad ; its front edge raised to form a sharp, curved transverse carina. Stigma of fore wing large and subtriangular, as in *Miscogaster*. Costal cell of hind wing with hairs scattered over most of its surface
clavigerum (Thomson) (p. 243)

– Sculptured part of gastral petiole at least slightly broader than long ; its front edge sometimes less distinctly carinate. Stigma of fore wing moderate-sized or small, not subtriangular. Costal cell of hind wing with at least its basal half bare 3

3 (2) Mesoscutum and vertex with numerous and distinct piliferous punctures ; mid lobe of mesoscutum with hairs scattered over its whole surface. Antennal seventh funicular segment varying from quadrate to 1·5 times as long as broad ; combined length of pedicellus and flagellum hardly 1·5 times breadth of head, flagellum stout ; scape hardly expanded distally. Propodeum, just on either side of the median carina, with weak or subobsolete sculpture, hence shiny . . . . ***socium*** (Zetterstedt) (p. 244)

– Mesoscutum and vertex with less numerous and rather indistinct piliferous punctures ; mid lobe of mesoscutum tending to be bare down the middle. Antennal seventh funicular segment 1·8 to 2·3 times as long as broad ; combined length of pedicellus and flagellum 1·7 to 2 times breadth of head 4

4 (3) Antennal scape hardly expanded distally, its outer surface wholly or nearly wholly reticulate. Gastral petiole usually with one to three hairs on each side. Left mandible with three teeth, right mandible with four
triangulare (Thomson) (p. 244)
and ***mirabile*** Delucchi (p. 245)

– Antennal scape (Text-fig. 185) strongly expanded distally, its outer surface with a large shiny boss which extends at least half way down. Gastral petiole bare at sides. Both mandibles (in the specimens examined) with four teeth 5

5 (4) Antenna with combined length of pedicellus and flagellum 1·9 to 2 times breadth of head ; seventh funicular segment 2 to 2·3 times as long as broad ; shiny boss of scape extending more than half way down (Text-fig. 185)
novickyi Delucchi (p. 245)

– Antenna with combined length of pedicellus and flagellum about 1·7 times breadth of head ; seventh funicular segment hardly twice as long as broad ; shiny boss of scape extending about half way down
? ***glaucum*** Delucchi (p. 246)

Skeloceras clavigerum (Thomson) comb. n.

Lamprotatus claviger Thomson, 1876*a* : 225, ♂ ♀ [*nec* Delucchi, 1955].
Skeloceras seiunctum Delucchi, 1953*a* : 217, ♂ ♀, **syn. n.**
Skeloceras seiunctum Delucchi, 1955 : 21, 22, ♂ ♀.

Type material. *Lamprotatus claviger* Thomson. There are 8 specimens under this name but the first and fourth disagree with the description and are probably not syntypes. The others are all conspecific and are clearly syntypes ; from them I select a female labelled " Tor " [Torekov] and " Scan ", as LECTOTYPE.

Delucchi (1955 : 89) misinterpreted *claviger* as a synonym of *Stictomischus obscurus* (Walker), probably by assuming that the first specimen in Thomson's series of *claviger* was the type ; but a reference to Thomson's description would immediately have shown that such could not be the case.

Skeloceras seiunctum Delucchi. Type (? holotype) ♀, Germany, Thuringia (*Schmiedeknecht*), in Naturhistorisches Museum, Vienna.

Variation in *clavigerum* is apparently slight. In most females the basal half to two-thirds of the fore femora is fuscous and the mid femora have a dark stripe beneath ; in some British specimens the hind femora are also infuscate basally, whilst I have one British female, which otherwise differs from typical *clavigerum* only in small details of structure, in which the proximal two-thirds of all the femora is fuscous. The raised sculptured part of the gastral petiole is as long as, or slightly longer than, broad. The median carina of the propodeum may be simple, forked, or irregular.

BRITAIN, IRELAND, SWEDEN, GERMANY, CZECHOSLOVAKIA.

Biology. Unknown ; imagines have been captured in the field in June and October.

Skeloceras socium (Zetterstedt)

Pteromalus socius Zetterstedt, 1838 : 425, ♀.
Lamprotatus puncticollis Thomson, 1876*a* : 225, ♀.
Skeloceras socium (Zetterstedt) Delucchi, 1955 : 29, ♂ ♀.

Type material. *Pteromalus socius* Zetterstedt. Syntypes, 2 specimens. LECTOTYPE, a female labelled in Zetterstedt's handwriting " Pt. socius ♀. Kengis " ; it also bears a red type label, and another in C. Ferrière's handwriting " Type redécrit par Delucchi 1955 ".

Lamprotatus puncticollis Thomson. Syntypes, 20 specimens on 9 pins. LECTOTYPE, a female labelled " Ö " [Öland] and " puncticollis Ths.". *L. puncticollis* was placed in synonymy with *P. socius* by Delucchi (1955 : 29).

BRITAIN, SWEDEN (Lapland).

Biology. Unknown. Imagines in June.

Skeloceras triangulare (Thomson)

Lamprotatus triangularis Thomson, 1876*a* : 223, ♂ ♀.
Skeloceras triangulare (Thomson) Delucchi, 1955 : 22, ♂ ♀.

Syntypes, 2 ♀, 3 ♂. LECTOTYPE, a female labelled " Lpl " and "triangularis Ths.".

SWEDEN (Lapland).

Biology. Unknown.

Skeloceras mirabile Delucchi

Skeloceras mirabile Delucchi, 1955 : 26, ♀.

I presume the type of *mirabile* to be a female placed second in the series of *Lamprotatus picinervis* in Thomson's collection ; it is labelled in Delucchi's handwriting " Skeloceras mirabilis n. sp." and also bears a label " Lund ". Delucchi stated (1955 : 27) that *mirabile* was described from a female in Thomson's collection probably placed under the name *Lamprotatus crassipes* Thomson ; but there is no such female in that series and the only one I can find is that placed in *picinervis*.

BRITAIN, SWEDEN.

Biology. A female was reared in England, Oxfordshire, Shotover, 28.ix.1923, from an unspecified host on *Rumex acetosa* L. (*E. G. R. Waters*). Imagines appear May–June and August.

Skeloceras cerebrosum Delucchi

Skeloceras cerebrosum Delucchi, 1955 : 21, 24–26, ♀.

Type material. Type (? holotype) ♀ (probably from Germany) in Naturhistorisches Museum, Vienna.

I have not seen the type of this species, and cannot recognize it from the description. In his key to the species of *Skeloceras* (1955 : 21–22) Delucchi distinguishes *cerebrosum* from *triangulare* (Thomson) and *mirabile* Delucchi mainly upon characters of the propodeal sculpture. This shows considerable variation in most of the species I have examined, and may be unreliable in the case of *cerebrosum* also. The latter species would appear to be near *mirabile* Delucchi. It will be necessary to re-examine the type of *cerebrosum* and compare fresh material with it before its status, and reliable characters for its recognition, can be ascertained.

? GERMANY ; ITALY.

Biology. Reared as a parasite of *Hylemyia* sp. (Dipt., Anthomyiidae) in Italy (three females determined by Delucchi, see Secrétariat, etc., 1961 : 215, 229).

Skeloceras novickyi Delucchi

Skeloceras novickyi Delucchi, 1953*a* : 217–218, ♀.
Skeloceras novickyi Delucchi, 1955 : 22, 27, ♀.

Type material. Type (? holotype) ♀, Switzerland, Valais, Saas Fee, 15.vii.1953, at 1800 m., in coll. Delucchi (not seen).

Some of my British and Irish *Skeloceras* run in Delucchi's key (1955 : 21–22) to the couplet including *novickyi* and *glaucum ;* they agree quite well with the diagnosis and also with the original description of *novickyi*, and I believe that they are that species. My specimens show some variation, which it may be useful to note. In females the line of hairs along the cubital vein (lower surface of wing) is

sometimes complete, sometimes present only in the distal half of the basal cell. The seventh funicular segment (detached first segment of the clava) is 1·6–1·7 times as long as broad, usually as long as the sixth segment though occasionally very slightly shorter. The propodeum has its median carina relatively strong and straight, most often complete though sometimes extending only half way to the hind margin (occasionally it is slightly irregular) ; the costula is usually distinct but very weak in one specimen ; the plicae are strong and extend nearly to the spiracles. The costula usually intercepts the median carina at (though sometimes before) its middle. The anterior transverse crest of the gastral petiole is usually sharp, occasionally weak. Males presumed to be conspecific with these females have the antennal scape strongly dilated above the middle, where there is a shiny boss which extends more than half way down the external surface ; they have the funicular segments rather longer than those figured by Delucchi (1955, fig. 25) for the male of *glaucum*. Most of these specimens have 4 teeth in both mandibles (one female, which does not appear to differ in other respects, has only 3 teeth in the left mandible).

ENGLAND : Berkshire, Tubney Wood, 2 ♂, 10.v.1952. SCOTLAND : Perthshire, Lawers, 1 ♂, 11.vii.1952, 1 ♀, 29.vi.1962 ; Killin, 1 ♂, 15.vii.1954 ; East Inverness, Granish, 1 ♀, 17.vi.1965. IRELAND : Co. Down, Tollymore Park, 1 ♀, 25.v.1957 ; Co. Wicklow, Glencree, 1 ♀, 4.vii.1949 (all *Graham*). SWITZERLAND (type female, see above).

Biology. Unknown.

Skeloceras glaucum Delucchi

Skeloceras glaucum Delucchi, 1955 : 22, 27–29, ♂ ♀.

Type material. Type, sex not mentioned but probably female ; Austria, Steiermark, Stuhleck am Wechsel (*R. Hicker*), in Naturhistorisches Museum, Vienna (not seen).

AUSTRIA.

Biology. Unknown.

I have not seen any fresh material which completely fits Delucchi's description of *glaucum*. In his key (1955 : 21–22) he distinguished the female from that of *novickyi* as follows : cubital vein bare on both surfaces of the fore wing ; seventh funicular segment (detached first segment of clava) hardly longer than broad and shorter than the sixth segment ; propodeum without a costula, its surface reticulate. As regards the propodeum, he contradicted the above statement in his description of the female (ibid. : 28) in which he stated that each plica was connected to the median carina by a costula or a complex of small costulae. I have a female from Scotland in which the antennae agree fairly well with Delucchi's description and figure, having the seventh funicular segment only slightly longer than broad ; but this specimen does not agree completely with the description of *glaucum* as regards the cubital vein and the propodeum. Possibly it is an aberrant specimen of *novickyi*.

MICRADELINI

MICRADELUS Walker

Micradelus Walker, 1834 : 170. Type-species : *M. rotundus* Walker, by monotypy.
Micradelus Walker ; Förster, 1856 : 60, 61.
Micradelus Walker ; Thomson, 1878 : 6–7.
Micradelus Walker ; Ashmead, 1904 : 283, 284.
Micradelus Walker ; Schmiedeknecht, 1909 : 155, 156, 159–160.
Micradelus Walker ; Nikol'skaya, 1952 : 209–210.
Micradelus Walker ; Kerrich & Graham, 1957 : 271–275.
Micradelus Walker ; Ferrière & Kerrich, 1958 : 22, 25.
Micradelus Walker ; Bouček, 1961 : 62–63.

This genus was recognized and redescribed by Thomson (1878) as a Cleonymid, but hardly noticed subsequently until its characters were re-assessed by Kerrich & Graham (1957), who objectively defined the type-species. In the latter paper Graham (pp. 271–272) followed Thomson's suggestion that it might be related to the Tridymine group and proposed to form for it a subfamily Micradelinae. In the present work the above placing is retained but the group is considered to have only tribal status.

Two European species were recognized by Kerrich & Graham (1957). One of these (*obscurus* Thomson) is now regarded as a probable synonym of *rotundus* ; but a new species is described in the present work.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Gaster short-oval or subcircular, 1·1 to 1·5 times as long as broad, apically, not counting the ovipositor sheaths, subobtuse ; last tergite subtrapeziform, its hind margin truncate or slightly emarginate. Antenna (Text-fig. 187) with two anelli and five funicular segments. Length 1·2 to 1·6 mm. Head in dorsal view 2·05 to 2·2 times as broad as long ; temples one quarter as long as eyes or slightly more ***rotundus*** Walker (p. 247)

– Gaster long-ovate, 1·7 to 2·1 times as long as broad, apically acute or slightly acuminate ; last tergite triangular. Antenna (Text-fig. 188) with three anelli and four funicular segments. Length 0·9 to 1·2 mm. Head in dorsal view 1·95 to 2 times as broad as long ; temples about one third as long as eyes . ***acutus*** sp. n. (p. 249)

(MALES)

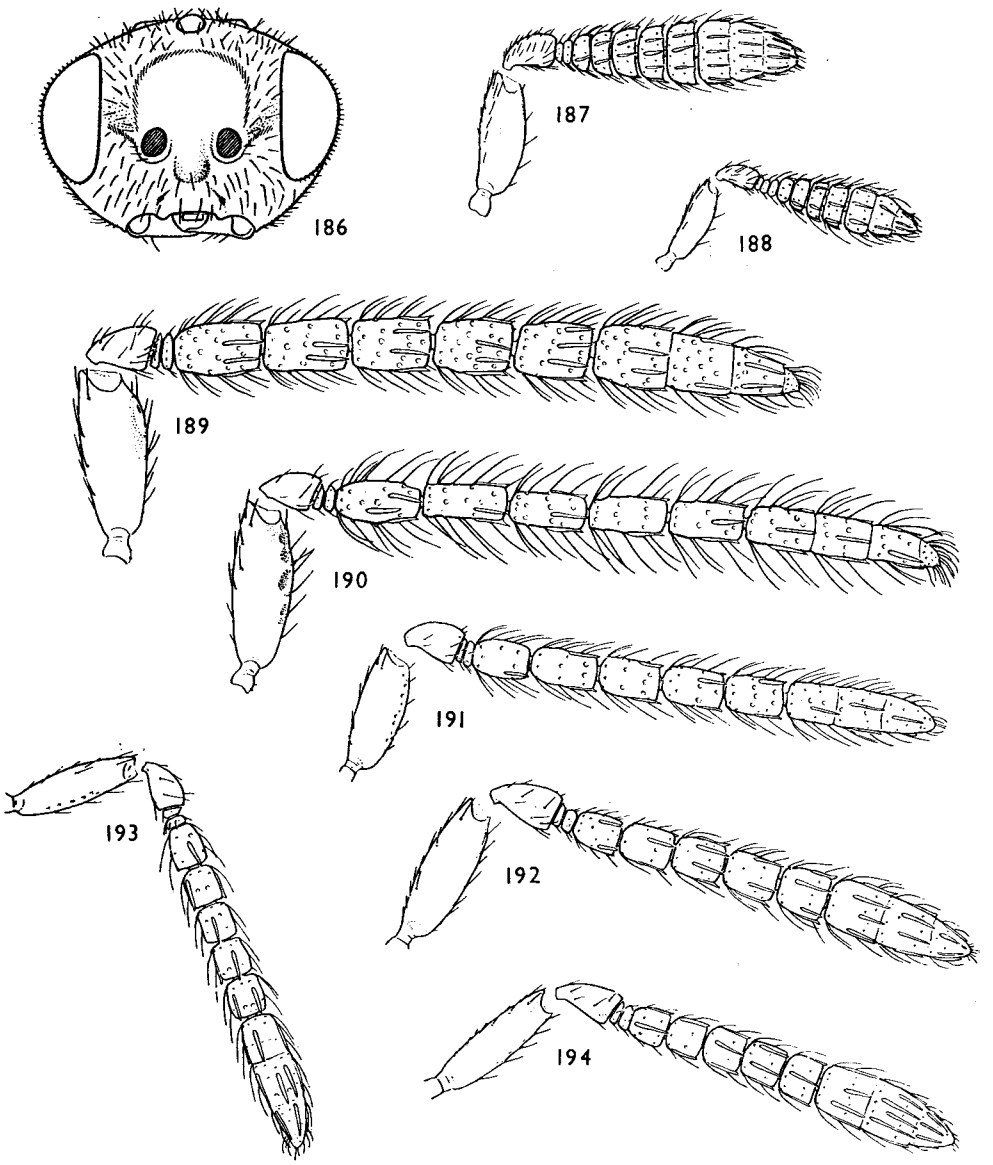
1 Length 1·2 to 1·8 mm. Head in dorsal view rather more transverse (as in female). Antennae with two anelli and five funicular segments . ***rotundus*** Walker (p. 247)

– Length 0·9 to 1·1 mm. Head in dorsal view rather less transverse (as in female). Antennae usually with three anelli and four funicular segments, occasionally with two anelli and five funicular segments . . . . . ***acutus*** sp. n. (p. 249)

Micradelus rotundus Walker

Micradelus rotundus Walker, 1834 : 170, ♂ ♀.
? Micradelus obscurus Thomson, 1878 : 6–7, ♂ ♀.
Micradelus rotundus Walker ; Kerrich & Graham, 1957 : 273–275, pl. 1, ♂ ♀.
Micradelus rotundus Walker ; Ferrière & Kerrich, 1958 : 25.
Micradelus rotundus Walker ; Bouček, 1961 : 62–63, [*ex parte*].

Type material. *Micradelus rotundus* Walker. Lectotype ♂ in Hope Dept.,



FIGS. 186–194. 186, *Micradelus rotundus* Walker, ♂, head ; 187, same, ♀, antenna ; 188, *Micradelus acutus* sp. n., ♀, antenna ; 189, *Semiotellus mundus* (Walker), ♂, antenna ; 190, *Semiotellus diversus* (Walker), ♂, antenna ; 191, *Systasis tenuicornis* Walker, ♂, antenna ; 192, same, ♀, antenna ; 193, *Systasis parvula* Thomson, ♂, antenna ; 194, same, ♀, antenna.

Oxford (Type Hym. 17), labelled in Walker's handwriting " Micradelus rotundatus " [*sic*].

Micradelus obscurus Thomson. Lectotype ♂ (Sweden, Luleå Lappmark) in Universitetets Zoologiska Institution, labelled " Lpl " [Lapland]. In Kerrich & Graham (1957 : 275) I regarded *obscurus* as a valid species and mentioned the characters by which the lectotype ♂ differed from that of *rotundus* Walker. Since then I have seen other specimens which appear to bridge the gap between the two and indicate that *obscurus* is merely a very large and robust example of *rotundus*.

Bouček (1961) drew attention to the extreme variation of what he considered to be *rotundus* Walker, in particular the shape of the female gaster, illustrating (fig. 6) a female in which this is long-ovate in shape. He also refers to the variation of the antennae in both sexes. For some time I had also been aware of considerable variation of a similar kind in my own material placed under *rotundus*. I now think that two species are involved because the variation does not appear to be continuous ; the differences between them are summarized in my key.

BRITAIN, SWEDEN, CZECHOSLOVAKIA.

Biology. Unknown. My own specimens have for the most part been swept in open situations (grassland, including chalk downland). Imagines May–June.

Micradelus acutus sp. n.

Micradelus rotundus Bouček, 1961 : 62, [*ex parte*] ; fig. 6, ♀ [*nec* Walker, 1834].

♀. Differs from that of *rotundus* Walker as follows :

Body smaller and rather less robust ; gaster longer and acute or even slightly acuminate apically, the last tergite being triangular. Antenna (Text-fig. 188) with flagellum rather more clavate, the funicle more slender proximally ; only four (instead of five) funicular segments. Head in dorsal view only 1·95 to 2 times as broad as long ; temples rather longer, about one third as long as eyes, and slightly more bulging. Fore wing with stigmal vein tending to be slightly curved, straighter in *rotundus ;* uncus on the average rather shorter ; marginal vein 1·2 to 1·5 times as long as the stigmal vein.

♂. Differs from that of *rotundus* in the characters given in the key above.

Holotype ♀. ENGLAND : Oxfordshire, Bald Hill, near Lewknor, 22.v.1960, on chalk downland (*Graham*), in the Hope Dept., University Museum, Oxford.

Paratypes. Same locality as holotype, 3 ♂, 2 ♀, 22.v.1960, 2 ♀, 2.vi.1957, on chalk downland ; Berkshire, Wytham, 1 ♂, 26.v.1955, 3 ♂, 7.v.1960, all swept in a damp meadow between Wytham Wood and the River Thames (*Graham*).

Biology. Unknown.

TERMOLAMPINI

TERMOLAMPA Bouček

Termolampa Bouček, 1961 : 60–61. Type-species : *T. pinicola* Bouček by monotypy and original designation.

Bouček (1961 : 61) proposed a new tribe, Termolampini, of the Tridyminae, for the reception of this genus. This seems to be a natural arrangement.

Termolampa pinicola Bouček

Termolampa pinicola Bouček, 1961 : 60–61, ♀.

Type material. Holotype ♀, Czechoslovakia, Bohemia, Týniště nad Orlici, 8.viii. 1959 (*Bouček*), in Národní Museum, Prague (Cat. no. 2967).

GERMANY, CZECHOSLOVAKIA.

Biology. A female was reared 26.v.1956 in the neighbourhood of Berlin, from *Evetria resinella* (L.) (Lep., Tortricidae) (*Schwenke*), Bouček (1961 : 61). Imagines May and August.

ORMOCERINI

(= Tridymini)

Walker (1833 : 370) proposed the family name Ormoceridae, in which he included not only true Ormocerines such as *Ormocerus*, *Glyphe*, *Gastrancistrus* and *Meromalus*, but also other genera which have no close connection with them. Förster's family Hormoceroidae (1856 : 19, 59) also contained diverse elements. Thomson's " tribe " Tridymina (1876 : 192) was (if one excepts *Metastenus*) a natural group. The tribe Tridymini of Ashmead (1904 : 273) included not only the genera placed there by Thomson, but also some which are currently referred to other tribes or even subfamilies. Schmiedeknecht (1909 : 274) followed Ashmead. Peck (*in* Muesebeck *et al.*, 1951 : 545–547) also included the unrelated genus *Trigonoderus* in Tridymini. Bouček (*in* Peck *et al.*, 1964 : 30, 34, 35), regarding Tridyminae as a subfamily, treated it in a wider sense, including Eunotini, Pirenini and Neodiparini, as well as the genera referred in the present work to Ormocerini. I regard the Eunotine and Neodiparine groups as relatively distinct ; I am treating Pirenini and Ormocerini as distinct (though very closely allied) tribes of Miscogasterinae. Some genera here placed in Ormocerini (e.g., *Ormocerus*) approach very closely to certain Miscogasterini on the other hand. These are only some of the difficulties which confront any worker investigating the higher categories of Chalcidoidea.

Ormocerini appear to be mainly parasites of Diptera (especially Cecidomyiidae), although *Ormocerus* species have been reared from galls of Cynipidae, whilst other hosts are recorded for certain species.

KEY TO EUROPEAN GENERA

1		Males	2
–		Females	5
2	(1)	Antennae with six funicular segments	3
–		Antennae with five funicular segments	10
3	(2)	Antennal clava with three segments ; two very distinct anelli present (antennal formula 11263). Postmarginal vein of fore wing somewhat longer than the marginal vein	4
–		Either the antennal clava has only two segments ; or else there is only one distinct anellus (the other being absent or so minute as to be invisible in dried specimens). Postmarginal vein of fore wing rarely longer than the marginal vein	6

4 (3) Anterior margin of clypeus slightly produced, but almost truncate medially ; metapleuron narrowing to a point dorsally and not reaching the cavity from which the hind wing arises . . . . . ***ORMOCERUS*** Walker (p. 252)

– Anterior margin of clypeus evenly and quite strongly curved forwards ; metapleuron narrowing less strongly dorsad and reaching the cavity from which the hind wing arises . . . . . *?**MEROMALUS*** Walker (p. 328)

5 (1) Antennae with six funicular segments (formula 11263 ; both anelli very distinct). Postmarginal vein of fore wing somewhat longer than the marginal vein. Metapleuron narrowing to a point dorsally and not reaching the cavity from which the hind wing arises . ***ORMOCERUS*** Walker (p. 252)

– Antennae with five funicular segments (formula 11153 or 11253). Postmarginal vein of fore wing usually shorter than or about as long as, rarely a little longer than, the marginal vein. Metapleuron (except in *Bugacia*) narrowing less strongly dorsad and reaching the cavity from which the hind wing arises 6

6 (5) Pronotal collar margined at least in the middle ; metapleuron narrowing to a point dorsally and not reaching the cavity from which the hind wing arises. Vertex usually with a transverse ridge or elevation behind the ocelli. Antennal formula 11163 in ♂, 11153 in ♀ . ***BUGACIA*** Erdös (p. 264)

– Pronotal collar immarginate, rounded off in front ; metapleuron narrowing only slightly dorsad and reaching the cavity from which the hind wing arises. Vertex without a ridge or elevation 7

7 (6) Antennae inserted low on the head, the lower edge of their toruli at most very slightly above the level of the ventral edge of the eyes, usually lower than this ; usually only one anellus visible in dried specimens, the other anellus (if present) being almost always minute, and discoid (Text-figs. 199–200, 209–211, 221, 223–225, 229, 239–247, 257). Clypeus convex, its anterior margin more or less curved forwards, though sometimes with an emargination in the middle of the curve, (Text-figs. 214–216). Mandibles, except in *Oxyglypta*, with four teeth. Scutellar frenum more or less distinctly marked off, at least by a very fine line. *Male* antenna usually with six funicular segments and a two-segmented clava ; rarely six funicular segments and a three-segmented clava 8

– Antennae inserted higher, the lower edge of their toruli well above the level of the ventral edge of the eyes ; two anelli clearly visible in dried specimens (Text-figs. 189–194). Clypeus flat or nearly so, sometimes with a slight depression before its anterior margin, which is truncate or slightly curved forwards. Both mandibles with three teeth. Scutellar frenum not, or at most very indistinctly, marked off. *Male* antenna nearly always with five funicular segments and a three-segmented clava (Text-figs. 189, 190, 193) (with six funicular segments and a two-segmented clava in *Semiotellus fumipennis* ; with five funicular segments and an apparently four-segmented clava in *Systasis annulipes*) 10

8 (7) Mesoscutum with sculpture composed of transverse ripples or striae. Both mandibles with three teeth. Body black with at most obscure metallic reflections. Median carina of propodeum fine, neither raised into a tubercle medially, nor traversed by a crest. Hypopygium of *female* extending two thirds or slightly more than two thirds length of gaster, but without a mucro at apex . . . . . ***OXYGLYPTA*** Förster (p. 265)

– Mesoscutum reticulate, at most with a trace of transverse rippling in front, in the latter case the body is distinctly metallic. Both mandibles with four teeth 9

9 (8) Gaster of *female* (Text-fig. 201) with the hypopygium extending far caudad and ending in a membranous mucro (m). Dorsal surface of hind coxae with indications of a longitudinal crest. Median carina of propodeum strongly raised, crossed at about the middle of its length by a transverse crest which in profile appears dentiform. Body black, or black with a weak bluish tinge ; length 2 to 3 mm. . . . ***MELANCISTRUS*** gen. n. (p. 266)

– Gaster of *female* with the hypopygium extending at most about half way along, and without a mucro. Dorsal surface of hind coxae without a longitudinal crest. Median carina of propodeum (when present) not stongly raised, and not traversed by a crest. Body most often distinctly metallic, rarely black or nearly so . ***GASTRANCISTRUS*** Westwood (p. 270) [see also *MEROMALUS* Walker]

10 (7) Mesoscutum and scutellum relatively shiny, their reticulate sculpture hardly raised above the general surface ; with several piliferous punctures which, even if small, are clearly visible, but most often they are very conspicuous. Anterior margin of clypeus slightly curved, tending to be produced slightly ventrad of the lower edge of the genae. Except in one species, each gastral pygostyle has one of its bristles conspicuously longer than the others. Fore wing : pilosity of disc extending to near the marginal vein at least below the distal half of the vein . . . ***SEMIOTELLUS*** Westwood (p. 254)

– Mesoscutum and scutellum relatively dull, their reticulate sculpture dense and distinctly raised above the general surface ; piliferous punctures minute and scattered, not easily seen on account of the dense reticulation. Anterior margin of clypeus truncate ; lower edge of genae adjacent to clypeus produced slightly ventrad of its anterior margin. Bristles of gastral pygostyles not very dissimilar in length. Fore wing (Text-figs. 195, 196) with a broad bare strip, upon which is situated a row of long hairs, below the marginal vein . . . . . ***SYSTASIS*** Walker (p. 257)

ORMOCERUS Walker

Ormocerus Walker, 1834 : 168. Type-species : *O. vernalis* Walker, by designation of Westwood, 1839 : 69.
Ormocerus Walker; Westwood, 1839 : 69.
Hormocerus Förster, 1856 : 59, 60 [emendation].
Terobia Förster, 1878 : 64. Type-species : *T. dispila* Förster, by monotypy.
Terobia Förster ; Ashmead, 1904 : 274, 275.
Terobia Förster ; Schmiedeknecht, 1909 : 275, 276, 283.
Terobia Förster ; Nikol'skaya, 1952 : 239–240.
Ormocerus Walker ; Delucchi, 1955*a* : 175.
Ormocerus Walker ; Askew, 1961*a* : 193–195.
Ormocerus Walker; Bouček, 1961 : 64.

The type-species of *Terobia* (*dispila* Förster) was synonymized with *Ormocerus vernalis* Walker by Delucchi (1955 : 175). Until then the genus *Ormocerus* had been misinterpreted (e.g., by Ashmead (1904), Schmiedeknecht (1909) and Nikol'skaya (1952), who followed Thomson). Thomson's supposed *Ormocerus* (1876*a* : 220, 242) was in fact *Seladerma* (=*Isoplata*) *geniculata* (q.v.).

KEY TO EUROPEAN SPECIES

1 *Female*. Fore wing with two fuscous clouds (one below the parastigma, the other below the stigma) which sometimes join on the disc of the wing ; basal cell, on upper

surface of wing, pilose in distal quarter only ; stigmal vein nearly straight ; palpi fuscous ; flagellum stout, with distal funicular segments strongly transverse, the sixth about twice as broad as long ; head and thorax dull green, the scutellum and axillae often more or less bronze. *Male.* Unknown ***vernalis*** Walker (p. 253)

– *Female.* Fore wing immaculate ; basal cell mainly pilose, at most with a small bare area in the middle ; stigmal vein distinctly curved ; palpi yellow ; flagellum more slender, with distal funicular segments less transverse, the sixth about 1·5 times as broad as long ; head and thorax bright or golden green to blue. *Male.* Characters of female, but antennal scape broader, flagellum nearly filiform ***latus*** Walker (p. 253)

Ormocerus vernalis Walker

Ormocerus vernalis Walker, 1834 : 169, ♀.
Terobia dispila Förster, 1878 : 65, ♀.
Ormocerus vernalis Walker ; Askew, 1961*a* : 193, ♀.
Ormocerus vernalis Walker ; Bouček, 1961 : 64.

Type material. *Ormocerus vernalis* Walker. Syntypes, 6 ♀. LECTOTYPE, the second specimen, bearing a Waterhouse label.

Terobia dispila Förster. Location of type not known to the writer. The species was placed in synonymy with *Ormocerus vernalis* Walker by Delucchi (1955*a* : 175).

Walker cited no locality for his original material of *vernalis*. However, in his annoted hand-copy of his *Monographia* (which I possess) he has entered against *vernalis* " May Woods near London. Holywood Mr. Haliday ". Most likely the original specimens came from near London because there is reason to suppose that he did not have material from Haliday until later than 1834.

BRITAIN, IRELAND, GERMANY, CZECHOSLOVAKIA.

Biology. Parasitic in galls of *Neuroterus albipes* (Schenck) and *Andricus ostreus* f. *furunculus* (Beyer) ; see Askew (1961 : 193).

I have swept only single females on various dates in April, May and June of different years. The male is still unknown.

Note. The species recorded as *Ormocerus vernalis* by Thomson (1876*a* : 242) was wrongly identified ; it is in fact the same as *Seladerma* (*Isoplata*) *geniculatum* (Zett.).

Ormocerus latus Walker

Ormocerus latus Walker, 1834 : 168, ♂.
? Ormocerus vernalis var. ε Walker, 1834 : 169, ♀.
Ormocerus latus Walker ; Askew, 1961*a* : 193, ♂ ♀.

Type material. One male, LECTOTYPE, bearing a Waterhouse label and another " Type Gahan 1927 ".

BRITAIN.

Biology. Parasitic in galls of *Neuroterus albipes* (Schenck) ; see Askew, 1961 : 193. I find it not uncommonly in mixed oakwoods during the spring months ; I have often swept it from foliage of *Betula*.

The other species originally placed by Walker in *Ormocerus* belong to other genera, and are mentioned in the appropriate places.

SEMIOTELLUS Westwood

Semiotus Walker, 1834 : 288, 290. Type-species : *S. mundus* Walker, by designation of Westwood, 1839 : 70. [Generic name pre-occupied by *Semiotus* Eschscholtz, 1829].
Semiotellus Westwood, 1839 : 70 [n. n.].
Stictonotus Förster, 1856 : 64, 68 [n. n. for *Semiotus* Walker *nec* Eschscholtz].
Semiotellus Westwood ; Thomson, 1876*a* : 193, 201.
Semiotellus Westwood ; Schmiedeknecht, 1909 : 275, 276, 280–282.
Semiotellus Westwood ; Nikol'skaya, 1952 : 240.
Semiotellus Westwood ; Peck *et al.*, 1964 : 33.

Key to European Species

(Females)

1 Antennal clava obliquely subtruncate at apex, the third segment with a rather large area of micropilosity ventrally ; the second suture of the clava in profile distinctly oblique. Gaster with bristles of pygostyles not very dissimilar in length. Fore wing with speculum large, extending as a bare wedge below the marginal vein for more than half the length of the latter ; stigma rather large, separated by about twice its height from the costal margin of the wing.

Combined length of pedicellus and flagellum slightly less than breadth of head. Large species, about three mm. ; body blue-green ; piliferous punctures of head, mesoscutum and scutellum very distinct ; gaster short sp. indet. (p. 255)

– Antennal clava not subtruncate at apex, the third segment with only a small tuft of micropilosity at its apex ; sutures not oblique. Gaster with one bristle of each pygostyle (Text-fig. 56) nearly twice the length of the other bristles. Fore wing with speculum nearly always less extended, there being, on upperside of wing, at least one row of hairs below the marginal vein and extending to near the base of the latter ; stigma relatively smaller 2

2 (1) Fore wing with marginal vein about 3·5 times as long as the stigmal vein ; upper surface of wing, below the marginal vein, with a band (three to five rows) of hairs which extends basad nearly to the junction of the marginal vein with the parastigma. Large species, about 3 mm ; body bronze-black ; head, mesoscutum, and scutellum extremely finely and delicately alutaceous, their piliferous punctures very small ; gaster hardly 1·5 times as long as head plus thorax . . . . ? ***fumipennis*** Thomson (p. 255)

– Fore wing with marginal vein 2·4 to 3 times as long as the stigmal vein ; upper surface of wing with the band of hairs below the marginal vein less broad and, below the basal half of the vein, often reduced to a single row of hairs. Body most often some tint of green or blue. Piliferous punctures of head, mesoscutum, and scutellum usually larger and more conspicuous (Text-fig. 56) ; gaster sometimes relatively longer 3

3 (2) Gaster 1·75 to 2 times as long as the thorax, and 2·7 to 3·3 times as long as broad ; hypopygium extending hardly half way along. Legs relatively more slender, especially the tibiae and tarsi ; spur of mid tibia about two thirds the length of the first tarsal segment. Large, 1·9 to 2·9 mm. ***diversus*** (Walker) (p. 256)

– Gaster (Text-fig. 56) 1·3 to 1·65 times as long as the thorax, and 1·5 to 2·7 times as long as broad ; hypopygium extending half or rather more than half way along. Legs relatively stout ; spur of mid tibia about four fifths the length of the first tarsal segment. Species sometimes smaller . . 4

4 (3) Length 1·6 to 2·7 mm. Antennal clava slightly shorter than, or at most as long as, the three preceding funicular segments together. Fore wings not shortened, and not markedly narrowed . . . ***mundus*** (Walker) (p. 256)

– Length 1·4 to 1·7 mm. Antennal clava slightly longer than the three preceding funicular segments together, sometimes equalling three and a half segments. Fore wings often shortened and narrowed, sometimes hardly reaching the apex of the gaster . . . ***laevicollis*** Thomson (p. 257)

(MALES)

1 Antennae apparently with six funicular segments and a two-segmented clava, the sixth funicular segment being separated from the clava by a deep constriction, though not apparently by a peduncle. Large species, 2·75 mm., body bronze-black ; head, mesoscutum, and scutellum extremely finely and delicately alutaceous, with minute piliferous punctures ; antennal scape reaching slightly above level of vertex . . ***fumipennis*** Thomson (p. 252)

– Antennae with five funicular segments and a three-segmented clava. The other characters not present in combination 2

2 (1) Antennal scape (Text-fig. 190) reaching above level of vertex, with a row of minutely-pitted foveae along its front edge ; combined length of pedicellus and flagellum 1·6 to 1·7 times the breadth of the head, the flagellum more slender than in the species which follow . . ***diversus*** (Walker) (p. 256)

– Antennal scape (Text-fig. 189) not reaching above level of vertex, without foveae along its front edge ; combined length of pedicellus and flagellum 1·35 to 1·45 times the breadth of the head, the flagellum stouter than in *diversus* 3

3 (2) Larger, 1·55 to 2·4 mm. ; funicular segments (Text-fig. 189) slightly to considerably longer than broad, the first as long as or longer than the pedicellus ; fore wing not narrow . . . ***mundus*** (Walker) (p. 256)

– Smaller, 1·3 to 1·8 mm. ; funicular segments quadrate or practically so, at least slightly shorter than the pedicellus ; fore wing relatively narrow (2·35 to 2·65 times as long as broad) . . . ***laevicollis*** Thomson (p. 257)

Semiotellus sp. indet.

The characters of this rather distinct undescribed species are given in my key above.

GERMANY : Isle of Rugen, Baabe, 2 ♀, vii.1960 (*Bouček*). Dr. Bouček very kindly allowed me to examine these.

Semiotellus fumipennis Thomson

Semiotellus fumipennis Thomson, 1876*a* : 203, ♂, ?♀.

Type material. Syntypes, 2 ♂. LECTOTYPE bears a tiny dark green ticket, also a label " fumipēnis Thom.". Thomson mentions the female in his diagnosis but I cannot find any female specimen in his collection.

SWEDEN ; ? ENGLAND [a female captured by me at Wytham Wood, Berkshire, 12.vi.1964, amongst *Phalaris arundinacea* L., resembles the lectotype male except in sexual characters and could be the female of *fumipennis*].

Biology. Unknown.

Semiotellus diversus (Walker)

Semiotus clarus Walker, 1834 : 291, ♀ [*nec* ♂].
Semiotus tarsalis Walker, 1834 : 292, ♀ [*nec* ♂].
Semiotus diversus Walker, 1834 : 294, ♂ ♀.

Type material. *Semiotus diversus* Walker. BM(NH), British section of the collection, 1 ♀ which is probably not original material ; foreign section, 3 ♀ and 2 ♂, all bearing Waterhouse labels. From the latter series I designate a female as LECTOTYPE.

Walker's series of both *clarus* and *tarsalis* are mixed, the females being the same as *diversus*, whilst the males belong to *mundus*. Their respective males on the whole agree best with his descriptions, hence lectotypes of that sex have been selected. This leaves *diversus* as the valid name for the present species.

BRITAIN (rather uncommon) ; SWEDEN.

Biology. Unknown. Imagines chiefly in June (some records for Aug.–Sept.).

Semiotellus mundus (Walker)

Semiotus mundus Walker, 1834 : 291, ♂ ♀.
Semiotus clarus Walker, 1834 : 291, ♂ [*nec* ♀], **syn. n.**
Semiotus tarsalis Walker, 1834 : 292, ♂ [*nec* ♀], **syn. n.**
Semiotus scoticus Walker, 1834 : 292, ♀, **syn. n.**
Semiotus varians Walker, 1834 : 293, ♂ ♀, **syn. n.**
Semiotus praestans Walker, 1834 : 293, ♂ ♀, **syn. n.**
? Semiotus quadratus Walker, 1834 : 295, ♂ ♀.
Semiotus maerens Walker, 1834 : 295, ♂, **syn. n.**
? Pteromalus punctifrons Nees, 1834 : 117, ♀.
Pteromalus Japis Walker, 1839 : 222, ♂, **syn. n.**
Semiotus varians Walker ; Haliday, 1841–1842 : vi, pl. J, fig. 2, ♀.
Semiotus tauriscus Walker, 1848 : 173, ♂, **syn. n.**
Semiotellus puncticollis Thomson, 1876*a* : 202, ♂ ♀, **syn. n.**
Semiotellus mundus (Walker) ; Peck *et al.*, 1964 : 33.

Type material. *Semiotus mundus* Walker. A female standing in the British collection in the BM(NH) is clearly not the type. In the foreign section there is a male which has been misplaced ; it is designated LECTOTYPE and is labelled " Semiotus mundus Walk. Type ♀. G. J. Kerrich det. 1958 ".

Semiotus clarus Walker. Five specimens (one a Eulophid !). LECTOTYPE, the third, a male.

Semiotus tarsalis Walker. One ♀ and 7 ♂ (but two probably not original material). LECTOTYPE, the fifth, a male.

Semiotus scoticus Walker. One female, LECTOTYPE ; it bears a printed label " Scoticus W.".

Semiotus varians Walker. In the British section of the BM(NH) collection there are 3 ♂, two of which are not original material, whilst the third disagrees with the description. In the foreign section of the collection there are 14 specimens which I regard as syntypes (4 ♀, 10 ♂). From these I select the first female as LECTO-

TYPE ; it is labelled " 38. 7. 12. 79 ", " Clermont, France ", and also bears a Waterhouse label.

Semiotus praestans Walker. Syntypes, 2 ♂, 2 ♀. LECTOTYPE, the first female, bearing a Waterhouse label.

Semiotus quadratus Walker. Syntypes, 7 specimens. LECTOTYPE, the fourth, a female bearing a Waterhouse label. It is probably within the range of variation of *mundus*.

Semiotus maerens Walker. Syntypes, 3 ♂. LECTOTYPE, the third ; Waterhouse label.

Pteromalus punctifrons Nees. Types lost.

Pteromalus japis Walker. One male, LECTOTYPE ; Waterhouse label.

Semiotus tauriscus Walker. One male, designated LECTOTYPE ; bears a green-bordered " Type " label, also a printed one " Tauriscus ".

Semiotellus punctifrons Thomson. Syntypes on 25 pins. LECTOTYPE, a female labelled " Rsiö " [Ringsjön].

This is a very common species (at least in Britain) and also extremely variable in size, colour of body and legs, size of wings and proportions of the flagellar segments of the antennae. All these variations seem to me to be within the range of variation of one species ; at all events the different forms cannot be separated at present by any reliable characters.

BRITAIN, IRELAND, SWEDEN, FRANCE; no doubt widely distributed in Europe.

Biology. Unknown. Imagines May–Aug. (mostly June–July).

Semiotellus laevicollis Thomson

Semiotellus laevicollis Thomson, 1876*a* : 203, ♂ ♀.

Type material. Syntypes, 6 ♀ and 1 ♂. LECTOTYPE, a female labelled " Esp " [Esperöd].

I retain *laevicollis* for the present as a valid species, though I am not sure whether it might not be a habitat-form of *mundus*, dwarfs of which approach very closely to the larger specimens of what I am calling *laevicollis*. I have taken several specimens of both sexes of *laevicollis* in Britain (on chalk-downland in Oxfordshire, on moorland in Perthshire, Scotland).

BRITAIN, SWEDEN ; very local.

Biology. Unknown. Imagines in June.

SYSTASIS Walker

Systasis Walker, 1834 : 288, 296. Type-species : *S. encyrtoides* Walker, by designation of Westwood, 1839 : 70.

Systasis Walker ; Thomson, 1876a : 193, 203.

Syntasis [*sic*] Walker ; Ashmead, 1904 : 274, 275.

Systasis Walker ; Schmiedeknecht, 1909 : 275, 276, 280.

? Guieralia Risbec, 1951 : 253. Type-species : *G. guierae* Risbec, by monotypy.

Systasis Walker ; Nikol'skaya, 1952 : 240.
Systasis Walker ; Bouček, 1955 : 324–327.
Systasis Walker ; Peck, 1963 : 644.
Systasis Walker ; Peck *et al.*, 1964 : 33.

The European species of *Systasis* have not been revised ; Bouček (1955) described two new species, one of which falls into synonymy.

Guieralia Risbec (described from Senegal) appears to me, from the descriptions of the genus and its type-species, as well as Risbec's figure (136a) of the fore wing, to be probably a synonym of *Systasis*.

Key to European Species

(Males and Females)

1 Metapleuron and sides of propodeum shiny and weakly sculptured ; mesopleuron mainly, and mesosternum, with obsolescent alutaceous sculpture, hence very shiny. Fore wing (upper surface) with basal cell closed below, basal vein pilose, sometimes also a few hairs in the distal part of the basal cell. Antennae with scape only slightly more than half as long as an eye and not reaching the median ocellus ; sutures of clava, in *female* only the second suture, oblique. *Female* with gaster lanceolate, as long as or longer than head plus thorax ; combined length of pedicellus and flagellum less than breadth of head, flagellum strongly clavate ; funicular segments all transverse, distal ones strongly so ; clava broader than, and almost as long as, the funicle. *Male* with combined length of pedicellus and flagellum less than breadth of head ; flagellum distinctly clavate ; all funicular segments transverse ; clava nearly as long as the funicle, apparently four-segmented, there being a large offset portion at the apex of the third segment. (subgenus *Systasina* Bouček) . . . . . . ***annulipes*** (Walker) (p. 266)

– Metapleuron and sides of propodeum strongly reticulate and relatively dull ; mesopleuron, and usually mesosternum, entirely reticulate or strongly alutaceous. Fore wing (upper surface) with basal cell bare, open below ; basal vein bare or with few hairs. Antennae with scape reaching at least level with lower edge of median ocellus ; sutures of clava not oblique. *Female* with gaster often relatively shorter ; combined length of pedicellus and flagellum at least equal to breadth of head ; flagellum weakly clavate ; funicular segments at most slightly transverse ; clava only slightly broader than funicle, at most slightly longer than the three preceding funicular segments together. *Male* with combined length of pedicellus and flagellum at least slightly greater than breadth of head ; flagellum filiform or very weakly clavate ; funicular segments not all transverse ; clava at most as long as the three preceding funicular segments together, three-segmented, with only a minute offset portion at the apex of the third segment (subgenus *Systasis* s. str.) 2

2 (1) Fore wing (Text-fig. 195) beyond the speculum relatively more thickly pilose ; no bare area either between the postmarginal and stigmal veins, or below the stigma. Lower face, laterad of the clypeus, either with very few and shallow punctures which are relatively inconspicuous amongst the reticulation of the surface, or virtually impunctate. *Male* antennal scape only 2·6 to 2·7 times as long as broad.

Antennal scape of *both sexes* hardly reaching above the level of the vertex ; flagellum of *female* (Text-fig. 192) rather slender, the funicle not stouter than the pedicellus . . . . . ***tenuicornis*** Walker (p. 260)

– Fore wing (Text-fig. 196) beyond the speculum relatively more sparsely pilose ; with at least a small bare area between the postmarginal and stigmal veins, and another just below the stigma. Lower face, laterad of the clypeus, usually with more numerous and quite conspicuous punctures, these may be less distinct in some small specimens. *Male* antennal scape at least three times as long as broad 3

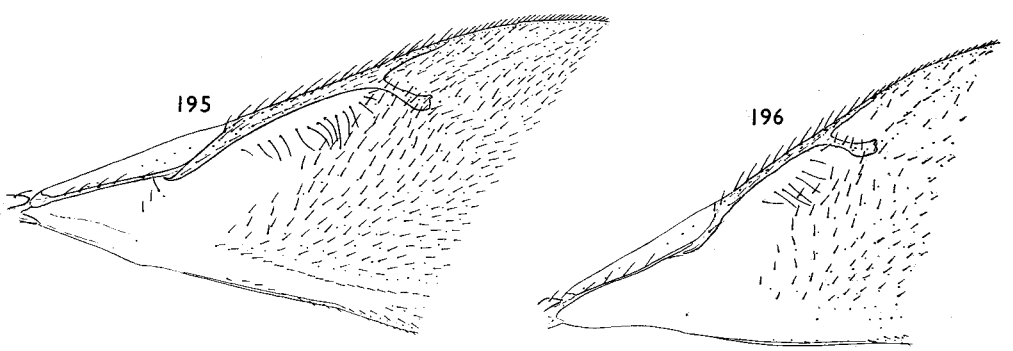
3 (2) *Female* antennal scape reaching to, or above, the level of the vertex ; funicle of practically uniform thickness and slightly stouter than the pedicellus ; clava, except in small specimens, at least slightly shorter than the combined length of the three preceding funicular segments. *Male* antennal scape reaching slightly to far above the level of the vertex, its length fully equal to or slightly greater than the transverse diameter of an eye ; combined length of pedicellus and flagellum about 1·3 times the breadth of the head ; first funicular segment at least slightly longer than the pedicellus, all the funicular segments distinctly longer than broad ; bristles of flagellum standing out at an angle of 40° to 45° 4

– *Female* antennal scape hardly reaching level of vertex ; funicle (Text-fig. 194) thickening slightly towards the clava, which is as long as the three preceding funicular segments together. *Male* scape not reaching above level of vertex, its length hardly as great as the transverse diameter of an eye ; combined length of pedicellus and flagellum only slightly greater than the breadth of the head ; first funicular segment (Text-fig. 193) shorter than the pedicellus, funicular segments quadrate or at most slightly longer than broad ; bristles of flagellum standing out at a smaller angle, sometimes nearly decumbent 5

4 (3) *Female* larger (length 1·6 to 2·4 mm., but usually more than 1·9 mm.) ; gaster 1·4 to 1·7 times as long as broad, usually slightly shorter than, occasionally as long as, head plus thorax . . . ***encyrtoides*** Walker (p. 261)

– *Female* 1·6 to 1·9 mm. ; gaster 1·75 to 1·9 times as long as broad, slightly longer than head plus thorax. Slovakia : perhaps only a form of *encyrtoides* sp. indet.

5 (3) *Female* gaster about 1·3 times as long as head plus thorax, and about 2·5 times as long as broad. Head in frontal view with vertex strongly arched ; eyes separated by about 1·45 times their length . ***longula*** Bouček (p. 263)



FIGS. 195–196. *Systasis* spp., fore wings (part) : 195, *tenuicornis* Walker, ♀ ; 196, *parvula* Thomson, ♀.

– *Female* gaster at most very slightly longer than head plus thorax, and at most about 2·3 times as long as broad, if as long as this, then the head in frontal view has the vertex weakly arched, and the eyes are separated by only 1·25 to 1·3 times their length 6

6 (5) *Female* antennal pedicellus about as long as anelli plus first funicular segment ; fifth funicular segment hardly shorter than the first segment of the clava ; gaster 2 to 2·3 times as long as broad, as long as head plus thorax, slightly narrower than the thorax ; length 1·8 to 2·0 mm. *Male* length 1·5 to 1·6 mm. ; antennal funicle fully as stout as the pedicellus ***angustula*** sp. n. (p. 262)

– *Female* antennal pedicellus (Text-fig. 194) distinctly longer than anelli plus first funicular segment ; fifth funicular segment distinctly shorter than the first segment of the clava ; gaster 1·3 to 1·6 times as long as broad, as broad as or broader than the thorax ; length 1·4 to 1·8 mm. *Male* length 1·0 to 1·4 mm. ; antennal funicle (Text-fig. 193) usually slightly thinner than the pedicellus . . . . . ***parvula*** Thomson (p. 263)

Subgenus ***SYSTASINA*** Bouček

Systasis (Systasina) annulipes (Walker) **comb. n.**

Gastrancistrus annulipes Walker, 1834 : 176, ♀.
Ormocerus Bambyce Walker, 1839 : 208, ♀, **syn. n.**
Systasis (*Systasina*) *clavicornis* Bouček, 1955 : 324, ♂ ♀, **syn. n.**

Type material. *Gastrancistrus annulipes* Walker. Syntypes, 2 ♀ which are conspecific. LECTOTYPE, the first specimen, with Waterhouse label, and another " Type C.F." [C. Ferrière].

Ormocerus bambyce Walker. One female, LECTOTYPE.

Systasis (*Systasina*) *clavicornis* Bouček. Type ♀, Bohemia, valley between Noutounice and Kováry, 6–11.vi.1953 (*Bouček*), in Národní Museum, Prague (Cat. no. 3063). I have examined the type.

BRITAIN, CZECHOSLOVAKIA, HUNGARY. In England, locally common on rough grassland, particularly chalk downland.

Biology. Unknown. Imagines mainly in June–July, single records for end of May, and August, in Czechoslovakia.

Subgenus ***SYSTASIS*** Walker, s. str.

Systasis (Systasis) tenuicornis Walker

(Text-figs. 191, 192, 195)

Systasis tenuicornis Walker, 1834 : 297, ♀.

Type material. Syntypes, 1 ♀, 2 ♂. LECTOTYPE, the female, bearing a Waterhouse label and another in C. Ferrière's handwriting " same sp. as above ? ".

ENGLAND : Berkshire, Windsor Forest (Walker, 1834 : 297) ; Wytham Wood, 1 ♀, 12.vii.1956 (*Graham*) ; Bagley Wood, 1 ♀, 28.vii.1955, 1 ♂, 1 ♀, 30.v.1957 (*Graham*).

This species appears to be much less common than *encyrtoides*.

Biology. Unknown. Imagines June–August.

Systasis (Systasis) encyrtoides Walker

Systasis encyrtoides Walker, 1834 : 296, ♂ ♀.
Systasis encyrtoides Walker ; Haliday, 1841–1842 : v, pl. B, fig. 1, ♀.
? *Tridymus punctatus* Ratzeburg, 1852 : 227.
Hormocerus impletus Walker, 1872 : 96, ♀, **syn. n.**
Systasis longicornis Thomson, 1876*a* : 204.

Type material. *Systasis encyrtoides* Walker. Syntypes, 5 specimens. One T-shaped card carries a male and a female ; the latter is designated LECTOTYPE ; the specimens bear a Waterhouse label.

Tridymus punctatus Ratzeburg. Types presumed lost. So far as one can tell from the description, *punctatus* probably was a *Systasis*, and might have been the same as *encyrtoides*. Reinhard (1857 : 78) synonymized *punctatus* with *encyrtoides*, apparently because the recorded biological data for the two were similar. Walker (1848*a* : 77) had stated that *Systasis encyrtoides* " Destroys an *Apion* on *Spartium Scoparium*, broom " ; the specimen or specimens of *encyrtoides* on which this record was based had been sent to him, together with the biological data, by Kaltenbach. Ratzeburg (1852 : 227) cited " Bruchus Spartii 2 " as host of his *Tridymus punctatus*, though from his further remarks it would seem that the parasite was merely reared from pods of broom (" aus den Schoten von *Spartium scoparium* ") together with the beetle mentioned. These two records support the idea that *encyrtoides* and *punctatus* could be the same. The records themselves are, however, rather circumstantial and need confirmation. At least three species of Cecidomyiidae are associated with the pods of broom (*Sarothamnus scoparius* (L.) Wimm.) and it seems more likely that the specimens of *encyrtoides* and *punctatus* recorded by Walker and Ratzeburg had been attacking one or other of these Diptera.

Hormocerus impletus Walker. One female, LECTOTYPE ; labelled " Corsica ", " Marshall coll. 1904–120 ", " implet[us] Cors[ica] ". The specimen lacks the gaster ; I cannot distinguish it from *encyrtoides*.

Systasis longicornis Thomson. Two females, one of which disagrees with the description. LECTOTYPE labelled " Sm " [Småland] and " Bhn " [Boheman].

Britain, Sweden, Czechoslovakia, Corsica, Moldavian S.S.R. ; a fairly common species in Britain.

Biology. Reared in Britain from galls of *Dasyneura epilobii* (F. Loew) on *Chamaenerion angustifolium* L. in Norfolk (*S. A. Manning*) ; from *Phytomyza isais* Her. in seeds of *Odontites verna* (Bell.) Dum. (*G. C. D. Griffiths*) ; material in BM (NH). It has also been recorded as a parasite of *Contarinia medicaginis* Kieff. in France (Secrétariat, etc. 1961 : 215, 228) ; of *Conchylidea implicatans* Wek. (Lep., Tortricidae) in Yugoslavia (ibid., 1963 : 343, 359) ; of *Contarinia ilicis* Kieffer in France, and of *Tortrix viridana* L. in Portugal (ibid., : 121, 129, 130). Of the continental records quoted, those referring to Cecidomyiid hosts are probably correct ; those of lepidopterous hosts seem rather unlikely and it would be satisfactory to have them confirmed. Imagines May–Sept., possibly more than one generation.

Systasis (Systasis) angustula sp. n.

♀. Bright green to bluish green. Antennae black, scape and pedicellus with green reflections. Legs mainly blackish with a green tinge ; knees and apices of tibiae, also an external stripe on the fore tibia, testaceous ; fore tarsi brownish, mid and hind tarsi pale testaceous becoming brownish distally, their fifth segment fuscous. Tegulae black with a metallic tinge ; wings hyaline, venation brownish testaceous. Length 1·8 to 2 mm.

Lower face, on either side of clypeus, rather irregularly reticulate and with several conspicuous piliferous punctures. Head in dorsal view 2·1 to 2·2 times as broad as long ; temples about one quarter as long as eyes. Head in frontal view about 1·25 times as broad as high, with vertex not strongly arched. Eyes separated, on vertex, by 1·25 to 1·3 times their length. Antenna with scape reaching about to level of lower edge of median ocellus, its length slightly less than the transverse diameter of an eye ; combined length of pedicellus and flagellum about equal to breadth of head ; pedicellus (profile) nearly twice as long as broad, approximately as long as anelli plus first funicular segment ; flagellum slightly clavate, proximally slightly stouter than the pedicellus (in profile) ; funicular segments increasing very slightly in length, the fifth as long as the first segment of the clava ; the segments are quadrate, or the fourth and fifth very slightly transverse ; clava about as long as the three preceding funicular segments together ; sensilla sparse ; hairs of flagellum subdecumbent.

Thorax squat, 1·3 to 1·4 times as long as broad. Fore wing much as in *parvula* (cf. Text-fig. 196) ; basal vein bare or with one or two hairs ; speculum broad and continued, on upper surface of wing, as a bare strip below the marginal vein as far as the stigmal vein ; the triangular area between the postmarginal and stigmal veins is mainly bare, and there is a small bare spot below the stigma ; disc of wing, beyond the speculum, rather sparsely haired ; postmarginal vein 1·2 to 1·3 times as long as the stigmal vein. Spur of mid tibia about three quarters the length of the first tarsal segment.

Gaster long-ovate, as long as head plus thorax, slightly narrower than the thorax, 2 to 2·3 times as long as broad, acutely pointed apically.

♂. Differs from ♀ chiefly in the antennae, gaster, and smaller size (1·5 to 1·6 mm.). Antenna with scape broader, only slightly more than three times as long as broad, with a row of small pits along its front edge ; combined length of pedicellus and flagellum slightly greater than breadth of head ; pedicellus slightly shorter than in ♀ ; funicle proximally as stout as the pedicellus when the latter is seen in dorsal view, hardly thickening distad ; its segments quadrate, or the proximal ones very slightly longer than broad ; clava nearly as long as the three preceding funicular segments together ; hairs of flagellum subdecumbent. Postmarginal vein only slightly longer than the stigmal vein. Gaster oval, depressed ; hardly as long as, and slightly narrower than, the thorax.

This species is very close to *parvula* Thomson and differs only in the characters mentioned in my key. The ♀ is also very near that of *longula* Bouček, but differs particularly in its relatively shorter gaster, also in some smaller details, as follows : eyes rather larger, separated (on vertex) by 1·25–1·3 times their length (by about 1·45 times in *longula*) ; head in frontal view distinctly transverse, with vertex less strongly arched (in *longula* more subcircular, with vertex strongly arched) ; in dorsal view the head is rather more transverse (in *longula* hardly twice as broad as long), with the temples shorter (more than one third as long as eyes in *longula*).

Holotype ♀. ENGLAND : Surrey, Riddlesdown, from *Kiefferia pimpinellae* Hed. (Dipt., Cecidomyiidae), 20.ix.1947 (*M. Niblett*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 3 ♂, 3 ♀ ; Surrey, Effingham Common, from

Putoniella marsupialis (F. Loew), 3 ♂, 3.vii.1947 (*M. Niblett*), in Hope Department, Oxford and in Manchester Museum.

Systasis (Systasis) parvula Thomson

(Text-figs. 193, 194, 196)

Systasis parvula Thomson, 1876*a* : 205, ♂ ♀.

Type material. Syntypes, 8 specimens. LECTOTYPE, a female labelled " Ar " [Arrie] and " par-vula " ; the specimen remounted by A. Jansson.

IRELAND, SWEDEN, CZECHOSLOVAKIA.

Biology. Unknown. All the specimens which I have captured were taken from weeds at the edges of cultivated fields. Imagines in July.

Systasis (Systasis) longula Bouček

Systasis longula Bouček, 1955 : 326, ♀.

Type material. Holotype ♀, S. Moravia, Hlohovec, 8.vi.1948 (*Bouček*), in Národní Museum, Prague (Cat. no. 3065) ; I have examined the type.

The male is unknown.

CZECHOSLOVAKIA.

Biology. Unknown.

It may be remarked here that the following extralimital species also belong to *Systasis* according to their respective types in BM(NH).

Miscogaster Cernus Walker, 1839*a* : 11, " ♀ " [*recte* ♂]. (Tasmania). LECTOTYPE ♂. Type Hym. 5.796. It appears to be quite near *encyrtoides* Walker.

Semiotus Merula Walker, 1839*a* : 17, ♀ (Tasmania). LECTOTYPE ♀. Type Hym. 5.667. A valid species, having the radial cell of the fore wing pilose as in *tenuicornis* Walker, but the face with distinct piliferous punctures and the gaster longer than head plus thorax.

Semiotus Dice Walker, 1839*a* : 15, ♂ (Australia). LECTOTYPE. Type Hym. 5.668.

Pteromalus Lelex Walker, 1839*a* : 95, ♀ (Australia). LECTOTYPE. Type Hym. 5.739.

Pteromalus Euctemon Walker, 1839*a* : 88, ♀ (Chile). LECTOTYPE. Type Hym. 5.744.

Note. Systasis celer Goureau (1851 : 151, pl. 10, figs. 10. 11) reared from *Phytomyza geniculata* Mg., probably does not belong to *Systasis* but to some genus of Miscogasterini. I have looked for the types in the Muséum Nationale d'Histoire Naturelle, Paris, and elsewhere, but have failed to locate any.

BUGACIA Erdös

Bugacia Erdös, 1946 : 162. Type-species : *B. arenaria* Erdös, by monotypy and original designation.
Bugacia Erdös ; Peck *et al.*, 1964 : 33.
Bugacia Erdös ; Bouček, 1965*d* : 84–86.

The species have been revised by Bouček (1965).

Key to European Species

(Males and Females)

1 Vertex posteriorly with a strongly raised and sharp transverse crest which extends laterally well outside the level of the posterior ocelli ; in frontal view this crest appears like three waves, separated by slight indentations at the level of each posterior ocellus. Antennal flagellum subfiliform, in *female* relatively thick throughout, the distal funicular segments only slightly transverse. Scutellar frenum more shiny than the rest of the scutellum, smooth at least in the middle. Basal cell of fore wing in *female* hairy only at extreme apex and along the basal vein. Tibiae testaceous or hardly at all infuscate . . . . . ***submontana*** Bouček (p. 264)

– Vertex with a weaker transverse ridge which is not sharp and extends at most very slightly outside the level of the posterior ocelli, sometimes the ridge is absent ; in frontal view the vertex does not appear to have three waves. Antennae either with the proximal funicular segments narrower than the distal ones; or with the latter strongly transverse, the fifth nearly twice as broad as long. Scutellar frenum finely reticulate like the rest of the scutellum and relatively dull. Basal cell of fore wing with scattered hairs over its distal third to half 2

2 (1) Vertex posteriorly with a fairly distinct transverse ridge which extends slightly laterad of the posterior ocelli. Antennal flagellum strongly clavate, the funicle proximally more slender with its second segment only slightly more than half as broad as the fifth segment. Propodeum nearly smooth, with plicae strong, often also with supplementary carinae between them and the median carina. Hind margin of basal tergite of gaster deeply, rectangularly emarginate . . . . . ***arenaria*** Erdös (p. 265)

– Vertex without a ridge or with at most a weak one which does not extend laterad of the posterior ocelli. Antennal flagellum less strongly clavate, the funicle relatively thicker proximally with its second segment not much narrower than the fifth segment. Propodeum delicately wrinkled, the wrinkles tending to radiate from the base of the median carina ; plicae weaker, no obvious supplementary carinae present. Hind margin of basal tergite of gaster shallowly emarginate . . ***classeyi*** Bouček (p. 265)

Bugacia submontana Bouček

Bugacia submontana Bouček, 1955 : 322, ♀.
Bugacia submontana Bouček, 1961 : 66, ♂.
Bugacia submontana Bouček, 1965*d* : 86.

Type material. Holotype ♀, Western Bohemia, Kamenná near Karlovy Vary, in a wet meadow, 20.vii. 1951 (*Bouček*), in Národní Museum, Prague (Cat. no. 3042).

BRITAIN [new : England, Warwickshire, Waverley Wood, 1 ♂ swept in a damp rushy area, 5.vii.1954 (*Graham*)] ; CZECHOSLOVAKIA. Rare.

Biology. Unknown. Imagines in May and July.

Bugacia arenaria Erdös

Bugacia arenaria Erdös, 1946 : 163, ♂ ♀.
Bugacia arenaria Erdös ; Bouček, 1965*d* : 86.

Type material. Syntypes, Hungary, Bugac, 28.iv.1944, 5 ♂, 11 ♀, in coll. Erdös and in National Museum of Hungary, Budapest (not seen).

BRITAIN [new : England, Berkshire, Bagley Wood, 1 ♀, 30.v.1954 (*Graham*)] ; CZECHOSLOVAKIA, HUNGARY, MOLDAVIAN S.S.R.

Biology. Unknown. Imagines Apr.–May.

Bugacia classeyi Bouček

Bugacia classeyi Bouček, 1965*d* : 84, ♂ ♀.

Type material. Holotype ♀, England, Middlesex, Hampton, 11.vi.1964 (*Bouček*), in Národní Museum, Prague (Cat. no. 26011) ; also paratypes in same institution.

BRITAIN (new record) : Middlesex, Southgate, ♂♂, ♀♀ swept on rough grassland, 11.vi.1965 (*Graham*).

Biology. Unknown.

OXYGLYPTA Förster

Oxyglypta Förster, 1856 : 64, 68. Type-species : *O. rugosa* Ruschka, 1912, by subsequent reference.
Oxyglypta Förster ; Schmiedeknecht, 1909 : 275, 276, 279.
Oxyglypta Förster ; Nikol'skaya, 1952 : 238–239.
Oxyglypta Förster ; Peck *et al.*, 1964 : 33.

Oxyglypta rugosa Ruschka

Oxyglypta rugosa Ruschka, 1912 : 240–242, ♂ ♀.

Type material. Syntypes, Lower Austria, Gross-Enzersdorf, 9.iii.1911, 22 ♀ and 8 ♂ from galls of *Oligotrophus bergenstammi* Wachtl, presumably in Naturhistorisches Museum. Vienna.

AUSTRIA.

Biology. Reared from galls of *Oligotrophus bergenstammi* Wachtl (Dipt., Cecidomyiidae) in twigs of pear-tree (Ruschka, ibid.).

MELANCISTRUS gen. n.

Derivation : Greek ἀγχιστρον, hook ; μελασ, black. Gender : masculine.
Type-species : *Tridymus mucronatus* Thomson, 1876*a* : 194.

Occiput not margined. Clypeus marked off from the face by a weak groove, its anterior margin strongly curved. Both mandibles with four teeth. Antennae inserted below the middle of the face but above the level of the ventral edges of the eyes, 12-segmented (11262 in male, 11253 in female) ; first funicular segment longer than the pedicellus.

Pronotum short, without a collar. Mesoscutum and scutellum having their surface uneven, reticulate and also with numerous small piliferous tubercles, hence appearing almost rugulose. Notauli complete, deep. The scutello-axillar sutures are straight and converge strongly towards the mesoscutum, so that the base of the scutellum is only about one fifth the breadth of the mesoscutum. Scutellum hairy, except its sides and the frenum ; frenum marked off by a weak grooved line. Axillae hairy, except laterally. Propodeum with a median carina which is crossed at about the middle of its length by a transverse crest or ridge which in profile appears like a tooth ; plicae and nucha absent ; callus hairy all over right to the edge of the metapleuron, the bases of the hairs giving it a roughened appearance, convex, with a raised tubercle in the middle ; spiracles small, nearly circular, close to the hind margin of the metanotum. Postspiracular sclerite broad, sometimes with indications of an oblique carina.

Dorsal surface of hind coxae roughened, with indications of a longitudinal crest, hairy along its whole length. Hind tibiae each with two spurs, the second weaker and about half the length of the first. Fore wing with no hyaline break between parastigma and marginal vein ; marginal vein longer than the curved stigmal vein ; postmarginal vein variable, from slightly shorter than to slightly longer than, the marginal.

Gaster compressed laterally, strongly so in female and strongly carinate ventrally ; hypopygium of female very long, its tip situated at about three quarters the length of the gaster, and provided with a membranous process or mucro (Text-fig. 201).

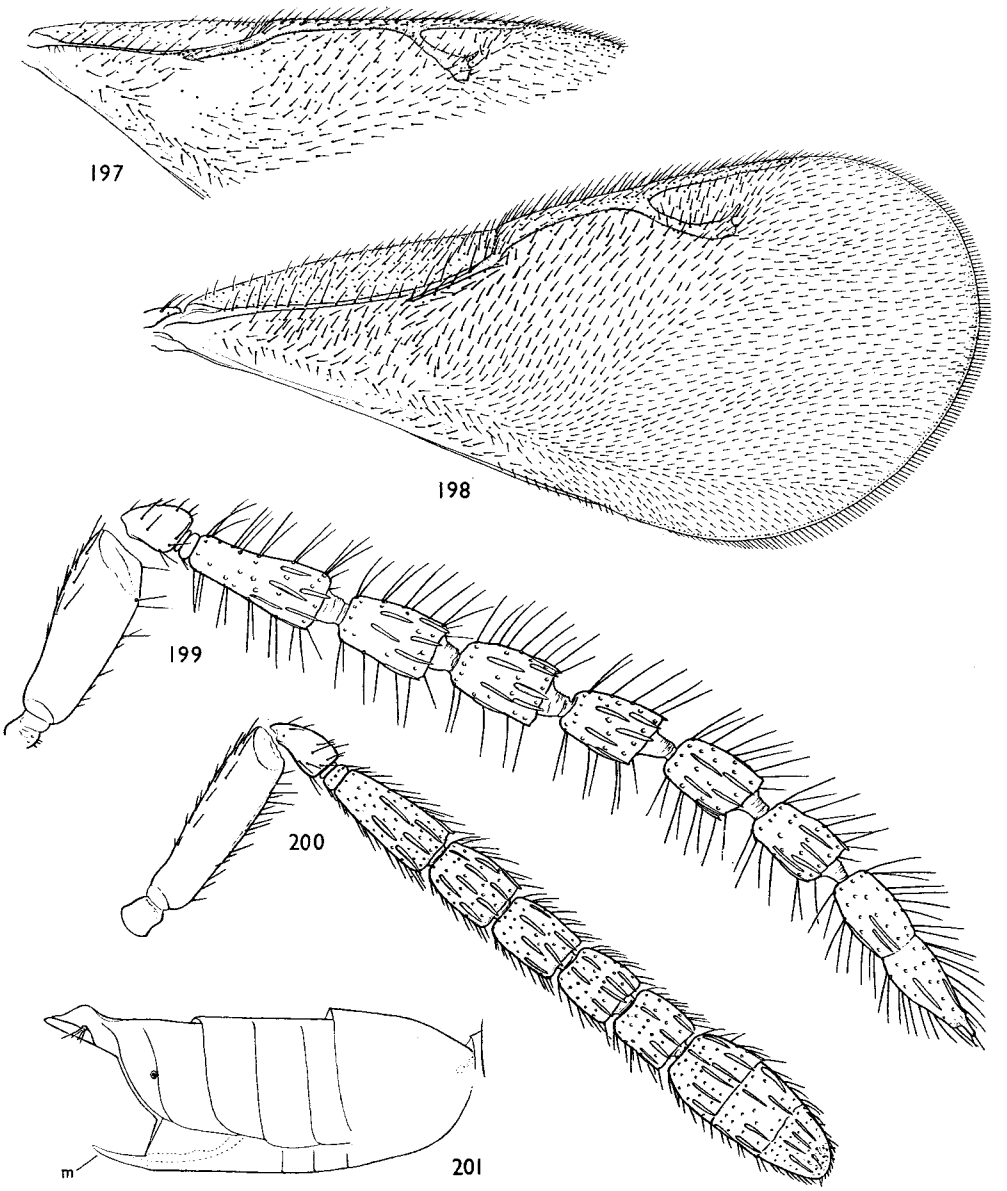
Melancistrus is close to *Gastrancistrus* Westwood, from which it differs by the following combination of characters.

Propodeal callus hairy all over as far as the edge of the metapleuron, convex and with a raised tubercle in its middle ; median carina of propodeum strongly raised, crossed at about the middle of its length by a transverse crest which in profile appears tooth-like. Dorsal surface of hind coxae with indications of a longitudinal crest, and hairy along their entire length. Gaster of female with the hypopygium extending far caudad, with a membranous mucro. Body black, or black with a very weak bluish tinge.

In females of *Gastrancistrus* species, the hypopygium is shorter, reaching at most about half way along the gaster and lacks a mucro.

Gastrancistrus coxalis Thomson approaches *Melancistrus* in the structure of the propodeum and has the hind coxae hairy dorsally ; but in *coxalis* the propodeal callus has only a weak tubercle, the median carina of the propodeum is not raised and is not transversed by a crest, the dorsal surface of the hind coxae has no longitudinal crest, whilst the body is metallic green.

In facies *Melancistrus* much resembles *Oxyglypta* Förster ; but in that genus the sculpture of the mesoscutum is composed of transverse ripples or striae, both mandibles have 3 teeth, the median carina of the propodeum is neither raised into a tooth medially nor traversed by a crest, whilst the hypopygium of the female gaster lacks an apical mucro.



FIGS. 197–201. 197, *Melancistrus specularis* sp. n., ♀, fore wing, part ; 198, *Melancistrus mucronatus* (Thomson), ♀, fore wing ; 199, same, ♂, antenna ; 200, same, ♀, antenna ; 201, *Melancistrus specularis* sp. n., ♀, gaster.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Fore wing (Text-fig. 198) with speculum absent ; postmarginal vein as long as, or very slightly longer than, the marginal vein ; costal cell relatively more hairy. Hind wing with costal cell with an irregular row of hairs extending its whole length ***mucronatus*** (Thomson) (p. 268)

– Fore wing (Text-fig. 197) with speculum present ; postmarginal vein distinctly shorter than the marginal vein ; costal cell relatively less hairy. Hind wing with costal cell bare . . . . . ***specularis*** sp. n. (p. 270)

The male of *mucronatus* only is known (see p. 269).

Melancistrus mucronatus (Thomson) comb. n.

(Text-figs. 198–200)

Tridymus mucronatus Thomson, 1876*a* : 194–195, ♀.

♀ (redescription of type). Black ; gaster brown at the base and more or less so on its sides, but possibly faded. Antennal scape testaceous ; pedicellus fuscous, paler beneath ; flagellum fuscous. Coxae black ; the mid and hind ones reddish testaceous apically ; femora and tibiae reddish testaceous, the former infuscate except narrowly at their bases and more broadly at their apices ; tarsi testaceous, the pretarsi brown. Tegulae brown ; wings hyaline, the fore wing with a faint brownish discal cloud which touches the marginal vein ; venation reddish testaceous ; the wings are clothed with brownish hairs, which appear rather golden in some lights. Length 2·55 mm.

Head slightly broader than the mesoscutum (85 : 80), in dorsal view 2·4 times as broad as its maximum length ; frontovertex where narrowest 0·65 the breadth of the head, therefore nearly four times the breadth of an eye ; temples extremely short ; POL : OOL as 17 : 15, ocelli in a triangle with base 31, height 14·5. Head in front view about 1·4 times as broad as high, subtrapeziform, the vertex moderately arched ; genae converging strongly towards the mouth, but buccate, their outline being distinctly curved ; eyes separated on the vertex by nearly 1·7 times their own length, their inner orbits diverging very slightly ventrad ; malar space 0·6 the length of an eye, malar sulcus distinct. Clypeus about 1·75 times as broad as high, convex, shiny and nearly smooth except for some piliferous punctures which bear long hairs. Genae compressed, ventrally with a sharp edge or margin which runs outward from the base of the mandibles for a short distance. Eyes nearly 1·2 times as long as broad, with short sparse pubescence. The surface of the head is moderately shiny, more so on the face, finely reticulate, the sculpture lightly engraved, tending to be transverse on the face below the antennal toruli, more longitudinal on the orbital region and genae, intricate on the vertex, which is duller than the rest of the head. Face and frons clothed with long hairs ; vertex thickly clothed with shorter, more bristly hairs.

Antennae (Text-fig. 200) inserted in a position such that the lower edges of the toruli are slightly above the level of the ventral edge of the eyes ; toruli nearer to each other than to the eyes ; scape slightly shorter than the transverse diameter of an eye, hardly four times as long as broad, not reaching the level of the lower edge of the median ocellus, with numerous hairs dorsally and along its front edge ; combined length of pedicellus and flagellum about 1·1 times the breadth of the head ; pedicellus about 1·5 times as long as broad ; anelli transverse, the first small, second larger ; funicle cylindrical, its first segment 1·6 times the length of the pedicellus and slightly more than twice as long as broad, the following segments decreasing in length, the fifth hardly longer than broad ; clava hardly broader than the funicle, slightly more than twice as long as broad ; hairs of funicle rather thick, rather strongly outstanding.

Thorax scarcely 1·5 times as long as broad. Pronotum short, transversely crescentic ;

dorsally shiny and nearly smooth, except the strip corresponding to the collar, which is alutaceous and thickly clothed with dark subadpressed hairs, the latter arising from small tubercles ; laterally the sclerite is lightly reticulate and nearly bare. Mesoscutum about twice as broad as long, uneven, intricately and finely reticulate, rather thickly clothed with dark hairs which are only slightly outstanding, these hairs arising from small tubercles ; notauli very deep and sharply defined. Axillae rather shiny, alutaceous, fairly thickly clothed, except along their outer edge, with dark hairs like those of the mesoscutum. Scutellum 1·25 times as long as broad, strongly convex, moderately shiny, finely intricately alutaceous, clothed, except the frenum, with numerous slightly outstanding fuscous hairs ; frenum bare, rather narrow, its length hardly one fifth of the total length of the scutellum, marked off by a weak line, with traces of longitudinal costulae. Dorsellum small, alutaceous. Propodeum medially nearly one third as long as the scutellum, with a row of irregular punctures along its base and along its hind margin, the rest of its surface, between the spiracles, very shiny and almost smooth, some traces of very weak oblique striae ; median keel a raised crest which in profile appears dentate in its middle, channelled longitudinally, this channel interrupted at the point where the tooth is situated ; callus clothed all over with long whitish hairs which spring from warts which give the surface a rough appearance ; spiracles small, nearly circular, separated by only about one third of their diameter from the hind margin of the metanotum. Postspiracular sclerite shiny, with some weak irregular wrinkles. Femoral groove of mesopleuron more or less reticulate ; mesepisternum polished and smooth, extending down nearly to the mid coxa ; mesepimeron nearly smooth, separated from the mesepisternum by an incomplete groove ; metapleuron shiny, finely obliquely reticulate. Mesosternum finely reticulate and hairy, except for a shiny and nearly smooth oval patch on each side of the middle ; mesolcus a shallow but distinct groove. Fore wing (Text-fig. 198) hardly more than twice as long as broad, surpassing the tip of the gaster ; costal cell about eight times as long as broad, its lower surface hairy throughout, its upper surface hairy over the distal half but with a bare strip just above the submarginal vein in the proximal half, the hairs long ; the rest of the wing is hairy except for a narrow strip below the submarginal vein and another along the hind margin of the wing in its basal third ; fringe of wing very short ; marginal vein about 2·4 times as long as the stigmal vein ; postmarginal slightly longer than the marginal ; stigmal vein strongly curved, the stigma nearly parallel to the costal edge of the wing, oblong and with a long uncus. Hind wing rounded at apex ; costal cell with a row of hairs which extends throughout its length ; rest of wing hairy. Hind coxae rather dull like the propodeal callus, finely reticulate except dorsally where it is somewhat roughened, the rough sculpture forming a weak crest ; a band of hairs extends right along the dorsal surface of the coxa, another runs along its ventro-lateral surface. The legs from the trochanters onwards are thickly hairy. The spur of the mid tibia is nearly two thirds the length of the first tarsal segment.

Petiole of gaster very strongly transverse. Gaster (cf. Text-fig. 201) about 2·5 times as long as broad in dorsal view, oblong-elliptic, slightly longer and much narrower than the thorax, pointed apically, sunken dorsally, strongly compressed so as to be higher than broad, ventrally strongly carinate over three quarters of its length ; the tip of the hypopygium is situated very far from the base of the gaster and is provided with a long pale mucro (Text-fig. 201, m). The sides of the gaster have a row of hairs on each segment (the apical segments have two or more rows). The hind margin of the first tergite is entire. Tips of ovipositor sheaths projecting very slightly.

♂ [undescribed]. Differs from ♀ as follows:

Antennae and coxae black ; mid tibiae fuscescent, hind tibiae fuscous except their bases and apices narrowly ; tarsi infuscate, except the bases of the mid and hind ones ; fore wing infumate, with a strong brown cloud which extends from the marginal vein about two thirds across the wing ; basal and costal cells somewhat brownish, the basal vein marked by a brown curved line ; hind wings infumate, more distinctly brownish beneath the marginal vein ; venation of both wings fuscous.

Antennae (Text-fig. 199) with scape more flattened and expanded, hardly 2·5 times as long

as broad, broadening slightly in its upper half ; combined length of pedicellus and flagellum 1·45 times the breadth of the head ; pedicellus somewhat flattened, in dorsal view hardly longer than broad ; flagellum subfiliform ; first funicular segment proximally slightly less stout than the pedicellus in profile, but broadening distally, about 2·5 times as long as broad ; the following segments about equal in breadth to the thickest part of the first segment, but gradually decreasing in length, the sixth about 1·5 times as long as broad ; clava about 3·5 times as long as broad, about equal in length to the two preceding funicular segments including their peduncles, constricted about half way along, two-segmented, pointed apically and with a terminal spine. Each funicular segment is constricted apically to form a conspicuous peduncle, and is clothed with strongly outstanding bristly hairs whose length is about equal to that of the segments themselves ; clava with similar hairs ; these hairs form irregular whorls.

Gaster sublinear in dorsal view, compressed and somewhat higher than broad, sunken dorsally, ventrally with a very strong sharp plica.

Fore wing with marginal vein rather shorter than in the female, only 1·5 to 1·6 times as long as the stigmal vein.

ENGLAND : Berkshire, Wytham Wood, ♂♂ captured 13.vi.1959, 20.vi.1959, 28.vi. 1960, all on *Picea* (*Graham*).

SWEDEN : Stockholm, without other data, one female (the type, presumably holotype) in Thomson collection, labelled " Hlm " [Holmiae], " Bhn " [Boheman], and in Thomson's handwriting " mucronatus ".

Biology. Unknown.

Melancistrus specularis sp. n.

(Text-figs. 197, 201)

♀. Differs from that of *mucronatus* (Thomson) as follows :

Fore wings hyaline ; head, thorax, and gaster with at least a faint bluish tinge in places.

Antennal scape with fewer hairs along its front edge. Sculpture of vertex, mesoscutum, axillae, and scutellum relatively a little stronger, so that these parts appear slightly duller. Fore wing (Text-fig. 197) with upper surface of costal cell less hairy, there being one irregular row, or two rows, of hairs near the costal edge plus some additional scattered hairs in the distal third of the cell ; there is a moderate-sized speculum which is partially effaced on the lower surface of the wing by a few hairs ; the postmarginal vein is 1·2 to 1·45 times as long as the marginal vein ; the latter is 2·15 to 2·3 times the length of the stigmal vein. The costal cell of the hind wing is bare. Gaster, Text-fig. 201.

♂. Unknown.

Holotype ♀. SCOTLAND : West Inverness, Isle of Rhum, Kinloch, 26.viii.1961, probably beaten from *Betula* (*Graham*), in Hope Department of Entomology, University Museum, Oxford.

Paratype ♀. ENGLAND : Berkshire, Bagley Wood, 12.x.1957 (*Graham*), in Graham collection.

Biology. Unknown.

GASTRANCISTRUS Westwood

Gastrancistrus Westwood, 1833*a* : 444. Type-species : *G. vagans* Westwood, by monotypy.
Glyphe Walker, 1834 : 168, 170. Type-species : *G. autumnalis* Walker, by monotypy.

Tridymus Ratzeburg, 1848 : 183. Type-species : *T. aphidum* Ratzeburg, by designation of Gahan Fagan, 1923 : 148.
Tripedias Förster, 1856 : 60. Type-species : *Gastrancistrus* (*Tripedias*) *tripedias* Bouček, 1964*a*, by subsequent reference.
Tridymus Ratzeburg ; Thomson, 1876*a* : 193–201.
Tridymus Ratzeburg ; Ashmead, 1904 : 273, 274.
Gastrancistrus Westwood ; Ashmead, 1904 : 273, 275.
Tridymus Ratzeburg ; Schmiedeknecht, 1909 : 274, 275, 276–277.
Gastrancistrus Westwood ; Schmiedeknecht, 1909 : 275, 276, 277–279.
Tridymus Ratzeburg ; Nikol'skaya, 1952 : 238.
Gastrancistrus Westwood ; Bouček, 1964*a* : 259–261.
Gastrancistrus Westwood ; Peck *et al.*, 1964 : 34.

The type-species of *Glyphe* Walker (*autumnalis* Walker) was transferred to *Gastrancistrus* by Walker (1846 : 25).

Tridymus Ratzeburg. Ratzeburg described this genus with three included species : *aphidum* Ratzeburg, 1848 ; [*Pteromalus*] *salicis* Nees, 1834 ; and *xylophagorum* Ratzeburg, 1848. Ashmead (1904) designated two different species as type-species of the genus : *Tridymus aphidum* Ratzeburg on p. 273, *Pteromalus salicis* Nees on p. 392. Gahan and Fagan (1923 : 148) adopted *aphidum* Ratzeburg as type-species. This decision was unfortunate because *aphidum* has not been recognized by any author subsequent to Ratzeburg. It might be more satisfactory if Gahan and Fagan's designation could be annulled and *Pteromalus salicis* Nees adopted instead as type-species, which course would objectively define the genus *Tridymus*. Dr. Bouček agrees with me on this point. An application may be made to the International Commission on Zoological Commission on this change.

Tripedias Förster. Described without included species. Bouček (1964*a* : 259) described a new species *Gastrancistrus tripedias* (which he at the same time designated as type-species of *Tripedias* Förster) from material in Förster's collection which with little doubt represented that on which Förster had originally based his genus *Tripedias*.

The species of *Gastrancistrus* will certainly prove to be very numerous ; already there is a large total for western Euope alone. One encounters some taxonomic difficulties, particularly with regard to certain species-groups. For example there are four closely allied species, not very easy to distinguish, in the group of *fuscicornis* Walker. Especially troublesome situations exist in the species-groups of *salicis* (Nees), *vagans* Westwood, and *compressus* Walker. In these groups, some of the forms here treated as valid species differ only slightly *inter se*, and it is difficult in certain cases to be sure whether some of them are really distinct or merely forms of one variable species. Much further research is needed to clarify such problems, and the present work should be regarded only as a beginning.

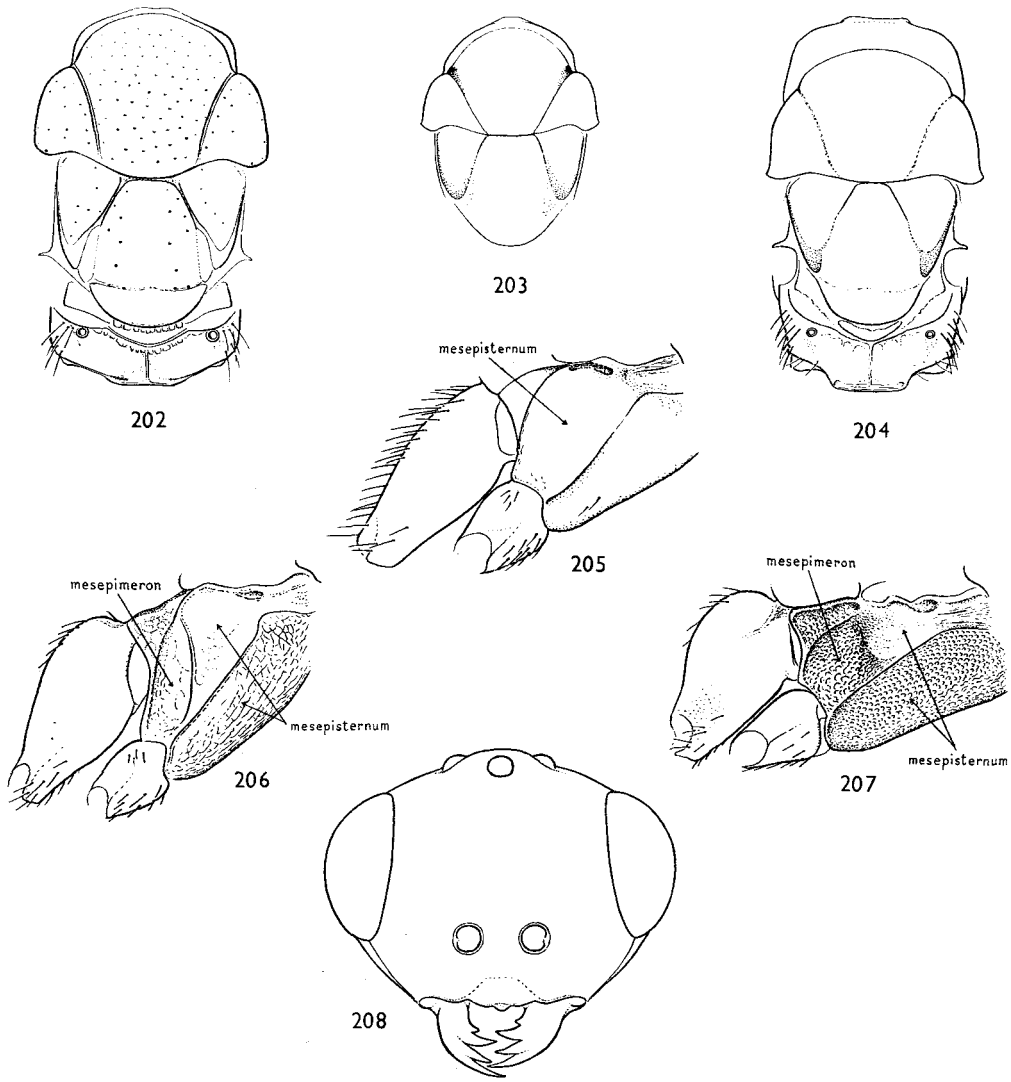
Key to European Species

(This key is intended primarily for the identification of females. In most cases it should also help to refer males to their correct species-group.)

1 Scutellum, except sometimes the axillulae, wholly reticulate, not noticeably more shiny than the mesoscutum ; in nearly all the species the scutello-

axillar sutures (Text-figs. 253, 255) meet the mesoscutum at least a little mesad of the hind ends of the notauli, or even converge so strongly that they meet (Text-figs. 202, 204) 2

– Scutellum generally entirely smooth and polished, occasionally more or less alutaceous anteriorly, but always for the most part conspicuously more shiny and smoother than the mesoscutum ; scutello-axillar sutures (Text-



FIGS. 202–208. *Gastrancistrus* spp. 202, *salicis* (Nees), ♀, thorax ; 203, *compressus* Walker, ♀, pronotum, mesoscutum and scutellum ; 204, *vernalis* sp. n., ♀, thorax ; 205, *indivisus* sp. n., ♀, meso- and metapleura, mid and hind coxae ; 206, *atropurpureus* Walker, ♀, meso- and metapleura, mid and hind coxae ; 207, *vernalis* sp. n., ♀, meso- and metapleura, mid and hind coxae ; 208, *alectus* Walker, ♂, head.

fig. 203) meeting the hind margin of the mesoscutum at approximately the same point as the hind ends of the notauli 52

2 (1) Mesepimeron not marked off from the mesepisternum (Text-fig. 205), or rarely weakly separated at its lower end ; hinder part of mesopleuron entirely or almost entirely smooth and polished. Scutello-axillar sutures not strongly convergent, so that the base of the scutellum (Text-figs. 253, 255) is more than half the distance which separates the hind ends of the notauli . . 50

– Mesepimeron (Text-figs. 206, 207) marked off from the mesepisternum by a distinct impressed line, or elongate fovea, and often more or less reticulate. Scutello-axillar sutures often strongly convergent or even meeting anteriorly (Text-figs. 202, 204) 3

3 (2) Upper (inner) tooth of mandible (Text-fig. 208) smaller than the others, which are large and acute. Anterior margin of clypeus angulate or with a weak median tubercle, sometimes with a median and two submedian tubercles (Text-fig. 208). Mesosternal mesolcus absent, or very fine and superficial. *Female* gaster subcircular, shorter than the thorax ; petiole as long as broad. Antennal scape in both sexes as long or practically as long as an eye 4

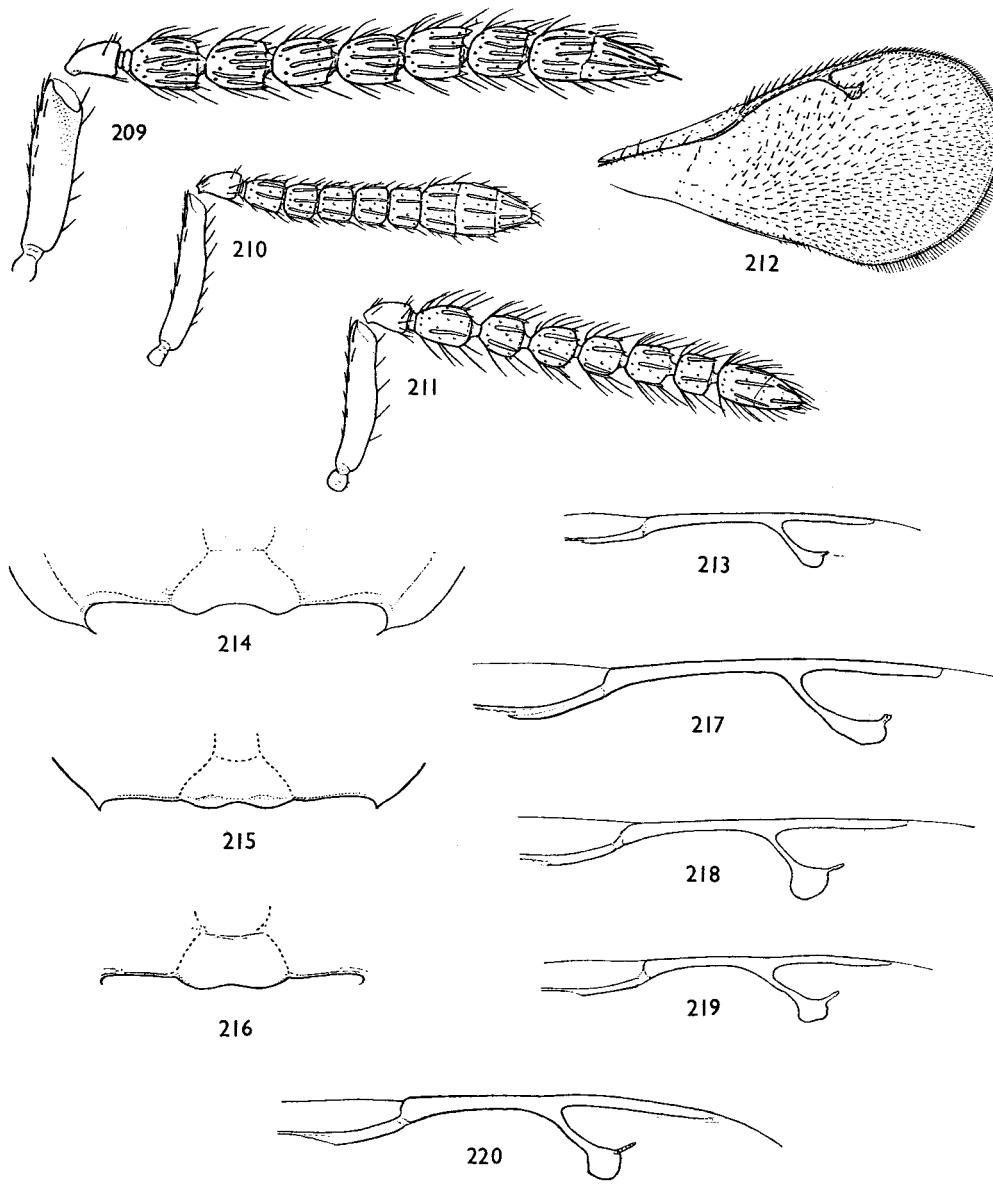
– Upper tooth of mandible (Text-figs. 235, 248) not obviously smaller than the others, which are sometimes rather obtuse. Anterior margin of clypeus without tubercles ; either curved, subtruncate, or emarginate medially. Mesosternal mesolcus distinct, usually deeply impressed. *Female* gaster rarely subcircular ; petiole nearly always transverse. Antennal scape usually shorter than an eye, except in two species, which have the gaster in the female lanceolate and acute 7

4 (3) *Male* flagellum (Text-fig. 209) with less outstanding hairs, with numerous sensilla, distinctly stouter than the pedicellus ; axillae with alutaceous sculpture all over. *Female* axillae with alutaceous sculpture all over ; all coxae entirely dark ; radial cell of fore wing pilose . ***dispar*** sp. n. (p. 289)

– *Male* flagellum (Text-fig. 211) with hairs standing out at an angle of 45° to 50°, with sparse sensilla, sometimes relatively less stout ; axillae usually having their inner angle more or less smooth, or with weaker sculpture than elsewhere. *Female* axillae usually with their inner angle more or less smooth, or with weaker sculpture than elsewhere, if not, then either the coxae are mainly testaceous, or the radial cell of the fore wing is more or less bare 5

5 (4) *Male* flagellum more slender, not or hardly stouter than the pedicellus ; first segment of funicle slightly to distinctly longer than the pedicellus, the following segments, except sometimes the sixth, at least slightly longer than broad ; scape as long as an eye. *Female* pedicellus at least slightly shorter than first segment of funicle ; funicular segments, except sometimes the fifth, at least very slightly longer than broad ; clava about as long as two and a half preceding funicular segments ; legs testaceous, with at most the bases of the coxae infuscate . . . . ***alectus*** Walker (p. 287)

– *Male* flagellum (Text-fig. 211) rather stout, slightly stouter than the pedicellus ; first funicular segment not or only slightly longer than the pedicellus, segments two to six quadrate or hardly longer than broad ; scape slightly shorter than an eye. *Female* pedicellus (Text-fig. 210) as long as, or usually slightly longer than, first segment of funicle ; at most, funicular segments one and two slightly elongate, the rest quadrate ; clava nearly or quite as long as the three preceding funicular segments together ; coxae, and femora mainly, black with a metallic tinge ; hind tibiae sometimes more or less infuscate 6



FIGS. 209–220. *Gastrancistrus* spp. 209, *dispar* sp. n., ♂, antenna ; 210, *fuscicornis* Walker, ♀, antenna ; 211, same, ♂, antenna ; 212, same, ♀, fore wing ; 213, *alectus* Walker, ♀, fore wing venation ; 214, *pyricola* (Marchal), ♀, clypeus and genae ; 215, *cupreus* sp. n., ♀, clypeus and genae ; 216, *unicolor* Walker, ♂, clypeus ; 217, *coxalis* (Thomson), ♀, fore wing venation ; 218, *pyricola* (Marchal), ♀, fore wing venation ; 219, *cupreus* sp. n., ♀, fore wing venation ; 220, *unicolor* Walker, ♀, fore wing venation.

6 (5) Fore wing with radial cell pilose in both sexes ; speculum, on upper surface of wing, not extending below the marginal vein . . ***consors*** sp. n. (p. 290)

– Fore wing (Text-fig. 212) with radial cell more or less bare in both sexes ; speculum of *female*, and sometimes that of male, on upper surface of wing, extending as a bare strip below the marginal vein as far as the stigmal vein. ♂ antenna (Text-fig. 211) ; ♀ antenna (Text-fig. 210) ***fuscicornis*** Walker (p. 287)

7 (3) Fore wing hairy all over, without a speculum ; upper surface of costal cell mainly pilose over its distal half. Propodeal callus hairy all over, as far as the edge of the metapleuron, and with a weak tubercle in its middle. Pronotum more hairy, with a broad band of hairs (three to four irregular rows) in its hinder part, reaching nearly half way to the front of the sclerite. Scutellum, except the frenum, with hairs scattered over its whole surface ; axillae hairy except along their outer edge. Dorsal surface of hind coxa pilose along its whole length. Legs, including all coxae except the base of the hind ones, lemon-yellow. Antenna of female with combined length of pedicellus and flagellum greater than breadth of head ; all funicular segments except sometimes the fifth longer than broad. Female gaster obovate, obtuse apically, slightly shorter than thorax.
Fore wing venation, Text-fig. 217 . . . ***coxalis*** (Thomson) (p. 291)

– Fore wing with at least a small speculum below the parastigma, though in most species it is moderate-sized or large ; upper surface of costal cell usually with only a single, occasionally a double, row of hairs in the distal half. Propodeal callus rarely pilose as far as the edge of the metapleuron, often with few hairs, sometimes only one row. Pronotum usually less hairy. Hairs of scutellum most often arranged in two longitudinal rows, leaving a median strip bare ; axillae usually with one irregular row of hairs in its mesal half, otherwise bare or nearly so. Dorsal surface of hind coxae usually not pilose throughout. Coxae usually dark, legs rarely so extensively pale as in above 8

8 (7) Antennae entirely, and fore coxae, clear citron-yellow 33

– Antennae sometimes testaceous or fulvous, but never entirely clear citron-yellow ; rarely the flagellum citron-yellow, but then the scape and fore coxae dark 9

9 (8) *Female* with antennal flagellum either wholly clear yellow, or with at most the anellus and basal segments of the funicle slightly darker ; gaster depressed, shortly oval and not longer than the thorax, obtuse apically, the ovipositor sheaths concealed in dorsal view ; funicular segments transverse ; scutello-axillar sutures converging strongly so that the base of the scutellum is at most half the distance which separates the hind ends of the notauli ***pusztensis*** (Erdös) (p. 290)

– *Female*. If the flagellum is wholly or mainly pale, then it is fulvous or testaceous, while the gaster is pointed apically, with the tips of the ovipositor sheaths just visible in dorsal view ; sometimes also the funicular segments are not all transverse, or the scutello-axillar sutures converge less strongly 10

10 (9) Anterior margin of clypeus (Text-figs. 214, 215) very distinctly emarginate medially 12

– Anterior margin of clypeus curved (Text-figs. 258, 259), truncate medially (Text-fig. 260), or at most shallowly emarginate (Text-fig. 216) . . 11

11 (10) Fore wing (Text-fig. 222) with speculum, on upper surface of wing, with its lower part interrupted by a band of hairs so that it does not reach the cubital vein ; postmarginal vein nearly or quite as long as the marginal vein 12

– Fore wing with speculum, on upper surface of wing, usually extending right to the cubital vein, if not then the postmarginal vein is distinctly shorter than the marginal vein 17

12 (11) *Female* propodeum broadly emarginate posteriorly, obviously shorter than the scutellar frenum ; gaster at base convex medially, with a fovea on each side. Scutello-axillar sutures not very strongly convergent. Postmarginal vein of fore wing distinctly shorter than the marginal vein. Anterior margin of clypeus (Text-fig. 214) deeply emarginate.
Fore wing (Text-fig. 218) with stigma large . . ?***pyricola*** (Marchal) (p. 291)

– *Female* propodeum not broadly emarginate posteriorly, as long as or slightly longer than the frenum ; gaster at base with a median, subtriangular or semicircular depression. Scutello-axillar sutures strongly convergent (as in Text-figs. 202, 204). Postmarginal vein of fore wing nearly or quite as long as the marginal vein 13

13 (12) Anterior margin of clypeus (Text-fig. 215) more distinctly emarginate ; speculum of fore wing large and closed below only by a single line of hairs on the cubital vein 14

– Anterior margin of clypeus (Text-fig. 216) shallowly emarginate ; speculum of fore wing, on upper surface of wing, interrupted below by several scattered hairs and so not reaching the cubital vein (Text-fig. 222) . . 15

14 (13) Head and thorax mainly green to blue. Mesepisternum with upper triangular area (below base of hind wing) smooth at least dorsally ***fumipennis*** Walker (p. 291)

– Head and thorax coppery to bronze. Mesepisternum with upper triangular area alutaceous.
Fore wing venation, Text-fig. 219 . . . . ***cupreus*** sp. n. (p. 291)

15 (13) *Female* gaster lanceolate, usually strongly compressed and much narrower than thorax ; including the ovipositor sheaths, 1·35 to 1·5 times as long as head plus thorax. Fore coxae mainly to wholly testaceous ; fore and mid femora often wholly pale, hind femora sometimes so. Stigma of fore wing rather small, slightly longer than high, separated by fully twice its height from costal edge of wing . . . . . ***coniferae*** sp. n. (p. 291)

– *Female* gaster ovate to sublanceolate, not or only slightly narrower than thorax ; including ovipositor sheaths, not or only slightly longer than head plus thorax. Fore coxae metallic, or indefinitely testaceous on their inner aspect only ; all femora more or less infuscate, at least proximally . . 16

16 (15) Stigma of fore wing (Text-fig. 222) smaller, slightly longer than high, separated by fully twice its height from costal edge of wing or even by rather more than twice . . . . . ***vulgaris*** Walker (p. 293)

– Stigma (Text-fig. 220) larger, subcircular, separated by slightly less than twice its height from costal edge of wing . . . ***unicolor*** Walker (p. 295)

17 (11) Antennal scape in both sexes very nearly as long as an eye and, unless head is abnormally collapsed and distorted, reaching the median ocellus. Combined length of pedicellus and flagellum in *female* slightly, in *male* obviously, greater than breadth of head. In *female* at least funicular segments one to three are longer than broad, and at most segment six is slightly transverse ; in *male* all funicular segments are obviously longer than broad. Mesepimeron nearly three times as long as broad 18

– Antennal scape in both sexes distinctly shorter than an eye, not reaching the median ocellus. Combined length of pedicellus and flagellum in *female* at most equal to breadth of head, but usually less. In the *female* of most species at most the first funicular segment is longer than broad, occasionally also the second segment, but rarely the third. *Males* of most species with at least the distal funicular segments subquadrate 19

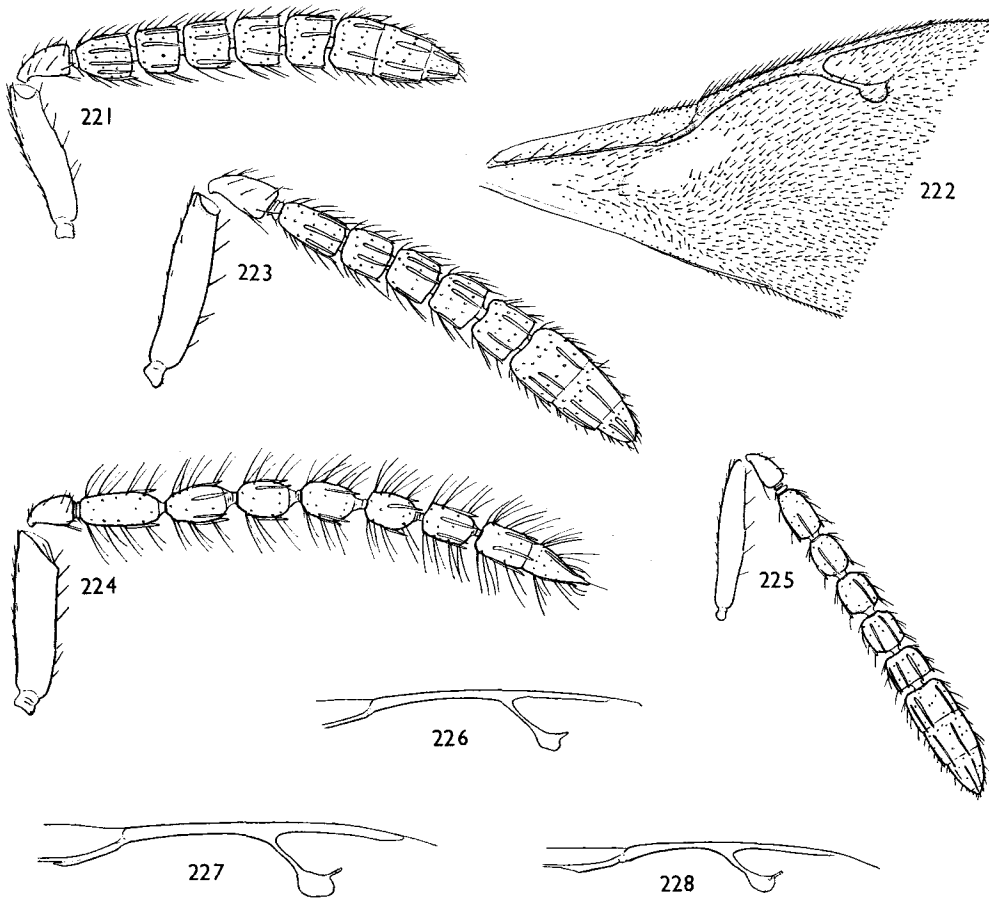
18 (17) Fore wing with speculum open below, or only partly closed. Larger (2·1 to 2·7 mm.), relatively more squat species. Scutellum with four to six pairs of bristles. Gaster, not counting ovipositor sheaths, not longer than head plus thorax.

Fore wing venation, Text-fig. 227 . . ***autumnalis*** (Walker) (p. 297)

– Fore wing with speculum closed below. Smaller (1·7 to 2 mm.), relatively more slender species. Scutellum with three to four pairs of bristles. Gaster, not counting ovipositor sheaths, somewhat longer than head plus thorax.

Antennae ♂ ♀, Text-figs. 224, 225 ; fore wing venation, Text-fig. 226

oporinus sp. n. (p. 297)



FIGS. 221–228. *Gastrancistrus* spp. 221, *coniferae* sp. n., ♀, antenna ; *vulgaris* Walker, ♀, fore wing, part ; 223, *cupreus* sp. n., ♀, antenna ; 224, *oporinus* sp. n., ♂, antenna ; 225, same, ♀, antenna ; 226, same, fore wing venation ; 227, *autumnalis* Walker, ♀, fore wing venation ; 228, *acutus* Walker, ♀, fore wing venation.

19 (17) Scutello-axillar sutures (Text-figs. 202, 204) converging strongly so as to meet the hind margin of the mesoscutum well mesad of the notauli, sometimes curving round and meeting, in which case the scutellum is separated from the mesoscutum by a deep, often more or less punctate, groove. Propodeum of *female* usually as long as or longer than the scutellar frenum . . 20

– Scutello-axillar sutures (Text-figs. 253, 255) converging less strongly, so as to meet the hind margin of the mesoscutum only slightly mesad of the notauli. Propodeum of *female* often relatively shorter, sometimes extremely short . 31

20 (19) Postmarginal vein of fore wing (Text-fig. 228) nearly or quite as long as the marginal vein ; lower part of speculum, on underside of wing, more or less effaced by scattered hairs or hair-bases ; on the upperside of the wing the speculum is closed below ; distal two thirds or more of the basal cell pilose. *Female* propodeum broadly emarginate posteriorly, medially shorter than the scutellar frenum ; callus with at most four bristles ; flagellum very short, strongly clavate, with all funicular segments transverse ***acutus*** Walker (p. 295)

– Postmarginal vein of fore wing (Text-figs. 230–233) slightly to very distinctly shorter than the marginal vein ; if only slightly so, then the speculum, on upperside of wing, is more or less open below and at most the distal quarter of the basal cell is pilose. Propodeum of *female* not broadly emarginate posteriorly, medially as long as or longer than the frenum ; callus nearly always with more numerous bristles, often quite thickly clothed with them 21

21 (20) Mesepimeron (Text-fig. 207) broad, as strongly reticulate as the metapleuron and relatively dull ; at least the lower angle of the triangular area of the mesepisternum reticulate. Mesoscutum (Text-fig. 204) with notauli relatively shallow ; mesoscutum, axillae, and scutellum relatively dull, with very fine dense sculpture and very weak short bristles, the piliferous punctures extremely small and hardly visible. Prosternum strongly reticulate and relatively dull. Propodeum of *female* medially somewhat more than one third as long as scutellum, finely densely reticulate and dull ***vernalis*** sp. n. (p. 300)

– Mesepimeron (Text-fig. 206) more elongate, more weakly reticulate, and more or less shiny ; upper triangular area of mesepisternum wholly smooth. Mesoscutum (Text-fig. 202) with notauli deep ; mesoscutum, axillae, and scutellum with longer and stronger bristles ; at least the mesoscutum has distinct piliferous punctures, or small tubercles. Prosternum less strongly sculptured, more or less shiny 22

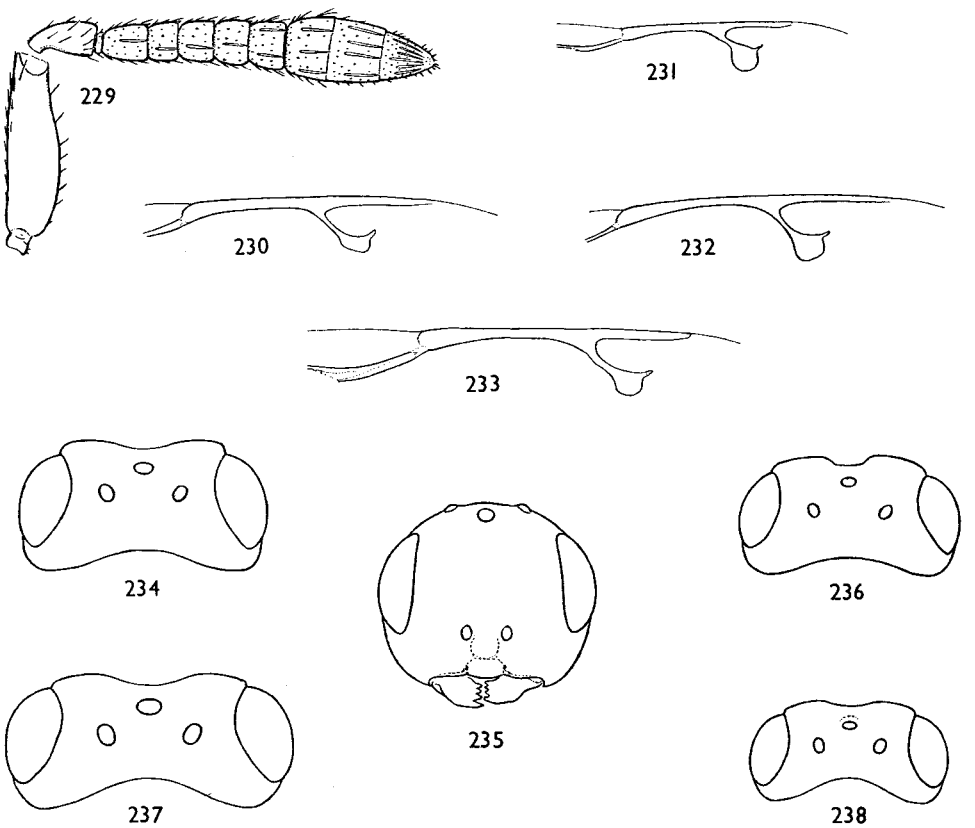
22 (21) Base of scutellum separated from the mesoscutum by a deep and broad groove (Text-fig. 202) ; the surfaces of both the mesoscutum and the scutellum dip more or less towards this groove. Fore wing (Text-figs. 230–233) : marginal vein 2·2 to 3 times as long as the stigmal vein ; postmarginal vein distinctly shorter than the marginal vein ; basal cell with scattered hairs over its distal half to two thirds, except in *clavatus*, which has a large stigma, few hairs on the propodeal callus, and none above the supracoxal flange. Mesoscutum, except in *clavatus*, tending to have its reticulation more or less raised above the general surface, and often more or less strigose transversely in front 23

– Base of scutellum separated from mesoscutum by a relatively shallow, and not always very broad, groove ; in profile the surfaces of the two sclerites therefore form an almost straight line. Fore wing with marginal vein 1·8 to 2·1 times as long as the stigmal vein ; postmarginal vein usually only slightly shorter than the marginal vein ; basal cell bare or with scattered hairs over at most its distal quarter ; stigma (Text-figs. 249, 250) small or

moderate-sized. Mesoscutum and scutellum with delicate sculpture which is engraved, or at most hardly raised above the general surface in places . 30

23 (22) Fore wing (Text-fig. 231) with stigma very large, subcircular, separated by less than its own height from the lower edge of the postmarginal vein ; basal cell bare. Propodeum smooth or virtually so, without a median carina ; callus with two to four bristles. Mesoscutum with delicate engraved sculpture ; inner angle of axilla more or less smooth and shiny. *Female* gaster lanceolate, somewhat compressed, longer than head plus thorax ; ovipositor sheaths projecting, their exserted portion about as long as the first segment of the hind tarsus or slightly more . ***clavatus*** (Thomson) (p. 296)

– Fore wing (Text-figs. 230, 232, 233) with stigma usually smaller and differently shaped ; basal cell with scattered hairs over its distal half or more. Propodeum nearly always with a median carina, often more or less reticulate ; callus often with numerous bristles. Mesoscutum with its sculpture at most partly engraved, otherwise scaly or very slightly raised above the general surface ; inner angle of axilla rarely smooth 24



FIGS. 229–238. *Gastrancistrus* spp. 229, *vernalis* sp. n., ♀, antenna ; 230, same, fore wing venation ; 231, *clavatus* (Thomson), ♀, fore wing venation ; 232, *praecox* sp. n., ♀, fore wing venation ; 233, *salicis* (Nees), ♀, fore wing venation ; 234, *fulvicoxis* sp. n., ♀, head ; 235, *coactus* sp. n., ♀, head, frontal ; 236, same dorsal ; 237, *salicis* (Nees), ♀, head ; 238, *praecox* sp. n., ♀, head.

24 (23) Fore and mid coxae fulvous, or with at most a dark spot basally ; hind coxa usually with its distal third or more fulvous, occasionally almost entirely metallic ; femora fulvous, or at most very slightly brownish proximally. Antennal scape at most infuscate at apex dorsally. Malar space about two thirds the length of an eye ; breadth of oral fossa 1·47 to 1·7 times the malar space ; clypeus at most 1·5 times as broad as long. Head in dorsal view (Text-fig. 234) only 1·8 to 2 times as broad as long ; temples not obviously convergent behind eyes. Head and thorax with strong sculpture, rather dull ; bristles of scutellum short 25

– All coxae most often entirely metallic, occasionally the fore coxae fulvous distally, femora at least slightly infuscate at base, most often their proximal one third to three quarters fuscous with a metallic tinge. Antennal scape often more heavily infuscate, sometimes entirely so. Except in *longigena* the malar space is at most slightly more than half the length of an eye, and the breadth of the oral fossa is 1·9 to 2·5 times the malar space. If the head is similar in shape to the above, then the head and thorax are less strongly sculptured and relatively shiny, the propodeum is more or less shiny, and the scutellar bristles are longer 26

25 (24) Anterior margin of clypeus moderately curved. Thorax relatively longer, 1·7 to 1·8 times as long as broad ; dorsellum strongly reticulate and relatively dull. Speculum of fore wing open below.
Head, Text-fig. 234 . . . . . ***fulvicoxis*** sp. n. (p. 304)

– Anterior margin of clypeus almost angulate medially. Thorax relatively shorter, about 1·65 times as long as broad ; dorsellum delicately reticulate and moderately shiny. Speculum of fore wing partly or completely closed below . . . . . ***triandrae*** sp. n. (p. 305)

26 (24) Breadth of oral fossa only 1·5 to 1·7 times the malar space ; the latter nearly or quite two thirds the length of an eye. Clypeus only about 1·6 times as broad as long, alutaceous except sometimes its anterior edge. Speculum, on upperside of wing, open below except sometimes at apex. Eyes almost circular . . . . . ***longigena*** sp. n. (p. 306)

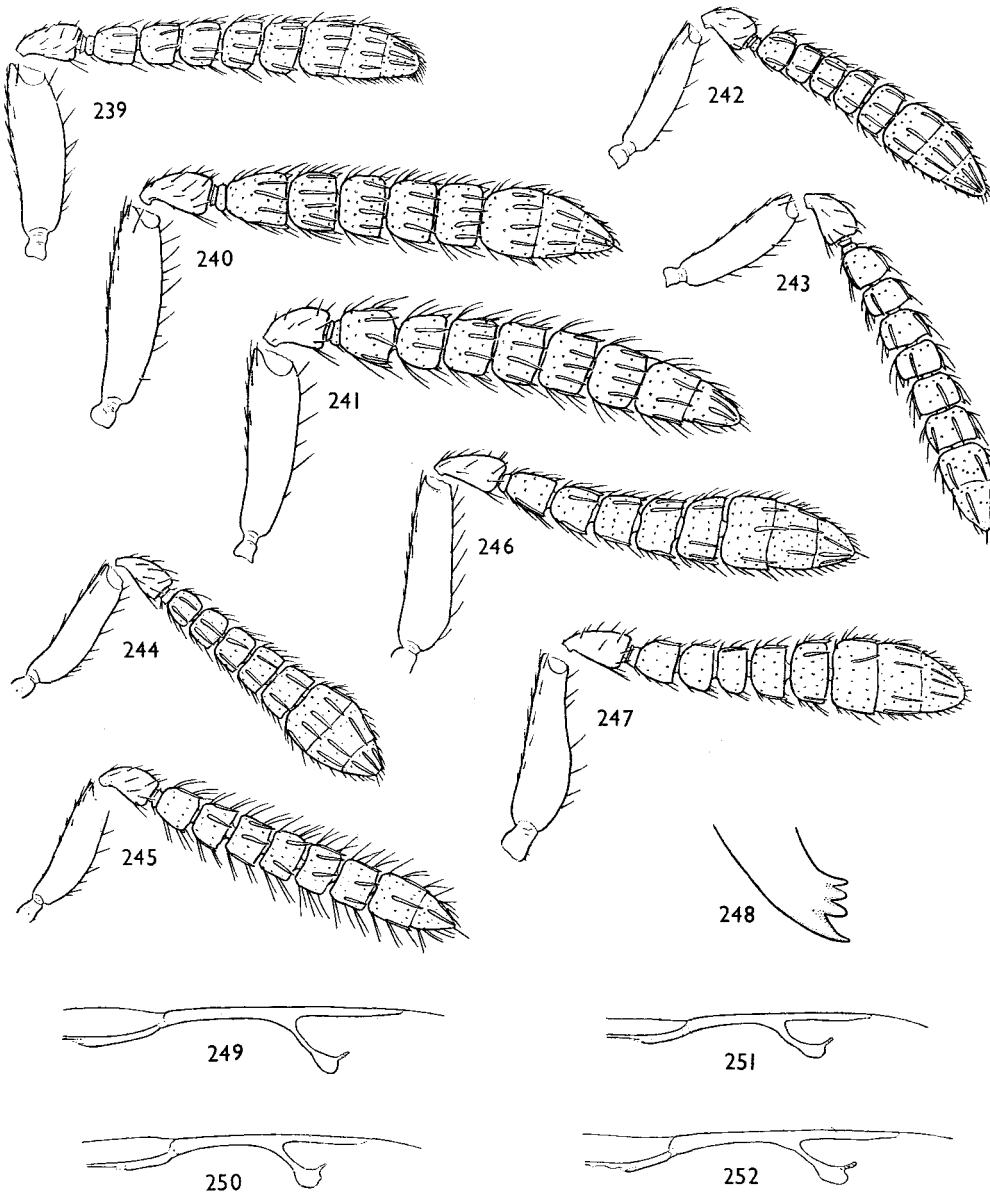
– Breadth of oral fossa 1·8 to 2·5 times the malar space ; the latter from slightly less than half, to slightly more than half, the length of an eye. Clypeus nearly or quite twice as broad as long, sometimes partly to almost entirely smooth. Speculum closed or nearly closed below 27

27 (26) Head in dorsal view (Text-fig. 237) more transverse, 2·1 to 2·3 times as broad as its maximum length ; eyes separated by 1·3 to 1·55 times their own length ; temples converging fairly strongly. Malar space half the length of an eye or slightly more. Antennal clava usually slightly shorter than the combined length of the three preceding funicular segments. Scutellum with 10 to 24 bristles. Larger species, 2·0 to 3·1 mm. . . . ***salicis*** (Nees) (p. 303)

– Head in dorsal view (Text-figs. 236, 238) less transverse, 1·8 to 2 times as broad as its maximum length ; eyes usually separated by 1·15 to 1·25 times their own length, if by rather more, then head of characteristic shape (Text-fig. 236). Malar space usually slightly less than half the length of an eye. Antennal clava as long as the combined length of the three or four preceding funicular segments. Scutellum with 6 to 10 bristles. Smaller species, 1·6 to 2·3 mm. 28

28 (27) Head in dorsal view (Text-fig. 236) with temples hardly narrowed behind eyes ***coactus*** sp. n. (p. 307)

– Head in dorsal view (Text-fig. 238) with temples more or less narrowed behind eyes 29



FIGS. 239–252. *Gastrancistrus* spp. 239, *longigena* sp. n., ♀, antenna ; 240, *salicis* (Nees), ♀, antenna ; 241, same, ♂, antenna ; 242, *fulvicornis* (Walker), ♀, antenna ; 243, same, ♂, antenna ; 244, *venustus* sp. n., ♀, antenna ; 245, same, ♂, antenna ; 246, *citripes* (Thomson), ♀, antenna ; 247, *lativentris* sp. n., ♀, antenna ; 248, *venustus* sp. n., ♀, right mandible ; 249, *hamillus* Walker, ♀, fore wing venation ; 250, *acontes* Walker, ♀, fore wing venation ; 251, *venustus* sp. n., ♀, fore wing venation ; 252, *citripes* (Thomson), ♀, fore wing venation.

29 (28) Length 1·8 to 2·1 mm. Posterior ocelli 1·3 to 1·4 times their diameter from the eyes ; POL 1·75 to 2 times OOL . . . . ***praecox*** sp. n. (p. 307)

– Length 1·6 to 1·9 mm. Posterior ocelli 1·4 to 1·75 times their diameter from the eyes ; POL 1·6 to 1·8 times OOL . . ***fulvicornis*** (Walker) (p. 308)

30 (22) Fore wing (Text-fig. 249) with stigma smaller. Mesepimeron rather less than three times as long as broad. Legs, excluding coxae, flavous to fulvous. Antennal scape usually wholly fulvous, sometimes infuscate dorsally. Propodeum with a more or less distinct median carina ***hamillus*** Walker (p. 296)

– Fore wing (Text-fig. 250) with stigma larger. Mesepimeron about three times as long as broad. Legs with all femora more or less infuscate with a metallic gloss. Antennal scape infuscate at least dorsally, sometimes more or less metallic. Propodeum medially raised like a roof, but usually without a distinct median carina . . . . . ***acontes*** Walker (p. 297)

31 (19) Propodeal callus with numerous bristles which are scattered over its surface and extend quite near to the metapleuron. Gaster of *female* with a subtriangular median depression at the base.

Postmarginal vein distinctly longer than stigmal vein. Propodeal spiracles not quite touching the metanotum. Mesoscutum quite thickly pilose ; head and thorax bright green to blue 32

– Propodeal callus with only three to six (seven) bristles, arranged in one or two longitudinal rows and leaving a broad bare strip between the bristles and the edge of the metapleuron. Gaster of *female* at base usually with two lateral foveae, convex or ridged between these ; rarely with a median depression 34

32 (31) Antennal scape at least mainly, and all coxae, black with a metallic tinge ; femora black proximally ; tegulae yellowish to brown ; antennal pedicellus and flagellum testaceous with their dorsal surface more or less infuscate. Gaster lanceolate or ovate-lanceolate, 2·5 to 3 times as long as broad, slightly to distinctly longer than head plus thorax . ***venustus*** sp. n. (p. 320)

– Antennal scape, fore coxae, femora, and tegulae, citron-yellow ; pedicellus and flagellum yellow, the incisures of the latter sometimes brownish. Gaster sometimes relatively shorter 33

33 (32) *Female* gaster 2 to 2·5 times as long as broad, including ovipositor sheaths, somewhat compressed and narrower than the thorax, slightly to distinctly (up to 1·3 times) as long as head plus thorax ; ovipositor sheaths exserted to a length about equal to the first segment of the hind tarsus. Antenna (Text-fig. 246) with combined length of pedicellus and flagellum equal to or slightly greater than breadth of head ; first funicular segment quadrate or very slightly longer than broad, second subquadrate, fifth 1·55 to 1·8 times as broad as long ; clava as long as, or hardly longer than, the three preceding funicular segments together . . . . . ***citripes*** (Thomson) (p. 318)

– *Female* gaster 1·3 to 1·6 times as long as broad, flattened and as broad as the thorax, only about as long as the thorax ; ovipositor sheaths at most slightly exserted. Antenna (Text-fig. 247) with combined length of pedicellus and flagellum slightly less than breadth of head ; first funicular segment quadrate to slightly transverse, second slightly transverse, fifth about twice as broad as long ; clava as long as 3·33 to 3·5 of the preceding funicular segments . . . . . ***lativentris*** sp. n. (p. 318)

34 (31) *Female* gaster oval, not longer than thorax, obtuse or subobtuse apically, the ovipositor sheaths concealed in dorsal view ; last tergite lying in about the same place as the preceding one and not separated from it dorsally by a membranous gap . . . . . ***aequus*** sp. n. (p. 321)

– *Female* gaster ovate to lanceolate, pointed apically, the ovipositor sheaths at least very slightly, but often far, exserted ; last tergite almost always turned upwards with respect to the preceding one and separated from it dorsally by a membranous gap 35

35 (34) *Female* propodeum extremely short, almost nil, medially ; exserted portion of ovipositor sheaths, in profile, as long as or somewhat longer than the hind tibia ; basal cell of fore wing pilose except at its base, speculum closed below ; thorax dorsally with at most the mesoscutum obscurely greenish, the rest bronze or dull purplish . . . ***atropurpureus*** Walker (p. 311)

– *Female* propodeum medially not so extremely short as in the above ; if approaching this condition then the basal cell of the fore wing is pilose over at most its distal half, the speculum is at least partly open below, and either the thorax dorsally is bright green to blue, or the ovipositor sheaths are rather less far exserted 36

36 (35) Fore wing with basal cell pilose except at its base ; speculum closed below. Mesoscutum thickly hairy (Text-fig. 253) 37

– Fore wing (Text-figs. 254, 256) with basal cell pilose over at most its distal half ; speculum most often open below. Mesoscutum more sparsely hairy as in Text-fig. 255 39

37 (36) Spiracles of propodeum distinctly separated by a small space from the hind margin of the metanotum. Thorax dorsally more or less, at least the mesoscutum, greenish ; scutellum with three to four pairs of bristles ***hirtulus*** sp. n. (p. 309)

– Spiracles of propodeum (Text-fig. 253) touching the hind margin of the metanotum. Mesoscutum most often bronze or purplish black, less often somewhat greenish ; scutellum with five to ten pairs of bristles . . 38

38 (37) Eyes inconspicuously hairy, the longest hairs not exceeding the diameter of an ocular facet in length. Scutellar frenum with nearly isodiametric
– reticulation. Mesoscutum rarely greenish.
Thorax, Text-fig. 253 . . . . . ***laticornis*** Walker (p. 308)
Eyes more obviously hairy, the length of their longest hairs about 1·5 times the diameter of an ocular facet. Scutellar frenum in some lights appearing longitudinally strigose-reticulate. Mesoscutum often greenish.
Fore wing venation, Text-fig. 261 . . . ***terminalis*** Walker (p. 309)

39 (36) Ovipositor sheaths far exserted, the length of the exserted portion, as seen in profile, from about three quarters as long as, to somewhat longer than, the hind tibia, and directed strongly obliquely upwards 40

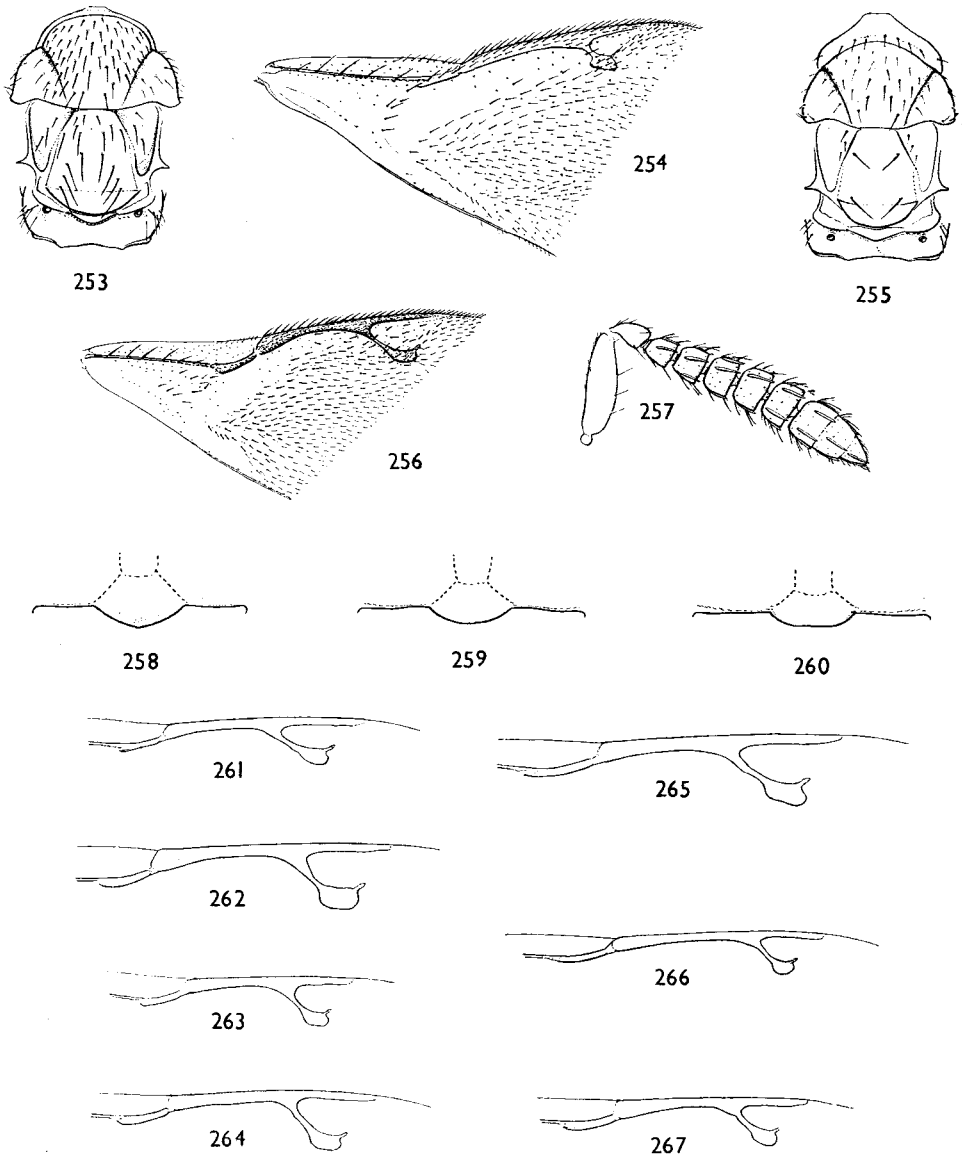
– Ovipositor sheaths at least slightly less far exserted 42

40 (39) Body, except pronotum, usually entirely bright green to blue ; occasionally the scutellum and axillae darker, in which case the anterior margin of the clypeus (Text-fig. 258) is almost angulate 41

– Body mainly bronze, usually with some purplish reflections ; at most the mesoscutum bright green or bluish. Anterior margin of clypeus evenly curved, or even slightly truncate medially 42

41 (40) Fore wing (Text-fig. 254) with basal cell bare except for a single or double row of hairs on the basal vein ; speculum extending as a broad bare strip below the marginal vein as far as the stigmal vein ; radial cell mainly bare. Anterior margin of clypeus (Text-fig. 258) almost angulate. Antennal scape at least ventrally, sometimes mainly, testaceous. Surface of mesoscutum and scutellum, especially the latter, relatively duller ***amaboeus*** Walker (p. 311)

– Fore wing with basal cell more or less pilose over its distal third ; speculum extending below the marginal vein only to about half its length ; radial cell more or less pilose. Anterior margin of clypeus (Text-fig. 259) roundly



FIGS. 253–267. *Gastrancistrus* spp. 253, *laticornis* Walker, ♀, thorax ; 254, *amaboeus* Walker, ♀, fore wing, part ; 255, *hemigaster* sp. n., ♀, thorax ; 256, same, fore wing, part ; 257, same, ♀, antenna ; 258, *amaboeus* Walker, ♀, clypeus ; 259, *viridis* Walker, ♀, clypeus ; 260, *vagans* Westwood, ♀, clypeus ; 261, *terminalis* Walker, ♀, fore wing venation ; 262, *laticeps* sp. n., ♀, forewing venation ; 263, *crassus* Walker, ♀, forewing venation ; 264, *puncticollis* (Thomson), ♀, fore wing venation ; 265, *indivisus* sp. n., ♀, fore wing venation ; 266, *compressus* Walker, ♀, fore wing venation ; 267, *glabellus* (Nees), ♀, fore wing venation.

produced, but almost truncate medially. Antennal scape black or mainly so. Surface of mesoscutum and scutellum more shiny . ***viridis*** Walker (p. 311)

42 (40) Head and thorax, except pronotum, and occasionally the scutellum and axillae, green to blue, usually brightly so ; exserted portion of ovipositor sheaths, in profile, at least half as long as hind tibia 49

– Either the thorax at least is bronze to coppery with at most the mesoscutum slightly greenish ; or the ovipositor sheaths are less far exserted . . 43

43 (42) Ovipositor sheaths hardly exserted, just the tips visible in dorsal view ; marginal vein of fore wing about 2·8 times as long as the stigmal vein ; body mainly bronze or coppery ; head strongly transverse, in dorsal view nearly 2·5 times as broad as its maximum length . . . . . sp. indet.

– Ovipositor sheaths usually distinctly exserted ; if hardly so, then the marginal vein is at most 2·4 times as long as the stigmal vein, the body is partly greenish or bluish, and the head is relatively less transverse . . 44

44 (43) *Female* gaster, not counting ovipositor sheaths, as long as, or slightly longer than, head plus thorax, tending to be lanceolate and somewhat compressed 45

– *Female* gaster, not counting ovipositor sheaths, not or hardly longer than the thorax, more ovate and not or only slightly compressed 46

45 (44) Anterior margin of clypeus slightly truncate medially (Text-fig. 260). Fore wing with speculum extending only as far as the end of the proximal third of the marginal vein ; about the distal third to half of the basal cell has scattered hairs. Exserted portion of ovipositor sheaths, in profile, from three quarters as long as, to slightly longer than, the hind tibia ***vagans*** Westwood (p. 312)

– Anterior margin of clypeus strongly curved. Fore wing with speculum, on upper surface of wing, extending as a bare strip nearly or quite to the stigmal vein ; basal cell pilose only at apex, next to the basal vein. Exserted portion of ovipositor sheaths, in profile, from slightly more than one third, to slightly more than half, as long as the hind tibia . . ***affinis*** sp. n. (p. 312)

46 (44) Antennal flagellum proximally hardly as stout as the pedicellus in profile, but strongly clavate distally, testaceous proximally and darkening distad ; head and thorax mainly to entirely bronze or coppery bronze ; small species, 1·4 to 1·6 mm. . . . . ***clavellatus*** sp. n. (p. 315)

– Antennal flagellum (Text-fig. 257) proximally as stout, or usually slightly stouter than the pedicellus, more weakly clavate, entirely fuscous to black ; at least the mesoscutum bluish or greenish, sometimes the body is more extensively blue or green 47

47 (46) Larger species, 1·7 to 2·3 mm. ; mid lobe of mesoscutum with numerous conspicuous piliferous punctures amongst the reticulation ; ovipositor sheaths only slightly exserted, at most as long as first segment of hind tarsus ; scutellum with three to four pairs of bristles.
Fore wing venation, Text-fig. 262 . . . . ***laticeps*** sp. n. (p. 316)

– Smaller species, 1·3 to 1·8 mm. ; mid lobe of mesoscutum with fewer, and often less distinct, piliferous punctures ; ovipositor sheaths usually farther exserted, if not then scutellum with only two pairs of bristles . . . 48

48 (47) Ovipositor sheaths, in dorsal view, exserted to a length at most equal to that of first segment of hind tarsus ; scutellum with two pairs of bristles. Marginal vein of fore wing 2·25 to 2·4 times as long as the stigmal vein ; speculum extending below marginal vein only for about half the length of the latter (Text-fig. 256) . . . . . ***hemigaster*** sp. n. (p. 314)

– Exserted portion of ovipositor sheaths from one third to about half as long as hind tibia ; scutellum nearly always with three pairs of bristles, rarely two pairs. Either the marginal vein is 2·5 to 2·8 times as long as the stigmal vein,

and the speculum on the upper surface of wing extends to the stigmal vein ; or the head and thorax are almost entirely bright green or blue . . . 49

49 (48) Marginal vein of fore wing (Text-fig. 263) 2·5 to 2·8 times as long as the stigmal vein ; speculum, on upper surface of wing, extending right to the stigmal vein ; head and thorax a less bright blue or green, the scutellum and axillae often bronze, mesoscutum and scutellum not very shiny ***crassus*** Walker (p. 314)

– Marginal vein of fore wing 2·2 to 2·3 times as long as the stigmal vein ; speculum, on upper surface of wing, extending below the marginal vein to only about half the length of the latter ; head, and thorax except pronotum, bright green or blue, mesoscutum and scutellum rather shiny ***torymiformis*** (Ratzeburg) (p. 311)

50 (2) Propodeum with plicae, which are sharp at least in the hinder half of the sclerite ; median carina sharp and straight. Basal cell of fore wing in *female* bare, or with at most four scattered hairs in its distal part. Side-lobes of mesoscutum, like the mid-lobe, with numerous piliferous punctures.

Fore wing venation, Text-fig. 264 . . ***puncticollis*** (Thomson) (p. 324)

– Propodeum without plicae ; median carina sometimes absent. Basal cell of fore wing in *female* with its distal third to half pilose. Side-lobes of mesoscutum tending to be more sparsely hairy than the mid-lobe . . . 51

51 (50) Propodeum medially nearly one fifth as long as scutellum, without a median carina. Antennae with combined length of pedicellus and flagellum slightly greater than breadth of head ; first funicular segment as long as or slightly longer than second segment, quadrate to 1·7 times as long as broad; at most the fourth and fifth funicular segments slightly transverse. POL 1·5 to 1·7 OOL.

Fore wing venation, Text-fig. 265 . . . ***indivisus*** sp. n. (p. 324)

– Propodeum medially at most slightly more than one seventh as long as scutellum, its median carina more or less indicated. Antennae with combined length of pedicellus and flagellum slightly less than breadth of head ; all funicular segments slightly transverse, the first slightly shorter than the following ones. POL about twice OOL . . . ***walkeri*** sp. n. (p. 326)

52 (1) Gaster including ovipositor sheaths not or hardly longer than the thorax ; sheaths, as seen in dorsal view, only slightly exserted and not projecting beyond the level of the tips of the pygostylar bristles. Anterior margin of clypeus evenly curved. Marginal vein of fore wing 2·1 to 2·5 times as long as the stigmal vein. Combined length of pedicellus and flagellum slightly less than the breadth of the head ; second funicular segment at least slightly transverse, distal segments strongly so . . . ***latifrons*** (Thomson) (p. 324)

– Ovipositor sheaths in dorsal view projecting at least slightly beyond the level of the tips of the pygostylar bristles ; either the gaster including ovipositor sheaths is longer than head plus thorax, or the marginal vein is 2·8 to 3·3 times as long as the stigmal vein 53

53 (52) Anterior margin of clypeus produced, but truncate or even weakly emarginate medially. Marginal vein of fore wing (Text-fig. 266) 2·8 to 3·3 times as long as the stigmal vein ; on the upper surface of the wing the speculum extends as a broad bare strip below the marginal vein, as far as the stigmal vein, and the radial cell is also bare. Exserted portion of ovipositor sheaths, in profile, from two fifths to slightly more than half as long as the hind tibia ***compressus*** Walker (p. 323)

– Anterior margin of clypeus evenly curved. Marginal vein of fore wing sometimes relatively shorter ; speculum on upperside of wing, below the

marginal vein, tending to narrow distally, and not always reaching the stigmal vein. Ovipositor sheaths sometimes less far exserted . . . 54

54 (53) Gaster including ovipositor sheaths longer than head plus thorax ; exserted portion of ovipositor sheaths, in profile, from slightly more than half as long, to as long as, the hind tibia. Marginal vein of fore wing (Text-fig. 267) 2·3 to 2·95 times as long as the stigmal vein . . ***glabellus*** (Nees) (p. 323)

– Gaster including ovipositor sheaths nearly or just as long as head plus thorax ; exserted portion of ovipositor sheaths, in profile, from one quarter, to about two fifths, as long as the hind tibia. Marginal vein 2·8 to 3·3 times as long as the stigmal vein . . . . . sp. indet.

THE FUSCICORNIS-GROUP

Gastrancistrus fuscicornis Walker

Gastrancistrus fuscicornis Walker, 1834 : 171, ♂.
? Tridymus Aphidum Ratzeburg, 1848 : 183, ♀.

Type material. *Gastrancistrus fuscicornis* Walker. Syntypes, 2 ♂. LECTOTYPE, the second specimen, bearing a Waterhouse label.

Tridymus aphidum Ratzeburg. Types presumed lost. Hartig's collection (Munich) contains 3 ♀ of *Gastrancistrus fuscicornis* mounted with some rose-leaves bearing the skins of parasitized aphids, from which the Chalcidoids were evidently reared. These are the only *Gastrancistrus* known to me which have been reared from aphids, and as they agree well enough with Ratzeburg's description of *Tridymus aphidum* they may be taken as an indication of the identity of that species. It might even be convenient to select one of the Hartig specimens as neotype of *aphidum*.

BRITAIN, GERMANY ; uncommon. I have swept it from foliage of *Quercus* and *Salix* spp. Bouček (1965 : 7) recorded it from MOLDAVIAN S.S.R. ; this record is possibly correct but needs checking since *fuscicornis* is now shown to be one of a complex of species.

Biology : see above. Imagines July–August.

Gastrancistrus alectus Walker

Gastrancistrus Alectus Walker, 1848 : 105, 158, "♂" [*recte* ♀].

♀ (redescription). Body black, with some metallic reflections as follows : head usually olive greenish, sometimes more or less suffused with purplish bronze ; petiole brown or partly testaceous ; base of gaster with rather conspicuous greenish reflections ; mesoscutum, scutellum sometimes, axillae, propodeum and disc of gaster, with obscure metallic reflections which vary from olive greenish to purplish bronze. Palpi and mandibles testaceous, the latter with reddish teeth. Scape testaceous, brownish apically ; pedicellus and flagellum fuscous. Legs testaceous, the knees and the mid and hind tarsi slightly paler than the rest ; hind coxae with their basal third or rather more infuscate, fore and mid coxae slightly infuscate basally ; fifth segment of all tarsi fuscous. Tegulae testaceous in front, more brownish posteriorly. Wings hyaline ; venation testaceous. Length 1 to 1·6 mm.

Head 1·3 to 1·4 times as broad as the mesoscutum, in dorsal view about 2·2 times as broad as long ; temples very short and receding ; ocelli in a very obtuse triangle whose base is about 2·5 times its height, POL about 1·2 OOL. In front view the head (Text-fig. 208) is transversely

oval, nearly 1·3 times as broad as high, with the vertex fairly strongly arched ; the genae hardly curved but converging strongly towards the mouth. Eyes separated by about 1·4 times their own length. Malar space slightly less than half the length of an eye. Breadth of oral fossa nearly 2·5 times the malar space. Clypeus (Text-fig. 208) relatively small, only about twice as broad as long, its anterior margin with a rounded median tooth or tubercle, usually also with some indication of a smaller tubercle on either side of the median one. Mandibles (Text-fig. 208) moderately large, somewhat falcate, with their lower margin sinuate ; teeth acute, the lower (outermost) one long, the next two progressively a little shorter, the inner one very small. Head, except clypeus and scrobes, which are polished and virtually smooth, with very fine delicately engraved alutaceous sculpture, rather shiny. Antennae with scape as long or practically as long as an eye ; combined length of pedicellus and flagellum about 1·25 times the breadth of the head ; pedicellus in profile about 1·5 times as long as broad, slightly shorter than the first funicular segment ; funicle of uniform thickness, slightly stouter than the pedicellus in profile, its segments, except usually the fifth, at least very slightly longer than broad, the first segment up to 1·5 times as long as broad ; clava slightly broader than the funicle, about three times as long as broad, slightly shorter than the three preceding funicular segments together ; sensilla of flagellum relatively sparse.

Thorax about 1·6 times as long as broad. Mesoscutum 1·5 to 1·7 times as broad as long, moderately shiny, with very fine delicately engraved reticulation, whose areoles are nearly isodiametric ; mid lobe with a few hairs, which arise from distinct pits ; notauli deep, nearly straight. Axillae mainly sculptured like the mesoscutum, but their inner angles are more shiny with the sculpture weaker or nearly obsolete. Scutellum slightly longer than broad, a little longer than the mesoscutum, strongly convex in the transverse axis, bearing three to four pairs of bristles in two longitudinal rows ; frenum marked off by a fine, superficial grooved line ; the main portion of the scutellum has sculpture like that of the mesoscutum, perhaps very slightly finer, but the frenum has rather wider-meshed reticulation ; the scutello-axillar sutures run forward as straight lines to meet the hind margin of the mesoscutum somewhat mesad of the hind ends of the notauli, the base of the scutellum being about one fifth the breadth of the mesoscutum. Dorsellum shiny, virtually smooth. Propodeum unusually long, medially almost half as long as the scutellum ; median carina fine, complete, the surface between it and the spiracles shiny with at most some weak alutaceous sculpture ; plicae absent ; spiracles circular, separated by about one third their diameter from the metanotum ; callus shiny and almost smooth, with three to five bristles. Metapleuron and mesepimeron shiny, with some very weak reticulation ; mesepimeron distinctly separated from the mesepisternum, ovate-subtriangular, less than twice as long as broad ; the triangular area in front of the mesepimeron is smooth and polished ; mesosternum, except laterally, polished and virtually smooth, its mesolcus absent. Postspiracular sclerite moderately shiny, with moderately fine, slightly raised reticulation. Legs not stout ; hind coxae rather slender, about 2·5 times as long as broad, shiny and weakly alutaceous, their dorsal surface bare ; spur of mid tibia about two thirds the length of the first tarsal segment. Fore wing about twice as long as broad ; costal cell broad (length : breadth about 8 : 1), its lower surface sparsely hairy, its upper surface bare except for a row of 6 to 11 hairs in the distal third ; basal cell bare except just near the pilose basal vein ; speculum closed below, on the upper surface of the wing moderate-sized though not extending below the marginal vein, on the lower surface more or less effaced by scattered hairs ; there is sometimes a small bare area in the angle formed by the bases of the postmarginal and stigmal veins, but usually this is absent ; wing beyond the speculum moderately thickly haired; marginal vein 1·2 to 1·4 times as long as the postmarginal vein and 2·25 to 2·35 times as long as the stigmal vein, the latter slender ; stigma small, suboval, with a distinct uncus.

Gastral petiole nearly as long as broad, about two thirds the median length of the propodeum, shiny and almost smooth, its sides nearly parallel, diverging very slightly caudad. Gaster obovate-subcircular, nearly as broad as but much shorter than the thorax, rounded apically, depressed dorso-ventrally ; dorsally the surface beyond the basal tergite is slightly sunken, ventrally the gaster is slightly convex ; the basal tergite occupies somewhat more than one

third of the total length, the following tergites are very strongly transverse ; tips of ovipositor sheaths not or hardly projecting beyond the last tergite ; ventrally, the hypopygium is not clearly visible owing to overlapping of the tergites, but its tip appears to be situated somewhat beyond the middle of the gaster.

♂. Differs from the female as follows :

Fore and mid femora infuscate over their basal half ; hind femora mainly fuscous.

Antennae with scape as long as an eye, 4·5 to 4·8 times as long as broad, not broadened in its upper half ; combined length of pedicellus and flagellum 1·35 to 1·4 times the breadth of the head ; funicle nearly cylindrical, slender, proximally not or hardly stouter than the pedicellus, its first segment 1·25 to 1·4 times as long as the pedicellus and 1·8 to 2 times as long as broad ; the following segments progressively a little shorter, but all, except sometimes the sixth, slightly longer than broad ; clava not broader than the funicle, barely as long as the two preceding funicular segments together, about 2·3 times as long as broad ; funicle clothed with hairs which stand out at an angle of 45° to 60°, the length of these hairs about equal to the breadth of the segments which bear them ; sensilla sparse.

Gaster very strongly compressed, almost knife-like, about as long as the thorax.

The ♀ of *alectus* closely resembles that of *fuscicornis* Walker, which differs as follows :

Clypeus more transverse, 3·1–3·3 times as broad as long, its anterior margin not denticulate, or with at most a weak median tubercle. Antennae with combined length of pedicellus and flagellum hardly equal to the breadth of the head ; funicular segments, except the first, quadrate or even very slightly transverse, the first slightly shorter than the pedicellus. Fore wing with speculum open below, extending as a bare strip below the marginal vein as far as the stigmal vein ; the space between the base of the postmarginal vein and the stigmal vein more or less bare, at least on the upper surface of the wing ; marginal vein slightly longer, costal cell with a row of only 4–5 hairs on its upper surface. Legs with coxae dark ; femora infuscate at least over their basal half ; hind tibiae sometimes more or less infuscate.

The ♂ of *alectus* differs from that of *fuscicornis* Walker in the structure of its antennae (see key to species) as well as in the characters mentioned above for the female.

Type material. None found. From the description, however, I am certain that *alectus* must be the species redescribed above. Walker described what he supposed to be the male, but I am sure that he must have had the female before him ; the latter has a short obtuse gaster and might easily be mistaken for a male.

BRITAIN : [the following are new records].

ENGLAND : Buckinghamshire, Hell Coppice, near Oakley, 1 ♂, 1 ♀, 2.viii.1953 ; Berkshire, Bagley Wood, 1 ♂, 29.viii.1954 (*Graham*) ; Kent, " July, Birchwood " (Walker MS.). SCOTLAND : Mid Perth, Killin, 1 ♀, 24.vii.1954 (*Graham*).

Biology. Unknown.

Gastrancistrus dispar sp. n.

(Text-fig. 209)

♀. Differs from that of *alectus* as follows :

All coxae black with a slight metallic tinge ; femora fuscous, the fore and mid ones broadly, the hind ones narrowly, pale at the apex.

Inner angles of axillae neither smoother nor more weakly sculptured than the rest.

The female differs from that of *fuscicornis* in having the space between the postmarginal and stigmal veins hairy, the speculum not extended as a bare strip below the marginal vein, and in having the axillae uniformly sculptured, their inner angles not smoother than the rest.

♂. Differs considerably from those of the other species of this group in the form of the antennal flagellum (Text-fig. 209), particularly in its numerous sensilla and relatively less strongly outstanding hairs. From ♂ *fuscicornis* it also differs in the more thickly hairy disc of the fore wing, with the speculum not extended below the marginal vein, and in having the space between the postmarginal and stigmal veins hairy. From ♂ *alectus* it also differs in its much stouter flagellum and relatively shorter funicular segments.

The sculpture of the axillae is similar in both sexes.

Holotype ♂. ENGLAND : Lancashire South, Freshfield, 26.vi.1962, from foliage of an isolated oak (*Quercus robur* L.), growing in an area of birch-scrub behind the dune-slacks (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 2 ♂, 1 ♀, 28.vi.1962, 2 ♂, 2 ♀, 29.vi.1962, 8 ♂, 2 ♀, 26.vii.1962 (*Graham*), in BM(NH) and Graham collections.

Biology. Unknown.

Gastrancistrus consors sp. n.

♂ ♀. Differ from those of *fuscicornis* as follows :

Fore wing with speculum, on upper surface of wing, not extending beyond the proximal end of the marginal vein ; the space between the postmarginal and stigmal veins mainly hairy ; the wing beyond the speculum more thickly haired. Axillae with a conspicuous smooth shiny area at their inner angles, this area larger and more distinct than in *fuscicornis*.

The characters by which *consors* differs from the other species of this group are summarized in the key.

Holotype ♂. ENGLAND : Lancashire South, Freshfield, 29.vi.1962. (*Graham*), in the Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 1 ♂, 3.vi.1959, 2 ♂, 2 ♀, 26.vi.1962, 1 ♂, 28.vi.1962, 4 ♂, 29.vi.1962 (*Graham*), in BM(NH) and Graham collections. With the exception of the male captured in 1959, all the above were taken from foliage of the same oak upon which *G. dispar* was found, and at the same time as the latter.

Biology. Unknown.

Species sola

Gastrancistrus pusztensis (Erdös) comb. n.

Meromalus pusztensis Erdös, 1946 : 153–154, fig. 10, ♂ ♀.
Gastrancistrus tripedias Bouček, 1964*a* : 259–261, ♀, **syn. n.**

Type material. I have not seen the types of *Meromalus pusztensis* Erdös, but from the description am confident that it must be the same as *Gastrancistrus tripedias* Bouček, the holotype of which I have examined. Three paratypes of the latter evidently represent the material upon which Förster based his genus *Tripedias*, described without included species (Bouček, 1964 : 259). A detailed redescription of the female was given by this author ; the only male specimen available was too damaged to be described.

BRITAIN [new] : Scotland, East Inverness, Aviemore, 1 ♀, 17.vi.1965, swept from foliage of *Populus tremula* L. (*Graham*). GERMANY, CZECHOSLOVAKIA, HUNGARY.

Biology. Parasitic on *Syndiplosis petioli* (Kieff.) (Dipt., Cecidomyiidae) on *Populus tremula* L. (Bouček, 1964).

Species sola

Gastrancistrus coxalis (Thomson) **comb. n.**

Tridymus coxalis Thomson, 1876*a* : 195, ♀.

Type material. One female, LECTOTYPE (though possibly holotype), labelled " Scan ", " ♀ " and " coxalis ".

SWEDEN ; so far known only from the type specimen.
Biology. Unknown.

THE *FUMIPENNIS*-GROUP

Gastrancistrus ? *pyricola* (Marchal)

? *Tridymus pyricola* Marchal, 1907 : 20–23, ♀.

Type material. Location not known to me. The original material was reared from *Contarinia pyrivora* Riley (Dipt., Cecidomyiidae). In the BM(NH) there are some specimens determined as *pyricola* by Dr. Ferrière ; in some respects they do not agree completely with the original description, but the latter may be faulty. I include the species here tentatively as *pyricola*, on the basis of these specimens.

? BRITAIN ; FRANCE.
Biology. Endoparasite of the larvae of *Contarinia pyrivora* Riley on pear-trees (Marchal, 1907). The British specimens presumed to be *pyricola* were reared (*H. F. Barnes*) from the same host, ENGLAND : Kent, 1938, 1 ♂ ; Norfolk, 6 ♂, 1 ♀, 1936 ; Shropshire, near Oswestry, 3 ♂, 3 ♀, 1938. Wales, Caernarvonshire, 4 ♂, 3 ♀, 1937.

Gastrancistrus fumipennis Walker

Gastrancistrus fumipennis Walker, 1834 : 174, "♀" [*recte* ♂].

Type material. Three males in Walker collection (one of which may not be original material). LECTOTYPE, the first specimen, bearing a Waterhouse label ; the gaster is squashed and looks rather like that of a female, which would account for Walker's having mistaken its sex.

BRITAIN ; uncommon ; near London (*Walker*) ; Buckinghamshire, Hell Coppice, near Oakley, 2 ♀, 24.vi.1958 (*Graham*). Imagines in June.
Biology. Unknown.

Gastrancistrus cupreus sp. n.

(Text-figs. 215, 219, 223)

♀. Head bronze ; face with greenish reflections, the frons mainly violet. Thorax and gaster black with a slight bronze tinge ; mesoscutum, scutellum, dorsellum and propodeum coppery

bronze ; base of gaster greenish. Mandibles testaceous with reddish teeth. Antennae testaceous ; sometimes scape at apex, and pedicellus more or less dorsally, brown ; flagellum dorsally brown. Coxae concolorous with the thorax ; trochanters more or less infuscate ; femora bronze-black, their tips, those of the fore and mid femora broadly, of the hind ones narrowly, testaceous ; tibiae testaceous, tarsi paler testaceous with their fifth segment brown. Tegulae brownish testaceous. Wings hyaline ; venation testaceous. Length 1·7 to 1·95 mm.

Head about 1·2 times as broad as the mesoscutum, in dorsal view strongly transverse, breadth to maximum length about 2·35 to 2·4 : 1, with POL about 1·25 OOL, the ocelli in a triangle whose base is about 2·25 times its height ; temples extremely short. Eyes separated by about 1·4 times their own length. Malar space slightly more than one third the length of an eye. Breadth of oral fossa nearly three times the malar space. Clypeus (Text-fig. 215) about twice as broad as long, its anterior margin produced but shallowly emarginate medially. Mandibles moderate-sized, hardly falcate, their lower margin weakly sinuate ; teeth acute, not very dissimilar in length although the outer one as usual is rather longer than the others. Head with extremely fine reticulation which is not or hardly raised above the general surface. Antenna (Text-fig. 223) with scape much shorter than an eye and not nearly reaching the median ocellus ; combined length of pedicellus and flagellum slightly less than the breadth of the head ; pedicellus in profile about 1·5 times as long as broad ; funicle proximally hardly stouter than the pedicellus, but thickening distad, its first segment about as long as the pedicellus and 1·5 to 1·6 times as long as broad ; second and following segments subquadrate ; clava slightly more than twice as long as broad, slightly broader than the funicle, nearly as long as the three preceding funicular segments together. Thorax nearly 1·5 times as long as broad. Mesoscutum about 1·6 times as broad as long, slightly shiny, with extremely fine alutaceous sculpture which is hardly raised above the surface, with numerous bristles which arise from small warts ; notauli deep, straight. Scutellum about as long as mesoscutum, distinctly longer than broad, strongly convex in the transverse axis, sculptured like the mesoscutum ; frenum marked off by a fine grooved line ; the scutello-axillar sutures curve round and join anteriorly, so that the scutellum touches the mesoscutum only in the middle. Axillae sculptured like the scutellum. Dorsellum shiny, weakly alutaceous, shorter than the frenum. Propodeum strongly transverse, medially hardly more than one third as long as the scutellum, shiny, weakly alutaceous ; median carina fine but complete ; plicae indicated at the hind margin of the sclerite ; spiracles circular, touching the metanotum ; callus with five to six bristles. Metapleuron and mesepimeron rather shiny, with moderately fine delicate reticulation ; mesepimeron distinctly separated from the mesopleuron, about 2·5 times as long as broad ; mesosternum delicately reticulate laterally, nearly smooth medially, its mesolcus distinctly impressed, at least posteriorly. Legs not stout ; hind coxae about twice as long as broad, with delicate sculpture which is only very slightly raised above the general surface ; their dorsal surface with a few hairs ; spur of mid tibia about two thirds the length of the first tarsal segment. Fore wing slightly more than twice as long as broad ; costal cell broad (length : breadth about 7 : 1), its lower surface sparsely hairy, its upper surface with a row of several hairs in the distal half ; basal cell, on the upper surface of the wing, with its distal quarter hairy ; speculum closed below, on the lower surface of the wing partly effaced by scattered hair-bases ; wing beyond the speculum moderately thickly haired ; marginal vein as long as or very slightly (up to 1·15 times) longer than the postmarginal vein, and 1·4 to 1·5 times as long as the stigmal vein ; stigma moderate-sized, subrectangular, its uncus long.

Gaster obovate, broadest slightly behind the middle and narrowing gradually basad ; about as long and as broad as the thorax, 1·25 to 1·55 times as long as broad, obtuse or bluntly pointed apically ; basal tergite occupying one third of the total length or rather more, with a triangular basal fovea, and with a grooved impression running back from the fovea for some distance ; beyond the basal tergite the gaster is slightly concave dorsally ; ventrally it is moderately convex, with the hypopygium reaching about half way along.

♂. Differs from the female only in the antennae and gaster. The antennae of the only known

male are broken, hence a complete description of this sex is postponed until fresh material is available.

G. cupreus appears to be most closely allied to *G. fumipennis* Walker, which differs chiefly in the characters mentioned in the key.

Holotype ♀. ENGLAND : Surrey, Box Hill, bred 20.v.1946 from *Craneiobia corni* (Giraud) (Dipt., Cecidomyiidae) (*M. Niblett*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as Holotype, 1 ♂, 2 ♀ ; Northamptonshire, Salcey Forest, 1 ♀, 6.vii.1954 (*Graham*) ; Oxfordshire, Bald Hill, near Lewknor, 1 ♀, 8.vi.1958 (*Graham*), in Hope Department and Graham collections.

THE *VULGARIS*-GROUP

Gastrancistrus vulgaris Walker

Gastrancistrus vulgaris Walker, 1834 : 175, ♂ ♀.

Type material. Syntypes, 4 ♂. LECTOTYPE, the first specimen, bearing a Waterhouse label, also one reading " Type C.F." [C. Ferrière].

BRITAIN, not uncommon ; SWEDEN.

Biology. Unknown. Imagines May–July.

Gastrancistrus coniferae sp. n.

(Text-fig. 221)

♀. Body green to blue-green ; dorsal surface of gaster, except the greater part of the basal tergite, bronze. Mandibles testaceous with darker teeth. Antennal scape testaceous, darker distally ; pedicellus and flagellum fuscous. Coxae concolorous with the thorax, except the fore coxae which are mainly to entirely testaceous ; legs otherwise testaceous with the femora sometimes more or less infuscate, especially the hind ones ; mid and hind tibiae occasionally brownish ; fifth segment of all tarsi brownish. Tegulae brownish testaceous. Wings slightly greyish-tinged ; venation brownish testaceous to brown. Length 1·7 to 2·1 mm.

Head about 1·25 times as broad as the mesoscutum, in dorsal view 2·2 to 2·25 times as broad as long ; temples very short and receding strongly ; ocelli in a triangle whose base is about 2·25 times its height, POL 1·2 to 1·35 OOL. In front view the head is transversely oval, about 1·4 times as broad as high, with the vertex moderately arched ; genae very slightly curved, converging strongly towards the mouth. Eyes separated by nearly 1·5 times their own length. Malar space somewhat more than one third the length of an eye. Breadth of oral fossa about 2·5 times the malar space. Clypeus slightly more than twice as broad as long, its anterior margin produced but truncate or shallowly emarginate medially. Mandibles rather small, hardly falcate, their outer tooth longest, the others decreasing regularly in length. Head, especially face, shiny, with very fine reticulation which is not raised above the general surface and is, on the lower part of the head, more or less engraved. Antennae (Text-fig. 221) with scape much shorter than an eye, hardly four times as long as broad ; combined length of pedicellus and flagellum equal to or slightly greater than the breadth of the head ; pedicellus in profile about 1·7 times as long as broad, as long as or very slightly longer than the first funicular segment ; flagellum moderately clavate ; funicle proximally very slightly stouter than the pedicellus,

thickening slightly distad, its first segment usually 1·5 to 1·6 times as long as broad, but quadrate in small specimens, the following segments subquadrate or some of the distal ones very slightly transverse ; clava fully twice as long as broad, about as long as two and a half funicular segments ; flagellum with rather conspicuous and somewhat outstanding bristles ; sensilla not very numerous.

Thorax barely 1·5 times as long as broad. Mesoscutum 1·7 to 1·8 times as broad as long, shiny, with fine delicate reticulation which is for the most part engraved ; mid lobe fairly thickly hairy, the hairs rather long ; notauli deep, slightly curved. Scutellum about as long as mesoscutum, slightly longer than broad, strongly convex in the transverse axis, with sculpture, excepting the frenum, rather finer than that of the mesoscutum ; four to five pairs of bristles ; frenum marked off by a distinct line ; scutello-axillar sutures converging strongly and curving round so as to meet ; the scutellum therefore touches the mesoscutum only on a narrow base. Dorsellum about one third as long as the frenum. Propodeum about as long as the frenum, and about one third as long as the whole scutellum, shiny with very weak alutaceous sculpture ; median carina virtually obsolete, though the propodeum is raised in a roof-like manner in the middle ; plicae absent ; spiracles suboval, not quite touching the metanotum ; callus with four to five bristles. Metapleuron, and mesopleuron except the smooth subtriangular dorsal area, shiny with fine delicate and hardly raised reticulation ; mesepimeron distinctly marked off, nearly three times as long as broad ; mesosternum shiny, with subobsolete sculpture, mesolcus distinctly impressed. Postspiracular sclerite with rather coarse, slightly raised, reticulation. Legs somewhat slender ; hind coxae nearly 2·5 times as long as broad, shiny, with not very fine longitudinally strigose-reticulate sculpture, which is very slightly raised above the general surface, the dorsal surface of the coxae with some hairs ; spur of mid tibia slightly more than two thirds the length of the first tarsal segment. Fore wing slightly more than twice as long as broad ; costal cell broad (eight to nine times as long as broad), its lower surface fairly thickly hairy, its upper surface with a row of numerous hairs in the distal half and with several additional hairs below this row in the distal third ; basal cell with scattered hairs over its distal third to half, and partly closed below by a line of hairs ; speculum small, reduced to an oval area below the parastigma and not reaching the cubital vein ; wing beyond the speculum quite thickly hairy ; veins rather thin, the postmarginal nearly or quite as long as the marginal vein, which is 1·7 to 1·8 times as long as the stigmal vein, the latter slightly curved ; stigma rather small, oval, slightly longer than high, with a long uncus.

Gaster lanceolate, including the ovipositor sheaths 1·35 to 1·5 times as long as head plus thorax, usually strongly compressed and much narrower than the thorax ; sunken dorsally beyond the basal tergite, the latter with a subtriangular basal fovea ; ovipositor sheaths, as seen in dorsal view, projecting beyond the apex of the gaster by a length varying from about one quarter to nearly one third that of the hind tibia ; hypopygium extending distinctly less than half way along the gaster.

♂. Unknown.

The female of *coniferae* sp. n. closely resembles that of *vulgaris* Walker, which differs as follows :

Fore coxae mainly to entirely metallic, at most with an indefinite pale stripe along the inner aspect ; all femora more or less infuscate, at least basally. Gaster shorter, ovate to ovate-lanceolate, including ovipositor sheaths from hardly longer than the thorax to slightly longer than head plus thorax, less compressed and as broad as or broader than high, only slightly narrower than the thorax, sometimes not narrower ; ovipositor sheaths rather less exserted.

Holotype ♀. SCOTLAND : East Inverness, Rothiemurchus, 21.vi.1965, beaten from *Picea* (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 5 ♀ ; West Inverness, Isle of Rhum, 2 ♀, 21.vi.1963 (*Graham*). ENGLAND : Berkshire, Wytham Wood, 1 ♀, 25.v.1959 (*Graham*), Bagley Wood, 1 ♀, 4.vi.1954, beaten from foliage of *Larix decidua* Mill (*Graham*), in Graham collection.

Biology. Unknown.

Gastrancistrus unicolor Walker

(Text-figs. 216, 220)

Gastrancistrus unicolor Walker, 1834 : 175, ♂.
Tridymus frenalis Thomson, 1876*a* : 199, ♂ [*nec* ♀], **syn. n.**

Type material. *Gastrancistrus unicolor* Walker. Syntypes, 4 ♂. LECTOTYPE, the first specimen, bearing a Waterhouse label.

Tridymus frenalis Thomson. Five specimens, male and female ; the females disagree with the description and belong to *puncticollis* (Thomson). LECTOTYPE, a male labelled " Esp " [Esperöd] and " ♂ ".

BRITAIN, SWEDEN ; uncommon.

Biology. Unknown. Imagines May–June.

Gastrancistrus obscurellus Walker

Gastrancistrus obscurellus Walker, 1834 : 175, ♂.

Type material. One male, designated LECTOTYPE (possibly it is holotype), bearing a Waterhouse label. I cannot definitely associate this male with any female known to me, so that it may well represent a valid species. No other specimen except the type has been seen.

ENGLAND : " June ; on grass beneath trees ; near London " (Walker, 1834 : 175).

Biology. Unknown.

Species sola

Gastrancistrus acutus Walker

(Text-fig. 228)

Gastrancistrus angulus Walker, 1834 : 177, ♂ ♀, **syn. n.**
Gastrancistrus acutus Walker, 1834 : 177, ♀.
Gastrancistrus Panares Walker, 1844*a* : 339, ♀, **syn. n.**
Gastrancistrus Loelianus Walker, 1848 : 105, 160, ♀, **syn. n.**
Tridymus acutus (Walker) ; Thomson, 1876*a* : 200, ♀.

Type material. *Gastrancistrus angulus* Walker. Syntypes, 2 ♀. LECTOTYPE, the first specimen, bearing Waterhouse label, also one " Type C.F." [C. Ferrière].

G. acutus Walker. Syntypes, 7 ♀. LECTOTYPE, the fifth, with Waterhouse label.

G. panares Walker. One female, LECTOTYPE, with Waterhouse label. It is an unusually large robust *acutus*.

G. loelianus Walker. One female, LECTOTYPE, with Waterhouse label, also " Type C.F." [C. Ferrière).

Since Thomson (1875 : 200) has already used the name *acutus*, I propose, under the First Reviser principle, to continue with this usage, although the name *angulus* has line priority.

BRITAIN, SWEDEN to LAPLAND. Uncommon ; I have found it both in rough pastures and meadows and on sand-dune vegetation. The ♂ is unknown to me.

Biology. Unknown. Imagines June–July.

Species sola

Gastrancistrus clavatus (Thomson)

(Text-fig. 231)

? Gastrancistrus Fulginas Walker, 1839*a* : 85, ♀.
Tridymus clavatus Thomson, 1876*a* : 199, ♀.
Gastrancistrus clavatus (Thomson) Dalla Torre, 1898 : 203.

Type material. *Gastrancistrus fulginas* Walker. One female was found standing above a label " Pteromalus Felginas W. 1842 " ; it is labelled " Felginas " in Walker's handwriting. It disagrees with the description of *Pteromalus felginas* and could not be the type of that species. However, it fits very well the description of *Gastrancistrus fulginas* and could well be its type. I believe that it is in fact the type of *fulginas* and that there has been a mistake in labelling. This idea seems to be confirmed by evidence in the old B.M. register of accessions, where there is the entry " *Gastrancistrus Fulginas* Chiloe " ; the name has originally been written as *Felginas* but altered to *Fulginas*. *G. fulginas* (type locality : Chiloe) is so like *clavatus* (Thomson) that I cannot at present distinguish them ; but in view of their widely different provenance it appears safer to use the Thomson name for our European species.

Tridymus clavatus Thomson. Syntypes, 7 specimens. LECTOTYPE, a female labelled " Hbg " [Hälsingborg] and " clavatus " ; the specimen remounted by A. Jansson.

BRITAIN, SWEDEN ; ? CHILE. New record : England, Berkshire, Thatcham Reeds, near Newbury, several ♀♀, 17.viii.1966, swept from inflorescences of *Artemisia vulgaris* L. (*Graham*).

Biology. Unknown. Imagines July–August.

THE *HAMILLUS*-GROUP

Gastrancistrus hamillus Walker

(Text-fig. 249)

Gastrancistrus Hamillus Walker, 1848 : 105, 156, ♀.
Tridymus flavipes Thomson, 1876*a* : 195, ♀, **syn. n.**

Type material. *Gastrancistrus hamillus* Walker. One female, LECTOTYPE, with Waterhouse label.

Tridymus flavipes Thomson. Syntypes, 6 specimens. LECTOTYPE, a female labelled " Sm " [Småland] and " Bhn " [Boheman].

BRITAIN, SWEDEN. I take it not uncommonly from the foliage of *Salix* species, also occasionally from that of *Betula*.

Biology. Unknown. Imagines July–August.

Gastrancistrus acontes Walker

(Text-fig. 250)

Gastrancistrus Acontes Walker, 1840 : 32, ♂.
Tridymus convergens Thomson, 1876*a* : 199, ♀, **syn. n.**

Type material. *Gastrancistrus acontes* Walker. LECTOTYPE (? holotype) ♂ in Greville coll., Edinburgh, standing above a label " Gastrancistrus Acontes W. s. n. fide Wk. Edinb." ; the specimen also bears a red-bordered Type label and another reading " Greville 1936–50. 290 ".

Tridymus convergens Thomson. Syntypes, 4 specimens. LECTOTYPE, a female labelled " L–d " [Lund] and " convergens Ths " ; also bearing A. Jansson's lectotype-label.

BRITAIN, SWEDEN, apparently rare.

Biology. Unknown. Imagines in June.

THE *AUTUMNALIS*-GROUP

Gastrancistrus autumnalis (Walker)

(Text-fig. 227)

Glyphe autumnalis Walker, 1834 : 171, ♀.
Gastrancistrus autumnalis (Walker) Walker, 1846 : 25.
Tridymus productus Thomson, 1876*a* : 196, ♀, **syn. n.**

Type material. *Glyphe autumnalis* Walker. Two specimens stand here, but one is probably not original material. The other, a female with a Waterhouse label, also labelled " Type " in A. B. Gahan's handwriting, is designated LECTOTYPE.

Tridymus productus Thomson. Syntypes, 2 females. LECTOTYPE labelled " V.G." [Vestra Gottland], " Bhm." [Boheman] and " productus ".

BRITAIN, IRELAND, SWEDEN. Occurs commonly on the foliage of *Fagus sylvatica* L. in the autumn. Walker (1834 : 171) first recorded it " on flowers of the ivy ; near London " ; I have taken it in the same situation.

Biology. Host unknown, but seems likely to be some Cecidomyiid associated with *Fagus*. Imagines Sept.–Oct.

Gastrancistrus oporinus **sp. n.**

♀. Head and thorax dark green ; gaster bronze-black, with greenish or bluish reflections on the

basal tergite and on the sides. Antennae testaceous ; pedicellus and flagellum darker dorsally ; scape sometimes with a dark streak dorsally. Coxae concolorous with the thorax ; femora black with a metallic tinge, more or less pale at their tips ; remainder of legs testaceous, with the fore tarsi, and the tips of the mid and hind tarsi, fuscous. Tegulae mainly testaceous. Wings hyaline ; venation testaceous. Length 1·7 to 2 mm.

Head about 1·2 times as broad as the mesoscutum, in dorsal view 2·25 to 2·35 times as broad as long ; temples about one fifth length of eyes, rounded off ; POL about 1·7 OOL, ocelli in a triangle whose base is nearly three times its height. Eyes separated by about 1·3 to 1·4 times their own length. Head in front view transversely oval, about 1·25 times as broad as high, with the vertex strongly arched, but the cheeks nearly straight in outline. Malar space slightly less than half the length of an eye. Breadth of oral fossa about 2·5 times the malar space. Clypeus about 2·3 times as broad as long, shiny with obsolescent sculpture, its anterior margin produced and almost angulate medially. The head is shiny, with fine, on the vertex very fine, alutaceous sculpture which is not distinctly raised above the general surface. Antenna (Text-fig. 225) with scape nearly as long as an eye, but not quite reaching the median ocellus, 4·5 to 4·8 times as long as broad ; combined length of pedicellus and flagellum 1·15 times the breadth of the head ; pedicellus in profile about 1·7 times as long as broad ; funicle proximally not stouter than the pedicellus, thickening distad, its first segment as long as or somewhat longer than the pedicellus and 1·6 to 1·8 times as long as broad, the second, and sometimes the third, segment slightly elongate, the fourth and fifth quadrate, or the fifth very slightly transverse ; clava about 2·5 times as long as broad, slightly broader than the funicle, nearly as long as the three preceding funicular segments together ; flagellum with rather bristly hairs which are slightly outstanding.

Thorax about 1·6 times as long as broad. Mesoscutum about 1·8 times as broad as long, shining, with very fine reticulation which is hardly raised above the general surface ; mid lobe moderately thickly haired ; notauli deep, slightly curved. Scutellum distinctly longer than the mesoscutum, longer than broad, strongly convex in the transverse axis, shiny, with very fine engraved sculpture, that of the frenum less fine, with three to four pairs of bristles ; frenum marked off by a fine line ; the scutellum also has a short longitudinal impressed line at its base ; the scutello-axillar sutures converge strongly and meet the hind margin of the mesoscutum well mesad of the notauli, the base of the scutellum being less than one sixth the breadth of the mesoscutum. Dorsellum about half as long as the frenum, shiny, weakly alutaceous. Propodeum medially barely as long as the scutellar frenum, and less than one third as long as the scutellum, shiny and weakly alutaceous or nearly smooth ; median carina weak or absent ; plicae absent ; spiracles circular, touching the metanotum ; callus with several hairs which are distributed from its base right to the supracoxal flange. Metapleuron and most of the mesopleuron, with fine delicately-engraved sculpture ; mesepisternum with a smooth subtriangular area dorsally ; mesepimeron distinctly marked off from the mesepisternum, about 2·5 times as long as broad ; mesosternum shiny and nearly smooth, mesolcus distinctly impressed. Postspiracular sclerite with somewhat coarse, but hardly raised, sculpture. Legs not stout ; hind coxae rather more than twice as long as broad, with delicate, hardly raised sculpture ; their dorsal surface with some hairs ; spur of mid tibia about two thirds the length of the first tarsal segment. Fore wing about twice as long as broad ; costal cell broad (length : breadth about 8 : 1), its lower surface with scattered hairs, its upper surface with a row of several hairs in the distal third ; basal cell hairy over about its distal third ; speculum closed below, on the upper surface of the wing moderate-sized and not extending below the marginal vein ; wing beyond the speculum thickly hairy ; marginal vein (Text-fig. 226) 1·1 to 1·25 times as long as the postmarginal vein and 2 to 2·2 times as long as the stigmal vein ; the latter slightly curved, the stigma moderate-sized and suboval, with a moderately long uncus ; submarginal vein with 12 to 15 bristles.

Petiole of gaster strongly transverse. Gaster lanceolate, even without the ovipositor somewhat longer than the head plus thorax, slightly narrower than the thorax, acute apically, 3 to 4·2 times as long as broad ; basal tergite with a semicircular basal fovea ; disc of gaster

sunken ; last tergite slightly transverse ; ovipositor sheaths slightly exserted ; ventrally the gaster is convex and keeled, the hypopygium extending about half way along or slightly less.

♂ Differs from the female as follows :

Antennal scape black with a metallic tinge, except its base and apex ; femora more or less infuscate, the infuscate parts with a metallic tinge, the fore and mid femora have about their basal half dark, the hind femora are mainly dark ; mid and hind tibiae sometimes with a faint infuscate band before their apices.

Antennae (Text-fig. 224) with scape shorter, its length only slightly greater than the transverse diameter of an eye, and broader, about four times as long as broad, but practically reaching the level of the lower edge of the median ocellus ; combined length of pedicellus and flagellum fully 1·5 times the breadth of the head ; pedicellus barely 1·5 times as long as broad, much shorter than the first funicular segment ; flagellum of uniform thickness, not or hardly stouter than the pedicellus ; funicular segments all longer than broad, the first 1·8 to 2·2 times, the sixth 1·3 to 1·7 times, as long as broad ; clava tapering and acutely pointed, not broader than the funicle, about 3·5 times as long as broad, hardly as long as the two preceding funicular segments together ; the funicular segments and the clava are clothed with long and strongly outstanding hairs, which form three whorls on each segment, sometimes four on the first funicular segment, the length of these hairs somewhat greater than the breadth of the segments which bear them. Propodeum somewhat longer. Marginal vein of fore wing slightly shorter relative to the stigmal vein.

Gaster oblong-sublinear, slightly shorter, and much narrower, than the thorax, subtruncate apically ; basal fovea of the basal tergite Y-shaped.

The female of *oporinus* on the whole most resembles that of *autumnalis* (Walker), from which it differs as follows :

Average size less, body more slender. Head in dorsal view less transverse, in *autumnalis* it is 2·4 to 2·5 times as broad as long ; clypeus slightly less transverse, about three times as broad as long in *autumnalis* and more weakly sculptured ; temples slightly longer, in *autumnalis* one sixth to one seventh the length of the eyes. Antennae with its funicular segments on the average rather shorter ; clava relatively a little longer, in *autumnalis* its length barely equals that of funicular segments five plus four plus half of three. Scutellum longer relative to the mesoscutum with fewer bristles (in *autumnalis* four to six pairs), the lines separating it from the axillae converging more strongly so that the base of the scutellum is less broad. Sculpture of mesoscutum and scutellum less fine ; that of the mesopleuron engraved, in *autumnalis* very slightly raised above the surface. Upper surface of costal cell of fore wing with fewer hairs, in *autumnalis* there are two rows, or even a partial third row, in the distal half of the cell ; speculum closed below ; submarginal vein with fewer bristles. Gaster rather longer, in *autumnalis*, excluding the ovipositor sheaths, not longer than head plus thorax ; basal fovea of basal tergite semicircular instead of triangular of Y-shaped ; the hind margin of the basal tergite is not emarginate medially, in *autumnalis* it is sometimes slightly so.

The male resembles that of *autumnalis*, which differs as follows :

Antennal scape yellow, or with at most its apex ± infuscate ; femora and tibiae yellow, or at most the hind femora ± infuscate. Clypeus rather more transverse, about 2·5 times as broad as long, with its anterior margin rather less strongly curved. Funicular segments of antennae relatively longer, the first 2·2 to 3 times, the sixth 1·5 to 2 times, as long as broad. The lines which separate the scutellum from the axillae converge less strongly, so that the base of the scutellum is broader, about one fifth the breadth of the mesoscutum, whilst the scutellum has four to five pairs of bristles. The fore wing has the speculum open below, or imperfectly closed by one or two widely-spaced hairs ; the submarginal vein has more numerous (17 or more) and rather shorter bristles.

Holotype ♀. ENGLAND : Berkshire, Bagley Wood, 14.x.1954, found on flowers

of *Angelica sylvestris* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 2 ♂, 2 ♀ ; same locality, 4.x.1957, 2 ♂, 4 ♀ and 1 gynandromorph, beaten from foliage of oak trees (*Quercus robur* L.) (*Graham*), in Graham collection.

The gynandromorphic specimen just mentioned is interesting as this condition appears to be rare in Chalcidoidea ; the specimen is female except for its antennae, which are those of a normal male.

Biology. Unknown.

Species sola

Gastrancistrus vernalis sp. n.

(Text-figs. 204, 207, 229)

♀. Head and thorax green to blue ; gaster bronze, its dorsal surface, except as a rule the disc, with greenish or bluish reflections which are most conspicuous on the basal tergite. Antennae brownish testaceous ; scape dorsally, or mainly, infuscate ; pedicellus infuscate over its proximal half or more ; incisures between the flagellar segments often brown, sometimes the flagellum infuscate dorsally. Coxae concolorous with the thorax ; trochanters partly dark ; femora blackish, except their tips which, like the tibiae and tarsi, are yellowish testaceous ; tips of tarsi fuscous. Tegulae testaceous anteriorly, fuscous posteriorly. Wings slightly infumate or subhyaline ; venation testaceous, the parastigma and stigmal vein often darker. Length 2 to 2·4 mm.

Head about 1·2 times as broad as the mesoscutum, in dorsal view 1·85 to 2 times as broad as long ; temples one fifth to more than one quarter the length of the eyes, rounded off ; POL about twice OOL, ocelli in a triangle whose base is about twice its height. Eyes rather large, separated by hardly 1·2 times their own length. Head in front view a nearly regular oval, about 1·25 times as broad as high ; both the vertex and the cheeks with a curved outline. Malar space slightly less than half the length of an eye. Breadth of oral fossa about twice the malar space. Clypeus only 1·5 to 1·8 times as broad as long, alutaceous, its anterior margin strongly and evenly curved. Mandibles rather small, their lower margin nearly straight ; the outer (lower) tooth moderately long, the others decreasing gradually in length. The head, apart from the smooth scrobes, has slightly, though distinctly, raised reticulation ; on the vertex the reticulation is extremely fine, elsewhere it is rather less fine. Antenna (Text-fig. 229) with scape approximately equal in length to the transverse diameter of an eye, about four times as long as broad, not reaching the median ocellus ; combined length of pedicellus and flagellum nearly equal to the breadth of the head ; pedicellus in profile about twice as long as broad, distinctly longer than the first funicular segment ; flagellum of characteristic appearance because of the hairs which clothe it being very short ; funicle proximally hardly stouter than the pedicellus, thickening slightly distad, its first segment 1·2 to 1·4 times as long as broad, the following segments subquadrate, or the distal segment very slightly transverse ; clava very slightly broader than the fifth funicular segment, unusually long, about three times as long as broad, nearly or quite as long as the four preceding funicular segments together.

Thorax (Text-fig. 204) unusually elongate, 1·9 to 2·4 times as long as broad. Mesoscutum only about 1·4 times as broad as long, only slightly shiny, with rather strong reticulation which is distinctly raised above the general surface ; this sculpture is extremely fine except in the front portion of the mid lobe ; the scattered hairs which clothe the mesoscutum are unusually short and arise from minute pits which are inconspicuous amid the reticulation ; notauli relatively shallow. Scutellum hardly longer than the mesoscutum, much longer than broad,

very strongly convex in the transverse axis, sculptured like the mesoscutum but rather more finely, except the frenum which on the contrary is more coarsely so, with two to three pairs of bristles which are short for the genus and tend to get broken off ; frenum marked off by an extremely fine line ; the scutello-axillar sutures converge strongly, then curve round anteriorly and meet, so that the scutellum is separated from the mesoscutum by a groove which is strong and more or less sculptured. Axillae sculptured like the scutellum. Dorsellum a raised, slightly reticulate transverse crest, whose length is slightly more than half that of the frenum. Propodeum long, medially distinctly more than one third the length of the scutellum, between the spiracles with very fine, but distinctly raised, reticulation, relatively dull ; median carina indicated but irregular ; plicae usually indicated at the hind margin of the sclerite ; at the base of the propodeum, on each side of the median carina, there are two or three foveae ; spiracles suboval, separated by about half their major diameter from the metanotum ; callus with rather weaker sculpture than the rest of the propodeum, very hairy, the hairs extending to the supracoxal flange, and laterally almost to the edge of the metapleuron. Metapleuron, and mesopleuron mainly (Text-fig. 207) with fine but strong reticulation which is distinctly raised above the general surface, on the mesopleuron the sculpture becomes obsolescent dorsad below the base of the hind wing ; mesepimeron unusually large, rhomboidal, sculptured like the metapleuron. Mesosternum shiny, with fine, delicate alutaceous sculpture which is hardly raised above the surface ; mesolcus strongly impressed. Postspiracular sclerite, and prosternum, strongly though moderately finely reticulate.

Legs rather short and stout ; hind coxae only about 1·75 times as long as broad, with fine though strong reticulation, rather stronger than that of the mesopleuron, their dorsal surface with hairs extending to the base. Spur of mid tibia about three quarters the length of the first tarsal segment.

Forewing rather long, about 2·25 times as long as broad, with the costal margin unusually straight : costal cell broad (length : breadth about 8 : 1), its lower surface with scattered hairs, its upper surface bare except for a very short row of two to four hairs at the apex of the cell ; basal cell, on upper surface of wing, bare, though the basal vein is pilose ; speculum partly open below, on the upper surface of the wing moderate-sized, not extending below the marginal vein, on the lower surface somewhat effaced by scattered hairs ; beyond the speculum the wing is rather thickly haired ; marginal vein 1·25 to 1·45 times as long as the postmarginal vein, 2·1 to 2·5 times as long as the stigmal vein ; the latter curved, with the stigma rather small, suboval, its uncus rather short.

Petiole strongly transverse. Gaster oblong-ovate, acute apically, about as long as but slightly narrower than the thorax, 2·1 to 2·5 times as long as broad, sunken on the disc dorsally ; basal tergite with a subtriangular basal fovea ; last tergite broader than long ; tips of ovipositor sheaths just visible in dorsal view ; ventrally the gaster is keeled, with the hypopygium extending about half way along.

♂. Differs from the female as follows :

Antennal scape broader, about three times as long as broad, and relatively a little shorter ; pedicellus very slightly shorter ; flagellum hardly thickening distad, clothed with bristly hairs which are slightly longer than those of the female, though still very short for a male of this genus ; clava only about twice as long as broad, about equal to two and a half of the preceding funicular segments.

Gaster oblong, nearly as long as but narrower than the thorax, obtuse apically.

This species much resembles those of the group of *salicis* (Nees) to which it is evidently closely related. It differs from them particularly in its weak notauli ; the fine short bristles of the head, mesocutum, axillae, and scutellum, which thus appear subglabrous (these bristles easily become rubbed off) ; and the strongly reticulate and relatively dull mesepimeron and prosternum.

Holotype ♀. ENGLAND : Berkshire, Wytham Wood, 15.v.1952, on *Salix cinerea* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 1 ♀, 16.v.1952, 1 ♀, 17.v.1952, both on *Salix cinerea* L., 1 ♀, 30.v.1953 on sallow (probably *S. cinerea* L.), 1 ♀, 26.v.1954, 1 ♀, 13.v.1959 (both on sallow) (all *Graham*) ; Buckinghamshire, Hell Coppice, near Oakley, 1 ♂, 31.v.1953 (on sallow), 2 ♀, (on *Salix cinerea*) (*Graham*) ; Surrey, Effingham, Barnthorns Wood, 1 ♂, bred 1.vii.1942 from *Rhabdophaga salicis* (Schr.) on *Salix atrocinerea* Brot. (= *cinerea* L.) (*M. Niblett*). One paratype ♂ in Hope Department, remainder ♂, ♀ in Graham collection.

THE *SALICIS*-GROUP

Scutellum wholly reticulate, not noticeably more shiny than the mesoscutum ; the scutello-axillar sutures converge strongly so as to approach the hind margin of the mesoscutum well mesad of the hind ends of the notauli (Text-fig. 202), whilst anteriorly these grooved lines curve round and meet so that the scutellum is separated from the mesoscutum by a deep, more or less sculptured groove. Mesepimeron marked off from the mesepisternum by a distinct grooved line or elongate fovea, not very elongate (about 1·5 to 2·5 times as long as broad). Propodeum more or less alutaceous or reticulate, medially as long as or (usually) a little longer than the scutellar frenum, its median carina nearly always more or less indicated, often complete though sometimes irregular ; callus with two to seven hairs, but except in *fulvicoxis* sp. n., without hairs above the supracoxal flange. Mesoscutum having its reticulation at least very slightly raised above the general surface ; anteriorly the sculpture tends towards a transversely-strigose or rippled type. Scutellar frenum distinctly marked off. Hind coxae usually with some hairs dorsally, except in some very small specimens. Mesosternal mesolcus distinctly impressed. Fore wing with marginal vein long, 2 to 2·3 times as long as the stigmal vein ; postmarginal vein distinctly shorter than the marginal ; basal cell with some scattered hairs in its distal half to two thirds, on the upper surface of the wing. Antennal scape shorter than an eye, not reaching the median ocellus ; combined length of pedicellus and flagellum less than or at most barely equal to the breadth of the head ; male flagellum clothed with relatively short bristles.

Gaster of female not strongly compressed, ovate to lanceolate, with ovipositor sheaths at most slightly projecting beyond the last tergite ; basal tergite usually with a subtriangular to semicircular median depression at the base ; in most specimens of *fulvicoxis* sp. n., however, there is a fovea on each side, separated by a convex ridge.

Some of the taxa included here as distinct species have previously been regarded as forms of one, *salicis* (Nees). It is possible, however, to segregate those dealt with below fairly well on morphological characters. Their biology is too imperfectly known as yet to provide useful information. All of them are apparently associated with willows (*Salix* spp.) and the available breeding records refer to *Rhabdophaga* spp. (Dipt., Cecidomyiidae) as hosts. At present it is difficult to assess how much of the variation shown is due to host differences, to the same host on different species of willow, or to geographical variation. As the Cecidomyiid hosts, and sometimes the host willows, are by no means easy to determine, this is not surprising.

A special study of the species of this group of *Gastrancistrus* would be a very interesting and valuable contribution to our knowledge, which is at present rudimentary. This can only be done by careful breeding from critically determined hosts whose host willow species are accurately named.

Gastrancistrus salicis (Nees)

(Text-figs. 203, 233, 237, 240, 241)

Pteromalus Salicis Nees ; 1834 : 105–107, ♂ ♀.
Seladerma Capreae Walker, 1848 : 112 [nec *Cynips Capreae* Linnaeus, 1761].
Tridymus salicis (Nees) Ratzeburg, 1848 : 183, ♂ ♀.
Pteromalus (*Seladerma*) *salicis* Walker, 1848*b* : 218.
Tridymus salicis (Nees) ; Thomson, 1876*a* : 196–197, ♂ ♀.
? Tridymus salicis (Nees) ; Felt, 1902 : 744.

Type material (presumably destroyed). Original specimens reared in April and May from galls on *Salix aurita* L., near Munich, Germany (" inter Sebersbrunn et Starenberg prope Monacum "), by Alexander Braun of Karlsruhe. The interpretation of Thomson (1876) is followed here, and the name *salicis* is restricted to the forms which agree with the redescription given below ; the latter is based on a number of accurate measurements taken from the British and other specimens mentioned below, of which those from Sweden are particularly important because they were reared from a host on the plant originally mentioned by Nees, i.e., *Salix aurita*.

♀. Head and thorax varying from golden or bronze-green through green to greenish blue; disc of gaster, or the hind margins of its segments, usually tinged with bronze. Mandibles varying from testaceous with darker teeth, to fuscous. Antennae testaceous, usually with their scape infuscate at the tip dorsally, the pedicellus fuscous dorsally over its basal half, and the flagellum more or less infuscate dorsally ; in the darkest forms the scape may be wholly fuscous with a metallic tinge, the pedicellus and the flagellum pale only beneath. Coxae concolorous with the thorax, or with at most their tips pale ; trochanters usually ± infuscate ; femora more or less infuscate proximally with a metallic tinge ; otherwise the legs are usually testaceous with only the fifth tarsal segment brown or fuscous, sometimes the tibiae are more or less infuscate in British specimens. Wings subhyaline ; venation brownish testaceous to fuscous. Tegulae testaceous, their hind edge sometimes darker. Length 2 to 3·1 mm.

Head in dorsal view (Text-fig. 237) 2·15 to 2·3 times as broad as long ; temples converging fairly strongly behind the eyes ; ocelli in a triangle whose base is 2 to 2·2 times its height, POL 1·5 to 1·7 OOL. Eyes 1·15 to 1·25 times as long as broad, separated by 1·3 to 1·55 times their own length. Malar space half, or slightly more than half, the length of an eye. Breadth of oral fossa 1·9 to 2·5 times the malar space. Clypeus from nearly twice, to slightly more than twice as broad as long, often rather strongly alutaceous but sometimes shiny and almost devoid of sculpture, its anterior margin gently curved. Antennae (Text-fig. 240) with scape about four times as long as broad, its length very slightly less than the transverse diameter of an eye, slightly broader in the middle than at either end ; pedicellus in profile about 1·6 times as long as broad, as long as or slightly longer than the first funicular segment ; combined length of pedicellus and flagellum slightly less than the breadth of the head ; funicle proximally slightly stouter than the pedicellus in profile, becoming a little thicker distad ; first funicular segment quadrate or slightly longer than broad, the second quadrate to very slightly transverse, the following segments slightly transverse; clava hardly more than twice as long as broad, not quite as long as the three preceding funicular segments together ; sensilla of flagellum fairly numerous, disposed in a single row on each segment.

Thorax (Text-fig. 202) 1·55 to 1·65 times as long as broad. Mesoscutum 1·5 to 1·7 times as broad as long, moderately shiny, with very fine scaly-reticulate sculpture ; on the front part of the mid lobe this sculpture is slightly raised above the general surface and tends to be transversely strigose-reticulate ; mid lobe with numerous bristles, most of which arise from minute tubercles ; notauli very deep, slightly curved. Axillae with extremely fine alutaceous sculpture. Scutellum distinctly longer than broad, strongly convex, with (5-) 6-12 pairs of

bristles ; surface with extremely fine, engraved or hardly raised alutaceous sculpture, that of the frenum, which is marked off by a fine but distinct line, is a little coarser. Dorsellum weakly alutaceous, shiny. Fore wing with speculum, on upper surface of wing, closed or nearly closed below ; stigma moderate-sized, its height slightly less than, or at most as great as, the distance between its upper edge and the lower edge of the postmarginal vein.

Gaster lanceolate-ovate to lanceolate, 2·15 to 2·7 times as long as broad, about as long as head plus thorax on the average, sometimes a little less or a little greater.

♂. Differs from the female as follows:

Antennal scape varying from brownish testaceous to entirely black with a metallic tinge ; in British examples the flagellum is more or less heavily infuscate dorsally.

Antennae (Text-fig. 241) with scape slightly broader, about 3·5 times as long as broad, a little wider above the middle than below it ; flagellum practically filiform, distinctly thicker than the pedicellus in profile, with its bristles relatively a little longer and rather more outstanding ; the first funicular segment is quadrate to very slightly elongate, the rest are quadrate to slightly transverse ; clava about twice as long as broad, only about as long as the two preceding funicular segments together.

Gaster sublinear, about as long as, but only about half as broad as, the thorax.

BRITAIN, IRELAND, GERMANY, SWEDEN, CZECHOSLOVOKIA (but probably more widely distributed). Felt (1902) recorded it from New York State as a parasite of *Rhabdophaga salicis* on galled willows which may have been of European origin ; the parasite was identified by Ashmead, possibly correctly though the specimens should be checked if still in existence.

Detailed measurements were made on the following material : ENGLAND : Cambridge, 2 ♂, 1937, reared from "Cecidomyiid galls on willow" (*E. McC. Callan*) ; Surrey, Epsom, 10 ♀, 23.iv.1927, 1 ♂, 1 ♀, 4.vi.1928, 1 ♀, 9.vi.1928, all reared from galls of *Rhabdophaga salicis* (Schr.) (*M. Niblett*) ; unlocalized, 2 ♀, 27.vi.1917, from " galls of *Cecidomyia* sp. on long-leaved willow " (*F. D. Morice*), 1 ♀ in coll. Marshall as " *Seladerma capreae* ", 2 ♀ and 1 ♀ in coll. Walker as " *Tridymus salicis* " ; all these specimens are in the BM(NH). Others, probably all Walker material, stand in the Hope-Westwood and Dale collections (Oxford) under the name " *Seladerma capreae* ". North Wales, unlocalized : 2 ♀ from galls of *Rhabdophaga salicis* (Schr.), reared June 1912 (*A. W. Dennis*), in BM(NH). Ireland : Co. Antrim, Ballycastle, ♂♂ ♀♀, 7.vi.1927, reared from Cecidomyiid galls on *Salix* (Miss *Knowles*). GERMANY : Aachen, specimens in coll. Förster, labelled " Pteromalus salicis Nees ". SWEDEN : Halland, Enslöv, ♂♂ reared 14.iii.1954 and 15.iii.1954, ♀♀ reared 17.iii.1954 and 20.iii.1955, from galls of *Rhabdophaga* on *Salix aurita* L. (*Hugo Andersson*).

Gastrancistrus fulvicoxis sp. n.

(Text-fig. 234)

♀. Head and thorax varying from golden green through green to greenish blue. Mandibles testaceous with darker teeth. Antennae fulvous ; scape usually more or less darkened at the apex dorsally ; pedicellus more or less so in its basal half dorsally ; flagellum infuscate dorsally. Legs fulvous with knees slightly paler ; fore and mid coxae sometimes with a dark spot at the base ; hind coxae usually having their proximal half to two-thirds black with a metallic tinge, occasionally almost entirely dark ; rarely the femora are faintly brownish proximally ; tarsi usually brownish distally, their fifth segment fuscous. Tegulae fulvous ; wings hyaline or

faintly yellowish ; venation testaceous, the parastigma, and usually the point of junction of the marginal and stigmal veins, darker. Length 2·6 to 3 mm.

In addition to the structural characters which are common to all species of this group, *fulvicoxis* has the following :

Body relatively elongate and slender, the thorax 1·7 to 1·8 times as long as broad, the gaster lanceolate.

Head in dorsal view (Text-fig. 234) only 1·8 to 2 times as broad as long ; temples not obviously converging behind the eyes ; eyes about 1·2 times as long as broad, separated by about 1·3 times their own length ; malar space approximately two thirds the length of an eye ; breadth of oral fossa 1·47 to 1·7 times the malar space ; clypeus rather small, not strongly transverse, at most 1·5 times as broad as long, alutaceous or reticulate all over, its anterior margin moderately but not strongly curved. Antennae with combined length of pedicellus and flagellum practically equal to the breadth of the head ; scape about 3·8 times as long as broad, its length equal to or slightly greater than the transverse diameter of an eye ; pedicellus twice as long as broad, as long as or very slightly longer than the first funicular segment ; funicle proximally not stouter than the pedicellus, thickening slightly distad, its first segment 1·8 to 2 times as long as broad, second segment slightly longer than broad, the following segments quadrate or very slightly elongate ; clava slightly broader than the funicle, twice as long as broad, nearly as long as the three preceding funicular segments together.

Head and thorax with rather stronger sculpture than in the other species, hence rather dull ; on the mesoscutum, axillae, and scutellum, the transverse walls of the areoles are slightly stronger than the other walls, so that the sculpture tends to have a transversely-rippled or substrigose appearance. Scutellum with five to seven pairs of bristles ; frenum often with some delicate wrinkles in addition to the reticulation. Dorsellum very finely but quite strongly reticulate, relatively dull. Propodeum finely but relatively strongly reticulate, only slightly shiny. Fore wing with speculum open below.

Gaster lanceolate, slightly to obviously longer than head plus thorax, 2·8 to 4 times as long as broad ; basal tergite usually with a longitudinal fovea on each side, separated by a convex median ridge ; tip of hypopygium situated about half way along the gaster.

♂. Differs from the female as follows :

Antennal scape and flagellum hardly at all darkened dorsally ; scape broader (length : breadth about 3·2 : 1) ; pedicellus a trifle shorter ; flagellum filiform ; combined length of pedicellus and flagellum very slightly greater than the breadth of the head ; clava nearly 2·5 times as long as broad, but only as long as the two preceding funicular segments together.

Gaster sublinear ; about as long, but only about half as broad, as the thorax.

Holotype ♀. ENGLAND : ? Norfolk, Merton, iv.1914, from *Helicomyia saliciperda* (Duf.) (*C. B. Williams*), in BM(NH).

Paratypes. Same data as holotype, 1 ♂, 4 ♀ ; Kent, unlocalized, from *Rhabdophaga* sp. on *Salix fragilis* L., 3 ♀, 1933 (*H. F. Barnes*), in BM(NH).

Gastrancistrus triandrae sp. n.

♀. Differs from that of *fulvicoxis* sp. n. as follows:

Anterior margin of clypeus strongly produced, almost angulate medially. Antennal pedicellus 1·8 to 2 times as long as broad, distinctly longer than the first funicular segment, which is 1·4 to 1·6 times as long as broad, therefore somewhat shorter than in *fulvicoxis* ; the second funicular segment is quadrate or hardly elongate, the following segments are quadrate, or the fifth very slightly transverse.

Thorax slightly shorter, about 1·65 times as long as broad. Dorsellum delicately reticulate and moderately shiny. Speculum of forewing partly or completely closed below.

Gaster relatively shorter, as long as or rather shorter than head plus thorax, about 2·8 times as long as broad.

♂. Differs from that of *fulvicoxis* as follows :

Anterior margin of clypeus almost angulate medially. Combined length of pedicellus and flagellum hardly as great as breadth of head ; funicular segments slightly shorter, the first distinctly shorter than the pedicellus and only 1·4 to 1·6 times as long as broad.

Holotype ♀. ENGLAND : Suffolk, 1930, bred from *Rhabdophaga* sp. on *Salix triandra* L. (*H. J. Barnes*), in BM(NH).

Paratypes. Same data as holotype, 3 ♂, 1 ♀, in BM(NH).

Gastrancistrus longigena sp. n.

(Text-fig. 239)

♀. Differs from that of *fulvicoxis* sp. n. as follows :

Antennal scape rather more extensively infuscate apically ; coxae black with a metallic tinge, or at most the distal third of the fore coxae is yellowish ; all the femora more or less infuscate proximally, at least with a dark stripe or mark beneath ; all tibiae, except their bases and tips, reddish, the mid and hind ones sometimes slightly infuscate medially ; wing venation somewhat darker, the parastigma, base and apex of the marginal vein, the stigmal vein and the stigma, brown. Length 1·9 to 2·6 mm.

Body less elongate, much as in *salicis* (Nees). Head in dorsal view 1·9 to 2 times as broad as long ; temples converging slightly behind the eyes. Eyes nearly circular, separated by 1·31 to 1·35 times their own length. Malar space nearly or quite two thirds the length of an eye. Breadth of oral fossa 1·5 to 1·7 times the malar space. Clypeus only about 1·6 times as broad as long, alutaceous, except sometimes its anterior margin. Antenna (Text-fig. 239). Head and thorax with rather weaker sculpture, hence rather more shiny. Dorsellum weakly alutaceous, shiny. Speculum of fore wing, on the upper surface of the wing, open below except sometimes proximally.

Gaster ovate, as long as or somewhat longer than the thorax, but shorter than head plus thorax, 1·8 to 2·3 times as long as broad.

♂. Unknown.

The female of *G. salicis* (Nees), as interpreted here, differs from that of *longigena* in its rather more transverse head, 2·15–2·3 times as broad as long ; slightly oval eyes, 1·15–1·2 times as long as broad ; rather shorter malar space, half the length of an eye or slightly more ; broader oral fossa, which is 1·9–2·5 times the malar space ; and broader clypeus, which is nearly or quite twice as broad as long. The speculum of the fore wing in *salicis* is closed or nearly closed below on the upper surface of the wing.

Holotype ♀. ENGLAND : Oxfordshire, Marston Ferry, near Oxford, 13.v.1961, swept from foliage of *Salix purpurea* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 2 ♀, 11.v.1961, 4 ♀, 13.v.1961, swept from foliage of *Salix purpurea* L. (*Graham*) ; Berkshire, Wytham, 2 ♀, 24.v.1961, swept from foliage of *Salix viminalis* L. (*Graham*), in Graham collection.

Biology. Unknown.

Gastrancistrus coactus sp. n.

(Text-figs. 235, 236)

♀. Colour as in *salicis* (Nees) but the body tends more towards blue-green or blue ; scape often extensively infuscate with a metallic tinge, sometimes wholly so, or pale at the base only ; femora tending to be darker, their proximal half to two thirds black ; tibiae often more or less broadly brown to blackish medially.

Structurally differs from *salicis* as follows ;

Head in dorsal view (Text-fig. 236) less transverse, 1·8 to 2 times as broad as long, shaped much as in *fulvicoxis*, with the temples hardly converging behind the eyes. Eyes 1·2 to 1·35 times as long as broad, separated by 1·15 to 1·25 times their own length. Malar space variable, from slightly less than half to slightly more than half the length of an eye. Anterior margin of clypeus (Text-fig. 235) gently curved or occasionally almost truncate. Antennae similar to those of *longigena* sp. n. (Text-fig. 239) ; pedicellus about as long as anelli plus first funicular segment or even a little more ; first funicular segment subquadrate, the following segments at least very slightly transverse ; clava as long as, or somewhat longer than, the three preceding funicular segments together.

Scutellum usually with three, occasionally four, rarely five, pairs of bristles. Propodeum medially approximately one third the length of the scutellum ; median carina more or less indicated but not sharp ; callus with four to six bristles. Fore wing with speculum open or closed.

Gaster ovate, 1·8 to 2·3 times as long as broad, about as long as or a little longer than the thorax.

♂. Unknown.

Holotype ♀. ENGLAND : Buckinghamshire, Hell Coppice, near Oakley, 2.vi.1953, from *Salix cinerea* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 1 ♀ ; Berkshire, Wytham, 2 ♀, 2.vi.1961, swept from *Salix* (*cinerea* L. or *caprea* L.) (*Graham*) ; Huntingdonshire, Woodwalton Fen, 1 ♀, 9.vi.1953, from *Salix* sp. (*Graham*), in Graham collection. SCOTLAND : West Inverness, Arisaig, 1 ♀, 5.vii.1961, swept from *Salix aurita* L. (*Graham*), in Graham collection : IRELAND : West Donegal, Sessiagh or Kill Lough, 1 ♀, 10.vi.1955 (*A. W. Stelfox*), in Graham collection.

Biology. Unknown.

Gastrancistrus praecox sp. n.

(Text-figs. 232, 238)

Semiotus fulvicornis Walker, 1874 : 316, ♀ [secondary homonym of *Lamprotatus fulvicornis* Walker, 1874 : 315, ♂].

♀. Colour as in *salicis* (Nees) ; tibiae sometimes heavily infuscate. Length 1·8 to 2·1 mm.

Structurally differs from *salicis* as follows :

Head in dorsal view (Text-fig. 238) very slightly less transverse (breadth : length 1·95 to 2). Eyes separated by 1·1 to 1·2 times their own length. Antennae with funicle rather more slender proximally, its first segment not stouter than the pedicellus in profile, sometimes even rather less stout, the flagellum therefore appears more distinctly clavate than in *salicis* ; clava slightly longer, its length equalling 3 to 3·5 of the preceding funicular segments ; sensilla of flagellum less numerous.

Each posterior ocellus is separated by 1·3 to 1·4 times its own major diameter from the adjacent eye ; POL 1·75 to 2 OOL.

♂. Very similar to that of *salicis*, but on the average slightly smaller. Flagellum slightly longer, combined length of pedicellus and flagellum equal to, or even very slightly greater than, the breadth of the head ; first funicular segment quadrate to slightly elongate, the following segments often quadrate though sometimes slightly transverse.

Holotype ♀. ENGLAND : Berkshire, Wytham, 17.v.1952, from *Salix cinerea* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, a few males and females ; same locality as holotype, 2 ♀, 16.v.1951, 1 ♂, 2 ♀, 26.v.1954 (*Graham*) ; Oxfordshire, Marston Ferry, near Oxford, several males and females, 11.v.1961, 13.v.1961, 14.v.1961, swept from *Salix purpurea* L. (*Graham*) ; Lancashire South, Formby Moss, a few males and females, 29.vi.1962, swept from *S. cinerea* L. (*Graham*), in Graham collection.

AMURLAND : one female (Type Hym. 5.665, LECTOTYPE of *Semiotus fulvicornis* Walker), in BM(NH).

Biology. Unknown.

Gastrancistrus fulvicornis (Walker) **comb. n.**

(Text-figs. 242, 243)

Lamprotatus fulvicornis Walker, 1874 : 315, "♂" [recte ♀].

♀. Resembles that of *praecox* sp. n., but is on the average slightly smaller (length 1·6 to 1·9 mm.). Each posterior ocellus is separated by 1·4 to 1·75 its major diameter from the adjacent eye ; POL 1·6 to 1·8 OOL. The antennal flagellum (Text-fig. 242) tends to be rather shorter ; the first funicular segment is quadrate or even very slightly transverse, the following segments are slightly transverse ; the length of the clava equals that of 3·5 to 4 of the preceding funicular segments. Scutellum with three to four pairs of bristles.

♂. Differs from that of *praecox* sp. n. in having a shorter flagellum, combined length of pedicellus and flagellum 0·85 to 0·9 the breadth of the head ; the hairs which clothe it tend to be slightly less outstanding. The first funicular segment is about quadrate, the following segments are at least slightly, sometimes rather strongly, transverse (Text-fig. 243).

ENGLAND : Lancashire South, Freshfield, a number of ♂♂ and ♀♀, 31.v.1959, 1.vi.1959, 3.vi.1959, swept from *Salix repens* L. in a dune-slack (*Graham*).

AMURLAND : one female, the LECTOTYPE, in Walker collection, BM(NH), Type Hym. 5.809, labelled " Amurland. Coll. F. Walker, 1913–71 " and in Walker's handwriting " Lamprotatus fulvicornis ".

Biology. Unknown.

THE *VAGANS*-GROUP

Gastrancistrus laticornis Walker

(Text-fig. 253)

? Gastrancistrus tenuicornis Walker, 1834 : 172, ♂ ♀.
Gastrancistrus laticornis Walker, 1834 : 174, ♀.
Gastrancistrus laticornis Walker ; Haliday, 1841–1842 : v, pl. D, fig. 2, ♀.

Type material. *Gastrancistrus tenuicornis* Walker. Syntypes, 1 ♂, 1 ♀, the

latter lacking the head. LECTOTYPE, the female, bearing a Waterhouse label ; it is almost certainly the same as *laticornis*.

G. laticornis Walker. Syntypes, 3 ♂, 1 ♀. LECTOTYPE, the female, bearing a Waterhouse label.

BRITAIN ; not uncommon.

Biology. Unknown. Imagines April–June.

Gastrancistrus terminalis Walker

(Text-fig. 261)

Gastrancistrus terminalis Walker, 1834 : 176, ♂ ♀.

Type material. Five specimens, but one is probably not original material. LECTOTYPE, a female bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type C.F.".

BRITAIN, apparently rare ; " June ; on grass beneath trees ; Windsor Forest, and near London " (Walker, 1834 : 176) ; Berkshire, Wytham, 17.vi.1960, 1 ♀ (*R. R. Askew*) ; Middlesex, Southgate, ♀♀, 11.vi.1965, 1 ♀, 24.vi.1966 (*Graham*).

Biology. Unknown.

Gastrancistrus hirtulus sp. n.

♀. Head and thorax greenish with some brassy and bronze reflections ; frons, and sometimes genae, coppery ; gaster violet-bronze-black. Antennae blackish ; scape weakly metallic. Coxae, and femora except their tips narrowly, black with a metallic tinge ; tibiae fuscous, narrowly testaceous at their base and apex ; fore tarsi brownish, mid and hind ones testaceous with their fifth segment fuscous. Tegulae brownish. Wings faintly greyish ; venation fusco-testaceous. Length (including ovipositor) 1·4 to 1·9 mm.

Head about 1·35 times the breadth of the mesoscutum, in dorsal view about 2·25 times as broad as long ; temples very short and receding ; ocelli in a triangle whose base is about 2·7 times its height, POL nearly twice OOL. Eyes separated by about 1·35 times their length, with extremely short inconspicuous pubescence ; malar space slightly more than one quarter the length of an eye ; breadth of oral fossa about 3·5 times the malar space ; clypeus fully three times as broad as long, its anterior margin produced but truncate medially (as in *vagans*, Text-fig. 260) or even weakly though broadly emarginate ; mandibles not large, their outer tooth the longest, the others decreasing slightly in length ; clypeus nearly smooth ; face, cheeks, and frons, shiny, with delicate hardly raised sculpture ; vertex less shiny, with very fine, slightly raised reticulation. Antennal scape short, its length about equal to the transverse diameter of an eye, not reaching the median ocellus, about 3·5 times as long as broad ; combined length of pedicellus and flagellum slightly less than the breadth of the head ; pedicellus about 1·7 times as long as broad, slightly to very distinctly longer than the first funicular segment ; funicle proximally very slightly stouter than the pedicellus, thickening distad ; first funicular segment quadrate to slightly transverse, the second slightly transverse, and the following segments rather more so, the fifth being about 1·5 times as broad as long ; clava about twice as long as broad, nearly as long as the three preceding funicular segments together ; flagellum with rather conspicuous, somewhat outstanding bristles.

Thorax about 1·4 times as long as broad. Mesoscutum about 1·8 times as broad as long, shiny, with fine and very delicate sculpture which is about level with the general surface,

neither engraved nor raised ; mid lobe with numerous hairs, especially anteriorly ; notauli deep, slightly curved. Scutellum about as long as the mesoscutum, slightly longer than broad, with sculpture like that of the mesoscutum but slightly finer, with three to four pairs of bristles ; frenum marked off by a fine line ; the scutello-axillar sutures converge only moderately, about as in *affinis* sp. n. Axillae with sculpture like that of the scutellum. Dorsellum about half as long as the frenum, shiny, smooth or weakly alutaceous. Propodeum short, medially nearly as long as the frenum, and about one fifth the length of the scutellum, shiny and, including the callus, virtually devoid of sculpture ; median carina absent or very fine ; plicae absent ; spiracles circular, separated by about half their diameter from the metanotum ; callus with three to four bristles. Metapleuron shiny, weakly alutaceous. Mesepimeron shiny, weakly alutaceous, distinctly marked off, about 2·5 times as long as broad ; mesepisternum with moderately fine, delicate alutaceous sculpture, shiny, with a smooth triangular area dorsally ; mesosternnm polished and nearly smooth, mesolcus distinctly impressed and nearly complete. Legs rather short but not stout ; hind coxae about twice as long as broad, shiny, with delicate though not very fine alutaceous sculpture, their dorsal surface with a row of hairs ; spur of mid tibia about two thirds the length of the first tarsal segment. Fore wing practically twice as long as broad ; costal cell somewhat narrow (length : breadth about 10 : 1), its lower surface sparsely haired, its upper surface with a row of hairs extending over nearly the distal half ; basal cell, on upperside of wing, hairy over about its distal third ; speculum closed below, on the upperside of the wing only moderate sized and not extending below the marginal vein ; disc rather thickly haired ; marginal vein slightly longer than the postmarginal and 1·8 to 1·9 times as long as the stigmal vein ; the latter hardly curved, the stigma rather large, subrectangular, longer than high, the length of the stigma is fully equal to the interval between its upper edge and the lower edge of the postmarginal vein, or even slightly greater.

Petiole strongly transverse. Gaster oblong, excluding the ovipositor sheaths as long as head plus thorax, much narrower than the thorax, widening gradually from base to near its apex, then narrowing suddenly ; basal tergite convex medially at the base, with a fovea on each side ; disc sunken ; last tergite more or less compressed and projecting upwards ; ovipositor sheaths, as seen in profile, exserted to a length equal to two thirds to three quarters that of the hind tibia, slightly ascending ; gaster ventrally convex, keeled, hypopygium extending slightly less than half way along.

♂. Unknown.

The ♀ of *hirtulus* resembles those of *laticornis* Walker and *terminalis* Walker in most characters, especially in having the mesoscutum relatively densely haired, the basal cell of the fore wing hairy except at its base, and the speculum closed below. It differs from them in having the propodeal spiracles distinctly separated from the metanotum, the thorax dorsally more tinged with greenish, the stigma of the fore wing larger, the gaster rather more compressed, the ovipositor sheaths slightly farther exserted, and the eyes less distinctly hairy. It also much resembles the female of *vagans* Westwood, which differs in having the thorax more bronze, the mesoscutum and scutellum more sparsely haired, the basal cell hairy in the distal half only, and the speculum more or less open below.

Holotype ♀. ENGLAND : Berkshire, Wytham Wood, 19.iv.1961, from *Larix decidua* Mill (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. ENGLAND : Berkshire, Bagley Wood, 1 ♀, 28.iv.1957 ; Wytham Wood, 1 ♀, 7.v.1955, probably from *Betula* (*Graham*) ; Buckinghamshire, Hell Coppice, near Oakley, 1 ♀, 8.v.1952, from foliage of *Betula*, 1 ♀, 9.v.1954, also from *Betula* (*Graham*), in Graham collection.

Biology. Unknown.

Gastrancistrus atropurpureus Walker

Gastrancistrus atro-purpureus Walker, 1834 : 173, ♂.
Gastrancistrus vagans Walker, 1834 : 173, ♀ [*nec* Westwood, 1833].

Type material. Syntypes, 2 ♂. LECTOTYPE, the first, bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type C.F.".

BRITAIN, SWEDEN. In Britain it is common in mixed oakwood during the spring.
Biology. Unknown. Imagines April–June.

Gastrancistrus viridis Walker

(Text-fig. 259)

Gastrancistrus viridus Walker, 1834 : 173, ♀.
Gastrancistrus Dryas Walker, 1839 : 209, ♀, **syn. n.**

Type material. *Gastrancistrus viridis* Walker. LECTOTYPE ♀ in BM(NH), bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type C.F. ". Walker stated (1834 : 173) that *viridis* was also taken by the Rev. G. T. Rudd, but I cannot find any specimen so labelled in the Rudd collection.
G. dryas Walker. One female, LECTOTYPE, bearing a Waterhouse label.

BRITAIN, FRANCE, SWEDEN. In England I have taken it frequently in rough grassy fields and sometimes on flowers of *Crataegus*.
Biology. Unknown. Imagines May–June.

Gastrancistrus torymiformis (Ratzeburg)

Tridymus torymiformis Ratzeburg, 1852 : 226, ♀.
Gastrancistrus torymiformis (Ratzeburg) Reinhard, 1858 : 320.

Type material. Holotype presumed lost.
I refer to this species some females which resemble those of *viridis* Walker except that they have the exserted portion of the ovipositor sheaths somewhat shorter. Possibly they may be only a form of *viridis*, but for the present, it seems better to regard them as distinct.

BRITAIN, GERMANY.
Biology. Ratzeburg reared the holotype ♀ " aus Cecidomyia an Werftweiden " [*Salix cinerea* L.]. On 30.iv.1960 I swept males and a female of the species I believe to be *torymiformis* from foliage of the same species of willow at Wytham Wood, Berkshire.

Gastrancistrus amaboeus Walker

(Text-figs. 254, 258)

Gastrancistrus Amaboeus Walker, 1848 : 105, 155, ♀.

Type material. One female, LECTOTYPE, bearing a Waterhouse label.

BRITAIN, CZECHOSLOVAKIA, apparently rare. New records. ENGLAND : Berkshire, Wytham, 22.vi.1960, 1 ♀ (*R. R. Askew*). CZECHOSLOVAKIA : Slovak Paradis, Klastorisko, 27.vii.1965, 1 ♀ (*Graham*).

Biology. Unknown.

Gastrancistrus vagans Westwood

(Text-fig. 260)

Gastrancistrus vagans Westwood, 1833 : 444, ♀.
? Gastrancistrus tenebricosus Walker, 1834 : 174, ♂.
Gastrancistrus Pacilus Walker, 1848 : 105, 160, ♀, **syn. n.**

Type material. *Gastrancistrus vagans* Westwood. LECTOTYPE (possibly holotype) ♀ in Westwood coll., labelled in Westwood's handwriting " Cb. [Coombe] 102 ♀. beginning of summer " and " GASTRANCISTRUS vagans Westw. Phil. Mag.".

G. tenebricosus Walker. Two males stand under this name but one (a *Psilocera*) is possibly not a syntype. LECTOTYPE, the other male, bearing a Waterhouse label ; it is probably a male of *vagans*.

G. pacilus Walker. One female, LECTOTYPE, bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type C.F.".

BRITAIN, apparently rare ; Surrey, Coombe Wood (*Westwood*) ; Berkshire, Wytham Wood, 1 ♀, 21.iv.1959 (*Graham*).

Biology. Unknown.

The species recorded as *vagans* by Walker (1834 : 173) was really *atropurpureus* (q.v.).

Gastrancistrus affinis sp. n.

♀. Body for the most part bronze-black ; propodeum, and gaster more or less, at least at its base, green ; front of head, and mid lobe of mesoscutum often more or less greenish, side lobes of mesoscutum obscurely bluish. Mandibles mainly reddish testaceous. Antennal scape usually wholly testaceous, sometimes ± infuscate dorsally ; pedicellus and flagellum brown or fuscous, ± testaceous beneath. Coxae, and femora except their tips broadly, bronze-black ; trochanters partly testaceous ; tibiae usually bright testaceous, occasionally slightly infuscate medially ; tarsi testaceous, their tips brown. Tegulae fuscous. Wings subhyaline ; venation testaceous, or more or less brown. Length 1·8 to 2·05 mm.

Head hardly 1·2 times the breadth of the mesoscutum, in dorsal view about 2·25 times as broad as long ; temples receding strongly and only about one tenth the length of the eyes ; POL nearly twice OOL, ocelli in a triangle whose base is nearly 2·5 times its height. Head in front view as broad as high. Eyes 2·25 to 2·5 times the malar space, separated by about 1·3 times their length. Breadth of oral fossa about three times the malar space. Anterior margin of clypeus evenly, fairly strongly curved. Antennal scape 0·8 to 0·85 the length of an eye, and not or only very slightly longer than the transverse diameter of an eye, not reaching the median ocellus ; combined length of pedicellus and flagellum about equal to breadth of head ; pedicellus 1·6 to 1·7 times as long as broad, as long as, or usually slightly longer than, the first funicular segment ; flagellum moderately clavate ; funicle proximally hardly stouter than the pedicellus, but thickening slightly distad, its first segment slightly elongate or quadrate, second and third

quadrate, fourth and fifth slightly transverse ; clava slightly more than twice as long as broad, its length about equal to two and a half of the preceding funicular segments ; flagellum with somewhat outstanding hairs, sensilla sparse.

Thorax about 1·5 times as long as broad. Mesoscutum about 1·8 times as broad as long, shiny, with fine delicate, for the most part engraved, sculpture ; mid lobe more sparsely haired than in *laticornis* (cf. text-fig. 253) ; notauli deep. Scutellum somewhat longer than mesoscutum, distinctly longer than broad, strongly convex in its transverse axis, with sculpture like that of the mesoscutum, with three to four pairs of bristles ; frenum marked off by a fine, weak line ; scutello-axillar sutures not converging strongly, meeting the mesoscutum slightly mesad of the notauli, the base of the scutellum being about one fifth the breadth of the mesoscutum. Dorsellum hardly half as long as the frenum, nearly smooth. Propodeum rather broadly and moderately deeply emarginate medially, where its length is hardly more than one fifth that of the scutellum ; surface shiny and virtually smooth ; median carina absent or, in one specimen, represented by a mere trace ; plicae absent ; spiracles subcircular, not quite touching the metanotum ; callus with four to six bristles. Metapleuron shiny, with fine delicate alutaceous, hardly raised, sculpture. Mesepimeron distinctly marked off, nearly three times as long as broad, with some very weak alutaceous sculpture ; mesepisternum smooth. Mesosternum medially smooth with mesolcus distinctly impressed, laterally with rather fine, hardly raised sculpture. Legs somewhat short though not stout ; hind coxae about twice as long as broad, shiny, with rather fine, hardly raised sculpture, dorsally bare or with only one or two hairs ; spur of mid tibia about three quarters the length of the first tarsal segment. Fore wing slightly more than twice as long as broad ; costal cell about 8·5 times as long as broad, its lower surface with a complete row of hairs, also some additional ones scattered over the distal half, its upper surface with a row of hairs in the distal third ; basal vein pilose, basal cell bare except for a few hairs near the basal vein ; speculum open below, on the upperside of the wing extending below the marginal vein for about half the length of the latter ; the area between the postmarginal and stigmal veins is partly bare on the upper surface of the wing ; disc moderately thickly haired ; margined vein about twice as long as the postmarginal, and 2·2 to 2·5 times as long as the stigmal vein, the latter hardly curved ; the stigma moderate-sized, subrectangular, longer than high, its uncus moderately long.

Petiole of gaster strongly transverse. Gaster, not counting the ovipositor sheaths, as long as or very slightly longer than the head plus thorax, narrower than the thorax, pointed apically, 2·3 to 3 times as long as broad ; base of first tergite with a curved longitudinal fovea on each side, between these usually convex ; disc of gaster sunken ; last tergite slightly compressed, projecting upwards ; ovipositor sheaths slightly ascending, in profile exserted to a length varying from slightly more than one third to a little more than half the hind tibia ; ventrally the gaster is convex, with the hypopygium extending rather less than half way along.

♂. Unknown.

Holotype ♀. ENGLAND : Oxfordshire, Bald Hill, near Lewknor, 22.v.1960 (*Graham*), in the Hope Department, University Museum, Oxford.

Paratypes. ENGLAND : Same locality as holotype, 1 ♀, 31.v.1963 (*Graham*) ; Oxfordshire, Wychwood, 1 ♀, 5.vi.1960 (*R. R. Askew*) ; Berkshire, Bagley Wood, 1 ♀, 23.v.1954 (*Graham*) ; Wytham Mead, 1 ♀, 7.v.1960 (*Graham*) ; Buckinghamshire, Bledlow Wood, 1 ♀, v.vi.1955 (*Graham*) ; Cheshire, Rostherne, 1 ♀, 5.vi.1962 (*R. R. Askew*), in Graham and Askew collections.

Biology. Unknown.

This species is very close to *vagans* Westwood, the female of which differs as follows : antennal scape black, pedicellus and flagellum fuscous; mesoscutum more coppery bronze ; tibiae more or less infuscate ; clypeus (Text-fig. 260) having its anterior margin less strongly curved, virtually truncate medially ; propodeum a little

longer with its median carina fine but distinct ; callus with only three bristles ; speculum of fore wing extending only as far as the end of the proximal third of the marginal vein ; area between postmarginal and stigmal veins mainly hairy ; about the distal third to a half of the basal cell hairy ; stigma more subcircular ; ovipositor sheaths slightly more exserted, to a length varying from three quarters, to slightly more than the whole length, of the hind tibia ; antennal funicle proximally a little stouter, the funicular segments a little shorter, 1–2 quadrate, 3 very slightly transverse, 4 and 5 slightly transverse, clava slightly longer, about equal to the three preceding funicular segments together.

Gastrancistrus crassus Walker

Gastrancistrus crassus Walker, 1834 : 177, ♂ ♀.

Type material. Syntypes, 7 specimens (but possibly 2 are not original material). LECTOTYPE, a female bearing a printed label " crassus W.", also one in C. Ferrière's handwriting " Type C.F.".

BRITAIN, IRELAND, uncommon ; I have swept it in rough grassy fields and damp meadows.

Biology. Unknown. Imagines June–August.

Gastrancistrus hemigaster sp. n.

(Text-fig. 255)

♀. Head and thorax dark green or bluish green, with brassy and bronzy tinge in places ; gaster bronze, slightly greenish at sides and apex. Antennal scape blackish with a metallic tinge ; pedicellus and flagellum fuscous. Coxae concolorous with the thorax ; trochanters mainly dark ; femora, except their tips, black with a metallic gloss ; tibiae brownish, their bases and tips paler ; fore tarsi mainly fuscous, mid and hind tarsi dull testaceous proximally and fuscous distally. Tegulae brownish testaceous ; wings subhyaline, venation fuscous. Length 1·35 to 1·45 mm.

Head hardly 1·2 times as broad as the mesoscutum, in dorsal view appearing strongly transverse, but as the frons usually collapses, the overall length cannot be measured accurately ; temples rounded off, hardly one fifth as long as the eyes ; POL about 1·8 OOL, ocelli in a very obtuse triangle. Head in front view oval, hardly 1·2 times as broad as high. Eyes separated by about 1·3 times their length. Malar space slightly more than one third the length of an eye. Breadth of oral fossa about 3·5 times the malar space. Clypeus about 2·5 times as broad as long, its anterior margin produced and curved but almost truncate medially, much as in *vagans* (cf. text-fig. 260). Mandibles rather long and narrow, not falcate, their teeth decreasing gradually in length from the outer one. Head shiny, with fine delicate, hardly raised, sculpture. Antenna (Text-fig. 257) with scape distinctly shorter than an eye ; combined length of pedicellus and flagellum slightly less than breadth of head ; pedicellus about 1·7 times as long as broad, distinctly longer than the first funicular segment ; funicle proximally hardly stouter than the pedicellus, but thickening distad so that the flagellum is fairly strongly clavate ; first funicular segment subquadrate, the following segments more or less transverse, the distal ones strongly so ; clava hardly twice as long as broad, its length about equal to that of the three preceding funicular segments together ; sensilla of funicle relatively sparse.

Thorax (Text-fig. 255) about 1·5 times as long as broad. Mesoscutum about 1·8 times as

broad as long, shiny, with fine delicate, for the most part engraved, sculpture ; mid lobe rather sparsely haired ; notauli deep, slightly curved. Scutellum somewhat longer than the mesoscutum, slightly longer than broad, strongly convex in the transverse axis, with sculpture like that of the mesoscutum but rather finer, with two pairs of bristles ; frenum only weakly marked off medially by an extremely fine line ; the scutello-axillar sutures converge only moderately and meet the mesoscutum slightly mesad of the hind ends of the notauli, the base of the scutellum being about one fifth the breadth of the mesoscutum. Axillae with sculpture like that of the scutellum, but slightly weaker at their inner angles, which are therefore slightly more shiny. Dorsellum about half as long as the frenum, shiny, nearly smooth. Propodeum rather deeply emarginate medially, when its length is hardly one-quarter that of the scutellum, shiny and weakly alutaceous ; median carina present, plicae absent ; spiracles subcircular, separated by about half their diameter from the metanotum ; callus with three to five bristles. Metapleuron and mesopleuron shiny, with rather fine delicate, hardly raised, sculpture ; the triangular area of the mesepisternum is smoother ; mesepimeron distinctly marked off, nearly three times as long as broad ; mesosternum shiny and almost smooth, its mesolcus distinctly impressed. Legs moderately short though not stout ; hind coxae hardly twice as long as broad, shiny, with moderately fine hardly raised reticulation, dorsally with a few hairs ; spur of mid tibia slightly more than three quarters the length of the first tarsal segment. Fore wing (Text-fig. 256) about twice as long as broad ; costal cell broad (length : breadth about 9 : 1), its lower surface with scattered hairs, its upper surface bare except for a row of several hairs in the distal third ; basal vein pilose, basal cell bare except for a few hairs near those of the basal vein ; speculum rather narrow, open or only partly closed below, on upperside of wing extending below the marginal vein for about half the length of the latter ; space between postmarginal and stigmal veins partly bare on upper surface of wing ; disc moderately thickly haired ; marginal vein 1·6 to 1·7 times as long as the postmarginal and 2·25 to 2·4 times as long as the stigmal vein ; stigmal vein slightly curved ; stigma moderate-sized, oval or subrectangular, with a moderately long uncus. Petiole of gaster strongly transverse. Gaster, excluding the ovipositor sheaths, oval, about as long and as broad as the thorax, subobtuse apically, 1·5 to 1·6 times as long as broad ; base of first tergite convex medially, with a longitudinal impression on each side ; disc of gaster sunken dorsally ; ovipositor sheaths slightly exserted ; gaster ventrally convex, hypopygium extending slightly less than half its length.

♂. Not definitely associated.

This species closely resembles *crassus* Walker, which differs in having the ovipositor sheaths more strongly exserted, the marginal vein 2·5–2·8 times as long as the stigmal vein, the speculum extending as far as the latter, the scutellum with 3 pairs of bristles ; the anterior margin of the clypeus evenly curved, and the propodeal spiracles closer to the metanotum.

Holotype ♀. SCOTLAND : Mid Perth, Kenmore, Taymouth Castle, 2.vii.1953, swept from grass under beeches (*Fagus*) (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 1 ♀ ; Mid Perth, Lawers, 1 ♀, 11.vii.1952 (*Graham*). IRELAND : Co. Down, Tollymore Park, 2 ♀, 24.vi.1957 (*Graham*), in Graham collection.

Biology. Unknown.

Gastrancistrus clavellatus sp. n.

♀. Bronze to coppery bronze ; propodeum and basal tergite of gaster greenish-tinged ; lower face and genae sometimes partly greenish. Antennae testaceous ; pedicellus infuscate

dorsally in the proximal half or more ; funicle becoming brownish distally, the clava brown. Coxae, and femora except their tips narrowly, concolorous with the thorax ; trochanters partly dark ; legs otherwise testaceous with the mid and hind tibiae at least broadly infuscate medially, usually fuscous except their bases and tips, the fore tibiae sometimes infuscate medially ; tips of tarsi fuscous. Tegulae brown to fuscous. Wings subhyaline ; venation brownish testaceous, the parastigma and stigma sometimes darker. Length 1·4 to 1·6 mm.

Differs from *hemigaster* sp. n. as follows :

Body rather less squat ; head in dorsal view 2·15 to 2·3 times as broad as long ; POL 1·4 to 1·7 OOL ; breadth of oral fossa 2·7 to 3 times the malar space, the latter slightly longer than in *hemigaster*, though less than half as long as an eye. Antennae with combined length of pedicellus and flagellum distinctly less than breadth of head ; funicle proximally not or hardly as stout as the pedicellus, but thickening distad so as to be strongly clavate ; first funicular segment quadrate to slightly longer than broad, second quadrate to very slightly transverse, the remaining segments transverse, the fifth about 1·7 times as broad as long. Mesoscutum only 1·6 to 1·7 times as broad as long. Scutellum with two pairs of bristles, in one female with an additional bristle anteriorly on one side. Propodeum medially about one quarter as long as the scutellum or rather more, a little more distinctly alutaceous. Hind coxae bare dorsally. Fore wing with marginal vein 2 to 2·3 times as long as the stigmal vein, and 1·7 to 1·9 times as long as the postmarginal ; space between the postmarginal and stigmal veins, on upper surface of wing, pilose ; stigma subrectangular. Gaster slightly narrower than the thorax, excluding the ovipositor sheaths 1·55 to 1·8 times as long as broad.

♂. Unknown.

Holotype ♀. ENGLAND : Berkshire, Bagley Wood, 13.vii.1957, on Norway Spruce (*Picea abies* (L.) Karst.) (*Graham*), in Hope Department, University Museum Oxford.

Paratypes. ENGLAND : Oxfordshire, Bald Hill, near Lewknor, 1 ♀, 8.vi.1958, swept from chalk-downland vegetation (*Graham*) ; Lancashire South, Freshfield, 1 ♀, 28.vi.1962, from foliage of *Quercus robur* L. (*Graham*). SCOTLAND : Mid Perth, Killin, 1 ♀, 24.vii.1954, from foliage of *Quercus* (*Graham*), in Graham collection.

Biology. Unknown.

Gastrancistrus laticeps sp. n.

(Text-fig. 262)

♀. Head and thorax usually bright green, in an Irish female bronze-green, the head tending to be more blue-green, especially on the vertex ; basal half or less of the scutellum, and sometimes the axillae partly, bronze ; gaster dorsally more or less green or blue-green in the basal half, sometimes only the basal tergite, the remainder purplish bronze. Antennal scape testaceous, sometimes more or less heavily infuscate dorsally ; pedicellus and flagellum fuscous, the former sometimes paler apically. Coxae, and femora except their tips narrowly, concolorous with the thorax ; trochanters partly fuscous, partly testaceous ; tibiae bright testaceous, sometimes more or less infuscate medially ; tarsi paler testaceous with their fifth segment brown. Tegulae brown with a metallic gloss. Wings subhyaline ; venation brownish testaceous. Length 1·7 to 2·3 mm.

Head about 1·2 times as broad as the mesoscutum, in dorsal view strongly transverse (2·4 to 2·5 times as broad as long); temples extremely short ; ocelli in a triangle whose base is about 2·5 times its height, POL about 1·6 times OOL. Head in front view broadly oval, 1·3 to 1·35 times as broad as high. Eyes separated by about 1·5 times their own length. Malar space nearly half the length of an eye. Breadth of oral fossa about 2·8 times the malar space. Clypeus

about 2·5 times as broad as long, its anterior margin evenly but not strongly curved. Mandibles moderate-sized, not falcate, their teeth only moderately long, the outer one longest, the others decreasing slightly in length. Head with extremely fine sculpture which is hardly raised above the general surface, rather shiny, slightly duller on the vertex. Antennal scape distinctly shorter than an eye, not reaching the median ocellus ; combined length of pedicellus and flagellum about equal to the breadth of the head ; pedicellus in profile about 1·8 times as long as broad, as long as or very slightly longer than the first funicular segment ; funicle proximally slightly stouter than the pedicellus, thickening distad, its first segment 1·3 to 1·6 times as long as broad, second segment quadrate, the fifth slightly transverse, the fourth and fifth segments are also slightly asymmetric, somewhat oblique ; clava slightly more than twice as long as broad, about as long as two and a half of the preceding funicular segments.

Thorax about 1·6 times as long as broad. Mesoscutum about 1·6 times as broad as long, with extremely fine engraved sculpture ; mid lobe fairly thickly haired ; notauli nearly straight, deep. Scutellum about as long as the mesoscutum, distinctly longer than broad, its sculpture, except that of the frenum, rather finer than that of the mesoscutum, with three to four pairs of bristles ; the scutello-axillar sutures converge moderately strongly forwards in straight lines to meet the mesoscutum somewhat mesad of the hind ends of the notauli, the base of the scutellum being about one sixth the breadth of the mesoscutum. Dorsellum slightly more than one third as long as the frenum, weakly alutaceous, shiny. Propodeum rather deeply emarginate posteriorly, hence rather short medially, rather more than one quarter as long as the scutellum, with fine alutaceous sculpture which is hardly raised above the surface, moderately shiny ; median carina fine though complete ; plicae absent ; spiracles slightly oval, transversely so, nearly touching the metanotum ; callus with three to four bristles. Metapleuron with fine alutaceous, hardly raised, sculpture ; mesepisternum with similar sculpture, but slightly smoother below the bases of the wings ; mesepimeron marked off by a distinct grooved line, nearly four times as long as broad ; mesosternum with sculpture similar to that of the mesepisternum but slightly smoother medially, its mesolcus sharply impressed ; postspiracular sclerite with reticulate sculpture which is slightly coarser and more raised than that of the mesopleuron. Legs somewhat short and stout ; hind coxae about twice as long as broad, sculptured much as the metapleuron, their dorsal surface with two to three hairs ; spur of mid tibia more than three quarters the length of the first tarsal segment. Fore wing about twice as long as broad ; costal cell broad (length : breadth nearly 8 : 1), its lower surface fairly thickly hairy, its upper surface with one, sometimes partly double, row of hairs in the distal half of the cell ; basal cell hairy over its distal third ; speculum open or partly closed below, moderate-sized, on the upper surface of the wing extending as a bare strip under the proximal half of the marginal vein ; wing beyond the speculum rather thickly haired ; marginal vein 1·5 to 1·6 times as long as the postmarginal vein and 2·1 to 2·3 times the length of the stigmal vein, the latter straight with a moderate-sized stigma which is subrectangular and longer than high (Text-fig. 262).

Gastral petiole strongly transverse. Gaster ovate, excluding the ovipositor sheaths nearly or about as long as the thorax, almost as broad as the thorax, 1·5 to 1·75 times as long as broad ; basal tergite basally convex with a longitudinal impression on each side, occupying about one third of the total length of the gaster ; last tergite transverse ; ovipositor sheaths slightly exserted ; ventrally the gaster is convex, the tip of the hypopygium situated about in the middle.

♂. Unknown.

This species is very near *hemigaster* sp. n. and *crassus* Walker, but differs from both in being on the average larger, with more numerous, and very conspicuous, piliferous punctures on the mesoscutum, with the antennal scape at least partly testaceous, the head and thorax usually more brightly metallic. From *hemigaster* it also differs in having 3–4 (instead of 2) pairs of bristles on the scutellum, the propodeum rather

more strongly alutaceous and less shiny, its spiracles nearly touching the metanotum. From *crassus* it also differs in having the ovipositor sheaths only slightly exserted, the marginal vein only 2·1–2·3 (instead of 2·5–2·8) times as long as the stigmal vein, the speculum extending only about half way below the marginal vein, the propodeum longer, medially about as long as the scutellar frenum, in *crassus* slightly to much shorter than the frenum.

Holotype ♀. ENGLAND : Buckinghamshire, Hell Coppice, near Oakley, 2.vi.1953, swept from mixed herbage (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype. 1 ♀ ; same locality as holotype, 1 ♀, 24.vi. 1958 (*Graham*) ; Berkshire, Bagley Wood, 1 ♀, 23.v.1954 (*Graham*) ; Shropshire, Wyre Forest, 1 ♀, 14.v.1960 (*R. R. Askew*). IRELAND : Co. Wicklow, Knickeen, 1 ♀, 2.vii.1950 (*Graham*), in Graham and Askew collections.

Biology. Unknown.

THE *CITRIPES*-GROUP

Gastrancistrus citripes (Thomson)

(Text-figs. 246, 252)

Tridymus citripes Thomson, 1876*a* : 197.
Gastrancistrus citripes (Thomson) Dalla Torre, 1898 : 203.

Type material. Syntypes, 5 specimens. LECTOTYPE, a female labelled " Lp in " [Lapponia inferioris] ; " Bhn " [Boheman] ; " 14/6 " ; and " citripes ". Two of the other syntypes (females) represent a new species, which is described below.

SWEDEN, apparently rare.

Biology. Unknown.

Gastrancistrus lativentris sp. n.

(Text-fig. 247)

♀. Body bright green, golden or blue-green ; middle tergites of gaster tinged with bronze or purplish, which tends to form transverse fasciae. Mandibles yellow with reddish teeth. Antennae, palpi, tegulae, and legs including fore coxae, citron-yellow ; tips of tarsi brownish. Wings hyaline, venation yellowish. Length 1·3 to 2 mm.

Head about 1·2 times as broad as mesoscutum, in dorsal view 1·15 to 1·2 times as broad as long, with temples short, about one seventh as long as eyes, and rounded off ; ocelli in a triangle whose base is about 1·3 times its height, POL 1·6 to 1·7 OOL. Head in frontal view about 1·3 times as broad as high. Eyes separated by about 1·25 times their length. Malar space slightly more than one third the length of an eye ; breadth of oral fossa about 2·7 times the malar space. Clypeus about 2·7 times as broad as long, its anterior margin evenly and quite strongly curved. Mandibles moderate-sized, not falcate, their lower margin hardly sinuate ; all four teeth acute, much as in *venustus* sp. n. Head with fine engraved sculpture, moderately shiny, the vertex rather duller ; scrobes smooth and polished. Antennae (Text-fig. 247) very similar to those of *citripes* (Thomson) but with combined length of pedicellus and flagellum slightly less than breadth of head ; first funicular segment nearly two thirds as long as the pedicellus, varying

from subquadrate to slightly transverse ; second segment slightly transverse, the following ones distinctly so, fifth nearly or quite twice as broad as long ; clava broader than the funicle, 1·5 to 1·7 times as long as broad, its length equalling 3·33 to 3·5 of the preceding funicular segments. Thorax about 1·6 times as long as broad. Mesoscutum about 1·6 times as broad as long, moderately shiny, especially in front, with very fine engraved sculpture ; mid lobe with numerous hairs ; notauli deep, slightly bisinuate. Scutellum hardly longer than the mesoscutum, distinctly longer than broad, sculptured like the mesoscutum but more finely and delicately, with three to four pairs of bristles ; frenum marked off only by a fine and superficial line ; scutello-axillar sutures converging only moderately, meeting the mesoscutum somewhat mesad of the hind ends of the notauli. Axillae sculptured like the scutellum. Dorsellum about half as long as the scutellar frenum, polished and smooth. Propodeum medially nearly one third as long as the scutellum, shiny and weakly alutaceous ; median carina fine ; plicae absent ; spiracles nearly circular, very close to hind edge of metanotum ; callus with several hairs, the pilosity extending nearly to the edge of the metapleuron. Metapleuron shiny, weakly alutaceous ; mesepisternum delicately alutaceous below, but with an upper subtriangular area which is shiny and virtually smooth ; mesepimeron distinctly marked off, nearly three times as long as broad, nearly smooth ; mesosternum polished and nearly smooth, mesolcus fine and weak. Postspiracular sclerite shiny, with some delicate alutaceous sculpture. Legs rather short ; femora moderately stout ; hind coxae nearly twice as long as broad, shiny, with delicate engraved, or hardly raised, alutaceous sculpture which is rather wide-meshed, with hairs along the whole length of their dorsal surface ; spur of mid tibia about two thirds the length of the first tarsal segment. Fore wing about twice as long as broad ; costal cell nine to ten times as long as broad, its lower surface with two irregular rows of hairs plus some additional hairs in the distal quarter, upper surface bare except for a row of hairs extending over the distal third to half of the cell ; basal cell hairy over about its distal third ; speculum partly open below, on upper surface of wing moderate-sized but not extending farther than the base of the marginal vein ; wing beyond the speculum thickly pilose ; marginal vein from very slightly to distinctly longer than the postmarginal vein, but 2 to 2·5 times as long as the stigmal vein, the latter shaped much as in *venustus* sp. n. (cf. Text-fig. 251).

Gastral petiole strongly transverse. Gaster oval or elliptic, depressed dorsally, about as long and as broad as the thorax, 1·3 to 1·5 times as long as broad, bluntly pointed apically ; ovipositor sheaths only slightly exserted ; basal tergite occupying about one third of the total length, with a subtriangular basal fovea ; last tergite much broader than long ; ventrally the gaster is only slightly convex, with the tip of the hypopygium situated about half way along.

♂. Unknown.

Holotype ♀. ? LAPLAND : Wittang, labelled " Wit ", and remounted on a card, on the same pin as, but below, a female of *citripes* (Thomson), in Thomson collection Universitetets Institutionen, Lund, Sweden.

Paratypes. SWEDEN : Skåne, Ringsjön, 1 ♀, in Thomson collection, Lund, labelled by A. Jansson " lativentris n. sp." [unpublished name]. SCOTLAND : Inverness-shire, Aviemore, 1 ♀, 16.vi.1965, swept from foliage of *Populus tremula* L., near the railway station (*Graham*), in Graham collection.

The female of *lativentris* sp. n. is very close to that of *citripes* (Thomson) which differs in having the gaster from slightly to as much as 1·3 times as long as head plus thorax, narrower than the thorax and slightly compressed, including the ovipositor sheaths 2·0–2·5 times as long as broad, the ovipositor sheaths slightly more exserted, to a length about equal to that of the first segment of the hind tarsus, the tip of the hypopygium situated slightly before the middle ; combined length of pedicellus and flagellum fully equal to, or slightly greater than, the breadth of the

head ; postmarginal vein (Text-fig. 252) rather more distinctly shorter than the marginal.

It differs from *venustus* sp. n. in its much shorter not compressed, short-oval gaster with longer hypopygium ; longer propodeum ; wholly citron-yellow antennae, fore coxae, femora, and tegulae ; as well as in some smaller details (compare the respective descriptions).

Gastrancistrus venustus sp. n.

(Text-figs. 244, 248, 251)

♀. Body bright green to blue-green, sometimes with slightly golden reflections in places. Mandibles testaceous with reddish teeth. Antennal scape metallic, sometimes narrowly pale at apex ; pedicellus and flagellum testaceous, more or less infuscate dorsally. Coxae concolorous with the thorax ; legs otherwise citron-yellow with the trochanters partly infuscate, about the basal half of all the femora black with a metallic tinge, fore tarsi brownish, mid and hind tarsi brownish distally with their fifth segment fuscous. Tegulae yellowish to brown. Wings hyaline ; venation yellow or yellowish testaceous, the parastigma and stigmal vein often somewhat darker. Length 1·3 to 1·8 mm.

Head about 1·2 times as broad as the mesoscutum ; in dorsal view 2·1 to 2·2 times as broad as long, with temples short, about one sixth length of eyes, and rounded off behind the eyes ; ocelli in a triangle whose base is about 2·2 times its height, POL about 1·6 times OOL. Head in front view about 1·25 times as broad as high. Eyes separated by about 1·35 times their own length. Malar space somewhat more than one third the length of an eye. Breadth of oral fossa about 2·5 times the malar space. Clypeus nearly three times as broad as long, its anterior margin evenly and fairly strongly curved. Mandibles rather small, not falcate, their lower margin hardly sinuate ; teeth acute, the outer one long, the others decreasing slightly in size. Head with fine engraved sculpture, moderately shiny with the vertex slightly duller ; scrobes smooth and polished. Antenna (Text-fig. 244) with scape not nearly reaching the median ocellus, its length only about equal to the transverse diameter of an eye, about four times as long as broad ; combined length of pedicellus and flagellum somewhat less than breadth of head ; pedicellus, in profile, about 1·7 times as long as broad, nearly twice as long as the first funicular segment ; funicle proximally about as stout as the pedicellus, thickening distad ; its first segment quadrate or very slightly transverse, the following segments slightly transverse, the fifth about 1·5 times as broad as long ; clava only 1·5 to 1·8 times as long as broad, but somewhat longer than the three preceding funicular segments together ; sensilla not numerous.

Thorax hardly 1·5 times as long as broad. Mesoscutum about 1·8 times as broad as long, moderately shiny, with very fine engraved sculpture ; mid lobe with numerous hairs ; notauli deep, slightly bisinuate. Scutellum slightly longer than the mesoscutum, distinctly longer than broad, sculptured like the mesoscutum though rather more delicately with three to four pairs of bristles ; frenum weakly marked off by a superficial line ; scutello-axillar sutures converging only moderately and meeting the mesoscutum only slightly mesad of the hind ends of the notauli. Axillae sculptured like the scutellum. Dorsellum about half as long as the frenum, polished and nearly smooth. Propodeum medially hardly more than one fifth the length of the scutellum, shiny and weakly alutaceous ; median carina fine ; plicae absent ; spiracles subcircular, separated by nearly half their diameter from the metanotum ; callus with several hairs, but these do not extend as far as the metapleuron. Metapleuron shiny, weakly alutaceous ; mesepisternum delicately alutaceous below, but with an upper subtriangular area which is nearly smooth ; mesepimeron distinctly marked off, about three times as long as broad, nearly smooth ; mesosternum polished and nearly smooth, mesolcus fine but distinctly impressed ; postspiracular sclerite with moderately fine reticulation which is slightly raised above the surface. Legs rather short, the femora stout ; hind coxae about 1·8 times as long as broad, with moderately fine alutaceous sculpture which is hardly raised above the

general surface, with hairs extending the whole length of their dorsal surface ; spur of mid tibia more than three quarters the length of the first tarsal segment. Fore wing about twice as long as broad ; costal cell not very broad (length : breadth about 10 : 1), its lower surface with two irregular rows, sometimes three rows in the distal part, of hairs, its upper surface bare except for a row of hairs extending over the distal half of the cell or rather less ; basal cell hairy over rather less than its distal half ; speculum open below, on the upper surface of the wing moderate-sized but not extending farther than the base of the marginal vein ; wing beyond the speculum thickly hairy ; marginal vein only very slightly longer than the post-marginal vein, but 1·7 to 2 times as long as the stigmal vein ; the latter slightly curved with a small, subcircular stigma which has a long uncus (Text-fig. 251).

Gastral petiole strongly transverse. Gaster lanceolate or ovate-lanceolate, if the ovipositor sheaths are included slightly to distinctly longer than head plus thorax, slightly narrower than the thorax, 2·5 to 3 times as long as broad, excluding the ovipositor sheaths, which are slightly exserted, acute apically ; the basal tergite occupies about one quarter or slightly more of the total length, and has a subtriangular basal fovea ; ventrally the gaster is keeled, the tip of the hypopygium situated somewhat before the middle.

♂. Differs from the female as follows :

Antennal scape (Text-fig. 245) shorter, its length distinctly less than the transverse diameter of an eye, and broader, only about 3·5 times as long as broad ; pedicellus only about 1·5 times as long as broad ; combined length of pedicellus and flagellum only slightly less than the breadth of the head ; pedicellus slightly shorter, 1·2 to 1·5 times as long as the first funicular segment ; funicle stout, proximally slightly stouter than the pedicellus, hardly thicker distally, its first segment quadrate, or hardly longer than broad, the following segments very slightly transverse ; clava hardly broader than the funicle, very short (1·5 to 1·7 times as long as broad), very slightly longer than the two preceding funicular segments together ; flagellum clothed with quite strongly outstanding hairs whose length is slightly less than the breadth of the segments which bear them.

Gaster compressed, nearly as long as but much narrower than the thorax.

The female of *venustus* differs from those of *citripes* (Thomson) and *lativentris* sp. n. in the darker colour of its antennae and legs (see key to species). It also differs from that of *citripes* in having the combined length of the pedicellus and flagellum somewhat less than the breadth of the head ; first funicular segment hardly more than half as long as the pedicellus, about two thirds as long in *citripes* ; clava a little longer. It also differs from the female of *lativentris* sp. n. in its much longer, compressed and lanceolate or sublanceolate gaster, which has a relatively shorter hypopygium ; shorter propodeum ; and other small details, for which see the respective descriptions.

Holotype ♀. ENGLAND : Oxfordshire, near Stanton St. John, 1.viii.1954, on *Pastinaca sativa* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 5♂, 4♀ ; Berkshire, Wytham, 3 ♀, 29.viii.1954 on Umbelliferae (*G. R. Gradwell*) ; Buckinghamshire, Hell Coppice, near Oakley, ♂♂ ♀♀, 26.vii.1953, captured on flowers of *Pastinaca sativa* L., ♀♀, 2.viii.1953, swept from grasses (*Graham*), in Graham and Gradwell collections.

Biology. Unknown.

Species sola

Gastrancistrus aequus sp. n.

♀. Head and thorax green to blue-green ; gaster bright green at the base, otherwise greenish

with the disc coppery bronze. Mandibles testaceous with darker teeth. Palpi yellowish. Antennae testaceous with the scape, pedicellus, and flagellum more or less infuscate dorsally. Coxae, about the basal half of the fore and mid femora, and the whole of the hind femora except their tips narrowly, concolorous with the thorax ; trochanters partly infuscate ; rest of legs bright testaceous with only the pretarsi and claws brown. Tegulae brownish testaceous. Wings hyaline ; venation testaceous with the parastigma, stigmal vein and stigma brownish. Length 2·1 to 2·2 mm.

Head about 1·2 times as broad as the mesoscutum, in dorsal view 2·25 to 2·3 times as broad as long ; temples short, one sixth to one fifth length of eyes, and rounded off ; ocelli in a triangle whose base is about 2·25 times its height, POL about twice OOL. Head in front view about 1·3 times as broad as high. Eyes separated by 1·3 times their own length. Malar space slightly more than one third the length of an eye. Breadth of oral fossa slightly more than three times the malar space. Mandibles moderate-sized, slightly falcate, their teeth decreasing slightly in size from the outside, though the innermost is not very short. Head with very fine, only slightly raised, sculpture ; moderately shiny with the vertex a little duller. Antenna with scape short, its length only about three quarters the length of an eye, only about 3·5 times as long as broad, not reaching the median ocellus ; combined length of pedicellus and flagellum distinctly less than the breadth of the head ; pedicellus in profile about 1·6 times as long as broad ; funicle proximally hardly as stout as the pedicellus, becoming conspicuously thicker distad, its first segment somewhat shorter than the pedicellus and quadrate, the second segment very slightly transverse, the following segments distinctly so, the fifth about twice as broad as long ; clava slightly less than twice as long as broad, about as long as the three preceding funicular segments together ; sensilla of flagellum moderately numerous.

Thorax about 1·6 times as long as broad. Mesoscutum about 1·5 times as broad as long, not very shiny, with extremely fine engraved sculpture ; mid lobe with numerous hairs ; notauli deep, nearly straight. Scutellum a little longer than the mesoscutum, distinctly longer than broad, sculptured like the mesoscutum but rather more finely, with four to six pairs of bristles, arranged in two longitudinal rows ; frenum marked off by a very fine, almost imperceptible, line ; the scutello-axillar sutures converge only moderately so as to meet the mesoscutum only slightly mesad of the hind ends of the notauli, the base of the scutellum being slightly less than one quarter the breadth of the mesoscutum. Dorsellum hardly half as long as the frenum, forming a strongly raised, slightly alutaceous, crest. Propodeum moderately long, medially slightly less than one third as long as the scutellum, shiny and weakly alutaceous ; median carina fine but complete ; plicae absent ; spiracles suboval, separated by about one third their diameter from the hind margin of the metanotum ; callus slightly less shiny than the rest of the propodeum, with extremely fine though slightly raised reticulation, with four to five bristles. Metapleuron and mesepimeron with fine, only slightly raised sculpture ; mesepimeron sharply marked off from the mesepisternum, hardly more than twice as long as broad ; mesepisternum with similar sculpture, except a nearly smooth subtriangular area below the base of the wings ; mesosternum shiny, with very delicate alutaceous sculpture, its mesolcus sharply impressed throughout ; postspiracular sclerite slightly shiny, with distinctly raised, and not very fine, reticulation. Legs somewhat short and moderately stout ; hind coxae about twice as long as broad, not very shiny, with rather coarse, distinctly raised reticulation, their dorsal surface bare ; spur of mid tibia about three quarters as long as the first tarsal segment. Fore wing about twice as long as broad ; costal cell moderately broad (length : breadth about 9 : 1), its lower surface sparsely hairy, its upper surface bare except for a row of several hairs extending over the distal third of the cell ; basal cell bare except in the vicinity of the basal vein where there are two to three rows of hairs ; speculum partly open below, on the upper surface of the wing not broad though extending as a bare strip below the marginal vein nearly to the stigmal vein ; wing beyond the speculum moderately thickly haired ; marginal vein about 1·7 times as long as the postmarginal vein and 2 to 2·1 times as long as the stigmal vein ; the latter curved, with a moderate-sized stigma which is longer than high and has a rather short uncus.

Gaster oval, depressed dorso-ventrally, nearly as long as and broad as the thorax, about 1·5 times as long as broad, obtuse apically ; dorsally slightly to distinctly sunken on the disc, the basal tergite with a semicircular fovea which has a median longitudinal ridge ; last tergite very short, much broader than long ; ovipositor sheaths concealed in dorsal view ; ventrally the gaster is strongly convex and keeled, with the tip of the hypopygium situated at about the middle.

♂. Unknown.

In general facies, and particularly in the shape of the gaster, *aequus* much resembles *pusztensis* (Erdös), but differs in its darker antennal flagellum, relatively longer marginal vein, shorter postmarginal vein, and in having the scutello-axillar sutures only slightly convergent. From all the other species having the latter character, it differs in the shape of the gaster (see couplet 34 of key to species), though in other respects it much resembles *laticeps* sp. n.

Holotype ♀. ENGLAND : Berkshire, Bagley Wood, 30.v.1954, swept from mixed herbage (*Graham*), in Hope Department, University Museum, Oxford.

Paratype. Same data, 1 ♀, in Graham collection.

Biology. Unknown.

THE *COMPRESSUS*-GROUP

Gastrancistrus compressus Walker

(Text-fig. 266)

Gastrancistrus compressus Walker, 1834 : 172, ♂.
Tridymus pallicornis Thomson, 1876*a* : 200, ♀, **syn. n.** [pre-occupied by *Gastrancistrus pallicornis* Walker, 1872 : 116, ♀.]
Gastrancistrus thomsonii Dalla Torre, 1898 : 205 [n. n. for *G. pallicornis* Thomson *nec* Walker].

Type material. *Gastrancistrus compressus* Walker. Syntypes, 2 ♂. LECTOTYPE, one bearing a Waterhouse label, also one in C. Ferrière's handwriting " Type C.F.".

Tridymus pallicornis Thomson. Syntypes, 7 specimens. LECTOTYPE, a female labelled " Ar 6/56 " ; the specimen has been remounted by A. Jansson and also bears his lectotype-label.

BRITAIN, SWEDEN. In England it is not uncommon in pastures and meadows.

Biology. Unknown. Imagines June–August.

Gastrancistrus glabellus (Nees) **comb. n.**

(Text-fig. 267)

Eulophus glabellus Nees, 1834 : 187, ♀.
Tridymus laeviscuta Thomson, 1876*a* : 200, ♀, **syn. n.**
Gastrancistrus leviscuta Dalla Torre, 1898 : 204 [emendation].

Type material. *Eulophus glabellus* Nees. One female, from the collection of Nees, exists in the Westwood collection in the Hope Department, University Museum, Oxford. It bears a small pink square with the number " 12 "; a label

in the handwriting of Nees " D.9b. glabella f. a. ♀. 12 Augt. 12 "; another in Westwood's handwriting " Eulophus glabellus Es. 2. 187. E Mus. Esenb. " The specimen lacks both flagella ; it agrees with the description except that the colour of the body is green rather than aeneous, and I designate it as LECTOTYPE.

Tridymus laeviscuta Thomson. Syntypes, 7 specimens. LECTOTYPE, a female labelled " Hbg " [Halsingborg] and " laeviscuta "; the specimen has been remounted by A. Jansson.

BRITAIN, SWEDEN, GERMANY ; uncommon. Occurs in the same habitats as *compressus*.

Biology. Unknown. Imagines June–August.

Gastrancistrus latifrons (Thomson)

Tridymus latifrons Thomson, 1876*a* : 201, ♂ ♀.
Gastrancistrus latifrons (Thomson) Dalla Torre, 1898 : 204.

Type material. Syntypes on 31 pins. LECTOTYPE, a female labelled " Ö " [Öland] ; the specimen has been remounted by A. Jansson and bears his lectotype-label.

BRITAIN, SWEDEN ; uncommon.

Biology. Unknown. Imagines June–July.

THE *PUNCTICOLLIS*-GROUP

Gastrancistrus puncticollis (Thomson)

(Text-fig. 264)

Tridymus puncticollis Thomson, 1876*a* : 200, ♂ ♀.
Gastrancistrus puncticollis (Thomson) Dalla Torre, 1898 : 204.

Type material. Syntypes on 23 pins. LECTOTYPE, a female standing seventh in the series and bearing my lectotype-label.

BRITAIN, IRELAND, SWEDEN. Fairly common in rough grassy fields and meadows.

Biology. Unknown. Imagines May–August.

Gastrancistrus indivisus **sp. n.**

(Text-figs. 205, 265)

♀. Head and thorax black with blue-green and bronze reflections ; gaster with similar but weaker tints. Mandibles testaceous with darker teeth. Antennal scape and pedicellus black, the latter sometimes testaceous beneath and at the apex ; flagellum fuscous, the clava sometimes slightly paler distally. Coxae, and femora except their tips rather narrowly, concolorous with the thorax ; trochanters more or less infuscate ; tibiae and tarsi testaceous, the tibiae often slightly infuscate medially, the fifth tarsal segment more or less brown. Tegulae fuscous. Wings greyish, the fore wing usually more or less infumate medially. Length 1·6 to 2·1 mm.

Head only slightly broader than the mesoscutum, in dorsal view 2·2 to 2·3 times as broad as

long ; temples extremely short, receding strongly ; POL 1·5 to 1·6 OOL, ocelli in a triangle whose base is about 2·25 times its height. Eyes rather small, separated by about 1·5 times their length. Head in front view suboval, the vertex strongly arched, the cheeks converging moderately strongly and in straight lines towards the mouth. Malar space slightly less than half the length of an eye. Breadth of oral fossa about 2·5 times the malar space. Clypeus about 2·5 times as broad as long, its front margin evenly and quite strongly curved. Mandibles moderate-sized, not falcate, their teeth only moderately long, the lower (outer) one longest, the other becoming progressively a little shorter. Vertex and upper part of frons rather dull, with extremely fine, engraved sculpture ; lower frons, face, clypeus and cheeks shiny, with delicate, only weakly engraved sculpture. Antennal scape almost as long as an eye, but not reaching the median ocellus ; combined length of pedicellus and flagellum slightly greater than the breadth of the head ; pedicellus (in profile) about 1·7 times as long as broad, from as long as to distinctly longer than the first funicular segment ; funicle proximally not or hardly stouter than the pedicellus, becoming thicker distad, its first segment as long as or slightly longer than the second, varying from subquadrate to 1·7 times as long as broad, the second segment quadrate or very slightly longer than broad, the fifth, or fourth and fifth, slightly transverse ; clava hardly broader than the fifth funicular segment, nearly twice as long as broad, slightly shorter than the combined length of the three preceding funicular segments ; flagellum with rather outstanding, bristly hairs ; sensilla not numerous.

Thorax nearly 1·5 times as long as broad. Mesoscutum about 1·7 times as broad as long, somewhat shiny, with very fine delicately engraved sculpture ; its mid lobe with numerous bristles which arise from tiny warts, the bristles are especially numerous anteriorly ; notauli deep, nearly straight. Axillae and scutellum sculptured much like the mesoscutum. Scutellum very slightly longer than the mesoscutum, slightly longer than broad, strongly convex, with three to four pairs of bristles arranged in two longitudinal rows ; frenum marked off by a very fine line ; the scutello-axillar sutures meet the hind margin of the mesoscutum only a little mesad of the hind ends of the notauli. Dorsellum very short, only about one third the length of the frenum, polished and without sculpture. Propodeum short, medially hardly one fifth the length of the scutellum, smooth and polished ; median carina and plicae absent ; spiracles subcircular, separated by about one third their diameter from the hind edge of the metanotum ; callus thickly hairy, the hairs extending almost to the edge of the metapleuron. Metapleuron (Text-fig. 205) with a trace of weak alutaceous sculpture ; mesopleuron and mesosternum wholly polished and smooth ; mesepimeron not marked off from the mesepisternum ; mesolcus nearly obsolete. Legs with hind coxae somewhat more than twice as long as broad, shiny, with very weak alutaceous sculpture, hairy along the whole length of their dorsal surface. Fore wing slightly more than twice as long as broad ; costal cell broad (length : breadth about 8 or 9 : 1), its lower surface with rather numerous hairs, its upper surface bare except for a row of several hairs in the distal half ; basal cell hairy over about its distal third ; speculum closed below by a line, sometimes even by two lines, of hairs on the cubital vein, on the upper surface of the wing moderately large, on the lower surface more or less effaced by scattered hairs ; wing beyond the speculum rather thickly haired ; marginal vein 1·3 to 1·4 times as long as the postmarginal vein and 1·7 to 1·9 times as long as the stigmal vein, the latter curved, the stigma moderate-sized and obliquely oval, with a distinct uncus.

Gaster lanceolate, slightly longer than head plus thorax, somewhat narrower than the thorax, acute apically, slightly compressed, sunken dorsally beyond the basal tergite, the latter usually remains convex after drying and its basal fovea is absent or hardly indicated ; ovipositor sheaths slightly exserted, to at most the length of the last tergite ; hypopygium extending only about one third the length of the gaster.

♂. Differs from the female as follows :

Antennal scape somewhat shorter than an eye, hardly more than three times as long as broad ; pedicellus in profile, only about 1·5 times as long as broad ; combined length of pedicellus and flagellum about 1·2 times the breadth of the head ; funicle hardly stouter distally than proximally ; first funicular segment varying from almost quadrate to 1·7 times as long as broad, as

long as or slightly longer than the pedicellus, second and following segments quadrate, or the fourth to the sixth sometimes very slightly transverse ; clava two-segmented, subconical, about 2·3 times as long as broad, hardly longer than the combined length of the two preceding funicular segments ; the flagellum is clothed with quite strongly outstanding bristly hairs whose length about equals the breadth of the segments which bear them ; the hairs are arranged in two or three irregular rows on each segment.

Propodeum longer, medially more than one quarter the length of the scutellum, and about as long as the frenum.

Gaster strongly compressed, about as long as but much narrower than the thorax.

This is a rather isolated species, though in some respects it seems to be near *puncticollis* (Thomson). It may easily be recognized by the combination of the polished mesopleuron which lacks a mesepimeron ; the thickly hairy propodeal callus, dorsal surface of the hind coxae, and mid lobe of the mesoscutum ; polished propodeum which lacks a median carina and plicae ; and the relatively long flagellum and funicular segments.

Holotype ♀. SCOTLAND : West Inverness, Isle of Rhum, Kinloch, 29.viii.1961, beaten from foliage of *Betula* sp. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, ♂♂, ♀♀ ; Wester Ross, Badachro, 4 ♂, 2 ♀, 20.viii.1953, taken when beating foliage of *Quercus* and *Betula* (*Graham*), in BM(NH), Universitetets Zoologiska Institutionen, Lund and in Graham collections.

Biology. Unknown.

Gastrancistrus walkeri sp. n.

♀. Resembles *indivisus* sp. n., but differs especially in having shorter antennae and propodeum, more sparsely pilose propodeal callus and hind coxae. POL slightly greater relative to OOL. The differences are given in more detail, as follows :

Mid and hind tibiae, except their bases and tips, fuscous to black ; fore tibiae, and fore tarsi dorsally, often more or less infuscate. Smaller species 1·35 to 1·7 mm. POL about twice OOL. Eyes slightly smaller, separated by slightly less than 1·5 times their own length. Genae slightly curved. Vertex rather more glossy. Antennal scape slightly shorter than an eye ; combined length of pedicellus and flagellum slightly less than breadth of head ; pedicellus slightly longer than anellus plus first funicular segment ; all funicular segments slightly transverse, the first slightly shorter than the others ; clava as long as the three preceding funicular segments together. Propodeum medially at most slightly more than one seventh as long as scutellum, with a median carina more or less indicated ; callus with two to four bristles only. Metapleuron alutaceous ; mesopleuron with traces of alutaceous sculpture. Hind coxae hardly twice as long as broad, with rather more distinct alutaceous sculpture than in *indivisus*, their dorsal surface with a few hairs in the basal half only. Fore wing with costal cell rather narrower ; speculum open, or partly closed below by a line of hairs.

♂. Differs from that of *indivisus* as follows :

Tibiae tending to be darker (as in ♀). Size less (1·2 to 1·5 mm.). Antennae with first funicular segment distinctly shorter than the pedicellus, usually slightly transverse though sometimes quadrate, remaining funicular segments slightly transverse ; clava slightly longer than the two preceding funicular segments together. Median carina of propodeum more or less indicated. With regard to the ratio POL : OOL, size of eyes, curvature of genae, pilosity of propodeal callus and of hind coxa, sculpture of meta- and mesopleuron, it resembles the female, and differs from the male of *indivisus* in these respects.

Holotype ♀. ENGLAND : Middlesex, Southgate, 29.iv.1965, from foliage of *Betula* sp. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 4 ♂, 5 ♀ ; Berkshire, Wytham Wood, 1 ♀, 14.v.1964, swept from foliage of *Betula* sp. (*Graham*) ; Oxfordshire, Shirburn Hill, near Lewknor, 1 ♀, 16.v.1960 (*Graham*), in Graham collection.

Biology. Unknown.

This species is named after Francis Walker, who collected many of his Chalcidoidea at Southgate. It is the first new species to be described from that neighbourhood since his time, some 130 years ago ; the holotype was captured within a mile or so of his former home, Arno's Grove.

Note. I have not seen the types of the following species of *Gastrancistrus*, which were described from Switzerland by Förster (1861) ; at least some of them are likely to be valid and may in such case take priority over certain Thomson names :

Gastrancistrus speculifer Förster, 1961 : 35, ♂. Probably belongs to the species-group of *compressus* Walker.

G. refulgens Förster, 1961 : 35, ♀. Probably also belongs to the species-group of *compressus*.

G. claviger Förster, 1961 : 35, ♂ ♀.

G. erythropus Förster, 1861 : 36, ♂.

G. subpunctatus Förster, 1961 : 36, ♂. Probably belongs to the species-group of *compressus* Walker.

Notes on some extra-limital species of *Gastrancistrus* and on species wrongly placed in that genus

A. *Gastrancistrus Polles* Walker, 1843*b* : 186, ♀ (Chile) is correctly placed in this genus (Type Hym. 5. 660).

B. The following also belonging to *Gastrancistrus* according to their respective types, which I have examined :

Miscogaster Menaetes Walker, 1839*a* : 20, ♂ (Australia) (Type Hym. 5. 662).

M. Psapho Walker, 1839*a* : 23, ♂ (Australia).

I found a male of this species, now designated LECTOTYPE, standing in the British collection under the name " *Lamprotatus psapho* "; it bears a handwritten label " Psapho ".

Seladerma Epulo Walker, 1839*a* : 86, ♀ (Chile) (Type Hym. 5. 797).

C. The following species were described as *Gastrancistrus* but do not belong to it :

G. Vonones Walker, 1839*a* : 67, ♂ (Brazil) (Type Hym. 5. 663). This belongs to the Eulophid genus *Chrysocharis* !

G. Cephalon Walker, 1843 : 30, ♀ (Chile) (Type Hym. 5. 661). This is a Pteromalid ; I am unable at present to place it to genus, although it is not a *Gastrancistrus*.

G. Hierocles Walker, 1848 : 105, 158, ♂ (England, type in British collection) ; this is a male of *Coruna clavata* Walker (q.v.).

G. Iriarte Walker, 1848 : 105, 159, ♂ (England, type in British collection) ; a male of *Chrysocharis idyia* (Walker) !

MEROMALUS Walker

Meromalus Walker, 1834 : 168, 178. Type-species : *M. flavicornis* Walker, by monotypy.

The identity of this genus cannot be definitely settled at present because the original material of its type-species has not been located in BM(NH). My own view is that *Meromalus* is probably the same as *Gastrancistrus* but the question must be left open for the time being (see further remarks below under *flavicornis*).

Meromalus flavicornis Walker

Meromalus flavicornis Walker, 1834 : 178, ♂.
? Ormocerus Drymo Walker, 1839 : 205, ♂.

Type material. *Meromalus flavicornis* was originally captured in " June ; on grass in fields ; near London " (Walker, 1834 : 178). In spite of several years' search I have not located the original material in Walker's collection ; but perhaps it may yet turn up.

Ormocerus drymo was placed in synonymy with *Meromalus flavicornis* by Walker himself (1848 : 106). I cannot find any material of *drymo* in Walker's collection ; but in Haliday's collection there are remnants (antennae, parts of the wings) of a specimen which is labelled " Drymo " in Walker's handwriting. This specimen belongs, I believe, to the *salicis*-group of *Gastrancistrus*. If Walker was correct in his synonymy, then this is the nearest indication we have at present to the probably identity of *Meromalus*. It is interesting to note that Thomson, in a Swedish footnote to his account of *Tridymus* (= *Gastrancistrus*) *salicis* (Nees), remarked (1876 *a*, 197) that *Meromalus* probably represented the male of *salicis*, although he could not have seen the type of *Meromalus flavicornis*.

Peck *et al.* (1964 : 33) place *salicis* (Nees) in the genus *Meromalus*, which they remark is probably synonymous with *Gastrancistrus*. They state, however, that the antennae of the male of *Meromalus* have 13 segments ; whereas the antennae of male *salicis* have 12 segments.

Erdös (1946 : 154) claimed to recognize *Meromalus flavicornis*, with which he compared his new species *M. pusztensis*. The latter is a very distinct species which I include in the genus *Gastrancistrus* (see above) but the description of *flavicornis* does not suggest to me that it might be near to *pusztensis*.

PIRENINI

Haliday (1844 : 295) established a tribe Pireniani [*sic*] in which he placed *Calypso* [= *Stenophrus*], *Macroglenes* and *Pirene*. Förster (1856 : 40) regarded it as a family (Pyrenoidae). Thomson (1876 : 12, 187) treated it as a " tribe " Pirenina (most of his " tribes " are the equivalent of families according to modern concepts). Ashmead (1904 : 271) made it a subfamily of Miscogasteridae. Ferrière (1934 : 85) redefined Pireninae as a subfamily of Pteromalidae, giving a key to the genera which he regarded as being true Pirenines, and mentioning certain others to be excluded from

this group. He described a new genus *Platecrizotes* (ibid. : 90–91) which he regarded as a Pirenine ; but Bouček (1963 : 503) considered it to be rather closely related to *Pachycrepoideus* Ashmead [q.v.] and not a Pirenine. I agree with Bouček's view. *Bairamlia* Waterston, also included in Pireninae by Ferrière (1934 : 85, 89–90) was later transferred to Asaphini by Bouček (*vide supra*, under *Bairamlia*). Some of the remaining genera which Ferrière included in Pireninae (especially those described by Girault) are not very well known, and some may not be correctly placed there. The genera placed in Pirenini by Peck (1963 : 637–640) show a diversity of hosts which may indicate that the tribe is heterogeneous. He includes not only *Macroglenes* and *Pirene* (known hosts : Cecidomyiidae) but also *Mesopeltitia* (hosts : Coccidae), *Herbertia* (Agromyzidae), *Morodora* (Calliphoridae), *Bairamlia* (Aphaniptera) and *Dipachystigma* (Col., Scolytidae). Clearly the constitution of the Pirenini needs to be re-investigated, especially with regard to the New World genera. Pirenini, even if only the European genera are considered, approach very closely to Ormocerini ; I cannot therefore give to either of these groups a status higher than that of a tribe.

Key to European Genera

1 *Males* with at least the mid and hind tibiae strongly swollen, broader than their respective femora. *Females* with fore tibiae armed with several short stout spines arranged in a row along their outer edge ; all the tibiae stout but less so than in males. Antennal scape very short, reaching hardly half way from the torulus to the median ocellus. Stigmal vein of fore wing nearly half as long as the marginal vein . . . ***SPATHOPUS*** Ashmead (p. 332)

– *Males* with tibiae not strongly swollen, not broader than their respective femora. *Females* with fore tibiae without spines, or (*Ecrizotes*) with at most four rather stout spines at the apex of the tibia and a row of fine slender spines along the dorsal edge. Antennal scape relatively longer. Stigmal vein of forewing often relatively shorter 2

2 (1) *Females* with antennae with four or five large funicular segments which are provided with sensilla. *Males* [that of *monticola* unknown] with antennae without visible anelli, with six large funicular segments which are provided with sensilla ; flagellum subfiliform ; hind tibiae (Text-fig. 270) compressed and more or less expanded, without a pecten. Fore wing (Text-fig. 269): stigmal vein long, from somewhat more than one third, to half, as long as the marginal vein, the stigma with a long petiole ; postmarginal vein fully half as long as the marginal vein, and slightly longer than the stigmal vein ***ECRIZOTES*** Förster (p. 330)

– *Females* with antennae (Text-figs. 276–278) with at most three large funicular segments which are provided with sensilla. *Males* with antennal flagellum (Text-figs. 275, 279, 280) clavate, with some anelliform segments, and at most three large funicular segments ; hind tibiae neither compressed nor expanded, and nearly always with a more or less developed pecten (Text-figs. 281–283). Fore wing (Text-figs. 271, 272) with stigmal vein shorter, from one eighth to one third as long as the marginal vein ; postmarginal vein from one sixth to slightly more than one third as long as the marginal vein, about as long as or shorter than the stigmal vein and often indistinctly defined 3

3 (2) Fore wing without a speculum ; basal cell pilose except for a narrow strip above the cubital vein. Antennae with flagellar segments three to five large and

provided with sensilla, as in Text-fig. 276. Thorax strongly arched dorsally. Propodeal callus with six or more bristles ; hind coxae with some hairs on their dorsal surface. Eyes of ♂ very large, approximated on vertex and touching the posterior ocelli ; antennal scape not swollen

STENOPHRUS Förster (p. 333)

– Fore wing with at least a narrow speculum on the upper surface, in most species it is present on both surfaces of the wing ; basal cell at most pilose in its distal third. Either the antennae have at most two large funicular segments provided with sensilla (Text-figs. 277–280) ; or if with three large segments (Text-fig. 276) then the thorax is flattened dorso-ventrally. Propodeal callus with only one to four bristles ; hind coxae bare dorsally. Eyes of ♂ large or small ; antennal scape sometimes swollen (Text-fig. 275)

PIRENE Haliday (p. 334)

ECRIZOTES Förster

Ecrizotes Förster, 1861 : 33. Type-species : *E. monticola* Förster, by monotypy.
Henicetrus Thomson, 1876 : 188, 190. Type-species : *H. annellus* Thomson, by designation of Gahan & Fagan, 1923.
Ecrizotes Förster ; Schmiedeknecht, 1909 : 270, 271, 273.
Ecrizotes Förster ; Ferrière, 1934 : 86, 88.
Ecrizotes Förster ; Nikol'skaya, 1952 : 237.
Ecrizotes Förster ; Graham, 1956*b* : 263.
Ecrizotes Förster ; Bouček, 1961 : 57–58.
Ecrizotes Förster ; Peck *et al.*, 1964 : 32.

Henicetrus Thomson was placed in synonymy with *Ecrizotes* Förster by Ashmead (1904 : 377).

Key to European Species

1 *Female* with gaster not strongly compressed, not longer than head plus thorax ; combined length of pedicellus and flagellum less than breadth of head ; pedicellus slightly longer than combined length of funicular segments one and two ; all funicular segments transverse ; clava nearly as long as the four preceding funicular segments together ; scape slightly shorter than an eye, 4 to 4·5 times as long as broad, reaching only about two thirds the distance from the toruli to the median ocellus. *Male* unknown

monticola Förster (p. 331)

– *Females* with gaster very strongly compressed like a knife-blade, much longer than head plus thorax ; combined length of pedicellus and flagellum equal to or greater than the breadth of the head ; pedicellus shorter than combined length of funicular segments one and two ; at least the first funicular segment slightly longer than broad, the remaining segments not or hardly transverse ; clava at least slightly shorter than the four preceding funicular segments together ; scape at least very slightly longer than an eye, 4·8 to 6·5 times as long as broad, reaching nearly or quite to the median ocellus. *Males* : for characters see below 2

2 (1) *Female* with antennae (Text-fig. 268) with all funicular segments longer than broad, the fifth 1·3 to 1·5 times as long as broad ; clava at most as long as, but usually slightly shorter than, the three preceding funicular segments together ; scape about 1·2 times as long as an eye, 6 to 6·5 times as long as broad. *Male* with mid and hind tibiae, especially the latter, (see Text-fig.

270) much expanded ; the maximum breadth of the hind tibia fully equal to, or even very slightly greater than, the breadth of the hind femur
longicornis (Walker) (p. 331)

– *Female* with antennae with only the first and second funicular segments distinctly longer than broad, the remaining segments subquadrate or hardly longer than broad ; clava as long as $3\frac{1}{2}$ to $3\frac{3}{4}$ of the preceding funicular segments ; scape hardly longer than an eye, 4·8 to 5·5 times as long as broad. *Male* with mid and hind tibiae not obviously expanded ; the maximum breadth of the hind tibia slightly less than that of the hind femur
filicornis (Thomson) (p. 332)

Ecrizotes monticola Förster

Ecrizotes monticola Förster, 1861 : 33, ♀.
Henicetrus annellus Thomson, 1876 : 191, ♀.
? Henicetrus caudatus Thomson, 1876 : 191, ♀.
Ecrizotes monticola Förster ; Bouček, 1961 : 57–58, ♀.

Type material. *Ecrizotes monticola* Förster. Syntypes in Zoologisches Museum, Berlin. Lectotype designated by Bouček (1961 : 58) : it is the female nearest the pin, staged on a block of pith, the latter bearing a red mark beneath the specimen ; the pin bears two labels " 17/276 Frst." and (in Förster's handwriting) " Roseggthal Ecrizotes monticola m. ♀ N. 8 u. 122 ". One antenna of the lectotype has been mounted on a microscope slide by Novitzky.

Henicetrus annellus Thomson. Holotype ♀ labelled " Hbg " [Hälsingborg] ; " ♀ " ; " Scan " ; "annellus " (the latter in Thomson's handwriting.

Henicetrus caudatus Thomson. Syntypes, 2 ♀. LECTOTYPE, a female labelled " Ö " [Öland] and remounted by A. Jansson. It differs from the type of *monticola* Förster in having the gaster slightly longer, the hypopygium projecting slightly farther, and the ovipositor sheaths rather more exserted. It is difficult, without a study of much more fresh material, to be sure whether more than just one variable species is involved, as Bouček (1961 : 58) remarks.

BRITAIN [new : Scotland, Mid Perth, Kenmore, 4 ♀, 19.vii.1954 (*Graham*)] ; SWEDEN, SWITZERLAND, CZECHOSLOVAKIA ; apparently rare, or very local.

Biology. Unknown. Imagines July–August.

Ecrizotes longicornis (Walker)

(Text-figs. 268–270)

Gastrancistrus longicornis Walker, 1848 : 105, 155, ♀.
Ecrizotes longicornis (Walker) Graham, 1956*b* : 263.

Type material. Lectotype female designated by Graham (1956*b* : 263). In the same paper I placed *Henicetrus filicornis* Thomson in synonymy with *longicornis* Walker. I now believe that these two represent close but different species (for distinguishing characters see key to species).

BRITAIN.

Biology. Unknown ; the species may be associated with some host on *Betula*, on which I have more than once taken it. Imagines June–July.

Ecrizotes filicornis (Thomson)

Henicetrus filicornis Thomson, 1876 : 191, ♀.

Type material. Lectotype ♀ labelled " Ö " [Öland] ; " ♀ " ; " filicornis " [in Thomson's handwriting]. The specimen also bears two labels added by A. Jansson viz., his lectotype label and another reading " Ecrizotes filicornis Ths. A. Jansson ",

BRITAIN, SWEDEN.

Biology. Unknown. Imagines June–August.

Note. The male taken in a nest of *Formica rufa* by Donisthorpe in England, and referred to *Ecrizotes filicornis* by Ferrière (1934 : 88, footnote[2] and fig. 1c) does not belong to that species. A specimen in the BM(NH) which appears to be this male, is a *Gastrancistrus*.

The specimens recorded as *longicornis* (Walker), from Czechoslovakia by Bouček (1961 : 58) will have to be re-examined in order to determine whether they are *filocirnis* (Thomson) or *longicornis* (Walker).

SPATHOPUS Ashmead

Spathopus Ashmead, 1904 : 272. Type-species : *S. anomalipes* Ashmead, by monotypy and original designation.
Spathopus Ashmead ; Schmiedeknecht, 1909 : 270, 271–272.
Spathopus Ashmead ; Ferrière, 1934 : 86, 88.
Spathopus Ashmead ; Bouček, 1964*a* : 254–257.

This genus was little understood until Bouček (1964) discovered a new species in Europe ; this was compared by Burks with the type-specimen of *anomalipes* Ashmead, following which Bouček gave a redescription of the genus (1964 : 255–257).

Only one European species is known.

Spathopus hofferi Bouček

Spathopus hofferi Bouček, 1964*a* : 257–258, ♂ ♀.

Type material. Holotype ♀, Southern Slovakia, Kamenín near Stúrovo, on halophilous vegetation, 17.ix.1947, (*A. Hoffer*), in Národní Museum, Prague (Cat. no. 25.766). Paratypes in coll. Bouček and in Zoological Institute of the Academy of Sciences, Leningrad.

CZECHOSLOVAKIA, U.S.S.R.

Biology. Unknown.

The differences between *hofferi* and *anomalipes* Ashmead are summarized by Bouček (1964*a* : 258).

STENOPHRUS Förster

Stenophrus Förster, 1841 : 40, pl. fig. 12 a-d. Type-species : *S. compressus* Förster, by monotypy.
Calypso Haliday, 1844 : 295, **syn. n.** [*nec* Risso, 1816]. Type-species : *C. serratulae* Haliday, by monotypy.
Euryophrys Förster, 1856 : 144 [n. n. for *Calypso* Haliday *nec* Risso], **syn. n.**
Euryophrys Förster ; Ferrière, 1934 : 86, 88.
Euryophrys Förster ; Peck *et al.*, 1964 : 32.

I have not seen any specimens of the type-species of *Stenophrus, compressus* Förster, from Förster's collection in Vienna. However, the Hope Department, Oxford, possesses a Förster female labelled in his handwriting " *Stenophrus compressus* Foerst. Aachen " ; this agrees with his figures (1841, pl. fig. 12 a–d) and is taken as an indication of the true identity of the species. *Stenophrus* was treated as a synonym of *Macroglenes* Westwood by Thomson (1876 : 188), Ashmead (1904 : 389), and Schmiedeknecht (1909 : 272). Ferrière (1937) and Peck *et al.* (1964) used the name *Euryophrys* Förster for the present genus.

Stenophrus compressus Förster

Stenophrus compressus Förster, 1841 : 40, pl. fig. 12 a-d, ♂ ♀.
Calypso serratulae Haliday, 1844 : 295, ♀, **syn. n.**
Macroglenes umbellatarum Haliday, 1844 : 295, ♂, **syn. n.**
Macroglenes occultus Thomson, 1876 : 188, ♂ ♀, **syn. n.**

Type material. *Stenophrus compressus* Förster. See above under generic synonymy.

Calypso serratulae Haliday. No material so named in Haliday's collection, though in Box 67 there is a group of specimens on a card (serial No. 1984) on which is written " serratula " in Haliday's handwriting ; these are probably syntypes. BM(NH) coll. : one female, LECTOTYPE ; it is mounted on a pentagonal card and bears three labels reading (1) " Calypso serratulae Hal. ♀ " in a handwriting not that of Haliday, (2) a blue circular label " 59.4 ", (3) Waterhouse label " Calypso serratulae Haliday ".

Macroglenes umbellatarum Haliday. Haliday coll. : no material so named, but there is a card of two males and a female, with the word " jacobe " written on the card in Haliday's handwriting. These are regarded as syntypes. Haliday (1844 : 295) says of *umbellatarum* " In floribus . . . etiam Senecio Jacobeae ". BM(NH) : two Haliday specimens which are clearly syntypes of *umbellatarum* and are both labelled with this name. One of them is designated LECTOTYPE : it is mounted on a rectangular card and bears a green label " Macroglen[es] umbellata[rum] " in Haliday's handwriting ; its head is missing, but the antennae and mouth-parts have been dissected off and placed near the upper end of the card.

Macroglenes occultus Thomson. Syntypes, 8 ♂, 4 ♀. LECTOTYPE, a female labelled " Ld [Lund] 8/57 ".

BRITAIN, IRELAND, GERMANY, SWEDEN, CZECHOSLOVAKIA ; probably widely distributed in Europe.

Biology. Unknown. Haliday (1844 : 295) recorded having taken the species [as *Macroglenes umbellatarum*] on flowers of *Angelica sylvestris* and *Senecio jacobaea ;* also (ibid., as *Calypso serratulae*) on flowers of " *Serratula arvensis* ". The latter plant was undoubtedly *Cirsium arvense* (L.) Scop. ; Haliday probably used Mackay's *Flora Hibernica* (1836) in which *Serratula arvensis* L. is cited (p. 155) as a synonym of " *Cnicus arvensis* Hoffm. Creeping Plume-Thistle ". Many Pirenines visit flowers of Umbelliferae and there is probably no specific association of *compressus* with *Angelica,* but its occurrence on the other plants mentioned might be worth investigation. Imagines of *compressus* appear in July and August.

PIRENE Haliday

Macroglenes Westwood, 1832*a* : 127, **syn. n.** Type-species : *M. oculatus* Westwood, by monotypy.
Pirene Haliday, 1833 : 336. Type-species : *P. varicornis* Haliday, by designation of Westwood, 1839 : 67.
Corynocere Nees, 1834 : 123. Type-species : *C. deplana* Nees, by designation of Gahan & Fagan, 1923 : 39.
Macroglenes Westwood ; Haliday, 1844 : 295.
Pirene Haliday, 1844 : 296.
Macroglenes Westwood ; Thomson, 1876*a* : 188–189 [*ex parte*].
Pirene Haliday ; Thomson, 1876 : 189–190.
Pirene Haliday ; Schmiedeknecht, 1909 : 271, 273.
? Phocion Girault, 1925 : 91–92. Type-species : *Ph. ipswichi* Girault, by original designation.
Macroglenes Westwood ; Ferrière, 1934 : 86, 88.
Pirene Haliday ; Ferrière, 1934 : 86, 89.
Pirenisca Ghesquière, 1946 : 369 (n. n. for *Pirene* Haliday, supposedly pre-occupied by *Pyrene* Bolten, 1798].
Pirene Haliday ; Nikol'skaya, 1952 : 237.
Macroglenes Westwood ; Nikol'skaya, 1952 : 237–238.
Pirene Haliday ; Peck *et al.*, 1964 : 32.
Macroglenes Westwood ; Peck *et al.*, 1964 : 32.

Hitherto *Macroglenes* Westwood and *Pirene* Haliday have been regarded as distinct genera. Males with enlarged eyes were referred to the former genus, those with normal eyes to the latter ; females were referred to one or other genus on the basis of the number of funicular segments. Haliday (1844 : 295) defined *Macroglenes* as follows : " Palpi maxillares 4-articulati. Oculi ♂ maximi vertice approximati ", and *Pirene* (ibid. : 296) thus " Palpi maxillares 2-articulati. Labiales obsoleti ". In *Macroglenes* he included *umbellatarum* Haliday [which is now referred to *Stenophrus*], *penetrans* Kirby, and *microcerus* Haliday, giving *Pirene graminea* Haliday, 1833 as a synonym of the latter. It does not seen possible to achieve a natural arrangement of the species on the basis of the number of segments in the maxillary palpi, as suggested by Haliday. The distinction he drew between *Macroglenes* and *Pirene* does not hold good partly because he miscounted the number of segments in the maxillary palpi of some species. I have examined these structures in 9 of the species which I now refer to *Pirene.* It is not easy to ascertain the exact number of segments, because in some species one is not sure whether the most

proximal portion of the maxillary palpus is articulated to the maxilla, or whether it merely forms a process of the latter, i.e., a structure which Kutter (1934 : 21, and fig. 9) terms the " podium ". In *penetrans* (Kirby), *microcera* (Haliday), *conjungens* sp. n., and *paludum* sp. n., the " podium " is definitely articulated to the maxilla ; thus in these species the palpus is 4-segmented. On the other hand, in *eximia* Haliday, *chalybea* Haliday, *varicornis* Haliday, and *herbacea* sp. n., the podium does not seem to be distinctly articulated, hence the palpus appears to have only 3 segments. An attempt to define *Macroglenes* as having 4-segmented maxillary palpi, and *Pirene* as having them 3-segmented, results in an arrangement which cuts across other characters ; for example, *conjungens* and *paludum* would have to go in *Macroglenes* although their males do not have the enlarged eyes characteristic of the type-species of that genus.

Thomson (1876 : 188) distinguished *Macroglenes* and *Pirene* as follows :

" a) Antennae funiculi articulis 2 primis annuli formibus. Scutellum postice declive. Oculi maris rubri superne valde convergentes. *Macroglenes.*

aa) Antennae funiculi articulis saltim 3 primis annuliformibus. Scutelli frenum horizontale. *Pirene.*"

The above characters suggested by Thomson do not work out any more consistently than do the number of segments in the maxillary palpi. Two species (*bouceki* sp. n. and *conjungens* sp. n.) which should go in *Macroglenes* according to Thomson's definition of the antennal segments, have males with the normal eyes characteristic of *Pirene*. The degree of slope of the scutellar frenum also cuts across other characters.

Finally, the male of *decipiens* sp. n. has large eyes as in *Macroglenes*, the male of *conjungens* sp.n. has normal eyes as in *Pirene ;* but the females of these two species are hard to distinguish. Thus there appears to be no really satisfactory way of distinguishing the two genera, consequently I synonymize them. I have felt some doubt as to which name to use. *Macroglenes* has priority, on the other hand *Pirene* has been more often used and has also formed the basis of tribal or subfamily names, therefore I have decided that its use would be more acceptable, and am applying to the International Commission on Zoological Nomenclature for the retention of *Pirene*.

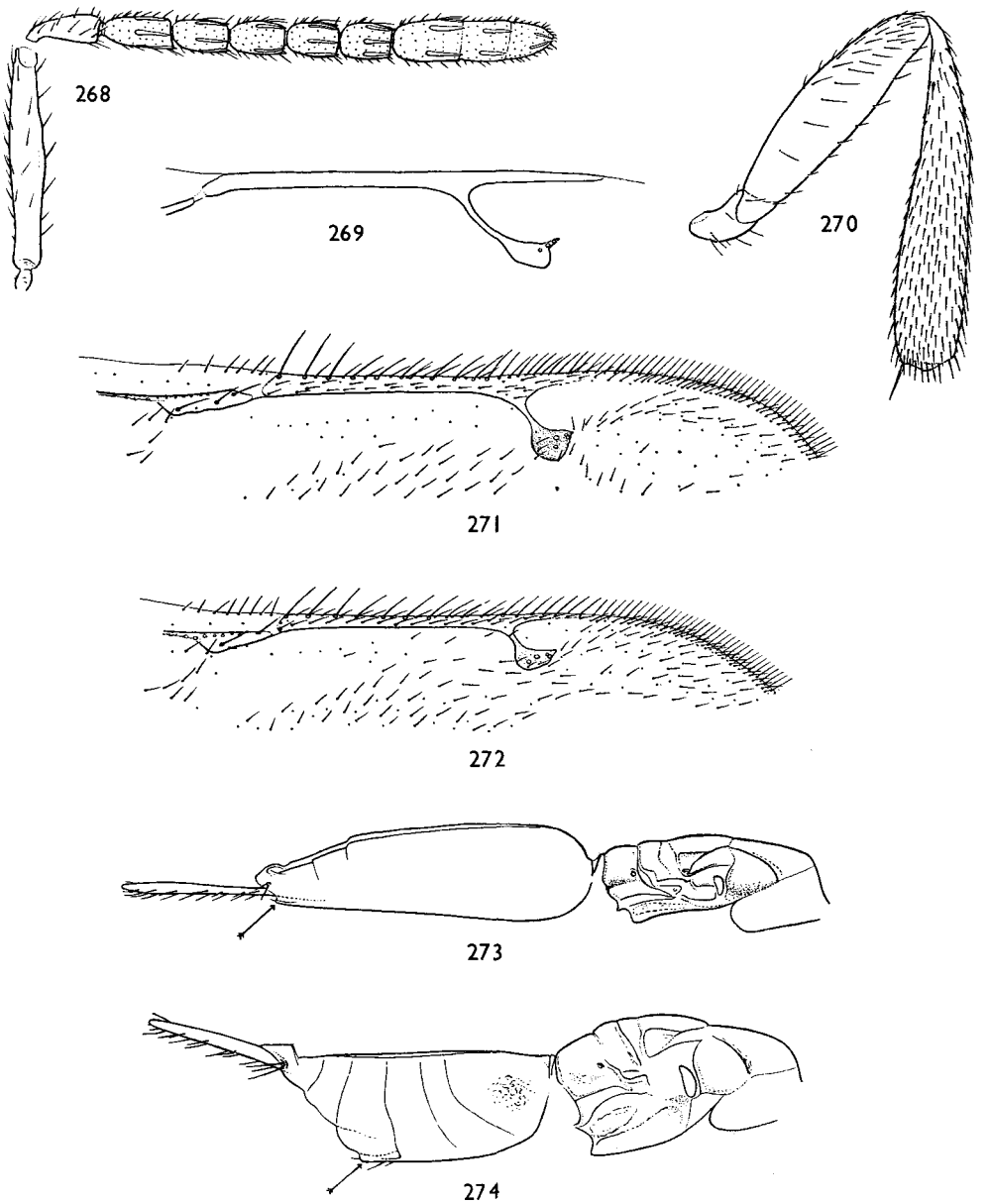
The earliest paper on the taxonomy of *Pirene* was that of Haliday (1833), in which he described four species ; the descriptions, although brief, are excellent. His revision of *Pirene* and *Macroglenes* (1844) contributed some valuable information. Thomson's account (1876) of *Pirene* added nothing of real value, and in fact introduced some errors because he wrongly associated the sexes of some species. Since the time of Haliday there has been no critical revision of the species of *Pirene* (including *Macroglenes*) and one is badly needed. In my keys to the species I have utilized many characters which have previously been used ; but a new one, the " pecten " (a row of specialized hairs on the inner aspect of the hind tibiae) is now introduced. The head provides some good structural characters, but unfortunately it very often collapses after death unless the specimens are specially prepared, and

in such cases the characters are obscured. In spite of this I have used the size and shape of the eyes in my key to species, as additional characters for separating the males of *microcera* (Haliday) from those of *graminea* Haliday, and the males and females of *decipiens* sp. n. from those of *penetrans* (Kirby). The specimens on which these head characters were measured have been left overnight in the vapour of ethyl acetate ; this procedure often ensures that the head retains its normal proportions, and only specimens in which this was the case were utilized. The gaster in many males, and in some females, is more or less strongly compressed after death ; but this feature is not constant, being dependent on the condition of the internal organs in the gaster at the time the specimens are killed. At one stage in my studies on *Pirene* it occurred to me that perhaps dimorphism might occur in the males of some species, with respect to the relative size of the eyes. This now seems to me unlikely.

KEY TO EUROPEAN SPECIES

(FEMALES)

1		Antenna (Text-fig. 276) with third to fifth flagellar segments large and provided with sensilla. Fore wing with speculum, on lower surface, nearly effaced by scattered hairs, on upper surface small and not extending beyond level of middle of marginal vein. Hind tibia without a pecten. Thorax depressed, the surfaces of the mesoscutum, scutellum, and propodeum all lying in virtually the same plane ; gaster oval, hardly as long as thorax, ovipositor sheaths not projecting . . . . . ***bouceki*** sp. n. (p. 350)
–		Antennae (Text-figs. 277–278) with at most the fourth and fifth flagellar segments large and provided with sensilla. Fore wing with speculum, on lower surface, at most partly effaced, on upper surface large and extending, as a bare strip below the marginal vein, as far as the stigmal vein. Hind tibia with at least a slightly developed pecten. Thorax often strongly arched dorsally ; if nearly as strongly depressed as in the above, then the ovipositor sheaths project very distinctly, and sometimes the gaster is relatively longer 2
2	(1)	Antenna (cf. Text-fig. 279) with fourth flagellar segment neither anelliform nor much shorter than the fifth, with sensilla 3
–		Antenna (Text-figs. 277, 278) with fourth flagellar segment anelliform without sensilla, often much shorter than the fifth 5
3	(2)	Eyes larger, 1·3 to 1·33 times as long as broad. Larger species, 1·55 to 1·8 mm. Head and thorax with fairly strong greenish to bluish metallic reflections. Fore wing (upper surface) with speculum extending right to the stigmal vein ; beyond the stigma an area which is almost or quite devoid of hairs (see Text-fig. 271) . . . . . ***penetrans*** (Kirby) (p. 341)
–		Eyes smaller, 1·4 to 1·45 times as long as broad. Smaller species, 1·2 to 1·4 mm. Head and thorax with weaker metallic reflections, which are usually bluish or bronze 4
4	(3)	Upper surface of fore wing with a bare or almost bare strip which extends from the stigma for some distance towards the apex of the wing, but on the under surface of the wing the strip is effaced by scattered hairs ?***decipiens*** sp. n. (p. 342)
–		Upper surface of fore wing without a distinct bare strip in this position (as in Text-fig. 272) . . . . . ***conjungens*** sp. n. (p. 344)
5	(2)	Ovipositor sheaths (Text-fig. 273) exserted to a length almost or quite equal to that of the hind tibia ; gaster, not counting the ovipositor, nearly 1·5 times as long as the thorax, with the tip of the hypopygium very nearly or

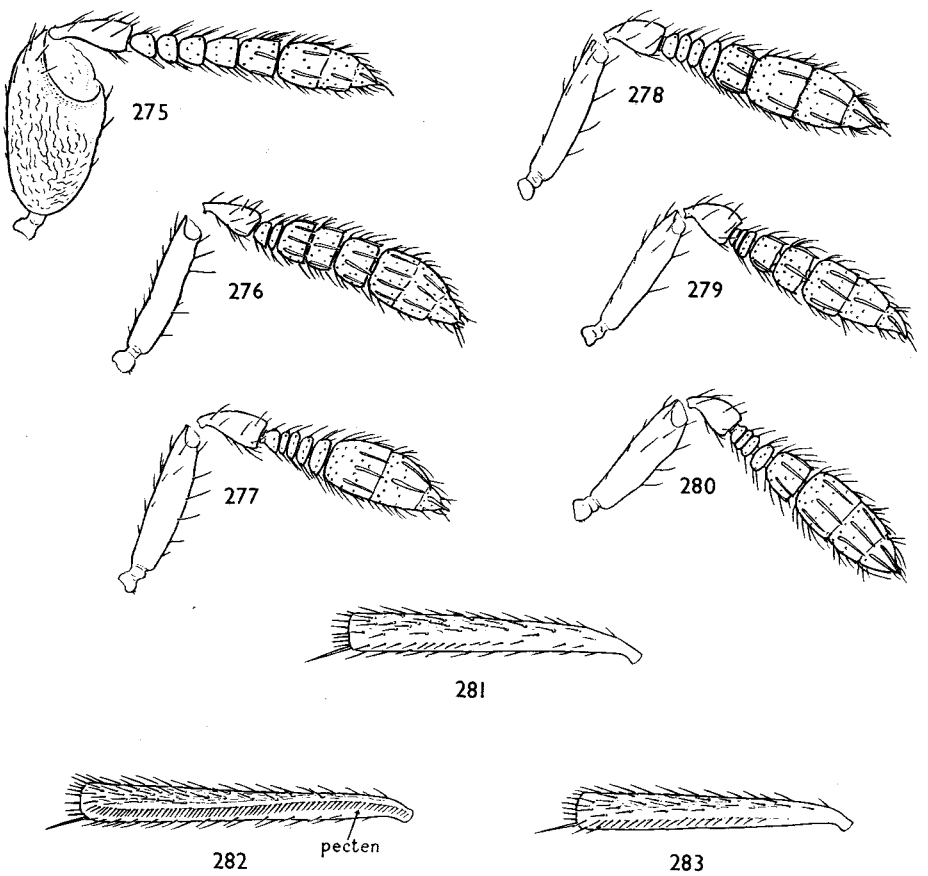


FIGS. 268–274. 268. *Ecrizotes longicornis* (Walker), ♀, antenna ; 269, same, fore wing venation ; 270, same, ♂, hind leg, excluding coxa and tarsus ; 271, *Pirene penetrans* (Kirby), ♂, fore wing, part ; 272, *Pirene conjungens* sp. n., ♂, fore wing, part ; 273, *Pirene eximia* Haliday, ♀, body excluding head, profile ; 274, *Pirene paludum* sp. n., ♀, body excluding head, profile (tip of hypopygium indicated by arrow).

quite level with the tip of the last tergite ; thorax in profile (Text-fig. 273) only slightly arched dorsally, the scutellum flat or nearly so ; head and thorax black with weak bluish and bronze reflections ***eximia*** Haliday (p. 345)

– Ovipositor sheaths rarely exserted to a length more than slightly over half that of the hind tibia ; if somewhat more than this (Text-fig. 274), then the gaster is relatively shorter, the tip of the hypopygium does not lie so near the apex of the gaster, the thorax in profile is distinctly arched dorsally, and the head and thorax are metallic green, blue- or bronze-green . . . 6

6 (5) Antenna (Text-fig. 277) with fifth flagellar segment without sensilla, and with only one, sometimes slightly irregular, row of bristles, twice or rather more than twice as broad as long, short, its length varying from hardly one third to less than half that of the first claval segment. Gaster, not counting



FIGS. 275–283. *Pirene* spp. 275, *bouceki* sp. n., ♂, antenna ; 276, same, ♀, antenna ; 277, *varicornis* Haliday, ♀, antenna ; 278, *paludum* sp. n., ♀, antenna ; 279, *conjungens* sp. n., ♂, antenna ; 280, *herbacea* sp. n., ♂, antenna ; 281, *paludum* sp. n., ♂, left hind tibia, inner aspect ; 282, *penetrans* (Kirby), left hind tibia, inner aspect ; 283, *graminea* Haliday, ♀, left hind tibia, inner aspect.

the ovipositor sheaths, as long as or slightly longer than head plus thorax ; ovipositor sheaths exserted to a length equal to half that of the hind tibia or slightly more. Head and thorax black with weak metallic reflections ***varicornis*** Haliday (p. 348)

– Antenna (Text-fig. 278) with fifth flagellar segment with sensilla and with two to three rows of bristles, at most about 1·5 times as broad as long . . 7

7 (6) Fore wing with basal cell with a large patch of hairs in its apical portion, on upper surface of wing ; exserted part of ovipositor sheaths (Text-fig. 274) two thirds to three quarters the length of the hind tibia. Antenna (Text-fig. 278) with flagellar segments one to four relatively less transverse, their combined length equal to or even slightly greater than the length of the pedicellus. Head and thorax conspicuously metallic, green, blue-green, or bronze-green . . . . . ***paludum*** sp. n. (p. 345)

– Fore wing with basal cell with only a few hairs in its distal portion, most of them on the basal vein ; exserted part of ovipositor sheaths at most slightly more than one third the length of the hind tibia. Antenna (cf. Text-figs. 279, 280) with flagellar segments one to four relatively more transverse, their combined length at least slightly less than the length of the pedicellus. Head and thorax sometimes with only weak metallic reflections . . 8

8 (7) Thorax in profile only weakly arched dorsally, scutellum appearing flat or nearly so ; gaster with tip of hypopygium situated nearly level with the apex of the last tergite. Eyes 1·6 to 1·65 times as long as broad. Flagellar segments one to three distinctly separated from each other ***chalybea*** Haliday (p. 349)

– Thorax in profile rather more distinctly arched, scutellum slightly convex ; tip of hypopygium not so near the level of the apex of the gaster. Eyes 1·4 to 1·5 times as long as broad. Flagellar segments one to three closely compacted as in *conjungens* (cf. Text-fig. 279), sometimes virtually fused . . 9

9 (8) Hind tibial pecten hardly developed, much as in ♂ *paludum* (Text-fig. 281). Head and thorax with strong greenish to blue reflections ; knees distinctly testaceous . . . . . ***herbacea*** sp. n. (p. 346)

– Hind tibial pecten (Text-fig. 283) well-developed and regular, extending over whole length of tibia except its proximal quarter. Head and thorax with weak bluish reflections, sometimes stronger on head ; at least mid and hind knees not or hardly at all pale . . . . ***graminea*** Haliday (p. 347)

(MALES)

1 Fore wing with speculum, on lower surface, nearly effaced by scattered hairs, on upper surface small and not extending farther than middle of marginal vein. Antenna (Text-fig. 275) characteristic ; clava distinctly shorter than the funicle ; flagellar segments not transverse, or at most the three proximal ones slightly so ; scape strongly swollen, with an apical excision which extends more than one third down the scape. Hind tibia without a pecten. Eyes small, with facets of uniform size ; separated from the posterior ocelli by fully twice the diameter of an ocellus ***bouceki*** sp. n. (p. 350)

– Fore wing with speculum, on lower surface, at most partly effaced, on upper surface large and extending, as a bare strip below the marginal vein, as far as the stigmal vein. Antenna (Text-figs. 279, 280) with clava as long as or longer than the funicle ; at least the three proximal flagellar segments quite strongly transverse ; scape often slender, but if strongly swollen, then its apical excision extends hardly one third down the scape. Hind tibia with at least a slightly developed pecten (Text-figs. 281–283). Eyes sometimes enlarged 2

2 (1) Eyes unusually large, touching or almost touching the posterior ocelli, separated by only half their length or less ; malar space from rather more than one quarter, to nearly one third, the length of an eye ; eye-facets of unequal size, those in the upper part of the eye larger than those of the lower part. Ocelli in a nearly equilateral triangle. Legs with the knees black or only very indistinctly pale. Antennal scape not strongly swollen . . . 3

– Eyes of normal size, separated from the posterior ocelli by fully the major diameter of an ocellus or rather more, the distance between the eyes about equal to their length ; eye-facets of uniform size. Ocelli in a right- or obtuse-angled triangle. Malar space fully one third the length of an eye or somewhat more. Legs with the knees more or less distinctly testaceous. Antennal scape sometimes swollen 6

3 (2) Antenna with fourth flagellar segment very much shorter and narrower than the fifth, less than half as long, without sensilla 4

– Antenna with fourth flagellar segment much larger than the third, at least slightly more than half as long as the fifth, with sensilla, and with bristles arranged in two to three irregular rows 5

4 (3) Antenna with segments one to three of flagellum distinctly separated from each other, their combined length about three quarters that of the pedicellus ; segment four not much larger than three, the funicle much as in ♀ *paludum* (Text-fig. 278). Eyes 1·5 to 1·55 times as long as broad ; only their upper half, or barely as much, with larger facets ; average diameter of these large facets 23–25μ ; upper part of eye with moderately short hairs. Stigma of fore wing subtriangular, subsessile, fuscous ***microcera*** (Haliday) (p. 343)

– Antenna with segments one to three of flagellum closely applied to each other as in *conjungens* (cf. Text-fig. 279), sometimes hardly distinguishable as separate segments, their combined length less than half that of the pedicellus ; segment four somewhat larger than three. Eyes 1·3 to 1·41 times as long as broad ; at least rather more than the upper half, to rather more than two thirds, of the eye has larger facets ; average diameter of these large facets 28–33μ ; upper part of eye with extremely short hairs. Stigma of fore wing sometimes petiolate, occasionally subcircular ***graminea*** Haliday (agg.) (p. 347)

5 (3) Eyes moderately large, 1·35 to 1·5 times as long as broad ; the upper half, or hardly more, of the eye has larger facets than the part below this. Head and thorax black with hardly any metallic tinge. Fore wing with stigma tending to be subtriangular (as in Text-fig. 272). Relatively smaller species, length 1·2 to 1·5 mm. . . . . ***decipiens*** sp. n. (p. 342)

– Eyes very large, only 1·15 to 1·25 times as long as broad ; the upper two thirds to nearly three quarters of the eye has larger facets than the part below this. Head and thorax with a rather strong bluish to greenish tinge. Fore wing (Text-fig. 271) with stigma tending to be subcircular. Relatively large species, length 1·4 to 1·9 mm. . . . ***penetrans*** (Kirby) (p. 341)

6 (2) Antennal scape not strongly swollen, at least rather more than three times as long as broad 7

– Antennal scape strongly swollen, only 2 to 2·3 times as long as broad . . 10

7 (6) Antenna (Text-fig. 279) with fourth flagellar segment nearly as large as the fifth, the latter about 1·3 times as broad as long. Fore wing, Text-fig. 272 ***conjungens*** sp. n. (p. 344)

– Antenna (Text-fig. 280) with fourth flagellar segment much smaller than the fifth 8

8 (7) Fore wing with basal cell with a large patch of hairs at its apex, on the upper surface of the wing. Head and thorax conspicuously metallic, green to

blue- or bronze-green. Antennal clava with a strong constriction between its first and second segments ; flagellar segments one to four not very dissimilar in size, their combined length as great as that of the pedicellus.

Hind tibial pecten (Text-fig. 281) hardly developed ***paludum*** sp. n. (p. 345)

– Fore wing with basal cell with at most two rows of hairs on the basal vein. Head and thorax less conspicuously metallic. Antennal clava with a weaker constriction between its first and second segments . . . 9

9 (8) Antenna (Text-fig. 280) with fifth flagellar segment quadrate or only slightly transverse ; flagellar segments one to three rather smaller than four, the combined length of one to four rather less than that of the pedicellus. Thorax relatively more arched dorsally. Hind tibial pecten hardly developed, much as in *paludum* sp. n. (Text-fig. 281) . ***herbacea*** sp. n. (p. 346)

– Antenna with fifth flagellar segment nearly or quite twice as broad as long ; segments one to four not very dissimilar in size, much as in Text-fig. 278, their combined length as great as that of the pedicellus. Thorax weakly arched, the upper surfaces of the scutellum, dorsellum, and propodeum lie in nearly the same plane. Hind tibial pecten nearly as well-developed as in *penetrans* (cf. Text-fig. 282) but more irregular basad and usually not quite reaching the base of the tibia . . . . . ***eximia*** Haliday (p. 345)

10 (6) Antenna : fifth flagellar segment with sensilla, and with bristles arranged in two rows, one half to three quarters as long as the first claval segment, distinctly longer than the fourth flagellar segment, at most 1·6 times as broad as long. Fore wing relatively shorter and broader, about 2·1 to 2·3 times as long as broad . . . . . ***chalybea*** Haliday (p. 349)

– Antenna : fifth flagellar segment without sensilla, with bristles arranged in a single row, one third or slightly more than one third as long as the first claval segment, not or only slightly longer than the fourth flagellar segment, rather more than twice as broad as long. Fore wing relatively long and narrow, about 2·4 to 2·5 times as long as broad . ***varicornis*** Haliday (p. 348)

Pirene penetrans (Kirby)

(Text-figs. 271, 282)

Ichneumon penetrans Kirby, 1800 : 109, pl. 4, figs. 10, 11, ♂ ♀.
Macroglenes oculatus Westwood, 1832 : 127, ♂.
Macroglenes penetrans (Kirby) Haliday, 1844 : 295, ♂ ♀.
Macroglenes penetrans (Kirby); Curtis, 1860 : 283.
Macroglenes brevicornis Thomson, 1876 : 189, ♀ (*ex parte* (lectotype)], **syn. n.**
Macroglenes umbellatarum Ferrière, 1934 : fig. 1d [*nec* Haliday, 1844].
Macroglenes penetrans (Kirby); Johansson, 1936 : 4–6, figs. 1, 2, ♂ ♀.
Macroglenes penetrans (Kirby); Peck, 1963 : 637.

Type material. *Ichneumon penetrans* Kirby. No specimens which can be definitely identified as the original material of *penetrans* exist in the BM(NH) ; there is a series of 4 old specimens but 3 of these are Walker specimens and one is a Haliday specimen. In Westwood's collection in Oxford there is one very ancient female specimen, with a blue label and another reading " penetrans", which might possibly be part of Kirby's original material. In this connection it is relevant to note that Curtis, who was the first subsequent author to redescribe and figure *penetrans*, published an interesting note (1860 : 283) as follows " Mr. Westwood . . . has examined Mr. Kirby's original specimen of *Ichneumon penetrans*, and informs me

that it is identical with his genus *Macroglenes* . . ." Curtis's description and figures (1860 : 283 and Plate J, figs. 3 [♂], 4 [♀]) are good enough to identify his *penetrans* as being the present one. In view of these facts, it is possible that the female in Westwood's collection is the type of *penetrans*. Unless contrary evidence is forthcoming it seems appropriate to regard it as such.

Macroglenes oculatus Westwood. A male stands below a pink label " MACROGLENES Westw. in Phil. Mag." and above a white label " MACROGLENES oculatus Westw." It is mounted on a card and bears a pink label " oculatus Westw." All these labels are written in Westwood's handwriting. This male is designated LECTOTYPE ; it lacks the antennae, apart from the scape of the left antenna, but is otherwise intact. Some other *Pirene*, including two males of *oculatus*, stand below the lectotype, and might be syntypes (hence the labelled male is designated lectotype although it might actually have been the holotype).

Macroglenes brevicornis Thomson. In Thomson's series, only 3 specimens (1 ♂, 2 ♀) are labelled with the correct locality (Ringsjön). The male disagrees with the description and is a *Stenophrus*. One female has the body hardly metallic and the ovipositor sheaths not projecting far enough. The other female is greenish-tinged and has a more strongly exserted ovipositor, hence it is designated LECTOTYPE ; it bears a label " Rsio " (Ringsjön). The head of the lectotype is broken off, but the specimen shows a combination of small characters which indicate that it is certainly the same as *penetrans* (Kirby).

In the male of *penetrans* the hind tibial pecten (Text-fig. 282) extends virtually or quite to the base of the tibia, and is composed of numerous regularly disposed hairs which stand out nearly at right angles. In the female the pecten is absent in the basal third or so of the tibia, and its hairs are rather less regularly disposed.

EUROPE (widely distributed and common) ; CANADA.

Biology. Originally reared from *Contarinia tritici* (Kirby) ; in the BM(NH) there is a series bred in 1936 from the same host in Southern Sweden by E. Johansson; reared from *Sitodiplosis mosellana* (Géhin) in Southern Sweden by E. Johansson 1936) and from the same host in Ottawa, Canada (see Peck, 1963 : 637). Johansson gave some notes on the life-history. Imagines appear June–August ; they often visit the flowers of *Angelica sylvestris* L., *Rubus* spp., and other plants.

Pirene decipiens sp. n.

♂. Colour as in *conjungens* sp. n., but the marginal, stigmal and especially the postmarginal veins are paler brown, although the stigma itself tends to be fuscous. The mid and hind tarsi are blackish, or obscurely testaceous medially. The metallic (bluish) tinge of the head and thorax is very weak. Length 1·3 to 1·5 mm.

Head in front view slightly broader than high ; eyes large, separated by a distance which is hardly equal to half their own length, 1·35 to 1·5 times as long as broad ; the facets in about the upper half, or hardly more, of the eye are large, the remaining facets are small ; ocelli placed in a nearly equilateral triangle, the posterior ones almost touching the eyes ; malar space nearly one third the length of an eye. Antennae similar to those of *conjungens* (cf. Text-fig. 279).

Thorax in profile strongly arched dorsally, the scutellum appearing convex. Mesoscutum with notaulices deep, both it and the scutellum with very delicate engraved sculpture. Fore wing similar to that of *conjungens*, but its upper surface with a bare or nearly bare strip extending from the stigma some distance towards the apex of the wing. Hind tibial pecten complete and regular, much as in *penetrans* (cf. Text-fig. 282).

Gaster very strongly compressed, almost knife-like.

The male of *decipiens* resembles even more closely that of *penetrans* (Kirby), from which it differs in the characters given in my key. The eyes are separated by a distance which varies from rather more than one third to a half of their own length, whilst in male *penetrans* they are separated by rather less than one third of their own length ; this character, however, can only be measured in specimens which have the head undistorted.

Holotype ♂. ENGLAND : Buckinghamshire, Hell Coppice, near Oakley, 2.viii.1953 (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 2 ♂ ; IRELAND : Co. Wicklow, coast near Bray Head, 1 ♂, 16.viii.1954, the Glen of the Downs, 1 ♂, 23.viii.1954 (*Graham*), in Graham collection.

I have taken some females which may belong to this species in two of the above localities (Hell Coppice ; the Glen of the Downs). They differ from females of *penetrans* (Kirby) in being smaller (length 1·2–1·4 mm.), with only weak metallic reflections on the head and thorax, the eyes slightly smaller and the malar space slightly longer. The mid and hind tarsi are testaceous with their tips brown, sometimes brownish dorsally on segments 3–5 ; in British specimens of *penetrans* the mid and hind tarsi are brown to fuscous with at most segments 1–4 more or less testaceous beneath. These small distinctions may be valid, but it seems advisable to postpone describing females of *decipiens* until they can be definitely associated with the males by breeding.

Biology. Unknown.

Pirene microcera (Haliday) **comb. n.**

Macroglenes microcerus Haliday, 1844 : 295, ♂ [*nec* ♀].

Type material. Syntypes in the BM(NH) and in Haliday collection. BM(NH) : one male, certainly a Haliday specimen, with a small green square label, also a Waterhouse label " Macroglenes microcerus Haliday ". Haliday coll., box 23, one male (No. 1662) with a green label " microcerus " in Haliday's handwriting, also a modern label " Ireland, Haliday " ; I select this male as LECTOTYPE. The syntype in BM(NH) is conspecific with it.

I have seen no other males which agree in structure with the syntypes of *microcerus*, and have not been able to identify the female. The latter might be expected to differ from that of *graminea* in the characters of segments 1–3 of the antennal flagellum, in the same way as their respective males (see key to males). Haliday (1844 : 295) synonymized his *Pirene graminea*, 1833 (described from the female only) with *microcerus*, of which he evidently knew only the male. However, I have

associated (I believe correctly) with the female of *graminea* a male which differs from that of *microcerus*.

The hind tibial pecten in the male of *microcera* resembles that of male *penetrans*.

IRELAND.

Biology. Unknown. Imagines June–July.

Pirene conjungens sp. n.

(Text-figs. 272, 279)

♂. Black, with weak metallic reflections, mainly bluish but some bronze, on the body, antennal scape, coxae, femora, and tibiae. Mandibles partly reddish. Knees hardly paler than the rest of the legs ; tarsi fuscous, or the mid and hind ones obscurely testaceous proximally. Wings subhyaline, venation fuscous ; tegulae dark. Length 1·2 to 1·75 mm.

Head in front view slightly broader than high ; eyes separated by a distance about equal to their own length, 1·4 to 1·45 times as long as broad, their facets of uniform size ; posterior ocelli separated by about their own major diameter from the eyes ; malar space about half the length of an eye. Antenna (Text-fig. 279) with scape relatively slender, about 4·5 times as long as broad ; pedicellus distinctly less than twice as long as broad ; flagellar segments one to three, especially one and two, very short and strongly transverse, anelliform, without sensilla ; four moderately large, with sensilla, about 1·5 times as broad as long ; five similar to four but slightly larger ; clava somewhat longer than pedicellus plus funicle.

Thorax in profile fairly strongly arched dorsally, the scutellum appearing convex. Mesoscutum and scutellum with very delicate engraved sculpture. Fore wing slightly more than twice as long as broad ; basal cell, on upper surface of wing, with only one to two hairs besides those on the basal vein ; marginal vein 4 to 4·7 times as long as the stigmal vein ; stigma moderate-sized, tending to have a subtriangular shape ; upper surface of wing without a bare strip extending distad from the stigma. Legs rather slender ; hind tibial pecten similar to that of ♀ *graminea* (cf. Text-fig. 283), not extending into the basal quarter of the tibia, its hairs moderately regularly disposed.

Gaster moderately to fairly strongly compressed, narrower than the thorax.

♀. Differs from the male as follows :

Length about 1·25 mm. Antennal scape rather more slender, about five times as long as broad. Gaster about as long as, but narrower than, the thorax, somewhat depressed dorsally but strongly keeled ventrally ; ovipositor sheaths exserted to a length about equal to the first segment of the hind tarsus ; hypopygium extending about three quarters of the distance from the base of the gaster to the tips of the ovipositor sheaths.

The ♂ of *conjungens* differs from those of all the other species of the genus, except *penetrans* and *decipiens* sp. n., in having the fourth flagellar segment large and provided with sensilla. From these two species, which otherwise it most resembles, it differs in its relatively small eyes having facets of uniform size, broader frontovertex and longer genae.

The ♀ of *conjungens* is very close to those of *penetrans* and *decipiens* sp. n., differing only in the small characters given in the key (q.v.).

Holotype ♂. ENGLAND : Gloucestershire, Hallen Wood, near Bristol, 25.x.1928 (*B. N. Blood*), in Hope Department, University Museum, Oxford.

Paratypes. ENGLAND : Cumberland, Skirwith, 1 ♂, 31.vii.1953 (*H. Britten*) ; Oxfordshire, Otmoor, 1 ♀, 27.viii.1955, 1 ♂, 15.ix.1956 (*Graham*) ; Wiltshire, near

Salisbury, 1 ♂, 1.ix.1962 (*Graham*). IRELAND : Co. Kildare, Royal Canal, 1 ♂, 5.viii.1951 (*A. W. Stelfox*), in Manchester Museum and Graham collections.

Biology. Unknown.

Pirene eximia Haliday

(Text-fig. 273)

Pirene eximia Haliday, 1833 : 338, ♀.
Pirene eximia Haliday, 1844 : 296, ♀.
Pirene eximia Haliday ; Thomson, 1876 : 190, ♀ [*nec* ♂].

Type material. Syntypes (2 ♀) in BM(NH). LECTOTYPE, the second specimen which bears a small green ticket, indicating Irish origin. There are several specimens belonging to the same species in Haliday's collection, but not labelled as *eximia*, therefore possibly not syntypes.

The hind tibial pecten of male *eximia* resembles that of male *penetrans* except that towards the base of the tibia its hairs are rather less numerous, and neither so closely nor so regularly spaced. The pecten of the female resembles that of female *graminea* (cf. Text-fig. 283).

BRITAIN, IRELAND ; apparently rare.

Biology. Unknown. Imagines in July.

Pirene paludum sp. n.

(Text-figs. 274, 278, 281)

♀. Head and thorax with fairly bright metallic reflections, green, blue- or bronze-green ; gaster with less intense tints which tend to be bluish. Antennae black, with slight metallic reflections which are most distinct on the scape and pedicellus ; tip of the scape pale ; radicula, and apex of pedicellus, sometimes testaceous. Mandibles testaceous with their teeth darker. Palpi testaceous. Coxae concolorous with the thorax ; trochanters fusco-testaceous, the fore ones sometimes testaceous. Legs otherwise fuscous with the following parts testaceous : fore femora at apex or mainly, apices of mid and hind femora narrowly, bases and apices of tibiae, of the fore tibiae broadly, of the mid and hind tibiae narrowly ; tarsi slightly paler beneath. Sometimes the inner aspect of the fore tibiae is testaceous, or the whole tibiae are of this colour except for a dark mark on their outer aspect. Tegulae metallic. Wings hyaline ; venation testaceous. Length (including ovipositor sheaths) 1·7 to 2 mm.

Head in front view slightly broader than high ; eyes separated by somewhat more than their own length, about 1·5 times as long as broad ; malar space slightly more than one third the length of an eye. Antenna (Text-fig. 278) with scape, minus radicula, nearly five times as long as broad, slightly shorter than an eye ; pedicellus in profile not quite twice as long as broad ; flagellar segments one to four small and anelliform, without sensilla, their combined length about equal to that of the pedicellus, all subequal in length, but the fourth a little broader than the others ; segment five large, slightly transverse, up to 1·5 times as broad as long, provided with sensilla, and with two to three irregular rows of bristles ; clava nearly as long as pedicellus plus funicle, about 2·5 times as long as broad, with a rather strong constriction between its first and second segments ; bristles of flagellum not unusually long.

Thorax in profile (Text-fig. 274) distinctly arched dorsally. Mesoscutum and scutellum with delicate, though distinct, engraved sculpture. Fore wing about 2·2 times as long as broad ;

costal cell rather narrow, its front margin slightly concave ; basal cell, on upper surface of wing, with a patch of several hairs in its distal portion ; marginal vein, not including the parastigma, 6 to 6·5 times as long as the stigmal vein, the latter forming a moderately acute angle with the postmarginal vein ; stigma small, subtriangular ; postmarginal vein about as long as the stigmal ; fringe of apical margin long, its longest bristles equal to or greater than the length of the stigmal vein. Legs rather slender ; hind tibial pecten (cf. Text-fig. 281) hardly developed.

Gaster (Text-fig. 274) about as long as head plus thorax, more or less, though not strongly, compressed ; hypopygium extending to between two thirds and three quarters of its length ; exserted portion of ovipositor sheaths two thirds to three quarters the length of the hind tibiae.

♂. Differs from the female as follows :

Legs tending to be more extensively pale ; sometimes the fore tibiae, occasionally also the fore femora, are wholly testaceous ; tarsi sometimes more or less testaceous. Antennal scape slightly broader, hardly four times as long as broad. Gaster hardly longer, but much narrower, than the thorax, strongly compressed. Pecten of hind tibia slightly more developed (Text-fig. 281).

Holotype ♀. SCOTLAND : Mid Perth, Killin, 7.vii.1952, swept in a marshy place near Finlarig Castle (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, many ♂♂ and ♀♀ (*Graham*). ENGLAND : Yorkshire, Askham Bog, 2 ♂, 12.vii.1953 (*W. D. Hincks*), in Graham collection and Manchester Museum.

Biology. Unknown.

This is a very distinct species, easily recognizable by the conspicuously metallic tints of the head and thorax, combined with the large patch of hairs in the distal part of the basal cell of the fore wing, and the ovipositor sheaths of the female which are more strongly exserted than in all the other species with the exception of *eximia* Haliday.

Pirene herbacea sp. n.

(Text-fig. 280)

♀. Resembles that of *paludum* sp. n., but differs as follows :

Antennae darker, the scape and pedicellus not distinctly pale-marked. Legs darker ; only the knees and sometimes the tips of the tibiae narrowly, testaceous ; tarsi sometimes testaceous beneath.

Antennae with flagellar segments one to three relatively a little smaller, distinctly smaller than four, the combined length of segments one to four at least slightly less than that of the pedicellus (as in Text-fig. 280) ; segment five quadrate or at most very slightly transverse ; clava slightly longer, nearly as long as pedicellus plus funicle. Fore wing : basal cell, on upper surface of wing, with only one or two hairs distally besides those on the basal vein and the adjacent parts of the cubital vein ; marginal vein only about five times as long as the stigmal vein. Ovipositor sheaths less exserted, their projecting portion at most slightly more than one third the length of the hind tibia.

♂. Differs from the female as follows :

Antenna (Text-fig. 280) with scape slightly more expanded, hardly four times as long as broad. Gaster hardly longer, but much narrower, than the thorax, strongly compressed.

The eyes resemble those of the female in having their facets of uniform size, and are 1·5 to 1·6 times as long as broad.

Holotype ♂. ENGLAND : Berkshire, Wytham, 29.vi.1951, swept in a damp

meadow between Wytham Wood and the River Isis (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 1 ♂, 29.vi.1951, 1 ♂, 3 ♀, 11.vii.1951 (*Graham*) ; Buckinghamshire, Hell Coppice, near Oakley, 2 ♂, 24.vi.1958 (*Graham*) ; Oxfordshire, Otmoor, 3 ♂, 6.vii.1962 (*Graham*), in Graham collection.

Biology. Unknown.

P. herbacea appears to be most closely related to *paludum* sp. n., from which it differs in having the basal cell of the fore wing less pilose distally, fourth flagellar segment distinctly larger than third, fifth segment quadrate or only slightly transverse, ovipositor of female less strongly exserted. The male might be confused with that of *eximia* Haliday, from which it differs in the characters noted in the key to males. The female is extremely close to that of *graminea* Haliday, differing only in the small features given in the key to females.

Pirene graminea Haliday (agg.)

(Text-fig. 283)

Pirene graminea Haliday, 1833 : 338, ♀.
Macroglenes microcerus Haliday, 1844 : 295 [*ex parte* (♀)].

Type material. In the BM(NH) 9 specimens, mounted on two cards, stand as *graminea ;* but in my opinion they are probably not Haliday material.

In Haliday's collection, Box 23, there is a female (No. 1661) with a green label " graminea " in Haliday's handwriting and a modern label " Ireland, Haliday " ; I designate it LECTOTYPE.

Haliday (1844 : 295) synonymized *graminea* with his *Macroglenes microcerus* (of which he evidently knew only the male). However, I have been able to associate with the female of *graminea* several males which differ from those of *microcera ;* hence I regard the two as valid species, although the female of *microcera* is still unknown. The males which I regard as those of *graminea* are rather variable as regards the size of the eyes and of their facets, and in the shape of the stigma of the fore wing. Possibly this is within the range of variation of a single species, but it may be worth while to note its details. The males which I have measured seem to fall into two forms, as follows :

(1) Eyes 1·3–1·32 times as long as broad ; large facets in upper part 30–33μ in diameter. Stigma of fore wing moderate-sized, tending to be subcircular, more distinctly petiolate than that of ♂ *microcera.*

(2) Eyes 1·4–1·41 times as long as broad ; large facets 28–29 μ in diameter. Stigma of fore wing subcircular to triangular, sometimes nearly as large as in ♂ *microcera,* sometimes only shortly petiolate.

The hind tibial pecten of the males of *graminea* (agg.) resembles that of *penetrans.* The pecten of the female is illustrated in Text-fig. 283.

Britain, Ireland. I have examined specimens from the following localities : England, Berkshire, Wytham, 1 ♂, 11.vii.1951 ; Lancashire South, Formby Moss,

♂♂, ♀♀, 29.vi.1962 ; Oxfordshire, Marston Ferry, ♂♂, ♀♀, 19.vi.1961 ; Otmoor, 1 ♂, 6.vii.1962. I have also captured males and females in other localities, but the sexes not taken together in these cases.

Biology. Unknown. The species, identified as *graminea* Hal., whose morphology and biology were described by Kutter (1934 : 16–62) was not *graminea*, but *chalybea* Haliday (q.v.). I have captured imagines of *graminea* (agg.) in the field from June to August.

Pirene varicornis Haliday

Pirene varicornis Haliday, 1833 : 337, ♂ ♀.
Corynocere deplana Nees, 1834 : 123, ♀.
Pirene varicornis Haliday, 1841–1842 : vi, pl. N, fig. 3, ♂ ♀.
Pirene varicornis Haliday, 1844 : 296, ♂ ♀.
Pirene varicornis Haliday ; Thomson, 1876 : 189–190, ♂ ♀.
Pirene varicornis Halliday ; Dalla Torre, 1898 : 216.
Pirene varicornis Haliday ; Ferrière, 1934 : fig. 1e.

Type material. *Pirene varicornis* Haliday. Syntypes as follows : BM(NH) : 1 ♂, 5 ♀ ; the females are all mounted on one octagonal card, bear a green label " varicornis " in Haliday's handwriting and on the lower surface of the card (in pencil) " 567 " ; I have selected and marked one female as LECTOTYPE. Haliday coll. : several males and females, but only 4 are labelled *varicornis* (two pairs, bearing my serial numbers 1 and 7).

Corynocere deplana Nees. Amongst Westwood's MSS. there is a small sheet of paper with some pencil sketches of the holotype ♀ of *deplana* (now lost). The sketches comprise an enlarged figure of the whole insect ; one of the antenna on a larger scale, against which Westwood has written, with a bracket pointing to the first three segments of the funicle " I am not sure whether there are 3 or 4 jts here Haliday says 4 " ; also a sketch, to the same scale, of the antenna, copied from Nees' own drawings (" fm. Esenbeck's drawings "). At the bottom Westwood has written " Corynocere deplana Esenb. 2. 123 [Pirene Hal. Ent. Mag. 1. 337] drawn from Esenbeck's unique specimen ". From these figures I would say that *deplana* could only have been a female of *Pirene varicornis* Haliday.

The hind tibial pecten in the male and female of *varicornis* much resembles that of the corresponding sexes in *chalybea* (q.v.).

BRITAIN, IRELAND, SWEDEN ; probably widely distributed in Europe. In the British Isles it is fairly common although the male, as Haliday remarked, is rare. I find it most abundantly in damp meadows.

Biology. In BM(NH) there is a female *varicornis* reared in Southern Sweden, in 1936, from *Contarinia tritici* (Kirby). Haliday (1833 : 338) said that the female could be found commonly on the flowering panicles of *Anthoxanthum*. Imagines June–July.

Pirene chalybea Haliday

Pirene chalybea Haliday, 1833 : 338, ♀ [*nec* ♂].
? Corynocere brevicornis Nees, 1834 : 124, ♀.
Pirene rubi Haliday, 1844 : 296, ♀, **syn. n.**
Pirene chalybea Haliday, 1844 : 296, ♀.
Pirene Scylax Walker, 1848 : 106, 162, ♂, **syn. n.**
? Pirene eximia Haliday ; Thomson, 1876 : 190 [*nec* ♀].
Pirene graminea Kutter, 1934 : 16–62 [*nec* Haliday 1833].
Pirene chalybea Haliday ; Johansson, 1936 : 6 [*ex parte*].

Type material. *Pirene chalybea* Haliday. Syntypes in BM(NH), one female (probably not a Haliday specimen) and 2 ♂ ; Haliday coll., Box 23, a female (No. 1663) labelled " Ireland, Haliday ", also several other males and females which are not labelled as *chalybea*. Haliday's description of the female is more detailed than that of the male ; hence I choose as LECTOTYPE the female in Haliday's collection (No. 1663).

Corynocere brevicornis Nees. Types now lost. I surmise that this species may have been the same as *chalybea*.

Pirene rubi Haliday. Haliday's description (1844 : 295) states " Abdomine ♀ depressiusculo thoracis longitudine " but gives no characters for the male, hence a female must be chosen as lectotype. In BM(NH) there is only one male labelled as *rubi* but as just remarked, Haliday did not describe this sex. Assuming that he had correctly associated the sexes of *rubi*, I assembled those males in his collection which agreed with the male in the BM(NH), together with all the females conspecific with these males. Amongst these specimens in Haliday's collection there is a batch of males and females (Nos. 1767–1773) mounted on a card which bears the word " Rubus " in his handwriting ; I consider them to be syntypes of *rubi* and designate a female (No. 1770) as LECTOTYPE.

Pirene scylax Walker. One male in BM(NH), LECTOTYPE, bearing a Waterhouse label.

The hind tibial pecten of male *chalybea* extends over the distal two-thirds of the tibia ; its hairs are regularly disposed in the distal part, but more irregularly basad, much as in female *graminea*, Text-fig. 283. The pecten of the female is less regular than that of the male, though more regular than that of *paludum*.

BRITAIN, IRELAND (common), GERMANY, SWITZERLAND, SWEDEN ; probably widely distributed in Europe.

Biology. Kutter (1934) gave a lengthy account of the morphology and biology of this species (under the name *graminea* Hal.) ; he reared it in the Rheintal province of Switzerland as an endophagous parasite of *Contarinia pisi* (Winn.). In BM(NH) there is a series of specimens reared in July 1931 from this locality, evidently representing part of Kutter's material ; these specimens are *chalybea* Haliday, and not *graminea*. Probably the species recorded under the name *graminea*, as a parasite of the same host in Germany (Secretariat, etc. 1966 : 120, 130) was also *chalybea* ; the material was determined by Delucchi, who had not seen the type of *graminea*. In BM(NH) there are also series of *chalybea* swept from a field of peas, on 27.vii and

2.viii.1956, at Crowle, North Lincolnshire (*D. Lomas*) ; and others reared in southern Sweden in 1936, from *Contarinia tritici* (Kirby) by E. Johansson. The latter evidently had a mixed series included in his record (1936) of *chalybea*, only part of which represented the true *chalybea ;* he stated that in *chalybea* the antennae were similar in both sexes, i.e., that the scape in the male was not swollen. This error can be traced back to Thomson (1876 : 190) who stated under *chalybea* " scapo ♂ haud dilatato ", he had associated the male of some other species with the female of *chalybea*. I have also examined a male of *chalybea* reared in England (Lincolnshire, Fulstow, 1956) from *Dasyneura viciae* (Kieffer) on *Vicia tetrasperma* (L.) Schreb. (*C. J. Guile*). Imagines appear in the field June–August. Kutter (1934) stated that there are two generations per annum, although the second may be incomplete because some larvae may overwinter.

***Pirene bouceki* sp. n.**

(Text-figs. 275–277)

♀. Shiny, black, with a faint bronze tinge in places. Mandibles, knees, tips of tibiae very narrowly, and tarsi proximally, brownish testaceous. Wings hyaline, or faintly brownish in the middle ; venation fuscous. Length 1·3 to 1·4 mm.

Head much compressed antero-posteriorly, hence in dorsal view appearing very short and strongly transverse, with the temples extremely short ; in frontal view slightly broader than high, unless abnormally collapsed after death. Edge of occiput, just behind the ocelli, rather sharp, probably not a post-mortem phenomenon. Eyes about 1·7 times as long as broad, sometimes relatively longer owing to shrinkage of head, separated by about 1·25 times their length, rather sparsely pilose, the length of the hairs fully 1·5 times the diameter of the ocular facets. Ocelli in an obtuse-angled triangle, but this is not easy to see because of the collapse of the frons ; POL about equal to OOL. Malar space slightly less than half the length of an eye. Antennae (Text-fig. 276) with scape shorter than an eye, about six times as long as broad ; pedicellus in profile 1·7 to 1·8 times as long as broad, about as long as flagellar segments one to three together ; flagellum fusiform, with its first and second segments anelliform, transverse, about equal in length, but the second segment slightly broader than the first ; segments three to five subequal in length and breadth, slightly transverse, provided with sensilla ; clava about twice as long as broad, slightly longer than the three preceding flagellar segments together ; flagellum clothed with rather short hairs.

Thorax depressed, the surfaces of the mesoscutum, scutellum, dorsellum, and propodeum all lying in virtually the same plane. Pronotum narrowing strongly forwards, somewhat shorter than the mesoscutum. Mesoscutum fully twice as broad as long, nearly flat, with delicate engraved (alutaceous) sculpture ; its mid lobe with six suberect bristles, four in an anterior transverse row and two posteriorly, occasionally a seventh bristle anteriorly. Scutellum about as broad as long, nearly flat, shiny, nearly smooth ; frenal groove weak or subobsolete ; six bristles present, two very near the front margin of the scutellum, two posteriorly, and one on each axillula. Dorsellum long, semicircular, smooth. Propodeum nearly horizontal, more than half as long as the scutellum, smooth, without a median carina ; spiracles circular, close to the metanotum ; callus with one to three bristles. Legs rather short and fairly stout ; hind tibia without a pecten. Fore wing slightly more than twice as long as broad ; lower surface of costal cell with scattered hairs in the distal half, upper surface with a row of eight to ten hairs in the distal third ; basal cell, on upper surface of wing, pilose in its distal third, on the lower surface of the wing with some hairs below the submarginal vein ; speculum on upper surface narrow but extending below the marginal vein for nearly half the length of the latter, on lower

surface of wing effaced by scattered hairs ; surface beyond the speculum rather thickly pilose throughout ; marginal vein 4·5 to 6 times as long as the stigmal vein ; stigma moderate-sized, slightly longer than high ; postmarginal vein fairly distinct, nearly or just as long as the stigmal vein.

Gaster oval, nearly as long as but slightly narrower than the thorax, sunken dorsally, not much compressed laterally, hence about as broad as high, carinate ventrally ; hypopygium very long, its tip situated at about five sixths the length of the gaster, or more ; tips of ovipositor sheaths just visible in profile but not projecting beyond the level of the apex of the last tergite.

♂. Differs from the female as follows :

Malar space half the length of an eye. Antennae (Text-fig. 275) with scape strongly swollen, only about twice as long as broad, as long as an eye, with a deep membrane-lined excavation in the upper part of its front surface, for the reception of the pedicellus ; pedicellus nearly as long as flagellar segments one to four, in profile about 2·5 times as long as broad, but flattened dorso-ventrally so that in dorsal view it appears only about 1·6 times as long as broad ; first flagellar segment subquadrate and slightly longer than the second segment, the latter slightly transverse, third segment subquadrate and about as long as the first ; fourth slightly larger than the third ; fifth distinctly longer than the fourth, quadrate or slightly longer than broad ; the fifth segment is provided with sensilla, the other segments lack them (there may be one sensillum on the fourth segment, but I am not quite sure). Thorax not quite so flattened, the dorsal surface being slightly arched and the scutellum weakly convex. Gaster oval, shorter than but almost as broad as the thorax, flattened dorso-ventrally.

Holotype ♀. CZECHOSLOVAKIA : Praha-Bohnice, 4.viii.1965 (*Z. Bouček*), in National Museum, Prague.

Paratypes. CZECHOSLOVAKIA : Bohemia, Kytín (Brdy), 1 ♀, vii.1959 (*J. Maček*) ; Praha-Bohnice, 1 ♂, 4.viii.1965 (*Z. Bouček*) ; Luka pod mednikem, 1 ♀, 4.vii.1954 (*Z. Bouček*), in National Museum, Prague.

ENGLAND : Oxfordshire, Otmoor, 1 ♂, 5.vi.1958, on a flower-head of *Angelica sylvestris* L. (*Graham*), in Graham collection.

I have great pleasure in naming this species after my friend, Dr. Bouček.

The female of *bouceki* differs from all the other described species of *Pirene* in having three of the flagellar segments provided with sensilla (in the other species at most two segments have sensilla) and in having the speculum of the fore wing nearly effaced on the lower surface of the wing, whilst on the upper surface it extends barely half way along the marginal vein (in the other species it is at most partly effaced on the lower surface, whilst on the upper surface it extends at least as a narrow bare strip below the marginal vein as far as the stigmal vein). The pecten of the hind tibia is not developed ; it is at least slightly developed in the other species.

The male of *bouceki* differs from all the other described *Pirene* in its rudimentary speculum (as in the female) ; in having at most the first three flagellar segments slightly transverse, the other segments being subquadrate ; the clava distinctly shorter than the funicle ; the excision at the apex of the scape much larger than in any other species, extending more than one third down the scape. The pecten of the tibia is not developed. In all the other species, either the antennal scape is not swollen, or if strongly swollen, then the apical excision extends less than one third down the scape ; the clava is as long as or longer than the funicle : at least three of

the flagellar segments are quite strongly transverse ; and the pecten of the hind tibia is at least slightly developed.

From *Stenophrus compressus* Förster, the new species differs in the characters given in the key ; also in its strongly flattened thorax, in having the ocelli disposed in an obtuse-angled triangle, and in lacking a pecten on the hind tibia. The male of *bouceki* also differs from *compressus* in having the eyes small and widely separated, remote from the ocelli, their facets of uniform size ; the scape strongly swollen, with a large distal excavation ; the proximal segments of the flagellum at most slightly transverse ; and the clava shorter than the funicle. The female of *bouceki* also differs from that of *compressus* in having shorter and less conspicuous hairs on the eyes.

At first I thought that *bouceki* might be referred to *Stenophrus*, but now consider it better placed in *Pirene*. It must be admitted, however, that these two general are pretty close to one another.

Biology. Unknown.

PTEROMALINAE

This is regarded as the central subfamily of Pteromalidae ; it is the largest, and includes a formidable number of genera. The other subfamilies are for the most part distinguished from it by more positive characters which are given in my key to subfamilies. Pteromalinae, however, show less positive characters, for which reason not attempt is made here to give a formal definition of the group. The main difficulty which the worker may encounter is that of distinguishing certain Miscogasterinae from Pteromalinae, because in such cases the characters given in the key are rather slight. The majority of Miscogasterinae have the notauli complete, though sometimes superficial posteriorly. Most Pteromalinae have the notauli incomplete ; of the genera which have complete notauli, only four (*Perniphora, Dorcatomophaga, Coruna, Platecrizotes*) have them sharply impressed throughout, whilst in the others they are superficial posteriorly. Many Miscogasterinae have two distinct apical spurs on each hind tibia, whilst the majority of Pteromalinae have only one spur. In Miscogasterinae this character is correlated to some extent with absolute size, larger species having as a rule two spurs, small species only one ; most Sphegigasterini, however, have only one spur irrespective of size, whilst Micradelini, Termolampini and Pirenini also have one spur. Sphegigasterini have a conspicuous, distinctly sculptured gastral petiole, which is found in only a few genera of Pteromalinae. Micradelini, Termolampini, Pirenini, and nearly all Ormocerini have only 12 antennal segments, whilst nearly all Pteromalinae have 13 antennal segments. The various exceptions to the above general rules are allowed for in the keys and it is hoped that careful attention to the other characters used will ensure correct identification in most cases.

I have not found it practicable to divide Pteromalinae into tribes ; it may be possible to do so when the genera are surveyed on a wider basis.

Key to European Genera

(Females)

1 Brachypterous forms 2

– Macropterous forms 4

2 (1) Antennal clava (Text-fig. 299) acute apically, with a terminal stylus ; propodeum as long as or slightly longer than scutellum, with a large reticulate nucha which projects well beyond the bases of the hind coxae ; legs including coxae, and gaster more or less, reddish yellow. Antennae with three anelli and five funicular segments. Wing rudiments not projecting beyond propodeal nucha, truncate apically ***CALLITULA*** Spinola (p. 458)

– Antennal clava obtuse or subobtuse apically. Propodeum sometimes shorter or without a distinct nucha. Coxae dark, or only partly pale ; gaster not pale-marked 3

3 (2) Propodeum only about half as long as scutellum, its nucha represented merely by a lunate or triangular area which is weakly sculptured or smooth ; occiput not margined ; antennae with three anelli and five funicular segments . . . . . ***MERAPORUS*** Walker (p. 681)

– Propodeum longer than half the scutellum, with a moderate-sized to large strongly reticulate nucha ; occiput margined except sometimes in small specimens ; antennae most often with two anelli and six funicular segments . . . . . ***EUPTEROMALUS*** Kurdjumov (p. 737)

4 (1) Flagellum (Text-fig. 284) aberrant, with a slightly curved finger-like process at the tip ; there are two anelli, followed by seven flagellar segments which are not clearly differentiated into funicle and clava ; marginal vein of fore wing very thick, only three to five times as long as broad ***RHAPHITELUS*** Walker (p. 420)

– Flagellum rarely with a terminal process, if so (*Norbanus*, *Picroscytoides*, *Callitula*, *Homoporus*) then the process (Text-figs. 299, 301) is pointed, and the flagellum is clearly differentiated into funicle and clava ; whilst except in some *Homoporus*, the marginal vein is not thickened . . . 5

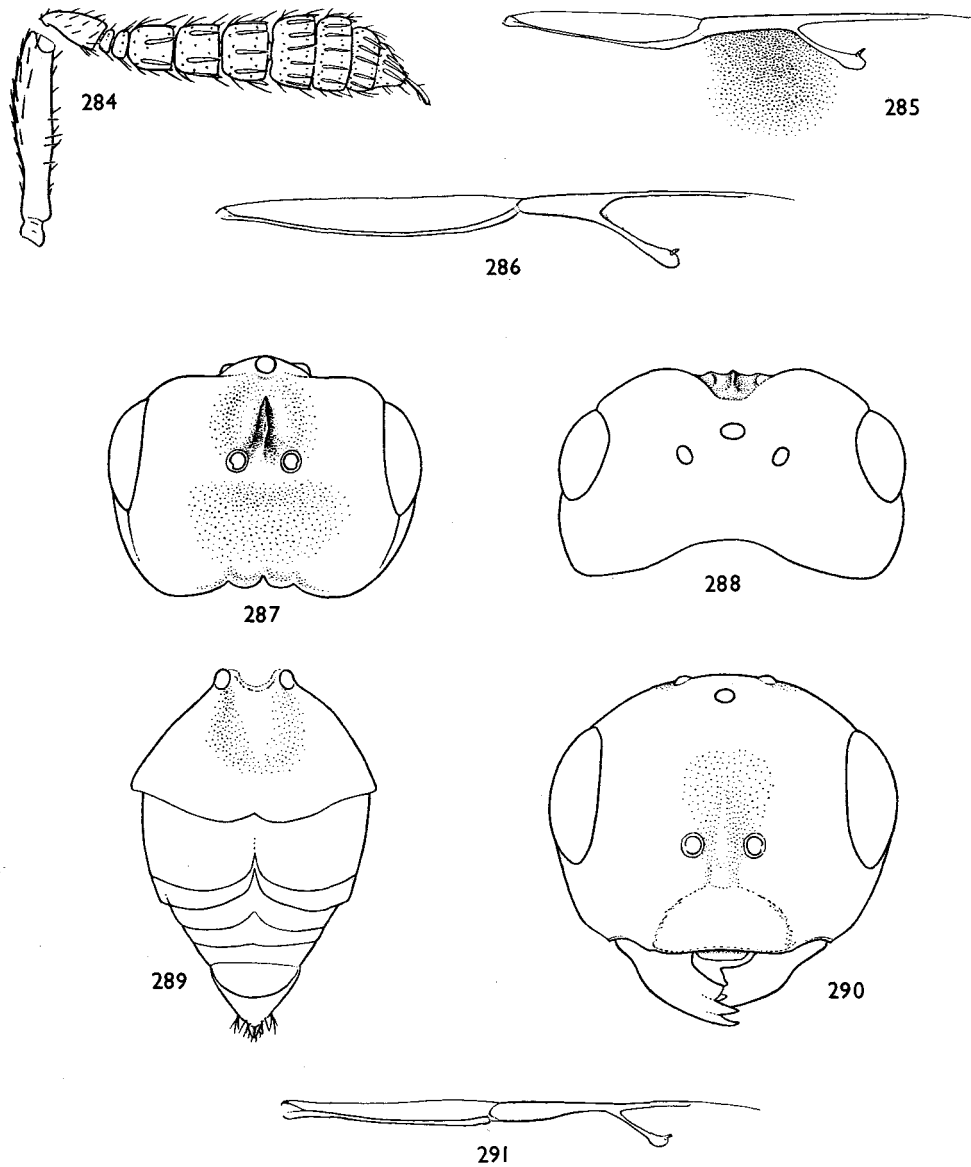
5 (4) Antennae with funicle fuscous, clava white. Marginal vein of fore wing rather thick, about three times as long as the stigmal vein. Funicular segments subquadrate, or the distal ones slightly transverse ; clava three-segmented, not acute at apex. Propodeum shiny, nearly smooth ***NEANICA*** Erdös (p. 422)

– Antennae rarely with funicle dark and clava contrastingly pale. In such cases the clava is yellowish, and either the marginal vein is only slightly longer than the stigmal vein and the funicular segments are longer than broad ; or else the antennal clava is acutely pointed, and the propodeum distinctly sculptured 6

6 (5) Fore wing with marginal vein (Text-figs. 285, 286, 323) considerably thickened throughout, usually only three to five (occasionally six) times as long as broad, sometimes a little thicker at its apex than at its base. . . . 7

– Fore wing with marginal vein either not or only slightly thickened, at least about seven times as long as broad ; or thickened only in its proximal half (Text-fig. 291) 14

7 (6) Antennae with first anellus somewhat longer than broad, longer than the second anellus ; clava, and sometimes distal segments of the funicle, yellow. Pronotum more or less, and all coxae, yellow. First tarsal segment of mid and hind legs very elongate, about nine times as long as broad and two fifths the length of the hind tibia.



FIGS. 284–291. 284, *Rhaphitelus maculatus* Walker, ♀, antenna ; 285, *Homoporus chalcidiphagus* (Walsh & Riley), ♀, fore wing venation ; 286, *Pachyneuron formosum* Walker, ♀, fore wing venation ; 287, *Perniphora robusta* Ruschka, ♀, head ; 288, *Xiphydriophagus meyerinckii* (Ratzeburg), ♀, head ; 289, *Psilocera atra* (Walker), ♀, gaster ; 290, *Habritys brevicornis* (Ratzeburg), ♀, head ; 291, *Muscidifurax raptor* Girault & Sanders, ♀, fore wing venation.

Fore wing with a diffuse brown discal cloud which sometimes touches the marginal vein, the latter about five times as long as broad
PANDELUS Förster (p. 422)

– Antennae with anelli more or less transverse ; clava not yellow. Pronotum and coxae usually dark, rarely more or less yellow. First tarsal segment of mid and hind tarsi almost always relatively shorter 8

8 (7) Fore wing with postmarginal vein at least slightly shorter than the marginal vein, and at most slightly longer than the stigmal vein ; post-spiracular sclerite, and dorsal surface of hind coxae, with some hairs ; notauli incomplete. Clypeus mainly reticulate . ***METACOLUS*** Förster (p. 418)

– Fore wing with postmarginal vein nearly always at least slightly longer than, rarely only as long as, the marginal vein ; postspiracular sclerite, and dorsal surface of hind coxae, bare ; notauli complete or incomplete. Clypeus, except in some *Homoporus*, radiately strigose 9

9 (8) Antennal clava acute or acuminate apically ; fore wing with a fuscous cloud below the marginal vein ; genae not sharp ***HOMOPORUS*** Thomson (p. 444)

– Antennal clava not acute apically ; fore wing immaculate ; genae usually with a sharp edge 10

10 (9) Notauli complete, deep throughout ; gaster in dorsal view appearing clavate, its basal tergite narrow and nearly twice as long as broad ; speculum of fore wing, on lower surface of wing, more or less effaced by scattered hairs ; stigma moderately large ; anterior margin of clypeus angularly produced
CORUNA Walker (p. 845)

– Notauli either incomplete or, if complete, then superficial posteriorly ; gaster not clavate, the basal tergite in dorsal view not longer than broad ; speculum of fore wing not effaced ; stigma large or small ; clypeus often otherwise 11

11 (10) Mesopleuron entirely reticulate ; antennae inserted level with ventral edge of eyes ; pronotal collar not margined ; notauli sometimes complete. Antennal formula 11353 . . ***PACHYCREPOIDEUS*** Ashmead (p. 846)

– Mesopleuron with a smooth shiny triangular area below the base of the hind-wing ; antennae inserted at least slightly above the level of the ventral edge of the eyes ; pronotal collar nearly always margined ; notauli incomplete. Antennal formula usually 11263 (11353 in some *Pachyneuron*) 12

12 (11) Gaster dorsally usually more or less sunken, or flat, discally ; if somewhat convex, then the anterior margin of the clypeus is produced and bluntly pointed medially . . . . . ***PACHYNEURON*** Walker (p. 830)

– Gaster strongly convex dorsally. Anterior margin of clypeus emarginate medially, sometimes rather deeply so 13

13 (12) Apical margin of fore wing ciliate ; postmarginal vein fully 1·5 times as long as the stigmal vein . . . . . ***EUNEURA*** Walker (p. 843)

– Apical margin of fore wing bare ; postmarginal vein less than 1·5 times as long as the stigmal vein . . . . . ***GYGAXIA*** Delucchi (p. 845)

14 (6) Face just below level of antennal toruli with a conspicuous blunt crest on each side, the face below this strongly excavated ; a strong crest present between the toruli ; head massive, though only slightly broader than thorax, with temples long ; pronotum large ; hind femora strongly swollen ; antennal formula 11353 (Central Asia) ***NIKOLSKAYANA*** Bouček (p. 429)

– Face without crests below antennal toruli, at most weakly excavated. The other characters not all present in combination 15

15 (14) Notauli traceable, at least as a superficial line, as far as the hind margin of the mesoscutum, but often distinctly and quite deeply impressed throughout 16

– Notauli not nearly reaching the hind margin of the mesoscutum . . . 18

16 (15) Marginal vein of fore wing rather abruptly thickened in its proximal half, much as in *Muscidifurax* (Text-fig. 291) ; antennae 11353, inserted at least slightly below the level of the ventral edge of the eyes ; thorax much depressed, scutellum nearly flat . . ***PLATECRIZOTES*** Ferrière (p. 848)

– Marginal vein of fore wing thickening only slightly and gradually from apex to base ; either the antennal formula and insertion otherwise, or else thorax not depressed 17

17 (16) Frons (Text-fig. 287) with a strongly raised crest between the antennal scrobes ; face slightly concave ; hind tibia with two spurs, of which the outer one is short but very thick ; clypeus (Text-fig. 287) large, its anterior margin with a pair of large rounded lobes ; notauli distinctly impressed throughout ; hind femora strongly swollen, excluding the trochantellus, only about 2·5 times as long as broad ; antennae with two anelli and six funicular segments . . . . . ***PERNIPHORA*** Ruschka (p. 428)

– Frons with at most a weak crest between the antennal toruli ; hind tibia with only one (the innermost) apical spur ; anterior margin of clypeus of different form ; except in *Dorcatomophaga*, which sometimes has three anelli and five funicular segments, the notauli are very superficial posteriorly and the hind femora are not so strongly swollen . . . 18

18 (17) Head massive, in dorsal view (Text-fig. 288) less than twice as broad as long, with the temples fully three quarters as long as the small eyes ; POL equal to OOL ; malar space three quarters the length of an eye ; mesopleuron wholly reticulate ; scrobes rather deep, with a crest or tubercle between the antennal toruli . . . ***XIPHYDRIOPHAGUS*** Ferrière (p. 426)

– Either the head is less massive or, if it approaches the above in form (Text-fig. 304) then POL is slightly greater than OOL ; the mesopleuron has a more or less smooth area below the base of the hind wing ; and either the temples are relatively shorter, or the scrobes are shallow without a crest or tubercle between the toruli 19

19 (18) Clypeus (Text-fig. 290) extremely large, its breadth fully equal to the distance separating its lateral border from the adjacent eye, reticulate, its anterior margin not sinuate laterally but weakly emarginate over its whole breadth ; labrum partly visible ; POL slightly less than OOL ; antennae with three anelli and five funicular segments ; hind tibiae with two spurs, the second quite strong ; mesopleuron wholly reticulate

HABRITYS Thomson (p. 427)

– Not having the above combination of characters. Clypeus nearly always relatively smaller, if approaching the above in size then it is more or less strigose with its anterior margin sinuate laterally, whilst the labrum is concealed, POL is not less than OOL, the antennae have two anelli and six funicular segments, and the hind tibiae have only one spur . . . 20

20 (19) Ovipositor far exserted, the length of the exserted portion of its sheaths at least half that of the hind tibia ; antennae with three anelli and five funicular segments 171

– Ovipositor sheaths rarely so far exserted, if so then the antennae have two anelli and six funicular segments. 21

21 (20) Gastral tergites one to five more or less, sometimes deeply, incised in the middle of their hind margin (Text-fig. 289) ; antennal clava (Text-figs. 339–341) with a large area of micropilosity ; flagellum more or less strongly clavate, either with two anelli and six funicular segments, or with three anelli and five funicular segments ; anterior margin of clypeus bidentate ;

propodeum with at least some trace of a transverse costula ; body bluish or bronze-black ; mandibles similar, both with three acute teeth
PSILOCERA Walker (p. 462)

– Either at most the first gastral tergite is incised posteriorly ; or if the hind margin of some of the following tergites is slightly emarginate, then the antennal clava has only a small area of micropilosity, and the other characters do not all agree with the above 22

22 (21) Second flagellar segment large, quadrate, only slightly shorter than the third, usually provided with sensilla ; marginal vein of fore wing thickened in its proximal half (Text-fig. 291) ; head protuberant at level of antennal toruli, face receding almost horizontally ; antennal scape very long, much longer than an eye . . ***MUSCIDIFURAX*** Girault & Saunders (p. 822)

– Second flagellar segment usually small and anelliform without sensilla ; if approaching the third segment in size, then the marginal vein of the fore-wing is not thickened 23

23 (22) Antennae with two anelli and six funicular segments 24

– Antennae with three anelli and five funicular segments 168

24 (23) Postmarginal vein of fore wing (Text-figs. 293, 294, 296) approximately equal in length to, or even slightly shorter than, the stigmal vein. In most species either the gaster is subcircular, or else the apical margin of the fore wing lacks cilia at least over a short space between the postmarginal vein and the tip of the wing 25

– Postmarginal vein of fore wing at least slightly longer than the stigmal vein 38

25 (24) Head compressed antero-posteriorly, hence appearing very transverse in dorsal view (2·2 to 2·3 times as broad as long); thorax flattened, distinctly broader than high, hardly arched dorsally ; scutellum virtually flat in the longitudinal axis, broader than long, very shiny discally where its sculpture is obsolescent . . . . . ***PLATNEPTIS*** Bouček (p. 800)

– Head not so compressed, in dorsal view at most about twice as broad as long ; thorax more or less distinctly arched dorsally, if only weakly so then the scutellum is distinctly reticulate all over 26

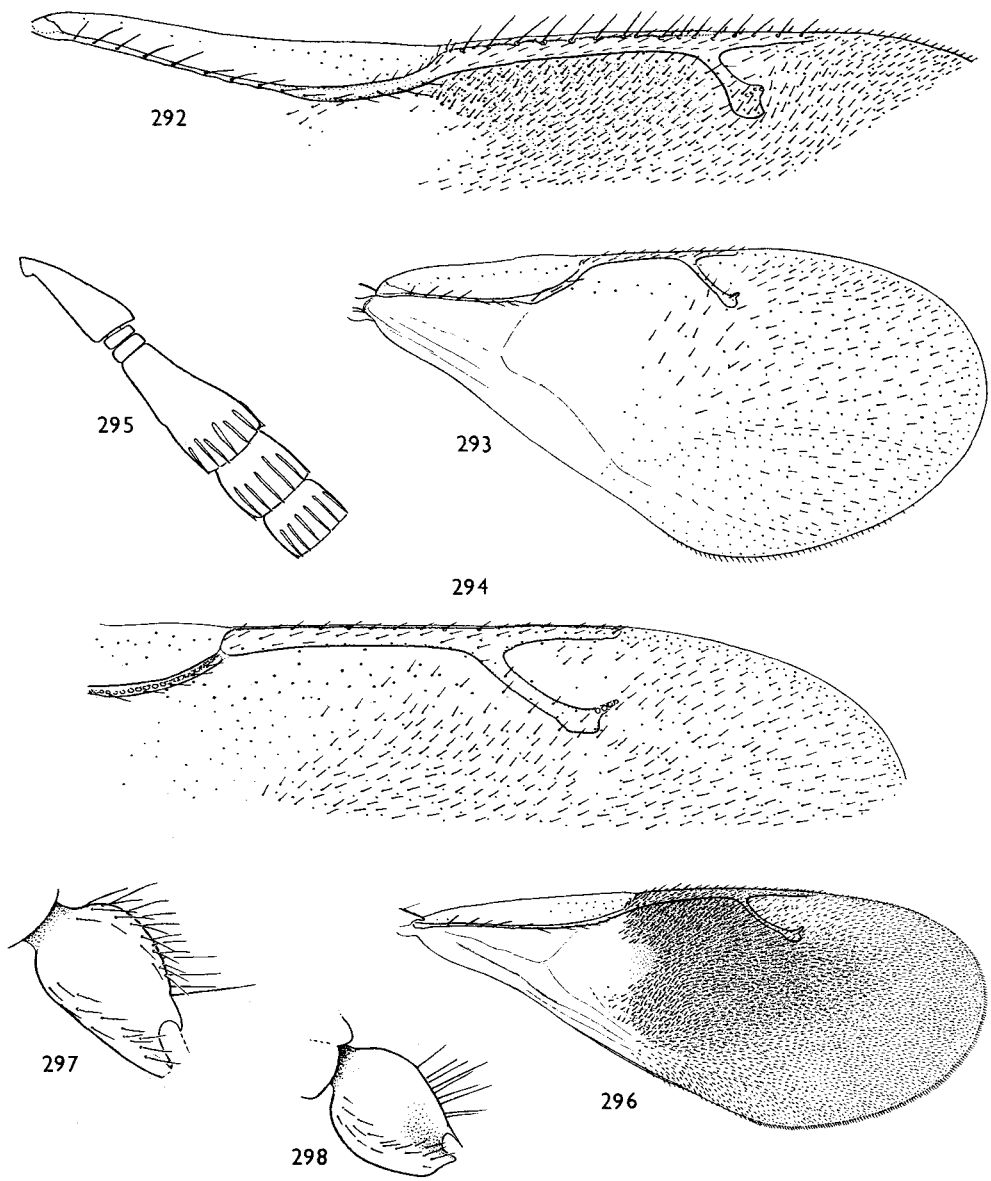
26 (25) Propodeum with a distinct, strongly reticulate nucha ; mesoscutum and scutellum with delicate, for the most part engraved, reticulation
cf. ***NASONIA*** (p. 799)

– Propodeal nucha represented by a sublunate strip which is weakly sculptured, transversely aciculate, or with reticulation having areoles elongated in the transverse axis ; mesoscutum and scutellum having reticulation at least slightly raised above the general surface 27

27 (26) Marginal vein of fore wing (Text-fig. 292) 3·5 to 4 times as long as the stigmal vein ; wing beyond the speculum, and especially below the marginal vein, densely pilose ; POL about twice OOL ; hind corners of propodeum prominent, almost dentiform. Antennae inserted below level of ventral edge of eyes ; flagellum slender, hardly stouter than the pedicellus. Gaster broad, subcircular . . . . ***STICHOCREPIS*** Förster (p. 822)

– Marginal vein of fore wing at most three times as long as the stigmal vein ; if as much as three times, then the wing is less densely pilose below the marginal vein, POL is distinctly less than twice OOL, and the hind corners of the propodeum are not prominent, often also the gaster is ovate 28

28 (27) Eyes with rather long and conspicuous hairs. Antennal flagellum strongly clavate ; clava ventrally with a large area of micropilosity which extends nearly to its base. Fore wing with basal cell more or less extensively pilose; speculum rather small, closed below ; apical margin of wing ciliate. Occiput margined. Gaster subcircular . ***DIGLOCHIS*** Förster (p. 782)



FIGS. 292–298. 292, *Stichocrepis armata* Förster, ♂, fore wing, part ; 293, *Schizonotus latus* (Walker), ♀, fore wing ; 194, *Dibrachys cavus* (Walker), ♀, fore wing, part ; 295, *Conomorium patulum* (Walker), ♀, pedicellus and proximal segments of flagellum ; 296, *Erdoesina alboannulata* (Ratzeburg), ♀, fore wing ; 297, *Trichomalus posticus* (Walker), ♀, left hind coxa, profile ; 298, *Habrocytus musaeus* (Walker), ♀, left hind coxa, profile.

– Eyes bare or with relatively short inconspicuous pubescence. Antennal clava with a small area of micropilosity on its apical segment only. Except in some *Tritneptis* and *Cyclogastrella*, which have the occiput immarginate, the basal cell of the fore wing is bare or virtually so, and the speculum is larger and open below. Gaster sometimes pointed apically . . . 29

29 (28) Fore wing (Text-fig. 293) with upper surface, just beyond the middle, with notably sparse pilosity 30

– Fore wing (Text-figs. 294, 296) : upper surface, beyond the middle, with ordinary, moderately dense or dense pilosity 34

30 (29) Fore wing (Text-fig. 293) with a broad bare strip below the marginal vein, extending to the stigmal vein and broken by at most a few scattered hairs on the lower surface of the wing. Genae moderately to strongly compressed, usually sharp near the bases of the mandibles 31

– Fore wing (Text-fig. 294) either without a bare strip below the marginal vein, or else having one on the upper surface only, effaced on the lower surface by numerous hairs. Genae at most slightly compressed, not sharp . 35

31 (30) Vertex, behind the ocelli, horizontal and nearly flat, forming a sharp abrupt edge with the occipital surface, which descends at about a right angle to the vertex. Gaster ovate, at least slightly pointed apically
DIBRACHOIDES Kurdjumov (p. 814)

– Vertex curving over into the occiput and at most forming a vague ridge where the two surfaces join, but usually without a ridge. Gaster subcircular, obtuse apically, not counting the ovipositor sheaths, which sometimes project very slightly 32

32 (31) First funicular segment of antenna (Text-fig. 295) subconical, constricted in its proximal half, about as long as the second and third segments together ; anelli short and strongly transverse. Marginal vein of fore wing only 1·2 to 1·4 times as long as the stigmal vein . . ***CONOMORIUM*** Masi (p. 821)

– First funicular segment of antennae not constricted proximally, at most a little longer than the second segment ; anelli sometimes longer and less transverse. Marginal vein of fore wing 1·7 to 2 times as long as the stigmal vein. 33

33 (32) Head strongly protuberant at level of antennal toruli, face receding strongly ; antennae inserted at or below level of ventral edge of eyes ; anelli large, at least the second anellus quadrate or only slightly transverse. Scutellar frenum not distinctly marked off, except sometimes at the sides
KRANOPHORUS Graham (p. 819)

– Head not protuberant at level of toruli, face not receding strongly ; antennae inserted very slightly above level of ventral edge of eyes ; anelli moderate-sized, both quite strongly transverse. Scutellar frenum marked off by a distinct impressed line . . ***SCHIZONOTUS*** Ratzeburg (p. 817)

34 (29) Antennae inserted at or even slightly below level of ventral edge of eyes. Fore wing usually immaculate, occasionally with a fuscous cloud in the middle ; apical margin nearly always bare at least between the end of the postmarginal vein and the tip of the wing, if not then the head is strongly protuberant at the level of the antennal toruli 35

– Antennae inserted at least slightly above level of ventral edge of eyes. Fore wing usually with a fuscous cloud below the marginal vein ; apical margin ciliate throughout. Head slightly to moderately protuberant at level of antennal toruli 37

35 (34) Vertex separated from the occipital surface by a transverse carina, at least in the middle.

Gaster varying from almost circular to sublanceolate
DIBRACHYS Förster (p. 804)

– Vertex not separated from the occipital surface by a carina 36

36 (35) Gaster usually ovate and distinctly pointed or acute apically ; if subcircular and hardly pointed, then slightly longer than the thorax
TRITNEPTIS Girault (p. 801)

– Gaster broad and circular, obtuse apically, at least slightly shorter than the thorax . . . . . ***CYCLOGASTRELLA*** Bukovskij (p. 796)

37 (34) First funicular segment of antenna (Text-figs. 651, 652) long and slightly constricted in its proximal half, much longer than any of the other segments. Propodeum with plicae complete or nearly so, costula sometimes indicated. Gaster ovate, pointed apically. Fore wing with only moderately dense pilosity below the marginal vein ***ARTHROLYTUS*** Thomson (p. 789)

– First funicular segment of antenna (Text-fig. 656) short, subquadrate, subequal in length to each of the following segments. Propodeum (Text-fig. 657) without plicae or costula. Gaster subcircular. Fore wing (Text-fig. 296) with very dense pilosity below the marginal vein
ERDOESINA Graham (p. 796)

38 (24) Antennae inserted below the level of the ventral edge of the eyes ; head protuberant at level of antennal toruli, the face receding strongly relative to the frons ; postmarginal vein of fore wing only slightly longer than the stigmal vein ; gaster subcircular. 27

If the antennae are inserted below the level of the ventral edge of the eyes and at the same time the front of the head is protuberant, then the postmarginal vein of the fore wing is much longer than the stigmal vein . . 39

39 (38) Gaster with a pale transverse band near the base ; basal cell of fore wing pilose over at least its distal half ; pronotal collar rounded off in front ; mesoscutum with numerous shallow but distinct piliferous punctures visible amongst the reticulation ; hind corners of propodeum appearing sharp in dorsal view ; hind tibiae with two apical spurs
DIMACHUS Thomson (p. 823)

– Not having the above combination of characters 40

40 (39) Clypeus shiny, its anterior margin with a median tooth or angulation ; two bristles of each gastral pygostyle much longer than the others ; mesoscutal notauli usually traceable to hind margin, though very superficial posteriorly ; pronotal collar rounded off in front ; marginal vein of fore wing tending to be somewhat thickened towards the base
HEMITRICHUS Thomson (p. 826)

– Anterior margin of clypeus rarely with a median tooth or angulation, if so then the bristles of the gastral pygostyles are subequal in length and relatively shorter, the notauli are incomplete, the pronotal collar is sometimes margined, whilst the marginal vein of the fore wing is not obviously thickened 41

41 (40) Mesoscutal notauli complete and sharply impressed throughout. Hind corners of propodeum as seen in dorsal view sharp, rectangular or acute, the propodeal callus slightly ridged longitudinally. Gaster alutaceous all over. Pronotal collar rounded off in front. Marginal vein of fore wing about 2·5 times as long as the stigmal vein
DORCATOMOPHAGA Kryger (p. 828)

– Notauli almost always incomplete and reaching at most somewhat more than half way across the mesoscutum ; very rarely traceable to its hind margin but then very superficial posteriorly, and the other characters not all agreeing with the above 42

42 (41) One or two bristles of each pygostyle (Text-figs. 344, 349) much longer than the others (only a few species have this character) 43

– Pygostylar bristles subequal in length, relatively shorter than in the above (the majority of species) 44

43 (42) Pronotal collar rounded off in front ; gaster not pale-marked ; hind corners of propodeum in dorsal view appearing prominent, rectangular or acute, the callus with a longitudinal ridge (Text-fig. 313). Fore wing immaculate. Propodeum with a distinct, reticulate nucha, usually also with at least some trace of a costula . . . ***LARIOPHAGUS*** Crawford (p. 823)

– Either the pronotal collar is sharply margined ; or the gaster is more or less extensively red basally. Hind corners of propodeum in dorsal view rounded, not prominent, callus without a longitudinal ridge. Fore wing sometimes with fuscous markings 44

44 (43) Occiput finely to sharply margined at least medially (care is needed, as when the margin is fine it might be overlooked) 45

– Occiput not margined 51

45 (44) Vertex curving over strongly into the occipital surface, the occipital carina at least slightly nearer to the foramen magnum than to the hind ocelli. Propodeum most often with a distinct and strongly reticulate nucha. . 46

– Vertex forming a rather abrupt edge with the occipital surface, the transverse ridge which separates them (Text-figs. 437, 438, 440) quite near the hind ocelli ; propodeal nucha represented merely by a narrow, weakly sculptured, transverse strip (some *Holcaeus*). 80

46 (45) Antennal clava ventrally with a large area of micropilosity which extends nearly to its base ; flagellum strongly clavate ; postmarginal vein of fore wing at most slightly longer than the stigmal vein ; gaster subcircular, obtuse apically ; propodeum with nucha not well developed ; eyes with rather long and conspicuous hairs . . ***DIGLOCHIS*** Förster (p. 782)

– Antennal clava with only a small area of micropilosity on its third segment ; postmarginal vein usually distinctly, rarely only slightly, longer than the stigmal vein ; gaster ovate to sublanceolate, pointed apically ; propodeum with a well-developed, often large, reticulate nucha 47

47 (46) Fore wing almost wholly pilose, the speculum absent or small. Eyes with rather long and conspicuous hairs . . ***UROLEPIS*** Walker (p. 780)

– Fore wing with a large speculum ; basal cell at least partly bare. Eyes with less conspicuous hairs, sometimes virtually bare 48

48 (47) Face receding strongly towards the oral cavity and forming an angle of only about 110° with the frons, as seen in profile ; mesoscutum and scutellum, at least mainly, with delicate engraved reticulation ***NASONIA*** Ashmead (p. 779)

– Face receding less strongly and forming a more obtuse angle, usually about 130° with the frons ; reticulation of mesoscutum and scutellum at least very slightly raised above the general surface 49

49 (48) Hind coxae with some hairs dorsally in the proximal half. Fore wing basally with a band of fine hairs just above the anal margin, on lower surface of wing. Anterior margin of clypeus virtually truncate ***GYRINOPHAGUS*** Ruschka (p. 777)

– Hind coxae bare dorsally. Fore wing lacking the above band of hairs. Anterior margin of clypeus usually more or less emarginate . . . 50

50 (49) Thorax not or hardly broader than high, distinctly arched dorsally in the long axis. Head in dorsal view with temples at least one fifth as long as eyes . . . . . ***EUPTEROMALUS*** Kurdjumov (p. 737)

– Thorax obviously broader than high, only weakly arched dorsally. Head in dorsal view strongly transverse, about 2·3 times as broad as its maximum length, with temples extremely short, hardly one eighth as long as eyes
PLATYPTEROMALUS Bouček (p. 737)

51 (44) Dorsal surface of hind coxae more or less hairy proximally (Text-fig. 297). Basal tergite of gaster often more or less conspicuously hairy laterally ; propodeal callus often densely pilose 52

– Dorsal surface of hind coxae bare in its basal half (Text-fig. 298). Basal tergite of gaster most often with few hairs 59

52 (51) Antennal clava, ventrally, with a line of micropilosity which extends nearly its whole length ; the sutures of the clava oblique as seen in profile. Segments of funicle, except sometimes sixth, longer than broad, each with sensilla arranged in at least two rows. Propodeum moderately long, reticulate ; nucha not distinctly developed ; costula more or less indicated
APELIOMA Delucchi (p. 582)

– Antennal clava with only a small area of micropilosity on the ventral surface of its third segment ; sutures of the clava not oblique. Segments of funicle often shorter, or with sensilla in one row. Propodeum often with a well-developed nucha 53

53 (52) Stigma of fore wing (see Text-fig. 324) large, often surrounded by a fuscous cloud ; nucha of propodeum not developed, represented only by a ridge, or a transverse lunate strip which is defined anteriorly by a sharp edge and is at most weakly aciculate. Clypeus reticulate, without or with at most a few striae 205

– Stigma of fore wing smaller ; nucha of propodeum often developed. Clypeus often radiately strigose 54

54 (53) Marginal vein of fore wing slightly shorter than, or at most as long as, the stigmal vein ; hind tibia with two distinct spurs ; pronotal collar not margined ; clypeus mainly reticulate, its anterior margin with two rounded lobes between which there is a deep incision. Propodeal nucha represented only by a transverse ridge. Disc of fore wing often infumate, or with two fuscous clouds . . . . . ***CAENOCREPIS*** Thomson (p. 429)

– Marginal vein at least very slightly longer than the stigmal vein ; hind tibia with one spur ; pronotal collar often margined ; clypeus often mainly to wholly striate, its anterior margin often shallowly emarginate ; propodeum often with nucha developed 55

55 (54) Nucha of propodeum not developed, represented merely by a lunate strip which is tranversely aciculate or smooth, and defined anteriorly by a sharp edge ; clypeus mainly reticulate, without or with at most weak traces of striation, its anterior margin often incised medially, or bidentate. Propodeum with at most about four hairs between the plica and the spiracular sulcus. Both mandibles with three teeth 205

– Nucha of propodeum most often developed and reticulate, sometimes large, strongly reticulate, and not sharply defined anteriorly ; if poorly developed, then the clypeus is mainly or entirely striate and its anterior margin is at most weakly emarginate, or the propodeum has a conspicuous tuft of whitish hairs between the plica and the spiracular sulcus. At least the right mandible with four teeth 56

56 (55) Sides of propodeum extremely hairy, the pilosity extending over the whole callus, except just mesad of the spiracles, and supracoxal flange, also encroaching upon the median area ; hind corners of propodeum dentate. Basal tergite of gaster not conspicuously hairy laterally
PEZILEPSIS Delucchi (p. 782)

– Sides of propodeum never so extensively hairy, the pilosity not encroaching upon the median area ; if the pilosity covers nearly the whole of the callus, then the basal tergite of the gaster is conspicuously hairy laterally, Hind corners of propodeum not dentate 57

57 (56) Both mandibles with four teeth ; pronotal collar finely but sharply and very regularly margined throughout anteriorly. Sides of basal tergite of gaster with a conspicuous or fairly conspicuous patch of whitish hairs ***TRICHOMALUS*** Thomson (p. 707)

– Left mandible with three teeth, right mandible with four ; either the pronotal collar is not distinctly margined or else the sides of the basal segment of the gaster have only an inconspicuous patch of hairs 58

58 (57) Head in dorsal view less transverse (1·9 to 2·1 times as broad as long) ; temples from one quarter to three quarters as long as eyes ; fore wing usually with brownish cloud or clouds. Propodeum with a large, strongly reticulate nucha, often also with a costula. Sides of basal tergite of gaster with a relatively inconspicuous patch of hairs ***SPANIOPUS*** Walker (p. 702)

– Head in dorsal view more transverse (2·2 to 2·5 times as broad as long) ; temples one eighth to one quarter as long as eyes ; fore wing immaculate. Either the propodeal nucha is narrow and very weakly sculptured, or there is no costula. Sides of basal tergite of gaster with a conspicuous patch of whitish hairs . . . . . ***PERIDESMIA*** Förster (p. 701)

59 (51) Tip of antennal clava acute or (Text-figs. 299–301) with a pointed stylus . 60

– Tip of antennal clava obtuse or only bluntly pointed 62

60 (59) Postspiracular sclerite visible only as a small subequilateral and weakly-sculptured triangle just in front of the tegula (cf. Text-fig. 318) ; head and thorax with rather conspicuous whitish hairs ; hind tibia with two spurs, but the second spur is weak, only about half as long as the first one . 195

– Postspiracular sclerite larger, reticulate, forming a triangle which is higher than broad and descends well ventrad (cf. Text-fig. 20) ; head and thorax often with brownish hairs, if the hairs are whitish then they are relatively inconspicuous ; hind tibia with one spur 61

61 (60) Gaster subcylindrical, convex dorsally, metallic ; fourth abdominal tergite shorter than the fifth, the latter shorter than the sixth ; fore wings immaculate, the marginal vein about 2·3 times as long as the stigmal vein ***MERISUS*** Walker (p. 443)

– Gaster usually more or less flattened or sunken dorsally ; if convex then more ovate in outline with abdominal tergites four, five and six equal or subequal in length, and fore wing with a fuscous cloud below the marginal vein. Marginal vein 1 to 2·2 times as long as the stigmal vein ; if as much as twice the stigmal vein, then the gaster is sunken dorsally and is more or less yellow . . . . . ***HOMOPORUS*** Thomson (p. 444)

62 (59) Distal half or more of basal cell in fore wing pilose ; gaster (Text-fig. 349) more or less extensively red at the base, and one bristle of each pygostyle much longer than the others ; funicular segments, except the first and second, not longer than broad, most often transverse ; anterior margin of clypeus incised medially ; fore wing usually with fuscous markings ***ERYTHROMALUS*** Graham (p. 468)

– If the basal cell of the fore wing is so extensively pilose and the gaster is also more or less red, then the pygostylar bristles are subequal in length and relatively short, all the funicular segments are longer than broad, the anterior margin of the clypeus is shallowly emarginate, and the fore wings are immaculate 63

63 (62) Gaster (Text-fig. 344) having two bristles of each pygostyle about twice as long as the others. Pronotal collar sharply margined anteriorly. Propodeum with a moderate-sized reticulate nucha. Gaster not pale-marked. Anterior margin of clypeus weakly emarginate. Fore wing immaculate
CALLIPRYMNA Graham (p. 467)

– In most species the pygostylar bristles are subequal in length and relatively short ; but if one or two are somewhat longer than the others, then the pronotal collar is rounded off anteriorly and the propodeal nucha is represented merely by a narrow weakly sculptured strip 64

64 (63) Antennae inserted very high, their toruli at least slightly nearer to the median ocellus than to the anterior margin of the clypeus ; scape usually reaching above level of vertex. Propodeal nucha represented merely by a lunate, smooth or transversely-aciculate strip 65

– Antennae inserted at a lower level, their toruli either midway between the median ocellus and the anterior margin of the clypeus, or nearer to the latter 67

65 (64) Small (1·2 to 1·6 mm.) species with thorax only about 1·5 times as long as broad, mesoscutum nearly twice as broad as long, pronotum appearing very short in dorsal view ; head and thorax bronze- or bluish black ; antennal toruli distinctly nearer to the median ocellus than to the anterior margin of the clypeus, the latter with or without a median tooth
APSILOCERA Bouček (p. 696)

– Larger species with thorax 1·8 to 2 times as long as broad, mesoscutum much less transverse, pronotum appearing longer in dorsal view; thorax, and usually head, bright green to blue ; antennal toruli only slightly nearer to the median ocellus than to the anterior margin of the clypeus . . 66

66 (65) Anterior margin of clypeus with a median tooth or tubercle, sometimes also (Text-fig. 468) with an angular protection on either side of it
STENOMALINA Ghesquière (p. 600)

– Anterior margin of clypeus without a median tooth or tubercle
CHLOROCYTUS Graham (p. 611)

67 (64) Anterior margin of clypeus with a median tooth or tubercle, sometimes also (Text-fig. 468) with an angular protection on either side of it 68

– Anterior margin of clypeus without a median tooth or tubercle ; truncate, emarginate, or bidentate 69

68 (67) Propodeum with nucha represented only by a narrow, transversely-aciculate or smooth strip which is sharply-defined in front ; genae not projecting below level of anterior margin of clypeus, the latter nearly always with an angular projection (Text-fig. 468) on either side of the median tooth
STENOMALINA Ghesquière (p. 600)

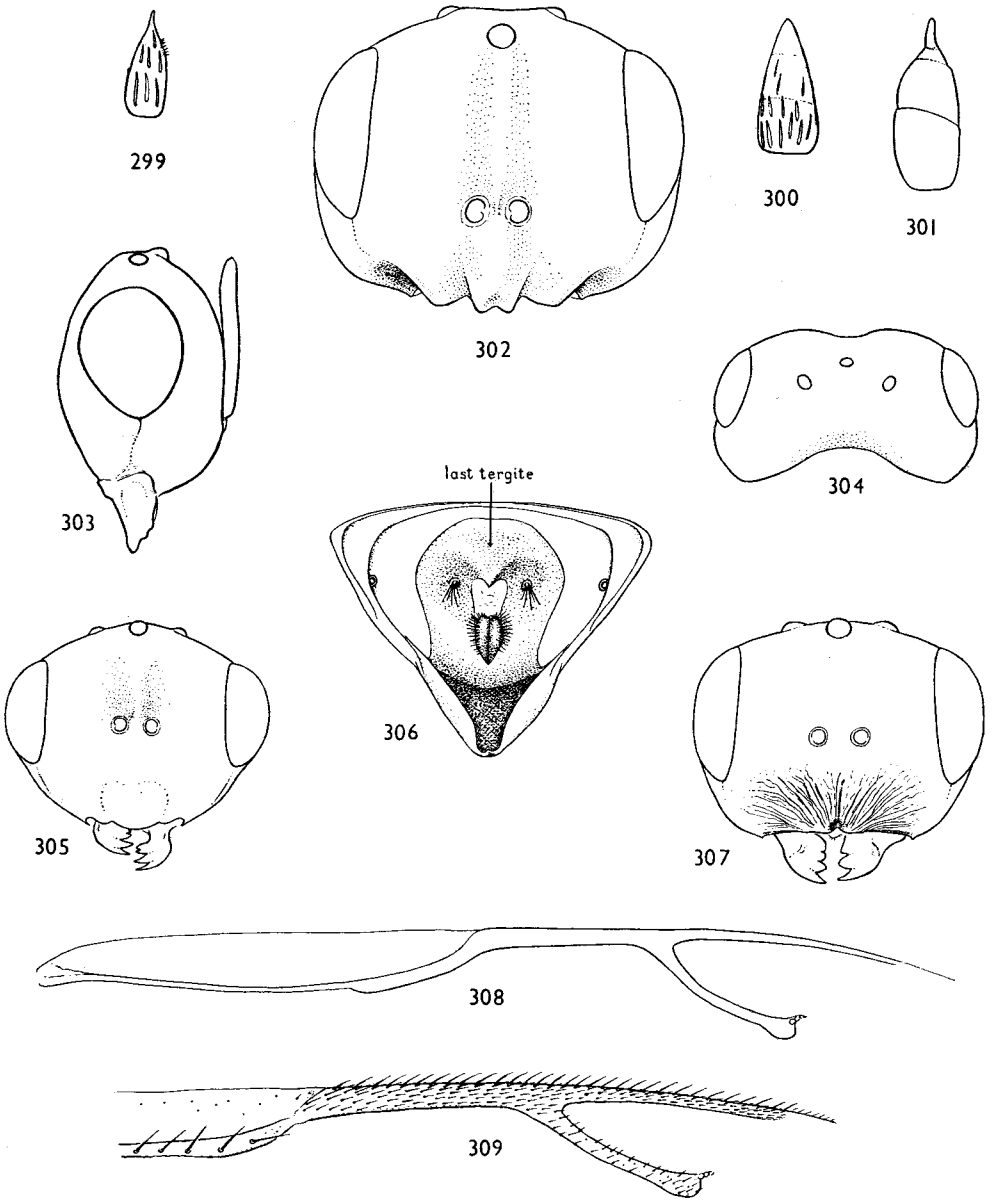
– Propodeum with nucha large, occupying about half the length of the propodeum, strongly reticulate, not sharply-defined in front ; genae projecting at least slightly below level of anterior margin of clypeus, the latter with a median tooth only (some *Rohatina*) 69

69 (68) Antennae inserted very low down ; the lower edge of their toruli at or slightly below the level of the ventral edge of the eyes 70

– Antennae inserted higher ; the lower edge of their toruli at least a little above the level of the ventral edge of the eyes 73

70 (69) Postmarginal vein of fore wing only very slightly (up to 1·2 times) as long as the stigmal vein 71

– Postmarginal vein of fore wing more than 1·2 times as long as the stigmal vein. 72



FIGS. 299–309. 299, *Callitula bicolor* Spinola, ♀, antennal clava ; 300, *Merisus splendidus* Walker, ♀, antennal clava ; 301, *Norbanus scabriculus* (Nees), ♀, antennal clava ; 302, *Catolaccus ater* (Ratzeburg), ♀, head ; 303, *Heteroprymna longicornis* (Walker), ♀, head, profile ; 304, *Gbelcia crassiceps* Bouček, ♀, head ; 305, *Endomychobius endomychi* (Walker), ♀, head ; 306, *Tomicobia promulus* (Walker), ♀, gaster, caudal view ; 307, *Hobbya stenonota* (Ratzeburg), ♀, head ; 308, *Psychophagus omnivorus* (Walker), ♀, fore wing venation ; 309, *Arthrolytus* (*Anarthrolytus*) *ocellus* (Walker), ♀, fore wing venation.

71 (70) Head distinctly protuberant at level of antennal toruli, face receding ; postmarginal vein of fore wing at most slightly more than half as long as the marginal vein, wing immaculate with its apical margin nearly always bare, at least between the tip of the postmarginal vein and the tip of the wing ; first funicular segment much shorter than the pedicellus
TRITNEPTIS Girault (p. 801)

– If the head is protuberant at the level of the antennal toruli, then the postmarginal vein of the fore wing is much more than half as long as the marginal vein ; and either the fore wing is maculate, or the apical margin is ciliate throughout, or the first funicular segment is not shorter than the pedicellus 72

72 (71) Antennae (Text-fig. 569) with flagellum slender, proximally hardly stouter than the pedicellus, with the proximal funicular segments longer than broad ; scape distinctly longer than an eye ; clava as long as the three preceding funicular segments together. Head (Text-fig. 303) slightly protuberant at level of toruli. Postmarginal vein of fore wing about as long as the marginal vein . . . ***HETEROPRYMNA*** Graham (p. 697)

– Antennae different in form ; either the flagellum is stouter or has shorter segments, or the scape is not longer than an eye, or the clava is relatively shorter. Most often the head is not protuberent at the level of the toruli. Postmarginal vein sometimes shorter than the marginal vein . . . 73

73 (72) Gena, above base of mandible, with a large hollow, which extends about one third to half way to the eye (Text-fig. 302). Either the gastral petiole is longer than broad, nearly as long as the propodeum ; or the pronotal collar is sharply and regularly margined anteriorly ; or else the fore wing virtually lacks a speculum 74

– Gena usually without a hollow, if a very small one is present (*Capellia, Spilomalus*, some *Pteromalus*) then the gastral petiole is as broad as long and shorter than the propodeum, the pronotal collar is usually weakly and irregularly margined, and the fore wing has a large speculum . . . 79

74 (73) Fore wing without a speculum or with at most a very narrow bare strip just outside the basal vein. Pronotal collar not margined but somewhat rounded off anteriorly. Petiole of gaster transverse. Head in front view (Text-fig. 302). Mandibles similar, both with four teeth, of which the second is smaller than the others and approximated to the third
CATOLACCUS Thomson (p. 467)

– Fore wing with a moderate-sized to large speculum. Pronotal collar usually sharply and regularly margined anteriorly. if immarginate then gastral petiole longer than broad. Head of different form. Mandibles most often otherwise 75

75 (74) Pronotal collar not margined, its lateral angles rather prominent ; petiole of gaster fully 1·5 times as long as broad, nearly as long as the propodeum, lightly reticulate, its sides nearly parallel ; all funicular segments, except sometimes the first, transverse . . . ***EURYDINOTA*** Förster (p. 474)

– Pronotal collar sharply margined anteriorly, its lateral angles not prominent. Petiole of gaster usually shorter than the propodeum and not longer than broad, if approaching the above in length and shape, then smooth, and the funicular segments not distinctly transverse 76

76 (75) Gaster (Text-fig. 463) lanceolate, acuminate, much longer than head plus thorax ; last tergite much longer than its basal breadth. Proximal segments of funicle longer than broad. Marginal vein of fore wing (Text-fig. 467) fully twice as long as the stigmal vein. Nucha of propodeum not developed . . . . . ***LONCHETRON*** Graham (p. 596)

– Gaster ovate to subcircular, not or hardly longer than the thorax ; last tergite at most very slightly longer than its basal breadth, but often transverse 77

77 (76) Antennal flagellum (Text-fig. 354) long, cylindrical, with all funicular segments, except sometimes the sixth, longer than broad, each of these segments with at least two rows of sensilla, often three ; marginal vein of fore wing (Text-figs. 351, 353) at most 1·5 times as long as the stigmal vein, basal cell pilose at least distally. Gaster at most slightly longer than broad, bluntly pointed apically with the ovipositor sheaths projecting very slightly (Text-fig. 352). Mandibles similar ; both with four acute teeth, of which the third and fourth are smaller and approximated ***CAPELLIA*** Delucchi (p. 475)

– Antennal flagellum shorter, usually more or less clavate, with funicular segments not or hardly longer than broad, each of them with only one row of sensilla ; marginal vein of fore wing 1·7 to 2 times as long as the stigmal vein ; basal cell often bare except for a row of hairs in the basal vein. Mandibles either not both four-dentate ; or if so, then their third and fourth teeth are not approximated 78

78 (77) Anterior margin of clypeus produced, and distinctly emarginate medially ; propodeal spiracles touching the metanotum and partly hidden beneath its hind margin ; medially the propodeum is produced well beyond the bases of the hind coxae, and has a convex nucha which is reticulate in front but has a more weakly sculptured lunate posterior strip ; gaster ovate, acutely pointed apically, the last tergite about as long as its basal breadth ; ovipositor sheaths projecting slightly ***VRESTOVIA*** Bouček (p. 828)

– Anterior margin of clypeus hardly produced, truncate or very broadly and shallowly emarginate (Text-fig. 457) ; propodeal spiracles separated by about their own length from hind margin of metanotum ; propodeum medially produced only slightly beyond bases of hind coxae, nucha represented only by a transversely lunate, weakly sculptured strip ; gaster oval or elliptic, obtuse apically, the last tergite very short and transverse ; ovipositor sheaths concealed (Text-figs. 459, 461) ***KALEVA*** Graham (p. 596)

79 (73) Gaster (Text-figs. 436, 451) with last tergite in dorsal view, not counting its extreme basal portion, linear or sublinear, much longer than broad . . 80

– Gaster with last tergite in dorsal view, if longer than broad, triangular. . 81

80 (79) Vertex (Text-figs. 437, 438, 440) with a transverse ridge behind the ocelli. Antennal clava (Text-fig. 439) as long as the three preceding funicular segments together, ventrally with a long band of micropilosity, the clava seen in profile having its sutures oblique . ***HOLCAEUS*** Thomson (p. 584)

– Vertex (Text-fig. 451) without a ridge behind the ocelli. Antennal clava shorter than the three preceding funicular segments together, with only a small area of micropilosity on its third segment, in profile having its sutures not oblique . . . . . ***EULONCHETRON*** Graham (p. 599)

81 (79) The edge of the gena, bordering the oral fossa, is raised to form a flange which is often tuberculate medially (Text-figs. 572, 573) ; genae projecting slightly to very distinctly below level of anterior margin of clypeus, the latter slightly produced forwards in the middle and occasionally with a small median tooth ; propodeum with a large reticulate nucha ***ROHATINA*** Bouček (p. 700)

– Edge of the gena not thus flanged ; or with at most a very weak flange, in which case the genae do not project ventrad of the clypeal margin, whilst the latter is emarginate medially. 82

82 (81) Head thick, in dorsal view (Text-fig. 304) less than twice as broad as its maximum length ; marginal vein of fore wing 2·3 to 2·6 times as long as the stigmal vein ; propodeum with a moderately large, reticulate nucha ; flagellum short, all funicular segments transverse ***GBELCIA*** Bouček (p. 699)

– If the head is comparably thick and also the marginal vein is more than twice as long as the stigmal vein, then the propodeal nucha is represented merely by a narrow transversely-aciculate strip 83

83 (82) Gaster, not counting the ovipositor sheaths, if visible, subcircular or with its apex obtuse, and with the last tergite shorter than its basal breadth, sometimes so short as to be hardly visible, in one genus turned downwards, so as to be visible only from behind ; ovipositor sheaths hardly or only just reaching tip of last tergite and so invisible in dorsal view. 84

– Gaster ovate to lanceolate, distinctly pointed apically, sometimes acuminate ; tips of ovipositor sheaths normally projecting at least very slightly beyond tip of last tergite and so visible in dorsal view. 90

84 (83) Mesopleuron wholly reticulate ; gena with a small hollow above base of mandible ; head in front view (Text-fig. 457) narrowing strongly towards the mouth, mandibles large and falcate ; all funicular segments transverse ***KALEVA*** Graham (p. 596)

– Mesopleuron most often with a mainly to entirely smooth subtriangular area below the base of the hind wing ; if this area is at all extensively reticulate, then the gena lacks a hollow, the head is not narrowed towards the mouth, the mandibles are smaller, and the funicular segments are not transverse 85

85 (84) Gena with a small hollow above base of mandible ; flagellum (Text-fig. 354) cylindrical, all funicular segments except sometimes the sixth longer than broad, each of these segments with at least two rows of sensilla, often with three . . . . . ***CAPELLIA*** Delucchi (p. 475)

– Gena without a hollow. At least funicular segments five and six quadrate to transverse ; flagellum often slightly clavate, funicular segments sometimes with only one row of sensilla 86

86 (85) Head (Text-fig. 305) : oral fossa small, its breadth only about 1·5 times the malar space ; genae converging strongly ; both mandibles with four teeth, the two middle ones approximated ; anterior margin of clypeus slightly curved forward. Propodeum with a small reticulate nucha. Petiole and base of gaster often testaceous. All or most of the funicular segments transverse . . . . . ***ENDOMYCHOBIUS*** Ashmead (p. 470)

– Oral fossa larger, its breadth twice or more than twice the malar space ; genae more or less buccate. Left mandible, or both mandibles, with three teeth, none of the teeth approximated. Anterior margin of clypeus emarginate or truncate. Propodeum without a distinct nucha. Petiole and gaster usually dark, rarely a little pale 87

87 (86) Last tergite of gaster (Text-fig. 306) turned downwards at nearly a right angle to the preceding tergite, so as to be nearly vertical ; ovipositor sheaths, visible only from behind, stout. Pronotal collar not margined. Postmarginal vein at least a little shorter than the marginal vein ***TOMICOBIA*** Ashmead (p. 784)

– Last tergite of gaster not turned abruptly downwards, but if sloping somewhat steeply then the pronotal collar is sharply margined 88

88 (87) Postmarginal vein of fore wing distinctly shorter than the marginal vein. Pronotal collar sharply margined except just at the sides. Usually both mandibles have three teeth, occasionally the right mandible has four, or both have four . . . . . ***DIRHICNUS*** Thomson (p. 787)

Postmarginal vein of fore wing about as long as, or even a little longer than, the marginal vein. Pronotal collar at most weakly margined in the middle. Left mandible with three teeth, right mandible with four . . . 89

89 (88) Anterior margin of clypeus deeply emarginate, almost incised, medially. Scutellum more shiny, its sculpture not distinctly raised, or even mainly engraved. Fore wing (Text-fig. 308) : stigmal vein strongly curved. Antennal funicle subcylindric ; the clava a little broader than the funicle ***PSYCHOPHAGUS*** Mayr (p. 473)

– Anterior margin of clypeus shallowly emarginate, almost truncate. Scutellum duller, its sculpture distinctly raised above the general surface. Fore wing : stigmal vein nearly straight. Antennal funicle thickening slightly distad, the flagellum therefore slightly clavate ***CHLOROCYTUS*** Graham (p. 611)

90 (83) Hind tibia with two distinct apical spurs 91

– Hind tibia with only one apical spur 92

91 (90) Fore wing either with two fuscous clouds present ; or else the marginal vein shorter than, or at most as long as, the stigmal vein. Pronotal collar not margined, rounded off into the neck region. Propodeal nucha not developed. Clypeus reticulate, without or with at most a few indistinct striae.

Fore and hind femora more or less swollen 204

– Fore wing hyaline or faintly greyish ; marginal vein at least slightly longer than the stigmal vein. Either the pronotal collar is margined, or else the propodeum has a nucha. Clypeus mainly to entirely striate . . . 92

92 (91) Clypeus (Text-fig. 307) with coarse radiating striae which extend well up the genae and face ; marginal vein of fore wing twice, or slightly more than twice, as long as the stigmal vein, postmarginal vein much shorter than the marginal ; propodeal nucha represented merely by a narrow, transversely-aciculate to smooth strip ; pronotal collar long, medially one fifth length of mesoscutum or slightly more, finely but sharply margined except at the sides. Antennal scrobes rather deep . . ***HOBBYA*** Delucchi (p. 596)

– Striae of clypeus when present nearly always finer and hardly extending on to the genae or face ; if they do extend up somewhat more, then the marginal vein of the fore wing is less than twice as long as the stigmal vein and/or the propodeum has a large reticulate nucha. 93

93 (92) Anterior margin of clypeus (Text-figs. 361, 393, 528) deeply incised medially, or bidentate 94

– Anterior margin of clypeus not deeply incised ; at most moderately emarginate as in Text-fig. 526 ; sometimes with a median tooth . . . 102

94 (93) Propodeum (Text-fig. 360) with a reticulate nucha which occupies nearly half of its length and is not sharply-defined anteriorly ; plicae absent. Fore wing (Text-fig. 359) most often with two fuscous clouds, one below the stigma, the other below the proximal part of the marginal vein. Clypeus striate . . . . . ***SPILOMALUS*** Graham (p. 479)

– Propodeal nucha represented merely by a lunate strip which is weakly sculptured or smooth, and is usually defined anteriorly by a sharp edge. Fore wing often immaculate, if with fuscous clouds then the clypeus is mainly reticulate 95

95 (94) Antennae inserted low down, the lower edge of the toruli not or hardly above the level of the ventral edge of the eyes ; marginal vein of forewing 2 to 2·25 times as long as the stigmal vein. Body green ; antennae and legs mainly yellowish. Median area of propodeum shiny, at most weakly sculptured ; spiracular sulci extremely shallow and smooth ***MESOPOLOBUS*** Westwood (p. 638)

– Lower edge of antennal toruli distinctly above the level of the ventral edge of the eyes ; marginal vein of forewing usually 1·2 to 1·75 times as long as the stigmal vein, if twice as long then the median area of the propodeum is distinctly reticulate 96

96 (95) Clypeus reticulate, except sometimes at the sides. Fore wing usually with a fuscous cloud, either below the stigma or below the proximal part of the marginal vein 205

– Clypeus mainly to entirely striate, the striae sometimes extending slightly up the face and genae 97

97 (96) Pronotal collar either immarginate, or at most weakly margined over its middle third ; medially one seventh to one sixth as long as the mesoscutum. Propodeum medially one third as long as the scutellum or slightly more, its median area smooth or weakly sculptured, without or with a weak costula ; spiracles long-oval, nearly touching the metanotum ***HABROCYTUS*** Thomson (p. 494)

– Pronotal collar sharply margined throughout except sometimes just at the sides ; medially sometimes much less than one seventh as long as the mesoscutum. Propodeum sometimes different in length or sculpture, its spiracles sometimes smaller 98

98 (97) Propodeum short, medially from slightly less than one quarter, to one third, as long as the scutellum 99

– Propodeum longer, about half as long as the scutellum 100

99 (98) Basal cell of fore wing with hairs scattered over its distal half or more ; wing beyond the speculum with dense pilosity 101

– Basal cell of fore wing, not counting hairs on basal vein, bare or with at most a few hairs distally ; wing beyond speculum with pilosity less dense ***CECIDOSTIBA*** Thomson (p. 564)

100 (98) Propodeum (Text-fig. 356) with petiolar foramen deeply, semicircularly excised ; costula absent. Fore wing with marginal vein 1·5 to 2 times as long as the stigmal vein ; stigma small. Anterior margin of clypeus (Text-fig. 355) with two curved lobes between which there is a narrow incision. Hind tibia with two apical spurs ***MOKRZECKIA*** Mokrzecki (p. 478)

– Propodeum with petiolar foramen only shallowly excised ; costula often present. Fore wing with marginal vein hardly 1·5 times as long as the stigmal vein ; stigma rather large, its height about half the distance between its upper edge and the costal margin of the wing. Anterior margin of clypeus with a broader incision, its lobes often pointed. Hind tibia usually with one spur (if two, the second weak) 101

101 (99) Either the distal half of the basal cell in the fore wing is hairy ; or else the propodeum has a strong costula and the panels of its median area are shiny and have little if any fine reticulation, though some coarser wrinkles may be present . . . . . ***CAENACIS*** Förster (p. 569)

– Basal cell of fore wing bare or with at most a very few isolated hairs distally ; median area of propodeum relatively dull, finely and nearly uniformly reticulate, the costula tending to be weak or even absent ***DINOTOIDES*** Bouček (p. 571)

102 (93) Antenna (Text-figs. 651, 652) with first funicular segment elongate, slightly constricted in its proximal half, longer than the pedicellus and much longer than any of the other funicular segments ; clava very short, at most about 1·5 times as long as broad, asymmetrical. Fore wing usually with a fuscous cloud below the marginal vein. Propodeal nucha represented merely by a lunate strip which is weakly sculptured or smooth ; propodeum often with some indication of a costula . ***ARTHROLYTUS*** Thomson (p. 789)

– First funicular segment of antenna not constricted proximally, often relatively short ; clava often relatively longer. When the fore wing is maculate, then the marking usually consists of a cloud around or below the stigmal vein ; but if there is a single cloud below the marginal vein, then the first funicular segment of the antenna is nearly always shorter than the pedicellus 103

103 (102) Fore wing with infumate cloud, or fuscous markings 104

– Fore wing immaculate 105

104 (103) Fore wing with a fuscous cloud immediately beyond the speculum, this cloud usually extending to the marginal and stigmal veins and often forming a transverse band ; pronotal collar rounded off in front ; first funicular segment of antennae as long as or slightly longer than the pedicellus, flagellum stout and cylindrical, clava very short, only about 1·5 times as long as broad ; stigmal vein (Text-fig. 309) forming an acute angle with the postmarginal vein. Antennae inserted hardly above level of ventral edge of eyes ; scape almost as long as an eye, legs stout, especially femora ***ARTHROLYTUS*** Thomson (p. 789)

– If the fore wing has a more or less developed cloud in this position, then either (1) the pronotal collar is sharply margined anteriorly; or (2) the first funicular segment of the antenna is very distinctly shorter than the pedicellus ; or (3) the stigmal vein forms a less acute angle with the postmarginal vein 105

105 (104) Antennal clava ventrally with a large area or band of micropilosity (Text-figs. 363, 365, 368, 430, 439) which extends at least half way to the base ; sutures of clava in profile appearing oblique, or at least the second suture 106

– Antennal clava with a small area of micropilosity which extends less than half way to the base ; sutures of clava not or hardly oblique . . . 108

106 (105) Propodeum with a large, strongly reticulate nucha, whose length is at least one third that of the propodeum. Pronotal collar usually weakly and irregularly margined. Gaster ovate . ***SCEPTROTHELYS*** Graham (p. 482)

– Propodeal nucha represented merely by a narrow, weakly aciculate transverse strip, or a ridge. Pronotal collar sharply margined. Gaster most often long-ovate or lanceolate 107

107 (106) Left mandible with three teeth, right mandible with four. Propodeum with a more or less distinct costula. Vertex without a transverse ridge ***APELIOMA*** Delucchi (p. 582)

– Both mandibles with three teeth. Propodeum without a costula or with only vague traces of one. Vertex often with a transverse ridge behind the ocelli ***HOLCAEUS*** Thomson (p. 584)

108 (105) Mesopleura entirely reticulate 109

– Mesepisternum with a partly to entirely smooth and polished triangular area below the base of the hind wing 111

109 (108) Propodeal plicae sharp only posteriorly, otherwise represented only by broad convex elevations ; median part of propodeum quite strongly reticulate and relatively dull ; antennae inserted at least very slightly above level of ventral edge of eyes 110

– Propodeal plicae complete, distinct to base of propodeum, usually sharp throughout ; median area of propodeum usually more shiny and relatively weakly sculptured, if not then antennae inserted level with ventral edge of eyes . . . . . ***MESOPOLOBUS*** Westwood (p. 638)

110 (109) Thorax (Text-fig. 311) moderately arched dorsally, the scutellum in profile distinctly convex ; mesoscutum convex, without visible piliferous punc-

tures ; basal cell of fore wing with at most a few hairs distally
TRYCHNOSOMA Graham (p. 594)

– Thorax very weakly arched dorsally, the surface of the scutellum in profile appearing virtually flat ; mesoscutum flat discally, with some shallow though distinct piliferous punctures amongst the reticulation ; basal cell of fore wing pilose over about its distal third ***ANOGMUS*** Förster (p. 628)

111 (108) Propodeum with nucha not developed but represented merely by a ridge or a narrow lunate strip, which is very weakly reticulate, transversely aciculate, or smooth, and is usually defined anteriorly by a sharp edge . . . 112

– Propodeum with a convex, reticulate nucha whose length is at least one third that of the propodeum ; usually this nucha is not sharply-defined anteriorly 157

112 (111) Pronotum without a collar, or if with a defined horizontal collar, then this has no trace of a carina anteriorly, though its front edge may be abrupt 113

– Pronotum with an offset collar which is at least slightly margined in the middle by a raised carina, sometimes sharply so throughout 123

113 (112) Fore wing with distal quarter to one third of basal cell pilose . . . 114

– Fore wing with basal cell, not counting any hairs which may be on the basal vein, bare or virtually so ; basal vein sometimes also bare . . . 115

114 (113) All funicular segments, except sometimes the first, transverse ; combined length of pedicellus and flagellum less than breadth of head. Propodeum short, medially about one third as long as the scutellum, reticulate. Fore wing infumate at least below the marginal vein, sometimes mainly so. Mesoscutum with some shallow though distinct piliferous punctures amongst the reticulation . ***CECIDOSTIBA (ANASTIBA)*** sgen. n. (p. 565)

– Either some of the funicular segments besides the first are quadrate to elongate ; or the propodeum is virtually smooth and the fore wing is hyaline ; or the propodeum is longer than half the scutellum 115

115 (114) Antennae inserted low down, the lower edge of their toruli not or hardly above level of ventral edge of eyes 116

– Antennae inserted higher, the lower edge of their toruli distinctly above level of ventral edge of eyes 118

116 (115) Gaster oval, not longer than thorax ; propodeum long, medially more than half as long as scutellum . . . ***CHLOROCYTUS*** Graham (p. 611)

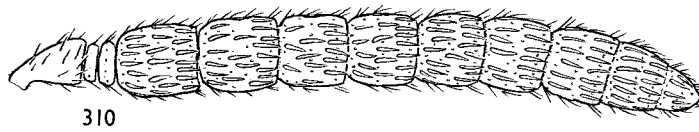
– Gaster lanceolate or sublanceolate, as long as or longer than head plus thorax ; propodeum medially less than half as long as scutellum . . 117

117 (116) Antennal clava appearing asymmetrical in profile, its upper edge more strongly curved than the lower edge ; anterior margin of clypeus truncate ; postspiracular sclerite relatively uniformly reticulate, not shiny
LEPTOMERAPORUS Graham (p. 687)

– Antennal clava appearing virtually symmetrical in profile ; anterior margin of clypeus distinctly emarginate medially ; postspiracular sclerite unevenly sculptured and partly smooth . ***HABROCYTUS*** Thomson (p. 494)

118 (115) Antennal flagellum (Text-fig. 310) much stouter than the pedicellus, cylindrical or tapering very slightly distad ; funicular segments with very numerous short sensilla, arranged in two rows on each segment, or even three on the proximal ones ; pronotal collar rounded off in front ; spiracles of propodeum circular ; gaster ovate, not longer than the thorax
PSYCHOPHAGOIDES gen. n. (p. 471)

– Either the antennal flagellum is at least slightly clavate ; or some of the funicular segments have sensilla arranged in one row only ; or the pronotal collar has an abrupt front edge ; or the spiracles of the propodeum are long-oval to sublinear 119



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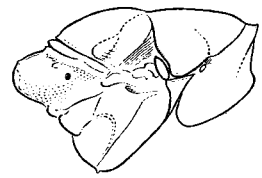

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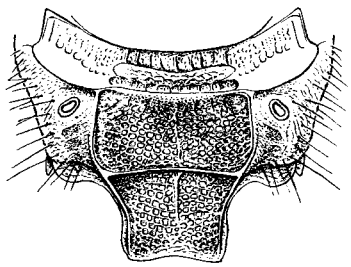

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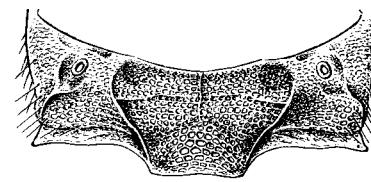

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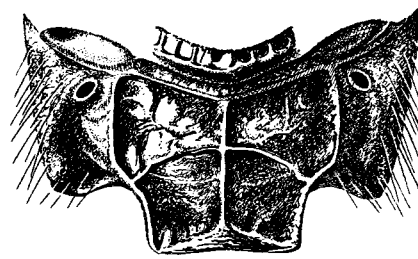

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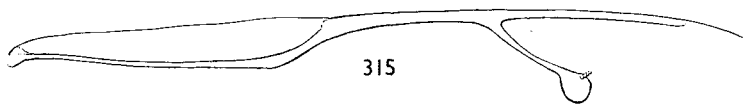

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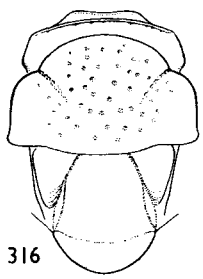

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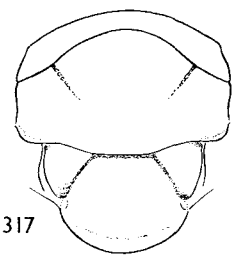

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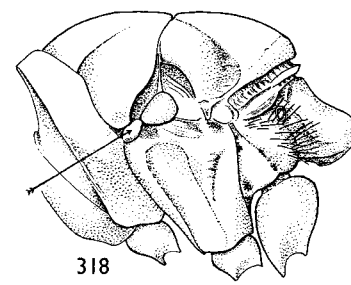

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FIGS. 310–318. 310, *Psychophagoides crassicornis* gen. et sp. n., ♀, antenna excluding scape ; 311, *Trychnosoma punctipleura* (Thomson), ♀, thorax, profile ; 312, *Ablaxia anaxenor* (Walker), ♀, metanotum and propodeum ; 313, *Lariophagus distinguendus* (Förster), ♀, propodeum ; 314, *Staurothyreus cruciger* Graham, ♀, metanotum and propodeum ; 315, *Phaenocytus glechomae* (Förster), ♀, fore wing venation ; 316, *Cecidostiba hilaris* (Walker), ♀, thorax, excluding metanotum and propodeum ; 317, *Dinarmus acutus* Thomson, ♀, thorax, excluding metanotum and propodeum ; 318, same, ♀, thorax, profile.

119 (118) The tip of the hypopygium, which is always clearly visible and sometimes rather prominent, is situated at two thirds to three quarters along the gaster ; body obscurely bluish or greenish ; marginal vein of fore wing about 1·5 times as long as the stigmal vein . ***SPINTHERUS*** Thomson (p. 480)

– Tip of hypopygium usually situated in or before the middle of the gaster ; if beyond this, then the body is bright green to blue, and the marginal vein of the fore wing is 1·8 to 2 times as long as the stigmal vein . . . 120

120 (119) Propodeum (Text-fig. 562) with spiracles small, circular to shortly oval, separated by nearly or quite their own length from the hind margin of the metanotum ; propodeum short, medially one quarter to one third as long as the scutellum, the surface including that of the shallow spiracular sulci shiny, alutaceous to nearly smooth, plicae absent or sharp only posteriorly. Pronotum without a collar, curving downwards right from its hind margin. Anterior margin of clypeus truncate or slightly curved forwards . . 121

– Either the propodeal spiracles are long-oval to sublinear and close to or nearly touching the metanotum ; or else the propodeum has a quite strongly reticulate median area defined laterally by complete or nearly complete plicae. Spiracular sulci usually with some transverse costulae, rarely smooth. Pronotum nearly always with at least a short subhorizontal collar. Anterior margin of clypeus at least slightly emarginate medially 122

121 (120) Postmarginal vein of fore wing (Text-figs. 563, 564) slightly shorter than, or at most as long as, the marginal vein, straight or nearly so ; marginal vein slightly thickened, seven to nine times as long as broad. Tibiae, sometimes also femora, occasionally some of the coxae, yellow ; gaster sometimes reddish basally . . . . ***STINOPLUS*** Thomson (p. 690)

– Postmarginal vein of fore wing (Text-fig. 560) distinctly longer than the marginal vein, curved ; marginal vein thinner, about ten times as long as its medial breadth. Tibiae at least slightly infuscate ; femora mainly, coxae and gaster entirely dark . . ***LAMPOTERMA*** Graham (p. 687)

122 (120) Antennal clava in profile asymmetrical, its upper edge strongly curved, its lower edge straighter ; marginal vein of fore wing 1·8 to 2 times as long as the stigmal vein ; propodeum more than half as long as the scutellum, its spiracles shortly oval and not very near the metanotum. Postspiracular sclerite broad, uniformly or nearly uniformly reticulate ***CHLOROCYTUS*** Graham (p. 611)

– Antennal clava in profile symmetrical ; marginal vein usually less than 1·8 times as long as the stigmal vein, if more, then the propodeum has its spiracles elongate and very close to the hind margin of the metanotum. Postspiracular sclerite narrower, irregularly reticulate and often partly smooth . . . . . ***HABROCYTUS*** Thomson (p. 494) and ***PTEROMALUS*** Swederus (p. 488)

123 (112) Petiole of gaster about 1·5 times as long as broad, subcylindrical, with one or two hairs on each side, about two thirds as long as the propodeum, which is more than half as long as the scutellum ; almost the whole dorsal surface of the antennal clava clothed with whitish subadpressed micropilosity, the clava appearing very asymmetrical in profile ***ISOCYRTUS*** Walker (p. 624)

– Gastral petiole at least slightly transverse, subconical, without hairs laterally, less than half as long as the propodeum, unless the latter is itself very short. Dorsal surface of antennal clava without whitish subadpressed micropilosity, the clava itself usually not asymmetrical 124

124 (123) Clypeus without striae, entirely or mainly reticulate ; antennae inserted distinctly above level of ventral edge of eyes (some *Dinotiscus*) . . 205

– Either the clypeus is mainly to entirely striate ; or the antennae are inserted

lower down, the lower edge of their toruli about level with the ventral edge of the eyes ; sometimes both characters are present simultaneously . 125

125 (124) Propodeum more than half as long as the scutellum, with a distinct costula (Text-figs. 312, 314) 126

– Propodeum usually without a costula, but if with indications of one then the propodeum is less than half as long as the scutellum 129

126 (125) Propodeum (Text-fig. 314) with panels of median area shiny, with some irregular wrinkles, but with little trace of fine reticulation 149

– Propodeum with panels of median area uniformly reticulate and relatively dull 127

127 (126) Head in dorsal view (Text-fig. 428) notably transverse (2·5 to 2·6 times as broad as its maximum length). Antenna with first funicular segment at least slightly longer than the pedicellus, and at least 1·6 times as long as broad ; funicle with sensilla numerous, arranged in two rows on all the segments, or even three rows on some of them . ***AGGELMA*** Delucchi (p. 580)

– Head in dorsal view (Text-figs. 425–427) not notably transverse (at most 2·25 times as broad as its maximum length). Antenna with first funicular segment usually not longer, sometimes slightly shorter, than the pedicellus, and usually relatively shorter in proportion to its breadth than in the above ; funicle with sensilla less numerous, usually arranged in one row on each segment, rarely two irregular rows on the proximal segments . . 128

128 (127) Gaster lanceolate, 4 to 5·5 times as long as broad, nearly twice as long as head plus thorax. Propodeum with costula slightly angulate in its middle . . . . . ***AGGELMA*** Delucchi (p. 580)

– Gaster at most 2·5 times as long as broad, at most slightly longer than head plus thorax. Propodeum with costula straight or nearly so ***ABLAXIA*** Delucchi (p. 572)

129 (125) Anelli, or at least the second anellus, quadrate or hardly transverse (Text-fig. 517) 130

– Anelli distinctly transverse, often strongly so 131

130 (129) Pronotal collar with a very sharp, usually very strongly raised, front margin. Propodeum (Text-fig. 522) nearly or quite half as long as the scutellum ; median area reticulate ; plicae complete. All or most of the hairs of the head and thorax whitish or pale . . ***EUMACEPOLUS*** Graham (p. 633)

– Pronotal collar with at most a weak, hardly raised margin . . . 131

131 (130) Pronotal collar finely though sharply margined throughout, or except just at the sides ; either the mesoscutum has several shallow though distinct piliferous punctures, as well as the reticulation, or else the posterior ocelli are large, separated by only about their own major diameter from the eyes. Fore wing often with fuscous markings 132

– If the pronotal collar is sharply margined throughout, then the mesoscutum has no clearly distinguishable piliferous punctures and the posterior ocelli are smaller, separated by distinctly more than their own major diameter from the eyes. Fore wing usually immaculate 133

132 (131) Stigma of fore wing moderate-sized, often with a fuscous mark below and touching it. Propodeum very short, medially from hardly one quarter to slightly more than one third as long as the scutellum ; plicae usually weak or absent anteriorly ; median area often irregularly sculptured ***CECIDOSTIBA*** Thomson (p. 564)

– Stigma of fore wing (Text-fig. 571) small ; fuscous markings, when present, placed differently. Propodeum medially about half as long as the scutellum, its median area uniformly reticulate ; plicae complete and sharp ***NEPHELOMALUS*** Graham (p. 697)

133 (131) First funicular segment of antennae as long as or longer than the pedicellus 134

– First funicular segment of antennae shorter than the pedicellus . . . 143

134 (133) Pronotal collar evenly and sharply, though sometimes finely, margined throughout, or except sometimes just at the sides 135

– Pronotal collar less distinctly and more irregularly margined, the carina only at all sharp over the middle third or less 136

135 (134) Gaster at most slightly longer than broad, barely as long as the thorax ; marginal vein of fore wing at most 1·5 times as long as the stigmal vein, basal cell pilose at least distally ; funicle with all segments except sometimes the sixth longer than broad, with (except in dwarfs) very numerous sensilla arranged in two to three rows on each segment. Pronotal collar very short medially (Text-figs. 351–354) . ***CAPELLIA*** Delucchi (p. 475)

– Either the gaster is longer, 1·7 to 4 times as long as broad and at least slightly longer than the thorax ; or the marginal vein is nearly to quite twice as long as the stigmal vein ; or the basal cell is bare and at least segments five and six of the funicle are quadrate to transverse. Pronotal collar often relatively long medially 136

136 (135) Propodeum with complete plicae, and with the panels of the median area very shiny, smooth or having only traces of weak sculpture ; basal tergite of gaster with a large patch of about 20 hairs on each side ; pronotal collar finely though sharply margined throughout ; spiracular sulci of propodeum distinctly impressed . . . . ***TRICHOMALUS*** Thomson (p. 707)

– If the median area of the propodeum is shiny and very weakly sculptured or smooth, then the plicae are at most indicated posteriorly, the basal tergite of the gaster has fewer hairs at the sides, and the spiracular sulci of the propodeum are very shallow 137

137 (136) Propodeum (Text-fig. 492) shiny and weakly reticulate to virtually smooth, medially usually less than half as long as the scutellum ; plicae absent or indicated only posteriorly. Postspiracular sclerite broad, its upper margin rather longer than the tegula, almost uniformly reticulate ***CHLOROCYTUS*** Graham (p. 611)

– Median area of propodeum quite strongly reticulate, sometimes also with some coarser wrinkles or rugosity, often more than half as long as the scutellum ; plicae variable, sometimes nearly absent but often nearly or quite complete. Postspiracular sclerite sometimes narrower . . . 138

138 (137) Propodeum (Text-fig. 356) with petiolar foramen deeply, semicircularly excised, bordered by a strongly-raised, crescentic carina which represents the nuchal strip. Gaster ovate, about as long as thorax. Head in dorsal view not notably transverse, about twice as broad as long ; POL equal to or slightly less than OOL. Plicae of propodeum sometimes traceable to base, but often weak or absent anteriorly ; spiracular sulci relatively shallow, smooth or nearly so. Antennal clava in profile appearing symmetrical . . . . . ***MOKRZECKIA*** Mokrzecki (p. 478)

– Petiolar foramen of propodeum rarely so deeply excised, or bordered by a strongly raised carina ; if so (some *Aggelma*) then either the gaster is lanceolate and longer than head plus thorax, or else the head in dorsal view (Text-fig. 428) is notably transverse. POL at least slightly greater than OOL. Plicae of propodeum sometimes sharp throughout ; spiracular sulci sometimes deeper and punctate or transversely costulate. Antennal clava in profile sometimes appearing asymmetrical 139

139 (138) Plicae complete, extending to base of propodeum, quite distinct throughout although not always very sharp 140

– Plicae present at hind margin of propodeum only ; or at least more or less effaced anteriorly and not reaching the base of the sclerite . . . 142

140 (139) Thorax not slender, in dorsal view 1·5 to 1·7 times as long as broad ; postspiracular sclerite weakly and irregularly sculptured, usually more or less smooth dorsally, with a curved impression in front. Spiracular sulci of propodeum distinctly impressed, with some punctures or transverse costulae . . . . . ***HABROCYTUS*** Thomson (p. 494) and ***PTEROMALUS*** Swederus (p. 488)

– Either the thorax is slender, in dorsal view about twice as long as broad ; or the postspiracular sclerite is almost uniformly reticulate, without a distinct impression in front. Spiracular sulci of propodeum sometimes shallow . 141

141 (140) Antennal clava in profile appearing asymmetrical, its dorsal edge curved, its ventral edge nearly straight. Propodeum medially half or somewhat more than half as long as scutellum . . ***CHLOROCYTUS*** Graham (p. 611)

– Antennal clava in profile appearing symmetrical or virtually so. Propodeum sometimes relatively shorter 142

142 (141) Antennal clava, unless abnormally collapsed, twice or somewhat more than twice as long as broad, at least as long as funicular segments 5 + 6. Either the postmarginal vein of fore wing is not longer than the marginal vein, or else the thorax is slender (length : breadth about 2 : 1) and the propodeum is fully half as long as the scutellum. Body usually bright green to blue, occasionally olive or bronze-green ***CHLOROCYTUS*** Graham (p. 611)

– Antennal clava either less than twice as long as broad, or shorter than funicular segments 5 + 6. Postmarginal vein slightly longer than the marginal vein. Thorax 1·65 to 1·75 times as long as broad. Propodeum less than half as long as the scutellum except in *violacea*, which has a notably transverse head (Text-fig. 428). Body sometimes olive-green, but often with bronze to coppery or violet tinge . ***AGGELMA*** Delucchi (p. 580)

143 (133) Thorax depressed ; the mesoscutum, scutellum, and propodeum all lying in the same or nearly the same plane ; scutellum in profile flat or virtually so ; either the distal third or so of the basal cell in the fore wing pilose, or else the antennae are inserted below the ventral edge of the eyes ***ANOGMUS*** Förster (p. 628)

– Thorax distinctly arched dorsally ; dorsal surface of scutellum in profile at least slightly convex ; basal cell of fore wing often bare ; antennae inserted level with or above the ventral edge of the eyes 144

144 (143) Antennae inserted distinctly above the level of the ventral edge of the eyes 145

– Lower edge of antennal toruli level with or hardly above a line joining the ventral edges of the eyes 153

145 (144) Basal cell of fore wing, not counting a row of hairs which is sometimes present on the basal vein bare, or virtually bare 146

– Basal cell of fore wing pilose over its distal quarter to half 153

146 (145) Marginal vein of fore wing about 1·5 times as long as the stigmal vein ; tip of hypopygium situated very distinctly beyond the middle of the gaster ; eyes about 1·5 times as long as broad ; both mandibles with four teeth ***SPINTHERUS*** Thomson (p. 480)

– Either the marginal vein is nearly or quite twice as long as the stigmal vein ; or the tip of the hypopygium is situated at most half way along the gaster. Eyes usually less elongate. Left mandible often with three teeth . . 147

147 (146) Antennal clava in profile appearing asymmetrical, its dorsal edge curved, its ventral edge nearly straight.

Propodeum medially half or somewhat more than half as long as the

scutellum. Marginal vein of fore wing 1·8 to 2 times as long as the stigmal vein . . . . . ***CHLOROCYTUS*** Graham (p. 611)

– Antennal clava in profile appearing symmetrical or virtually so 148

148 (147) Plicae complete and extending to base of propodeum ; their anterior half represented at least by a distinctly impressed longitudinal groove, though most often the outer edge of this groove is raised to form a sharp fold . 149

– Plicae incomplete ; either present only at hind margin of propodeum, or else more or less effaced in the middle or in front 152

149 (148) Propodeum (Text-fig. 314) : the median area with a very distinct costula, its panels shiny and with irregular wrinkles. Basal tergite of gaster with few hairs at the sides. Pronotal collar finely, sharply margined. Spiracular sulci of propodeum distinctly impressed ***STAUROTHYREUS*** Graham (p. 699)

– Propodeum without a costula, or with at most a vague trace of one ; panels of median area most often relatively uniformly reticulate and relatively dull, if shiny then without conspicuous irregular wrinkles 150

150 (149) Propodeum with panels of median area very shiny, smooth or with only traces of weak sculpture ; basal tergite of gaster with a large patch of 20 or so hairs on each side ; pronotal collar finely though sharply margined throughout ; spiracular sulci of propodeum distinctly impressed ***TRICHOMALUS*** Thomson (p. 707)

– Panels of median area of propodeum nearly always strongly reticulate, if very weakly so then the basal tergite of the gaster has only a few hairs at the sides, and the spiracular sulci of the propodeum are very shallow. Pronotal collar sometimes weakly margined 151

151 (150) Spiracular sulci of propodeum distinctly impressed, more or less punctate or with some transverse costulae. Postspiracular sclerite (Text-fig. 336) usually weakly and irregularly reticulate, sometimes partly smooth. Marginal vein of fore wing sometimes less than 1·7 times as long as the stigmal vein . . . . . ***HABROCYTUS*** Thomson (p. 494) and ***PTEROMALUS*** Swederus (p. 488)

– Spiracular sulci shallow, alutaceous to nearly smooth. Postspiracular sclerite (Text-fig. 335) nearly uniformly reticulate, relatively broad. Marginal vein of fore wing 1·7 to 2·3 times as long as the stigmal vein ***CHLOROCYTUS*** Graham (p. 611)

152 (148) Marginal vein of fore wing 1·7 to 2·3 times as long as the stigmal vein. Spiracular sulci of propodeum shallow, broad ***CHLOROCYTUS*** Graham (p. 611)

– Marginal vein of fore wing about 1·5 times as long as the stigmal vein. Spiracular sulci of propodeum distinctly impressed, narrow (*conopidarum* Bouček) . . . . . ***HABROCYTUS*** Thomson (p. 494)

153 (144, 145) Mesepisternum wholly or almost wholly reticulate, the upper triangular area below the base of the hind wing being reticulate or at most smooth posteriorly ; propodeal spiracles large, oval, close to the hind margin of the metanotum . . . . . ***MESOPOLOBUS*** Westwood (p. 638)

– Mesepisternum having its upper triangular area smooth or mainly so ; propodeal spiracles smaller, often subcircular, sometimes separated by nearly their own diameter from the metanotum 154

154 (153) Gaster subcircular to ovate, 1·2 to 1·7 times as long as broad, not or only slightly longer than the thorax ; distal part of basal cell of fore wing more or less pilose 155

– Gaster lanceolate, twice or (usually) more than twice as long as broad, at least as long as head plus thorax ; basal cell of fore wing bare, a row of hairs which is sometimes present on the basal vein is not counted 156

155 (154) Head and thorax green to blue ; POL hardly greater than OOL ; antennal clava (Text-fig. 502) shorter than the three preceding funicular segments together . . . . . ***CHLOROCYTUS*** Graham (p. 611)

– Head and thorax bronze to greenish bronze ; POL 1·4 to 1·6 OOL ; antennal clava about as long as the three preceding funicular segments together ***PEGOPUS*** Förster (p. 684)

156 (154) POL about 1·5 times OOL ; antennal clava asymmetrical, its dorsal edge more strongly curved than its ventral edge ***LEPTOMERAPORUS*** Graham (p. 687)

– POL equal to, or hardly greater than, OOL ; antennal clava in profile appearing symmetrical or virtually so . ***HABROCYTUS*** Thomson (p. 494)

157 (111) Propodeum with a more or less distinct costula (Text-figs. 312, 373–376, 378–380) 158

– Propodeum without a costula 160

158 (157) Pronotal collar sharply, though sometimes finely, margined throughout, or except just at the sides ; propodeum more than half as long as the scutellum, its median area wholly reticulate, the costula distinct, straight or only slightly angled 159

– Either the pronotal collar is at most weakly margined in the middle only ; or the propodeum is less than half as long as the scutellum ; or the costula is weak, or distinctly angled in its middle (Text-figs. 374–380) . . . 161

159 (158) Antennal flagellum stout, subfusiform, with all the funicular segments quite strongly transverse ; head thick antero-posteriorly ; propodeal nucha convex, strongly reticulate, and distinctly limited in front by a transverse depression . . . . . ***HALOMALUS*** Erdös (p. 781)

– Antennal flagellum subclavate, with at least the proximal funicular segments not transverse ; head relatively more transverse ; propodeal nucha (Text-fig. 312) relatively less convex and not, or not very distinctly, limited in front . . . . . ***ABLAXIA*** Delucchi (p. 572)

160 (157) Anelli, or at least the second anellus, quadrate or hardly transverse ; pronotal collar margined anteriorly by a sharp carina which is usually very strongly raised. Spiracular sulci of propodeum rather shallow, finely reticulate or alutaceous . . . ***EUMACEPOLUS*** Graham (p. 633)

– Anelli distinctly, often strongly, transverse. If the pronotal collar is sharply margined, then the carina is fine and only slightly raised, or else the spiracular sulci of the propodeum are distinctly impressed and punctate 161

161 (160) Posterior ocelli rather large, separated by only about 1·5 times their own major diameter from the eyes, the latter separated by only 1·15 to 1·2 times their own length ; mesoscutum with several shallow though distinct piliferous punctures ; anterior margin of clypeus truncate. Pronotal collar finely but sharply margined throughout. Fore wing usually with fuscous clouds . . . . . ***NEPHELOMALUS*** Graham (p. 697)

– Posterior ocelli usually smaller and separated by at least twice their own major diameter from the eyes, if by somewhat less then the mesoscutum has no piliferous punctures and the anterior margin of the clypeus is emarginate medially. Pronotal collar often weakly margined, or immarginate. Fore wing sometimes infumate, but rarely with definite fuscous markings 162

162 (161) Propodeum with panels of median area very shiny, smooth or at most very weakly sculptured 163

– Propodeum with median area distinctly and usually strongly sculptured; reticulate, wrinkled, or obliquely strigose-reticulate 164

163 (162) Pronotal collar finely though sharply margined throughout ; basal tergite of gaster with a large patch of 20 or more hairs on each side ***TRICHOMALUS*** Thomson (p. 707)

– Pronotal collar at most weakly margined in the middle ; basal tergite of gaster with few hairs at the sides 164

164 (163) Mesoscutum and scutellum with delicate, for the most part engraved, reticulation ; face receding strongly so as to form an angle of only about 110° with the frons ; antennae inserted level with ventral edge of eyes, all funicular segments transverse . . . cf. ***NASONIA*** Ashmead (p. 779)

– Mesoscutum and scutellum with stronger reticulation which is at least slightly raised above the general surface ; face not receding so strongly ; antennae most often inserted above the level of the ventral edge of the eyes 165

165 (164) Hind tibia with two very distinct spurs. Propodeum : plicae absent or represented only by weak convex elevations. Large species, 3·8 to 5 mm., with elongate subconical gaster. Pronotal collar not margined, almost rounded off in front. Both mandibles with four teeth [Central and Southern Europe] . . . . . ***STENETRA*** Masi (p. 474)

– Hind tibia with only one spur. Propodeum nearly always with plicae which are at least sharp posteriorly, but often complete. Pronotal collar sometimes margined, or with an abrupt front edge. Left mandible sometimes with three teeth 166

166 (165) Propodeum with spiracular sulci shallow, alutaceous ; plicae at most sharp posteriorly, effaced in the middle, anteriorly represented only by foveae ; fore wing with stigma (Text-fig. 315) rather large, separated by only about 1·6 to 1·8 times its height from the lower edge of the postmarginal vein, the wing often with a fuscous mark or transverse band in the middle (at the edge of the speculum) ; gaster elongate and conical, often reddish at the base ; pronotal collar not or hardly margined ***PHAENOCYTUS*** gen. n. (p. 561)

– Propodeum (Text-figs. 373–389) : spiracular sulci rather deep, with some transverse costulae or punctures ; plicae at least sharp posteriorly but most often traceable as a fold or ridge to the base of the propodeum; stigma of fore wing smaller, separated by at least twice its height from the lower edge of the postmarginal vein, the wing immaculate or at most indefinitely infumate ; gaster not reddish-marked ; pronotal collar sometimes margined 167

167 (166) Sutures of antennal clava not oblique, the clava with only a small area of micropilosity on its third segment ventrally ***HABROCYTUS*** Thomson (p. 494) and ***PTEROMALUS*** Swederus (p. 488)

– Second suture of clava (seen in profile) distinctly oblique ; the area of micropilosity on the third segment ventrally (Text-fig. 363) larger and extending nearly half way to the base of the clava ***Sceptrothelys parviclava*** sp. n. (p. 487)

168 (23) Hind corners of propodeum in dorsal view appearing prominent and sharp, rectangular or acute ; notauli most often traceable to hind margin of mesoscutum even if superficial posteriorly ; pronotal collar rounded off in front 169

– Hind corners of propodeum in dorsal view not prominent, rounded off, notauli incomplete ; pronotal collar sometimes margined 170

169 (168) Notauli complete and fairly sharply impressed throughout ; gaster wholly alutaceous ; marginal vein of fore wing somewhat more than twice as long as the stigmal vein ; propodeum without a distinctly-defined nucha, plicae vague, costula absent . ***DORCATOMOPHAGA*** Kryger (p. 828)

– Notauli incomplete or, if complete, very superficial posteriorly ; gaster at least partly smooth ; marginal vein of fore wing not more than twice as long as the stigmal vein ; propodeum with a nucha marked off by a constriction, plicae and costula more or less indicated
LARIOPHAGUS Crawford (p. 823)

170 (168) Ovipositor sheaths far exserted, the exserted portion at least half as long as the hind tibia 171

– Ovipositor sheaths at most slightly exserted 172

171 (170) Face below level of antennal toruli and clypeus, with several very distinct piliferous punctures. Antennae inserted at least slightly above level of ventral edge of eyes . . . . ***ROPTROCERUS*** Ratzeburg (p. 423)

– Face and clypeus without piliferous punctures. Antennae inserted at or slightly below level of ventral edge of eyes 190

172 (170) Antennal clava either acute apically (Text-fig. 300) ; or with a terminal spur (Text-fig. 299 ; often indistinctly segmented or solid . . . 173

– Antennal clava neither acute nor with a terminal spur, distinctly three-segmented 175

173 (172) Gaster ovate to lanceolate, distinctly pointed apically ; postmarginal vein distinctly longer than the stigmal vein. Gaster often more or less extensively red or yellow 174

– Gaster subcircular, obtuse apically, disregarding the ovipositor sheaths, if visible ; postmarginal vein usually not or hardly longer than the stigmal vein. Gaster not pale-marked 175

174 (173) Propodeum as long as or longer than the scutellum, strongly reticulate, its nucha large and strongly produced backwards so that (in dorsal view) its hinder edge is nearly or quite level with the tips of the hind coxae. Gaster usually reddish-marked ; all coxae mainly to entirely reddish. Underside of fore wing with a row of rather long, downward-pointing hairs a little below the marginal vein . . . . ***CALLITULA*** Spinola (p. 458)

– Propodeum shorter than the scutellum, its nucha short or indistinct, more weakly reticulate, and produced at most slightly beyond the bases of the hind coxae. Pale areas of gaster (when present) more yellowish ; coxae often dark, occasionally all pale. Underside of fore wing, below marginal vein, with only fine, short scattered hairs . ***HOMOPORUS*** Thomson (p. 444)

175 (173) Gaster subcircular, obtuse apically, disregarding the ovipositor sheaths, if visible ; postmarginal vein of fore wing usually about equal in length to, or hardly longer than, the stigmal vein 176

– Gaster ovate to lanceolate, usually distinctly pointed apically but if obtuse then obviously longer than broad ; postmarginal vein usually distinctly longer than the stigmal vein, rarely only slightly so 177

176 (175) Occiput margined. Antennae clavate ; clava subobtuse, ventrally with a large area of micropilosity which extends nearly to its base. Eyes with rather long conspicuous hairs. Fore wing with basal cell extensively pilose, speculum small and not reaching down to cubital vein, apical margin of wing ciliate . . . . . ***DIGLOCHIS*** Förster (p. 782)

– Occiput not margined. Antennae subfusiform ; clava pointed, ventrally with only a small area of micropilosity on its third segment. Eyes with very short inconspicuous pubescence. Fore wing with basal cell bare or pilose in distal part only, speculum large and extending to cubital vein
CYCLOGASTRELLA Bukovkij (p. 796)

177 (175) Pronotal collar usually (Text-fig. 317) as wide as the mesoscutum, if slightly less wide, then the hairs of the head and thorax are conspicuous and, at least most of them, whitish. Pronotum, in front of the collar, descending

almost vertically to the neck, which is very short and hardly visible from above. Postspiracular sclerite most often visible only as a small plate in front of the tegula (Text-fig. 318), rarely broad or descending far ventrad. Hind tibiae usually with two apical spurs (but one of these often weak and hard to see). Body usually bronze, bluish black, or dark greenish, rarely more brightly coloured.

Species more frequent in xerotherm habitats, especially in Central and Southern Europe ; not yet found in Britain 196

– Pronotal collar usually distinctly less wide than the mesoscutum, if only slightly so then the hairs of the head and thorax (excluding propodeum) are inconspicuous and not whitish, or the pronotum descends less abruptly in front of the collar. Postspiracular sclerite most often broader or descending far ventrad. Hind tibiae with one apical spur. Body often brightly metallic (green or blue).

Almost all the genera of this section occur in North-western Europe, in varied habitats, some represented by numerous species 178

178 (177) Fore wings without a speculum, hairy almost all over. Thorax much flattened dorso-ventrally, scutellum almost flat ; mesoscutum, scutellum and propodeum all lying in nearly the same plane. Eyes rather conspicuously hairy. Occiput deeply concave, forming a fairly sharp edge where it joins the vertex, and sometimes slightly margined at this point ***RAKOSINA*** Bouček (p. 781)

– Fore wing with a speculum ; basal cell most often mainly bare, sometimes with its distal half more or less hairy. Thorax usually not flattened . . 179

179 (178) Occiput finely margined medially. Propodeum with a reticulate nucha . 180

– Occiput not margined. Propodeal nucha sometimes represented only by a narrow transverse strip or ridge 181

180 (179) Face receding strongly so as to form an angle of about 110° with the frons. Mesoscutum and scutellum with delicate, for the most part engraved, reticulation . . . . . cf. ***NASONIA*** Ashmead (p. 779)

– Face receding less strongly. Mesoscutum and scutellum with stronger reticulation which is slightly raised above the general surface ***EUPTEROMALUS*** (part) (p. 737)

181 (179) Propodeum with a conspicuous tuft of white hairs between the callus and the plica, on each side ; dorsal surface of hind coxae with some hairs ; pronotal collar finely though sharply margined. Antennae and body, Text-figs. 580, 582 . . . . . ***ATRICHOMALUS*** Graham (p. 737)

– Propodeum, between the callus and the plica, with at most a few hairs which do not form a conspicuous tuft [the callus itself is always more or less hairy] ; dorsal surface of hind coxae without hairs ; pronotal collar sometimes immarginate 182

182 (181) Antennae (Text-figs. 431, 432) with clava ventrally with a line of micropilosity extending nearly to its base, the sutures of the clava strongly oblique. Gena with a fairly large hollow above the base of the mandible. Propodeum (Text-fig. 433) medially strongly produced beyond bases of hind coxae, with a large reticulate nucha, often also traces of a costula. Stigma of fore wing usually (Text-fig. 434) moderate-sized ***SYNEDRUS*** Graham (p. 583)

– Antennal clava with a smaller area of micropilosity which is confined to its third segment and extends at most half way to the base of the clava ; sutures of the latter not or hardly oblique. The other characters not all present in combination 183

183 (182) Propodeum with a moderate-sized reticulate nucha, whose length is about one third that of the median length of the propodeum ; antennae inserted about level with the ventral edge of the eyes, the head somewhat protuberant at level of antennal toruli ; mesoscutum and scutellum, at least mainly, with delicate engraved reticulation ***NASONIA*** Ashmead (p. 779)

– Either the propodeal nucha is a narrower weakly sculptured transverse strip or ridge ; or the antennae are inserted well above the level of the ventral edge of the eyes ; or the reticulation of the mesoscutum and scutellum is slightly raised above the general surface 184

184 (183) Propodeum with a moderate-sized reticulate nucha, its length one third to half that of the propodeum ; antennae inserted well above the level of the ventral edge of the eyes 185

– Propodeal nucha nearly always represented merely by a transverse ridge or narrow strip, which is aciculate or smooth ; but if the nucha is rather more distinct then the antennae are inserted about level with the ventral edge of the eyes 186

185 (184) Gena with a hollow above the base of the mandible, extending fully one third up the malar space ; marginal vein of fore wing somewhat thickened ***METASTENUS*** Walker (p. 829)

– Gena without a hollow above the base of the mandible ; marginal vein of fore wing not thickened . . . . ***TRICOLAS*** Bouček (p. 563)

186 (184) Gena with a large hollow above the base of the mandible ; stigma of fore wing (Text-fig. 319) rather large, subcircular ; first funicular segment obviously longer than broad . . ***PSEUDOCATOLACCUS*** Masi (p. 694)

– Gena without a hollow. Stigma of fore wing smaller, tending to be oval or oblong ; first funicular segment often quadrate or transverse . . . 187

187 (186) Tip of hypopygium situated near apex of gaster, which in dorsal view appears blunt, the tips of the ovipositor sheaths rounded, and is hardly longer than the thorax ; propodeum without plicae ; antennae inserted somewhat above level of ventral edge of eyes. Head distinctly broader than thorax, rather thick antero-posteriorly. Both mandibles with three teeth . . . . . ***KARPINSKIELLA*** Bouček (p. 632)

– Tip of hypopygium remote from apex of gaster except in some *Psilonotus* and *Mesopolobus*, in which the gaster is pointed or acute apically with tips of the ovipositor sheaths pointed, the gaster is at least somewhat longer than the thorax, the propodeum has plicae at least sharp posteriorly, and the right mandible has four teeth ; often also, the antennae are inserted at or slightly below the level of the ventral edge of the eyes 188

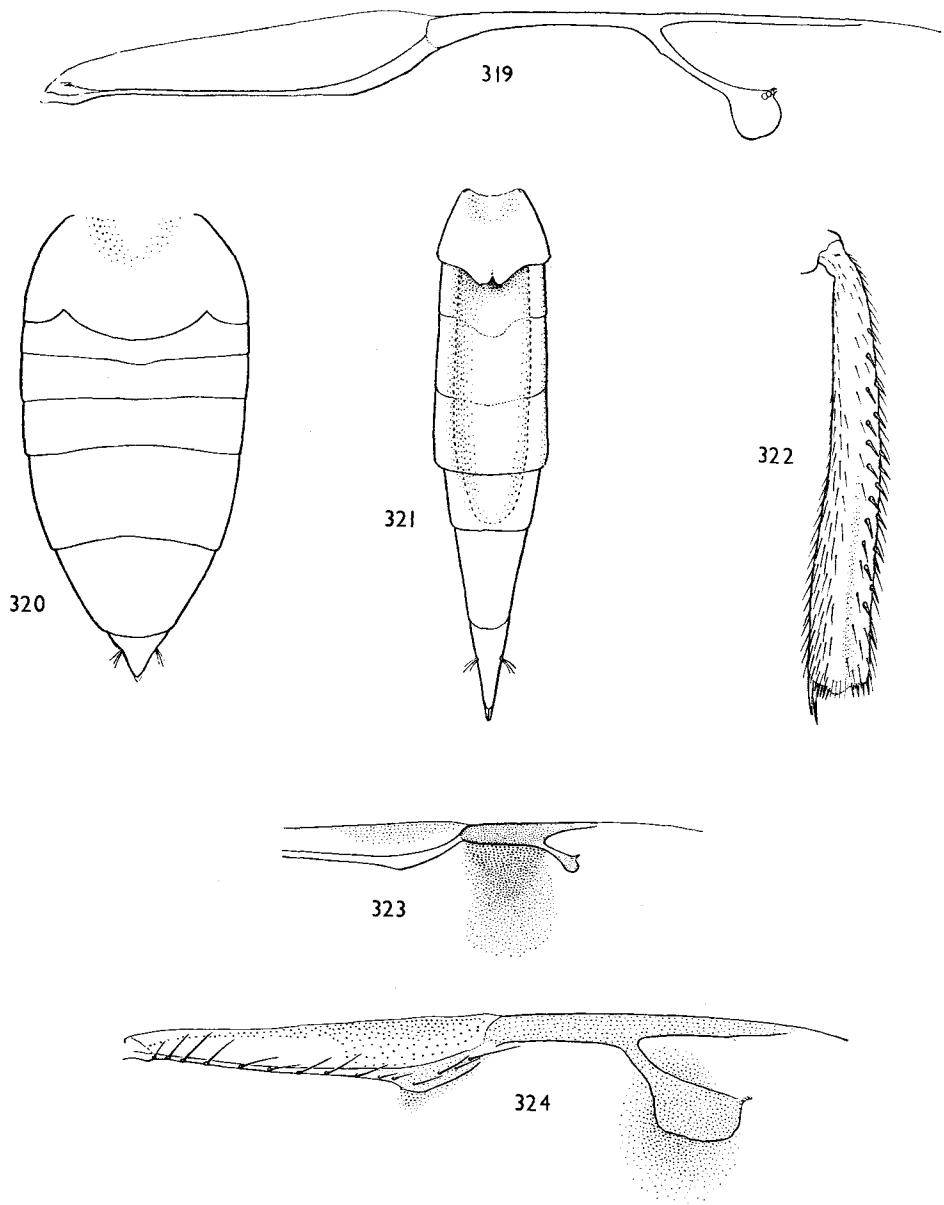
188 (187) Hypopygium very long, its tip situated at least at three quarters the length of the gaster, or even beyond 189

– Hypopygium shorter, its tip situated at most a little more than half way along the gaster. 190

189 (188) Anterior margin of clypeus incised medially. Marginal vein of fore wing at most 1·6 times as long as the stigmal vein ; postmarginal vein nearly or quite as long as the marginal vein . ***PSILONOTUS*** Walker (p. 625)

– Anterior margin of clypeus truncate or shallowly emarginate. Marginal vein of fore wing sometimes twice, or rather more than twice, as long as the stigmal vein ; postmarginal vein sometimes distinctly shorter than the marginal vein . . . . . ***MESOPOLOBUS*** Westwood (p. 638)

190 (171) Thorax distinctly flattened dorso-ventrally ; scutellum in profile appearing flat or virtually so, at least very slightly broader than long ; third anellus of antenna usually about twice as broad as long or more. Either the mesopleuron is entirely reticulate ; or the ovipositor sheaths are far



FIGS. 319–324. 319, *Pseudocatolaccus nitescens* (Walker), ♀, fore wing venation ; 320, *Picroscytoides cerasiops* Masi, ♀, gaster ; 321, *Stenoselma nigrum* Delucchi, ♀, gaster ; 322, *Cheiropachus quadrum* (F.), ♂, left hind tibia ; 323, *Metacolus unifasciatus* Förster, ♀, fore wing, part ; 324, *Acrocormus semifasciatus* Thomson, ♂, fore wing, part.

exserted, the exserted part about half as long as hind tibia ; or the antennae are inserted well below the ventral edge of the eyes and very close to the clypeus. Basal cell of fore wing more or less extensively pilose distally . . . . . ***ANOGMUS*** Förster (p. 628)

– Thorax nearly always distinctly arched dorsally, with the upper surface of the scutellum appearing distinctly curved in profile ; if the thorax is rather distinctly flattened, then the scutellum is slightly longer than broad and the third anellus is subquadrate. Mesopleuron rarely entirely reticulate, usually with a partly to wholly smooth area below the base of the hind wing. Ovipositor sheaths never so far exserted. Antennae usually inserted level with or slightly above the ventral edge of the eyes, rarely slightly below 191

191 (190) Plicae of propodeum usually absent or indicated only in the hinder half of the sclerite, occasionally traceable farther forward, but then extremely weak ; antennae inserted distinctly above level of ventral edge of eyes, their toruli nearly equidistant from the median ocellus and the anterior margin of the clypeus ; clypeus reticulate or at most partly striate. Postmarginal vein of fore wing usually as long as or longer than the marginal vein, rarely slightly shorter. Both mandibles with three teeth . 192

– Plicae of propodeum usually complete, if vague anteriorly or incomplete then the antennae are inserted at or hardly above the level of the ventral edge of the eyes, and at least slightly nearer to the anterior margin of the clypeus than to the median ocellus, whilst the clypeus is sometimes wholly striate. Right mandible, rarely also left mandible, with four teeth. . 193

192 (191) Pronotal collar finely though sharply margined anteriorly. Propodeum (medially) slightly more than half as long as the scutellum ; surface between the spiracles finely reticulate, not very shiny ; plicae often indicated posteriorly and sometimes traceable well forward ***CRICELLIUS*** Thomson (p. 591)

– Pronotal collar rounded off anteriorly into the neck. Propodeum (medially) hardly one third as long as the scutellum ; surface between the spiracles shiny, weakly alutaceous to virtually smooth ; plicae absent ***LAMPOTERMA*** Graham (p. 687)

193 (191) POL 1·8 to 2·2 times OOL . . . ***MESOPOLOBUS*** Westwood (p. 638) and ***STUROVIA*** Bouček (p. 637)

– POL 1·3 to 1·6 times OOL 194

194 (193) Left mandible with three teeth, right mandible with four. Mesoscutum without, or with hardly perceptible piliferous punctures. Propodeal spiracles large, oval. Pronotal collar reticulate. Antenna with third anellus quadrate or only slightly transverse ***MESOPOLOBUS*** Westwood (p. 638)

– Both mandibles with four teeth. Mesoscutum with numerous fairly distinct piliferous punctures. Propodeal spiracles small, subcircular. Pronotal collar with a more or less shiny strip along its hind edge. Antenna with third anellus about three times as broad as long ***MERAPORUS*** Walker (p. 681)

195 (60) Hind margin of basal segment of gaster not trilobed. Basal cell of fore wing bare, speculum large . . . . . ***NORBANUS*** Walker (p. 437)

– Hind margin of basal segment of gaster (Text-fig. 320) trilobed. Basal cell of fore wing mainly to entirely pilose, speculum absent or rudimentary ***PICROSCYTOIDES*** Masi (p. 441)

196 (177) Fore wing with speculum absent or rudimentary ; basal cell mainly to entirely pilose ; hind margin of basal tergite of gaster (Text-fig. 321) produced and emarginate medially ; antennae inserted at or hardly above level of ventral edge of eyes . . ***STENOSELMA*** Delucchi (p. 437)

– Fore wing speculum distinct, often large ; basal cell usually mainly to entirely bare, if extensively pilose then the basal tergite of the gaster is not produced as in the above. Antennae often inserted distinctly above level of ventral edge of eyes 197

197 (196) Fore wing with two fuscous clouds, one below the parastigma, the other below the stigmal vein. Propodeum with a convex reticulate nucha ; mesopleuron with a smooth triangular area below the base of the hind-wing ; anterior margin of clypeus incised medially. Antennae inserted only very slightly above level of ventral edge of eyes

DINARMOIDES Masi (p. 436)

– Fore wing immaculate. Either the propodeal nucha is not developed ; or the triangular area of the mesopleuron is at least mainly reticulate ; or the anterior margin of the clypeus is not incised 198

198 (197) Propodeum with a subglobose reticulate nucha which projects beyond the bases of the hind coxae ; mesopleuron wholly reticulate, or with the triangular area below the base of the hind wing at most partly smooth . 199

– Propodeum usually without a subglobose nucha ; if with one then it does not project beyond the bases of the hind coxae, whilst the triangular area of the mesopleuron, below the base of the hind wing, is entirely smooth . . 200

199 (198) Anterior margin of clypeus bidentate ; marginal vein of fore wing slightly shorter than the stigmal vein, stigma rather large ***OEDAULE*** Waterston (p. 435)

– Anterior margin of clypeus shallowly emarginate ; marginal vein of fore wing at least slightly longer than the stigmal vein, stigma small

DINARMUS Thomson (p. 434)

200 (198) Antennae inserted only very slightly above the level of the ventral edge of the eyes ; propodeum with a convex, weakly sculptured and shiny nucha

ANISOPTEROMALUS Ruschka (p. 433)

– Antennae inserted well above level of ventral edge of eyes ; propodeal nucha not developed but represented merely by a narrow transverse strip . . 201

201 (200) Antennal toruli situated much nearer to the median ocellus than to the anterior margin of the clypeus ; funicular segments very long, the first about four times, fifth about twice, as long as broad. Malar space from two thirds to nearly three quarters the length of an eye, the latter relatively small. Anterior margin of clypeus virtually truncate

GUGOLZIA Delucchi (p. 430)

– Antennal toruli situated about midway between the median ocellus and the anterior margin of the clypeus, or only slightly above this level ; funicular segments relatively less elongate. Malar space relatively shorter, eyes larger. Anterior margin of clypeus at least slightly emarginate . . 202

202 (201) Marginal vein of fore wing thickened at the base ; third anellus quadrate

ISCHYROPTYX Delucchi (p. 433)

– Marginal vein not thickened basally ; third anellus transverse . . . 203

203 (202) Pronotal collar finely though fairly sharply margined throughout. Antennal clava in the type-species with its sutures oblique, and with a line of micropilosity extending fully half way to the base. Genae, at least near the mandibles, with a rather sharp edge . . ***OXYSYCHUS*** Delucchi (p. 432)

– Pronotal collar not margined, or with at most a weak carina in the middle. Antennal clava with sutures not oblique, and with only a small area of micropilosity on its third segment. Genae without a sharp edge

CYRTOPTYX Delucchi (p. 430)

204 (91) Anterior margin of clypeus with two rounded lobes between which is an incision. Pronotal collar virtually as wide as the mesoscutum ; thorax in dorsal view squat, only slightly longer than broad. Postspiracular sclerite

very narrow and inconspicuous. Bristles along the posterior edge of the hind tibiae not unusually short or spine-like. Fore wing with marginal vein usually at least slightly shorter than, occasionally as long as, the stigmal vein, and tending to be somewhat thickened towards the base ; wing sometimes immaculate, sometimes with dusky clouds below the parastigma and the stigma . . . . . ***CAENOCREPIS*** Thomson (p. 429)

– Anterior margin of clypeus shallowly emarginate medially. Pronotal collar distinctly less wide than the mesoscutum ; thorax in dorsal view obviously longer than broad. Postspiracular sclerite broad and conspicuous. Hind tibiae (cf. Text-fig. 322) with a row of short spines along their posterior edge. Fore wing with marginal vein at least very slightly longer than the stigmal vein, not thickened ; wing with two fuscous clouds, one below the parastigma, the other lying across the stigmal vein ***CHEIROPACHUS*** Westwood (p. 416)

205 (124) Pronotal collar margined anteriorly. Hind tibia with one apical spur ***DINOTISCUS*** Ghesquière (p. 409)

– Pronotal collar not margined. Hind tibia with one or two apical spurs . 206

206 (205) Hind tibia with two apical spurs ; pronotum with a short subhorizontal collar, in front of this falling steeply to the neck ***ACROCORMUS*** Förster (p. 415)

– Hind tibia with one apical spur ; pronotum without a distinct subhorizontal collar, but rounded off into the neck region ***RHOPALICUS*** Förster (p. 412)

Key to most European Genera

(Males)

The following genera are not included in the key because their males are unknown to me; in some cases they have not yet been recognized :

Gygaxia Delucchi, *Platecrizotes* Bouček, *Nikolskayana* Bouček, *Neanica* Erdös, *Gbelcia* Bouček, *Stinoplus* Thomson, *Trychnosoma* Graham, *Heteroprymna* Graham, *Metastenus* Walker, *Mokrzeckia* Mokrzecki, *Eurydinota* Förster, *Aggelma* Delucchi.

The males of many Pteromalinae species are less well known than the females, and often present poor characters which make tabulation difficult. However, in some cases they show more obvious features than their females, and this may be useful if one has a bred series of both sexes, when the key to males can be used as a check against the key to females. Hence it was thought worthwhile to include the following key to males, although the writer is very conscious of its imperfections.

1 Brachypterous forms 2

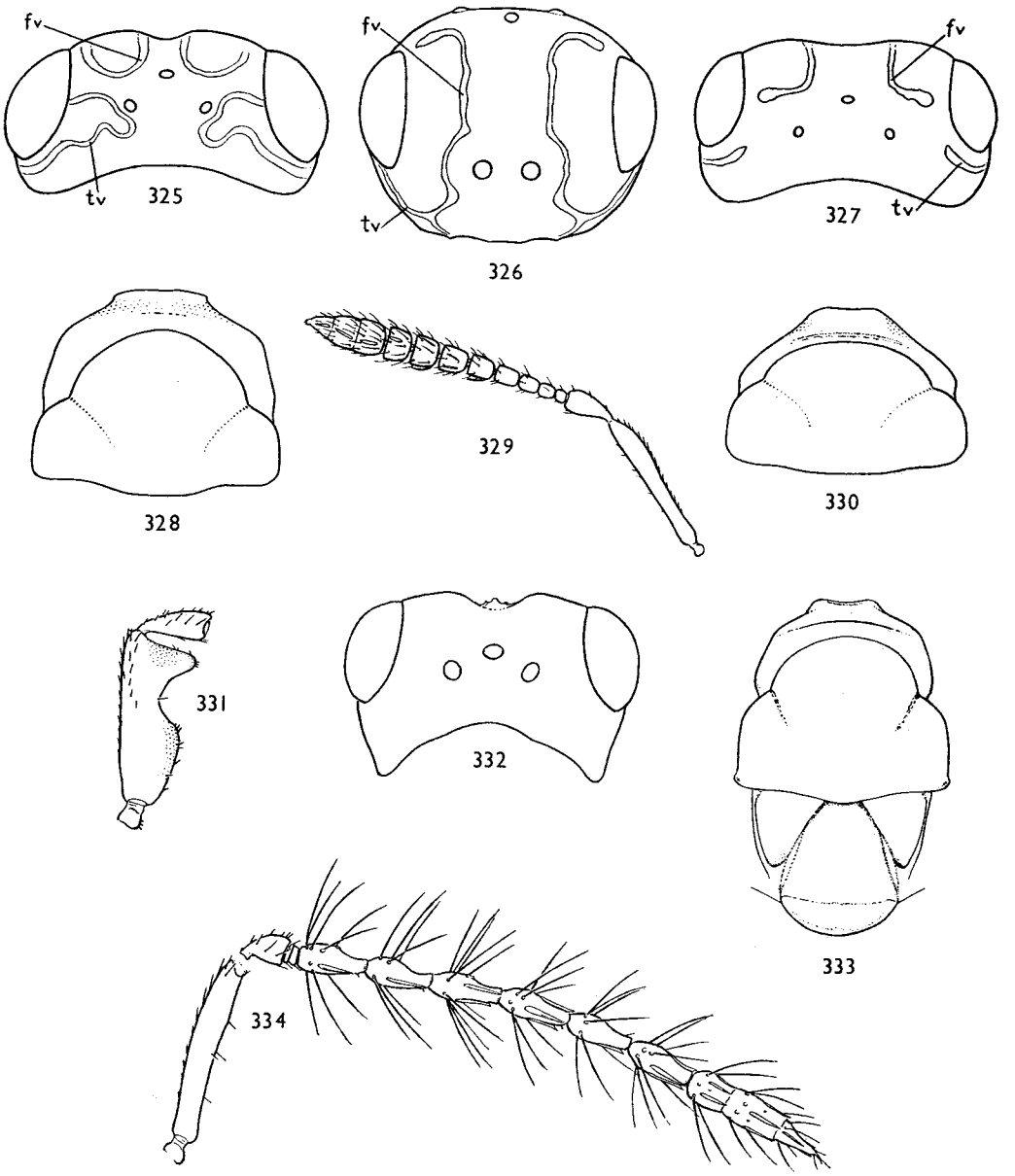
– Macropterous forms 8

2 (1) Face, frons, and vertex with a pattern formed by a sinuous smooth line (Text-figs. 325–327) 3

– Face and frons without such a pattern ; very rarely the temples may have a smooth band extending from mandibular base to vertex (Text-fig. 574) . 4

3 (2) Antennal flagellum rather stout, subfusiform ; fifth flagellar segment fully as broad as the pedicellus ; anelli transverse ; proximal segments of funicle usually slightly transverse. Pattern of head, Text-fig. 325. Both mandibles with four teeth. Pronotum and mesoscutum, Text-fig. 330 ***MERAPORUS*** Walker (p. 681)

– Antennal flagellum (Text-fig. 329) clavate, proximally slender with fifth flagellar segment less broad than the pedicellus ; anelli as long as broad ; segments one to four of funicle quadrate or even very slightly longer than broad. Pattern of head, Text-figs. 326, 327. Left mandible with three teeth, right mandible with four. Pronotum and mesoscutum, Text-fig. 328 ***LEPTOMERAPORUS*** Graham (p. 687)



FIGS. 325–334. 325, *Meraporus graminicola* Walker, ♂, head ; 326, *Leptomeraporus nicaee* (Walker), ♂, head, frontal view ; 327, same, dorsal ; 328, same, pronotum and mesoscutum ; 329, same, left antenna ; 330, *Meraporus graminicola* Walker, ♂, pronotum and mesoscutum ; 331, *Stichocrepis armata* Förster, ♂, scape and pedicellus ; 332, *Kranophorus extentus* (Walker), ♂, head ; 333, *Chlorocytus pulchripes* (Walker), ♀, thorax excluding metanotum and propodeum ; 334, *Apsilocera bramleyi* Graham, ♂, antenna.

4 (2) Fore wing with fuscous markings, at least a dark cloud below the stigma ; occiput not margined ; antennae with two anelli and six funicular segments . . . . . ***ARTHROLYTUS*** Thomson (p. 789)

– Fore wings immaculate or, if slightly infumate discally, then the occiput is finely margined 5

5 (4) Propodeum with a large reticulate nucha which projects well behind the bases of the hind coxae ; all coxae, and gaster more or less, red to reddish yellow. Antennae with three anelli and five funicular segments. Occiput not margined . . . . . ***Callitula pyrrhogaster*** (Walker) (p. 462)

– Propodeum with a relatively smaller nucha which projects less strongly ; coxae and gaster dark with a metallic tinge. Antennae usually with two anelli and six funicular segments. Occiput usually at least slightly margined 6

6 (5) Thorax flattened, at least 1·5 times as broad as high, weakly arched dorsally ; head in dorsal view strongly transverse, 2·25 to 2·3 times as broad as its maximum length . . . ***PLATYPTEROMALUS*** Bouček (p. 737)

– Thorax not or hardly broader than high, usually strongly arched dorsally ; head rarely so strongly transverse, usually not more than twice as broad as long. 7

7 (6) Face receding strongly below the antennal toruli, and forming an angle of at most about 110° with the frons ; mesoscutum and scutellum shiny, their reticulation hardly raised above the general surface, or even partly engraved ***NASONIA*** Ashmead (p. 779)

– Face not receding strongly, forming an angle of about 130° with the frons ; mesoscutum and scutellum less shiny, their reticulation distinctly raised above the general surface . ***EUPTEROMALUS*** Kurdjumov (p. 737)

8 (1) Antennal formula 11353 ; flagellum very stout and short, combined length of pedicellus and flagellum hardly two-thirds the breadth of the head. POL slightly less than OOL. Genae fringed with black bristly hairs which point downwards. Mesepisternum wholly reticulate. Clypeus large, reticulate, its anterior margin virtually truncate. Body, and legs (especially femora) stout ; hind tibia with two spurs ***HABRITYS*** Thomson (p. 427)

– If the antennal formula is 11353, then POL is not less than OOL, and the genae are not fringed with black bristly hairs ; usually also the mesepisternum has a partly smooth area below the base of the hind wing, the clypeus is of different form or sculpture, and the hind tibia has only one spur 9

9 (8) Notauli traceable to hind margin of mesoscutum, and sometimes sharply impressed throughout, though more often superficial posteriorly . . 10

– Notauli not nearly reaching the hind margin of the mesoscutum . . . 12

10 (9) Clypeus (cf. Text-fig. 287) reticulate, its anterior margin with two rounded lobes separated by an incision ; POL distinctly less than OOL ; notauli sharply impressed throughout ; marginal vein of fore wing thickening only gradually towards its base . . . . ***PERNIPHORA*** Ruschka (p. 428)

– Clypeus either mainly to entirely striate, or its anterior margin of different form ; POL equal to or greater than OOL ; notauli sometimes superficial posteriorly ; marginal vein sometimes thickened throughout . . . 11

11 (10) Postero-lateral angles of propodeum dentate or sharp ; notauli sharply impressed throughout ; marginal vein not conspicuously thickened ***DORCATOMOPHAGA*** Kryger (p. 828)

– Postero-lateral angles of propodeum not sharp ; notauli sharp throughout or superficial posteriorly ; marginal vein often conspicuously thickened, at least in its basal half 12

12 (11) Marginal vein of fore wing (cf. Text-figs. 285, 286, 323, 324) conspicuously thickened throughout, usually only three to five (occasionally six) times as long as broad, sometimes a little thicker at its apex than at its base . 13

– Marginal vein of fore wing either not or only slightly thickened, at least about seven times as long as broad ; or else thickened only in its proximal half . 24

13 (12) Antennal formula 11353 ; postmarginal vein of fore wing not or hardly longer than the marginal vein ; notauli incomplete
MESOPOLOBUS Westwood (p. 638)

– Either antennal formula 11262 ; or else the postmarginal vein of the fore wing is nearly to quite 1·5 times as long as the marginal vein. Notauli sometimes complete 14

14 (13) Mesepisternum wholly reticulate ; pronotal collar not margined. Notauli usually traceable to hind margin of mesoscutum, but superficial posteriorly . . . ***PACHYCREPOIDEUS*** Ashmead (p. 846)

– Mesepisternum with a mainly to entirely smooth subtriangular area below the base of the hind wing. Pronotal collar sometimes margined . . . 15

15 (14) Notauli complete, deep throughout ; stigma of fore wing moderately large ; anterior margin of clypeus angularly produced medially
CORUNA Walker (p. 845)

– Notauli incomplete ; stigma large or small ; anterior margin of clypeus of varied form, sometimes emarginate 16

16 (15) Pronotal collar margined, at least in the middle, but often throughout . 17

– Pronotal collar not margined 19

17 (16) Clypeus reticulate ; hind coxae hairy dorsally in their basal half ; genae rounded ; fore wing with parastigma conspicuously thickened, stigma large, often surrounded by a fuscous cloud (cf. Text-fig. 324)
DINOTISCUS Ghesquière (p 409)

– Clypeus striate ; hind coxae bare dorsally in their basal half ; genae most often compressed with a sharp edge near the mandibles ; fore wing with parastigma not conspicuously thickened, stigma smaller . . . 18

18 (17) Antennae with combined length of pedicellus and flagellum hardly equal to breadth of head ; flagellum subclavate, funicular segments subquadrate. Gaster convex dorsally ; second tergite slightly shorter than the third
EUNEURA Walker (p. 843)

– Antennae with combined length of pedicellus and flagellum at least slightly greater than breadth of head ; flagellum filiform ; funicular segments sometimes longer than broad. Gaster usually sunken or flat dorsally ; second tergite as long as or longer than the third
PACHYNEURON Walker (p. 830)

19 (16) Antennae having first anellus longer than broad, longer than the second anellus. Pronotum more or less, and all coxae, yellow
PANDELUS Förster (p. 422)

– Antennae having anelli at least slightly transverse. Pronotum, and often coxae, dark 20

20 (19) Fore wing (Text-fig. 324) with parastigma conspicuously thickened, at its broadest part, almost as broad as the marginal vein ; stigma very large, separated by hardly more than its own height from the costal edge of the wing, surrounded by a fuscous cloud. Hind coxae pilose dorsally, virtually to their bases . . . . . ***ACROCORMUS*** Förster (p. 415)

– Parastigma usually not thickened, if slightly so then the stigma is smaller ; if the fore wing has a fuscous cloud then it is situated below the marginal vein 21

21 (20) Antennae with flagellum at least slightly clavate ; combined length of pedicel-

lus and flagellum at most equal to the breadth of the head. Marginal vein of fore wing of uniform thickness throughout, or slightly thicker at apex than at base 22

– Antennae with flagellum filiform ; combined length of pedicellus and flagellum usually greater than breadth of head. Marginal vein at least very slightly thicker at base than at apex 23

22 (21) Fore wing with postmarginal vein at least slightly shorter than the marginal vein, and sometimes not longer than the stigmal vein ; marginal longer than the stigmal (cf. Text-fig. 323). Hind coxae pilose dorsally, virtually to base . . . . . ***METACOLUS*** Förster (p. 418)

– Fore wing with postmarginal vein as long as or longer than the marginal vein, the latter not longer than the stigmal vein. Hind coxae dorsally usually bare in their basal half, occasionally with one or two hairs ***RHAPHITELUS*** Walker (p. 420)

23 (21) Anterior margin of clypeus incised medially, with a rounded lobe on either side of the incision. Hind tibia with two spurs. Propodeum medially somewhat shiny, weakly reticulate . ***CAENOCREPIS*** Thomson (p. 429)

– Anterior margin of clypeus truncate or virtually so. Hind tibia with one spur. Propodeum medially strongly reticulate and relatively dull ***HOMOPORUS*** Thomson (p. 444)

24 (12) Antennae with two anelli : usually with six funicular segments, occasionally seven, rarely eight 25

– Antennae with three anelli and five funicular segments 159

25 (24) Marginal vein of fore wing (Text-fig. 291) conspicuously and rather abruptly thickened in its proximal half 26

– Marginal vein either not thickened, or at most thickening very gradually towards its base 27

26 (25) Antennae inserted low on head, lower edge of toruli about level with ventral edge of eyes ; head protuberant at level of toruli ***MUSCIDIFURAX*** Girault & Sanders (p. 822)

– Antennae inserted higher on head, lower edge of toruli at least slightly above level of ventral edge of eyes ; head not protuberant 27

27 (26) Temples with a shiny band which extends from base of mandible to vertex (Text-fig. 574) . . . . . ***PERIDESMIA*** Förster (p. 701)

– Temples without a shiny band 28

28 (27) Mid tibia either conspicuously expanded, and at least partly flattened ; or with a process on its outer edge. Face and clypeus without conspicuous piliferous punctures 29

– Mid tibia neither conspicuously expanded nor with a process, if slightly expanded, then face below toruli, and clypeus, with conspicuous piliferous punctures amongst the reticulation 31

29 (28) Propodeum with a large, quite strongly reticulate nucha, often also with a costula ; dorsal surface of hind coxae with some hairs in its basal half ***SPANIOPUS*** Walker (p. 702)

– Propodeum with nucha represented only by a short, transversely lunate, weakly aciculate or smooth strip ; dorsal surface of hind coxae bare in its basal half 30

30 (29) Mid tarsi proximally somewhat expanded and flattened, tapering distally. Body dark or bronze-green ; legs extensively infuscate ; antennae brown or testaceous . . . . . ***PEGOPUS*** Förster (p. 684)

– Mid tarsi neither expanded nor flattened. Body bright green to blue ; legs and antennae mainly to wholly yellow ***MESOPOLOBUS*** Westwood (p. 638)

31 (28) Penultimate segment of the yellow maxillary palpi with a long flattened subspatulate process. Head in dorsal view only 1·6 to 1·8 times as broad as long ; thorax elongate, 1·8 to 2·3 times as long as broad ***MESOPOLOBUS*** Westwood (p. 638)

– Penultimate segment of maxillary palpi without a process, the palpi sometimes dark. Head usually relatively more transverse ; thorax often less elongate 32

32 (31) Antennal scape (Text-fig. 331) excised in the middle of its front edge, and with a triangular projection above this ***STICHOCREPIS*** Förster (p. 822)

– Antennal scape neither excised nor with a triangular projection . . . 33

33 (32) Genae forming convex protuberances which, in frontal view of head, project conspicuously below the level of the anterior margin of the clypeus. Eyes with long conspicuous hairs.

Lower edge of antennal toruli, except in *Halomalus*, not or hardly above level of ventral edge of eyes ; antennae yellow or testaceous with at most the clava black 34

– Genae rarely produced ventrad of the clypeal margin ; if so, then not forming convex protuberances, and the eyes with short inconspicuous hairs, the antennae sometimes extensively darkened 36

34 (33) Antennal flagellum subcylindrical, much stouter than the pedicellus ; all funicular segments transverse. Occiput sharp, or margined. Propodeal nucha represented by a short, transversely-lunate strip which is very weakly reticulate ; costula weak or irregular ***DIGLOCHIS*** Förster (p. 782)

– Antennal flagellum clavate, proximally not stouter than the pedicellus ; at most some of the distal segments of the funicle transverse. Occiput neither sharp nor margined. Propodeum with a moderate-sized or large, strongly reticulate nucha ; costula strong 35

35 (34) Propodeum with hind corners with a small tooth ; callus densely pilose, the hairs also covering the supracoxal flange and even encroaching upon the median area ; nucha moderate-sized . . ***PEZILEPSIS*** Delucchi (p. 782)

– Propodeum with hind corners rounded off ; callus sparsely pilose ; nucha large, subglobose . . . . . ***HALOMALUS*** Erdös (p. 781)

36 (33) Antennae (Text-figs. 334, 342, 343) with funicular segments separated by peduncle-like constrictions, and with whorls of outstanding hairs ; often seven funicular segments, sometimes six 37

– Antennae with funicular segments more compacted, separated by inconspicuous peduncles 39

37 (36) Antennae (Text-fig. 334) inserted high on the head, their toruli much nearer to the median ocellus than to the anterior margin of the clypeus, with scape reaching far above level of vertex ; antennal formula 11263 ; propodeum hardly half as long as the scutellum, its median area not uniformly reticulate, without a costula, the nucha short ***APSILOCERA*** Bouček (p. 696)

– Antennal toruli at most slightly nearer to the median ocellus than to the anterior margin of the clypeus ; scape reaching at most slightly above level of vertex, if reaching above it then antennal formula 11272 ; propodeum at least half as long as scutellum 38

38 (37) Gena with a hollow above the base of the mandible ; pronotum not as wide as the mesoscutum ; propodeum with a costula and the anterior part of the plicae more or less indicated, nucha moderate-sized ; antennal formula 11263 or 11272 (Text-figs. 342, 343) ***PSILOCERA*** Walker (p. 462)

– Gena without such a hollow ; pronotum as wide as the mesoscutum ; propodeum without costula or plicae, nucha poorly-defined ; antennal formula 11272 . . . . . ***NORBANUS*** Walker (p. 437)

39 (36) Antennal formula 11272 or 11281 ; funicular segments very elongate, the first segment 3·5 to 5 times, the last segment 1·7 to 2·5 times, as long as broad 40

– Antennal formula 11263 ; funicular segments usually relatively shorter . 41

40 (39) Propodeum without plicae ; postspiracular sclerite very small ; head and thorax with conspicuous whitish hairs. Antennal formula 11272 ***ISCHYROPTYX*** Delucchi (p. 433)

– Propodeum with plicae indicated in at least the basal half ; postspiracular sclerite moderate-sized ; head, and thorax excluding propodeum, with very inconspicuous hairs which are not whitish. Antennal formula 11272 or 11281 . . . . . ***ARTHROLYTUS*** Thomson (p. 789)

41 (39) Postmarginal vein of fore wing only as long as, sometimes even slightly shorter than, the stigmal vein 42

– Postmarginal vein at least slightly longer than the stigmal vein . . . 51

42 (41) Face below antennal toruli, and clypeus, with numerous conspicuous piliferous punctures amongst the reticulation. Antennae inserted well above level of ventral edge of eyes . . . ***ROPTROCERUS*** Ratzeburg (p. 423)

– Face and clypeus with at most inconspicuous piliferous punctures. Antennae most often inserted at or hardly above level of ventral edge of eyes . . 43

43 (42) Temples (Text-fig. 332) strongly produced backwards, in dorsal view at least half as long as eyes, forming acute points. Apical margin of fore wing bare. Antennae with anelli large, only moderately transverse, the second anellus more than half as long as the first funicular segment ; antennae inserted slightly below ventral edge of eyes, head very prominent at level of toruli . . . . . ***KRANOPHORUS*** Graham (p. 819)

– Temples rarely appearing acutely pointed in dorsal view, if so then they are slightly less than half as long as the eyes, whilst the apical margin of the fore wing is at least partly ciliate, the anelli are short and strongly transverse, and the head is only slightly prominent at level of toruli . . 44

44 (43) Vertex behind the ocelli almost flat, the occipital surface descending at almost a right angle to it, the edge separating the two surfaces sharp ; gena with a small hollow above the base of the mandible ***DIBRACHOIDES*** Kurdjumov (p. 814)

– Vertex behind the ocelli curved in the longitudinal axis, most often not separated from the occipital surface by a sharp edge ; gena most often without a distinct hollow 45

45 (44) Head compressed antero-posteriorly, in dorsal view 2·25 to 2·4 times as broad as long ; thorax somewhat flattened, distinctly broader than high ; scutellum in profile appearing nearly flat, its disc shiny with extremely weak sculpture . . . . . ***PLATNEPTIS*** Bouček (p. 800)

– Head not compressed, in dorsal view at most about twice as broad as long ; thorax rarely distinctly flattened, the scutellum more convex, with distinct reticulation all over 46

46 (45) Occiput margined, at least medially. Fore wing, beyond the speculum, with normal moderately dense pilosity, and without a broad bare strip below the marginal vein . . . . . ***DIBRACHYS*** Förster (p. 804)

– Occiput usually immarginate ; if with a vague indication of a margin, then the fore wing beyond the speculum is sparsely pilose and there is a broad bare strip below the marginal vein, on upperside of wing . . . 47

47 (46) Costal cell of fore wing narrow, at least ten times as long as broad, its front edge straight or slightly concave in the middle ***TRITNEPTIS*** Girault (p. 801)

– Costal cell of fore wing at most about eight times as long as broad, its front edge at least slightly curved forwards 48

48 (47) Upper surface of fore wing with a broad bare strip below the marginal vein ; and rather sparsely pilose beyond the speculum 49

– Upper surface of fore wing without a bare strip below the marginal vein ; disc of wing fairly thickly to rather densely pilose. 50

49 (48) Mesosternum posteriorly, just in front of the trochantinal lobes, clothed with long whitish hairs which stand out almost vertically. Head protuberant at level of antennal toruli. Antennae with first funicular segment about 1·5 times as long as the second segment, and at least 1·5 times as long as broad . . . . . ***CONOMORIUM*** Masi (p. 821)

– Mesosternum posteriorly with hairs only slightly outstanding. Head convex, but not protuberant, at level of antennal toruli. Antennae with first funicular segment not or hardly longer than the second segment, and slightly transverse . . . . . ***SCHIZONOTUS*** Ratzeburg (p. 817)

50 (48) Posterior half of mesosternum clothed with long, outstanding white hairs ***ERDOESINA*** Graham (p. 796)

– Mesosternum with sparse, only slightly outstanding hairs ***CYCLOGASTRELLA*** Bukovskij (p. 796)

51 (41) Lower edge of antennal toruli at or even slightly below level of ventral edge of eyes 52

– Lower edge of antennal toruli at least slightly above level of ventral edge of eyes. 54

52 (51) Hind corners of propodeum (supracoxal flanges) in dorsal view appearing right-angled or even slightly acute 56

– Hind corners of propodeum in dorsal view rounded or obtuse 53

53 (52) Postmarginal vein of fore wing only slightly (up to 1·2 times) longer than the stigmal vein. Head rather strongly protuberant at level of antennal toruli 46

– Postmarginal vein obviously longer than the stigmal vein. Head at most slightly protuberant at level of antennal toruli 54

54 (53) Clypeus shiny and nearly smooth, its anterior margin with a median tooth ; hind tibia with two spurs ; pronotal collar long, at least one quarter as long as mesoscutum, rounded off in front ; notauli usually traceable to hind margin of mesoscutum, though very superficial posteriorly ***HEMITRICHUS*** Thomson (p. 826)

– If the clypeus has a median tooth, then the surface of the clypeus is striate or reticulate, the hind tibia has one spur, the pronotal collar is relatively shorter and is often margined, and the notauli are incomplete . . . 55

55 (54) Hind corners of propodeum, in dorsal view, appearing sharp (right-angled or acute) ; basal cell of fore wing with scattered hairs over the distal half or more ; hind tibia with two spurs, but the second spur is weaker than the first ; anterior margin of clypeus truncate or curved slightly forwards ***DIMACHUS*** Thomson (p. 823)

– Hind corners of propodeum rarely appearing sharp, if so then the basal cell of the fore wing is at most pilose at apex, the hind tibia has only one spur, and the anterior margin of the clypeus is emarginate medially 56

56 (55) Hind corners of propodeum (supracoxal flanges) in dorsal view appearing right-angled or even slightly acute ; propodeal callus sparsely pilose, supracoxal flange bare ; genae curved ; antennal clava pointed, often acutely . . . . . ***LARIOPHAGUS*** Crawford (p. 823)

– Hind corners of propodeum (supracoxal flanges) nearly always rounded or obtuse ; if sharply-pointed, then the propodeal callus and supracoxal flanges are densely pilose, the genae are prominent, almost angled, and the antennal clava is obtuse 57

57 (56) Occiput finely to very strongly margined, at least medially. Notauli usually quite sharply impressed to about halfway across the mesoscutum . . 58
– Occiput not margined. Notauli usually less sharply impressed . . . 61
58 (57) Transverse ridge separating occiput from vertex situated only slightly behind the ocelli, separated from them by hardly their own diameter. Propodeal nucha not developed, but represented merely by a ridge or narrow, weakly-sculptured transverse strip . ***HOLCAEUS*** Thomson (p. 584)
– Transverse carina separating occiput from vertex situated farther back, and separated from the posterior ocelli by more than their own diameter. Propodeum with a reticulate nucha which occupies at least about a third of the median length of the sclerite 59
59 (58) Fore wing almost wholly pilose, the speculum absent or very small ***UROLEPIS*** Walker (p. 780)
– Fore wing with a large speculum ; basal cell at least partly bare . . 60
60 (59) Hind coxae hairy dorsally in their basal half ***GYRINOPHAGUS*** Ruschka (p. 777)
– Hind coxae bare dorsally, at least in their basal half ***EUPTEROMALUS*** Kurdjumov (p. 737)
61 (57) Hind coxae hairy dorsally in their proximal half or more 62
– Hind coxae bare dorsally in their proximal half at least 69
62 (61) Clypeus mainly to entirely reticulate, its anterior margin usually incised. Propodeal nucha not developed. Pronotal collar often immarginate . 63
– Clypeus mainly to entirely strigose, its anterior margin at most moderately deeply emarginate. Propodeal nucha usually developed, sometimes large. Pronotal collar usually margined 66
63 (62) Hind tibia with two distinct spurs. Pronotal collar rounded off in front. Fore wing with marginal vein usually shorter than, sometimes as long as, the stigmal vein, no fuscous cloud around the latter. Anterior margin of clypeus with two rounded lobes separated by a moderately deep incision ***CAENOCREPIS*** Thomson (p. 429)
– Hind tibia with only one spur. Pronotal collar sometimes margined. Fore wing with marginal vein sometimes longer than the stigmal vein, sometimes with a fuscous cloud around the latter. Anterior margin of clypeus either with two pointed teeth, or subtruncate 64
64 (63) Face below level of antennal toruli, and clypeus with several conspicuous piliferous punctures amongst the reticulation. Anterior margin of clypeus not, or only very shallowly, emarginate. Pronotal collar rounded off in front . . . . . ***ROPTROCERUS*** Ratzeburg (p. 423)
– Face and clypeus often without obvious piliferous punctures ; if with some, then either the anterior margin of the clypeus is incised medially, or the pronotal collar is margined 65
65 (64) Pronotal collar margined. Fore wing usually with a speculum ***DINOTISCUS*** Ghesquière (p. 409)
– Pronotal collar not margined. Speculum of fore wing sometimes absent or rudimentary . . . . . ***RHOPALICUS*** Förster (p. 412)
66 (62) Scutello-axillar sutures curving anteriorly and meeting ; the scutellum therefore touches the mesoscutum only at a point, or has only a very narrow base. Propodeal callus not densely hairy ; sides of basal tergite of gaster nearly bare. Left mandible with three teeth, right mandible with four. Funicular segments of antenna all longer than broad, the first much longer than the pedicellus . . . . ***APELIOMA*** Delucchi (p. 582)
– Scutello-axillar sutures converging less strongly in front ; the base of the scutellum at least slightly more than half the maximum breadth of an

axilla, sometimes as great as that of an axilla. Propodeal callus sometimes densely hairy ; sides of basal tergite of gaster sometimes conspicuously so. Sometimes both mandibles have four teeth. Funicular segments very variable in length, from shorter than to much longer than the pedicellus 67

67 (66) Sides of propodeum extremely hairy, the hairs extending over the whole callus nearly to the plicae, over the supracoxal flanges, and even partly on to the median area ; postero-lateral corners of the propodeum with a small tooth. Basal tergite of gaster not conspicuously hairy. Genae, in frontal view of head, almost angulate . . . ***PEZILEPSIS*** Delucchi (p. 782)

– Sides of propodeum less extensively pilose, the hairs not encroaching on the median area ; if they cover nearly the whole of the callus, then the basal tergite of the gaster is conspicuously hairy laterally. Postero-lateral corners of propodeum rounded off. Genae curved 68

68 (67) Both mandibles with four teeth. If the propodeum has a large strongly reticulate nucha, then the costula is rarely present, whilst the gaster is oblong or sublinear . . . . . ***TRICHOMALUS*** Thomson (p. 707)

Left mandible with three teeth, right mandible with four. Propodeum with a large strongly reticulate nucha, and usually with a costula, which may be strong. Gaster subcircular or shortly oval, much shorter than the thorax ***SPANIOPUS*** Walker (p. 702)

69 (61) Antennae inserted very high on the head, their toruli distinctly nearer to the median ocellus than to the anterior margin of the clypeus ; scape reaching above level of vertex.

Postspiracular sclerite rather large, reticulate. Propodeal nucha represented merely by a transverse, weakly-sculptured or smooth strip . . 70

– Antennae inserted less high, their toruli either midway between the median ocellus and the anterior margin of the clypeus, or else nearer to the latter 73

70 (69) Face below level of antennal toruli, and the clypeus, with several conspicuous piliferous punctures ; the clypeus otherwise mainly reticulate. Pronotal collar not margined . . . . . ***ROPTROCERUS*** Ratzeburg (p. 423)

– Face and clypeus without piliferous punctures ; the clypeus striate. Pronotal collar at least slightly margined 71

71 (70) Antennal flagellum (Text-fig. 334) with a whorl of very long, strongly outstanding hairs on each segment ; funicular segments somewhat nodulose ; scape reaching very far above level of vertex. Body bronze to bluish black.

Anterior margin of clypeus emarginate or with a median tooth ***APSILOCERA*** Bouček (p. 696)

– Antennal flagellum with hairs not arranged in a single whorl on each segment, the hairs neither so long nor so strongly outstanding ; funicular segments not nodulose but cylindrical. Body bright green to blue . . . 72

72 (71) Anterior margin of clypeus with a median tooth ***STENOMALINA*** Ghesquière (p. 600)

– Anterior margin of clypeus without a tooth ***CHLOROCYTUS*** Graham (p. 611)

73 (69) Gena with a large hollow which extends one third to half the distance between the base of the mandible and the eye 74

– Gena usually without a hollow, rarely with a very narrow one just above the base of the mandible 80

74 (73) Fore wing without a speculum. Pronotal collar not margined but somewhat rounded off anteriorly . . ***CATOLACCUS*** Thomson (p. 467)

– Fore wing with a large speculum. Pronotal collar at least weakly margined 75

75 (74) Pronotal collar weakly and irregularly margined. Stigma of fore wing (Text-fig. 319) subcircular, rather large, separated by less than twice its height from the lower edge of the postmarginal vein. Propodeal nucha represented only by a narrow, smooth or weakly aciculate transverse strip
PSEUDOCATOLACCUS Masi (p. 694)

– Pronotal collar sharply and regularly margined. Stigma of fore wing smaller except in *Synedrus*, in which it is oval in shape, in that genus also the propodeum has a reticulate nucha 76

76 (75) Spiracles of propodeum touching the hind margin of the metanotum, the front part of the spiracular rim partly hidden ; propodeum medially more than half as long as the scutellum and produced well beyond the bases of the hind coxae ; the nucha short, transversely aciculate, rather well-defined in front. Funicular segments about 1·5 times as long as broad
VRESTOVIA Bouček (p. 828)

– Spiracles of propodeum at least slightly separated from the hind margin of the metanotum. If the propodeum is more than half as long as the scutellum, then the nucha is reticulate and not very distinctly defined in front, while the funicular segments are relatively longer 77

77 (76) Propodeum, medially, more than half as long as the scutellum, produced well beyond the bases of the hind coxae ; nucha reticulate, not very distinctly defined in front. Stigma of fore wing rather large, separated by less than twice its height from the lower edge of the postmarginal vein. At least the proximal funicular segments twice or more than twice as long as broad
SYNEDRUS Graham (p. 583)

– Propodeum, medially, at most half as long as the scutellum, less strongly produced backwards ; nucha represented only by a narrow, transversely-lunate strip which is smooth or transversely aciculate. Stigma of fore wing often smaller. Funicular segments sometimes relatively shorter . 78

78 (77) First funicular segment shorter than, or at most as long as, the pedicellus ; all the funicular segments varying from slightly transverse to slightly longer than broad. Left mandible with three teeth, right mandible with four . . . . . ***KALEVA*** Graham (p. 596)

– First funicular segment longer than the pedicellus ; all the funicular segments longer than broad. Both mandibles with four teeth . . . 79

79 (78) Marginal vein of fore wing twice or nearly twice as long as the stigmal vein. Anterior margin of clypeus very broadly truncate. Body bright green
LONCHETRON Graham (p. 596)

– Marginal vein 1·2 to 1·3 times as long as the stigmal vein. Anterior margin of clypeus shallowly emarginate. Body dark green, bluish, or bronze
CAPELLIA Delucchi (p. 475)

80 (73) Mesepisternum wholly reticulate. Antennae with combined length of pedicellus and flagellum much less than breadth of head ; flagellum strongly clavate, with distal segments of funicle strongly transverse. Gena with a small hollow . . . . . ***KALEVA*** Graham (p. 596)

– Mesepisternum usually with a mainly to entirely smooth subtriangular area below the base of the hind wing ; if this area is wholly reticulate, then the antennae are different in form 81

81 (80) Anterior margin of clypeus with a median tooth or tubercle, often also with an angular projection on either side of it (Text-figs. 468, 469) . . . 82

– Anterior margin of clypeus without a median tooth or tubercle . . . 83

82 (81) Propodeum with a rather large reticulate nucha. Genae (Text-fig. 572) produced somewhat ventrad of level of anterior margin of clypeus ; the latter with a median tooth only. Thorax slightly flattened ; scutellum

weakly convex, frenum marked off by a rather distinct impressed line
ROHATINA Bouček (p. 700)

– Propodeal nucha represented merely by a lunate, transversely-aciculate to smooth strip. Genae not distinctly produced ventrad of anterior margin of clypeus, the latter with a median tooth or tubercle and usually an angular projection on either side of it. Thorax arched dorsally ; scutellum convex, its frenum not very distinctly marked off
STENOMALINA Ghesquière (p. 600)

83 (81) Oral fossa greatly enlarged (Text-figs. 337, 338), so that genae are very short, breadth of oral fossa 5 to 30 times the malar space 84

– Oral fossa not greatly enlarged, its breadth at most about 3·5 times the malar space 86

84 (83) Mandibles (Text-fig. 338) small, separated from the gena by a large hemispherical pit, which appears to be membranous
PTEROMALUS Swederus (p. 488)
and ***HABROCYTUS*** Thomson (p. 494)

– Mandibles (Text-fig. 337) large, the base of each mandible forming a flat or convex lamina, whose rounded edge fits closely to the edge of the gena or is separated from it only by a narrow lunate space 85

85 (84) Anterior margin of clypeus broadly and shallowly emarginate. Antennae with funicular segments quadrate . ***HABROCYTUS*** Thomson (p. 473)

– Anterior margin of clypeus moderately deeply incised. Antennae with funicular segments, except sometimes the sixth, somewhat longer than broad . . . . . ***PSYCHOPHAGUS*** Mayr (p. 473)

86 (83) Anterior margin of clypeus (Text-figs. 307, 361) deeply and rather narrowly incised medially, sometimes bidentate 87

– Anterior margin of clypeus more broadly and shallowly emarginate (Text-figs. 394, 435, 450, 457, 464, 496, 523–527, 529, 566, 568, 655) . . . 94

87 (86) Pronotum as wide or virtually as wide as the mesoscutum. Genae, just above bases of mandible, with a sharp edge. Head and thorax usually with whitish hairs. Mesepisternum sometimes wholly reticulate . . 155

– Either pronotum distinctly less wide than the mesoscutum ; or else genae without a sharp edge, and vertex and dorsum of thorax, excluding the propodeum, with dark hairs. Mesepisternum with a partly to entirely smooth area below the base of the hind wing 88

88 (87) Propodeum (cf. Text-fig. 360) with a reticulate nucha which occupies about one third of the median length of the sclerite, and is not sharply defined in front. Basal cell of fore wing bare, or pilose only just at its apex ; wing sometimes with a trace of two fuscous clouds ***SPILOMALUS*** Graham (p. 479)

– Either the propodeal nucha is represented merely by a narrow, weakly-sculptured transverse strip ; or the basal cell of the fore wing is pilose over at least its distal half 89

89 (88) Propodeum (cf. Text-fig. 349) with a moderately large reticulate nucha ; plicae nearly complete ; costula usually indicated. Basal cell of fore wing with its distal half or more pilose . . ***ERYTHROMALUS*** Graham (p. 468)

– Propodeal nucha represented only by a transverse ridge, or a lunate nearly smooth or weakly transversely-aciculate strip ; plicae sometimes very incomplete ; costula often absent. Basal cell of fore wing most often bare, extensively pilose only in some *Caenacis* 90

90 (89) Clypeus reticulate. Marginal vein of fore wing slightly shorter than, or at most as long as, the stigmal vein. Hind tibia with two spurs. Pronotal collar not margined . . . . ***CAENOCREPIS*** Thomson (p. 429)

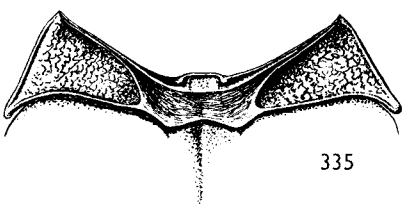
– Clypeus, at least mainly, striate. Marginal vein 1·2 to 2 times as long as the stigmal vein. Hind tibia usually with one spur, a weak second spur present in *Dinotoides*. Pronotal collar usually margined . . . 91

91 (90) Clypeus with strong striae which extend well up the face (Text-fig. 307). Marginal vein of fore wing about twice as long as the stigmal vein ; stigma small, separated by about twice its height from costal edge of wing ; postmarginal vein much shorter than the marginal vein. Pronotal collar long, even medially about one fifth as long as mesoscutum

HOBBYA Delucchi (p. 569)

– Clypeus with finer striae which hardly extend up the face. Marginal vein 1·2 to 1·5 times as long as the stigmal vein ; stigma often rather large ; postmarginal vein about as long as the marginal vein. Pronotal collar relatively shorter medially 92

92 (91) Mesoscutum (Text-fig. 316) with several shallow though distinct piliferous punctures amongst the reticulation ; sides of frons, and face, with rugulose-reticulate sculpture. Propodeum without a distinct costula, medially only about one third as long as the scutellum ***CECIDOSTIBA*** Thomson (p. 564)



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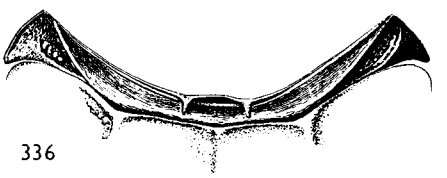

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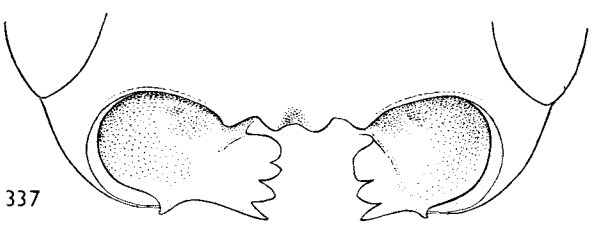

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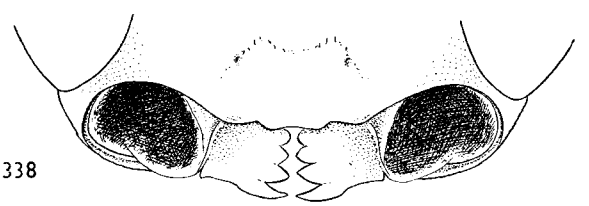

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FIGS. 335–338. 335, *Chlorocytus pulchripes* (Walker), ♀, postspiracular sclerite, ventral ; 336, *Habrocytus elevatus* (Walker), ♀, postspiracular sclerite, ventral ; 337, *Psychophagus omnivorus* (Walker), ♂, lower part of head ; 338, *Pteromalus squamifer* Thomson, ♂, lower part of head.

– Mesoscutum without evident piliferous punctures ; frons and face not rugulosely reticulate. Propodeum usually with some trace of a costula, medially at least slightly more than one third as long as the scutellum . 93

93 (92) Either the distal half or more of the basal cell of the fore wing is pilose ; or the median area of the propodeum has a strong costula and some irregular wrinkles, but little fine reticulation . . . . ***CAENACIS*** Förster (p. 569)

– Basal cell of fore wing, not counting the basal vein, bare or nearly so ; median area of propodeum nearly uniformly reticulate, the costula weak ***DINOTOIDES*** Bouček (p. 571)

94 (86) Postspiracular sclerite (Text-fig. 318) visible only as a small subequilateral triangle lying against the tegula ; pronotum (Text-fig. 317) as wide or virtually as wide as the mesoscutum, the surface in front of the pronotal collar descending vertically to the very short neck ; head and thorax most often with whitish hairs 153

– Postspiracular sclerite often large ; if narrow (Text-fig. 336) then visible as an elongate triangle which descends well ventrad, and the pronotum (Text-figs. 316, 333) at least slightly less wide than the mesoscutum ; head, mesoscutum, and scutellum usually with at least most of their hairs dark . 95

95 (94) External edge of hind tibia (Text-fig. 322) with several short spines in addition to the ordinary hairs ; fore femur more or less swollen ; clypeus mainly reticulate ; fore wing usually with two fuscous clouds, one below the parastigma, the other around the stigmal vein ***CHEIROPACHUS*** Westwood (p. 416)

– External edge of hind tibia without spines. Fore femur usually not swollen. Clypeus usually striate. Fore wing usually immaculate, occasionally with a fuscous cloud below the marginal vein, rarely with a cloud around the stigmal vein 96

96 (95) Face below level of antennal toruli, and clypeus, with several conspicuous piliferous punctures ; the clypeus otherwise mainly reticulate. Pronotal collar not margined.

Propodeal nucha represented only by a narrow, weakly-sculptured transverse strip, or a ridge . . . ***ROPTROCERUS*** Ratzeburg (p. 423)

– Face and clypeus nearly always without piliferous punctures ; if with a few, then either the clypeus is mainly striate, or the pronotal collar is margined 97

97 (96) Clypeus (Text-fig. 572) abnormal, bent under anteriorly, its front margin angularly produced ; in a frontal view of the head, the anterior edge of the clypeus appears to lie at least slightly farther dorsad than the lower edge of the genae.

Propodeum with a distinct, reticulate nucha. Pronotal collar sharply margined . . . . . ***ROHATINA*** Bouček (p. 700)

– Anterior part of clypeus not bent under, its front margin not angularly produced ; anterior edge of clypeus rarely lying farther dorsad than the lower edge of the genae 98

98 (97) Propodeum with a more or less developed costula 99

– Propodeum without a costula 102

99 (98) Propodeum medially half or more than half as long as the scutellum, and produced well beyond the bases of the hind coxae. Pronotal collar sharply margined almost throughout 100

– Either the propodeum (medially) is less than half as long as the scutellum ; or the pronotal collar is at most margined in the middle 102

100 (99) Median area of propodeum shiny, its panels with some irregular wrinkles but little or no fine reticulation ; costula not straight, usually irregular ;

nucha represented merely by a sharply-defined transverse ridge
STAUROTHYREUS Graham (p. 699)

– Median area of propodeum relatively dull, uniformly reticulate ; costula often straight ; nucha more or less developed though not very clearly defined anteriorly, reticulate 101

101 (100) Propodeum medially at least somewhat more than half as long as the scutellum ; costula straight or nearly so, if not quite straight, then the median length of the propodeum is about two thirds that of the scutellum
ABLAXIA Delucchi (p. 572)

– Propodeum medially about half as long as the scutellum ; costula not quite straight, often weak, especially in the middle ***APELIOMA*** Delucchi (p. 582)

102 (99) Antennae with usually both anelli, occasionally only the second anellus, quadrate ; the anelli very conspicuous, their combined length at least somewhat more than half that of the first funicular segment (Text-figs. 518, 520, 521). POL much greater than OOL.
Propodeal nucha represented only by a narrow, transversely lunate strip, which is weakly sculptured 103

– Antennae with both anelli usually moderately to strongly transverse ; if only slightly transverse, then POL is only about equal to OOL . . 104

103 (102) First funicular segment of antennae not longer, and often shorter, than the sixth segment, and usually shorter than the second segment. Pronotal collar with at most a weak irregular marginal carina. Hairs of vertex, mesoscutum, and scutellum sometimes dark
MESOPOLOBUS Westwood (p. 683)

– First funicular segment slightly to much longer than the sixth segment, and as long as, or slightly longer than, the second segment. Pronotal collar with a strongly raised, very sharp front margin, except in one species which has the hairs of the vertex, mesoscutum, and scutellum pale
EUMACEPOLUS Graham (p. 633)

104 (102) Propodeal nucha represented only by a ridge ; or a narrow transverse strip which is weakly aciculate (transversely) or smooth, and is usually defined anteriorly by a sharp edge 105

– Propodeum with a convex reticulate nucha which occupies at least about one third of the median length of the propodeum, and is not, or not very sharply, defined anteriorly 144

105 (104) Postmarginal vein of fore wing only slightly longer than the stigmal vein . 106

– Postmarginal vein obviously longer than the stigmal vein 109

106 (105) Fore wing (upper surface) with a broad bare strip below the marginal vein, extending right to the stigmal vein ; on the lower surface of the wing this bare strip is interrupted only by a few scattered hairs ; disc of wing rather sparsely pilose. Head protuberant at level of antennal toruli. Posterior half of mesosternum clothed with long whitish hairs which stand out nearly at a right angle to the surface . . . ***CONOMORIUM*** Masi (p. 821)

– Fore wing with at most a narrow bare strip below the marginal vein ; if such a strip is present, then the disc of the wing is not sparsely pilose, the head is not protuberant at the level of the antennal toruli, and the hairs of the mesosternum are not strongly outstanding 107

107 (106) Posterior half of mesosternum clothed with strongly outstanding whitish hairs
ERDOESINA Graham (p. 796)

– Posterior half of mesosternum with hairs only slightly outstanding . . 108

108 (107) Antennal toruli much nearer to the anterior margin of the clypeus than to the median ocellus, their lower edges not or hardly above the ventral edge of the eyes. Head somewhat protuberant at level of toruli, the face distinctly

receding. Antennal scape virtually as long as an eye
CYCLOGASTRELLA Bukovskij (p. 796)

– Either the antennal toruli are not or hardly nearer to the anterior margin of the clypeus than to the median ocellus ; or else the head is not protuberant at level of toruli and the face hardly recedes 109

109 (108) Mesepisternum wholly reticulate. POL only about equal to OOL. Fore wing with basal cell with some scattered hairs ; speculum, on lower surface of wing, somewhat effaced by scattered hairs ; marginal vein about twice as long as the stigmal vein. Pronotal collar not margined
XIPHYDRIOPHAGUS Ferrière (p. 426)

– Mesepisternum usually with a shiny and mainly to entirely smooth area below the base of the hind wing ; if this area is reticulate, then the other characters do not all agree with the above 110

110 (109) Oral fossa (cf. Text-fig. 305) small, its breadth at most 1·5 times the malar space. Gaster subcircular or subtriangular, shorter than the thorax ; petiole yellowish.
Pronotal collar very short medially, usually slightly margined
ENDOMYCHOBIUS Ashmead (p. 470)

– Oral fossa larger, its breadth more than 1·5 times the malar space. Gaster most often oblong to sublinear, if subcircular then the petiole is not yellowish 111

111 (110) Pronotal collar without trace of a margin, often rounded off in front, though sometimes forming an abrupt edge with the pronotal neck . . . 112

– Pronotal collar margined, at least in the middle 124

112 (111) Fore wing with distal half or more of basal cell pilose 113

– Basal cell of fore wing, not counting any hairs on basal vein, bare or with at most a very few hairs near the basal vein 114

113 (112) Propodeum short, medially only slightly more than one third as long as scutellum ; plicae absent or indicated only posteriorly. All funicular segments, except sometimes the first, at least slightly transverse
CECIDOSTIBA (ANASTIBA) sgen. n. (p. 565)

– Either the propodeum is relatively longer, or has plicae distinct throughout, or some of the funicular segments in addition to the first are quadrate to longer than broad 114

114 (113) Propodeum with plicae represented only by foveae at the base of the propodeum ; spiracular sulci shallow or almost absent 115

– Propodeal plicae sharp at least posteriorly 118

115 (114) Propodeum between the spiracles very shiny, smooth or weakly alutaceous. Fore wing with postmarginal vein somewhat longer than the marginal vein ; basal cell with scattered hairs distally ***LAMPOTERMA*** Graham (p. 687)

– Propodeum between the spiracles not very shiny, distinctly, sometimes quite strongly, reticulate. Fore wing with postmarginal vein shorter than, or at most as long as, the marginal vein ; basal cell, not counting basal vein, usually bare, rarely with a few hairs distally 116

116 (115) Flagellum with numerous short sensilla arranged in two to four rows on each segment ; hairs of flagellum subadpressed. Marginal vein of fore wing 2 to 2·3 times as long as the stigmal vein . . ***MERISUS*** Walker (p. 443)

– Flagellum with sparser sensilla which are arranged in one row on at least the distal segments of the funicle ; hairs of flagellum outstanding. Marginal vein often shorter relative to the stigmal vein 117

117 (116) Marginal vein of fore wing 1·5 to 2·5 times as long as the stigmal vein
HOMOPORUS Thomson (p. 444)

– Marginal vein at most 1·4 times as long as the stigmal vein
SPINTHERUS Thomson (p. 480)

118 (114) Lower edge of antennal toruli hardly above level of ventral edge of eyes . 119
– Lower edge of antennal toruli distinctly above level of ventral edge of eyes 121

119 (118) POL hardly greater than OOL. Postmarginal vein of fore wing about as long as the marginal vein. Pedicellus in dorsal view somewhat less than twice as long as broad.
Body green to blue . . . ***CHLOROCYTUS*** Graham (p. 611)
– POL much greater than OOL. Postmarginal vein shorter than the marginal vein. Pedicellus in dorsal view fully twice as long as broad . . . 120

120 (119) Antennal flagellum clavate ; antennae mainly to wholly yellow. Body bright green to blue ; legs, except coxae, mainly to wholly yellow ; gaster usually with a yellowish spot or band . ***MESOPOLOBUS*** Westwood (p. 638)
– Antennal flagellum filiform, black. Body bronze or olive-bronze ; legs testaceous or partly infuscate ; gaster immaculate
TOMICOBIA Ashmead (p. 784)

121 (118) Antennae with first funicular segment at least slightly shorter than the pedicellus 122
– Antennae with first funicular segment as long as or longer than the pedicellus 123

122 (121) Either the clypeus is mainly reticulate ; or the metanotal dorsellum is reticulate. Both mandibles with three teeth. Scutellar frenum distinctly marked off . . . . . ***TOMICOBIA*** Ashmead (p. 784)
– Clypeus strigose ; metanotal dorsellum smooth or nearly so. Left mandible with three teeth, right mandible with four. Scutellar frenum not distinctly marked off except at the sides . . ***HABROCYTUS*** Thomson (p. 494)

123 (121) In a dorsal view of the thorax, the pronotal neck (Text-fig. 333 *n*) appears at least slightly longer than the collar, the latter short medially. Postspiracular sclerite (Text-fig. 335) broader, relatively uniformly reticulate. Marginal vein of fore wing 1·65 to 1·85 times as long as the stigmal vein
CHLOROCYTUS Graham (p. 611)
– In a dorsal view, the pronotal neck is usually invisible (cf. Text-fig. 405) or appears shorter than the collar, occasionally as long as the collar, the latter often long medially. Postspiracular sclerite (Text-fig. 336) narrower, more weakly and irregularly sculptured. Marginal vein 1·35 to 1·7, but usually not more than 1·5, times as long as the stigmal vein
HABROCYTUS Thomson (p. 494)
and ***PTEROMALUS*** Swederus (p. 488)

124 (111) Clypeus (Text-fig. 307) with strong striae which extend some way up the face and genae ; pronotal collar long, medially about one fifth as long as the mesoscutum or slightly more ; marginal vein of fore wing nearly twice as long as the stigmal vein . . . . . ***HOBBYA*** Delucchi (p. 569)
– Clypeus with finer striae ; pronotal collar often shorter medially ; marginal vein sometimes shorter relative to the stigmal vein. 125

125 (124) Fore wing with distal third to half of basal cell pilose ; thorax distinctly depressed, scutellum in profile appearing nearly flat ; gaster immaculate
ANOGMUS Förster (p. 628)
– Basal cell, not counting basal vein, usually bare, but if somewhat pilose distally then the thorax is convex dorsally and the scutellum in profile appears distinctly curved ; sometimes also the gaster has a yellowish spot or band 126

126 (125) Gena with a small hollow above the base of the mandible ; marginal vein of fore wing only 1·2 to 1·3 times as long as the stigmal vein ; all funicular segments longer than broad, the first at least twice as long as the pedicellus ;

propodeum with plicae weak, often sharp only at hind margin and otherwise represented only by basal foveae . . ***CAPELLIA*** Delucchi (p. 475)

– Gena without a hollow above base of mandible. Either the marginal vein is 1·5 to 2·3 times as long as the stigmal vein ; or the first funicular segment is at most slightly longer than the pedicellus 127

127 (126) Propodeum with plicae represented only by foveae at base of propodeum ; spiracular sulci absent or very shallow. 128

– Propodeal plicae at least sharp posteriorly ; spiracular sulci most often distinctly impressed, sometimes punctate or with transverse costulae . 131

128 (127) Marginal vein of fore wing only about 1·2 times as long as the stigmal vein ; body bronze-black ; both mandibles with four teeth ; first funicular segment not or hardly longer than the pedicellus ***PEGOPUS*** Förster (p. 684)

– Marginal vein 1·4 to 2·3 times as long as the stigmal vein. Head and thorax sometimes mainly green to blue. Mandibles sometimes with three teeth. First funicular segment sometimes much longer than the pedicellus . . 129

129 (128) Propodeum between the spiracles convex, shiny, smooth or weakly alutaceous ; pronotal collar sharply margined ; left mandible with three teeth, right mandible with four ; marginal vein 1·7 to 2·3 times as long as the stigmal vein ; head and thorax mainly bright green ***CHLOROCYTUS*** Graham (p. 611)

– Propodeum between the spiracles distinctly reticulate ; pronotal collar sometimes weakly margined ; mandibular teeth sometimes otherwise ; marginal vein sometimes relatively shorter ; head and thorax often dark blue or dark green 130

130 (129) Both mandibles with three teeth. Pronotal collar evenly margined throughout, sometimes very finely, but most often strongly ***HOLCAEUS*** Thomson (p. 584)

– Left mandible with three or four teeth, right mandible with four. Pronotal collar weakly and irregularly margined . ***HOMOPORUS*** Thomson (p. 444)

131 (127) Gastral petiole 1·6 to 1·8 times as long as broad, about two-thirds as long as the propodeum, subcylindrical, with one to two hairs on each side. Marginal vein about twice as long as the stigmal vein. Propodeum medially slightly more than half as long as the scutellum ***ISOCYRTUS*** Walker (p. 624)

– Gastral petiole at most as long as broad, but most often transverse, subconical, without hairs laterally 132

132 (131) Lower edge of antennal toruli not or hardly above level of ventral edge of eyes 133

– Lower edge of antennal toruli distinctly above level of ventral edge of eyes 134

133 (132) Antennae blackish with at most the scape partly pale ; femora mainly black ; gaster immaculate . . . . ***CHLOROCYTUS*** Graham (p. 611)

– Antennae and legs, except coxae, mainly to entirely yellow ; gaster usually with a yellowish spot or band . . ***MESOPOLOBUS*** Westwood (p. 638)

134 (132) Pronotal collar margined at most over its middle third, and sometimes weakly so 135

– Pronotal collar margined throughout, or except just at the sides . . . 137

135 (134) Antennal pedicellus, in dorsal view, about twice as long as broad, at least slightly longer than the first funicular segment. Either the metanotal dorsellum is finely reticulate ; or the clypeus is mainly reticulate ***TOMICOBIA*** Ashmead (p. 784)

– Antennal pedicellus in dorsal view usually 1 to 1·6 times as long as broad, if rather longer then the metanotal dorsellum is smooth. Clypeus striate 136

136 (135) In exact dorsal view of thorax, the pronotal neck (Text-fig. 333 *n*) appears at least slightly longer than the collar, which is short medially. Post-

spiracular sclerite (Text-fig. 335) broader, relatively uniformly reticulate. Marginal vein 1·65 to 1·85 times as long as the stigmal vein
CHLOROCYTUS Graham (p. 611)

– In exact dorsal view of thorax, the pronotal neck appears shorter than, or at most as long as, the collar, the latter often long medially, sometimes as much as one fifth the length of the mesoscutum. Postspiracular sclerite (Text-fig. 336) narrower, more weakly and irregularly reticulate. Marginal vein 1·35 to 1·7, but usually not more than 1·5 times as long as the stigmal vein . . . . . ***HABROCYTUS*** Thomson (p. 494)

137 (134) Antennal scape as long as an eye 138

– Antennal scape somewhat, often much, shorter than an eye . . . 139

138 (137) Antennal pedicellus, in dorsal view, about 1·5 times as long as broad. Head slightly protuberant immediately below antennal toruli, the face forming an angle of about 45° with the frons. Spiracular sulci of propodeum shallow, not or hardly sculptured . . ***DIRHICNUS*** Thomson (p. 787)

– Antennal pedicellus in dorsal view appearing hardly longer than broad. Head not protuberant at level of toruli. Spiracular sulci of propodeum distinctly impressed, more or less punctate or with transverse costulae
HABROCYTUS Thomson (p. 494)

139 (137) Marginal vein of fore wing 1·1 to 1·2 times as long as the stigmal vein ; body bronze-black, legs mainly dark, antennae blackish ; both mandibles with four teeth. First funicular segment at most slightly longer than the pedicellus . . . . . ***PEGOPUS*** Förster (p. 684)

– Either the marginal vein is at least 1·5 times as long as the stigmal vein ; or else the head and thorax are mainly green to blue-green, the tibiae and tarsi are at least mainly yellowish, and the antennal flagellum is yellowish beneath. Left mandible, or both mandibles, with three teeth . . 140

140 (139) Marginal vein 1·2 to 1·3 times as long as the stigmal vein ; mesoscutum with several shallow piliferous punctures in addition to the reticulation, much as in Text-fig. 316 ; pronotal neck sloping vertically with respect to the surface of the collar, so that in an exact dorsal view of the thorax the neck is invisible . . . . . ***CECIDOSTIBA*** Thomson (p. 564)

– Marginal vein 1·5 to 2 times as long as the stigmal vein. Mesoscutum usually without piliferous punctures, if with a few then the pronotal neck slopes less steeply and is visible in a dorsal view of the thorax . . 141

141 (140) Propodeum (cf. Text-figs. 371–381) with plicae distinct throughout ; spiracular sulci distinctly impressed, even just behind the spiracles, and with some transverse costulae or punctures. Base of scutellum nearly as broad as base of axilla.
Mesosternal mesolcus subobsolete. Left mandible with three teeth, right mandible with four . . . . ***HABROCYTUS*** Thomson (p. 494)

– Propodeal plicae usually absent, or subobsolete anteriorly (Text-figs. 492, 493) ; if distinct throughout, then the base of the scutellum is at most half as broad as the base of an axilla. Spiracular sulci of propodeum usually shallow, and without costulae or punctures 142

142 (141) Both mandibles with three teeth. Vertex usually (Text-figs. 437, 438, 440) with a transverse ridge behind the ocelli ; if lacking a ridge, then the mesosternal mesolcus is a sharply-impressd line, and the head and thorax are usually dark blue . . . . ***HOLCAEUS*** Thomson (p. 584)

– Left mandible with three teeth, right mandible with four. Vertex without a transverse ridge. Head and thorax at least mainly bright green to blue. Mesosternal mesolcus at most weakly impressed, sometimes obsolete anteriorly 143

143 (142) Propodeum medially barely half as long as the scutellum. Stigma of fore wing moderate-sized . . . ***EULONCHETRON*** Graham (p. 599)

– Propodeum, medially, slightly more than half as long as the scutellum except in one species which has the stigma small ***CHLOROCYTUS*** Graham (p. 611)

144 (104) Propodeum with panels of median area shiny, smooth or virtually so. Pronotal collar finely though sharply margined throughout ***TRICHOMALUS*** Thomson (p. 707)

– Propodeum with panels of median area at least mainly reticulate or otherwise sculptured. Pronotal collar sometimes immarginate . . . 145

145 (144) Hind tibia with two spurs. Propodeal plicae represented only by convex elevations ; spiracular sulci distinctly impressed. Antennal flagellum very short, only about equal to the distance between the eyes. Vertex and dorsum of thorax with rather stiff dark hairs ***STENETRA*** Masi (p. 474)

– Hind tibia with one spur. The other characters not all present in combination 146

146 (145) Propodeum with plicae represented only by basal foveae and a sharp portion occupying at most the hinder half ; spiracular sulci absent or very shallow 147

– Propodeum either with the plicae nearly or quite complete ; or with the spiracular sulci distinctly impressed 149

147 (146) Either the marginal vein is about twice as long as the stigmal vein ; or else the antennal scape does not reach the level of the median ocellus. Pronotal collar sometimes margined.
Left mandible with three or four teeth, right mandible with four ***HOMOPORUS*** Thomson (p. 444)

– Marginal vein at most 1·6 times as long as the stigmal vein. Antennal scape reaching the level of the median ocellus. Pronotal collar not margined 148

148 (147) Left mandible with three teeth, right mandible with four. Scutellum strongly convex. Head 1·3 to 1·4 times as broad as mesoscutum ***PHAENOCYTUS*** gen. n. (p. 561)

– Both mandibles with four teeth. Scutellum only moderately convex. Head about 1·25 times as broad as mesoscutum ***SPINTHERUS*** Thomson (p. 480)

149 (146) Fore wing with marginal vein about 1·8 times as long as the stigmal vein ; stigma rather large, separated by barely twice its height from the costal edge of the wing . . . . . ***APELIOMA*** Delucchi (p. 582)

– Fore wing with marginal vein rarely as much as 1·8 times as long as the stigmal vein, if so then the stigma is relatively smaller . . . 150

150 (149) Postspiracular sclerite broad, mainly reticulate ; pronotal collar sharply margined throughout ; spiracles of propodeum small, subcircular, separated by about their own diameter from hind margin of metanotum ***NEPHELOMALUS*** Graham (p. 697)

– Postspiracular sclerite narrower, weakly sculptured. Pronotal collar sometimes margined only in the middle. Spiracles of propodeum often oval and close to the metanotum 151

151 (150) Antennal clava as long as, or somewhat longer than, the combined length of the three preceding funicular segments ; funicular segments quadrate or nearly so, the first at least very slightly shorter than the pedicellus.
Mandibular formula 3·4 . . ***SCEPTROTHELYS*** Graham (p. 482)

– Antennal clava shorter than the combined length of the three preceding funicular segments ; funicular segments sometimes relatively longer, the first often as long as or longer than the pedicellus 152

152 (151) Both mandibles with four teeth. Postmarginal vein or fore wing as long as, or longer than, the marginal vein. [Species included in key to ♂ *Habrocytus*]
PTEROMALUS Swederus (p. 488)

– Left mandible with three teeth, right mandible with four. Postmarginal vein as long as, or shorter than, the marginal vein
HABROCYTUS Thomson (p. 494)
SCEPTROTHELYS Graham (p. 482)

153 (94) Fore wing with speculum absent or rudimentary ; basal cell wholly pilose . 154
– Fore wing with a moderate-sized or large speculum ; basal cell partly to entirely bare 155

154 (153) Antennae with first funicular segment longer than broad, longer than the pedicellus ; the following segments subquadrate to slightly longer than broad ; sensilla numerous, in three to four rows on all the funicular segments . . . . . ***PICROSCYTOIDES*** Masi (p. 441)
– Antennae with funicular segments slightly broader than long, the first segment shorter than the pedicellus, and slightly shorter than the second segment; sensilla sparse, in one row on all the funicular segments
STENOSELMA Delucchi (p. 437)

155 (153) Propodeum with a large, subglobose, quite strongly reticulate nucha which projects well beyond the bases of the hind coxae. Mesepisternum wholly reticulate, or with at most a narrow vertical smooth line below the base of the hind wing 156
Propodeum with at most a small, weakly-reticulate nucha which projects only slightly beyond the bases of the hind coxae ; most often with nucha undeveloped and represented only by a transverse lunate strip. Mesepisternum most often with a shiny, weakly sculptured or smooth area below the base of the hind wing 157

156 (155) Anterior margin of clypeus deeply emarginate and bidentate. Fore wing with stigma rather large, separated by somewhat less than twice its height from the costal edge of the wing ; costal cell very broad, at most five times as long as broad, its lower surface with a very broad longitudinal band of densely-aggregated hairs . . . . . ***OEDAULE*** Waterston (p 435)
– Anterior margin of clypeus shallowly emarginate. Fore wing with stigma small, separated by at least twice its height from the costal edge of the wing ; costal cell less broad, its lower surface with sparser hairs
DINARMUS Thomson (p. 434)

157 (153) Propodeum with a convex, delicately reticulate nucha which projects slightly beyond the bases of the hind coxae, and is not very sharply-defined anteriorly . . . . . ***ANISOPTEROMALUS*** Ruschka (p. 433)
– Propodeal nucha represented only by a transverse lunate strip which is sharply-defined anteriorly, and is transversely aciculate or smooth . . 158

158 (157) Anterior margin of clypeus deeply emarginate, virtually incised. Pronotal collar usually sharply margined . . ***OXYSYCHUS*** Delucchi (p. 432)
– Anterior margin of clypeus shallowly emarginate. Pronotal collar not or hardly margined . . . . . ***CYRTOPTYX*** Delucchi (p. 430)

159 (24) Hind femora strongly swollen, at most slightly more than twice as long as broad ; postspiracular sclerite very small, visible only as a minute triangle in front of the tegula ; pronotum almost as wide as the mesoscutum ; fore wing with two fuscous clouds . . ***DINARMOIDES*** Masi (p. 436)
– Hind femora not, or only slightly, swollen ; postspiracular sclerite larger, extending well ventrad ; pronotum usually less wide ; fore wing immaculate or with at most one fuscous cloud 160

160 (159) Fore wing without a speculum ; marginal vein about three times as long as the stigmal vein. Eyes conspicuously hairy ***RAKOSINA*** Bouček (p. 781)
– Fore wing with a speculum ; marginal vein rarely so long in proportion to the stigmal vein. Eyes rarely conspicuously pilose 161

161 (160) Occiput margined medially. Propodeum with a convex, quite strongly reticulate nucha . . . ***EUPTEROMALUS*** Kurdjumov (p. 737)

– Occiput not margined. Propodeal nucha often narrow and weakly sculptured, or hardly developed 162

162 (161) Dorsal surface of hind coxa with some hairs in the proximal half ; propodeal callus thickly hairy 163

– Dorsal surface of hind coxa bare in the proximal half or more ; propodeal callus less thickly hairy 164

163 (162) Third anellus at least fully 1·5 times as broad as long ; fore wing with basal cell thickly pilose over at least its distal half ; thorax only about 1·4 times as long as broad . . . . . ***ATRICHOMALUS*** Graham (p. 737)

– Third anellus not or hardly transverse ; fore wing with basal cell less thickly hairy, or bare ; thorax 1·55 to 1·7 times as long as broad ***TRICHOMALUS*** Thomson (p. 707)

164 (162) Propodeum medially as long as or longer than the scutellum, very strongly produced beyond the bases of the hind coxae, with a large convex strongly reticulate nucha. Antennal clava in profile appearing asymmetrical, with one edge strongly curved, the other nearly straight. Legs, including the coxae at least mainly, testaceous to reddish. Lower surface of fore wing, below the marginal vein, with a row of rather long, downward-pointing hairs . . . . . ***CALLITULA*** Spinola (p. 458)

– Propodeum medially at least slightly shorter than the scutellum, not or only slightly produced beyond the bases of the hind coxae ; nucha most often undeveloped, if developed then relatively small and not strongly reticulate. Antennal clava in profile not or hardly asymmetrical. Coxae usually dark, occasionally the fore coxae yellow. Lower surface of fore wing, below the marginal vein, with shorter hairs which do not form a distinct row . . 165

165 (164) Face, frons, and vertex with a pattern formed by a smooth sinuous line (Text-figs. 325–327) 166

– These parts without such a pattern 167

166 (165) Antennal flagellum rather stout, subfusiform ; fifth flagellar segment fully as broad as the pedicellus ; anelli transverse ; proximal segments of funicle usually slightly transverse. Pattern of head, Text-fig. 325. Both mandibles with four teeth . . . . ***MERAPORUS*** Walker (p. 681)

– Antennal flagellum clavate, proximally slender with fifth flagellar segment less stout than the pedicellus ; anelli as long as broad ; segments one to four of funicle quadrate or even very slightly longer than broad. Pattern of head, Text-figs. 326, 327. Left mandible with three teeth, right mandible with four . . . ***LEPTOMERAPORUS*** Graham (p. 687)

167 (165) Anterior margin of clypeus incised medially (cf. Text-fig. 528) . . . 168

– Anterior margin of clypeus at most moderately deeply emarginate as in Text-fig. 526, sometimes truncate 170

168 (167) Lower edge of antennal toruli distinctly above level of ventral edge of eyes. Propodeum without plicae . . . ***KARPINSKIELLA*** Bouček (p. 632)

– Lower edge of antennal toruli not, or only slightly, above level of ventral edge of eyes. Plicae at least indicated in the posterior part of the propodeum, sometimes reaching its base 169

169 (168) Marginal vein of fore wing about 1·5 times as long as the stigmal vein. Terminal segment of maxillary palpi not dilated ***PSILONOTUS*** Walker (p. 625)

– Marginal vein about 1·8 times as long as the stigmal vein. Terminal segment of maxillary palpi dilated . . ***MESOPOLOBUS*** Westwood (p. 638)

170 (167) Thorax somewhat depressed dorso-ventrally, the scutellum in profile appear-

ing nearly flat. Fore wing with at least the distal quarter of the basal cell pilose 171

– Thorax arched dorsally, the scutellum in profile appearing distinctly convex. Basal cell of fore wing usually bare or nearly so 172

171 (170) Either the antennae are inserted below the level of the ventral edge of the eyes ; or the mesepisternum is wholly reticulate and dull, and the genae are prominent just above the bases of the mandibles (frontal view) ***ANOGMUS*** Förster (p. 628)

– Lower edge of antennal toruli at or slightly above the level of the ventral edge of the eyes ; genae not prominent above bases of mandibles, but evenly curved ; mesepisternum with the subtriangular area below base of hind wing as a rule partly smooth ***MESOPOLOBUS*** Westwood (p. 638)

172 (170) Antennal flagellum fuscous, subfiliform, with relatively long, moderately to strongly outstanding hairs ; lower edge of antennal toruli well above ventral edge of eyes. Legs testaceous with at least the femora more or less infuscate, sometimes also the tibiae. Both mandibles with three teeth ***CRICELLIUS*** Thomson (p. 591)

– Antennal flagellum partly to entirely yellow or testaceous, clavate, with short at most slightly outstanding hairs ; lower edge of toruli sometimes not or hardly above ventral edge of eyes. Femora and tibiae most often entirely bright yellow, sometimes with the femora, occasionally also the tibiae more or less, infuscate. Right mandible, or both mandibles, with four teeth. 173

173 (172) Propodeum with plicae usually complete, occasionally indicated at hind margin only. Second tergite of gaster not, or only slightly, shorter than the third. Left mandible with three teeth, right mandible with four. Antennal clava often obtuse . . ***MESOPOLOBUS*** Westwood (p. 638)

– Propodeum with plicae represented only by basal foveae. Second tergite of gaster distinctly shorter than the third. Both mandibles with four teeth. Antennal clava pointed at apex ***HOMOPORUS*** Thomson (p. 444)

DINOTISCUS Ghesquière

Dinotus Förster, 1856 : 66, 70, 71. Type-species : *D. bidentulus* Thomson, 1878, by designation of Ashmead, 1904 : 316 [pre-occupied by *Dinotus* Guettard, 1770 (Verm., Polych.)].
Dinotus Förster ; Thomson, 1878 : 32, 38.
Dinotus Förster ; Schmiedeknecht, 1909 : 316, 317, 318.
Dinotus Förster ; Kurdjumov, 1913 : 4, 10.
Dinotiscus Ghesquière, 1946 : 370 [n.n. for *Dinotus* Förster *nec* Guettard].
Dinotiscus Ghesquière ; Ferrière, 1948 : 524–526.
Dinotus Förster ; Nikol'skaya, 1952 : 216.
Dinotiscus Ghesquière ; Hedqvist, 1963 : 83–93.
Dinotiscus Ghesquière ; Peck *et al.*, 1964 : 44.

The European species were revised by Ferrière (1948) and again by Hedqvist (1963).

Key to European Species

(Females)

1 Anterior margin of clypeus slightly produced but without teeth. Fore wing immaculate ; basal cell usually having a few hairs scattered over its distal part, in addition to those on the basal vein ; stigma moderate-sized, tending to be somewhat quadrangular, as long as or slightly longer than high. . 2

–		Anterior margin of clypeus bidentate. Fore wing usually with a fuscous cloud around the stigma, sometimes with another below the parastigma . 3
2	(1)	Propodeum (medially) one quarter as long as scutellum or slightly more. Fore wing with marginal vein 1·7 to 1·8 times as long as the stigmal vein ; stigma moderate-sized. Antennae with first funicular segment as long as or slightly longer than, and as broad as, the second segment. Head distinctly reticulate and not very shiny* . . . ***eupterus*** (Walker) (p. 410)
–		Propodeum (medially) about half as long as the scutellum. Fore wing with marginal vein 2 to 2·1 times as long as the stigmal vein ; stigma small. Antennae with first funicular segment slightly shorter and slightly narrower than the second segment. Head more weakly reticulate and more shiny. . . . . sp. indet.
3	(1)	Fore wing with stigma at least slightly longer than high ; a fuscous cloud usually present around the stigma ; basal vein with six or more hairs, the basal cell often with a few hairs in its distal part . ***aponius*** (Walker) (p. 411)
–		Fore wing with stigma higher than long ; a fuscous cloud present around the stigma, and usually a dusky spot below the parastigma ; basal vein sparsely pilose, basal cell usually bare . . . . ***colon*** (Linnaeus) (p. 411)

(MALES)

1		Anterior margin of clypeus slightly produced but without teeth. Fore wing immaculate . . . . . ***eupterus*** (Walker) (p. 410)
–		Anterior margin of clypeus bidentate. Fore wing usually with a fuscous cloud around the stigma, sometimes with another below the parastigma . 2
2	(1)	Fore wing with stigmal vein much shorter than the stigma, which is large and as high as or higher than long ; wing usually with a fuscous cloud around the stigma, and another below the parastigma . . ***colon*** (Linnaeus) (p. 411)
–		Fore wing with stigmal vein as long as the stigma, which is at least slightly longer than high ; wing usually with a fuscous cloud around the stigma, but none below the parastigma . . . . . ***aponius*** (Walker) (p. 411)

Dinotiscus eupterus (Walker)

Pteromalus eupterus Walker, 1836 : 482, ♀.
Pteromalus dimidiatus Walker, 1836*a* : 12, ♀.
? Pteromalus capitatus Förster, 1841 : 21, ♂.
Pteromalus lanceolatus Ratzeburg, 1848 : 204, ♂ ♀.
Dinotus clypealis Thomson, 1878 : 40, ♂ ♀.
Dinotiscus capitatus (Förster) Ferrière, 1948 : 525, ♂ ♀.
Dinotiscus eupterus (Walker) Hedqvist, 1963 : 84, 90–93, ♂ ♀.

Type material. *Pteromalus eupterus* Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen, bearing a Waterhouse label.

Pteromalus dimidiatus Walker. One female, LECTOTYPE, bearing a Waterhouse label.

Pteromalus capitatus Förster. Types not seen ; I am not aware if they have been critically re-examined in recent years.

Pteromalus lanceolatus Ratzeburg. Types presumed destroyed. The species was placed in *Dinotus* [=*Dinotiscus*] by Kurdjumov (1913 : 10) and his conclusion has been generally accepted.

* *D. wichmani* Bouček (1967 : 635–637 ; Austria) runs out here but has forewing more extensively pilose, stigma larger.

Dinotus clypealis Thomson. Syntypes examined by the writer, but no lectotype has yet been selected.

BRITAIN, SWEDEN, GERMANY, CENTRAL EUROPE.

Biology. Parasitic on several species of Scolytidae, e.g., *Polygraphus* sp., *Phthorophloeus spinulosus* Rey, *Cryphalus* spp., *Pityophthorus* spp., *Pityogenes* sp., *Dryocoetes autographus* Ratz. (see Hedqvist, 1963 : 92–93). Stewart's record of the rearing of *Etroxys dimidiatus* Walker from *Pityogenes bidentatus* Herbst in Scotland (1923 : 138) probably refers to *Dinotiscus eupterus* (Walker). Imagines most often in June and Aug.–Sept. (apparently 2 generations in some areas).

Dinotiscus aponius (Walker)

Hetroxys Aponius Walker, 1848 : 127, 215, ♂ ♀.
Pteromalus capitatus Ratzeburg, 1848 : 196, pl. 3, fig. 7, ♂ ♀ [? *nec* Förster, 1841].
Dinotus bidentulus Thomson, 1878 : 39, ♂ ♀.
Dinotus capitatus (Ratzeburg) Kurdjumov, 1913 : 10.
Dinotiscus bidentulus (Thomson) Ferrière, 1948 : 525–526, ♂ ♀.
Dinotiscus aponius (Walker) Hedqvist, 1963 : 84, 85–87, ♂ ♀.

Type material. *Hetroxys aponius* Walker. Syntypes, 1 ♂, 1 ♀. LECTOTYPE, the male specimen, bearing a Waterhouse label.

Pteromalus capitatus Ratzeburg. Types presumed destroyed. Ratzeburg's figure of the fore wing (1848, pl. 3, fig. 7) agrees best with that of *aponius* (Walker). The species was transferred to *Dinotus* by Kurdjumov (1913 : 10).

Dinotus bidentulus Thomson. Syntypes examined by the writer, but no lectotype yet selected.

NORTH-WEST (including BRITAIN) and CENTRAL EUROPE.

Biology. Parasite of *Scolytus rugulosus* Ratz., *S. multistriatus* Marsh., *S. ratzeburgi* Jans., *Hylesinus fraxini* Pz. (see Hedqvist, 1963 : 86–87). Imagines May–September (possibly more than one brood).

The species varies considerably in size.

Dinotiscus colon (Linnaeus) **comb. n.**

Sphex colon Linnaeus, 1758 : 571.
Sphex colon Linnaeus, 1761 : 413.
Dinotus calcaratus Thomson, 1878 : 40, ♀, **syn. n.**
Dinotiscus calcaratus (Thomson) Ferrière, 1948 : 525, 526, ♂ ♀.
Dinotiscus calcaratus (Thomson) ; Hedqvist, 1963 : 84, 87–90, ♂ ♀.

Type material. *Sphex colon* Linnaeus. In the Linnean collection (The Linnean Society, London) there is a pinned specimen labelled " colon ". It agrees well enough with the original description (and also with the rather more detailed one by Linnaeus, 1761) and is designated LECTOTYPE. Contrary to all expectation, it is a ♂ of *Dinotiscus calcaratus* (Thomson). Walker (1848 : 127) incorrectly synonymized *Diplolepis* [= *Cheiropachus*] *quadrum* Fabricius with *Sphex colon*,

probably on the evidence of the type ♂ in the Linnean collection, whose identity he mistook. He certainly saw this specimen, because his interleaved copy of a set of some of his papers [in my library] contains MS. remarks headed " Linn. Cabinet ", one of which states " Colon so ticketed is Cheiropachus quadrum ".

Dinotus calcaratus Thomson. Syntypes examined by the writer, but no lectotype yet selected.

BRITAIN, SWEDEN, FINLAND, GERMANY, CZECHOSLOVAKIA.

Biology. Parasite of *Blastophagus piniperda* L., *B. minor* Htg., and *Ips acuminatus* Gyll. (see Hedqvist, 1963 : 90). Imagines most often in June.

Note. Most or all of the North American species placed in *Cecidostiba* by Peck (*in* Muesebeck, Krombein & Townes, 1951 : 557) belong in or very near *Dinotiscus*.

Pteromalus dulcis Walker (1872 : 121, ♂) from Madeira appears, according to its type (Type Hym. 5. 714) to be very near *Dinotiscus*.

RHOPALICUS Förster

Rhopalicus Förster, 1856 : 66, 70. Type-species : *Cleonymus maculifer* Förster, 1841, by monotypy.
Rhopalicus Förster ; Thomson, 1878 : 32, 41.
Rhopalicus Förster ; Schmiedeknecht, 1909 : 316, 317, 319.
Rhopalicus Förster ; Kurdjumov, 1913 : 4, 10 [*ex parte*].
Rhopalicus Förster ; Ferrière, 1948 : 519–522.
Rhopalicus Förster ; Nikol'skaya, 1952 : 216.
Rhopalicus Förster ; Hedqvist, 1963 : 71–83.
Rhopalicus Förster ; Peck *et al.*, 1964 : 44.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Fore wing with lower surface of costal cell with two to four rows of hairs even in its proximal half ; basal cell with a few scattered hairs distally in addition to those on the basal vein ; stigma conspicuously longer than high. Gaster at least slightly longer than head plus thorax. Combined length of pedicellus and flagellum fully equal to breadth of head. Head in dorsal view 2·1 to 2·15 times as broad as long ; temples from one quarter to nearly one third as long as eyes. Fore wing often with a fuscous cloud around the stigma . . . . . ***tutela*** (Walker) (p. 413)

– Fore wing with lower surface of costal cell with only one row of hairs in its proximal half ; basal cell bare, not counting the row of hairs on the basal vein ; stigma sometimes less elongate. Gaster at most as long as head plus thorax. Combined length of pedicellus and flagellum slightly less than breadth of head. Head in dorsal view 2·15 to 2·45 times as broad as long, relatively more transverse in larger specimens ; temples from one sixth to one fifth as long as eyes. Fore wing either immaculate, or with a fuscous spot below the basal part of the marginal vein. 2

2 (1) Fore wing immaculate ; stigma distinctly longer than high ; stigmal vein forming a relatively acute angle (barely 35°) with the postmarginal vein. Antennal flagellum slightly clavate. Scutellum, in profile, appearing virtually flat . . . . . ***brevicornis*** Thomson (p. 414)

– Fore wing with a fuscous spot below the basal part of the marginal vein ; stigma subcircular or short-oval ; stigmal vein forming a rather less acute angle with the postmarginal vein. Antennal flagellum virtually cylindrical. Scutellum, in profile, appearing slightly convex ***guttatus*** (Ratzeburg) (p. 415)

(MALES)

1 Fore wing without a speculum or with at most a very narrow bare strip ; the upper surface of the wing, not counting the costal cell, otherwise entirely pilose ; lower surface of costal cell with two or more rows of hairs even in its proximal half ; usually a large fuscous blotch below but touching the stigma, often another spot on the disc of the wing below the parastigma. Antenna with proximal segments of funicle, in larger specimens, longer than broad . . . . . ***tutela*** (Walker) (p. 413)

– Fore wing with a moderate-sized or large speculum ; basal cell often sparsely pilose ; lower surface of costal cell with only one row of hairs in its proximal half ; wing immaculate . . . . . ***brevicornis*** Thomson (p. 414) and ***guttatus*** (Ratzeburg) (p. 415)

I am not able at present to give good characters for distinguishing the males of *brevicornis* and *guttatus*.

Rhopalicus tutela (Walker)

Cheiropachus tutela Walker, 1836 : 14, ♂ ♀.
Cleonymus maculifer Förster, 1841 : 34, ♀.
Pteromalus suspensus Ratzeburg, 1844*a* : 189 [♀].
Pteromalus Spinolae Ratzeburg, 1844*a* : 189, ♂ ♀.
Pteromalus immaculatus Ratzeburg, 1844*a* : 189, 205.
Pteromalus lunula Ratzeburg, 1848 : 193, ♀.
Pteromalus multicolor Ratzeburg, 1848 : 193 [n. n. for *P. spinolae* Ratz. 1844, *nec* Förster, 1841].
Pteromalus aemulus Ratzeburg, 1848 : 203 [♀].
Rhopalicus Annellus Thomson, 1878 : 42, ♂ ♀.
Rhopalicus tutela (Walker) Ferrière, 1948 : 519–521, ♂ ♀.
Rhopalicus tutele [*sic*] (Walker) ; Hedqvist, 1963 : 71–79, ♂ ♀.

Type material. *Cheiropachus tutela* Walker. Six specimens stand under this name but the series is very mixed and clearly the types of some other species have been misplaced here. LECTOTYPE, a female bearing a Waterhouse label " Cheiropachus Tutela Walker " and my lectotype label.

Cleonymus maculifer Förster. Types not seen (presumably in Naturhistorisches Museum, Vienna). Ferrière (1948 : 520) stated that he had seen a specimen of *maculifer* from Förster's collection and found it to be the same as *Rhopalicus tutela*.

Pteromalus suspensus Ratzeburg. The types of this and the following Ratzeburg species are presumably destroyed. Kurdjumov (1913 : 10) transferred *suspensus* to *Rhopalicus*, at the same time synonymizing with it Ratzeburg's species *spinolae* (=*multicolor*), *lunula*, and *aemulus*. This synonymy has been generally accepted. In the case of *suspensus* Ratzeburg must have had a mixed series because he stated (1844*a* : 189) that his original specimens had been obtained both from " Kegelförmigen Gallen der Buchenblätter (*Cecidomyia fagi*) " and from the larvae of *Bostrichus*

laricis ; the specimens from beech galls must have belonged to some other genus than *Rhopalicus*.

Pteromalus immaculatus Ratzeburg. Transferred to *Dinotus* [=*Dinotiscus*] by Kurdjumov (1913 : 10) who remarked " this species is a transitional form to the genus *Rhopalicus* ". Ratzeburg, however (1848 : 189) considered *immaculatus* to be probably only a form of *spinolae* [=*Rhopalicus tutela*] and this seems more likely.

Rhopalicus annellus Thomson. Type ♀ not seen ; Ferrière (1948 : 520) stated that he had examined it and found it to be the same as *tutela* (Walker).

As Hedqvist (1963) remarked, this species varies greatly in size and wing-markings. Females usually have a dark cloud beneath the stigma of the fore wing, but this may be absent (most often in small specimens). Large males have bold and extensive wing-markings, consisting of a smaller cloud on the disc below the parastigma and a larger one below the stigma ; sometimes the two spots are joined. Smaller males tend to have the spots reduced, and one (or rarely both) may be absent.

Widely distributed in EUROPE.

Biology. A common parasite of a number of genera and species of Scolytidae ; also recorded from species of *Pissodes* (Curculionidae) ; for a list see Hedqvist, 1963. The latter gave a full account of the known facts relating to the biology of the species. He stated that its time of appearance extends over most of the summer and that it has no marked peak-period. There appear to be 2 generations in good seasons, possibly more in some Continental countries. In Britain imagines have been captured in the field from May until September.

Rhopalicus brevicornis Thomson

Pteromalus quadratus Ratzeburg, 1844*a* : 203, ♀.
Pteromalus Neostadiensis Ratzeburg, 1844*a* : 204, ♀.
Rhopalicus brevicornis Thomson, 1878 : 43, ♀.
Rhopalicus brevicornis Thomson ; Ferrière, 1948 : 519, 521, ♀.
Rhopalicus brevicornis Thomson ; Hedqvist, 1963 : 71, 79–82, ♂ ♀.

Type material. *Pteromalus quadratus* Ratzeburg. Types presumed destroyed. The species was placed in *Rhopalicus* by Kurdjumov (1913 : 10) and the description certainly suggests that it may have been the same as *brevicornis* Thomson.

Pteromalus neostadiensis Ratzeburg. Holotype ♀ presumed lost. The species was placed in synonymy with *brevicornis* Thomson by Kurdjumov (1913 : 10) and this seems a reasonable conclusion.

Rhopalicus brevicornis Thomson. Types seen but no lectotype yet selected.

NORTH-WESTERN EUROPE, including BRITAIN.

Biology. Parasite of *Hylurgops palliatus* Gyll., *Phloeosinus thuyae* Perr., *Blastophagus minor* Htg., *B. piniperda* L., *Pityogenes bidentatus* Herbst., *P. quadridens* Htg., *P. monacensis* Fuchs, *Orthotomicus proximus* Eichh., *Ips acuminatus* Gyll., *I. amitinus* Eichh. (for details of the biology see Hedqvist, 1963 : 80–82). Imagines may be found over most of the summer (mostly June–July) ; there is often more than one generation.

Pteromalus azureus Ratzeburg (1844*a* : 203) has sometimes been regarded as being identical with *Rhopalicus brevicornis* Thomson but Szczepański (1960 : 411, 416) maintained that this view could not be correct. I agree with his opinion ; moreover I consider that *azureus* is recognizable as a valid species of the genus *Metacolus* (see below).

Rhopalicus guttatus (Ratzeburg)

Ichneumon (*Pteromalus*) *guttatus* Ratzeburg, 1844 : 29, pl. 8, fig. 5, ♀.
Pteromalus guttatus Ratzeburg, 1844*a* : 188, pl. 8, fig. 5, ♀.
Rhopalicus guttatus (Ratzeburg) Thomson, 1878 : 43, ♀.
Rhopalicus guttatus (Ratzeburg) ; Ferrière, 1948 : 519, 521, ♀.
Rhopalicus guttatus (Ratzeburg) ; Hedqvist, 1963 : 71, 82–83, ♀.

Type material. Syntypes presumed destroyed. The identity of the species, however, is perfectly clear from Ratzeburg's description and figure, particularly that in *Die Forst-Insecten*, vol. 3, which in the copies I have seen is coloured. If it is considered necessary to erect a neotype at some stage, one could be selected with advantage from the material of Thomson, the first reviser.

BRITAIN, GERMANY, SWEDEN, CZECHOSLOVAKIA.

Biology. Reared in Sweden by Hedqvist from *Pissodes validirostris* Gyll. (Col., Curculionidae) ; also from other species of that genus (Hedqvist, 1963). Imagines July–Sept.

Most females of *guttatus* have a characteristic fuscous spot on the fore wing, just below the parastigma ; occasionally this spot is absent (Ratzeburg himself (1852 : 236) noted such a variation).

ACROCORMUS Förster

Acrocormus Förster, 1856 : 66, 70, 71. Type-species : *A. semifasciatus* Thomson, by subsequent reference.
Acrocormus Förster ; Thomson, 1878 : 32, 34.
Acrocormus Förster ; Schmiedeknecht, 1909 : 155, 157, 165 [*ex parte*].
Acrocormus Förster ; Ferrière, 1948 : 524.
Acrocormus Förster ; Nikol'skaya, 1952 : 211–212.
Acrocormus Förster ; Hedqvist, 1963 : 107–109.
Acrocormus Förster ; Peck *et al.*, 1964 : 44.

Only one European species is known :

Acrocormus semifasciatus Thomson

Acrocormus semifasciatus Thomson, 1878 : 34, ♂ ♀.
Acrocormus semifasciatus Thomson ; Ferrière, 1948 : 524, ♂ ♀.
Acrocormus semifasciatus Thomson ; Hedqvist, 1963 : 107–109, ♂ ♀.

Type material. LECTOTYPE ♀ (Lapland, *Boheman*) in Thomson coll., selected by Delucchi and validated by Hedqvist (1963 : 109).

BRITAIN, SWEDEN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Reared in Sweden from *Scolytus intricatus* Ratzeburg (Hedqvist, 1963 : 109) ; in Bohemia from *Magdalis armigera* (Geoffr.) in twigs of elm (*Ulmus*) and in Slovakia from *Hylesinus toranio* Danth. on ash (*Fraxinus*) according to Bouček 1957 : 164). Beaver (1965) reared it in England from *Ulmus* logs infested by *Acrantus vittatus* (F.) (Col., Scolytidae). Imagines in spring and late summer.

Note. *Acrocormus megastigmus* Ashmead (*in* Riley *et al.*, 1894 : 155, type-locality St. Vincent, Grenada) is represented in BM(NH) by the ♂ type (Type Hym. 5. 678). It does not belong to *Acrocormus*, but to some genus of Pteromalidae unknown to me and not allied to any of our European forms.

CHEIROPACHUS Westwood

Cheiropachus Westwood, 1828 : 23. Type-species : *Diplolepis quadrum* Fabricius, by original designation.
Cheiropachys Haliday, 1833 : 268 [erroneous subsequent spelling].
Pachychirus Agassiz, 1846 : 777 [n. n. for *Cheiropachus* Westwood, supposedly pre-occupied by *Chiropacha* Carpentier, 1841].
Pachychirus Agassiz ; Förster, 1856 : 66, 69.
Chiropachys van Vollenhoven, 1871, fasc. 3, pl. 10 [erroneous subsequent spelling].
Tropidogastra Ashmead, 1904 : 323. Type-species : *T. arizonensis* Ashmead, by monotypy.
Cheiropachys Westwood ; Schmiedeknecht, 1909 : 155, 157, 162 [*ex parte*].
Cheiropachys Westwood ; Kurdjumov, 1913 : 22–23.
Cheiropachus Westwood ; Ferrière, 1948 : 522–523.
Cheiropachus Westwood ; Hedqvist, 1963 : 102–110.
Cheiropachus Westwood ; Peck *et al.*, 1964 : 44.

The genus *Tropidogastra* Ashmead was placed in synonymy with *Cheiropachus* Westwood by Gahan (1938 : 219). In the same paper (pp. 219–220) Gahan gave a key to the North American species of *Cheiropachus*.

In Europe only one species is known :

Cheiropachus quadrum (Fabricius)

?Cynips tripunctatus Fourcroy, 1785 : 389.
Ichneumon quadrum Fabricius, 1787 : 270.
Pteromalus bimaculatus Swederus, 1795 : 222.
Cleonymus maculipennis Curtis, 1827 : folio 194, ♂.
Cheiropachus quadrum (Fabricius) Westwood, 1828 : 25.
Pteromalus bimaculatus (Spinola) Nees, 1834 : 96, ♂.
Pteromalus bicaliginosus Ratzeburg, 1844*a* : 190 [♂].
Pteromalus binaevius Ratzeburg, 1844*a* : 190, ♂.
Pteromalus Fraxini Ratzeburg, 1844*a* : 191, ♀.
Pteromalus binimbatus Ratzeburg, 1844*a* : 191, ♀.
Pteromalus binubeculatus Ratzeburg, 1844*a* : 191, ♀.
Pachychirus quadrum (Fabricius) Förster, 1856 : 70.
Pachychirus intermedius Förster, 1856 : 70.
Cheiropachys colon (Linnaeus) Thomson, 1878 : 33, ♂ ♀ [nec *Sphex colon* Linnaeus, 1758].
Cheiropachys colon (Linnaeus) ; Kurdjumov, 1913 : 22–23.
Cheiropachys colon (Linnaeus) ; Russo, 1938 : 181–195.

Cheiropachus colon (Linnaeus) ; Ferrière, 1948 : 522–523, ♂ ♀.
Cheiropachus colon (Linnaeus) ; Sachtleben, 1952 : 178–181.
Cheiropachus colon (Linnaeus) ; Hedqvist, 1963 : 103–110, ♂ ♀.

Type material. *Cynips tripunctatus* Fourcroy. Types probably lost. Identity very doubtful.

Ichneumon quadrum Fabricius. Syntypes, 2 specimens in the private collection of Fabricius, Kiel University. LECTOTYPE ♂, a pinned specimen labelled " quadrum ", probably in the handwriting of Fabricius.

Cleonymus maculipennis Curtis. Described from material " in the Cabinets of Mr. Cooper and the Author ". The collection of Cooper cannot be traced ; Westwood's collection contains some Chalcidoidea from Cooper, but no specimens of *maculipennis*. Dr. A. Neboiss kindly sent me notes on the specimens standing as such in Curtis' collection. They comprise 5 specimens, 2 ♂ and 3 ♀, of which only the 2 ♂ can be regarded as syntypes. None of the specimens bears any label on the pin, but in Curtis' notebook there is the following information : " June, 4 ♂ trunks of decayed elms nr. Knight's hill Cottage, Dulwich. July & Aug. ♂ ♀ Coomb wood on an old rail in the sunshine, and ♂ ♀ from an oak Oxford, ♀ Southgate." Of the two male syntypes, one is carded and the other pinned. The carded male has exactly the same type of mounting as a female which is also carded ; Dr. Neboiss therefore believes that it could have been part of the July and August collecting. This leaves the pinned male which presumably represents one of the June specimens ; as the latter are the only ones originally mentioned by Curtis in folio 194, p. [2], this pinned male is selected as LECTOTYPE of *maculipennis*.

The type material of the other species cited in the above synonymy has not been examined. The Ratzeburg species were synonymized with *colon* (L.) by Kurdjumov (1913 : 22–23) ; their respective types are now presumed to be destroyed.

Since the time of Thomson (1878) this species has generally been known by the name *Cheiropachus colon* (Linnaeus), although prior to that date the name *C. quadrum* (F.) was in general use. Thomson evidently followed Walker who (1848) incorrectly synonymized *quadrum* with *colon*. The Linnean type of *colon* belongs to *Dinotiscus* (see discussion, p. 411 under *Dinotiscus colon*). This means that *Cheiropachus colon* auctt. [*nec* Linnaeus] must once more be known as *C. quadrum* (Fabricius). The transfer of the name *colon* to another genus is unfortunate, but unavoidable.

Whole of EUROPE ; TURKESTAN ; NORTH AFRICA ; CANADA ; U.S.A. ; ARGENTINA.

Biology. Reared from many species of Coleoptera Scolytidae (see Sachtleben, 1952 ; Hedqvist, 1963). Russo (1938) gave a very detailed account of the biology (as *colon*) studied in Italy, where several annual generations may occur, the insect being found from early spring until November. Hedqvist (1963) considered that at most 2 generations occur in Sweden. In Britain I have captured specimens in the field in July, August, and September ; in Poland it has been recorded in June–July and Oct.–Nov.

Adults of *quadrum* vary greatly in size, males 1·8–3 mm., females 1·83–4·65 mm. according to Russo, who stated that variations in size and colour were connected

with the quantity of food available to the host larva. Large specimens tend to have bold wing-markings and relatively paler legs, small specimens have the wing-markings reduced and the legs darker. *C. intermedius* Förster was regarded by Russo as merely a small form of *colon* [= *quadrum*].

Extra-limital species incorrectly referred to *Cheiropachus*

Cheiropachus genualis Walker (1862 : 389, ♀ ; type locality, Port Natal, Africa) is represented in BM(NH) by the type ♀ (Type Hym. 5. 677). It appears to belong somewhere in the neighbourhood of the genus *Picroscytoides* Masi.

METACOLUS Förster

Metacolus Förster, 1856 : 65, 70. Type-species : *M. unifasciatus* Förster, by monotypy.
Pterosema Förster, 1878 : 44. Type-species : *P. varicolor* Förster, by monotypy and original designation.
Metacolus Förster ; Thomson, 1878 : 32, 36.
Metacolus Förster ; Schmiedeknecht, 1909 : 316, 317–318.
Metacolus Förster ; Kurdjumov, 1913 : 4.
Metacolus Förster ; Mercet, 1926 : 41–47.
Metacolus Förster ; Ferrière, 1948 : 529–530.
Metacolus Förster ; Nikol'skaya, 1952 : 215–216.
Metacolus Förster ; Bouček, 1957*b* : 75–76.
Metacolus Förster ; Hedqvist, 1963 : 97—102.
Metacolus Förster ; Peck *et al.*, 1964 : 43.

The genus *Pterosema* Förster was placed in synonymy with *Metacolus* by Bouček (1957*b* : 76).

Key to European Species

(Females)

1 Fore wing with a fuscous band extending from the marginal vein, usually at least half way across the wing. Antennae with combined length of pedicellus and flagellum slightly greater than breadth of head ; pedicellus not, or only slightly, longer than first funicular segment ; proximal segments of funicle at least slightly longer than broad . . . . . ***unifasciatus*** Förster (p. 419)

– Fore wing immaculate. Antennae with combined length of pedicellus and flagellum slightly less than breadth of head ; pedicellus distinctly longer than first funicular segment ; proximal segments of funicle quadrate to very slightly transverse ***azureus*** (Ratzeburg) (p. 419)

(Males)

1 Fore wing with a fuscous band (as in ♀). Combined length of pedicellus and flagellum about equal to breadth of head . . . . . ***unifasciatus*** Förster (p. 419)

– Fore wing immaculate. Combined length of pedicellus and flagellum slightly less than breadth of head . . . . . ***azureus*** (Ratzeburg) (p. 419)

Burks (1965 : 116–119) gives some information about the characters which distinguish the North American *Metacolus fasciatus* Girault from the European species mentioned here.

Metacolus unifasciatus Förster

Metacolus 1-fasciatus Förster, 1856 : 70, ♂ ♀ [*sine descr.*].
Metacolus unifasciatus Thomson, 1878 : 36, ♂ ♀.
Metacolus unifasciatus Thomson ; Mercet, 1926 : 43–45, 47.
Metacolus unifasciatus Thomson ; Ferrière, 1948 : 529–530, ♂ ♀.
Metacolus unifasciatus Thomson ; Hedqvist, 1963 : 97–99, ♂ ♀.

The name *unifasciatus* Förster is presumably validated by Förster's description of the genus (1856 : 65). This would be an "indication", according to the International Code of Zoological Nomenclature (1961), in which one form of indication is defined (Art. 16 (a) vi) as " a single combined description of a new nominal genus and a new nominal species, which provides an indication for each name ". I have not seen the types of *unifasciatus*, although I have examined Thomson's specimens.

BRITAIN, SWEDEN, NORWAY, FINLAND, U.S.S.R., CZECHOSLOVAKIA, ISTRIA, SPAIN.

Biology. Parasite of *Blastophagus minor* Htg., *Ips acuminatus* Gyll., *Pityogenes quadridens* Htg. ; other hosts are also mentioned in the literature (see Hedqvist, 1963 : 99). Hedqvist states that in Sweden there is only one generation per annum. The species has been taken in the field June–August.

Metacolus azureus (Ratzeburg) **comb. n.**

Pteromalus azureus Ratzeburg, 1844*a* : 203, ♂ [? *nec* ♀].
Pteromalus azureus Ratzeburg, 1848 : 191, ♂ ♀.
? Pteromalus azurescens Ratzeburg, 1852 : 235, ♂.
Pterosema varicolor Förster, 1878 : 44–45, ♀, **syn. n.**
Metacolus aulloi Mercet, 1926 : 45–47, ♀, **syn. n.**
Metacolus aulloi Mercet ; Ferrière, 1948 : 530, ♀.
Metacolus varicolor (Förster) Bouček, 1957*b* : 76.
Metacolus varicolor (Förster) ; Hedqvist, 1963 : 97, 100–102, ♂ ♀.

Type material. *Pteromalus azureus* Ratzeburg. Types presumed destroyed. This species was placed in *Rhopalicus* as a synonym of *brevicornis* Thomson, by Kurdjumov (1913 : 10) but Ratzeburg's description does not agree with the male of that species. It does, however, agree very well with the male of *Metacolus varicolor* (Förster), especially Ratzeburg's amplified description of 1848.

Pteromalus azurescens Ratzeburg. Types presumed destroyed.

Pterosema varicolor Förster. This species was not recognized until Bouček (1957*b* : 76) transferred it to the genus *Metacolus* and remarked that it might be conspecific with *aulloi* Mercet. I have not seen the type of *varicolor*, which is presumably in Naturhistorisches Museum, Vienna, but I think Bouček's opinion is correct.

Metacolus aulloi Mercet. Type ♀ (not seen), Spain, Province of Avila, Pinares Llanos, presumably in Instituto Español de Entomologia, Madrid.

SWEDEN, NORWAY, FINLAND, GERMANY, POLAND, CZECHOSLOVAKIA, JUGOSLAVIA, SPAIN.

Biology. Parasite of *Pityogenes bidentatus* Herbst and *P. quadridens* Htg. (on biology see Hedqvist, 1963 : 102). Imagines in spring and early summer.

RHAPHITELUS Walker

Rhaphitelus Walker, 1834 : 168, 178. Type-species : *R. maculatus* Walker, by monotypy.
Styloceras Ratzeburg, 1844*a* : 207. Type-species : *S. Ladenbergii* Ratzeburg, by designation of Gahan and Fagan, 1923 : 138.
Rhaphidotelus Agassiz, 1846 : 932 [invalid emendation].
Storthygocerus Ratzeburg, 1848 : 208 [n. n. for *Styloceras* Ratzeburg, considered an inappropriate name].
Rhaphidotelus Agassiz ; Förster, 1856 : 60, 62–63.
Raphitelus Walker ; Thomson, 1878 : 37 [erroneous subsequent spelling].
Rhaphitelus Walker ; Schmiedeknecht, 1909 : 316, 318.
Rhaphiteles [*sic*] Walker ; Kurdjumov, 1913 : 4.
Eucerchysius Brèthes, 1913 : 103. Type-species : *E. scolytii* Brèthes.
Rhaphitelus Walker ; Ferrière, 1948 : 526–528.
Rhaphitelus Walker ; Nikol'skaya, 1952 : 214.
Rhaphitelus Walker ; Bouček, 1957*b* : 76–78.
Rhaphitelus Walker ; Hedqvist, 1963 : 93–96.
Rhaphitelus Walker ; Peck *et al.*, 1964 : 42.

Eucerchysius Brèthes was synonymized with *Rhaphitelus* by de Santis (1952 : 271). The European species were revised by Bouček (1957*b* : 76–78).

Key to European Species

(Females)

1 Antennae inserted hardly above the ventral edge of the eyes ; scape slightly shorter than an eye, barely reaching the level of the median ocellus. Fore wing with marginal vein thicker, only about three times as long as broad ; height of stigma not greater than breadth of marginal vein. Mesoscutum anteriorly hardly more coarsely reticulate than the collar region of the pronotum ***maculatus*** Walker (p. 420)
– Antennae inserted distinctly above the ventral edge of the eyes ; scape relatively longer, reaching above the level of the median ocellus. Fore wing with marginal vein less thick, about four times as long as broad ; height of stigma distinctly greater than breadth of marginal vein. Mesoscutum anteriorly more coarsely reticulate than the collar region of the pronotum . ***ladenbergi*** (Ratzeburg) (p. 421)

(Males)

1 Fore wing with marginal vein about three times as long as broad ; stigma smaller, its height not greater than the breadth of the marginal vein. Mesoscutum anteriorly not more coarsely reticulate than the collar region of the pronotum. Antennal scape shorter than an eye, not expanded distally ***maculatus*** Walker (p. 420)
– Fore wing with marginal vein about four times as long as broad ; stigma larger, its height distinctly greater than the breadth of the marginal vein. Mesoscutum anteriorly more coarsely reticulate than the collar region of the pronotum. Antennal scape as long as an eye, somewhat expanded just before its apex ***ladenbergi*** (Ratzeburg) (p. 421)

Rhaphitelus maculatus Walker

(Text-fig. 284)

Rhaphitelus maculatus Walker, 1834 : 179, "♂" [*recte* ♀].
Pteromalus Hecato Walker, 1839 : 271, ♂, **syn. n.**

Rhaphitelus maculatus Walker ; Haliday, 1841–1842 : v, pl. A, fig. 2, ♀.
Pteromalus subulifer Förster, 1841 : 30, ♀.
Styloceras subulifer (Förster) Ratzeburg, 1844*a* : 208, ♂ ♀.
Storthygoceras subulifer (Förster) ; Ratzeburg, 1848 : 208–209, ♂ ♀.
Rhaphidotelus maculatus Walker ; Förster, 1856 : 56.
Raphitelus [*sic*] *maculatus* Walker ; Russo, 1938 : 216–225, ♂ ♀.
Rhaphitelus maculatus Walker ; Ferrière, 1948 : 527–528, ♂ ♀ [*ex parte*].
Rhaphitelus maculatus Walker ; Bouček, 1957*b* : 76, ♂ ♀.
Rhaphitelus maculatus Walker ; Hedqvist, 1963 : 94–96, ♂ ♀.
Rhaphitelus maculatus Walker ; Peck, 1963 : 654–655.

Type material. *Rhaphitelus maculatus* Walker. One female, mounted on a card and unlabelled (though standing under this name). I identify this as the Holotype ; Walker (1873 : 298) stated that he had seen only one specimen of *maculatus* in England. His description applies well to the female and clearly he mistook the sex of the holotype.

Pteromalus hecato Walker. One male, designated LECTOTYPE (but probably holotype), bearing a Waterhouse label.

Pteromalus subulifer Förster. Type ♀ (presumably in Naturhistorisches Museum, Vienna) not seen.

De Santis (1952 : 272) synonymized *Eucerchysius scolytii* Brèthes (1913 : 103–104) with *Rhaphitelus maculatus*. He did not, however, observe any differences between the latter species and *ladenbergi*, so that his synonymy will have to be rechecked.

Widely distributed in EUROPE (probably the whole) ; also said to occur in the U.S.A. and ARGENTINA (but specimens from these countries not examined).

Biology. Recorded in Europe and North America as a parasite of various Scolytidae, especially species of *Scolytus*, *Hylesinus*, and *Phloeotribus* (see Hedqvist, 1963 : 96) ; also in North America, of some Curculionidae (*Magdalis* and *Pissodes* spp.), see Peck, 1963. Probably most of these records are correct, though in some cases the allied species *R. ladenbergi* may have been confused with *maculatus*. Russo (1938) gave a very detailed account of the biology of *maculatus*, which he studied in Italy as a parasite of *Phloeotribus scarabaeoides* (Bern.). Russo considered that *maculatus* could produce 5–7 annual generations ; in northern Europe, however, there are probably fewer. Imagines have been captured in the field from April to October (most records for June–July).

Rhaphitelus ladenbergi (Ratzeburg)

Styloceras Ladenbergii Ratzeburg, 1844*a* : 208, ♂ ♀.
Storthygocerus Ladenbergii Ratzeburg, 1848 : 208, pl. 3, fig. 11.
? Pteromalus distinctus Rudow, 1866 : 268.
Rhaphitelus ladenbergi (Ratzeburg) Bouček, 1957*b* : 76–78, ♂ ♀.

Type material. *Styloceras ladenbergi* Ratzeburg. Types presumed destroyed. The species had often been regarded as identical with *maculatus* Walker until Bouček (1957*b* : 76) pointed out that Ratzeburg's figures of the wing and antenna (1848 : pl. 3, fig. 11) indicated that *ladenbergi* was a distinct species. Bouček

(1957*b* : 78) designated as plesiotypes of *ladenbergi* a female and a male from Czechoslovakia (Točna, south of Prague) ; these are in Národní Museum, Prague (Cat. nos. 3077, 3078).

Pteromalus distinctus Rudow. Location of types (if extant) not known to me. According to Masi (1921 : 238) the species is the same as *ladenbergi* Ratzeburg.

FRANCE, GERMANY, CZECHOSLOVAKIA, ITALY, ? SICILY.

Biology. Parasite of *Scolytus carpini* Ratzeburg, and of *S. intricatus* Ratz. in twigs of *Fagus*, *Crataegus*, and *Sorbus* (see Bouček, 1957*b* : 78). Imagines in May and June.

PANDELUS Förster

Pandelus Förster, 1856 : 65, 70. Type-species : *Cleonymus flavipes* Förster, 1841, by monotypy.
Zapachia Förster, 1878 : 47. Type-species : *Z. spiloptera* Förster, 1878, by monotypy.
Pandelus Förster ; Thomson, 1878 : 32, 35.
Pandelus Förster ; Schmiedeknecht, 1909 : 316, 317.
Pandelus Förster ; Kurdjumov, 1913 : 4.
Pandelus Förster ; Ferrière, 1948 : 528–529.
Zapachia Förster ; Nikol'skaya, 1952 : 211.
Pandelus Förster ; Nikol'skaya, 1952 : 216.
Pandelus Förster ; Peck *et al.*, 1964 : 43.

Zapachia Förster was placed in synonymy with *Pandelus* Förster by Ferrière (1948 : 528) on the authority of Novitzky, who may have seen the respective types.

Pandelus flavipes (Förster)

Cleonymus flavipes Förster, 1841 : 33, ♀.
Pandelus flavipes (Förster) Förster, 1856 : 70, ♀.
Pandelus flavipes (Förster); Thomson, 1878 : 35, ♀.
Zapachia spiloptera Förster, 1878 : 47, ♀.
Pandelus flavipes (Förster) ; Ferrière, 1948 : 528–529, ♂ ♀.

Type material. I have seen neither the types of *Cleonymus flavipes* Förster nor that of *Zapachia spiloptera* Förster. These two species were synonymized by Ferrière (1948 : 528).

GERMANY, SWEDEN, CZECHOSLOVAKIA.

Biology. Bouček (1957*b* : 81) says that in Czechoslovakia it has been found on the trunks of old worm-eaten willows in company with *Ptilinus* sp. (Col., Anobiidae), also with *Lyctus linearis* Goeze (Lyctidae) and *Teretrius picipes* (F.) (Histeridae). Hedqvist (personal communication) has reared it in Sweden from *Ptilinus* sp. Imagines appear in June and July.

NEANICA Erdös

Neanica Erdös, 1953 : 225–226. Type-species : *N. clavalis* Erdös by monotypy and original designation.
Neanica Erdös ; Peck *et al.*, 1964 : 43.

I have not seen the type-species of this genus, which Erdös considered to be near *Metacolus* Förster ; some points in his description (mandibular formula 3.4, clypeus striate) suggest that it does not belong here, but perhaps in the vicinity of *Homoporus*.

Neanica clavalis Erdös

Neanica clavalis Erdös, 1953 : 226–227, ♀.

Type material. Syntypes, Hungary, Tompa, 2 ♀, 7.v.1949, taken from flowers of *Lepidium draba* L., in coll. Erdös, Tompa.

The male of *clavalis* is unknown.

HUNGARY.

Biology. Unknown.

Note. Four of the following genera (*Roptrocerus, Xiphydriophagus, Perniphora,* and *Nikolskayana*) have much in common as regards morphological characters, e.g., the shape of the head, which tends to be swollen ; the mandibles, both of which have 3 teeth, the upper tooth occasionally slightly emarginate ; relatively small eyes and short antennae ; thick legs, especially the femora ; fore wing having a constriction or hyaline break marking the junction of the parastigma with the marginal vein ; pronotum without a margined collar. Although some of the similarities might be due to convergence, these genera give the impression of really being fairly closely related. *Habritys* also shares most of the above characters, but has no hyaline break between the parastigma and marginal vein. *Roptrocerus* also appears to have some slight affinity with certain genera allied to *Cheiropachus* (e.g., to *Rhopalicus*).

ROPTROCERUS Ratzeburg

Pachyceras Ratzeburg, 1844*a* : 217. Type-species : *P. xylophagorum* Ratzeburg (autobasic).
Roptrocerus Ratzeburg, 1848 : 209. Type-species : *P. xylophagorum* Ratzeburg, by designation of Ashmead, 1904 : 388.
Roptrocerus Ratzeburg ; Förster, 1856 : 64, 68–69.
Roptrocerus Ratzeburg ; Ashmead, 1904 : 323.
Roptrocerus Ratzeburg ; Schmiedeknecht, 1909 : 360.
Rhoptrocerus [*sic*] Ratzeburg ; Kurdjumov, 1913 : 3.
Rhoptrocerus Ratzeburg ; Nikol'skaya, 1952 : 214.
Pachycerus Ratzeburg ; Györfi, 1952 : 113–117.
Roptrocerus Ratzeburg ; Hedqvist, 1963 : 61–70.
Roptrocerus Ratzeburg ; Peck *et al.*, 1964 : 42.

Ratzeburg thought that his generic name *Pachyceras* was pre-occupied (by *Pachycerus* Gyllenhal, 1826) and he proposed the name *Roptrocerus* to replace it. *Roptrocerus* is a *nomen conservandum* by the decision of the International Commission on Zoological Nomenclature (1957, *Opin. Decl. int. Commn zool. Nom.* **15** : 35–40) ; *Pachyceras* Ratzeburg is a rejected and invalid name by the same decision.

The European species have been revised by Hedqvist (1963). The earlier paper

by Györfi (1952) employed unreliable characters for identifying the species, some of which were known to the author only through the literature.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Fore wing with postmarginal vein about twice as long as the stigmal vein ; marginal vein 2·3 to 2·7 times as long as the stigmal vein ; wing beyond the speculum densely pilose ; the area between the postmarginal and stigmal veins completely pilose ; speculum, in upper surface of wing, extending below the marginal vein for at most about half the length of the latter.

Antennae with combined length of pedicellus and flagellum approximately equal to breadth of head ; anelli subequal in length, the third anellus at most very slightly longer than either of the others. Ovipositor sheaths in dorsal view with hairs standing out at an angle of 20° to 25°, none of these bristly in appearance. Anterior margin of clypeus slightly produced in the middle . . . . . ***mirus*** (Walker) (p. 425)

– Fore wing with postmarginal vein at most about 1·5 times as long as the stigmal vein, marginal vein 1·75 to 1·9 times as long as the stigmal vein, if the postmarginal vein is as much as 1·5 times as long as the stigmal vein, then the wing beyond the speculum is less densely pilose and the area between the postmarginal and stigmal veins is partly bare ; speculum on upper surface of wing extending nearly or quite to the stigmal vein . . . 2

2 (1) Fore wing with postmarginal vein about 1·5 times as long as the stigmal vein ; marginal vein 1·75 to 1·8 times as long as the stigmal vein. Antennae with combined length of pedicellus and flagellum approximately equal to breadth of head ; pedicellus not or hardly longer than first funicular segment ; third anellus longer than either of the others ; segments of funicle relatively longer, at most four and five slightly transverse. Ovipositor sheaths with short hairs which in dorsal view appear subadpressed, except at the tips of the sheaths, where there are several longer, more outstanding bristly hairs. Anterior margin of clypeus slightly produced in the middle ***xylophagorum*** (Ratzeburg) (p. 425)

– Fore wing with postmarginal vein not or hardly longer than the stigmal vein ; marginal vein 1·8 to 1·9 times as long as the stigmal vein. Antennae with combined length of pedicellus and flagellum somewhat less than breadth of head ; pedicellus distinctly, up to about twice, longer than first funicular segment ; anelli subequal in length ; segments of funicle relatively short, the second at least very slightly, fifth strongly, transverse. Ovipositor sheaths in dorsal view similar to those of *mirus*, but with some stronger bristly hairs at their tips. Anterior margin of clypeus truncate or virtually so . . . . . ***brevicornis*** Thomson (p. 426)

(MALES)

Some differences in the male genitalia of the three species have been illustrated by Hedqvist (1963, fig. 32).

1 Fore wing with postmarginal vein nearly twice as long as the stigmal vein ; speculum, on upper surface of wing, extending below the marginal vein for only about half the length of the latter. Base of gaster more or less yellowish . . . . . ***mirus*** (Walker) (p. 425)

– Fore wing with postmarginal vein at most about 1·6 times as long as the stigmal vein ; speculum, on upper surface of wing, extending below the marginal vein nearly or quite to the stigmal vein. Base of gaster not or only indistinctly yellowish 2

2 (1) Antenna with combined length of pedicellus and flagellum 1·4 to 1·6 times breadth of head ; funicular segments relatively longer, the first 1·6 to 1·8, sixth 1·3 to 1·7 times, as long as broad. Anterior margin of clypeus slightly produced . . . . . ***xylophagorum*** (Ratzeburg) (p. 425)

– Antenna with combined length of pedicellus and flagellum only slightly greater than breadth of head ; funicular segments relatively shorter, subquadrate or only slightly longer than broad. Anterior margin of clypeus virtually truncate . . . . . ***brevicornis*** Thomson (p. 426)

Roptrocerus mirus (Walker)

Amblymerus mirus Walker, 1834 : 351, ♀.
Roptrocerus mirus (Walker) Thomson, 1878 : 84–85, ♀.
Pachyceras janssoni Hedqvist, 1955 : 84–85, ♀.
Roptrocerus mirus (Walker) ; Hedqvist, 1963 : 61, 62–63, ♂ ♀.

Type material. *Amblymerus mirus* Walker. One female, designated LECTOTYPE (possibly holotype), lacking the head, bearing a Waterhouse label " Pteromalus mirus ".

Pachyceras janssoni Hedqvist. Holotype ♀, Sweden, Östergötland, Simonstorp, 1–4.viii.1955, in coll. Hedqvist. Placed in synonymy with *mirus* (Walker) by Hedqvist (1963 : 62).

BRITAIN, SWEDEN.

Biology. Parasite of Coleoptera Scolytidae. Reared in Britain from *Myelophilus* (=*Blastophagus*) *piniperda* (L.) according to Hanson (1940 : 505) ; and in Sweden from *Ips typographus* L. by Hedqvist (1963). The records for *mirus* in the paper by Györfi (1952) need checking as it is not certain whether he identified the species correctly. Imagines appear in August.

Roptrocerus xylophagorum (Ratzeburg)

Pachyceras Xylophagorum Ratzeburg, 1844*a* : 218, ♀.
Pachyceras Eccoptogastri Ratzeburg, 1844*a* : 218, ♀.
Roptrocerus Xylophagorum (Ratzeburg) Ratzeburg, 1848 : 209, pl. 3, fig. 2.
Roptrocerus rectus Provancher, 1887 : 202, ♀.
Platygerrhus ? scolyti Ashmead, 1894*b* : 335, ♀, ? ♂.
Roptrocerus xylophagorum (Ratzeburg) ; Hedqvist, 1963 : 61, 62, 66–70, ♂ ♀.

Type material *Pachyceras xylophagorum* Ratzeburg. Type presumed destroyed.

Pachyceras eccoptogastri Ratzeburg. Types presumed destroyed. The species was placed in synonymy with *xylophagorum* by Hedqvist (1963 : 66).

Roptrocerus rectus Provancher. Lectotype (Canada, Quebec, Cap Rouge) in Museum of the Province of Quebec, designated by Gahan and Rohwer (1918 : 171) ; it is stated to bear a yellow label with the number 1386. The species was placed in

synonymy with *xylophagorum* (Ratzeburg) by Burks (*in* Krombein *et al.*, 1958 : 76) ; Burks stated that Peck had examined Provancher's type.

Platygerrhus ? *scolyti* Ashmead. Type (U.S.A., West Virginia, Morgantown) in U.S. Nat. Mus. (not seen by the writer). Placed in synonymy with *xylophagorum* by Peck (*in* Muesebeck *et al.*, 1951 : 549).

Widely distributed, probably the whole of EUROPE ; U.S.A. ; GUATEMALA ; JAPAN.

Biology. Reared from many species of Scolytidae ; for its biology see Hedqvist (1963 : 70) who says that it is apparently more frequently found on spruce than on pine. Usually 1 generation per annum, 2 in good seasons ; imagines normally in June and late summer.

Note. Pachyceras typographi Györfi (1952 : 114, 116–117, ♀) was reared by Györfi in the middle of April 1947, from *Ips typographus* L. under bark of spruce at Sopron, Hungary. I have not seen the holotype female. Györfi says (ibid. : 171) that it differs from *xylophagorum* Ratzeburg in its larger size (4·5 mm.), darker colour, and the yellowish brown middle part of the ovipositor. These distinctions are of doubtful validity ; *xylophagorum* is quite variable in colour, and I have a female which, including ovipositor sheaths, measures 5·4 mm. in length. Unless other differences not mentioned in the description exist, *typographi* would appear to be a form of *xylophagorum* which, incidentally, has been reared from the same host as that cited for *typographi*.

Roptrocerus brevicornis Thomson

Roptrocerus brevicornis Thomson, 1878 : 85, ♀.
Roptrocerus brevicornis Thomson ; Hedqvist, 1963 : 61, 62, 64–66, ♂ ♀.

Type material. One female, LECTOTYPE, labelled " Dlc Bhn " [Dalecarlia, Boheman] and " brevicornis Ths ".

SWEDEN, FINLAND, U.S.S.R.

Biology. Hosts *Pityogenes quadridens* Htg., *P. bidentatus* Htg. and other Scolytidae (see Hedqvist, 1963: 66, who says that it is apparently associated with *Pinus*).

XIPHYDRIOPHAGUS Ferrière

Xiphydriophagus Ferrière, 1952 : 323. Type-species : *Pteromalus meyerinckii* Ratzeburg, 1848, by original designation.
Xiphydriophagus Ferrière ; Peck *et al.*, 1964 : 42.

Xiphydriophagus meyerinckii (Ratzeburg)

(Text-fig. 288)

Pteromalus Meyerinckii Ratzeburg, 1848 : 198–199, ♀.
Pteromalus meyerinckii Ratzeburg ; Kurdjumov, 1913 : 22.
Pteromalus xiphydriae Fahringer, 1935 : 212.
Xiphydriophagus meyerinckii (Ratzeburg) Ferrière, 1952 : 323–324, ♂ ♀.

Type material. *Pteromalus meyerinckii* Ratzeburg. Types presumed destroyed.

They were seen by Kurdjumov who redescribed the species (1913 : 22) and noted that it probably represented a new genus near *Habritys*. Ferrière (1952 : 322) proposed the genus *Xiphydriophagus* for it.

Pteromalus xiphydriae Fahringer. Types in Hochschule fur Bodenkultur, Vienna ; re-examined by Novitzky, on the basis of which Ferrière (1952 : 322) decided that *xiphydriae* was a synonym of *meyerinckii*.

BRITAIN, GERMANY, MORAVIA.

Biology. Reared from *Xiphydria camelus* (L.) and *X. prolongata* (Geoffr. in Fourcr.) (=*dromedarius* (F.) (Hym., Xiphydriidae).

Xiphydriophagus meyerinckii has the distinction of being the first Chalcidoid whose life history has been filmed (in " The Alder Woodwasp " made in the Department of Forestry, Oxford, by G. H. Thompson and E. R. Skinner). The film shows how the female *meyerinckii* enters an old burrow of the host, the woodwasp *Xiphydria camelus*. When such a burrow is near to a living woodwasp larva, the parasite bites a tunnel through the solid wood towards it, and on entering the woodwasp gallery she paralyzes the larva and lays her eggs upon it. A year later her offspring escape by following the route made by the mother.

HABRITYS Thomson

Dimachus subg. *Habritys* Thomson, 1878 : 50, 54. Type-species : *Pteromalus brevicornis* Ratzeburg, 1844*a*, by monotypy.
Habritus [*sic*] Thomson ; Ashmead, 1904 : 276.
Habritys Thomson ; Schmiedeknecht, 1909 : 285, 288.
Habrytis [*sic*] Thomson ; Nikol'skaya, 1952 : 233.
Habritys Thomson ; Peck *et al.*, 1964 : 45.

Only one European species is known, but another has been described from North America by Wallace (1954 : 199–200).

Habritys brevicornis (Ratzeburg)

(Text-fig. 290)

Pteromalus brevicornis Ratzeburg, 1844*a* : 201.
Pteromalus (*Schizonotus*) *Pannewitzii* Ratzeburg, 1852 : 230, ♀, **syn. n.**
Habritys brevicornis (Ratzeburg) Thomson, 1878 : 55, ♂ ♀.
Schizonotus pannewitzi Ratzeburg, Bouček, 1958*a* : 396.
Habritys brevicornis (Ratzeburg) ; Askew, 1962*a* : 126.

Type material. Types of *Pteromalus brevicornis* Ratzeburg and *P.* (*S.*) *pannewitzii* Ratzeburg presumed destroyed. The name *brevicornis*, however, has been generally accepted. Bouček (1958*a* : 396) said that he believed *pannewitzi* Ratzeburg was probably the same as *brevicornis ;* I had come to the same conclusion, from Ratzeburg's description and the host which he mentioned, " *Crabro cephalotes* " [=*Clytochrysus* sp.].

BRITAIN, IRELAND, SWEDEN, GERMANY ; no doubt widely distributed in Europe.

Biology. Parasitic chiefly on Crabronid wasps (Hym., Sphecoidea). In Britain it has been reared from *Coelocrabro leucostomoides* Rich. by Saunt (1925 : 257–258) ; from *Clytochrysus chrysostomus* (LeP.) by Hallet (1927 : 54) ; and from *Coelocrabro ambiguus* (Dahlb.) in a dead willow, by Callan (1936 : 128). Valkeila (1959 : 181) reared *brevicornis* in Finland from cocoons of *Ectemnius* (=*Clytochrysus*) *cavifrons* (Thomson) ; 16–24 larvae developed in each coccoon. An unusual host was recorded by Askew (1962*a* : 126) who stated that specimens were reared from puparia of the Stratiomyid fly *Pachygaster meromelas* Duf. (=*orbitalis* Wahlb.) found beneath bark of horse-chestnut (*Aesculus hippocastanum* L.) at Moccas, Herefordshire, 20.v.1961 (*P. Skidmore*) ; apparently only a single chalcid emerged from each host puparium. Ruschka (1923 : 201) recorded having obtained some specimens of *brevicornis* in a rearing along with four species of Scolytid and Lymexylonid beetles, but it seems likely that the parasite was not attacking them but some Hymenopteron.

PERNIPHORA Ruschka

Perniphora Ruschka, 1923 : 198. Type-species : *P. robusta* Ruschka, by monotypy.
Perniphora Ruschka ; Nikol'skaya 1952 : 210.
Perniphora Ruschka ; Hedqvist, 1963 : 118–121.
Perniphora Ruschka ; Peck *et al.*, 1964 : 34.

Only one European species of the genus is known ; another species has been described from North America by Miller (1965 : 78–82).

Perniphora robusta Ruschka

(Text-fig. 287)

Perniphora robusta Ruschka, 1923 : 198–201, ♂ ♀.
Perniphora robusta Ruschka ; Thomsen *et al.*, 1949 : 250–253, 324.
Perniphora robusta Ruschka ; Hedqvist, 1963 : 118–121, ♂ ♀.

Type material. Types in Deutsches Entomologisches Museum, Berlin, and cotypes in Forstakademie Eberswalde (coll. Ruschka) according to Ruschka (not seen by the writer).

BRITAIN, SWEDEN, DENMARK, FINLAND, GERMANY, CZECHOSLOVAKIA, HUNGARY, POLAND, U.S.S.R. Not previously recorded from BRITAIN, new records : ENGLAND ; Hampshire, New Forest, 1 ♂, 1.vi.1900 (*D. Sharp*) the specimen in Cambridge University Museum ; 1 ♂, 30.v.1910 (*H. Donisthorpe*), specimen in Hope Dept., Oxford.

Biology. Parasite of *Trypodendron domesticum* L. and other species of that genus ; *Xyleborus* spp., etc. For accounts of the biology of *robusta* see Thomsen *et al.* (1949) and Hedqvist (1963 : 121). Thomsen *et al.* studied it as a parasite of *Xyloterus domesticus* L. on *Fagus* in Denmark. They state that it oviposits in June and July on the host larva. The chalcid larva lives as an ectoparasite, matures in about 2 weeks and hibernates in the larval state.

Imagines June–July.

[*NIKOLSKAYANA* Bouček

Nikolskayana Bouček, 1965*a* : 377. Type-species : *N. mirabilis* Bouček, by original designation.

Nikolskayana mirabilis Bouček

Nikolskayana mirabilis Bouček, 1965*a* : 378–380, ♂ ♀.

CENTRAL ASIA (Turkmenian S.S.R.).

Biology. Parasite of *Carpophoborus perrisi* Chap. (Col., Scolytidae) on *Pistacia* (Bouček, 1965*a* : 380).]

CAENOCREPIS Thomson

Dimachus sgen. *Caenocrepis* Thomson, 1878 : 50, 51. Type-species : *C. arenicola* Thomson, by monotypy.
Xenocrepis Ashmead, 1904 : 276 [*nec* Förster, 1856].
Xenocrepis Schmiedeknecht, 1909 : 284, 285, 286 [*nec* Förster].
Xenocrepis Nikol'skaya, 1952 : 223 [*nec* Förster].
Caenocrepis Thomson ; Bouček, 1958*a* : 398–401.
Caenocrepis Thomson ; Peck *et al.*, 1964 : 44, 45.

The two European species of this genus were revised by Bouček (1958*a*).

KEY TO EUROPEAN SPECIES

[The following key is adapted from that of Bouček, 1958*a* : 400–401.]

1 Fore wing beyond the speculum quite densely pilose ; speculum ending about level with the beginning of the marginal vein ; lower surface of costal cell with more than two irregular rows of hairs in the distal half. Gaster of *female* short-ovate, about as long as head plus thorax ; hind margin of basal tergite only very shallowly emarginate medially . . . . . ***arenicola*** Thomson (p. 429)

– Fore wing beyond the speculum with sparse pilosity ; speculum extending as a bare strip below the marginal vein as far as the stigmal vein ; lower surface of costal cell with one complete row of hairs, and with at most a few additional hairs in the distal part. Gaster of *female* sublanceolate, longer than head plus thorax ; hind margin of basal tergite distinctly incised medially . ***bothynoderi*** Gromakov (p. 430)

Caenocrepis arenicola Thomson

Caenocrepis arenicola Thomson, 1878 : 51, ♀.
Caenocrepis arenicola Thomson ; Bouček, 1958*a* : 400–401, figs. 3, 4, ♂ ♀.

Type material. Syntypes, 7 specimens. LECTOTYPE, a female labelled " O " [Öland], " arenicola Ths ", and bearing a label " TYPE ".

SWEDEN, FRANCE, AUSTRIA, CZECHOSLOVAKIA, HUNGARY, U.S.S.R.

Biology. Unknown.

Caenocrepis bothynoderi Gromakov

Caenocrepis bothynoderi Gromakov, 1940, *Dopov. Akad. Nauk U.R.S.R.*, **5** : 11–13 [not seen].
Caenocrepis bothynoderi Gromakov, 1941 : 122–126.
Caenocrepis bothynoderi Gromakov ; Bouček, 1958*a* : 400–401, ♂ ♀.

Type material. Syntypes (not seen by the writer) examined by Bouček (1958*a* : 400).

U.S.S.R., ANATOLIA.

Biology. Egg-parasite of *Bothynoderes punctiventris* Germ. (Gromakov, 1940, 1941).

GUGOLZIA Delucchi & Steffan

Gugolzia Delucchi & Steffan, 1956 : 30–34. Type species : *G. harmolitae* Del. & Steffan, by monotypy and original designation.

Gugolzia harmolitae Delucchi & Steffan

Gugolzia harmolitae Delucchi & Steffan, 1956 : 31–34, ♀.

Type material (not seen). Holotype and 2 paratypes in Muséum National d'Histoire Naturelle, Paris ; 2 paratypes in coll. Delucchi, France, Alpes-Maritimes, Menton, June, 1953 (*J. R. Steffan*).

FRANCE.

Biology. According to Delucchi and Steffan the species is a solitary ectophagous parasite of *Harmolita* [=*Tetramesa*] *romana* (Walker) (Hym., Eurytomidae) which lives in *Arundo donax* L.

CYRTOPTYX Delucchi

Cyrtoptyx Delucchi, 1956*a* : 240, 252. Type-species : *Dinarmus robustus* Masi, 1907, by original designation.

Delucchi (1956*a* : 254) published a key to the European species of which he recognized three. I have not seen the types of two of these species, hence I cannot add any further information. They occur in the Mediterranean area, but probably not in north-western Europe.

Cyrtoptyx dacicida (Masi)

Trichomalus spiracularis Del Guercio, 1900 : 65 [*nec* Thomson, 1878].
Psilocera concolor Paoli, 1907 : 38, fig. 22 [nec *Metopon concolor* Thomson, 1878].
Dinarmus dacicida Masi, *in* Silvestri *et al.*, 1908 : 20–29, ♂ ♀.
? Dinarmus dacicida ssp. *virescens* Masi, *in* Silvestri *et al.*, 1908 : 191–192, ♂ ♀.
? Dinarmus lesbiacus Masi, 1921*a* : 271, 276, ♂.
? Dinarmus virescens Masi, 1921*a* : 271, 276–277, ♂ ♀.
Dinarmus dacicida Masi, 1921*a* : 277–278.
Cyrtoptyx dacicida (Masi) Delucchi, 1956*a* : 254, 255.

Type material (not seen) in Istituto di Entomologia agraria, Portici.

Dinarmus dacicida Masi. Syntypes, Italy, several localities in Puglia, Calabria, Umbria, and Tuscany.

D. lesbiacus Masi. Holotype ♂, Italy, Isle of Metelino, x.1906. Delucchi (1956*a* : 254–255) suggests that it is probably the same as *dacicida*.

D. virescens Masi. Syntypes, ♂ and ♀♀, Syria, Beirut, 1907. Delucchi (1956*a* : 254–255) believes it may be the same as *dacicida*.

MEDITERRANEAN REGION.

Biology. Parasite of *Dacus oleae* Gmel. (Dipt., Trypetidae) ; *dacicida*, *lesbiacus*, and *virescens* were all originally reared from this host.

Cyrtoptyx robustus (Masi)

Dinarmus robustus Masi, 1907 : 288, ♂ ♀.
Dinarmus robustus Masi, 1921*a* : 271, 275.
? Dinarmus cynipidis Masi, 1921*a* : 271, 275–276, ♀.
Cyrtoptyx robustus (Masi) Delucchi, 1956*a* : 254.

Type material (not seen) in Istituto di Entomologia agraria, Portici.

Dinarmus robustus Masi. Syntypes, Italy, Umbria, Bevagna, several specimens reared from galls of *Cynips coriaria* Htg.

D. cynipidis Masi. Syntypes, Italy, S. Vito de' Normanni, one female from gall of *Cynips tomentosa* Trotter ; Corigliano Calabro, one female from gall of *Cynips argentea* Hartig. These specimens have not been examined either by Dr. Delucchi or the writer; Delucchi (1956*a* : 254–255) suggested that they were probably the same as *robustus* Masi.

MEDITERRANEAN REGION.

Biology. Parasitic on Cynipidae, see above under type material ; also records of rearing from *Cynips* [*Andricus*] *kollari* (Htg.) and *C. polycera* Giraud mentioned by Delucchi (1956*a* : 255) which refer to material apparently identical with *robustus*.

Cyrtoptyx lichtensteini (Masi)

Dinarmus lichtensteini Masi, 1921*a* : 271, 275.
Cyrtoptyx lichtensteini (Masi) Delucchi, 1956*a* : 254–255.
Cyrtoptyx lichtensteini (Masi) ; Delucchi, 1962 : 123.

Type material (not seen). Syntypes, Southern France, reared from *Mononychus punctumalbum* Herbst (*J. Lichtenstein*) ; one at least of these specimens is in Muséum Nationale d'Histoire Naturelle, Paris (see Delucchi, 1956*a* : 255).

FRANCE, NORTH AFRICA.

Biology. Parasite of *Mononychus punctumalbum* Herbst in France (see above) ; also recorded from North Africa as a parasite of *Lixus* sp. on *Halogeton*, by Delucchi (1962).

OXYSYCHUS Delucchi

Oxysychus Delucchi, 1956*a* : 240, 246. Type-species : *Dinarmus silvestrii* Masi, 1921, by original designation.
Oxysychus Delucchi ; Peck *et al.*, 1964 : 46–47.

Delucchi (1956*a* : 247–248) published a key to the European species, of which he recognized four. Of these, I have seen the types only of *pilosulus* (Thomson) and have nothing to add to Delucchi's information.

Oxysychus silvestrii (Masi)

Dinarmus silvestrii Masi, 1921*a* : 271, 272–273, ♀.
Oxysychus silvestrii (Masi) Delucchi, 1956*a* : 248–249, ♀.

Type material. Holotype ♀, Italy, Isle of Giglio, July 1901 (*G. Doria*), in Museo Civico di Storia Naturale, Genoa.

ITALY.
Biology. Unknown.

[*Oxysychus regnieri* (Masi)

Dinarmus regnieri Masi, 1934*a* : 98, ♀.
Oxysychus regnieri (Masi) Delucchi, 1956*a* : 248, 249–250, ♀.

Type material. Holotype ♀, Moroccan Sahara, Oasis of Tarzougeurt, in Museo Civico di Storia Naturale, Genoa.

MOROCCAN SAHARA and TANGIER.
Biology. Reared, according to Masi (1934*a* : 98) together with *Hesperophanes fasciculatus* Fln. (Col., Cerambycidae) and *Hypoborus ficus* Erik. (Col., Ipidae) on fig].

Oxysychus pilosulus (Thomson)

Dimachus (*Dinarmus*) *pilosulus* Thomson, 1878 : 57, ♀.
Dinarmus pilosulus Thomson ; Masi, 1921*a* : 270.
Oxysychus pilosulus (Thomson) Delucchi, 1956*a* : 247, 251, ♀.

Type material. Syntypes, 3 ♀. LECTOTYPE, a specimen labelled " KK Bhn " [Kinnekulle, Boheman] and " pilosulus Ths ".

SWEDEN.
Biology. Unknown.

Oxysychus planiscuta Delucchi

Oxysychus planiscuta Delucchi, 1956*a* : 247–248, 251–252, ♀.

Type material. Holotype ♀, France, Var, Gorges d'Ollioules, 23.viii.1947 (*J. Barbier*), in coll. C. Granger, Paris.

FRANCE.
Biology. Unknown.

ISCHYROPTYX Delucchi

Ischyroptyx Delucchi, 1956*a* : 240, 256. Type-species : *Dinarmus ligusticus* Masi, 1921, by original designation.

Only one species described.

Ischyroptyx ligusticus (Masi)

Dinarmus ligusticus Masi, 1921*a* : 271, 274–275, ♀.
Ischyroptyx ligusticus (Masi) Delucchi, 1956*a* : 256, ♂ ♀.

Type material. Syntypes, 3 ♀, Italy: Stazzano Scrivia, ix.1883 (*P. M. Ferrari*) ; Genoa, vii.1890 (*Solari*) ; Genoa, viii,1895 (*Mantero*) in Museo Civico di Storia Naturale, Genoa (not seen).

ITALY.
Biology. Unknown.

ANISOPTEROMALUS Ruschka

Anisopteromalus Ruschka, 1912 : 243. Type-species : *A. mollis* Ruschka, by monotypy.
Aplastomorpha Crawford, 1913 : 252. Type-species : *A. pratti* Crawford, by monotypy.
Anisopteromalus Ruschka ; Peck *in* Muesebeck *et al.*, 1951 : 563–564.
Aplastomorpha Crawford ; Nikol'skaya, 1952 : 225.
Anisopteromalus Ruschka ; Nikol'skaya, 1952 : 225.
Anisopteromalus Ruschka ; Peck *et al.*, 1964 : 46.

Aplastomorpha was synonymized with *Anisopteromalus* by Peck (*in* Muesebeck *et al.*, 1951).

Anisopteromalus calandrae (Howard)

Pteromalus calandrae Howard, *in* Comstock, 1881 : 273, ♂.
Meraporus Vandinei Tucker, 1910 : 342–344, ♂ ♀.
Anisopteromalus mollis Ruschka, 1912 : 243–245, ♂ ♀.
Aplastomorpha pratti Crawford, 1913 : 252–253, ♂ ♀.
Aplastomorpha vandinei (Tucker) Waterston, 1921 : 8, 11–12, ♂ ♀.
Aplastomorpha calandrae (Howard) Gahan, 1923*a* : 188.
? Neocatolaccus indicus Ayyar & Mani, 1937 : 126–127, ♀.
Neocatolaccus mamezophagus Ishii & Nagasawa, 1942 : 67–68, ♂ ♀.
Anisopteromalus calandrae (Howard) ; Peck *in* Muesebeck *et al.*, 1951 : 564.
Anisopteromalus calandrae (Howard) ; Peck, 1963 : 733–735.

Type material (not seen).
Pteromalus calandrae Howard. Type, U.S.A., Texas, Waller Co., Hempstead, formerly in U.S.N.M. (destroyed, according to Gahan, 1923*a* : 187–188). That author considered *calandrae* to have been the same as *vandinei* (Tucker).

Meraporus vandinei Tucker. Types, Texas, Plano, in U.S.N.M.

Anisopteromalus mollis Ruschka. Syntypes, Austria, Vienna, 7 ♀ and 5 ♂ from larvae of *Laemophloeus ferrugineus* Creutz, presumably in Naturhistorisches Museum, Vienna.

Aplastomorpha pratti Crawford. Type ♀, Texas, Dallas, in U.S.N.M.

Meraporus vandinei and *Aplastomorpha pratti* were placed in synonymy with *Aplastomorpha* [=*Anisopteromalus*] *calandrae* by Gahan (1923*a*).

Neocatolaccus indicus Ayyar & Mani. Holotype ♀, India, Coimbatore, 1932 (*Ramakrishna* and *Margabandhu*), on 3 slides in collection of Zoological Survey, Indian Museum, Calcutta, no.1572/H.3 (not seen by the writer). Ferrière (1939 : 165–166) remarked that the species was probably the same as *Aplastomorpha calandrae*.

Neocatolaccus mamezophagus Ishii & Nagasawa. Location of type not known to the writer. The species was synonymized with *A. calandrae* by Tachikawa (1966 : 99).

Only the chief references are quoted here ; many others are listed by Peck (1963).

COSMOPOLITAN.

Biology. *A. calandrae* is a well-known parasite of Coleoptera and Lepidoptera which attack stored products. A list is given by Peck (1963) of the recorded hosts up to that date. In addition it was recorded [as *mollis* Ruschka] as a parasite of *Ectomyelois ceratoniae* Zell. (Lep., Phycitidae) in Israel (Secrétariat, etc. 1966 : 119, 127).

DINARMUS Thomson

Dimachus sgen. *Dinarmus* Thomson, 1878 : 50, 56. Type-species : *D. acutus* Thomson, by designation of Ashmead, 1904 : 276.
Dinarmus Thomson ; Ashmead, 1904 : 276.
Bruchobius Ashmead, 1904 : 314. Type-species : *B. laticeps* Ashmead, by monotypy and original designation.
Dinarmus Thomson ; Schmiedeknecht, 1909 : 285, 288–289 [*ex parte*].
Bruchobius Ashmead ; Schmiedeknecht, 1909 : 310, 311, 314.
Bruchobius Ashmead ; Kurdjumov, 1913 : 6.
Sphaerakis Masi, 1924*a* : 214. Type-species : *S. mayri* Masi, by monotypy.
Dinarmus Thomson ; Nikol'skaya, 1952 : 233 [*ex parte*].
Bruchobius Ashmead ; Nikol'skaya, 1952 : 233.
Dinarmus Thomson ; Delucchi, 1956*a* : 238, 240.
Dinarmus Thomson ; Peck *et al.*, 1964 : 46.

The genus, in its restricted sense, was revised by Delucchi (1956*a*) who recognized 2 European species (not counting *D. laticeps* Ashmead, which is sometimes introduced).

Dinarmus acutus Thomson

(Text-figs. 317, 318)

Pteromalus robustus Walker, 1847 : 230, ♂, **syn. n.** [nec Walker, 1835].
Dinarmus acutus Thomson, 1878 : 56, ♀.

Pteromalus kollari Dalla Torre, 1898 : 131 [n. n. for *Pteromalus robustus* Walker, 1847, *nec* 1835].
Sphaerakis mayri Masi, 1924*a* : 215, ♂ ♀.
Dinarmus acutus Thomson ; Delucchi, 1956*a* : 243–245, ♂ ♀.

Type material. *Pteromalus robustus* Walker, 1847. One male in Hope-Westwood coll., Oxford, now designated LECTOTYPE ; it is card-pointed and labelled " Pteromalus robustus Kll ". It is a very large specimen (2·5 mm.) but I think the same as *acutus* Thomson.

Dinarmus acutus Thomson. Type (probably holotype) ♀ labelled " Sm. Bhn " [Småland, Boheman] and " acutus Ths ".

Sphaerakis mayri Masi. Syntypes, from various localities in Italy, Sardinia, and Austria, in Museo Civico di Storia Naturale, Genoa (not seen by the writer).

Widely distributed in EUROPE ; NORTH AFRICA.

Biology. Recorded as a parasite of *Bruchus lentis* Fröl. in Italy (Secrétariat, etc., 1961 : 215, 221), and of *Bruchidius gilvus* Gyll. and *B. lividimanus* Gyll. in Algeria and Italy (Secrétariat, etc., 1963 : 342, 355).

Dinarmus bifoveolatus Delucchi

Dinarmus bifoveolatus Delucchi, 1956*a* : 243, 246, ♂.

Type material : type (? holotype), France : Seine et Marne, Chartrettes, 10.viii.1947 (*Granger*), in coll. Granger, Paris (not seen). I have seen no other specimens which agree with the description.

FRANCE.

Biology. Unknown.

OEDAULE Waterston

Oedaule Waterston, 1922 : 81. Type-species : *O. stringifrons* Waterston, by monotypy and original designation.
Oedaule Waterston ; Masi, 1922*c* : 161.
Oedaule Waterston ; Masi, 1924 : 152.
Oedaule Waterston ; Nikol'skaya, 1952 : 233.
Oedaule Waterston ; Delucchi, 1956*a* : 238.
Oedaule Waterston ; Peck *et al.*, 1964 : 45.

The European species of *Oedaule* are badly in need of revision. Four were described from Italy by Masi, but no key to these species exists. In order to prepare a sound revision it will be necessary to re-examine the types of Masi's species, which are all preserved in Museo Civico di Storia Naturale, Genoa ; I have not seen these.

Oedaule italica Masi

Oedaule italica Masi, 1922*c* : 162, ♂ ♀.
Oedaule italica Masi, 1924 : 154.

Type material. Syntypes, Italy, Isle of Giglio, 13 ♀ and 1 ♂, captured in 1901 and 1902.

ITALY, ALGERIA.

Biology. Reared in Algeria from *Bruchidius albosparsus* Fähr., the material determined by Dr. Delucchi (Secrétariat, etc., 1966 : 120, 125).

Oedaule parvula Masi

Oedaule parvula Masi, 1922*c* : 167, ♂.

Type material. Syntypes, Italy, Isle of Giglio, 2 ♂, captured in March, 1901.

ITALY.

Biology. Unknown.

Oedaule major Masi

Oedaule major Masi, 1924 : 154, ♂ ♀.

Type material. Syntypes, Italy, Liguria, Varazze, viii.1920, 2 ♂, 1 ♀.

ITALY.

Biology. Unknown.

Oedaule latialis Masi

Oedaule latialis Masi, 1924 : 156, ♂ ♀.

Type material. Syntypes, Italy, environs of Rome, vii.1918 ; Monte Cimino (Lazio), 29.vii. and 1.viii.1907 (*G. Lepri*), 2 ♂, 3 ♀.

ITALY.

Biology. Unknown.

DINARMOIDES Masi

Dinarmoides Masi, 1924*a* : 232. Type-species : *D. spilopterus* Masi, by monotypy.
Gothbergia Heqvist, 1957 : 23. Type-species : *G. elymi* Heqvist, by monotypy and original designation.
Dinarmoides Masi ; Bouček, 1958*a* : 400, 402.
Dinarmoides Masi ; Peck *et al.*, 1964 : 45.

Delucchi (1958*a* : 57) noted the close affinity of *Dinarmoides* and *Gothbergia*, though without synonymizing them. *Gothbergia* was placed in synonymy with *Dinarmoides* by Bouček (1958*a* : 400, 402). The male of the single known species, *D. spilopterus* Masi, is easily recognized on account of its greatly swollen hind femora, in combination with the fuscous wing-markings. The hind femora of the female, however, are not unusually swollen.

Dinarmoides spilopterus Masi

Dinarmoides spilopterus Masi, 1924*a* : 20–23, ♀.
Gothbergia elymi Heqvist, 1957 : 23–24, 26, ♂.
Dinarmoides spilopterus Masi ; Bouček, 1958*a* : 400, 402, ♂ ♀.

Type material. *Dinarmoides spilopterus* Masi. Syntypes, 4 ♀, Italy, Isle of Giglio, June 1903, in Museo Civico di Storia Naturale, Genoa (not seen by the writer). I have examined females from Central Europe which agree with Masi's description of *spilopterus*.

Gothbergia elymi Heqvist. Holotype ♂, Sweden, Gotska Sandön, 17.viii.1955 and paratype ♂ in coll. Hedqvist (Stockholm) ; I have seen these specimens. The species was synonymized with *Dinarmoides spilopterus* by Bouček (1958*a* : 400, 402).

SWEDEN (Island of Gotska Sandön), CZECHOSLOVAKIA, ITALY (Isle of Giglio) ; in sandy or xerothermic habitats.

Biology. Unknown. Imagines June–August.

STENOSELMA Delucchi

Stenoselma Delucchi, 1956*b* : 65. Type-species : *S. nigrum* Delucchi, by monotypy and original designation.

Only the type-species is so far known.

Stenoselma nigrum Delucchi

(Text-fig. 321)

Stenoselma nigrum Delucchi, 1956*b* : 66, 67, figs. 1–5, ♂ ♀.

Type material. Syntypes, 2 ♀ (one the type), Italy, Tuscany, 4.ix.1951, in coll. Delucchi. I have not seen the type but have females from Czechoslovakia which agree perfectly with Delucchi's description.

CZECHOSLOVAKIA, ITALY, NORTH AFRICA (probably widely distributed in the Mediterranean and Central European regions).

Biology. Unknown. Imagines July–Sept.

NORBANUS Walker

Norbanus Walker, 1843*e* : 159. Type-species : *N. dysaules* Walker, by designation of Ashmead, 1904 : 320.
Arthrolysis Förster, 1856 : 52. Type-species : *Pteromalus scabriculus* Nees, 1834, by designation of Ashmead, 1904 : 276, 367.
Picroscytus Thomson, 1878 : 50, 58. Type-species : *Pteromalus scabriculus* Nees, by monotypy.
Stylophorella Ashmead, 1904 : 275, 389. Type-species : *S. perplexa* Ashmead, by monotypy.
Arthrolysis Förster ; Schmiedeknecht, 1909 : 284, 285, 287–288 [*ex parte*].
Norbanus Walker ; Schmiedeknecht, 1909 : 328, 356.
Picroscytus Thomson ; Szelényi, 1941 : 116–131.
Picroscytus Thomson ; Nikol'skaya, 1952 : 231.
Norbanus Walker ; Peck *in* Muesebeck *et al.*, 1951 : 565.
Norbanus Walker ; Peck, 1963 : 740–741.
Norbanus Walker ; Peck *et al.*, 1964 : 46.

Arthrolysis Förster, *Picroscytus* Thomson, and *Stylophorella* Ashmead, were

placed in synonymy with *Norbanus* Walker by Peck (*in* Muesebeck *et al.*, 1951). I have examined the syntypes of the type-species of *Norbanus* (*dysaules* Walker) in BM(NH) ; the species was described from material taken at St. John's Bluff, Florida. I have not seen the type-species of *Stylophorella* Ashmead but I accept the synonymy proposed by Peck (1951).

The European species of *Norbanus* need revision. I feel uncertain as to how many are valid ; Szelényi (1941) recognized three belonging to the group of *scabriculus* (Nees), but the differences between them are very small, whilst some of those he mentioned do not seem to work out consistently. At present I am prevented by lack of material from attempting a revision of the species. In my key I have noted some differences between *scabriculus* (Nees) and *meridionalis* (Masi) which may be valid. The other species, *globulariae* (Szelényi), *giordanii* (Ferrière) and *albicans* (Masi) I have not seen.

KEY TO TWO EUROPEAN SPECIES

(FEMALES)

1 Antennal flagellum fuscous to black with at most the apex of the clava pale. Head, and thorax dorsally, relatively duller, with rather denser sculpture. Head 1·2 to 1·25 times as broad as the mesoscutum. Legs with femora and tibiae fuscous, only the knees and the tips of the tibiae narrowly pale. Stigmal vein of fore wing distinctly curved . . . . . ***scabriculus*** (Nees) (p. 438)

– Antennal flagellum brown, or testaceous with the incisures between its segments blackish. Head, and thorax dorsally, more shiny, with rather less dense sculpture. Head 1·3 to 1·33 times as broad as the mesoscutum. Legs relatively paler, especially the tibiae which are more broadly pale apically, sometimes fully the distal third of the hind tibiae is pale. Stigmal vein hardly curved ***meridionalis*** (Masi) (p. 439)

I am unable to provide a key to males.

Norbanus scabriculus (Nees)

(Text-fig. 301)

Pteromalus scabriculus Nees, 1834 : 100, ♂ ♀.
Dimachus (*Picroscytus*) *scabriculus* (Nees) Thomson, 1878 : 58–59, ♂ ♀.
Picroscytus scabriculus (Nees) ; Masi, 1922*c* : 148.
Picroscytus scabriculus (Nees) ; Szelényi, 1941 : 124.
Norbanus scabriculus (Nees) Peck, 1963 : 740–741.

Type material. Types presumed lost (none amongst the remnants of Nees' collection in Oxford). It will probably be necessary to erect a neotype when the species of the genus are revised. This could be selected from the material in the collection of Thomson, who first revised *scabriculus* ; but preferably perhaps from that in the collection of Ruschka, which seems to agree better with the original description. Ruschka's specimens were also re-examined by Masi (1922*c*) who noted some differences between them and his new species *meridionalis*.

Nees (1834) stated that the wings of female *scabriculus* were " obscure hyalinae "

Thomson, however (1878 : 59) mentioned that the fore wings of his specimens had a discal cloud (" umbra longitudinali subfumata sub radio et stigmate "). Masi (1922*c*) said that Ruschka's specimens of *scabriculus* had a brownish yellow discal cloud. Szelényi (1941) distinguished *scabriculus* (Nees) from *meridionalis* (Masi) and his own species *globulariae* by the presence of a distinct cloud on the wing of *scabriculus* and its absence in the other species. I have seen specimens which agree with the redescriptions of *scabriculus* given by Thomson and Masi except that they have the fore wings immaculate. Probably, therefore, this character is variable and not diagnostic. Masi (1922*c*) stated that females of his *meridionalis* differed from those identified as *scabriculus* by Ruschka in having the head a little broader relative to the breadth of the thorax, as well as in some other details of colour and structure. Possibly the distinguishing characters given by Masi (with the exception of the presence or absence of a cloud on the fore wing) have specific value ; at all events, they seem to be borne out fairly well in the material I have seen.

SWEDEN, GERMANY ; recorded also from U.S.S.R. and ITALY, but this material has not been examined ; released in Canada but not established, according to Peck (1963).

Biology. The species was recorded as a parasite of *Cephus pygmaeus* L. and *Trachelus tabidus* F. (Hym., Tenthredinoidea) on cereals in U.S.S.R., by Borodin (1915, *Chozîajstvo Kiev*, nos. 33–36, *passim*) ; and as a parasite of *Lixus junci* Boh. (Col., Curculionidae) on sugar-beet in Italy, by Menozzi (1936). The material upon which these records were based is not traceable, and confirmation is desirable.

Norbanus meridionalis (Masi) **comb. n.**

Arthrolysis scabricula Masi, 1919 : 162–163 [nec *Pteromalus scabriculus* Nees, 1834].
Picroscytus meridionalis Masi, 1922*c* : 147–150, ♂ ♀.
Picroscytus meridionalis Masi ; Szelényi, 1941 : 124.

Type material. Syntypes, Italy, Liguria, 1 ♀ ; Isle of Giglio, 36 ♀ captured June–August 1901 and 6 ♂ captured in May 1901 and July 1902, in Museo Civico di Storia Naturale, Genoa (not seen).

Masi originally recorded his material as *scabricula*, but in 1922 decided that it represented a distinct species after comparing it with specimens determined by Ruschka as *Picroscytus scabriculus*. For a discussion of the differences between *scabricula* and *meridionalis* see Masi (1922*c*).

CZECHOSLOVAKIA, HUNGARY, ITALY.

Biology. Unknown.

Norbanus globulariae (Szelényi) **comb. n.**

Picroscytus globulariae Szelényi, 1941 : 124–125, 126–130, ♂ ♀.

Type material. Holotype ♀, Hungary, Budapest, Hármashatárhegy, in Hunga-

rian National Museum, Budapest ; paratypes in the Hungarian National Institute for Plant Hygiene (Zoological Dept.).

Szelényi (1941 : 126–130) has given a very detailed description of *globulariae*. In his key to species (ibid : 124–125) he distinguishes *globulariae* from *meridionalis* Masi by the following characters : in *globulariae* the postmarginal vein is a little shorter relative to the marginal vein (ratio of *m* to *pm* 1·62 : 1·91 instead of 1·63 : 2·01) and the stigmal vein is slightly longer relative to the marginal (ratio of *m* to *s* 1·91 : 1 instead of 2·01 : 1) ; the antennae are uniformly black, instead of brown with darker rings ; the tibiae are blackish brown and only the extreme tips of the mid and hind tibiae are obscurely brownish, in *meridionalis* the tibiae are brownish, becoming gradually paler distad, the hind tibiae having their distal third yellowish white ; the fore wings are hyaline, in *meridionalis* slightly yellowish ; and the length of the body is less (female 2·8–3 mm., male 2·5–2·9 mm. ; in *meridionalis* 4–5 mm. and 2·5–3 mm. respectively). These differences, although small, probably do indicate that *globulariae* is a valid species.

HUNGARY.

Biology. Reared from flower-heads of *Globularia willkommii* Nym., in which the Lepidopteron *Stagmatophora albiapicella* H.-S. lives ; there are apparently two generations, which emerge in spring and summer. Szelényi (1941 : 126–127) gives further details of the biology of *globulariae*, including a description of the larva.

Norbanus giordanii (Ferrière) **comb. n.**

Picroscitus Giordanii Ferrière, *1952a* : 166–167, ♂ ♀.

Type material. Syntypes, Italy, Barena near Chioggia, 1.vii.1944 ; Ile Campana, 4.viii.1946 ; Marghera, 19.iv.1947 in halophile zone, 20.vi.1947 in *Salicornietum* ; Moranzani, 12.v.1947 in *Salicornietum* ; S. Giuliano, 7.vii.1947 in *Scirpetum*, in Museo Civico di Storia Naturale, Venice, and in coll. G. Soika.

ITALY.

Biology. Unknown.

Norbanus albicrus (Masi) **comb. n.**

Picroscytus albicrus Masi, *1934b* : 17–18, ♀.
Picroscytus albicrus Masi ; Szelényi, 1941 : 125.

Type material. Holotype ♀, Cyprus, Limassol, August (*G. A. Mavromoustakis*), in Museo Civico di Storia Naturale, Genoa (not seen).

The female of this species should be recognizable by its entirely white hind tibiae.

CYPRUS.

Biology. Unknown.

PICROSCYTOIDES Masi

Picroscytoides Masi, 1922*c* : 151–158. Type-species : *P. cerasiops* (Ruschka MS.) Masi, by original designation.
Picroscytoides Masi ; Nikol'skaya, 1952 : 232.
Picroscytoides Masi ; Peck *et al.*, 1964 : 47.

Two species of this genus from southern Europe (*obscurus* and *cerasiops*) were described by Masi (1922*c*). I have seen some other species from central Europe and the Mediterranean region, but I do not think it advisable to describe them at present, although I have mentioned their chief diagnostic characters in my key (see below). Probably others will be discovered in the regions mentioned, but hitherto no representative has been found in north-west Europe.

Key to European Species

(Females)

1 Head in dorsal view only 1·9 to 1·95 times as broad as long. Antennal flagellum fuscous proximally but becoming gradually paler, the distal part of the funicle and the clava being yellowish testaceous.
Antenna with combined length of pedicellus and flagellum equal to breadth of head ; flagellum slender, proximally not stouter than the pedicellus in dorsal view ; third segment of clava forming a sublinear stylus. Fore wing with an incipient speculum, forming a narrow bare strip outside the basal vein and below the marginal vein. Head and thorax black with weak bluish and bronze reflections ; gaster violet-tinged . ***obscurus*** Masi (p. 442)

– Head in dorsal view 2·15 to 2·25 times as broad as long. Antennal flagellum black with at most the anelli and the clava pale. The other characters not all present in combination 2

2 (1) Body black with weak bluish and bronze reflections ; eyes brown or reddish brown. Antennae with combined length of pedicellus and flagellum equal to or slightly greater than breadth of head ; flagellum slender ; third segment of clava forming a sublinear stylus. Edge of gena, for a short distance above the base of the mandible, with a sharp lamina. Species not more than 5·5 mm. in length. Gaster black or bronze-black sp. indet. A (p. 442)

– At least the thorax bright green, blue, or violet ; eyes bright red. Antennae with combined length of pedicellus and flagellum distinctly less than breadth of head ; flagellum rather less slender ; clava tapering to an acute point but having its third segment triangular, not styliform. Edge of gena, near mandible, fairly sharp but without a lamina. Species up to 7 mm. in length. Gaster sometimes partly red 3

3 (2) Gaster not red-marked, or at most very obscurely reddish about the attachment of the petiole, 2·2 to 2·5 times as long as broad. POL approximately equal to OOL. Marginal vein of fore wing 1·8 to 2 times as long as the stigmal vein. Tibiae infuscate medially . . ***cerasiops*** Masi (p. 442)

– Gaster broadly red at base, sometimes the proximal half or more red . . 4

4 (3) Gaster about twice as long as broad. Marginal vein about 1·7 times as long as the stigmal vein. POL slightly less than OOL. Tibiae infuscate medially sp. indet. B (p. 442)

– Gaster about 2·5 times as long as broad. Marginal vein 2·2 times as long as the stigmal vein. POL hardly less than OOL. Tibiae pale sp. indet. C (p. 442)

I am unable to provide a key to males.

Picroscytoides obscurus Masi

Picroscytoides obscurus Masi, 1922*c* : 151–154, ♂ ♀.
Picroscytoides obscurus Masi ; Nikol'skaya, 1952 : 232.

Type material. Syntypes, Italy, Isle of Giglio, 4 ♀ captured in June and July, 3 ♂ in July, 1901 and 1902, presumably in Museo Civico di Storia Naturale, Genoa.

ITALY, TURKEY.

Biology. Nikol'skaya (1952) says that the species parasitizes the " cereal sawfly ", but I cannot trace the record on which this statement is based.

Picroscytoides sp. indet. A.

CYPRUS : Limassol, 2 ♀, 12.v.1934 and 1.vi.1934 (*Mavromoustakis*).

Picroscytoides cerasiops Masi

(Text-fig. 320)

Picroscytoides cerasiops (Ruschka MS.) Masi, 1922*c* : 154–158, ♂ ♀.
Picroscytoides cerasiops Masi ; Menozzi, 1930 : 58.

Type material. Syntypes, Italy, Isle of Giglio, 2 ♀ and 6 ♂, captured in July 1901 and 1902, presumably in Museo Civico di Storia Naturale, Genoa ; specimens taken in southern France (Prof. *J. Lichtenstein*), location unknown ; one specimen from Dalmatia, coll. Ruschka, Vienna.

FRANCE, ITALY, DALMATIA, ?CYPRUS.

I have not seen the types of this species, but have included it in my key on the basis of females from Cyprus which I believe to be correctly determined.

Biology. Menozzi (1930) recorded this species from the mainland of Italy as a parasite of *Lixus junci* Boh. ; he remarked that it appeared to be an endophagous parasite of the beetle larvae, though he admitted the possibility that it might be acting as a hyperparasite through *Bracon intercessor* Nees or *Eurytoma* sp., both of which were present as primary parasites of the *Lixus*. The species was also mentioned by the same author in other papers which the writer has not seen (1930*a*, 1934, 1936).

Picroscytoides sp. indet. B.

CYPRUS : Limassol, 16.vi.1934, 1 ♀ (*Mavroumoustakis*), specimen in BM(NH).

Picroscytoides sp. indet. C.

ISRAEL : Tiberias, 16.v.1945, 1 ♀ (Dr. *Bytinski-Salz*).

MERISUS Walker

Merisus Walker, 1835 : 166. Type-species : *M. splendidus* Walker, by monotypy.
Merisus Walker ; Förster, 1856 : 53, 58.
Merisus Walker ; Thomson, 1878 : 60, 62.
Merisus Walker ; Ashmead, 1904 : 324.
Merisus Walker ; Schmiedeknecht, 1909 : 362, 364 [*ex parte*].
Merisus Förster [*sic*] ; Kurdjumov, 1913 : 3.
Merisus Walker ; Delucchi, 1956*a* : 229–233.
Merisus Walker ; Peck *et al.*, 1964 : 47.
Merisus Walker ; Bouček, 1965*e* : 22–23.

Key to European Species

(Females)

1 Malar space one quarter length of an eye or hardly more. Antennae with combined length of pedicellus and flagellum distinctly less than breadth of head ; funicular segments relatively short, the first subquadrate, fourth to sixth slightly transverse ; clava slightly longer than funicular segments five plus six, acuminate apically, its sutures indistinct. Ocelli large, the hind ones distinctly less than twice their own major diameter from the eyes . . . . . ***splendidus*** Walker (p. 443)

– Malar space about one third length of an eye. Antennae with combined length of pedicellus and flagellum hardly less than breadth of head ; funicular segments relatively longer, the first slightly longer than broad, sixth quadrate ; clava about as long as funicular segments five plus six, blunter apically, its sutures more distinct. Ocelli smaller, the hind ones more than twice their own major diameter from the eyes . . . . . ***flagellatus*** Bouček (p. 444)

(Males)

1 Antennae with combined length of pedicellus and flagellum about 1·3 times breadth of head ; scape much longer than first funicular segment, the latter slightly less than twice as long as broad ; remaining funicular segments less than twice as long as broad, the sixth quadrate or only slightly longer than broad ***splendidus*** Walker (p. 443)

– Antennae with combined length of pedicellus and flagellum about twice breadth of head ; scape about as long as first funicular segment ; the latter nearly 2·5 times as long as broad ; remaining funicular segments about twice as long as broad ***flagellatus*** Bouček (p. 444)

Merisus splendidus Walker

(Text-fig. 300)

Merisus splendidus Walker, 1835 : 167, ♀.
Merisus splendidus Walker ; Haliday, 1841–1842 : v, pl. A, fig. 1, ♀.
Merisus acutangulus Thomson, 1878 : 64, ♀.
Merisus splendidus Walker ; Delucchi, 1956*a* : 231–233, ♂ ♀.

Type material. *Merisus splendidus* Walker. Type not yet found. Delucchi (1956*a* : 233) erected a neotype from Varinella, Val Scrivia, Italy, collected between July and September, 1927 (*Mancini*). Probably the type was loaned to Haliday for the purpose of his figure (1842) and might not have been returned to Walker.

Merisus acutangulus Thomson. Syntypes, 2 ♀. LECTOTYPE labelled " Hg " [Hälsingborg] on a pale green label. Thomson's *acutangulus* was treated as a

distinct species by Delucchi (1956*a* : 233) but Bouček (1965*e* : 23) considered Thomson's type to be a dwarf of *splendidus*. Although slight differences are discernible between the types of *acutangulus* and *splendidus*, I am disposed to accept Bouček's view.

The colour of the body in *splendidus* varies considerably from bright green (some English females) through bright blue, to violet. A violet tinge seems more common in Swedish specimens and in those from Central and Southern Europe ; I have not seen it in British specimens. The length of the body in females varies from 2·6 to 5·5 mm. (rarely more).

BRITAIN, SWEDEN, GERMANY, FRANCE, ITALY, CZECHOSLOVAKIA, HUNGARY, MOLDAVIAN S.S.R. ; NORTH AFRICA.

Biology. A male of *splendidus* was reared in southern England from a group of galls produced by *Tetramesa brevicornis* (Walker) in stems of *Festuca rubra* L. var. *arenaria* (Osb.) Fr., by Dr. Claridge (1958 : 227). In Britain imagines appear in June and July ; in North Africa they have been taken in March and April.

Merisus flagellatus Bouček

Merisus flagellatus Bouček, 1965*e* : 22, ♂ ♀.

Type material. Holotype ♂, Moldavian SSR, Rybnitsa, 12.v.1959 (*V. I. Talitzki*), in Národní Museum, Prague (Cat. no. 26.009).

MOLDAVIAN S.S.R.

Biology. Unknown. Imagines in April, May, July.

HOMOPORUS Thomson

Merisus sgen. *Homoporus* Thomson, 1878 : 60, 64. Type-species : *Pteromalus fulviventris* Walker, 1835, by designation of Ashmead, 1904 : 324.
Phaenacra Förster, 1878 : 51. Type-species : *Ph. nubigera* Förster, by monotypy.
Parapteromalus Ashmead, 1904 : 320, 384, **syn. n.** Type-species : *P. isosomatis* Ashmead, by monotypy.
Phaenacra Förster ; Ashmead, 1904 : 323, 324.
Homoporus Thomson ; Ashmead, 1904 : 324.
Homoporus Thomson ; Schmiedeknecht, 1909 : 362, 363.
Phaenacra Förster ; Schmiedeknecht, 1909 : 362, 363–364.
Phaenacra Förster ; Kurdjumov, 1913 : 3–4, 10.
Merisoporus Masi, 1924*a* : 226–230. Type-species : (*?*) *Pteromalus luniger* Nees, 1834, by original designation.
Merisus Gahan, 1933 : 89–109 [*nec* Walker, 1835].
Merisus Peck in Muesebeck *et al.*, 1951 : 547–548 [*nec* Walker].
Phaenacra Förster ; Nikol'skaya 1952 : 217.
Merisus Walker ; Nikol'skaya, 1952 : 217 [*ex parte*].
Merisoporus Masi ; Nikol'skaya, 1952 : 218.
Homoporus Thomson ; Nikol'skaya, 1952 : 218.
Pseudomerisus Erdös & Novitzky *in* Erdös, 1953 : 236. Type-species : *Ps. stipae* Erdös & Novitzky, by original designation.
Homoporus Thomson ; Szelényi, 1956 : 167–180.
Homoporus Thomson ; Delucchi, 1957*a* : 400–421.

It is doubtful whether *Homoporus* Thomson or *Phanacra* Förster (both published in the same year) has priority. I follow the lead of Delucchi who adopted (1957*a* : 400–401) the name *Homoporus* in his revision of the European species. *Parapteromalus* Ashmead was synonymized with *Merisus* (*sensu* Gahan, 1933, *nec* Walker) by Peck (*in* Muesebeck *et al.*, 1951 : 547), but as *Merisus* in the sense of American authors is the same as *Homoporus* Thomson, *Parapteromalus* Ashmead now becomes a synonym of the latter. The genera *Merisoporus* Masi and *Pseudomerisus* Erdös & Novitzky were united with *Homoporus* by Delucchi (1957*a*). The revision of *Homoporus* by Szelényi (1956) contains some useful information but that author was at a disadvantage because he had not seen the types of most of the species with which he dealt. Delucchi's (1957*a*) revision is a very useful contribution and has cleared up many problems ; it does not, however, take Szelényi's work into consideration. Delucchi's key to the species, which is on the whole very good, will not work satisfactorily for some species, especially for British material, because the colour of the coxae and femora is too variable. Some changes in nomenclature have also occurred since the publication of his paper. The key to species presented here deals mainly with the north-west European species ; I have not seen the types of several of those described from Central Europe, which still need further revision.

The form of the antennal clava is a useful character in ♀ *Homoporus*. In some species it is merely conically pointed apically ; in others it is acuminate and ends in a very narrow " terminal stylus " which apparently represents the third claval segment.

Key to British (and some other European) Species

(Females)

1		Pronotum as wide as the mesoscutum. Gaster fulvous, except sometimes at the base. Basal cell of fore wing with hairs scattered over its distal third to half. Head and thorax with conspicuous whitish hairs. Squat species ; thorax only about 1·4 times, gaster about 1·3 times, as long as broad. Legs, except coxae, fulvous. First funicular segment about half as long as pedicellus, subquadrate, fifth and sixth distinctly transverse . . . . . ***semiluteus*** (Walker) (p. 458)
–		Either the pronotum is distinctly less wide than the mesoscutum ; or the gaster is wholly black with a metallic tinge. Basal cell of fore wing, not counting any hairs which may be on the basal vein, usually bare, rarely with a few hairs. Hairs of head and thorax rarely at all conspicuously whitish . 2
2	(1)	Antennae with third segment of flagellum anelliform, at most half as long as the fourth segment, without sensilla, quadrate to distinctly transverse . . 3
–		Antennae with third segment of flagellum not anelliform, usually as long as or longer than the fourth segment, provided with sensilla ; sometimes somewhat shorter than the fourth, but then quadrate to slightly longer than broad . 4
3	(2)	Gaster black with metallic tints 13
–		Gaster at least partly yellowish, some specimens of *fulviventris* . . . 12
4	(2)	Fore wing with postmarginal vein longer than the marginal vein, the latter slightly to quite conspicuously thickened, five to nine times as long as its breadth in the middle. Pronotum as wide as the mesoscutum. Both mandibles with three teeth. Scutellum discally with coarse reticulation, almost or quite as coarse as that of the posterior part of the mesoscutum . 5

– Fore wing with postmarginal vein at most as long as the marginal vein, the latter not noticeably thickened. Pronotum nearly always at least slightly less wide than the mesoscutum. Right mandible, or both mandibles, with four teeth. Scutellum discally with in most cases finer reticulation, rarely as coarse as that of the posterior part of the mesoscutum 6

5 (4) Marginal vein 1·1 to 1·25 times as long as the stigmal vein. Antenna with sutures of clava indistinct . . ***chalcidiphagus*** (Walsh & Riley) (p. 449)

– Marginal vein 1·25 to 1·65 times as long as the stigmal vein. Antenna with first suture of clava fairly distinct . . . ***apharetus*** (Walker) (p. 449)

6 (4) Pronotum, in front of the collar, descending vertically with respect to the plane of the mesonotum and scutellum, the pronotal neck is therefore hardly visible in dorsal view. Gaster black with metallic reflections, or at most reddish at the base. Legs relatively stout. Fore wing often with a fuscous cloud 7

– Pronotum, in front of the collar, not descending vertically with respect to the plane of the mesoscutum and scutellum, the pronotal neck at least partly visible in dorsal view. Gaster often partly to wholly fulvous or yellow. Legs sometimes slender. Fore wing immaculate 8

7 (6) Left mandible with three teeth, right mandible with four. Malar space half or slightly more than half as long as an eye ; breadth of oral fossa hardly twice the malar space. Fore wing most often with a fuscous cloud below the base of the marginal vein. Gaster not reddish-marked, on the average relatively longer, normally 1·75 to 2·2 times as long as broad, rarely less. Tibiae usually more or less infuscate medially . . ***luniger*** (Nees) (p. 450)

– Both mandibles with four teeth. Malar space one third or slightly more than one third as long as an eye ; breadth of oral fossa 2·3 to 2·7 times the malar space. Fore wing immaculate, sometimes faintly yellowish-tinged. Gaster sometimes reddish basally, relatively short, 1·4 to 1·65 times as long as broad. Tibiae yellow or testaceous . . . ***destructor*** (Say) (p. 450)

8 (6) Left mandible with three teeth, right mandible with four. Gaster blackish with a weak metallic tinge, or at most somewhat reddish or testaceous at the base ventrally. Antennal clava with a terminal stylus 9

– Both mandibles with four teeth. Gaster, except in *arestor*, in which the antennal clava has no terminal stylus, at least partly yellow dorsally, often mainly so both dorsally and ventrally 10

9 (8) Speculum of fore wing open below. Antennal scape reaching barely or only just to the lower edge of the median ocellus . . ***subniger*** (Walker) (p. 451)

– Speculum of fore wing virtually closed below. Antennal scape reaching about to the level of the middle of the median ocellus ***crassiceps*** Thomson (p. 452)

10 (8) Antennal clava without a terminal stylus, merely conically pointed. Fore wing with postmarginal vein distinctly shorter than the marginal vein. Gaster wholly metallic, or pale beneath at its base only. Legs relatively stout, with femora more or less infuscate. Malar space barely or just one third the length of an eye . . . . . ***arestor*** (Walker) p. 452)

– Antennal clava acuminate with a terminal stylus except in *gibbiscuta*, which has the postmarginal vein virtually or quite as long as the marginal vein, the gaster at least partly yellow dorsally (sometimes wholly yellow) and the legs slender with wholly yellow femora. Gaster usually at least partly yellow both dorsally and ventrally, rarely almost wholly dark in some extreme forms of *fulviventris*. Malar space, except in *gibbiscuta*, about half the length of an eye 11

11 (10) Postmarginal vein of fore wing virtually or quite as long as the marginal vein. Malar space only about one third the length of an eye. Scutellum strongly convex, best seen in profile. Legs slender ; spur of mid tibia hardly half as

long as the first tarsal segment, the latter five to six times as long as thick ***gibbiscuta*** Thomson (p. 452)

– Postmarginal vein distinctly shorter than the marginal vein. Malar space from virtually half, to slightly more than half, the length of an eye. Scutellum, as seen in profile, only moderately convex. Legs rather stouter ; spur of mid tibia half or rather more than half as long as the first tarsal segment, the latter 4 to 4·5 times as long as thick 12

12 (3, 11) Antennae inserted well above level of ventral edge of eyes ; scape reaching level of vertex or slightly above it ; combined length of pedicellus and flagellum about equal to breadth of head ; first funicular segment 1·3 to 1·6 times as long as broad, not or hardly shorter than the second segment, sixth segment quadrate or slightly longer than broad. Malar space about half the length of an eye . . . . . ***febriculosus*** (Girault) (p. 453)

– Antennae inserted only slightly above level of ventral edge of eyes ; scape not nearly reaching the median ocellus ; combined length of pedicellus and flagellum distinctly less than breadth of head ; first funicular segment at least slightly shorter and narrower than the second segment, usually quadrate, occasionally a little longer than broad ; distal segments quadrate to slightly transverse. Malar space slightly more than half the length of an eye . . . . . ***fulviventris*** (Walker) (p. 454)

13 (3) The two Central European species *pulchripes* Erdös (p. 456) and *sashegyensis* Erdös (p. 456) would run here. They need revision and might be only forms of one variable species ; the differences noted by Delucchi (1957*a* : 404–405, 409) do not appear to work out very satisfactorily.

Males

1 Antennae with three anelli and five funicular segments ; combined length of pedicellus and flagellum slightly less than breadth of head ; flagellum subclavate, clothed with short subdecumbent hairs ; funicular segments short. Head and thorax golden to blue-green. [The two Central European species *pulchripes* Erdös and *sashegyensis* Erdös would run here.]

– Antennae with two anelli and six funicular segments ; combined length of pedicellus and flagellum slightly to much greater than breadth of head ; flagellum filiform, clothed with hairs whose length is at least half the breadth of the segments that bear them and which stand out moderately to quite strongly ; funicular segments often long. Head and thorax often more obscurely coloured 2

2 (1) Fore wing with postmarginal vein at least slightly longer than the marginal vein, the latter slightly to rather conspicuously thickened ; wing often with a fuscous cloud below the marginal vein. Pronotum as wide as the mesoscutum. Both mandibles with three teeth. Gaster oval, much shorter than the thorax, immaculate. Marginal vein of fore wing at most about 1·5 times as long as the stigmal vein 8

– Fore wing with postmarginal vein at most as long as, often shorter than, the marginal vein ; the latter not thickened ; wing immaculate. Pronotum at least slightly less wide than the mesoscutum. Both mandibles with four teeth, except in *luniger* and *subniger* in which the left mandible has three teeth. Gaster oblong-oval to oblong, nearly or about as long as the thorax, often with a pale subbasal spot. Marginal vein of fore wing (except in *destructor*, *subniger*, and some *luniger*) twice or rather more than twice as long as the stigmal vein 3

3 (2) Antennae with combined length of pedicellus and flagellum about twice the breadth of the head ; flagellum very slender ; all funicular segments conspicuously elongate, the first 3·5 to 4 times, sixth 2·5 to 3 times, as long as

broad ; scape reaching slightly above the vertex. Head and thorax golden to bronze-green, or coppery ; gaster with a pale subbasal spot, sometimes also partly pale ventrally . . . . . ***febriculosus*** (Girault) (p. 453)

– Antennae with combined length of pedicellus and flagellum at most 1·7 times the breadth of the head ; flagellum relatively less slender ; funicular segments relatively shorter, the distal segments sometimes not longer than broad ; scape not reaching above the vertex. Head and thorax often more obscurely metallic ; gaster sometimes immaculate 4

4 (3) Antennae with combined length of pedicellus and flagellum 1·6–1·7 times the breadth of the head ; all funicular segments very distinctly longer than broad, even the sixth 1·7 to 2 times as long as broad. Head and thorax mainly green. Marginal vein of fore wing about twice as long as the stigmal vein. Both mandibles with four teeth . . . ***arestor*** (Walker) (p. 452)

– Antennae with combined length of pedicellus and flagellum at most 1·4 times the breadth of the head ; funicular segments relatively shorter, the sixth at most 1·5 times as long as broad, sometimes quadrate or very slightly transverse. Head and thorax dark blue or dark greenish blue 5

5 (4) Fore wing with marginal vein twice, or rather more than twice, as long as the stigmal vein ; venation yellowish. Scutellum rather shiny. Antennae with scape shorter than the transverse diameter of an eye and not nearly reaching the median ocellus, slightly expanded above the middle ; funicular segments short, the first at most slightly longer than the pedicellus, sixth subquadrate. Malar space more than half the length of an eye. Both mandibles with four teeth . . . . . ***fulviventris*** (Walker) (p. 454)

– Fore wing with marginal vein 1·5 to 1·75 times as long as the stigmal vein ; venation yellow to fuscous. Scutellum duller. Antennae with scape nearly or quite as long as the transverse diameter of an eye, nearly or quite reaching the median ocellus ; funicular segments sometimes relatively longer. Left mandible often with three teeth 6

6 (5) Antennae with combined length of pedicellus and flagellum 1·3 to 1·4 times the breadth of the head ; flagellum rather slender ; scape reaching the median ocellus, not expanded above the middle, without a shiny boss, usually partly or wholly testaceous ; sixth funicular segment about 1·5 times as long as broad. Both mandibles with four teeth . . . ***destructor*** (Say) (p. 450)

– Antennae with combined length of pedicellus and flagellum 1·1 to 1·15 times the breadth of the head ; flagellum tending to be thicker ; scape hardly reaching the median ocellus, slightly expanded above the middle and with a shiny boss which extends about half way down, black ; sixth funicular segment quadrate to 1·3 times as long as broad. Left mandible usually with three teeth (with four in aberrant *luniger*) 7

7 (6) Thorax nearly twice as long as broad ; pronotal collar not margined. Tibiae infuscate medially, usually broadly so . . . . ***luniger*** (Nees) (p. 450)

– Thorax about 1·7 times as long as broad ; pronotal collar slightly margined medially. Tibiae yellow, or at most the hind tibiae at all distinctly infuscate medially . . . . . ***subniger*** (Walker) (p. 451)

8 (2) Marginal vein of fore wing distinctly thickened, five to six times as long as its maximum breadth, 1·1 to 1·3 times as long as the stigmal vein ; wing usually with a distinct fuscous cloud below the marginal vein ***chalcidiphagus*** (Walsh & Riley) (p. 449)

– Marginal vein of fore wing only slightly thickened, about eight times as long as its maximum breadth, 1·2 to 1·45 times as long as the stigmal vein ; wing immaculate or with only a weak and diffuse cloud below the marginal vein ***apharetus*** (Walker) (p. 449)

Homoporus chalcidiphagus (Walsh and Riley)

(Text-fig. 285)

Pteromalus tricolor Walker, 1836 : 190, [*ex parte* (excl. lectotype)].
Pteromalus Nypsius Walker, 1839 : 274, ♀, **syn. n.**
Semiotellus chalcidiphagus Walsh & Riley, 1869 : 152, ♂ ♀.
Homoporus crassinervis Thomson, 1878 : 68, ♀.
Merisoporus crassinervis (Thomson) Masi, 1924*a* : 230, ♀.
Merisoporus chalcidiphagus (Walsh & Riley) Gahan, 1933 : 104–109, ♂, ♀.
Homoporus chalcidiphagus (Walsh & Riley) ; Delucchi, 1957*a* : 407, 417, ♂ ♀.

Type material. *Pteromalus nypsius* Walker. Syntypes, 2 ♀. LECTOTYPE labelled " 38. 8. 13. 69 ". This name has priority over *chalcidiphagus*, but the latter is well known and generally accepted.

Semiotellus chalcidiphagus Walsh & Riley. Type, Canada, Ontario, Grimsby, in U.S.N.M. (not seen by the writer). The species was redescribed and figured by Gahan (1933).

Homoporus crassinervis Thomson. Syntypes, 4 ♀. LECTOTYPE labelled " Ar " [Arrie], also bearing A. Jansson's lectotype label. The species was synonymized with *chalcidiphagus* by Gahan (1933 : 107–108) although he did not see the type of *crassinervis*.

Widely distributed in EUROPE, but apparently not very common ; NORTH AFRICA (Morocco) ; U.S.A.

Biology. Peck (1963 : 652) lists as hosts the Cecidomyiid *Phytophaga destructor* Say ; various Eurytomidae (*Eurytoma* and *Tetramesa* spp.) living in grasses ; and the Torymid *Ditropinotus aureoviridis* Crawf. In north-western Europe imagines appear July–August.

Homoporus apharetus (Walker)

Pteromalus Apharetus Walker, 1839 : 228, ♂.
Homoporus flaviscapus Thomson, 1878 : 69, ♂ ♀.
Phaenacra nubigera Förster, 1878 : 52, ♀ [*ex parte*].
Homoporus flaviscapus Thomson ; Delucchi, 1957*a* : 407, 416, ♂ ♀.

Type material. *Pteromalus apharetus* Walker. Syntypes, 2 ♂. LECTOTYPE, the first specimen, bearing a Waterhouse label.

Homoporus flaviscapus Thomson. Syntypes, 5 specimens. LECTOTYPE ♀ labelled " Bås " [Båstad] and " flaviscapus Ths ".

H. flaviscapus Thomson was synonymized with *P. apharetus* Walker, on the basis of information supplied by the writer, by Bouček (1965*e* : 35).

BRITAIN, SWEDEN, GERMANY, AUSTRIA, CZECHOSLOVAKIA, MOLDAVIAN S.S.R. Not uncommon in Britain.

Biology. Unknown. Imagines July–August.

Homoporus luniger (Nees)

Pteromalus luniger Nees, 1834 : 119, ♀.
Pteromalus tricolor Walker, 1836 : 190, ♂ ♀ [*ex parte* (incl. lectotype)], **syn. n.**
Pteromalus Zonaras Walker, 1839 : 227, ♂, **syn. n.**
Homoporus luniger (Nees) Thomson, 1878 : 67, ♂ ♀.
Phaenacra nubigera Förster, 1878 : 52, ♀ [*ex parte* (lectotype)].
Merisoporus luniger (Nees *sensu* Thomson), Masi, 1924*a* : 227–230, ♀.
Homoporus luniger (Nees) ; Delucchi, 1957*a* : 408, 419, ♂ ♀.

Type material. *Pteromalus luniger* Nees. Types now destroyed. The interpretation of Thomson has been generally accepted. Delucchi (1957*a* : 420) suggested that the type of *nubigera* Förster might be taken as neotype of *luniger*.

Pteromalus tricolor Walker. Syntypes, 18 specimens. None agrees really well with the description, but 14 are females of *luniger* (Nees) which suggests that this species formed the basis of his description. One of these females, bearing a Waterhouse label, is selected as LECTOTYPE.

Pteromalus zonaras Walker. Syntypes, 3 ♂. LECTOTYPE labelled " 38. 7. 12. 185 ".

Phaenacra nubigera Förster. Type ♀ in Naturhistorisches Museum, Vienna (not seen by the writer). Delucchi (1957*a* : 401) stated that only one of the specimens so named in Förster's collection agreed with his description ; but he did not mention the labels on the specimen.

Widely distributed in EUROPE ; one of the commonest species of the genus.

Biology. Females of *luniger* were reared in England (*M. F. Claridge*), from *Tetramesa calamagrostidis* (Hed.) (Hym., Eurytomidae), as follows:—Berkshire, Cothill, 5.iv.1957 ; Buckinghamshire, Hell Coppice, 29.iv.1957, Oakley Wood, 9.iv.1957, 29.iv.1957 ; Warwickshire, Waverley Wood, 19.v.1956. Delucchi (1957 : 420) stated that it was probably parasitic on *Mayetiola* spp., but this needs confirmation. Imagines appear in the field May–September (probably representing several broods).

Ferrière & Faure (1925 : 227–228) recorded, under the name *Homoporus luniger* var. *braconidis*, a species which they had reared from *Apanteles glomeratus* (L.) ; it is in fact a *Dibrachys* (q.v.).

Homoporus destructor (Say)

Ceraphron destructor Say, 1817 : 47–48, ♂ ♀.
Merisus intermedius Lindeman, 1887 : 179–183, 192, ♂ ♀.
Merisus destructor (Say) Gahan, 1933 : 89–95, ♂ ♀.
Homoporus destructor (Say) Delucchi, 1957*a* : 407–408, 418, ♂ ♀.
Merisus destructor (Say) ; Peck, 1963 : 645–648.

A full list of references to this species is given by Peck (1963).

Type material. *Ceraphon destructor* Say. Types presumed destroyed ; see Gahan, 1933 : 94, who gave sound reasons for his adoption of this name.

Merisus intermedius Lindeman. Gahan (1933 : 94) referred to specimens which

he had examined and considered to be part of Lindeman's original material ; he stated that they could not be distinguished from American specimens of *destructor*.

BRITAIN, FRANCE, CENTRAL EUROPE, U.S.S.R ; NORTH AFRICA ; CANADA, U.S.A.

Biology. This species was regarded by Gahan (1933) as one of the most important parasites of the Hessian-fly, *Mayetiola destructor* Say ; he stated that it is normally a solitary, primary ectoparasite. Occasionally, however, it may act as a secondary parasite through *Platygaster hiemalis* Forbes or *P. zosine* Walker. According to other authors it will also attack *Mayetiola avenae* Marsh., *Oscinella frit* (L.) and *Elachiptera cornuta* (Fln.) (see Gahan, 1933 : 94). Imagines July–August in Britain.

Homoporus brunneiventris Szelényi

Homoporus brunneiventris Szelényi, 1956 : 172, 175–176, ♀.

Type material. Holotype ♀, Hungary, Nagykovácsi, Nagyszénás, 7.vii.1953, in a Festucetum sulcatae community (*Szelényi*) in Hungarian National Museum, Budapest (not seen). Szelényi (1956 : 172, 176) stated that the female of *brunneiventris* differed from that of *destructor* in having the antennal clava distinctly 3-segmented and shorter than the two preceding funicular segments together, the first funicular segment being subequal in length to the sixth, and in having the propodeal nucha present and occupying more than half the length of the propodeum.

HUNGARY.

Biology. Unknown.

Homoporus subniger (Walker)

Pteromalus subniger Walker, 1835 : 95, ♂ ♀.
Pteromalus chalcomelas Walker, 1836 : 476, ♀, **syn. n.**
Homoporus (*Phaenacrinodes*) *kurdjumovi* Szelényi, 1956 : 179–180, ♂ ♀.
Homoporus danuvianus Delucchi, 1957*a* : 413, ♂ ♀, **syn. n.**

Type material. *Pteromalus subniger* Walker. Syntypes, 9 specimens. LECTOTYPE, the fourth specimen, a female, bearing a Waterhouse label.

Pteromalus chalcomelas Walker. Syntypes, 2 ♀. One is selected as LECTOTYPE ; it bears a Waterhouse label.

Homoporus kurdjumovi Szelényi. Holotype, Hungary, Budapest, ? in coll. Szelényi (not seen by the writer). The species was placed in synonymy with *subniger* (Walker) by Bouček (1965*e* : 35).

Homoporus danuvianus Delucchi. Type ♀ in Naturhistorisches Museum, Vienna ; Delucchi mentioned several specimens but did not specify which was the type.

BRITAIN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Several specimens were reared in England : Cambridgeshire, The Devil's Dyke, in June and July 1965, from stems of *Centaurea scabiosa* L. (host not ascertained, but probably *Phanacis centaureae* Förster). Recorded [as *kurdjumovi*

Szel.] by Szelényi (1956 : 171, 180) as a primary parasite of *Timaspis papaveris* Kieffer in the stems of *Papaver somniferum* L. ; and from galls of *Phanacis centaureae* Förster in stems of *Centaurea sadleriana* Janka. Imagines chiefly June–Sept. (one record for April, specimens reared under artificial conditions).

Homoporus crassiceps Thomson

Homoporus crassiceps Thomson, 1878 : 66, ♀.
Homoporus crassiceps Thomson ; Delucchi, 1957*a* : 406, 412, ♀.

Type material. Syntypes, 4 specimens. LECTOTYPE ♀ labelled " Hg " [Hälsingborg] on a green label ; " crassiceps Ths " ; " HOMOPORUS crassiceps Ths. V. Delucchi det." ; and " LECTOTYPE " on a red label.

I am not sure whether *crassiceps* may not be a form of *subniger* (Walker) ; but none of my own specimens of the latter agree completely with the type of *crassiceps*, so the possibility that the latter is a valid species should not be ruled out.

SWEDEN.

Biology. Recorded by Lebedeva (1926) as a parasite of *Theresia* (*Procris*) *ampelophaga* Bayle (Lep., Zygaenidae) in U.S.S.R. ; but this record cannot be checked and the parasite may not have been correctly identified.

Homoporus arestor (Walker)

Pteromalus Arestor Walker, 1848 : 124, 179, ♀.
Homoporus chlorogaster Thomson, 1878 : 66, ♂ ♀.
? Homoporus (*Pseudomerisus*) *simplex* Szelényi, 1956 : 171, 177–179, ♀.
Homoporus chlorogaster Thomson ; Delucchi, 1957*a* : 406, 414, ♀.
Homoporus arestor (Walker) Bouček, 1965*e* : 35.

Type material. *Pteromalus arestor* Walker. One female, LECTOTYPE (possibly holotype), bearing a Waterhouse label.

Homoporus chlorogaster Thomson. Syntypes, 10 specimens. LECTOTYPE, a female labelled " Lund " and " chlorogaster Ths ". The species was placed in synonymy with *arestor* by Bouček (1965*e* : 35).

Homoporus (*Pseudomerisus*) *simplex* Szelényi. Holotype ♀ (not seen), Hungary, Mátra, Saskö-Disznókö, 13.ix.1949, presumably in Hungarian National Museum, Budapest. According to the description it might be the same as *arestor* (Walker) (=*chlorogaster* Thomson). Szelényi had not seen the types of *arestor* or *chlorogaster* ; he included the latter in his key to the species of *Homoporus* (1956 : 172), on the basis of Thomson's description.

BRITAIN, SWEDEN, CENTRAL EUROPE. Apparently uncommon (or perhaps very local).

Biology. Unknown.

Homoporus gibbiscuta Thomson

Homoporus gibbiscuta Thomson, 1878 : 66, ♀.
Homoporus gibbiscuta Thomson ; Delucchi, 1957*a* : 406, 412.

Type material. Syntypes, 2 ♀; LECTOTYPE, labelled "Mrl" [?] and "gibbiscuta Ths".

BRITAIN, SWEDEN, GERMANY; NORTH AFRICA.

Biology. Unknown. Imagines appear in August.

The colour of the coxae varies in this species. In the lectotype ♀ the fore and mid coxae are dark; but I have a British ♀, otherwise indistinguishable from the lectotype of *gibbiscuta*, in which all the coxae are yellow with the exception of the proximal part of the hind coxae.

Homoporus febriculosus (Girault) comb. n.

Stictonotus Isomatis Webster, 1885 : 387 [*nec* Riley, 1882].
Merisus febriculosus Girault, 1917 : 17, ♀.
Merisus febriculosus Girault; Gahan, 1933 : 95–99, ♂ ♀.
?Homoporus filicornis Erdös, 1953 : 241–242, fig. 10c, ♀.
? Homoporus filicornis Erdös; Delucchi, 1957*a* : 405, 410–411, ♀.
? Homoporus filicornis Erdös, 1961 : 188–189, 201, figs. 1, 2, ♂ ♀.
Merisus febriculosus Girault; Peck, 1963 : 648–649.

Type material. *Merisus febriculosus* Girault. Types, U.S.A., Ohio, Wooster, in U.S.N.M. (not seen by the writer).

Gahan (1933 : 96–97) gave a very detailed redescription of *febriculosus*. The European specimens which I have identified as *febriculosus* agree perfectly with his description; they are also conspecific with North American specimens identified as *febriculosus* (by Gahan and by Peck) which I have been able to examine. Gahan (1933 : 99) also mentioned "In the British Museum the writer has seen two female specimens collected on the Isle of Wight which seemed to agree in every way with American representatives of *febriculosus*. These two specimens constituted a part of the material identified as *Homoporus fulviventris* (Walker) ....." I have myself examined these specimens [there are actually three, not two] and find that they agree with my own material already presumed to be *febriculosus*. I am therefore confident that I have identified the species correctly.

Homoporus filicornis Erdös. Holotype ♀, Hungary, Soltvadkert, 14.viii.1945, taken in a Phragmitetum bordering the salt-marsh Városi-tó, in coll. Erdös (not seen).

I am somewhat puzzled about the identity of *filicornis*. Some of my specimens of *febriculosus*, those with entirely pale femora, run in Delucchi's key (1957*a* : 404) to *filicornis* Erdös. These specimens, however, do not agree completely with Erdös' original description. For example, they have the postmarginal vein shorter than the marginal, whereas Erdös (1953 : 242) stated that these two veins were equal in length; and they have the antennal flagellum less slender proximally than is shown in the figure given by Erdös (1953, fig. 10c). On the other hand, my specimens of *febriculosus* agree well with Erdös' later figures (1961, figs. 1 (♂) and 2 (♀)); in these the postmarginal vein is shown as slightly shorter than the marginal, whilst the antennal flagellum of the ♀ is not quite so slender as that shown in Erdös' figure of 1953. If the earlier figure, and description of the length of the

postmarginal vein were not quite accurate ; and if the later figures, and Delucchi's key-description, are correct, then it seems likely that *filicornis* is the same as *febriculosus*.

There is some variation in British specimens of *febriculosus* as regards the colour of the legs. Most of the females have all the coxae black and the femora entirely yellow ; some, however, have the femora darkened proximally (in one specimen they are extensively infuscate). On the other hand, one female has the internal aspect of the fore coxae pale. The specimens with darkened femora would run in Delucchi's key (1957*a*) to *fulviventris* and *budensis*, which are quite different in other respects from *febriculosus*. The proportions of the funicular segments also vary somewhat in females of *febriculosus* ; in large specimens these segments may be 1·6 times as long as broad, while in some small ones they are nearly quadrate.

EUROPE (BRITAIN, CENTRAL EUROPE, U.S.S.R.) ; CANADA, U.S.A.

Biology. A list of the recorded hosts of *febriculosus* is given by Peck (1963 : 649). It includes Hymenoptera of the families Cephidae, Braconidae, Eupelmidae, Eurytomidae (*Tetramesa* spp.) and Platygasteridae ; also *Phytophaga* (=*Mayetiola*) *destructor* (Say) (Dipt., Cecidomyiidae). The species is a solitary (and normally primary) ectoparasite. In America some workers have observed at least two generations per annum (see Gahan, 1933 : 98) with a wide range over the season. In Britain adults have been captured in the field from May until August (but most in June–July).

Homoporus fulviventris (Walker)

Pteromalus fulviventris Walker, 1835 : 190, ♀.
Pteromalus bicolor Förster, 1841 : 24, " ♂ " [*recte* ♀].
? Merisus bicolor Six, 1876 : 135, pl. 6, fig. 4, ♀.
Homoporus fulviventris (Walker) Thomson, 1878 : 64–65, ♂ ♀.
Homoporus fulviventris (Walker) ; Delucchi, 1957*a* : 407, 415, ♂ ♀.

Type material. *Pteromalus fulviventris* Walker. Several specimens are so labelled but some are probably not original material. LECTOTYPE, a ♀ bearing a Waterhouse label, also one in Ch. Ferrière's handwriting " This seems to be the Type. CF ".

Pteromalus bicolor Förster. The probable type, according to Delucchi (1957*a* : 416) is a ♀ in the Förster collection in Vienna. I have not seen the specimen but accept the opinion of Delucchi, who synonymized *bicolor* with *fulviventris* (ibid. : 416).

Merisus bicolor Six. Location of types unknown to me (? possibly in Rijksmuseum van Natuurlijke Historie, Leiden). The species was evidently described as new, as Six made no reference to Förster's *bicolor*. The description and figure suggest that it must be the same as *fulviventris* (Walker).

Widely distributed in EUROPE. In my experience it occurs most frequently in dry habitats (e.g., chalk downland, sand-dunes).

Biology. Unknown. Imagines May–Sept.

This species varies considerably in colour. In females the head and thorax vary from bright blue to almost black. In pale specimens only the hind femora are marked with black ; in dark ones all the femora may be mainly black ; in exceptionally dark British females the tibiae are more or less infuscate medially. In bright coloured examples the gaster is yellow with only a dark stripe down the middle of the ventral surface ; at the other extreme I have a female from southern England in which the gaster is brown with only traces of yellowish coloration here and there. Again, in bright coloured specimens the antennal flagellum is entirely yellow ; but in others the funicle is more or less infuscate, occasionally almost entirely so.

The following Central and Southern European species, with the exception of *semiluteus* Walker, are not included in my key because I have not seen their respective types. Most of the species described by Erdös were examined by Delucchi, who redescribed them and included them in his key to the European species (1957*a*). The new species described by Szelényi (1956), however, were not seen by Delucchi and are not mentioned in his paper of 1957*a*. Before a comprehensive key to the European species can be produced, it will be necessary to re-examine and compare all those described by Erdös and Szelényi. No doubt some names will fall into synonymy as a result of such a revision. Most of these species fall into the species-group of *fulviventris* (Walker) ; *stipae* (Erd. & Nov.), *cupreus* Erd., *pulchripes* Erd., and *sashegyensis* Erd., appear a little more distinct and might form a separate species-group ; *semiluteus* (Walker), *biroi* Szel., and possibly *cephalotes* Szel., form another species-group. It was thought advisable to include the references to all these species although they do not apparently occur in north-western Europe.

Several North American species included in *Merisus* by Peck (1963 : 644–650) probably belong to *Homoporus*. No doubt most of them are valid, but their comparison with the European species seems desirable.

Homoporus stipae (Erdös & Novitzky)

Pseudomerisus stipae Erdös & Novicky [Novitzky] *in* Erdös, 1953 : 237–238, ♂ ♀.
Homoporus (*Pseudomerisus*) *stipae* (Erdös & Novicky) Szelényi, 1956 : 171.
Homoporus stipae (Erdös & Novicky) ; Delucchi, 1957*a* : 406–407, 415, ♂ ♀.

Described originally as the type-species of a new genus *Pseudomerisus*. Szelényi (1956 : 171) reduced *Pseudomerisus* to the rank of a subgenus of *Homoporus*. Delucchi (1957*a*) did not consider it generically distinct from *Homoporus*. When the species of *Homoporus* are better known, it is possible that *Pseudomerisus* will be regarded as a species-group.

Type material. Syntypes, Hungary, Tompa, Kelebia, April and May 1949, April and May 1950, reared from *Stipa joannis* Čel. (Dr. *J. Erdös*) in Hungarian National Museum, Budapest, in coll. Novitzky, in coll. Ferrière, and in coll. Szelényi.

HUNGARY.

Biology. In May 1949 Erdös reared a number of *stipae* together with many *Tetramesa* [=*Harmolita*] *scheppigi* Hed., which he suggested might be its host.

Homoporus cupreus Erdös

Homoporus cupreus Erdös, 1953 : 245, ♀.
Homoporus cupreus Erdös ; Delucchi, 1957*a* : 407, 415.

Type material. Holotype ♀, Hungary, Kelebia (Darvas erdö) swept from grass, 18.vi.1951, in coll. Erdös.

HUNGARY.
Biology. Unknown.

Homoporus pulchripes Erdös

Homoporus pulchripes Erdös, 1953 : 245, ♂ ♀.
Homoporus pulchripes Erdös ; Delucchi, 1957*a* : 405, 408.
Pseudomerisus pulchripes Erdös, 1961 : 202.

Type material. Syntypes, Hungary, Buda mountains (Sashegy) near Berhida ; Sopron (Bécsi domb) (*Erdös*), in coll. Erdös.

SWITZERLAND, HUNGARY, MOLDAVIAN S.S.R.
Biology. Reared in Hungary as a parasite of *Tetramesa aciculata* v. Schlecht. in culms of *Stipa capillata* L. (Dr. *J. Erdös*) (Erdös, 1961 : 202).

Homoporus sashegyensis Erdös

Homoporus sashegyensis Erdös, 1953 : 247, ♀.
Homoporus sashegyensis Erdös ; Delucchi, 1957*a* : 405, 408.
Pseudomerisus sashegyensis Erdös, 1961 : 194, 202, ♂.

Type material. Holotype ♀, Hungary, Buda mountains (Sashegy), 16.vii.1951 (*Erdös*), in coll. Erdös.

HUNGARY.
Biology. Paratypes were reared in Hungary, as parasites of *Tetramesa cylindrica* Hed. in seeds of *Stipa capillata* L. (Dr. *J. Erdös*) (Erdös, 1961 : 202).

Homoporus auratus Erdös

Homoporus auratus Erdös, 1953 : 241, ♀.
Homoporus auratus Erdös ; Delucchi, 1957*a* : 405, 410.

Type material. Holotype ♀, Hungary, near Péterréve, in a partly dry Phragmitetum named Csikér, 28.viii.1944 (*Erdös*) in coll. Erdös.

HUNGARY.
Biology. Unknown.

Homoporus laeviusculus Erdös

Homoporus laeviusculus Erdös, 1953 : 242, ♀.
Homoporus laeviusculus Erdös ; Delucchi, 1957*a* : 405, 409.

Type material. Holotype ♀, Hungary, Kalocsa, 10.vi.1946 (*Erdös*) and paratypes in coll. Erdös.

HUNGARY.
Biology. Unknown.

Homoporus clavicornis Erdös

Homoporus clavicornis Erdös, 1953 : 243–244, ♂ ♀.
Homoporus clavicornis Erdös ; Szelényi, 1956 : 171.
Homoporus clavicornis Erdös ; Delucchi, 1957*a* : 406, 411.

Type material. Syntypes, Hungary, Miske, Tompa, Csillebérc, Berhida, in coll. Erdös. Delucchi (1957*a* : 411) stated that the syntypes represented a mixed series ; he selected as lectotype, a female captured at Miske, 16.vi.1944.

HUNGARY.
Biology. Unknown.

Homoporus titanes Szelényi

Homoporus titanes Szelényi, 1956 : 171, 176–177, ♂ ♀.

Type material. Holotype ♀, Hungary, Nagykovácsi, Nagyszénás, vi.1954, presumably in Hungarian National Museum, Budapest.

HUNGARY.
Biology. Unknown.

Homoporus elegans Delucchi

Homoporus elegans Delucchi, 1957*a* : 406, 411–412, ♂ ♀.

Type material. Holotype ♀, Lower Austria, Kaltleutgeben, 2.vii.1916, in Naturhistorisches Museum, Vienna.

AUSTRIA.
Biology. Unknown.
Possibly *elegans* is the same as *titanes* Szelényi.

Homoporus budensis Erdös

Homoporus budensis Erdös, 1953 : 244, ♀.
Homoporus budensis Erdös ; Delucchi, 1957*a* : 407, 416.

Type material. Syntypes, Hungary, in Buda mountains (Sashegy), 22.v.1951, 10.v.1951 (*Erdös*), in coll. Erdös.

HUNGARY, MOLDAVIAN S.S.R.

Biology. Szelényi (1956 : 171) stated that he had a single female of *budensis* which had been bred by Prof. Balás from galls of *Xestophanes szepligetii* Balás in stems of *Potentilla recta* L.

Homoporus cephalotes Szelényi

Homoporus cephalotes Szelényi, 1956 : 172, 174–175, ♀.

Type material. Holotype ♀, Hungary, Vác, Gajári-telep, 18.vi.1924 (*Biró*), presumably in Hungarian National Museum, Budapest.

HUNGARY.

Biology. Unknown.

Homoporus semiluteus (Walker) **comb. n.**

Pteromalus semiluteus Walker, 1872*a* : 101, ♀.
Picroscytus bicolor Erdös, 1955 : 294–295, ♀, **syn. n.**
Homoporus bicolor (Erdös) Szelényi, 1956 : 171.
Homoporus robustus Delucchi, 1957*a* : 408, 420, ♀, **syn. n.**

Type material. *Pteromalus semiluteus* Walker. One ♀, LECTOTYPE, labelled " Marshall coll. 1904–120 ".

Picroscytus bicolor Erdös. Holotype ♀, Hungary, Tompa (Zsiroskuti erdö), 7.vii.1951, in coll. Erdös (not seen). The description agrees well with the lectotype female of *semiluteus* (Walker) and I consider it to be the same species.

Homoporus robustus Delucchi. Holotype ♀ (not seen) in Naturhistorisches Museum, Vienna ; Delucchi (1957*a* : 420) gives two localities (Germany, Blankenburg ; Italy, Trieste) but does not state from which the holotype came.

GERMANY, CORSICA, ITALY, HUNGARY, MOLDAVIAN S.S.R.

Biology. Unknown.

Homoporus biroi Szelényi

Homoporus Biroi Szelényi, 1956 : 171, 172–174, ♂ ♀.

Type material. Holotype ♀, Hungary, Szigetszentmiklós, 25.vii.1912 (*Biró*), in Hungarian National Museum, Budapest.

HUNGARY.

Biology. Unknown.

Szelényi (1956 : 174) states that *biroi* is closely related to *H. bicolor* Erdös, from which it differs in the sharp margin of the pronotum, the depressed mesoscutum and scutellum, the more slender legs (femora) and the longer funicle joints.

CALLITULA Spinola

Callitula Spinola, 1811 : 151, no. 20. Type-species : *C. bicolor* Spinola, by monotypy.
Micromelus Walker, 1833 : 371, 464. Type-species : *M. rufomaculatus* Walker, by designation of Westwood 1839 : 69.

Micromelus Walker ; Förster, 1856 : 53, 57.
Baeotomus Förster, 1856 : 145 [n. n. for *Micromelus*, supposedly pre-occupied in botany].
Merisus subg. *Baeotomus* Förster ; Thomson, 1878 : 60.
Micromelus Walker ; Ashmead, 1904 : 323, 324.
Micromelus Walker ; Schmiedeknecht, 1909 : 362–363.
Micromelus Walker ; Kurdjumov, 1913 : 3.
Callitula Spinola ; Hill & Smith, 1928 : 153–155.
Callitula Spinola ; Gahan, 1933 : 109–114.
Callitula Spinola ; Nikol'skaya, 1952 : 217.
Callitula Spinola ; Peck, 1963 : 652–653.
Callitula Spinola ; Bouček, 1964 : 9–15.
Callitula Spinola ; Peck *et al.*, 1964 : 30, 47.

The name *Callitula* Spinola was adopted for this genus by Gahan (1933) and has been generally accepted since. Gahan, who gave (1933 : 111–113) a detailed historical account of the generic nomenclature, pointed out that Spinola's description was quite inadequate for recognition of the type-species (*bicolor* Spin.) but gave plausible reasons for his adoption of the name in spite of this.

Key to European Species

(Females)

1 Antennal scape somewhat longer than an eye, reaching well above the level of the vertex. Gaster sublanceolate, slightly longer than head plus thorax, 2·3 to 2·4 times as long as broad. Anterior margin of clypeus deeply emarginate, appearing bidentate in some aspects. Large species, length 2 to 3·2 mm. Wings fully developed . . . . . ***elongata*** (Thomson) (p. 460)

– Antennal scape at most as long as an eye, reaching at most slightly above level of vertex. Gaster short- to long-ovate, at least somewhat shorter than head plus thorax. Anterior margin of clypeus less deeply emarginate, sometimes almost truncate. Species on the average smaller, up to 2·2 mm. 2

2 (1) Antennal scape as long or virtually as long as an eye, reaching slightly above the level of the vertex. Gaster usually at least slightly sunken dorsally, even tergites one and two ; tergite two at most half as long as one, and usually only slightly longer than three. Anterior margin of clypeus distinctly emarginate, but less deeply than in *elongata*. Wings fully developed ***ferrierei*** Bouček (p. 460)

– Antennal scape slightly shorter than an eye. Gaster weakly to strongly convex dorsally ; tergite two, two thirds to three quarters as long as one, and much longer than tergite three. Anterior margin of clypeus very shallowly emarginate, almost truncate 3

3 (2) Wings fully developed. Head in dorsal view approximately twice as broad as long. Gaster, dorsally, usually immaculate or with a reddish spot in its basal half, rarely more extensively reddish . . ***bicolor*** Spinola (p. 460)

– Wings rudimentary, tips of fore wings reaching at most hardly beyond apex of propodeal nucha. Head in dorsal view only 1·8 to 1·85 times as broad as long. Gaster, dorsally, usually with its basal half or more red ***pyrrhogaster*** (Walker) (p. 462)

(Males)

1 Anterior margin of clypeus deeply emarginate, appearing bidentate in some lights. Fore tibiae at most weakly infuscate at apex ; fore tarsi at most

weakly fuscous-marked. Malar space virtually two thirds the length of an eye. Antenna with scape reaching well above level of vertex ; proximal segments of funicle, except in small specimens, longer than broad ; flagellum uniformly brown to fuscous . . . . . ***elongata*** (Thomson) (p. 460)

– Either the anterior margin of the clypeus is very shallowly emarginate, almost truncate ; or else the fore tibia are blackish at apex and the fore tarsi are annulated with fuscous or black. Malar space slightly less than two thirds the length of an eye. Antennae with scape reaching at most slightly above level of vertex ; proximal segments of funicle usually subquadrate, sometimes slightly longer than broad 2

2 (1) Fore tibiae blackish at apex ; spur black ; fore tarsi annulated with fuscous or black. Wings fully developed. Anterior margin of clypeus distinctly emarginate. Antennal flagellum testaceous with the clava brownish ***ferrierei*** Bouček (p. 460)

– Fore tibiae testaceous ; spur pale ; fore tarsi not annulated with fuscous. Fully winged or brachypterous. Anterior margin of clypeus very shallowly emarginate. Antennal flagellum uniformly coloured, testaceous to brownish 3

3 (2) Wings fully developed. Gaster, dorsally, usually immaculate or with a reddish spot in the basal half, rarely the whole basal half reddish ***bicolor*** Spinola (p. 460)

– Wings rudimentary. Gaster, dorsally, having its basal half or so usually reddish . . . . . ***pyrrhogaster*** (Walker) (p. 462)

Callitula elongata (Thomson)

Merisus (*Baeotomus*) *elongatus* Thomson, 1878 : 62, ♀.
Callitula elongata (Thomson) Bouček, 1964 : 10, 14–15, ♂ ♀.

Type material. One female, LECTOTYPE (but probably holotype), labelled " Hlm " [Holmiae], " Bhn " [Boheman] and " elongatus Ths ".

The species has been redescribed by Bouček (1964).

SWEDEN, CZECHOSLOVAKIA.

Biology. Unknown, but the species appears to be associated with *Phragmites*. Imagines July.

Callitula ferrierei Bouček

Callitula ferrierei Bouček, 1964 : 10, 11–14, ♂ ♀.

Type material. Holotype ♀, Czechoslovakia, Bohemia, Nový Hradec Králové, 22.vii.1955, on *Phragmites* (*Bouček*) in Národní Museum, Prague (Cat. no. 25660).

BRITAIN, CZECHOSLOVAKIA, BULGARIA, MOLDAVIAN S.S.R.

Biology. Host not known, but the species appears to be associated with *Phragmites*. Imagines chiefly July–Sept., some British records for April and May.

Callitula bicolor Spinola

(Text-fig. 299)

Callitula bicolor Spinola, 1811 : 151.
Micromelus rufo-maculatus Walker, 1833 : 465, ♂ ♀.
Pteromalus plagiatus Nees, 1834 : 115, ♀.

Merisus (*Baeotomus*) *plagiatus* (Nees) Thomson, 1878 : 61, ♂ ♀.
Callitula bicolor Spinola ; Hill & Smith, 1928 : 153–155.
Callitula bicolor Spinola ; Imms, 1932 : 443–447.
Callitula bicolor Spinola ; Gahan, 1933 : 109–114, ♂ ♀.
Callitula bicolor Spinola ; Peck, 1963 : 652–653.
Callitula bicolor Spinola ; Bouček, 1964 : 10–11, ♂ ♀.

Type material. *Callitula bicolor* Spinola. Location of types, if extant, not known. Synonymized by Nees (1834 : 115) with his *Pteromalus plagiatus*, which is the present species. The name *bicolor* Spinola has been generally accepted since its adoption by Gahan (1933).

Micromelus rufomaculatus Walker. Six specimens stand under this name (but probably some are not original material). LECTOTYPE, a female bearing a label " 1045 ", also a Waterhouse label.

Pteromalus plagiatus Nees. LECTOTYPE ♀ in Westwood coll., Oxford (*ex* coll. Nees). It bears the following labels : a pink one with the number " 8 " ; one in the handwriting of Nees " D. 48. b (25) plagiata mihi ♀ 2. N. 12 " ; another in Westwood's handwriting " Pteromalus plagiatus Es. 2. 115. Callitula bicolor Spin. E Mus. Esenb ". Nees himself cited *Callitula bicolor* Spinola as a synonym of *plagiatus*, but seems to have regarded Spinola's name as a *nomen nudum*. It is just possible that Nees may have seen Spinola's types of *bicolor*, because he mentions (1834, *passim*) having been sent material of other species by that author.

Thomson (1878 : 61) cited " Pteromalus futilis Foerster " as a synonym of *plagiatus* [=*bicolor*]. There is no Förster species having this name ; probably Thomson meant *mutilus* Förster which, however, is almost certainly the same as *C. pyrrhogaster*, see below.

C. bicolor was redescribed in detail and figured by Gahan (1933), also by Imms (1932).

Widely distributed in EUROPE ; NORTH AMERICA.

Biology. The species is a primary or secondary parasite of various small Diptera in stems of Gramineae. It has been reared in Europe and North America from *Mayetiola destructor* (Say) (Cecidomyiidae) ; and from the following Chloropidae : from *Chlorops taeniopus* Mg. and *Lasiosina cinctipes* Mg. in U.S.S.R. ; *Meromyza americana* Fitch in North America, *M. saltatrix* (L.) in U.S.S.R., *Oscinella frit* (L.) in Europe and North America, *O. minor* (Adams) in North America, possibly also *O. carbonaria* (Löw) and *O. soror* (Macq.) in North America. *C. bicolor* has also been recorded as a hyperparasite, attacking Proctotrupoidea (Platygasteridae) which are primary parasites of the above Diptera : e.g., *Platygaster vernalis* (Myers) and *P. zosine* Walker, in U.S.S.R. and North America. Females evidently hibernate in Britain ; Mr. Gradwell and I have both found females during the winter in grass tussocks (particularly of *Deschampsia caespitosa*). I have rarely found any other Chalcidoid (except *Cyrtogaster vulgaris*) hibernating in grass. In Britain adults of *bicolor* also occur in the field from May until October ; probably therefore more than one brood per annum.

Callitula pyrrhogaster (Walker)

Micromelus pyrrhogaster Walker, 1833 : 465, ♂ ♀.
Micromelus pyrrhogaster Walker ; Haliday, 1841–1842 : v, pl. E, fig. 2, ♂.
Pteromalus mutilus Förster, 1841 : 29, ♂ ♀.
Micromelus pyrrhogaster Walker ; Reinhard, 1858 : 17.
Merisus (*Baeotomus*) *pyrrhogaster* (Walker) Thomson, 1878 : 62.
Callitula pyrrhogaster (Walker) Goodliffe, 1942 : 323.
Callitula pyrrhogaster (Walker) ; Bouček, 1964 : 10, ♂ ♀.

Type material. *Micromelus pyrrhogaster* Walker. Three specimens (one probably not original material) stand under this name. LECTOTYPE, a female bearing a label " 1046 ", also a Waterhouse label.

Pteromalus mutilus Förster. I have not seen the types (which are presumably in Naturhistorisches Museum, Vienna), but the description immediately suggests that the species is the same as *pyrrhogaster*, as already stated by Reinhard (1858 : 17).

Widely distributed in EUROPE.

Biology. Reared in England from puparia of *Oscinella frit* (L.) (see Goodliffe, 1942 : 323) ; and from *Mayetiola poae* (Bosc) (Dipt., Cecidomyiidae) in Czechoslovakia, according to Bouček (1964 : 10).

C. pyrrhogaster so closely resembles *bicolor* that it has sometimes been thought to be a form of it ; for example, Goodliffe (1942 : 323) mentions a suggestion by Nixon that *pyrrhogaster* might represent merely a phase of *bicolor*. Earlier Kurdjumov (1914 : 2) had suggested the same possibility. However, at present there is no definite proof of this idea. Females apparently hibernate, like those of *bicolor* ; in January 1953 Mr. Gradwell found a female *pyrrhogaster* amongst grass roots. Otherwise adults occur in the field most frequently from July until October.

PSILOCERA Walker

Psilocera Walker, 1833 : 373. Type-species : *Ps. obscura* Walker, by monotypy.
Metopon Walker, 1834 : 302. Type-species : *M. atrum* Walker, by monotypy.
Eupsilocera Westwood, 1839 : 69 [n. n. for *Psilocera* Walker, supposedly pre-occupied].
Metopum Agassiz, 1846 : 670 [invalid emendation].
Dichalysis Förster, 1856 : 52, 56 [n. n. for *Psilocera* Walker, supposedly pre-occupied].
Metopum [*sic*] Walker ; Förster, 1856 : 64, 69.
Metopon sgen. *Metopon* Walker ; Thomson, 1878 : 165–168.
Psilocera Walker ; Ashmead, 1904 : 315 [*ex parte*].
Metapon [*sic*] Walker ; Ashmead, 1904 : 314 [*ex parte*].
Psilocera Walker ; Schmiedeknecht, 1909 : 311, 315 [♂ only].
Metopon Walker ; Schmiedeknecht, 1909 : 310, 315 [*ex parte*].
Metapon [*sic*] Walker ; Kurdjumov, 1913 : 6.
Psilocera Walker ; Nikol'skaya, 1952 : 222–223.
?*Psilocera* Walker ; Peck, 1963 : 628–629, [*ex parte*].
Psilocera Walker : Peck *et al.*, 1964 : 54.

Walker (1848: 113) synonymized his genera *Psilocera* and *Metopon*, and this has been accepted by authors who had personal acquaintance with both sexes.

Förster (1856 : 64, 69) stated that the genus *Metopum* [=*Psilocera*] had 3 anelli (Ringeln) in the antennae. Thomson (1878 : 166, "Anm.") refers to Förster's statement and says that he has not himself seen any species of *Metopon* with 3 anelli. Of the species placed in *Psilocera* in the present work, one has 3 anelli, whilst two have 2 anelli, in the female antenna. Males of all three species, however, have 2 anelli. In the female *Psilocera* the segments of the flagellum tend to be very closely compacted so as to be difficult to count, especially the anelli. In spite of the difference in the number of anelli between the females of some species of *Psilocera*, these species are so similar in other respects that their inclusion in a single genus is justified.

I am not sure whether any of the species referred to *Psilocera* by Peck (1963) really belong to it. *Metopon deiphon* Walker, which he includes in *Psilocera*, appears to be near *Spaniopus* or *Trichomalus* according to the type specimen (Hym. 5. 693) in BM(NH). The original descriptions of the other two species, *Metapon californicum* Ashmead and *M. rufipes* Ashmead, fit the characters of *Psilocera* ; but I am acquainted with another North American genus very near *Psilocera*, to which they might equally well belong. Ashmead did not mention the characters which would allow one to decide the question.

Key to European Species

(Females)

1 Antenna (Text-fig. 341) with three anelli and five funicular segments, the third flagellar segment being without sensilla, not or hardly half as long as the fourth segment, and quadrate or even very slightly transverse.
Rather small species, length 2 to 2·7 mm. Basal cell of fore wing having about its distal third pilose. Propodeal costula separated from base of propodeum by hardly one third the total length of the propodeum. Antennal scape mainly, sometimes also the pedicellus and anelli, reddish (*Metopon* Walker). Gaster, Text-fig. 289 . . . ***atra*** (Walker) (p. 465)

– Antennae (Text-figs. 339, 340) with two anelli and six funicular segments, the third flagellar segment provided with sensilla, at least about two thirds as long as the fourth segment, and quadrate or longer than broad (*Psilocera* Walker) 2

2 (1) Antenna (Text-fig. 340) with flagellum strongly clavate (the clava about twice as broad as the first funicular segment) its segments closely compacted ; area of micropilosity on the clava occupying nearly two thirds its length ; first funicular segment 1·6 to 1·9 times as long as broad, as long as or a little longer than the pedicellus. Large species, length 2·6 to 4 mm. Basal cell of fore wing often having its distal half or more pilose
crassispina (Thomson) (p. 466)

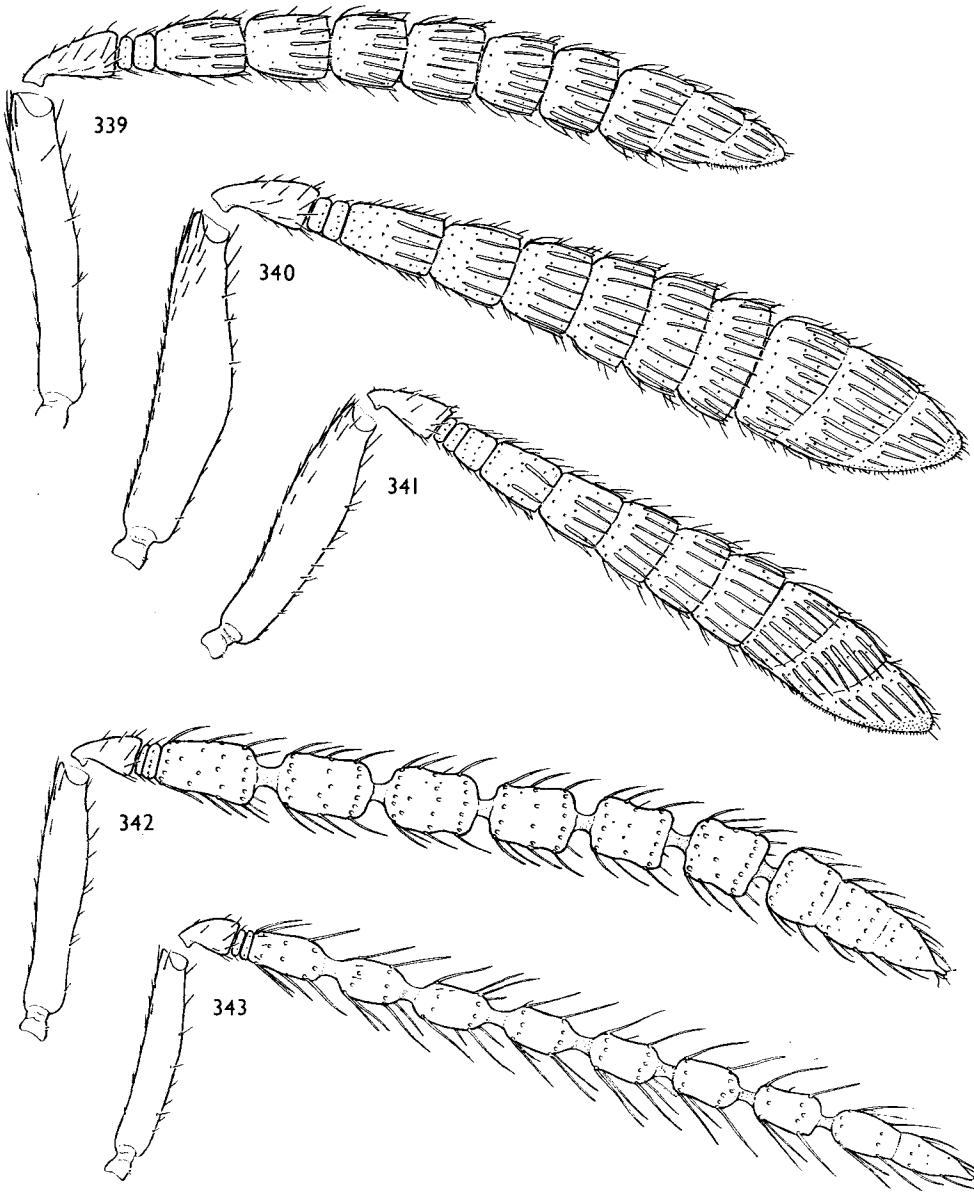
– Antenna (Text-fig. 339) with flagellum only moderately clavate (the clava about 1·5 times as broad as the first funicular segment) its segments separated by deep constrictions ; area of micropilosity on the clava occupying only half or barely half its length ; first funicular segment varying from quadrate to 1·5 times as long as broad, at most barely as long as the pedicellus. Smaller species, length 2·05 to 2·9 mm. Basal cell of fore wing with only a few hairs in its upper distal corner . ***obscura*** Walker (p. 466)

(Males)

1 Antenna (Text-fig. 342) with funicle with only six segments separated by

peduncles ; clava three-segmented ; hairs of flagellum standing out less strongly, at an angle of about 30° to 40° . . . ***atra*** (Walker) (p. 465)

– Antenna (Text-fig. 343) with funicle with seven segments separated by peduncles ; clava two-segmented ; hairs of flagellum standing out at an angle of 45° to 60° 2



FIGS. 339–343. *Psilocera* spp., antennae. 339, *obscura* Walker, ♀ ; 340, *crassispina* (Thomson), ♀ ; 341, *atra* (Walker), ♀ ; 342, same, ♂ ; 343, *obscura* Walker, ♂.

2 (1) Antenna with combined length of pedicellus and flagellum only 1·3 to 1·4 times the breadth of the head ; seventh funicular segment quadrate or very slightly transverse . . . . . ***crassispina*** (Thomson) (p. 466)

– Antenna (Text-fig. 343) with combined length of pedicellus and flagellum 1·6 to 1·7 times the breadth of the head ; seventh funicular segment at least very slightly longer than broad, up to 1·6 times as long as broad ***obscura*** Walker (p. 465)

Psilocera atra (Walker)

Metopon atrum Walker, 1834 : 303, ♀.
Metopon atrum Walker ; Haliday, 1841–1842 : v, pl. B, fig. 3, ♀.
Metopon punctifrons Thomson, 1878 : 168, ♂ ♀, **syn. n.**

Type material. *Metopon atrum* Walker. One female, designated LECTOTYPE (probably holotype), bearing a Waterhouse label.

Metopon punctifrons Thomson. Syntypes, 5 specimens. LECTOTYPE, a male labelled " Bås " [Båstad].

BRITAIN, SWEDEN, CZECHOSLOVAKIA.

Biology. Unknown. The species generally occurs in open grassy situations. Imagines May–August.

Psilocera obscura Walker

Psilocera obscura Walker, 1833 : 374, ♂.
Psilocera obscura Walker ; Haliday, 1841–1842 : v, pl. D, fig. 3, ♂.
Metopon concolor Thomson, 1878 : 168, ♀ [lectotype], **syn. n.**

Type material. *Psilocera obscura* Walker. In BM(NH) there are no specimens labelled as *obscura* ; but standing with the series of *Prosodes ater* Walker (and bearing a Waterhouse label " Prosodes ater ") there is a male *Psilocera* which fits the description of *obscura* well and is now designated LECTOTYPE. It could easily have been misplaced and wrongly labelled, especially since in Walker's *Monographia* (*Ent. Mag.*, 1) the genus *Prosodes* follows immediately after *Psilocera*. Other evidence supports the conclusion that my identification of *obscura* is correct. Thus in Haliday's collection there is a male (No. 641) labelled " Psilocera obscura " and conspecific with the lectotype. In Westwood's collection there is a Walker male labelled " Psilocera obscura " in his handwriting, also conspecific with the lectotype. The specimen in Westwood's collection could well be taken as lectotype but I have chosen the male in BM(NH) in preference, since most of Walker's types are in that museum. The male in Haliday's collection may well be that from which Haliday's figures (1841–1842 : pl. D, figs. 3, 3a) were drawn.

Metopon concolor Thomson. Syntypes, 6 specimens. Lectotype, a female labelled " Ö " [Öland]. The male associated with this species by Thomson may be a small specimen of *crassispina*.

BRITAIN, SWEDEN, CZECHOSLOVAKIA.

Biology. Unknown. Imagines May–August.

Psilocera crassispina (Thomson)

Pteromalus curtus Zetterstedt, 1838 : 422, ♀ [*nec P. curtus* Walker, 1835 : 490].
?Pteromalus obumbratus Walker, 1874 : 316, ♂ [*nec P. obumbratus* Walker, 1872 : 122].
Metopon crassispina Thomson, 1878 : 166, ♂ ♀.
Pteromalus curtulus Dalla Torre, 1898 : 119 [n. n. for *Pteromalus curtus* Zetterstedt *nec* Walker].
?Pteromalus nicaeensis Dalla Torre, 1898 : 137 [n. n. for *Pteromalus obumbratus* Walker 1874, *nec* 1872].
Psilocera crassipina (Thomson) Dalla Torre, 1898 : 157.
Metopon crassispina Thomson ; Masi, 1944 : 84, ♂ ♀.

Type material. *Pteromalus curtus* Zetterstedt. One female designated LECTOTYPE, labelled in Zetterstedt's handwriting " P. curtus ♀. Kengis ".

Pteromalus obumbratus Walker, 1874. Syntypes, 2 ♀. LECTOTYPE labelled " Amurland. Coll. F. Walker 1913–71 " and " 661 " ; the specimen is card-pointed. It may be within the range of variation of male *crassispina*.

Metopon crassipina Thomson. Syntypes, 7 specimens. LECTOTYPE, a female labelled " O.G. Bhn " [Oster Gottland, Boheman] and " crassispina Ths ". It is not easy to decide just how extensive is the variation of *crassispina*. As regards females from Britain, France and Sweden, there is some variation in the fore wings, which may be relatively broad or rather narrow, subhyaline or slightly infumate ; the basal cell may have only a few hairs distally or, at the other extreme, may be mainly pilose. The length of the first funicular segment relative to that of the pedicellus varies slightly (from 0·9 to 1·15).

A number of females from Czechoslovakia which Dr. Bouček kindly allowed me to examine, show greater variation and are rather puzzling. One form from Moldavia has the fore wing very narrow and strongly infumate, with the basal cell pilose except at its base. Others have the fore wing rather broad, subhyaline or weakly infumate, with the basal cell, not counting the basal vein, sometimes bare, sometimes with about the distal third pilose ; in some of these specimens the first funicular segment is shorter, in others longer, than the pedicellus. A few specimens are intermediate. At first sight the Moldavian form with narrow infuscate wings appear as though it might be distinct, but the existence of intermediate forms seems to negative this idea. Possibly all these forms from Czechoslovakia are *crassispina*, however. Whatever their status, the apparent variation of *crassispina* in Central Europe will pose some problems.

BRITAIN, FRANCE, SWEDEN, CZECHOSLOVAKIA, ITALY.
Biology. Unknown. Imagines June–August.

Psilocera ? *pandens* (Walker)

Pteromalus pandens Walker, 1872 : 101, ♂.

Type material not located. The species was described from Spain. Walker (1874 : 316) says that his *Pteromalus obumbratus*, 1874 [which is a *Psilocera*, see above under *crassispina*] is allied to *pandens*, so that the latter may also have belonged to this genus.

Extra-limital species wrongly placed in *Psilocera*

Metopon Deiphon Walker (1843*e* : 161, ♀) is represented in BM(NH) by Type Hym. 5. 693 ; the specimen appears to be near *Spaniopus* or *Trichomalus*.

CALLIPRYMNA Graham

Calliprymna Graham, 1966*b* : 295–297. Type-species : *C. bisetosa* Graham, by monotypy and original designation.

Calliprymna bisetosa Graham

(Text-figs. 344–348)

Calliprymna bisetosa Graham, 1966*b* : 297–298, ♀.

Type material. Holotype ♀, England: Oxfordshire, 14.viii.1955, in Hope Department, University Museum, Oxford.

ENGLAND.

Biology. Unknown ; the holotype was beaten from foliage of *Salix fragilis* L.

CATOLACCUS Thomson

Pteromalus sgen. *Catolaccus* Thomson, 1878 : 146, 152. Type-species : *C. cavigena* Thomson, by monotypy.
Catolaccus Thomson ; Ashmead, 1904 : 320, 322.
Catolaccus Thomson ; Schmiedeknecht, 1909 : 328, 330, 355–356 [*ex parte*].
Merisoides Masi, 1911 : 141. Type-species : *M. crassiceps* Masi, by monotypy.
Catolaccus Thomson ; Kurdjumov, 1913 : 5.
Merisoides Masi ; Kurdjumov, 1913 : 5.
Catolaccus Thomson ; Nikol'skaya, 1952 : 223.
Catolaccus Thomson ; Peck *et al.*, 1964 : 50.

In the opinion of Dr. Delucchi, who has seen the type-species of *Merisoides* Masi, this genus is the same as *Catolaccus* Thomson.

Only one European species is recognized here ; this shows some variation, however, and it seems possible that it may not be a homogeneous entity.

Catolaccus ater (Ratzeburg)

(Text-fig. 302)

Pteromalus ater Ratzeburg, 1852 : 233, ♂ ♀.
Catolaccus cavigena Thomson, 1878 : 152, ♀.
?Merisoides crassiceps Masi, 1911 : 141–145, ♀.
Catolaccus ater (Ratzeburg) Kurdjumov, 1912 : 232–233, ♂ ♀.
Catolaccus ater (Ratzeburg) ; Bouček, 1965*e* : 8.

Type material. *Pteromalus ater* Ratzeburg. Types presumed destroyed. Kurdjumov (1912) who had seen the type of *ater*, placed it in *Catolaccus* and cited *C. cavigena* Thomson as a synonym ; his opinion has been generally accepted.

Catalaccus cavigena Thomson. Syntypes, 3 ♀. Lectotype labelled " Sm. Bhn " [Småland, Boheman] and " cavigena Ths ".

Merisoides crassiceps Masi. Holotype ♀, Italy, Catanzaro, from the cocoon of an Ichneumonid on *Inula viscosa*, presumably in Museo Civico di Storia Naturale, Genoa. Masi (1911 : fig. 3) shows the antenna of *crassiceps* as having 3 anelli and 5 funicular segments, whereas all the females of *ater* that I have seen have 2 anelli and 6 funicular segments ; *crassiceps* may, however, have been a very aberrant female of *ater*.

BRITAIN, SWEDEN, GERMANY, CZECHOSLOVAKIA.

Biology. Reared in Sweden as a hyperparasite of an unknown host through *Apanteles globatus* (L.) by A. Jansson (1952*a* : 180) ; also recorded as a parasite of *Apanteles spurius* Wesm. in Germany (Secrétariat, etc., 1957 : 320, 325), and of *Rhynchaenus salicis* L. in Italy (ibid., 1963 : 342, 357). Otten (1940 : 185) recorded having reared it in Germany, often from *Apanteles congestus* Nees and *Gelis* sp., and twice from *Chamaepora* [=*Apatele*] *rumicis* (L.) (Lep., Noctuidae). Imagines in April, May, July and August.

ERYTHROMALUS Graham

Erythromalus Graham, 1956 : 83. Type-species : *Pteromalus nubilipennis* Walker, 1835, by original designation.

The two species included here are somewhat variable, particularly in the relative length of the gaster in the female, and the pilosity of the basal cell of the fore wing ; but I believe they are distinct.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Antenna with combined length of pedicellus and flagellum equal to or slightly greater than breadth of head. Basal cell of fore wing (Text-fig. 350) having at most its distal half pilose. Gaster slightly longer than head plus thorax, 1·9 to 2·2 times as long as broad (Text-fig. 349) . . . . . ***nubilipennis*** (Walker) (p. 468)

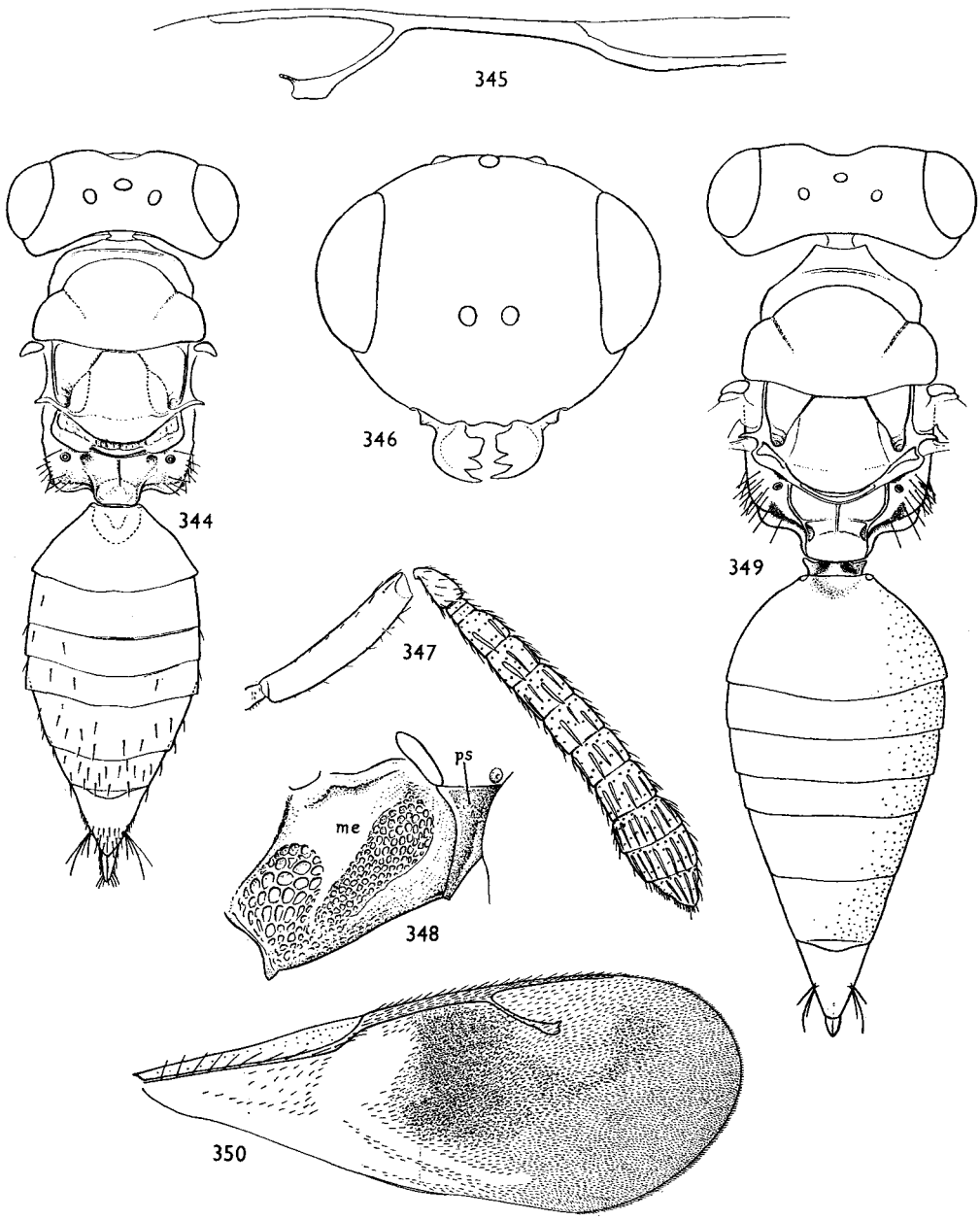
– Antenna with combined length of pedicellus and flagellum slightly to quite distinctly less than breadth of head. Basal cell of fore wing having at least its distal two thirds pilose, sometimes wholly pilose except just at the base. Gaster shorter than, or at most as long as, head plus thorax, 1·65 to 1·9 times as long as broad ***rufiventris*** (Walker) (p. 470)

The males of *Erythromalus* are not keyed because that of *nubilipennis* has not definitely been identified.

Erythromalus nubilipennis (Walker)

Pteromalus nubilipennis Walker, 1835*a* : 195, ♀.
?Pteromalus Faustina Walker, 1839 : 251, ♂.
Erythromalus nubilipennis (Walker) Graham, 1956 : 84–86, ♀.

Type material. *Pteromalus nubilipennis* Walker. Lectotype designated by Graham (1956 : 86) who also redescribed the ♀.



FIGS. 344–350. 344, *Calliprymna bisetosa* Graham, ♀, body, excluding appendages ; 345, same, fore wing venation ; 346, same, head ; 347, same, antenna ; 348, same, postspiracular sclerite (*ps*) and mesopleuron (*me*) of right side ; 349, *Erythromalus nubilipennis* (Walker), ♀, body, excluding appendages ; 350, same, fore wing.

Pteromalus faustina Walker. One male, LECTOTYPE ; Waterhouse label. It could well be the ♂ of *nubilipennis*.

BRITAIN, IRELAND.
Biology. Unknown. Imagines July–Aug.

Erythromalus rufiventris (Walker)

Pteromalus rufiventris Walker, 1835 : 192, ♀.
Pteromalus Empoclus Walker, 1839 : 214, ♂.
Erythromalus rufiventris (Walker) Graham, 1956 : 86, ♀.

Type material. *Pteromalus rufiventris* Walker. Lectotype ♀, designated by Graham (1956 : 86).
Pteromalus empoclus Walker. One male, designated LECTOTYPE (possibly holotype), bearing a Waterhouse label. It definitely belongs to *Erythromalus*, and probably to *rufiventris* (Walker).

BRITAIN, CZECHOSLOVAKIA.
Biology. Unknown. Imagines in September.

ENDOMYCHOBIUS Ashmead

Endomychobius Ashmead, 1896 : 227. Type-species : *E. flavipes* Ashmead, by monotypy.
Endomychobius Ashmead ; Schmiedeknecht, 1909 : 328, 330, 335.
Endomychobius Ashmead ; Ruschka, 1924 : 14–15.

I have not seen the type-species of this genus but presume that it is correctly identified here. The only European species, *endomychi* (Walker), was referred to *Endomychobius* by Ruschka (1924 : 14).

Endomychobius endomychi (Walker)
(Text-fig. 305)

Pteromalus Endomychi (Curtis MS.) Walker, 1836 : 496, "♂" [*recte* ♀].
Pteromalus Mazaces Walker, 1844*a* : 341, "♂" [*recte* ♀], **syn. n.**
Endomychobius endomychi (Walker) Ruschka, 1924 : 14.

Type material. *Pteromalus endomychi* Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen, bearing a Waterhouse label ; it is evidently a Curtis specimen, being mounted in his style, on a small card-point which is gummed to a rectangular card.
Pteromalus mazaces Walker. Syntypes, 2 ♀. One, bearing a Waterhouse label, is selected as LECTOTYPE.

BRITAIN, GERMANY, NORWAY (Alten), SWEDEN ; uncommon.
Biology. Reared in 1835 from larvae of *Endomychus coccineus* (L.) found by John Curtis under the bark of "the decayed stump of a Fir-tree" (Curtis, 1835 : folio 570). He stated that he found the larvae "in the plantations of my

friend Philip Bennet, Esq., of Rougham Old Hall" [this locality is in Suffolk, just east of Bury St. Edmunds]. Ruschka (1924 : 14) recorded the rearing of *endomychi* in Sweden, by F. Nordström, from the same host. In BM(NH) there is a large series, reared in England (Somerset, Bridgwater, July 1923) from the same host, by Miss Barrington. Imagines have been taken (in Britain) in May, July, and September.

PSYCHOPHAGOIDES gen. n.

(Derivation : from *Psychophagus*, and *-oides*, like. Gender: masculine).
Type-species: *Psychophagoides crassicornis* sp. n.

Only the female sex is known and has the following characters:

Occiput not margined. Genae without a hollow above the bases of the mandibles. Left mandible with three teeth, right mandible with four. Clypeus strigose, its anterior margin shallowly emarginate. Antennae (Text-fig. 310) inserted distinctly above level of ventral edge of eyes, toruli about equidistant from anterior margin of clypeus and the median ocellus, formula 11263 ; anelli strongly transverse ; flagellum notably stout, with very numerous sensilla arranged in two rows on each segment ; sutures of clava not oblique. Pronotum short, without a collar, the dorsal part rounded off anteriorly. Notauli incomplete. Scutellar frenum marked off by a fairly distinct line. Propodeum rather short, medially not produced beyond the bases of the hind coxae, its hind margin therefore nearly straight ; median carina weak, plicae indistinct ; nucha represented only by a small subtriangular, weakly sculptured area ; spiracular sulci moderately distinct, spiracles rather small, subcircular, nearly touching the metanotum ; callus sparsely pilose. Postspiracular sclerite rather large, mainly reticulate. Mesepisternum with a partly smooth area below base of hind wing ; mesosternal mesolcus subobsolete. Hind coxae bare dorsally ; hind tibia with one strong spur, and a second very weak spur, which is only about one third as long as the first. Fore wing with a speculum ; marginal vein much longer than the stigmal vein ; postmarginal vein slightly shorter than the marginal ; stigma small. Costal cell of hind wing bare. Gastral petiole transverse, smooth. Gaster ovate, pointed apically ; ovipositor sheaths hardly projecting beyond the last tergite ; tip of hypopygium situated about half way along the gaster ; pygostylar bristles relatively short, subequal in length.

This genus is on the whole nearest to *Psychophagus* Mayr ; the female differs as follows :

Antennal flagellum stouter, thicker proximally (thinner and filiform in *Psychophagus*) with more numerous sensilla, in *Psychophagus* arranged in one row on each segment, or at most a partial second row on the proximal segments ; anelli more transverse, only about twice as broad as long in *Psychophagus ;* pronotal collar not differentiated, in *Psychophagus* there is a subhorizontal collar which has at least a weak margin anteriorly ; sculpture of scutellum slightly raised, engraved in *Psychophagus*, frenum longer and more distinctly marked off ; propodeum not produced medially, distinctly so in *Psychophagus*, with basal foveae small, instead of large and oblong, spiracles close to metanotum, separated from it by nearly their own length in *Psychophagus* ; gaster pointed, instead of obtuse apically ; marginal vein longer relatively to the stigmal vein, the latter nearly straight, very distinctly curved in *Psychophagus*, Text-fig. 308 ; postmarginal vein slightly shorter, instead of slightly longer than the marginal. In *Psychophagoides* the anterior margin of the clypeus is shallowly emarginate instead of incised, whilst the ratio of POL to OOL is relatively greater than in *Psychophagus*.

Psychophagoides crassicornis sp. n.

(Text-fig. 310)

♀. Head and thorax bluish black ; gaster black, basal tergite and last tergite bluish-tinged. Antennal scape testaceous, slightly darker at tip ; pedicellus fuscous, testaceous apically ; flagellum brown. Mandibles brown. Coxae concolorous with the thorax ; femora mainly fuscous, testaceous at tips ; trochanters partly fuscous ; rest of legs testaceous with tips of tarsi brown. Tegulae black ; wings subhyaline, venation brown. Length 2·5 mm. Head only slightly broader than the mesoscutum, in dorsal view about 2·15 times as broad as long, with temples moderately convergent and about one quarter as long as eyes ; POL 1·7 OOL, ocelli in a triangle of about 135°. Genae moderately buccate, malar space half the length of an eye. Eyes separated by 1·4 times their length, inner orbits diverging very slightly ventrad. Breadth of oral fossa about 2·15 malar space. Mandibles moderate-sized, their lower edge slightly curved ; outer tooth acute, middle ones subobtuse, inner one truncate, in the left mandible broadly so. Clypeus radiately strigose, the striae extending some way up the genae ; head otherwise very finely reticulate ; vertex clothed with black bristly hairs. Antenna (Text-fig. 310) : scape about three quarters the length of an eye, about four times as long as broad, barely reaching the median ocellus ; combined length of pedicellus and flagellum about equal to breadth of head ; pedicellus (profile) about 1·5 times as long as broad, nearly as long as first funicular segment ; anelli about three times as broad as long ; flagellum stout, subfusiform, thickest at about the second funicular segment, thence tapering slightly distad, proximally distinctly stouter than the pedicellus ; first funicular segment about 1·2 times as long as broad, second and third subquadrate, following segments slightly transverse ; clava about 2·3 times as long as broad, about as long as 2·5 of the preceding funicular segments, with a small tuft of micropilosity at the tip of its third segment ; sensilla short and thick, arranged in two rows on each segment, a partial third row on the first segment.

Thorax about 1·5 times as long as broad. Pronotum, mesoscutum and scutellum with black bristly hairs. Pronotum very finely reticulate, with a narrow smooth line along its hind margin. Mesoscutum about 1·75 times as broad as long, its reticulation slightly raised above the general surface, very fine, except discally where it is slightly stronger and coarser. Scutellum as long as the mesoscutum and about as broad as long, moderately convex ; frenum unusually long, about one third the total length of the scutellum ; very finely reticulate, extremely finely on disc, the frenum somewhat more coarsely. Dorsellum a convex transverse strip, about four times as broad as long, finely reticulate. Propodeum about two fifths as long as the scutellum ; median carina weak and irregular ; plicae indicated only by a pair of small depressions at the base of the propodeum and by a pair of sharp carinae in the posterior third ; area between the plicae obliquely strigose-reticulate, moderately shiny, that between plicae and spiracular sulci longitudinally strigose-reticulate ; spiracular sulci distinct but shallow, with a number of fine transverse ridges. Postspiracular sclerite finely reticulate. Mesosternum finely reticulate, more coarsely at sides ; mesepisternum finely reticulate, the upper subtriangular area having its dorsal half smooth ; mesepimeron rather coarsely reticulate. Legs rather short, femora rather stout. Fore wing moderately broad ; costal cell about nine times as long as broad, its upper surface bare, lower surface with a single complete row of hairs plus some scattered hairs in the distal third ; parastigma somewhat thickened ; basal cell virtually bare, open below except at apex ; basal vein pilose throughout ; speculum moderate-sized, on upper surface of wing extending hardly beyond the beginning of the marginal vein, open below ; marginal vein 1·9 times as long as the stigmal vein and 1·1 times as long as the postmarginal ; stigmal vein nearly straight, stigma small, suboval, separated by nearly three times its height from the costal edge of the wing ; fringe of apical margin of wing very short.

Gastral petiole more than three times as broad as long. Gaster about as long as, but somewhat broader than, the thorax, 1·3 times as long as broad, slightly sunken dorsally and convex ventrally ; basal tergite occupying rather less than one third of the whole, its hind margin

weakly curved ; last tergite nearly three times as broad as long ; ovipositor sheaths projecting by a length nearly equal to that of last tergite.

Holotype ♀. ENGLAND : Oxfordshire, Chiltern Hills, Christmas Common, 12.viii.1962 (*Graham*), in Graham collection.

Biology. Unknown.

PSYCHOPHAGUS Mayr

Pteromalus sgen. *Diglochis* Thomson, 1878 : 147, 156. Type-species : *Pteromalus omnivorus* Walker, 1835, by monotypy [*nec Diglochis* Förster, 1856].
Psychophagus Mayr, 1904 : 598 [n. n. for *Diglochis* Thomson *nec* Förster].
Diglochis Ashmead, 1904 : 320, 322 [*nec* Förster].
Diglochis Schmiedeknecht, 1909 : 329, 330, 357 [*nec* Förster].
Psychophagus Mayr ; Kurdjumov, 1913 : 8, 16.
Psychophagus Mayr ; Nikol'skaya, 1952 : 228.
Psychophagus Mayr ; Peck, 1963 : 696–698.
Psychophagus Mayr ; Peck *et al.*, 1964 : 54.

Only one species is found in Europe ; another occurs in North America.

Psychophagus omnivorus (Walker)

(Text-fig. 308)

Pteromalus omnivorus Walker, 1835 : 204, ♂ ♀.
Pteromalus Processionae Ratzeburg, 1844*a* : 194, ♀.
Pteromalus rotundatus Ratzeburg, 1844*a* : 194 (footnote).
Pteromalus Antorides Walker, 1845 : 262, ♂, **syn. n.**
Pteromalus Coeruleocephalae Ratzeburg, 1852 : 237.
Diglochis omnivorus (Walker) Thomson, 1878 : 157.
Pteromalus chrysorrhoeae Dalla Torre, 1898 : 117 [n. n. for *Pteromalus rotundus* Ratzeburg *nec* Fonscolombe].
Psychophagus omnivorus (Walker) Mayr, 1904 : 598.
Psychophagus omnivorus (Walker) ; Kurdjumov, 1913 : 16.
Psychophagus omnivorus (Walker) ; Bouček, 1961 : 83–84.
Psychophagus omnivorus (Walker) ; Peck, 1963 : 696–698.

Many other references are cited by Peck (1963).

Type material. *Pteromalus omnivorus* Walker. Syntypes, 2 ♀ and 2 males. One female is pinned and is labelled " Paris reared from Coccinella [sic!] " ; it clearly came from Laporte (Castelnau) who is mentioned by Walker (1835 : 205), but the host cited on the label is incorrect. The other syntypes probably represent the British material referred to by Walker. The specimen which agrees best with the description, a male, is designated LECTOTYPE ; it has been remounted on a card-point, and bears a Waterhouse label " Pteromalus omnivorus Walker ".

Pteromalus processionae Ratzeburg and *P. rotundatus* Ratzeburg. Type material presumably destroyed. The former species was synonymized with *omnivorus* (Walker) by Reinhard (1858 : 18), the latter by Kurdjumov (1913) who also accepted *processionae* as a synonym of *omnivorus*.

Pteromalus antorides Walker. One male, designated LECTOTYPE, bearing a Waterhouse label.

Pteromalus coeruleocephalae Ratzeburg. Syntypes, 2 ♂, in Zoologisches Museum, Berlin (from coll. Ratzeburg), both card-pointed ; the specimen nearest the pin was designated lectotype by Bouček (1961 : 84) who synonymized the species with *omnivorus* (Walker).

It is just possible that *Ichneumon cyniphidis* Linnaeus (1758 : 567) (= *I. cynipedis* L., 1761 : 1639) is the same as *Psychophagus omnivorus*. The Linnean collection (Linnean Society, London) contains a carded ♂ of *omnivorus*, marked " 942 " and labelled " cynipedis ", which agrees with the description. The number 942 (on the card) refers to species no. 942 in Linnaeus, 1746, *Fauna Svecica* (first edition), which reference was cited later by Linnaeus (1758 : 567). His original specimens were reared from terminal twig-galls on *Salix pentandra* L. (? possibly galls of *Euura amerinae* (L.) (Hym., Tenthredinoidea)).

Widely distributed in EUROPE.

Biology. Recorded as a parasite of many species of Lepidoptera, and of a few Tenthredinoidea ; also as a hyperparasite, attacking Ichneumonidae, Braconidae and Tachinidae (see host-list in Peck, 1963). Imagines June–Sept.

STENETRA Masi

Stenetra Masi, 1931 : 170. Type-species : *S. ligustica* Masi, by monotypy.
Stenetra Masi ; Peck *et al.*, 1964 : 47.

Masi considered this genus to be near *Dinarmoides*. In my opinion it is rather close to *Habrocytus* Thomson, from which it differs in having two distinct spurs on the hind tibia, both mandibles with 4 teeth, and to a lesser extent in the structure of the propodeum and pronotal collar.

Stenetra ligustica Masi

Stenetra ligustica Masi, 1931*a* : 170–172, ♀.

Type material. Type (? holotype) ♀, Italy, Liguria, Borgio Verezzi, vii.1921 (*F. Invrea*), in Museo Civico di Storia Naturale, Genoa.

The male of *ligustica* has not been described.

CZECHOSLOVAKIA, ITALY.

Biology. Unknown. Imagines in July.

EURYDINOTA Förster

Eurydinota Förster, 1878 : 42–43. Type-species : *E. leptomera* Förster, by monotypy.
Eurydinota Förster ; Schmiedeknecht, 1909 : 375, 376, 381.
Eurydinota Förster ; Delucchi, 1958*a* : 57–59.
Eurydinota Förster ; Bouček, 1961 : 73–74.
Eurydinota Förster ; Peck *et al.*, 1964 : 41.

This genus was not correctly recognized until 1958, when Delucchi redescribed it. Bouček (1961 : 73–74) added further notes on the genus and also objectively defined the type-species, which is the only one so far known.

Eurydinota leptomera Förster

Eurydinota leptomera Förster, 1878 : 42–43, ♀.
Eurydinota leptomera Förster ; Delucchi, 1958*a* : 59, fig. 1, ♀.
Eurydinota leptomera Förster ; Bouček, 1961 : 73–74, ♀.

Type material. Lectotype ♀ in Zoologisches Museum, Berlin (designated by Bouček, 1961 : 74) ; it is mounted on a micro-pin attached to a block of pith and is labelled " 17/185 Aachen Frst. " and (in Förster's handwriting) " Eurydinota m. leptomeras m. ♀. Aachen " [the letter " s " at the end of *leptomeras* crossed out]. One antenna, the left fore wing, and the left hind leg, have been slide-mounted by Novitzky.

GERMANY, AUSTRIA.

Biology. Unknown. Bouček (1961 : 74) recorded a female captured near Vienna in September.

Note. The North American species placed in *Eurydinota* by Peck (*in* Muesebeck *et al.*, 1951 : 543) belong to other genera ; *lividicorpus* Girault belongs to *Sceptrothelys*, *rufiventris* Girault to *Capellia* (q.v.).

CAPELLIA Delucchi

Capellia Delucchi, 1958*a* : 59. Type-species : *Eurydinota rufiventris* Girault, 1920*a*, by original designation.
Hylocomus Graham, 1959 : 107. Type-species : *Metopon* (*Dirhicnus*) *magnicornis* Thomson, 1878, by original designation.
Capellia Delucchi ; Bouček, 1965*b* : 550–551.

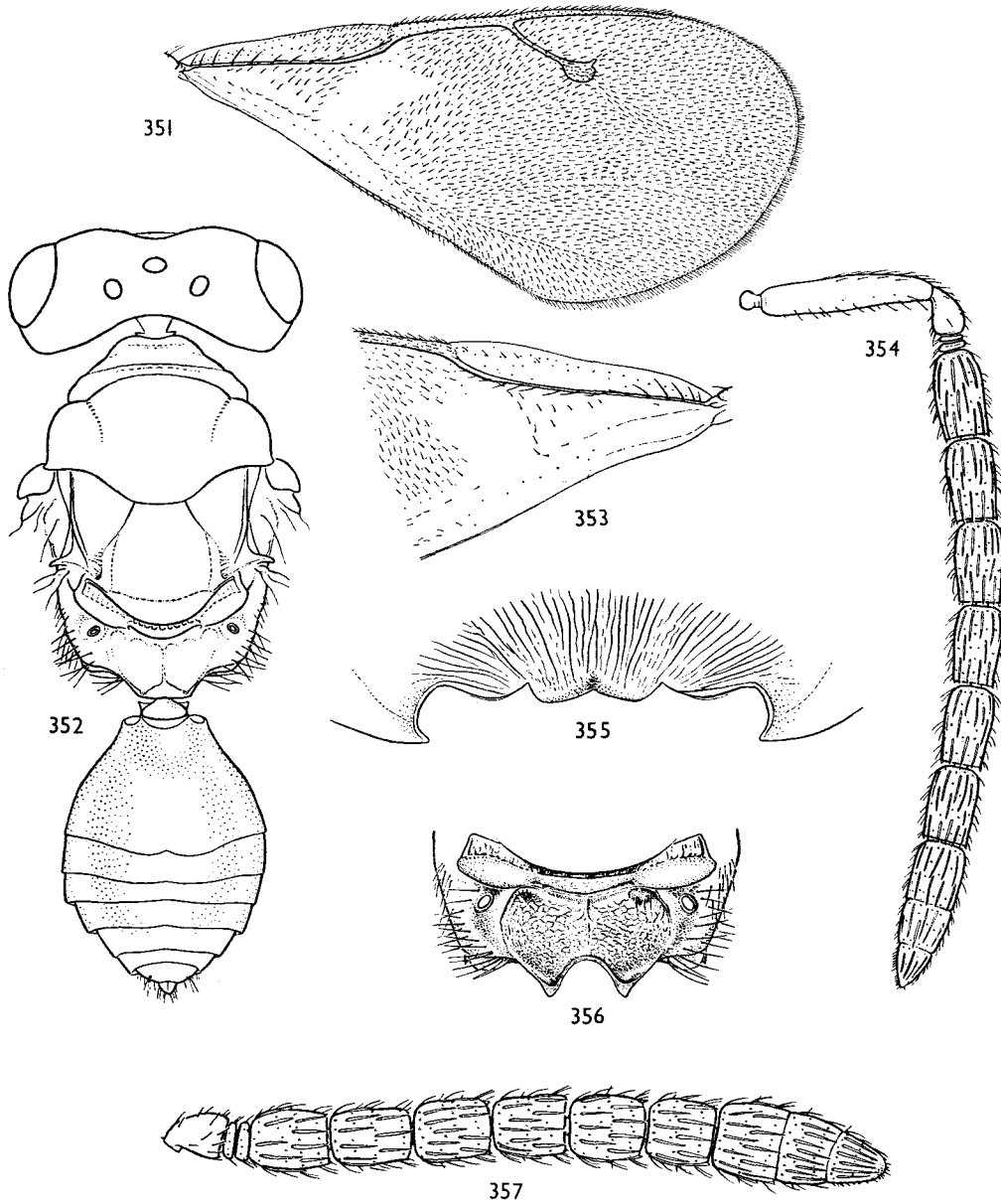
Hylocomus Graham was placed in synonymy with *Capellia* by Bouček (1965*b* : 550), after examining the respective type-species.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Fore wing (Text-fig. 351) with basal cell closed below throughout or except just at base, pilose all over except just above the cubital vein ; lower surface of costal cell with a broad band of hairs, composed of two to four rows ; marginal vein 1·1 to 1·3 times as long as the stigmal vein. Antennal scape reaching only about level with lower edge of median ocellus, its length hardly greater than the transverse diameter of an eye. Hind margin of basal tergite of gaster from very weakly, to quite distinctly emarginate in the middle. Legs on the average darker ; femora nearly always mainly fuscous, tibiae sometimes more or less so.
Body and antennae, Text-figs. 352, 354 . . ***cecidomyiae*** (Ratzeburg) (p. 477)

– Fore wing (Text-fig. 353) with basal cell open below except distally, with at most its distal third pilose, and a row of hairs below the submarginal vein ; lower surface of costal cell usually with only one complete row of hairs, rarely two ; marginal vein



FIGS. 351–357. 351, *Capellia cecidomyiae* (Ratzeburg), ♀, fore wing ; 352, same, ♀, body excluding appendages ; 353, *Capellia orneus* (Walker), ♀, fore wing, part ; 354, *Capellia cecidomyiae* (Ratzeburg), ♀, antenna ; 355, *Mokrzeckia pini* (Hartig), ♀, clypeus ; 356, same, lectotype ♀, metanotum and propodeum ; 357, *Mokrzeckia obscura* sp.n., ♀ antenna excluding scape.

1·25 to 1·55 times as long as the stigmal vein. Antennal scape reaching at least to level of middle of the ocellus, sometimes to level of vertex, its length clearly greater than the transverse diameter of an eye. Hind margin of basal tergite of gaster usually entire, occasionally very weakly emarginate in the middle. Legs on the average paler ; femora often wholly reddish ; tibiae usually reddish or fulvous
orneus (Walker) (p. 477)

(MALES)

1 Fore wing with basal cell closed below except at extreme base, its surface pilose except for a band above the cubital vein ; lower surface of costal cell with two to three complete rows of hairs ; speculum nearly closed below. Hind wing with costal cell with some hairs . . . . . . ***cecidomyiae*** (Ratzeburg) (p. 477)

– Fore wing with basal cell closed below in at most its distal half, with at most its distal third pilose and a line of hairs below the submarginal vein ; lower surface of costal cell with one or two complete rows of hairs ; speculum partly open below. Hind wing with costal cell bare . . . . . ***orneus*** (Walker) (p. 477)

Capellia cecidomyiae (Ratzeburg)

Pteromalus Cecidomyiae Ratzeburg, 1844*a* : 192, ♂ ♀.
Metopon (*Dirhicnus*) *magnicornis* Thomson, 1878 : 173, ♂ ♀.
Pseudocatolaccus Strandi Masi, 1911*a* : 206–207, "♂" [*recte* ♀].
Pteromalus cecidomyiae Ratzeburg ; Kurdjumov, 1913 : 23.
Hylocomus magnicornis (Thomson) Graham, 1959 : 109, ♀.
Capellia cecidomiae (Ratzeburg) Bouček, 1965*b* : 550–551.

Type material. *Pteromalus cecidomyiae* Ratzeburg. Lectotype ♂ designated by Bouček (1965*b* : 550) ; full details are given in his paper. Ratzeburg's *cecidomyiae* was first recognized as belonging to *Capellia* by Bouček, who also placed *Metopon magnicornis* Thomson and *Pseudocatolaccus strandi* Masi in synonymy with it.

Metopon (*Dirhicnus*) *magnicornis* Thomson. Syntypes, 2 ♀, 1 ♂. LECTOTYPE, a female labelled " Dlc Bhn " (Dalecarlia, Boheman) and " *magnicornis* Ths. ". The species was placed in synonymy with *cecidomyiae* (Ratzeburg) by Bouček (1965*b* : 550).

Pseudocatolaccus strandi Masi. Type ♀ (wrongly described as ♂) in Zoological Museum, Berlin, labelled " Norvegia. E. Tönsät 3.iv.03. coll. Strand " (see Bouček, 1961 : 82–83).

BRITAIN, SWEDEN, NORWAY, GERMANY, CZECHOSLOVAKIA, POLAND, JUGOSLAVIA, U.S.S.R.

Biology. Reared in Poland from the resin galls of *Cecidomyia* (=*Itonida*) *pini* (DeG.) on *Pinus* (see Bouček, 1965*b* : 550). Imagines mainly July–Sept. (single records for April and June).

Capellia orneus (Walker)

Pteromalus Orneus Walker, 1839 : 275, ♀.
Pteromalus Tychon Walker, 1848 : 124, 178, ♀.
Hylocomus orneus (Walker) Graham, 1959 : 111–112, ♀.
Capellia orneus (Walker) Bouček, 1965*b* : 550.

Type material. Lectotypes of *Pteromalus orneus* Walker and *P. tychon* Walker designated by Graham (1959 : 111–112).

BRITAIN, FRANCE, CZECHOSLOVAKIA, POLAND.

Biology. Associated with galls of Lepidoptera (*Exoteleia dodecella* (L.)) on pine shoots (see Bouček, 1961 : 83). Imagines June–Sept.

MOKRZECKIA Mokrzecki

Mokrzeckia Mokrzecki, 1933 : 143. Type-species : *Pteromalus pini* Hartig, 1838, by monotypy.
Mokrzeckia Morawski, 1934 : 18–20.
Beierina Delucchi, 1958 : 271. Type-species : *Pteromalus pini* Hartig by orginal designation.
Mokrzeckia Mokrzecki ; Bouček, 1961 : 74.
Mokrzeckia Mokrzecki ; Peck *et al.*, 1964 : 46.

As Bouček (1961) has pointed out, the original diagnosis of *Mokrzeckia* was very imperfect ; hence, as it was published after 1931, it may not be valid according to the International Code of Zoological Nomenclature. This question can only be decided by the International Commission ; meanwhile the name *Mokrzeckia* is provisionally accepted. The genus *Beirina* was synonymized with it by Bouček (1961).

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Anterior margin of clypeus (Text-fig. 355) deeply emarginate with a notch in the middle of the emargination. Legs, including at least the fore coxae partly, yellow-testaceous. Antenna with combined length of pedicellus and flagellum slightly less than breadth of head ; flagellum testaceous or brownish, stout ; proximal segments of funicle quadrate or very slightly longer than broad. Fore wing with marginal vein 1·7 to 1·9 times as long as the stigmal vein ; basal cell, on upperside of wing, with some hairs scattered over its upper half. Mesoscutum about twice as broad as long, extremely finely reticulate. Median area of propodeum (Text-fig. 356) delicately reticulate, moderately shiny. Hind tibia with two spurs, but the second is weak, hardly half as long as the first . . . ***pini*** (Hartig) (p. 478)

– Anterior margin of clypeus shallowly emarginate. Coxae black with a metallic tinge ; femora extensively infuscate. Antenna with combined length of pedicellus and flagellum slightly greater than breadth of head ; flagellum (Text-fig. 357) fuscous, more slender ; funicular segments slightly longer than broad, or at most the sixth quadrate. Fore wing with marginal vein 1·55 times as long as the stigmal vein ; basal cell bare or virtually so. Mesoscutum hardly 1·7 times as broad as long, its disc moderately coarsely reticulate. Median area of propodeum more strongly reticulate, duller. Hind tibia with one spur . . . . ***obscura*** sp. n. (p. 479)

Mokrzeckia pini (Hartig)

(Text-figs. 355, 356)

Pteromalus pini Hartig, [?1837] 1838 : 253, ♂ ♀.
Pteromalus pini Hartig ; Ratzeburg, 1844*a* : 193, pl. 8, fig. 6, ♂ ♀.
? Pteromalus Halidayanus Ratzeburg, 1848 : 207, ♀.

Pteromalus pini Hartig *sensu* Ratzeburg ; Kurdjumov, 1913 : 23.
Schizonotus Pailloti Ferrière & Faure, 1925 : 221.
Mokrzeckia pini (Hartig) Mokrzecki, 1933 : 143.
Mokrzeckia pini (Hartig) ; Morawski, 1934 : 18–20.
Beierina pini (Hartig) Delucchi, 1958 : 271–273, ♂ ♀.
Mokrzeckia pini (Hartig) ; Bouček, 1961 : 74.

Type material. *Pteromalus pini* Hartig. Syntypes in Zoologische Sammlung des Bayerischen Staates, Munich : a whorl of 8 card-pointed specimens (4 ♂, 4 ♀) labelled " Pteromal Pini ". LECTOTYPE, a female whose card-point I have marked with a red spot.

Pteromalus halidayanus Ratzeburg. Types presumed lost. Bouček (1961 : 75) says that, according to the description and host cited, it could be the same as *pini* (Htg.). Kurdjumov (1913 : 23) had already remarked that the two were congeneric, and he had seen the type of *halidayanus*.

Schizonotus pailloti Ferrière & Faure. Holotype female in BM(NH), Type Hym. 5. 701 ; I have examined the specimen.

The synonymy is fully discussed by Bouček (1961 : 74–75).

FRANCE, GERMANY, AUSTRIA, CZECHOSLOVAKIA, POLAND.

Biology. Hyperparasite of Lepidoptera through *Apanteles* species (Ferrière & Faure, 1925 ; Mokrzecki, 1933 ; Delucchi, 1958 ; Bouček, 1961). Imagines June–Aug.

***Mokrzeckia obscura* sp. n.**
(Text-fig. 357)

♀. Head and thorax bluish green ; gaster bronze-green, its basal tergite mainly blue-green, the remaining tergites extensively suffused with purplish. Antennae fuscous ; proximal half of scape testaceous. Coxae concolorous with thorax ; femora mainly fuscous ; rest of legs testaceous with tips of tarsi brownish. Wing hyaline, veins brownish. Length 2·6 mm.

Resembles the ♀ of *pini* (Hartig) but differs mainly in the characters noted in my key to species (q.v.) Other differences are : in *pini* the head, pronotal collar, and mesoscutum are densely clothed with short whitish hairs, whilst in *obscura* the hairs are much sparser and darker ; the propodeal callus of *obscura* is more sparsely pilose than that of *pini*, whilst the reticulation of the head, axillae, and scutellum is less fine and less dense then in *pini*. Although *obscura* thus differs in several characters from *pini*, it seems appropriately placed in the same genus ; the structure of the propodeum and petiole is identical in the two species and appears to be characteristic.

♂. Unknown.

Holotype ♀. ENGLAND : Lancashire South, Freshfield, from *Betula* in the vicinity of pinewood, 5.ix.1960 (*Graham*), in the Hope Department, University Museum, Oxford.

Biology. Unknown.

SPILOMALUS Graham

Spilomalus Graham, 1956 : 88. Type-species : *Pteromalus quadrinota* Walker, 1835, by original designation.

Spilomalus quadrinota (Walker)

(Text-figs. 359–361)

Pteromalus quadrinota Walker, 1835 : 501, ♀.
Spilomalus quadrinota (Walker) Graham, 1956 : 88–89, ♀.

Type material. Lectotype ♀ designated by Graham (1956 : 89) ; the species was redescribed in the same paper (ibid. : 88–89).

BRITAIN: rare, apparently associated with sandy habitats, particularly on the coast. It has also been recorded from Sardinia (Secrétariat, etc., 1966 : 121, 125) but I have not seen the specimens. Imagines July–Sept.

Biology. The specimens recorded from Sardinia were reared from *Auletobius politus* Serv. (Col., Curculionidae).

Spilomalus biquadratus (Wollaston) **comb. n.**

Pteromalus biquadratus Wollaston, 1858 : 27, ♀.

Type material. LECTOTYPE ♀, Type Hym. 5. 723, labelled " Madeira Wollaston " and (on a blue label) " Pteromalus biquadratus W.".

MADEIRA (Lombo dos Pecegueiros).

Biology. Unknown.

This is probably a valid species. The female differs from that of *quadrinota* in having the antennal flagellum more slender, proximally not stouter than the pedicellus ; pronotum, mesoscutum, and scutellum more finely reticulate and more matt, possibly also with more numerous hairs ; fore wing extensively yellowish infumate, with the spots more or less joined.

SPINTHERUS Thomson

Etroxys sgen. *Spintherus* Thomson, 1878 : 88, 129. Type-species : *S. obscurus* Thomson, by monotypy.
Spintherus Thomson ; Ashmead, 1904 : 314, 315.
Spintherus Thomson ; Schmiedeknecht, 1909 : 310, 313–314 [*ex parte*].
Spintherus Thomson ; Kurdjumov, 1913 : 9, 17–18.
Spintherus Thomson ; Nikol'skaya, 1952 : 231 [*ex parte*].
Spintherus Thomson ; Peck *et al.*, 1964 : 58.

Spintherus is very close to *Habrocytus* Thomson and *Pteromalus* Swederus. It differs from *Habrocytus* chiefly in having 4 teeth in both mandibles. The long hypopygium, extending distinctly beyond the middle of the gaster, of female *Spintherus* distinguishes them from all female *Habrocytus* except those of *platyphilus* and *crassicornis* ; those species, however, have a large reticulate propodeal nucha and distinct plicae, whereas the nucha of *Spintherus* is very short and weakly sculptured, and the plicae are distinct only posteriorly. *Spintherus* differs from *Pteromalus* in its propodeal characters (short, weakly sculptured nucha, indistinct plicae, and smaller spiracles) and in the longer hypopygium of the female.

Spintherus dubius (Nees)

Pteromalus dubius Nees, 1834 : 99, ♀.
Pteromalus nigro-aeneus Walker, 1835*a* : 206, ♀, **syn. n.**
Pteromalus signatus Walker, 1836 : 479, ♀, **syn. n.**
Pteromalus orbiculatus Walker, 1836 : 490, ♀, **syn. n.**
Pteromalus caligatus Walker, 1836 : 494, ♀, **syn. n.**
Pteromalus conterminus Walker, 1836 : 494, ♀, **syn. n.**
Pteromalus Codrus Walker, 1839 : 249, ♂, **syn. n.**
Pteromalus triqueter Förster, 1841 : 21, ♀, **syn. n.**
Pteromalus flavitarsis Förster, 1841 : 21, ♀, **syn. n.**
Pteromalus lutescens Förster, 1841 : 30, ♀, **syn. n.**
Pteromalus Opheltes Walker, 1848 : 124, 183, ♂, **syn. n.**
Pteromalus Hermachus Walker, 1848 : 124, 187, ♂, **syn. n.**
Pteromalus Anchinoe Walker, 1848 : 125, 192, ♂, **syn. n.**
Pteromalus Alimentus Walker, 1848 : 126, 210, ♀, **syn. n.**
Pteromalus caligatus Walker, 1874 : 318, ♀.
Spintherus obscurus Thomson, 1878 : 129, ♂ ♀.
Spintherus linearus Kurdjumov, 1913 : 17–18 [nec *Pteromalus linearis* Walker].
Spintherus dubius (Nees) Bouček, 1961*c* : 13.
Spintherus dubius (Nees); Bouček, 1965*e* : 8.

Type material (all Walker lectotypes bear Waterhouse labels unless otherwise stated).

Pteromalus dubius Nees. One female in coll. Westwood, ex coll. Nees, lacking the gaster ; now designated LECTOTYPE. It is pinned and bears a small pink label with the figure " 8 " ; a label in Nees' handwriting " D. 17. dubia m. α ♀ " ; one in Westwood's handwriting " Pteromalus dubius Es. 2. 99. E Mus. Esenb.". The identity of *dubius* was communicated to Dr. Bouček, who published the fact (1961).

Pteromalus nigroaeneus Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen.

Pteromalus signatus Walker. No specimen stood under this name, but one female (LECTOTYPE) was located in the series of *Eutelus signatus* ; it bears a Waterhouse label " *Pteromalus signatus* ". Walker described only the male of *Eutelus signatus* ; evidently the female lectotype of *Pteromalus signatus* had been misplaced with the male syntypes of *Eutelus signatus* when he transferred the latter species to *Pteromalus* (1846 : 39) owing to their having the same trivial name.

Pteromalus orbiculatus Walker. One ♂, two ♀ (but ♂ not described). LECTOTYPE, the second female specimen.

Pteromalus caligatus Walker, 1836. No specimens under this name. The seventh specimen standing under *Pteromalus subniger* Walker, a female, agrees well with the description of *caligatus* and is designated LECTOTYPE. Walker (1846 : 42) placed *caligatus* as a " var." of *subniger*, for which reason I sought the type of *caligatus* under that same.

Pteromalus conterminus Walker. Syntypes, 2 ♀. LECTOTYPE, the first specimen.

Pteromalus codrus Walker. Syntypes, 4 specimens. LECTOTYPE, a male labelled " 38. 7. 12. 217 ".

Pteromalus triqueter Förster, *P. flavitarsis* Förster and *P. lutescens* Förster. Types (not seen by the writer) in Naturhistorisches Museum, Vienna. Delucchi saw these types and placed the three species in synonymy with *Spintherus obscurus* Thomson (Delucchi, 1958*a* : 52).

Pteromalus opheltes Walker. One ♂, LECTOTYPE.

Pteromalus hermachus Walker. One ♂, LECTOTYPE.

Pteromalus anchinoe Walker. One ♂, LECTOTYPE.

Pteromalus alimentus Walker. One ♀, LECTOTYPE.

Pteromalus caligatus Walker, 1874. One ♀, Type Hym. 5. 725, LECTOTYPE, labelled " 142 ", " Amurland. Coll. F. Walker 1913–71 " and (in Walker's handwriting) " Pteromalus colligatus " [*sic*]. It is not clear whether the species name as written on the label is a *lapsus*, or whether Walker intended to describe it under that name. I assume that he had forgotten his earlier *caligatus* (1836).

Spintherus obscurus Thomson. Syntypes on 25 pins. One pin carries 5 females and is labelled " Ö " [Öland] and " obscurus Ths " ; the uppermost female is designated LECTOTYPE.

Widely distributed in EUROPE, from the BRITISH ISLES to U.S.S.R., and extending nearly to the eastern limit of the Siberian region.

Biology. Kurdjumov (1913 : 18) recorded this species [under the name " *Spintherus linearis* Walker "] as having been reared in U.S.S.R. from *Apion trifolii* [? = *aestivum* Germar] and " *A. africum* " [? *apricans* Herbst] ; also as a parasite of *Apion* sp. on clover. I have examined some specimens reared in Britain from *Apion* sp. in the seeds of *Trifolium pratense* L. In Britain imagines appear in the field in April–May and August–September (I swept 1 ♀ on 21.iii.1950, from foliage of *Cupressus*, at Salmonby, Lincolnshire).

Note. *Spintherus dubius* Ashmead (*in* Riley *et al.* 1894*c* : 159, ♀), the type ♀ of which is in BM(NH) as Type Hym. 5. 783, is not a *Spintherus*. It may belong in the neighbourhood of the genus *Chlorocytus* Graham.

SCEPTROTHELYS Graham

Sceptrothelys Graham, 1956 : 89. Type-species : *Pteromalus grandiclava* Walker, 1835*a*, by original designation.

Sceptrothelis Graham ; Delucchi, 1958*a* : 51 [invalid emendation].

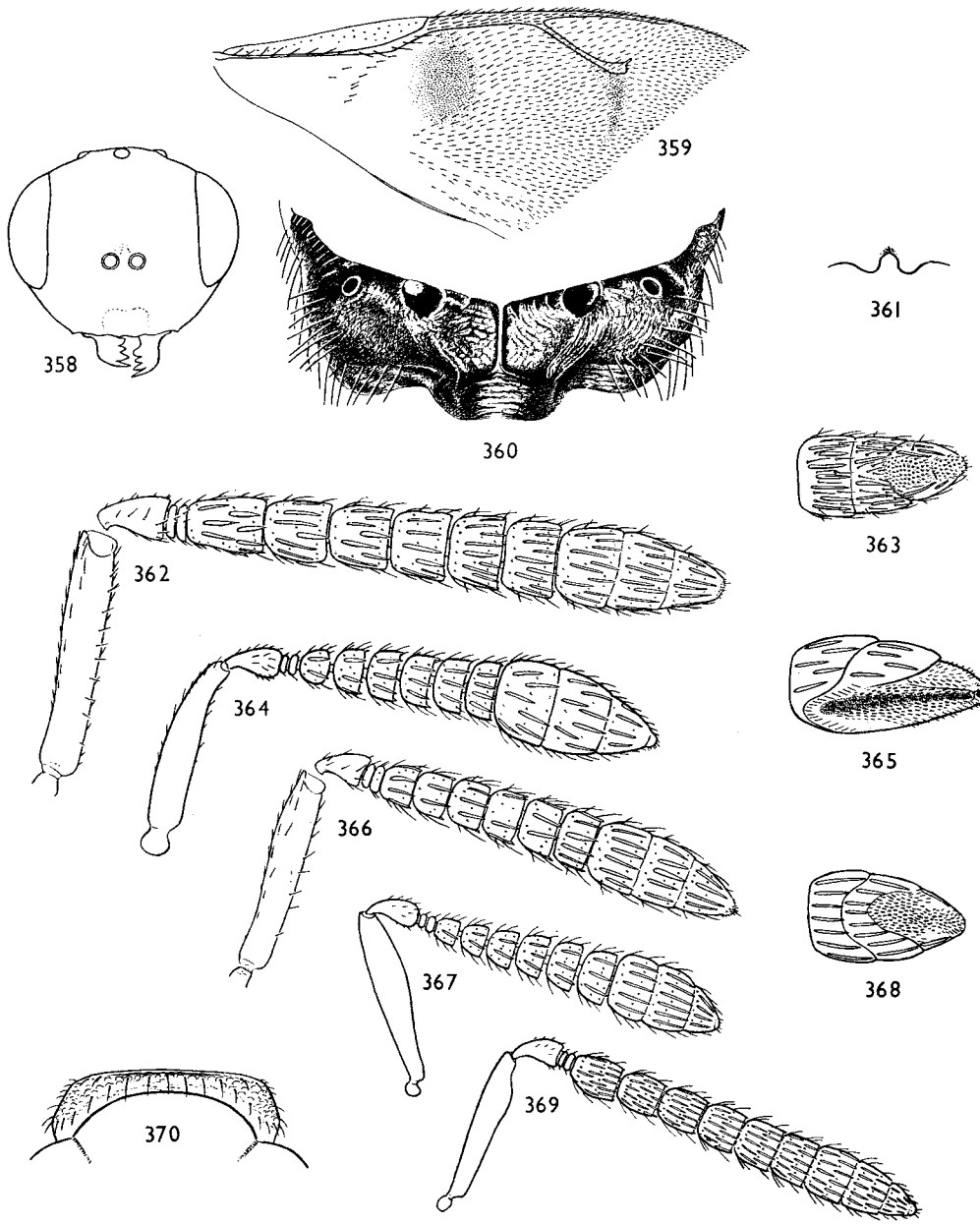
Sceptrothelys Graham ; Peck *et al.*, 1964 : 46.

KEY TO EUROPEAN SPECIES

(FEMALES)

– Antenna (Text-fig. 362) with first funicular segment slightly longer than broad, about equal in length to the pedicellus, second and third subquadrate, the following segments very slightly transverse. Clava viewed ventrally (Text-fig. 363) with its area of micropilosity extending about half way towards the base ; apical margin of first claval segment nearly straight

parviclava sp. n. (p. 487)



FIGS. 358–370. 358, *Spintherus dubius* (Nees), ♀, head ; 359, *Spilomalus quadrinota* (Walker), ♀, fore wing, part ; 360, same, propodeum ; 361, same, clypeus ; 362, *Sceptrothelys parviclava* sp.n., ♀, antenna ; 363, same, clava, ventral ; 364, *Sceptrothelys grandiclava* (Walker), ♀, antenna ; 365, same, clava, subventral ; 366, *Sceptrothelys intermedia* sp.n., antenna ; 367, *Sceptrothelys deione* (Walker), ♀, antenna ; 368, same, clava, ventral ; 369, same, ♂, antenna ; 370, same, ♀, pronotum.

– Antennae (Text-figs. 364, 366, 367) with first funicular segment clearly shorter than the pedicellus and quadrate to slightly transverse, second at least slightly transverse, third to sixth distinctly so. Clava viewed ventrally (Text-figs. 365, 368) with its area of micropilosity extending more than half way towards the base ; apical margin of first claval segment distinctly excised 2

2 (1) Antenna (Text-fig. 364) with clava about as long as the five preceding funicular segments together, sometimes nearly as long as the whole funicle ; viewed ventrally (Text-fig. 365) its area of micropilosity extends nearly to the base of the clava, whose first segment has its apical margin deeply semicircularly excised ; distal funicular segments strongly transverse, the sixth about twice as broad as long ; scape not reaching the median ocellus. Propodeum with nucha occupying about one third of the total length or slightly more
grandiclava (Walker) (p. 486)

– Antenna (Text-figs. 366, 367) with clava about as long as the three or four preceding funicular segments together ; viewed ventrally its area of micropilosity extends two thirds to three quarters of the distance towards the base : distal funicular segments less strongly transverse, the sixth at most about 1·7 times as broad as long : scape reaching at least to the level of the lower edge of the median ocellus. Propodeum with nucha occupying about half the total length 3

3 (2) Antennal scape partly to wholly fulvous : legs except coxae, usually fulvous, sometimes the femora more or less reddish. Pronotal collar indistinctly margined, reticulate except for a very narrow strip along its hind margin. Head and thorax with strong green to greenish blue metallic reflections ; gaster strongly metallic-tinged. Antennal funicle (Text-fig. 366) rather less attenuate proximally, where it is usually slightly stouter than the pedicellus, only just as stout as the pedicellus in small females
intermedia sp. n. (p. 486)

– Antennal scape metallic ; femora mainly dark, tibia usually more or less broadly infuscate. Pronotal collar (Text-fig. 370) distinctly margined, with a fairly broad smoother strip along its hind margin. Head and thorax usually with obscure bluish and bronzy reflections, less often with the mesoscutum and scutellum greenish or coppery. Antennal funicle (Text-fig. 367) rather more attenuate proximally, where it is not stouter than the pedicellus, in small females even less stout . . . . ***deione*** (Walker) (p. 485)

(MALES)

1 Head and thorax bluish black, usually with some bronze reflections on the scutellum and mesoscutum ; legs very dark, the femora mainly blackish, tibiae more or less broadly infuscate. Antenna (Text-fig. 369) with flagellum with subdecumbent hairs, funicular segments quadrate or hardly longer than broad, the first at most as long as the pedicellus ; clava nearly as long as the three preceding funicular segments together. Mesoscutum relatively shiny, its sculpture having wider-meshed areoles. Pronotal collar rather sharply and evenly margined, except just at the sides
deione (Walker) (p. 485)

– Head and thorax usually green to blue-green, occasionally bronze-green ; tibiae nearly always testaceous, sometimes also the femora. Antenna with flagellum clothed with pale or whitish hairs which stand out at an angle of about 30° ; proportions of funicular segments and clava usually otherwise. Mesoscutum relatively duller, its sculpture usually denser. Pronotal collar tending to be less distinctly margined, sometimes nearly immarginate . 2

2 (1) Antenna with clava only about as long as 2·5 of the preceding funicular segments ; funicular segments, except sometimes the sixth, longer than broad, the first at least slightly longer than the pedicellus. Larger species, length 2·1 to 2·5 mm. . . . . ? ***parviclava*** sp. n. (p. 487)

– Antenna with clava slightly longer than the three preceding funicular segments together ; at most some of the funicular segments very slightly longer than broad, the first shorter than or at most as long as the pedicellus. Smaller species, 1·7 to 2 mm. 3

3 (2) Antenna with funicular segments quadrate, or the proximal ones very slightly longer than broad . . . . . ***intermedia*** sp. n. (p. 487)

– Antenna with funicular segments very slightly transverse, or at most the proximal ones quadrate . . . . . ***grandiclava*** (Walker) (p. 486)

Sceptrothelys deione (Walker)

(Text-figs. 367–370)

Miscogaster Deione Walker, 1839 : 199, ♀.
Pteromalus Charops Walker, 1839 : 242, ♂, **syn. n.**
Dicyclus deione (Walker) Walker, 1846 : 28.
Pteromalus Aeacus Walker, 1848 : 211, ♀.
Metopon punctatum Thomson, 1878 : 169, ♀.
Metopon aeneiscapus Thomson, 1878 : 169, ♀, **syn. n.**
Sceptrothelys deione (Walker) Graham, 1956 : 91–92, ♂ ♀.
? Eurydinota lividicorpus Girault, 1917*e* : 86–87.
? Eurydinota leptomera Bakkendorf, 1955 : 148 [*nec* Förster, 1878].

Type material. *Miscogaster deione* Walker and *Pteromalus aeacus* Walker. Lectotypes designated by Graham (1956 : 92).

Pteromalus charops Walker. Syntypes, 3 ♂. LECTOTYPE, the first specimen, bearing a Waterhouse label ; it is a large male of *deione*.

Metopon punctatum Thomson. One ♀, LECTOTYPE, labelled " Reftera " and " transitus ad hona in Foer " ; at first sight it looks different from *deione* but I now consider it must a very large robust example of that species.

Metopon aeneiscapus Thomson. Syntypes, 3 ♀ LECTOTYPE, one labelled " Hg " [Hälsingborg] on a mauve label, and " aeneiscapus Ths ".

From Dr. O. Peck (Ottawa) I have received specimens, identified as *Eurydinota lividicorpus* Girault, which are the same as *Sceptrothelys deione* (Walker). Presumably therefore *E. lividicorpus* (1917*e* : 86–87 ; reared from *Coleophora malivorella* Riley) (Lep., Coleophoridae) is a synonym of *deione*. Incidentally, Bouček's statement (1965*b* : 550) attributing *lividicorpus* Girault to the genus *Spaniopus* Walker was a *lapsus* [personal communication].

Britain, Sweden, ? Iceland ; North America.

Biology. Reared in England " from rose leaves, probably a parasite of *Nepticula* (=*Stigmella*) *centifoliella* (Zell.) " in 1932, by E. G. R. Waters (specimen in Hope Department, Oxford). Four species of *Coleophora* are cited as hosts of *Eurydinota lividicorpus* Gir. by Peck (1963 : 627–628). Imagines May, July–Sept.

Note. The species recorded from Iceland as *Eurydinota leptomera* Förster by

Bakkendorf (1955) is not that species, but may be *Sceptrothelys deione* (Walker). That recorded from England as a parasite of *Coleophora laricella* (Hbn.) under the name *Eurydinota laricinellae* (Ratzeburg), by Ferrière (*in* Thorpe 1933 : 272, 289) was probably not a *Eurydinota*, but may also have been *Sceptrothelys deione*. Ratzeburg originally described *laricinellae* as a *Pteromalus* (1852 : 198), from the same host, and there is nothing in his description which seems to contradict the supposition that it is the same as *deione*.

Sceptrothelys grandiclava (Walker)

Pteromalus grandiclava Walker, 1835*a* : 193, ♀.
Pteromalus claviger Förster, 1841 : 24, ♀.
Sceptrothelys grandiclava (Walker) Graham, 1956 : 89–91, ♂ ♀.
Sceptrothelys grandiclava (Walker) ; Bouček, 1961 : 79.

Type material. *Pteromalus grandiclava* Walker. Lectotype designated by Graham (1956 : 91) ; it bears a Waterhouse label. The species was redescribed in the same paper (1956 : 89–91).

Pteromalus claviger Förster. Lectotype ♀ (not seen by the writer) selected by Delucchi (1958*a* : 51) who stated it to be the same as *grandiclava*.

BRITAIN, SWEDEN, GERMANY, CZECHOSLOVAKIA. The record of "*Pteromalus claviger* Först." from Hungary by Erdös (1948 : 46) evidently refers to some other species than *grandiclava* (Walker).

Biology. Unknown. In Britain the species occurs in open situations (chiefly rough grassland). Imagines June–August.

Sceptrothelys intermedia sp. n.

(Text-fig. 366)

Sceptrothelys grandiclava (Walker) Graham ; Markkula, 1960 : 227 [*nec* Walker].

♀. Head and thorax olive-green, or brighter green to greenish blue ; gaster with strong metallic reflections, especially upon its basal tergite. Mandibles testaceous with reddish teeth. Antennal scape bright testaceous, its distal part more or less infuscate ; pedicellus and flagellum fuscous. Coxae concolorous with the thorax ; legs otherwise bright or reddish testaceous ; the knees, tips of the tibiae, and bases of the tarsi, paler ; tarsi distally, the fore tarsi sometimes wholly, brownish. Tegulae bright or reddish testaceous ; wings subhyaline, venation testaceous. Length 1·5 to 2·2 mm.

Structurally this species closely resembles *grandiclava* (Walker) a redescription of which was given earlier (Graham, 1956 : 89). It differs from *grandiclava* as follows :

The antennal scape is slightly longer, reaching level with the lower edge of the median ocellus or somewhat above this level. The flagellum (Text-fig. 366) is rather less clavate ; the distal funicular segments are less strongly transverse, the sixth being about 1·5 times (instead of about twice) as broad as long ; the clava is relatively shorter, its length about equalling the combined lengths of the three or four preceding funicular segments ; ventrally the clava has a shorter area of micropilosity, which extends from the tip about three quarters of the distance towards the base, whilst the apical margin of the first claval segment is less strongly excised than in *grandiclava*. The propodeum has a slightly larger nucha, whose length is about half, instead of one third or hardly more, the length of the sclerite.

♂. Very similar to that of *grandiclava* (redescribed by me, 1956 : 91). The funicular segments of the antenna appear to be relatively very slightly longer than in male *grandiclava*, quadrate, or the proximal ones very slightly elongate, whilst the propodeal nucha is perhaps slightly larger.

Holotype ♀. FINLAND : Tikkurila, beginning of May 1956 (*M. Markkula*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotypes, several ♂♂ and ♀♀, in Graham collection ; ENGLAND : Berkshire, Wytham, 3 ♀, 23.vi.1956 (*Graham*), in Graham collection.

Biology. The specimens reared by Mr. Martti Markkula were obtained when investigating the biology of the clover weevil, *Phytonomus nigrirostris* F., but it is not certain whether they were actually parasitizing this beetle. They were identified by me as *S. grandiclava* (Walker) since at that time I thought them to come within the range of variation of that species.

Sceptrothelys parviclava sp. n.

(Text-figs. 362, 363)

♀. Head and thorax deep green, verging towards bluish in parts ; almost the whole surface of the gaster with strong bluish green reflections. Mandibles reddish with fuscous teeth. Antennal scape reddish testaceous, its distal third fuscous ; pedicellus fuscous ; flagellum black. Coxae concolorous with the thorax ; legs otherwise mainly reddish testaceous ; femora basally, the hind ones mainly, fuscous ; knees, tips of mid and hind tibiae, and bases of mid and hind tarsi, paler testaceous ; tips of tarsi fuscous. Tegulae and wing venation brownish testaceous ; wings hyaline. Length 2·7 mm.

Antenna (Text-fig. 362) with scape reaching level with the lower edge of the median ocellus ; combined length of pedicellus and flagellum about equal to breadth of head ; pedicellus in profile nearly twice as long as broad ; flagellum only moderately clavate ; first funicular segment about as long as, and distinctly stouter than, the pedicellus, slightly elongate, second and third subquadrate, fourth to sixth more or less transverse, the fourth slightly so, sixth about 1·5 times as broad as long. Clava about equal in length to the three preceding funicular segments ; in ventral view (Text-fig. 363) the apical margin of the first claval segment is nearly straight, that of the second segment is deeply excised ; the area of micropilosity extends about half way towards the base of the clava.

Pronotal collar indistinctly margined, reticulate, with a narrow shiny strip along its hind margin. Propodeum with median carina strong ; nucha occupying rather more than one third of the total length of the sclerite. Fore wing with basal vein pilose throughout ; marginal vein 1·6 times as long as the stigmal vein ; postmarginal vein nearly as long as the marginal.

Gaster conic-ovate, about twice as long as broad, slightly longer than the thorax ; basal tergite (third abdominal) occupying hardly one third of the total length, last tergite about as long as its basal breadth.

Otherwise resembles *grandiclava* (Walker) (see my redescription of that species, 1956 : 89–91) ; the chief characters which distinguish it from that species and the others of the genus are given in the accompanying key.

♂. The males mentioned in my key to *Habrocytus* ♂♂ as doubtfully those of *S. parviclava* may in fact belong to it, but I am not certain.

Holotype ♀. ENGLAND : Lancashire South, Freshfield, 2.vi.1959, swept from a patch of *Carex nigra* (L.), in the northern part of Massam's Slack (*Graham*), in Graham collection.

Biology. Unknown.

The following extra-limital species also belong to *Sceptrothelys* :—

Sceptrothelys consocius (Walker) **comb. n.**

Pteromalus consocius Walker, 1874 : 317, ♂.

Type material. LECTOTYPE ♂, Type Hym. 5. 727, labelled " Amurland. Coll. F. Walker 1913–71 " and (in Walker's handwriting) " Pteromalus consocius ".

The lectotype male of *consocius* is very close to that of *grandiclava* (Walker) but has rather longer funicular segments in the antennae, slightly smaller ocelli, and POL less (only about 1·15 OOL) ; it may, therefore, represent a good species.

ASIA : Amurland.

Biology. Unknown.

Sceptrothelys placens (Walker) **comb. n.**

Pteromalus placens Walker, 1874 : 319, ♂.

Type material. LECTOTYPE ♂, Type Hym. 5. 731, labelled " 142 ", " Amurland. Coll. F. Walker 1913–71 " and (in Walker's handwriting " Pteromalus placens ".

The lectotype male is very close to that of *intermedia* sp. n. but has the antennal flagellum longer (combined length of pedicellus and flagellum greater than breadth of head) ; funicular segments longer ; propodeal nucha rather shorter. No doubt it represents a distinct species.

ASIA : Amurland.

Biology. Unknown.

PTEROMALUS Swederus

Pteromalus Swederus, 1795 : 16 : 201. Type-species : *Ichneumon puparum* L., 1758, by designation of Westwood, 1839 : 71.
Coelopisthia Förster, 1856 : 65. Type-species : *Pteromalus cephalotes* Walker, 1836, by designation of Ashmead, 1904 : 320 [nec *Coelopisthia* of authors].
Pteromalus (*Pteromalus*) Swederus ; Thomson, 1878 : 153–155 [*ex parte* ; sect. A].
Pteromalus Swederus ; Ashmead, 1904 : 320, 321.
Pteromalus Swederus ; Schmiedeknecht, 1909 : 328, 330, 335–354 [*ex parte*].
Pteromalus Swederus ; Kurdjumov, 1913 : 9, 17 [*ex parte*].
Heterolaccus Masi, 1937 : 371. Type-species : *H. mauritanicus* Masi by original designation.
Pteromalus Swederus ; Nikol'skaya, 1952 : 230.
Pteromalus Swederus ; Peck *et al.*, 1964 : 58.

Heterolaccus Masi was placed in synonymy with *Pteromalus* by Bouček (1961 : 93).

The great majority of species described in *Pteromalus* by the earlier authors do not belong to that genus in its restricted sense. Thomson (1878) was the first to redefine it (as a subgenus) in a more natural way, although he included in it two

species which have since been removed to *Eupteromalus* ; his section A corresponds to *Pteromalus* as restricted in the present work. However, the genus *Habrocytus* is extremely close to *Pteromalus*, and it is a matter of opinion whether the two should be united or not. Because of the difficulty in deciding whether some species belong to *Pteromalus* or *Habrocytus* without the inconvenience of looking at the mandibles, I have included the species of both in a single key (see under *Habrocytus*).

Pteromalus puparum (Linnaeus)

(Text-figs. 59, 392)

Ichneumon puparum Linnaeus, 1758 : 567.
Pteromalus puparum (Linnaeus) Swederus, 1795 : 203.
Pteromalus latifrons Walker, 1835 : 501, ♀, **syn. n.**
Pteromalus cephalotes Walker, 1836 : 481, ♀, **syn. n.**
Pteromalus comes Walker, 1836 : 492, ♀, **syn. n.**
Pteromalus Ornytus Walker, 1839 : 238, ♂, **syn. n.**
Pteromalus Brassicae Curtis, 1842 : 8, pl. E, fig. 13, ♀.
Pteromalus Pontiae Curtis, 1842 : 8, ♂.
Pteromalus Orinus Walker, 1845 : 263, ♀, **syn. n.**
Pteromalus Brassicae Curtis, 1860 : 100, ♀.
Pteromalus Pontiae Curtis, 1860 : 100, ♂.
Pteromalus nigricans Walker, 1872*b* : 121, ♀, **syn. n.** [*nec* Förster, 1841].
Pteromalus brassicae Packard, 1877 : 747, ♀.
Pteromalus pieridis Provancher, 1881 : 296, ♂ ♀.
Pteromalus nigritulus Dalla Torre, 1898 : 137 [n.n. for *nigricans* Walker, 1872, *nec* Förster, 1841].
Pteromalus puparum (Linnaeus) ; Masi, 1908*a* : 119–122, ♂ ♀.
Pteromalus puparum (Linnaeus) ; Peck *in* Muesebeck *et al.*, 1951 : 561.
Pteromalus puparum (Linnaeus) ; Peck, 1963 : 718–721.

Type material. *Ichneumon puparum* Linnaeus. There are 10 specimens in the Linnean collection (Linnean Society, London). They are mounted on two large cards, on each of which is written " In puppa Urticana "; one card bears 6 ♂♂ and a pupal skin, the other 4 ♀♀, all belonging to the species currently known as *Pteromalus puparum*. I designate as LECTOTYPE the uppermost ♀ (that nearest the word " Urticana " on the second card. Linnaeus (1758 : 567) cited DeGeer (" *De Geer ins.* 1. t.30. f.18 ") which suggested to me the possibility that syntypes might also have been in DeGeer's collection. In 1959 I examined that collection in Stockholm ; in Cabinet 36, drawer 5, I found a large square card on which numerous males and females of the species commonly known as *Pteromalus puparum* were mounted. The card bears a label in DeGeer's handwriting " I. verd doré des crisalides I. puparum L. [? T.3] 883 ". I consider these also as syntypes.

Pteromalus latifrons Walker. One ♀, LECTOTYPE, Waterhouse label ; it is a small specimen of *puparum*.

Pteromalus cephalotes Walker. Syntypes, 2 ♀. LECTOTYPE, one bearing a Waterhouse label, also another " Type Gahan 1927 ".

Pteromalus comes Walker. One ♀, LECTOTYPE (possibly holotype) ; Waterhouse label.

Pteromalus ornytus Walker. Syntypes, 2 ♂. LECTOTYPE, the first specimen ; Waterhouse label.

Pteromalus brassicae Curtis and *P. pontiae* Curtis. Types probably in Curtis collection, National Museum of Victoria, Melbourne, Australia (not seen). Both species were later synonymized with *puparum* (Linnaeus) by Curtis himself (1860 : 100, footnote). These are not *nomina nuda*, as supposed by Sherborn (1924, 1929).

Pteromalus orinus Walker. One ♀, LECTOTYPE, bearing a Waterhouse label ; a very small specimen with antennal funicular segments unusually short.

Pteromalus nigricans Walker. Syntypes, 2 ♀ mounted on the same card (Type Hym. 5. 713) ; LECTOTYPE, the left-hand specimen. Labels " Madeira Wollaston " and (in Walker's handwriting) " Pteromalus nigricans ".

Pteromalus pieridis Provancher. Lectotype, Canada, Quebec, in Museum of the Province of Quebec (not seen) ; the species was placed in synonymy with *puparum* by Peck (*in* Muesebeck *et al.*, 1951 : 561).

EUROPE, MADEIRA, ASIA, NORTH AFRICA, CANADA, U.S.A. ; NEW ZEALAND (introduced).

Biology. Well known as a parasite of the pupae of Lepidoptera, particularly Rhopalocera ; in Europe most often on *Pieris* spp., *Nymphalis* spp., also on *Papilio machaon* L., *Aglais urticae* (L.), *Pyrameis cardui* (L.), *Vanessa atalanta* (L.) and other butterflies. Peck *in* Muesebeck, *et al.* (1951) and Peck (1963) cited records of rearings from species belonging to other families of Lepidoptera ; from Ichneumonidae, Braconidae, and in one case from the Chalcidoid *Dibrachys cavus* (Walker), in these instances as a hyperparasite ; and from species of Vespidae and Sphecidae. In Europe imagines may be found in the field May–October.

Pteromalus bifoveolatus Förster

Pteromalus bifoveolatus Förster, 1861 : 36, ♂.
? Pteromalus Saturniae Rudow, 1886 : 266.
Heterolaccus mauritanicus Masi, 1937 : 371–372, ♂ ♀.
Pteromalus bifoveolatus Förster ; Delucchi, 1958*a* : 53–54.
Pteromalus (*Heterolaccus*) *bifoveolatus* Förster ; Bouček, 1961 : 93–94.

Type material. *Pteromalus bifoveolatus* Förster. Type ♂ (not seen by the writer) in coll. Förster, Vienna, labelled with the number 103 (see Delucchi, 1958*a* : 53).

Pteromalus saturniae Rudow. Types ? in coll. Rudow, Phyletischen Museum der Friedrich-Schiller-Universität, Jena. Bouček (1961 : 94) suggested that *saturniae* might be the same as *bifoveolatus* (Förster).

Heterolaccus mauritanicus Masi. Syntypes, Morocco, Rabat, 3 ♂ and 3 ♀, reared from *Cerura* (= *Dicranura*) *vinula* (L.), in Museo Civico di Storia Naturale, Genoa. The species was synonymized with *bifoveolatus* (Förster) by Delucchi (1958*a* : 53–54).

BRITAIN, CONTINENTAL EUROPE (probably widely distributed), ? SICILY ; NORTH AFRICA.

Biology. Parasite of Lepidoptera (Lasiocampidae, Notodontidae and Saturnidae) ; reared in Britain from *Philudoria* (=*Odonestis*) *potatoria* (L.) ; in Czechoslovakia, Sicily and Italy as a gregarious parasite of *Saturnia pyri* Schiff., and more rarely from *Malacosoma neustria* L. (see Bouček, 1961 : 94) ; in North Africa from *Cerura vinula* (L.) according to Masi (1937). Imagines April–July.

Pteromalus squamifer Thomson

(Text-fig. 338)

Pteromalus squamifer Thomson, 1878 : 155, ♂ ♀.
Pteromalus squamifer Thomson ; Valkeila, 1959 : 181.

Type material. Syntypes, 8 ♀, 1 ♂. LECTOTYPE, a female labelled " Lund ".

BRITAIN, SWEDEN, FINLAND.

Biology. Reared in Finland as a parasite of *Scoliopteryx libatrix* (L.) ; see Valkeila (1959). Imagines June–August.

Pteromalus venustus Walker

Pteromalus venustus Walker, 1835 : 494, ♀.
Pteromalus planiscuta Thomson, 1878 : 155, ♂ ♀, **syn. n.**

Type material. *Pteromalus venustus* Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen ; Waterhouse label.

Pteromalus planiscuta Thomson. Syntypes, 7 ♀, 2 ♂. LECTOTYPE, a female labelled " Sm " [Småland] and " Bhn " [Boheman].

BRITAIN, SWEDEN.

Biology. Parasite of *Megachile* spp. (Hym., Apoidea). Imagines June–August.

The females of this species show considerable variation in the proportions of the funicular segments, the presence or absence of a median carina on the propodeum, and the breadth of the base of the scutellum relative to the breadth of an axilla. At first I thought that *planiscuta* could be separated from *venustus* on the basis of these characters, but further investigation has shown that they are apparently too variable to form reliable criteria.

Pteromalus proprius Walker

Pteromalus proprius Walker, 1874 : 318, ♂.

Type material. LECTOTYPE ♂, Type Hym. 5. 733, labelled " 142 ", " Amurland. Coll. F. Walker 1913–71 " and (in Walker's handwriting) " Pteromalus proprius ".

The lectotype ♂ of *proprius* is very close to the ♂ of *venustus* Walker but possibly represents a distinct species. It differs in having the head and thorax green, the mesoscutum rather more coarsely reticulate, the median carina of the propodeum sharp, the stigma of the fore wing rather smaller. The ♀ is unknown.

ASIA (Amurland).
Biology. Unknown.

Pteromalus vopiscus Walker

Pteromalus Vopiscus Walker, 1839 : 274, ♀.

Type material. One ♀ stands under this name and is accepted as the TYPE. It bears no label except my own, which reads " Pteromalus vopiscus Walker, Type ".

The type was captured by Walker in the south of France, and I have seen no other material. It is very close to *Pteromalus* and *Habrocytus* and may belong to one or other of these genera. I retain it provisionally in *Pteromalus* until additional material is forthcoming and allows the mandibular formula, and some other characters not visible in the type, to be ascertained. In facies, sculpture, and shape of the propodeum it is rather like *Habrocytus platyphilus*, but has the distal half of the basal cell in the fore wing pilose, and the proximal segments of the antennal funicle slightly longer than broad.

FRANCE.
Biology. Unknown.

Pteromalus sp. indet. A

BRITAIN : Scotland, Wester Ross, Badachro, 1 ♀, 20.viii.1953 (*Graham*).

Pteromalus procerus sp. n.

(Text-figs. 389, 390)

♀. Body bright green to blue-green. Antennal scape testaceous, more or less infuscate in its distal half ; pedicellus fuscous, usually pale below and at apex ; flagellum more or less distinctly testaceous beneath, infuscate dorsally. Coxae concolorous with the thorax; femora infuscate over their proximal half or more ; legs otherwise testaceous with the tips of the tarsi fuscous, the fore tarsi brownish, and sometimes with the tibiae slightly infuscate medially. Tegulae testaceous, or infuscate posteriorly. Wings hyaline ; venation fulvous to testaceous. Length 1·9 to 2·4 mm.

Head about 1·2 times as broad as the mesoscutum ; in dorsal view about twice as broad as long ; temples slightly more than one third as long as eyes, converging moderately and rather straight ; ocelli rather small, the posterior ones separated by about 2·5 times their major diameter from the eyes, POL 1·2 to 1·25 OOL. Head in front view suboval ; eyes separated by about 1·4 times their length. Malar space nearly or just half as long as an eye. Both mandibles with four teeth. Anterior margin of clypeus shallowly emarginate, hardly impressed in the middle. Head finely reticulate, rather more coarsely on the frons ; clypeus strigose, the striae hardly extending on to the face and genae. Antennae (Text-fig. 390) inserted well above the level of the ventral edge of the eyes, the toruli about equidistant from the median ocellus and the anterior margin of the clypeus ; scape only slightly shorter than an eye, reaching to level of vertex or slightly above it ; combined length of pedicellus and flagellum almost equal to breadth of head ; pedicellus (profile) 1·7 to 1·8 times as long as broad, slightly to distinctly longer than the first funicular segment ; flagellum moderately clavate ; funicle proximally hardly stouter than the pedicellus, its first segment quadrate or very slightly longer than broad,

the following segments quadrate, or the sixth very slightly transverse ; clava 1·6 to 1·8 times as long as broad, about as long as two and a half of the preceding funicular segments ; sensilla rather sparse, in one row on each of the funicular segments.

Thorax about 1·6 times as long as broad. Pronotal collar distinctly less wide than the mesoscutum, shorter medially than at the sides, medially from slightly more than one eighth, to one seventh, as long as the mesoscutum, finely reticulate with a narrow shiny strip along its hind edge, slightly to distinctly margined anteriorly. Mesoscutum 1·8 to 1·85 times as broad as long, somewhat coarsely reticulate, more finely at the sides. Scutellum about as broad as long, moderately convex, moderately finely reticulate, the frenum hardly more coarsely than the rest. Propodeum (Text-fig. 389) somewhat more than half as long as the scutellum, medially produced well behind the bases of the hind coxae ; median area 1·3 to 1·55 times as broad as long, its panels almost uniformly reticulate and not very shiny ; median carina complete or incomplete ; plicae sharp throughout, hardly sinuate in the middle, their posterior part converging slightly ; costula absent ; nucha occupying about one third the median length of the propodeum, convex, rather more strongly reticulate than the panels of the median area, with the areoles slightly lengthened in the transverse axis ; spiracles moderate-sized, oval, separated by about one third their length from the metanotum ; callus moderately shiny, lightly reticulate, rather sparsely pilose ; on the posterior part of the callus, above the supracoxal flange, there are one to two hairs only. Postspiracular sclerite narrow, shiny, nearly smooth, with an impressed line along its front edge. Mesepisternum moderately finely reticulate, with a nearly smooth area below the base of the hind wing ; mesepimeron rather more coarsely reticulate ; metapleuron finely reticulate. Legs rather short, moderately stout. Fore wing with upper surface of costal cell bare, lower surface with a complete row of hairs and some additional ones scattered over the distal third ; basal cell bare, open below ; basal vein bare or with 1 to 5 hairs ; speculum open below, on upper surface of wing extending below the marginal vein for about half the length of the latter ; wing beyond the speculum moderately thickly pilose, the area between the postmarginal and stigmal veins pilose ; apical margin ciliate ; marginal vein 1·4 to 1·7 times as long as the stigmal vein ; postmarginal vein from slightly shorter, to slightly longer, than the marginal vein ; stigmal vein slightly curved, forming a somewhat acute angle with the postmarginal ; stigma small, suboval.

Gaster lanceolate or sublanceolate, usually as long as or slightly longer than the head plus thorax, occasionally slightly shorter, 1·8 to 2·3 times as long as broad ; basal tergite occupying from one quarter, to slightly less than one third, the total length ; last tergite as long as or somewhat longer than its basal breadth ; ovipositor sheaths slightly exserted ; hypopygium extending about half way along the gaster.

♂. Differs from the female as follows:

Antennal scape testaceous, or more or less infuscate distally ; flagellum testaceous with the incisures dark, or somewhat infuscate dorsally. Pale parts of the legs yellowish ; femora lightly infuscate at the base only, or the fore and mid femora immaculate. Malar space slightly to somewhat more than half the length of an eye ; oral fossa enlarged, its breadth 2·5 to 3 times the malar space. Mandibles separated from the edges of the genae by a large semicircular membranous space. Antennal scape as long as, or even slightly longer than, an eye ; combined length of pedicellus and flagellum equal to breadth of head or hardly greater ; pedicellus 1·6 to 1·7 times as long as broad, about as long as the first funicular segment ; flagellum subcylindrical, hardly stouter than the pedicellus ; first funicular segment 1·6 to 1·8 times, sixth 1 to 1·4 times, as long as broad ; clava about three times as long as broad, somewhat longer than the combined length of the two preceding funicular segments ; hairs of flagellum standing out at an angle of 30° to 40°, their length about half the breadth of the segments or a little more. Propodeum about two thirds as long as the scutellum ; median area about 1·25 times as broad as long. Fore wing with marginal vein 1·5 to 1·75 times as long as the stigmal vein ; basal vein with up to eight hairs. Gaster oval, shorter than but hardly narrower than the thorax, with a ventral plica.

This species may be known from the other described species of *Pteromalus* dealt

with in the present paper, by its relatively long marginal vein combined with the long gaster of the female.

Holotype ♀. ENGLAND : Berkshire, Wytham Wood, 30.ix.1951 (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 2 ♂, 23.viii.1951, 1 ♂, 20.ix.1951, 1 ♀, 5.ix.1959 (*Graham*) ; most of these specimens were swept in a damp meadow between Wytham Wood and the River Thames. IRELAND : Co. Dublin, Golliers-town, 2 ♀, 1.ix.1954 (*Stelfox*), in Graham collection.

Biology. Unknown.

Pteromalus smaragdus sp. n.

(Text-fig. 391)

♀. Differs from that of *procerus* sp. n. as follows:

Size larger (2·6 to 2·8 mm.). Antennal scape entirely or almost entirely testaceous ; flagellum conspicuously testaceous beneath.

Head in dorsal view with temples longer (half or slightly more than half as long as the eyes). POL 1·15 to 1·2 OOL. Antennae (Text-fig. 391) : flagellum only very slightly clavate ; proximal segments of funicle relatively longer, the first segment as long as the pedicellus and 1·4 to 1·5 times as long as broad. Propodeum medially more obviously produced beyond the bases of the hind coxae ; median area only 1·25 to 1·35 times as broad as long ; nucha larger, occupying more than one third, though not quite half, the median length of the propodeum.

Gaster ovate, longer than the thorax but shorter than head plus thorax, 1·55 to 1·6 times as long as broad, as broad as or slightly broader than the thorax ; basal tergite occupying about one third the total length ; last tergite slightly shorter than its basal breadth.

In the two specimens described, the postmarginal vein is slightly longer than the marginal vein.

From *P. puparum, bifoveolatus, squamifer, venustus* and *planiscuta*, this species differs particularly in its longer marginal vein (see key to females).

Holotype ♀. SWEDEN : Skåne, Falsterbo, 10.viii.1951, swept from sand-dune vegetation (*Graham*), in Graham collection.

Paratype ♀. Same locality and habitat, 1 ♀, 27.vii.1959 (*Graham*), in Graham collection.

Biology. Unknown.

HABROCYTUS Thomson

Colas Curtis, 1827 : folio 166. Type species : *C. dispar* Curtis, by monotypy and original designation.

Gnatho Curtis, 1829 : col. 118, genus 641 [n. n. for *Colas* Curtis].

Colax Curtis, 1829, ibid. [emendation of *Colas* Curtis].

Colax Stephens, 1829 : 395 [n. n. for *Colas* Curtis].

Metopachia Westwood, 1839 : 71. Type-species : *Colas dispar* Curtis, by monotypy and original designation.

Etroxys sgen. *Habrocytus* Thomson, 1878 : 88, 109. Type-species : *Pteromalus albipennis* Walker, by designation of Ashmead, 1904 : 316.

Metopopachia Dalla Torre, 1898 : 159 [emendation of *Metopachia* Westwood].

Habrocytus Thomson ; Ashmead, 1904 : 316, 317.

Habrocytus Thomson ; Schmiedeknecht, 1909 : 316, 317, 321–322 [*ex parte*].

Pteromalus Swederus ; Schmiedeknecht, 1909 : 335–354 [*ex parte*].

Habrocytus Thomson ; Kurdjumov, 1913 : 9, 18–21 [*ex parte*].
Habrocytus Thomson ; Nikol'skaya, 1952 : 231 [*ex parte*].
Habrocytus Thomson ; Peck *et al.*, 1964 : 58.

The identity of *Colas* Curtis has not hitherto been recognized in any publication, though for some years I have known that its type-species belonged to the genus which is generally known as *Habrocytus* Thomson. In view of the widespread usage of the latter name, and also because *Habrocytus* is in any case perhaps doubtfully distinct from *Pteromalus*, I reject *Colas* Curtis although it has priority. On the other hand it is possible that at some future time, the species-group of *Habrocytus* to which the type-species (*dispar* Curtis) of *Colas* belongs, may be regarded as a good genus ; in that case the name *Colas* would be available for it.

It is quite difficult to construct a workable key to the species of *Habrocytus* and *Pteromalus*, even when only the British species are taken into consideration. This is due to the considerable variation presented by some characters. Those used in the following key to females have resulted in what is, I believe, a fairly natural grouping of the species within the key, although this was not a primary aim. Hence one hopes that it may be a reasonably sound basis for work on the European species. The latter will undoubtedly prove to be very numerous, consequently the difficulties already apparent will increase. I have included *Habrocytus* and *Pteromalus* in a single key because at present I know of only one character (the number of teeth in the mandibles) which will separate them. This character cannot always be seen and is therefore not a practical one. It should be noted that I have examined the mandibular teeth in all the species included in the key ; those having 4 teeth in both mandibles have been referred to *Pteromalus*, those with 3 teeth in the left mandible to *Habrocytus*. The number of teeth appears to be very constant within the species. Rarely aberrations occur, however, and these are somewhat embarrassing. For example, I possess a female of *Habrocytus isarchus* (Walker) which has 4 teeth in both mandibles! Logically the best course might be to unite both genera under *Pteromalus*, but as *Habrocytus* is so well known I hesitate to do this at present.

The males of many of the species are known to me. Some present very good and obvious characters, but more often the males of allied species are very difficult to separate. I consider it advisable to await the study of more extensive, and in particular, bred material before attempting to publish a comprehensive key to the males even of British species. A tentative key to some of the more easily recognizable species is given, however ; it should help to assign a number of males at least to their correct species-group.

An exhaustive study of *Habrocytus*, perhaps the largest genus of Pteromalidae, would itself be almost the work of a lifetime.

HABROCYTUS Thomson and *PTEROMALUS* Swederus

Key to British (and some other European) Species

(Females)

1 Lower edge of antennal toruli not or hardly above the level of the ventral

edge of the eyes. Propodeum (Text-fig. 371) less than half as long as the scutellum, its nucha represented only by a narrow, transversely-striate strip. Ocelli very small, each posterior ocellus separated by 3 to 3·5 times its major diameter from the adjacent eye (Text-fig. 414). Malar space nearly or quite two thirds the length of an eye . . . ***H. microps*** sp. n. (p. 556)

– Either the lower edge of the toruli distinctly above the level of the ventral edge of the eyes ; or the propodeum is at least half as long as the scutellum and has a large reticulate nucha, the ocelli are not so very small, and the malar space is relatively shorter 2

2 (1) Anterior margin of clypeus (Text-fig. 393) deeply incised medially, hence appearing almost bidentate. Propodeal nucha represented only by a narrow, transversely-aciculate to smooth strip 3

– Anterior margin of clypeus at most moderately deeply emarginate as in Text-fig. 394, sometimes truncate. *Note* : there is often a fovea immediately above the clypeal emargination, which in some lights might be mistaken for an incision, see Text-fig. 394. Propodeal nucha often larger and reticulate 7

3 (2) Fore wing with basal cell with at least a few scattered hairs over its distal third ; lower surface of costal cell with a complete row of hairs ; speculum on upper surface of wing extending hardly as far as the middle of the marginal vein ; postmarginal vein curved, about as long as the marginal vein. Pronotal collar very short medially, less than one tenth as long as the mesoscutum. POL about 1·5 OOL. Plicae of propodeum indicated only at the hind margin of the sclerite . . . . ***H. janssoni*** sp. n. (p. 558)

– Fore wing with basal cell bare or virtually so, basal vein usually bare ; lower surface of costal cell with the row of hairs usually widely broken in the middle (cf. Text-fig. 403) ; speculum on upper surface of wing extending nearly or quite to the stigmal vein ; postmarginal vein straight or virtually so, usually shorter than the marginal vein. Pronotal collar longer, medially one eighth to one sixth as long as the mesoscutum. POL 1·65 to 1·8 OOL. Plicae of propodeum often complete 4

4 (3) Gaster short-ovate, not or hardly longer than the thorax, only about 1·5 times as long as broad.

Antennal flagellum moderately stout ; proximal segments of funicle quadrate, distal segments slightly transverse. (Slovakia) ***H.*** sp. indet. I (p. 556)

– Gaster long-ovate, as long as or slightly longer than head plus thorax, 1·75 to 2·3 times as long as broad 5

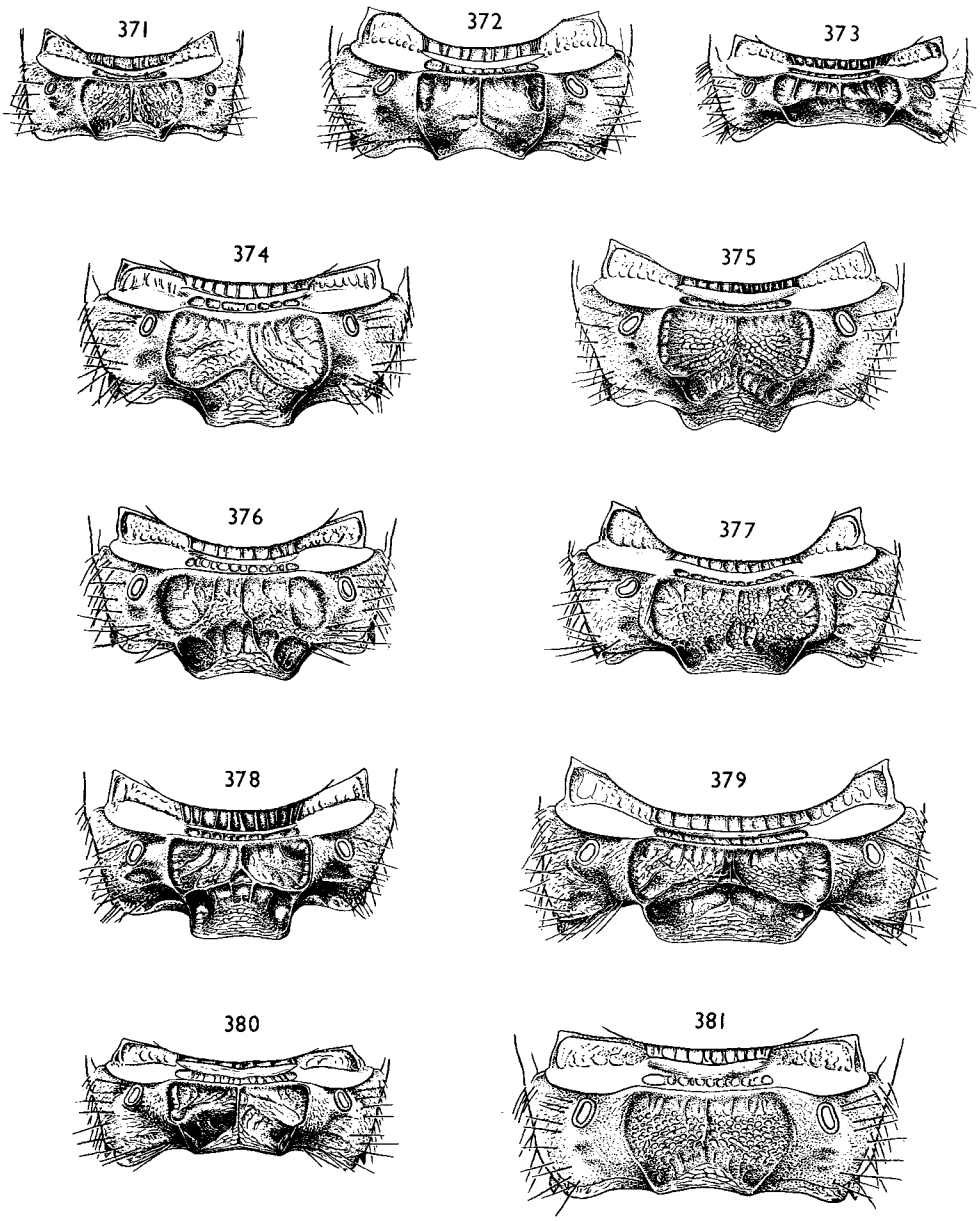
5 (4) Propodeum with plicae represented by sharp carinae on the sides of the nucha, and foveae at the base of the propodeum, but effaced in the middle. Antennal flagellum stout, distinctly stouter proximally than the pedicellus in dorsal view ; proximal segments of funicle subquadrate, distal segments at least slightly transverse . . . . ***H. cionobius*** (Erdös) (p. 555)

– Propodeum with plicae complete, sometimes not sharp in the middle but always distinct there. Antennal flagellum sometimes less stout ; proximal segments of funicle sometimes slightly longer than broad 6

6 (5) Antennae with scape reaching or nearly reaching the level of the vertex ; proximal segments of funicle usually at least slightly longer than broad, occasionally subquadrate, distal segments subquadrate or at most the sixth slightly transverse.

Propodeum, Text-fig. 372 . . . . ***H. sequester*** (Walker) (p. 554)

– Antennae with scape reaching only to about level of lower edge of median ocellus ; proximal segments of funicle subquadrate, distal segments slightly transverse. (Czechoslovakia) . . . . ***H.*** sp. indet. J (p. 556)



FIGS. 371–381. *Habrocytus* spp., metanotum and propodeum. 371, *microps* sp. n., ♀ ; 372, *sequester* (Walker), ♀ ; 373, *cardui* (Erdös), ♀ ; 374, *glabriculus* Thomson, lectotype ♀ ; 375, *cioni* Thomson, ♀ ; 376, *parietinae* sp. n., ♀ ; 377, *tripolii* sp. n., ♀ ; 378, *berylli* (Walker), ♀ ; 379, *elevatus* (Walker), ♀ ; 380, *myopitae* sp. n., ♀ ; 381, *ochrocerus* Thomson, lectotype ♀.

7 (2) Median area of propodeum polished and virtually smooth ; plicae sharp only posteriorly, otherwise represented only by foveae at the base of the propodeum ; spiracular sulci shallow and virtually smooth. All funicular segments, except sometimes the first, at least slightly transverse. (Slovakia) ***H.*** sp. indet. K (p. 556)

– Median area of propodeum distinctly sculptured, reticulate, strigose-reticulate, wrinkled, or with costulae ; plicae usually traceable to the base of the propodeum ; spiracular sulci distinctly impressed, nearly always punctate or with some transverse costulae (Text-figs. 373–389) 8

8 (7) Genae, near base of mandibles, strongly compressed and with a sharp edge ; antennae usually having at most the sixth funicular segment slightly transverse, rarely also the fifth in some dwarfs ; pronotal collar (Text-fig. 405) long, medially almost or quite one fifth as long as mesoscutum. Striae of clypeus extending as far as the malar sulcus, and some distance up the face. Propodeum with a large reticulate nucha ; the panels of the median area uniformly reticulate . . . . . ***H. chrysos*** (Walker) (p. 527)

– Genae nearly always terete, if slightly sharp near the base of the mandibles, then all the funicular segments, except sometimes the first, are slightly transverse, and the pronotal collar is very short medially 9

9 (8) Lower edge of antennal toruli not or hardly above the level of the ventral edge of the eyes, toruli distinctly nearer to the anterior margin of the clypeus than to the median ocellus. Propodeum at least half as long as the scutellum and with a rather large, convex reticulate nucha. Postmarginal vein as long as or longer than the marginal vein 10

– Lower edge of antennal toruli distinctly above the level of the ventral edge of the eyes, toruli usually about equidistant from the median ocellus and the anterior margin of the clypeus, sometimes slightly nearer to the latter. Propodeum sometimes relatively shorter ; nucha large or small. Postmarginal vein often not longer than the marginal vein 11

10 (9) Gaster lanceolate, at least as long as head plus thorax, 2·3 to 3·2 times as long as broad ; hypopygium extending only half way along the gaster. Flagellum not short ; at most the distal segments of the funicle slightly transverse ; clava obviously shorter than the combined length of the three preceding funicular segments. Striae of clypeus extending only slightly on to the face and genae ; the latter not compressed but rounded, and without a hollow above the base of the mandibles 50

– Gaster ovate, not or hardly longer than the thorax, at least slightly less than twice as long as broad ; hypopygium extending at least slightly more than half way along the gaster. Flagellum short ; all funicular segments except sometimes the first slightly transverse ; clava nearly or quite as long as the combined length of the three preceding funicular segments. Striae of clypeus strong, and extending some way up the face and genae ; the latter compressed and tending to have a rather sharp edge, sometimes also with a small hollow just above the base of the mandible 93

11 (9) Anterior margin of clypeus (Text-fig. 395) truncate, or sometimes even very slightly curved forwards, without a median fovea, its surface flat. Gaster ovate. Propodeum (cf. Text-fig. 387) medially less than half as long as the scutellum ; plicae converging slightly to rather strongly in their posterior part ; panels of median area relatively uniformly reticulate, costula absent or very weakly indicated ; nucha short with its sculpture composed of transversely-lengthened areoles. Pronotal collar sloping down somewhat, hence in profile forming an obtuse angle with the neck . . . 75

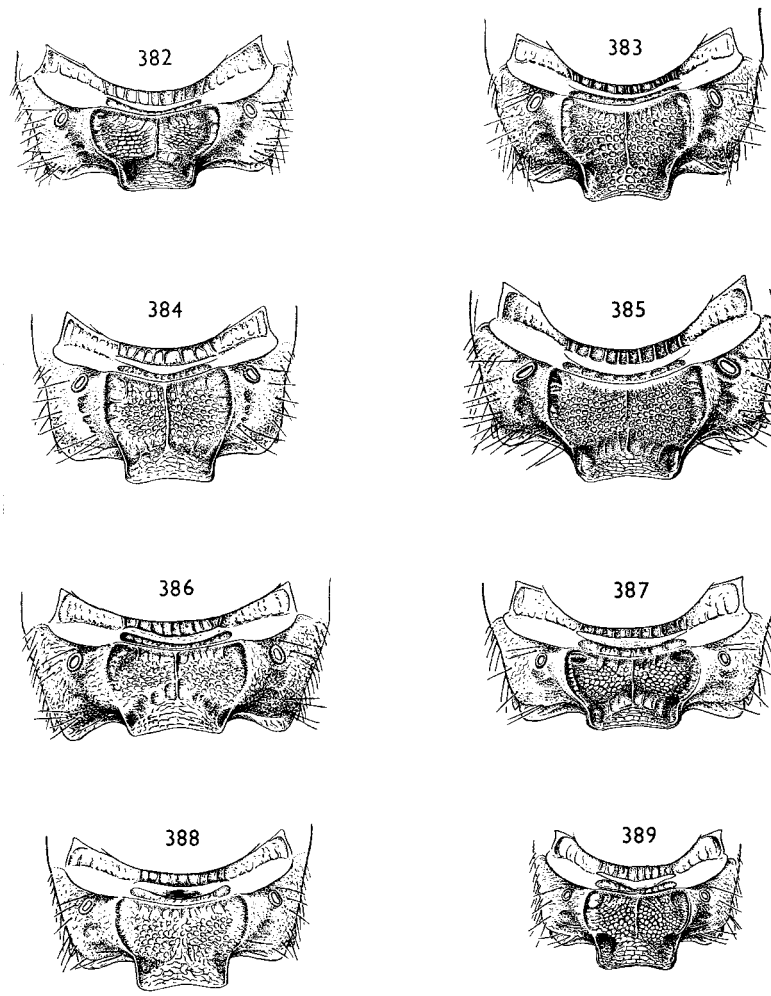
– Anterior margin of clypeus (cf. Text-fig. 394) at least slightly emarginate,

nearly always with a median fovea just above the emargination, or with the surface slightly concave anteriorly. The other characters usually not all present simultaneously 12

2 (11) Propodeum (Text-fig. 373) with median area very strongly transverse, 2·8 to 3 times as broad as long 13

– Propodeum with median area at most about 2·5 times as broad as long . 14

13 (12) Propodeum (Text-fig. 373) with panels of median area with some strong and straight longitudinal carinulae which extend to the costula, which is also sharp and nearly straight ; propodeum medially slightly less than one third as long as the scutellum. Gaster hardly longer than head plus



FIGS. 382–389. *Habrocytus* and *Pteromalus* spp., metanotum and propodeum. 382, *H. chlorospilus* (Walker), ♀ ; 383, *H. dispar* (Curtis), ♀ ; 384, *H. grandis* (Walker), ♀ ; 385, *H. semotus* (Walker), ♀ ; 386, *H. fasciatus* Thomson, ♀ ; 387, *H. altus* (Walker), ♀ ; 388, *H. crassinervis* Thomson, ♀ ; 389, *P. procerus* sp. n., ♀.

thorax. Fore wing with lower surface of costal cell with its row of hairs complete, or at most very slightly interrupted in the middle
H. cardui (Erdös) (p. 540)

– Propodeum with the longitudinal carinulae of the median area, if present, are irregular or do not reach the costula, or else the latter is weak or absent. Gaster sometimes longer than head plus thorax. Fore wing with lower surface of costal cell with its row of hairs sometimes widely interrupted in the middle or before the middle 14

14 (13) Propodeum (Text-figs. 374–377, 379–381, 385, 386) with posterior part of plicae, at sides of nucha, converging slightly to strongly towards the median line. Fore wing with line of hairs on lower surface of costal cell sometimes widely broken medially, or before the middle 15

– Propodeum (Text-figs. 378, 382–384, 387–389) with posterior part of plicae, at sides of nucha, parallel or virtually so. Fore wing with line of hairs on lower surface of costal cell always complete 49

15 (14) Propodeum (Text-fig. 385) with posterior part of plicae converging only slightly ; median area without a costula, its panels uniformly reticulate. Fore wing with line of hairs on lower surface of costal cell complete. Antennal scape often reaching the level of the vertex or slightly above it. Gaster usually at least slightly longer than head plus thorax 70

– Propodeum (Text-figs. 374–377, 379–381, 386) with posterior part of plicae converging quite strongly ; median area often with a costula, its panels often irregularly sculptured. Either the line of hairs on the lower surface of the costal cell is broken medially ; or the antennal scape does not quite reach the level of the vertex ; or the gaster is not longer than head plus thorax 16

16 (15) Fore wing with row of hairs on lower surface of costal cell (Text-fig 403) broken medially or before the middle, often widely so 17

– Fore wing with row of hairs on lower surface of costal cell complete . . 26

17 (16) Gaster as long as, or longer than, head plus thorax ; usually 2 to 4·5 times as long as broad, only occasionally a little less than twice 18

– Gaster at least slightly shorter than head plus thorax, 1·2 to 1·9 times as long as broad 36

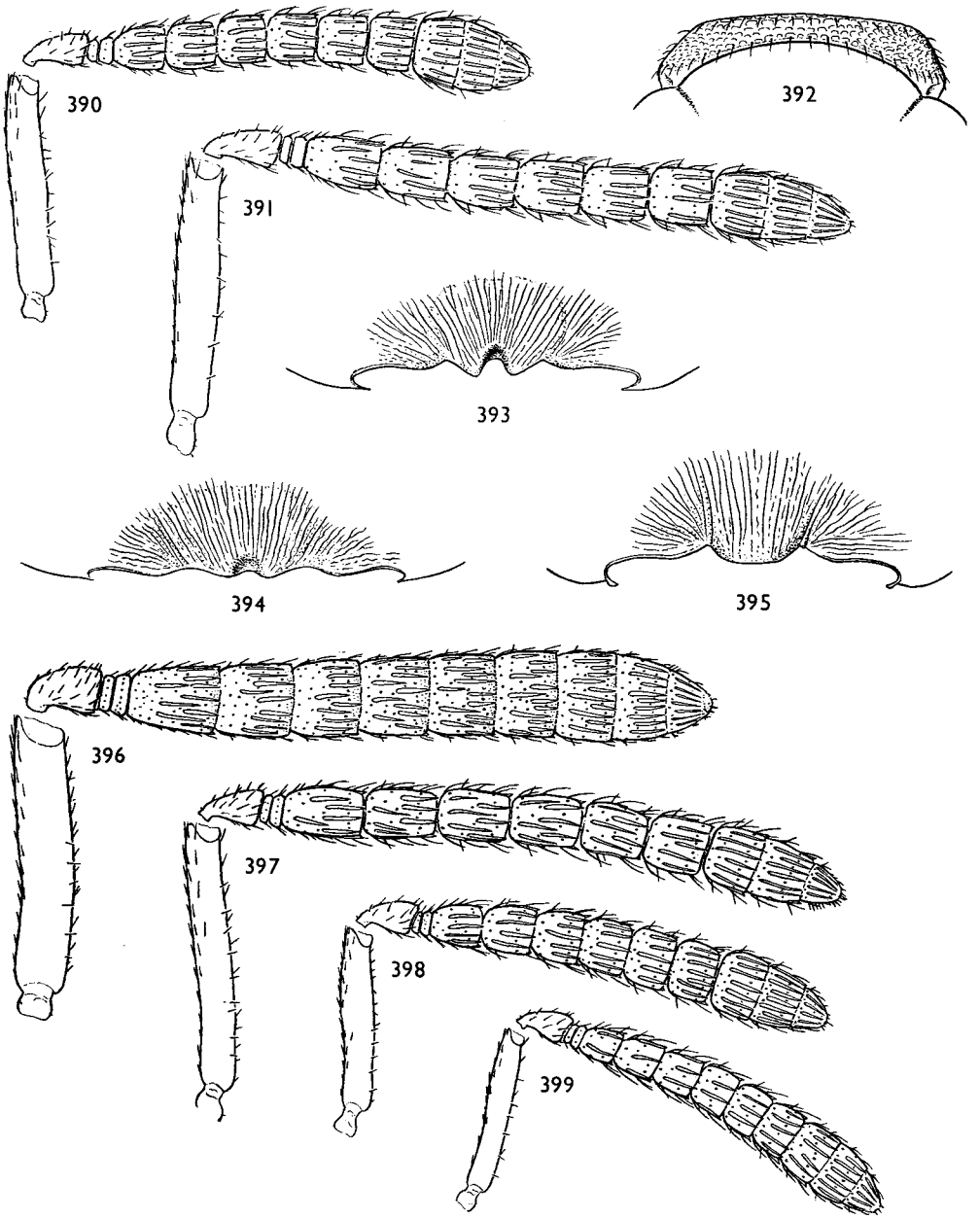
18 (17) Pronotal collar very long, medially one quarter as long as mesoscutum, or slightly more. Large species, over 3 mm. in length ; gaster nearly three times as long as broad, longer than head plus thorax ; proximal segments of antennal funicle subquadrate, the first segment hardly as long as the pedicellus ; body mainly coppery green. (Madeira) ***H. integer*** (Walker) (p. 538)

– Pronotal collar at most slightly more than one fifth as long as mesoscutum ; if as much as one fifth, then the gaster is at most 2·65 times as long as broad 19

19 (18) Pronotal collar longer, medially as a rule one fifth or slightly more than one fifth as long as mesoscutum, slightly less in dwarfs ; very sharp anteriorly and sometimes with a slightly raised carina anteriorly. Antennal flagellum testaceous at least beneath ; head and thorax often dull or bronze-green, sometimes brighter green to blue. Length usually 2·5 mm. or more, rarely less 20

– Pronotal collar shorter, medially one seventh to one sixth as long as mesoscutum, sometimes not sharp anteriorly. Antennal flagellum often black ; head and thorax usually bright green to blue, olive to bronze in the Madeiran species *alternipes*. Length sometimes less than 2·5 mm. 21

20 (19) Head in dorsal view (Text-fig. 408) 2·15 to 2·25 times as broad as long ; temples at most somewhat more than one third as long as eyes, tending to converge rather distinctly, especially in smaller specimens. Gaster only 1·1 to 1·2 times as long as head plus thorax, 2 to 2·35 times as long as



FIGS. 390–399. *Pteromalus* and *Habrocytus* spp. 390, *P. procerus* sp. n., ♀, antenna ; 391, *P. smaragdus* sp. n., ♀, antenna ; 392, *P. puparum* (L.), ♀, pronotum ; 393, *H. sequester* (Walker), ♀, clypeus ; 394, *H. albipennis* (Walker), ♀, clypeus ; 395, *H. altus* (Walker), ♀, clypeus ; 396, *H. ochrocerus* Thomson, lectotype ♀, antenna ; 397, *H. helenomus* sp. n., ♀, antenna ; 398, *H. decipiens* sp. n., ♀, antenna ; 399, *H. scandiae* sp. n., ♀. antenna.

broad ; last tergite rarely more than 1·2 times as long as its basal breadth. Head and thorax often dull or bronze-green . ***H. intermedius*** (Walker) (p. 542)

– Head in dorsal view (Text-fig. 410) twice or hardly more than twice as broad as long ; temples nearly half as long as eyes, converging only very slightly. Gaster 1·25 to 1·35 times as long as head plus thorax, 2·3 to 2·65 times as long as broad ; last tergite 1·3 to 1·6 times as long as its basal breadth. Head and thorax bright green . . . ***H. temporalis*** sp. n. (p. 547)

21 (19) Malar space nearly two thirds the length of an eye. Head and thorax olive-green with bronze reflections. Gaster hardly three times as long as broad, only slightly longer than head plus thorax. Antennae with proximal segments of funicle subquadrate, distal segments slightly transverse. (Madeira) ***H. alternipes*** (Walker) (p. 543)

– Malar space rarely more than slightly over half the length of an eye ; if nearly two thirds, then the head and thorax are bright green to blue, and the gaster is longer, distinctly longer than head plus thorax, and three to four times as long as broad (European species) 22

22 (21) Smaller (1·8 to 2·5 mm.). Antennae with proximal segments of funicle quadrate, the first segment at least very slightly shorter than the pedicellus ; sensilla in one, sometimes irregular, row on all the funicular segments . 23

– Larger (2·5 to 4 mm.). Antennae with proximal segments of funicle at least very slightly longer than broad, the first segment as long as or longer than the pedicellus ; sensilla in two rows on at least some of the funicular segments 24

23 (22) Gaster 1·65 to 2·1 times as long as broad. Antennal flagellum testaceous beneath. Fore wing with marginal vein 1·27 to 1·45 times as long as the stigmal vein. Head in dorsal view with temples hardly more than one quarter as long as eyes . . . . . ***H. decipiens*** sp. n. (p. 548)

– Gaster 2·2 to 3 times as long as broad. Antennal flagellum usually black, occasionally slightly testaceous beneath. Fore wing with marginal vein 1·35 to 1·6 times as long as the stigmal vein. Head in dorsal view with temples from nearly, to slightly more than, one third as long as eyes (Text-fig. 406) . . . . . ***H. albipennis*** (Walker) (p. 544)

24 (22) Marginal vein of fore wing 1·65 to 1·9 times as long as the stigmal vein. Gaster 1·3 to 1·5 times as long as head plus thorax, 3·4 to 4 times as long as broad. Malar space from somewhat more than half, to nearly two thirds, the length of an eye. Veins of fore wing fulvous or testaceous. Length of body 4 to 4·8 mm.

Gaster of male without a pale spot . . . ***H. caudiger*** sp. n. (p. 548)

– Marginal vein 1·35 to 1·65 times as long as the stigmal vein. Gaster 1·1 to 1·3 times as long as head plus thorax, 2·2 to 3·5 times as long as broad. Malar space from hardly half, to somewhat more than half, the length of an eye. Veins of fore wing often pale yellowish 25

25 (24) Gaster 2·2 to 3 times as long as broad, 1·1 to 1·3 times as long as head plus thorax. Marginal vein 1·35 to 1·6 times as long as the stigmal vein.

Gaster of male without a pale spot . . ***H. albipennis*** (Walker) (p. 544)

– Gaster 3 to 3·5 times as long as broad, 1·25 to 1·3 times as long as head plus thorax. Marginal vein 1·5 to 1·65 times as long as the stigmal vein.

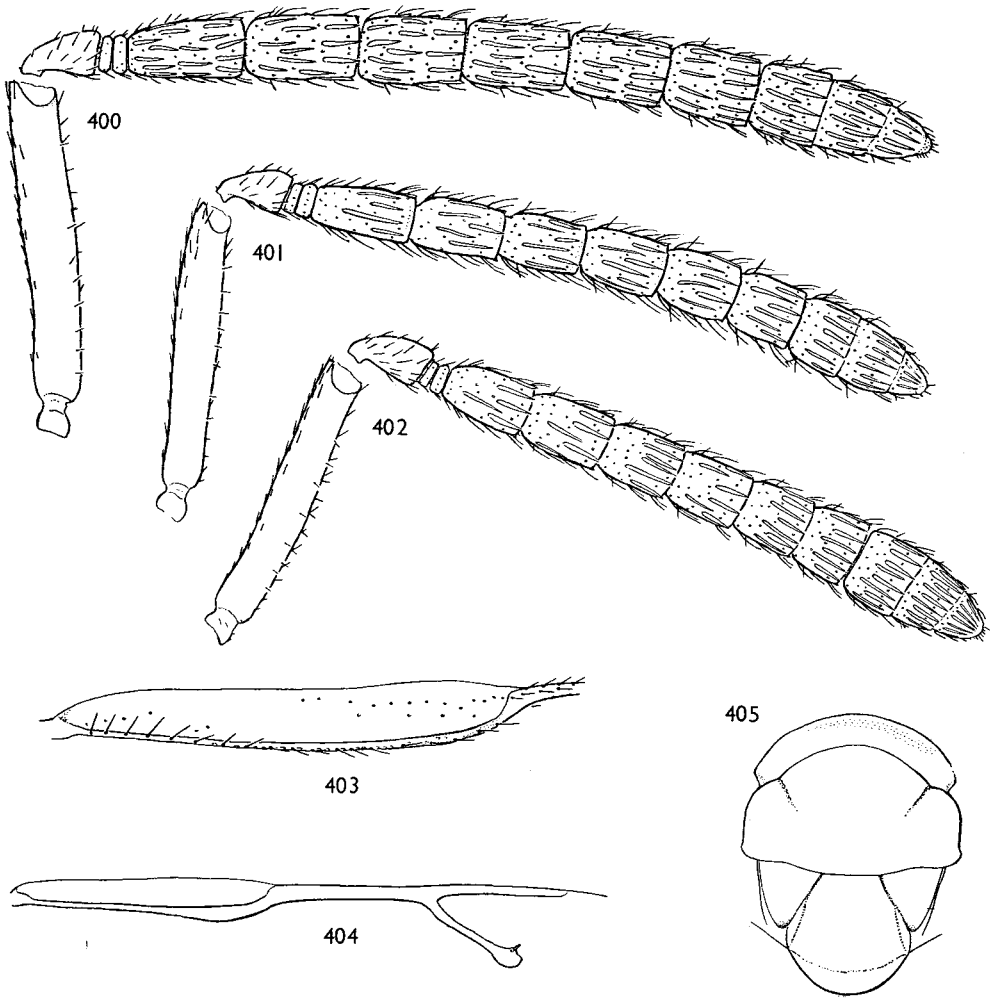
Gaster of male with a yellowish subbasal spot . ***H. patro*** (Walker) (p. 547)

26 (16) Antenna with combined length of pedicellus and flagellum fully equal to, or slightly greater than, the breadth of the head ; all funicular segments longer than broad, or at most the sixth quadrate ; scape reaching middle of median ocellus, or nearly to level of vertex. Gaster from nearly as long as,

to slightly longer than, head plus thorax. Propodeum (Text-figs. 374, 376) with a distinct, often strong, costula 27

– Antenna with combined length of pedicellus and flagellum slightly less than breadth of head ; funicular segments sometimes quadrate, or the distal ones transverse ; scape often reaching only to lower edge of median ocellus. Gaster sometimes much longer than head plus thorax. Propodeum with costula present or absent 29

27 (26) Antennal flagellum (Text-fig. 401) slender, hardly stouter than the pedicellus,



FIGS. 400–405. *Habrocytus* spp. 400, *glabriculus* Thomson, ♀, antenna ; 401, *parietinae* sp. n., ♀, antenna ; 402, *tripolii* sp. n., ♀, antenna ; 403, *albipennis* (Walker), ♀, fore wing, costal cell ; 404, *crassinervis* Thomson, ♀, fore wing venation ; 405, *chrysos* (Walker), ♀, thorax excluding metanotum and propodeum.

bright testaceous beneath. Head and thorax bright green to blue-green. Head in dorsal view with temples nearly half as long as eyes
H. parietinae sp. n. (p. 553)

– Antennal flagellum less slender, proximally distinctly stouter than the pedicellus, fuscous or at most obscurely testaceous beneath. Head and thorax sometimes bronze-green. Temples sometimes appearing shorter in dorsal view of head 28

28 (27) Median area of propodeum (Text-fig. 374) 1·5 to 1·6 times as broad as long ; propodeum, medially, about half as long as the scutellum. Head in dorsal view with temples half or practically half as long as eyes. Head and thorax a rather dull green to blue-green.
Head, Text-fig. 411 . . . . . ***H. glabriculus*** Thomson (p. 542)

– Median area of propodeum 1·7 to 1·9 times as broad as long ; propodeum, medially, slightly less than half as long as the scutellum. Head in dorsal view with temples somewhat less than half as long as eyes. Head and thorax tending to be bronze-green . . . . . ***H.*** sp. indet. H (p. 542)

29 (26) Propodeum (Text-figs. 375, 381) without a costula ; panels of the median area uniformly or almost uniformly reticulate or strigose-reticulate . . . 30

– Propodeum (Text-figs. 376–380) with a costula ; panels of the median area often irregularly sculptured 35

30 (29) POL hardly greater than OOL. Propodeum (Text-fig. 375) half as long as the scutellum ; posterior part of the plicae not reaching the hind edge of the nucha, somewhat convergent . . . . . ***H. cioni*** Thomson (p. 526)

– POL distinctly greater than OOL except in a few species, which have the posterior part of the plicae extending to the hind edge of the nucha, and the propodeum itself less than half as long as the scutellum 31

31 (30) Antennae with proximal segments of funicle subquadrate, distal segments slightly transverse ; scape reaching at most to level of lower edge of median ocellus 32

– Antennae with proximal segments of funicle distinctly longer than broad, distal segments usually not transverse ; scape sometimes reaching level with middle or top of median ocellus 33

32 (31) Antennae with flagellum stout, proximally very distinctly stouter than the pedicellus when the latter is seen in dorsal view, cylindrical or only weakly clavate ; sensilla numerous, usually in two rows, rarely one row, on each funicular segment. Head in dorsal view (Text-fig. 412) with temples one third as long as eyes or slightly more, not converging very strongly . . 46

– Antennae with flagellum slightly to very distinctly clavate, proximally not or hardly stouter than the pedicellus when the latter is seen in dorsal view ; sensilla in one, sometimes slightly irregular, row on each funicular segment. Head in dorsal view with temples one quarter as long as eyes or slightly more 33

33 (32) Propodeum, medially, virtually half as long as the scutellum . . . 34

– Propodeum, medially, at most slightly more than one third as long as the scutellum 35

34 (33) Gaster about as long as, or slightly longer than, head plus thorax. Either the pronotal collar medially is only about one eighth as long as the mesoscutum ; or its front edge is somewhat obtuse 78

– Gaster distinctly shorter than head plus thorax. Pronotal collar one sixth to one fifth as long as the mesoscutum, its front edge abrupt, the dorsal surface of the collar forming about a right angle with the pronotal neck, and sometimes slightly margined 35

35 (34) Gaster at least slightly shorter than head plus thorax, 1·2 to 1·9 times as long as broad 36

– Gaster as long as, or longer than, head plus thorax ; usually 2 to 4·5 times as long as broad, rarely somewhat less 41

36 (35) Small species, length 1·7 to 2·3 mm. Antennae with scape reaching only about level with lower edge of median ocellus ; proximal segments of funicle not or hardly longer than broad, distal segments at least very slightly transverse ; sensilla in one, sometimes irregular, row on each funicular segment . . 37

– Larger species, length 2·5 to 3·1 mm. Antennae with scape reaching about level with middle of median ocellus, or even to vertex ; proximal segments of funicle at least slightly longer than broad, distal segments not, or at most the sixth, transverse ; sensilla usually in two rows on each funicular segment 39

37 (36) Antennal flagellum (Text-fig. 399) proximally more slender, not stouter than the pedicellus when the latter is seen in dorsal view, but thickening distad. Fore wing with marginal vein 1·5 to 1·75 times as long as the stigmal vein ; postmarginal vein distinctly shorter than the marginal vein

H. scandiae sp. n. (p. 550)

– Antennal flagellum proximally stouter, slightly to distinctly stouter than the pedicellus when the latter is seen in dorsal view. Fore wing with marginal vein 1·15 to 1·45 times as long as the stigmal vein 38

38 (37) Postmarginal vein slightly to quite distinctly shorter than the marginal vein. Gaster 1·85 to 2 times as long as broad. Flagellum testaceous beneath

H. tibiellus (Zetterstedt) (p. 550)

– Postmarginal vein usually as long as, or very slightly longer than, the marginal vein, rarely very slightly shorter. Gaster 1·4 to 1·9 times as long as broad. Flagellum usually not paler beneath, apart from the sensilla

H. brachygaster sp. n. (p. 549)

39 (36) Head in dorsal view (Text-fig. 407) with temples nearly half as long as eyes. Fore wing with row of hairs on lower surface of costal cell complete. Antennal flagellum bright testaceous beneath. Gaster longer than thorax, 1·5 to 1·9 times as long as broad.

Propodeum, Text-fig. 376 . . . . . ***H. parietinae*** sp. n. (p. 553)

– Head in dorsal view (Text-fig. 409) with temples one third, or slightly more than one third, as long as eyes. Fore wing with row of hairs on lower surface of costal cell usually widely broken in the middle. Antennal flagellum usually black, sometimes obscurely testaceous beneath 40

40 (39) Pronotal collar, medially, from slightly more than one sixth, to slightly more than one fifth, as long as the mesoscutum. Gaster not longer than thorax, 1·2 to 1·6 times as long as broad ; last tergite at least slightly shorter than its basal breadth. Head and thorax brightly metallic, green to blue, brassy, or coppery.

Propodeum, Text-fig. 377 . . . . . ***H. tripolii*** sp. n. (p. 551)

– Pronotal collar, medially at most slightly more than one sixth as long as the mesoscutum. Gaster slightly longer than the thorax, 1·5 to 1·85 times as long as broad ; last tergite as long as, or slightly longer than, its basal breadth. Head and thorax with weaker metallic tints, bluish, bronze, or olive . . . . . ***H. conformis*** sp. n. (p. 553)

41 (35) Antennae with proximal segments of funicle quadrate, the first usually at least very slightly shorter than the pedicellus ; sensilla usually in one, sometimes irregular, row on all funicular segments. Smaller species, length 1·8 to 2·5 mm. 42

– Antennae with proximal segments of funicle at least slightly longer than broad, the first usually as long as or longer than the pedicellus ; sensilla in two rows on at least some of the funicular segments. Larger species,

length 2·5 to 5·5 mm., but usually more than 2·5 mm. 43

42 (41) Gaster 1·65 to 2·1 times as long as broad. Head and thorax green, blue-green, or golden-green. Fore wing with speculum, on upper surface, reaching nearly or quite to the stigmal vein ; venation pale yellowish. Antennae with sensilla in one row on all segments of the funicle. Panels of median area of propodeum reticulate, often irregularly . ***H. decipiens*** sp. n. (p. 548)

– Gaster 2·5 times as long as broad or more. Head and thorax bronze, olive-green, or dark bluish. Fore wing with speculum, on upper surface, not nearly reaching the stigmal vein ; venation often relatively dark. Panels of median area of propodeum often irregularly sculptured, with coarser wrinkles, or partly smooth 43

43 (42) Antennal scape reaching at least to level of middle of median ocellus. Head distinctly broader than mesoscutum. Scutellum discally nearly or quite as coarsely reticulate as the inner half of the axillae 44

– Antennal scape reaching at most to level of lower edge of median ocellus. Head hardly broader than mesoscutum. Scutellum discally finely to very finely reticulate, not more coarsely than the outer half of the axillae . . 45

44 (43) Body mainly deep blue or greenish blue. Propodeum (Text-fig. 378) with posterior part of plicae, at sides of nucha, hardly convergent. Pronotal collar with an abrupt edge anteriorly, sometimes slightly margined in the middle . . . . . ***H. berylli*** (Walker) (p. 544)

– Body green, bronze- or coppery green. Propodeum with posterior part of plicae strongly convergent (as in Text-fig. 379). Pronotal collar usually somewhat rounded off in front, at least in the middle ***H. musaeus***(Walker) (p. 540)

45 (43) Postmarginal vein of fore wing as long as or slightly longer than the marginal vein. Propodeum (Text-fig. 379) with panels of median area quite strongly sculptured, for the most part very finely reticulate ; median carina raised to form a tooth subbasally. Gaster 1·1 to 1·6 times as long as head plus thorax ***H. elevatus*** (Walker) (p. 538)

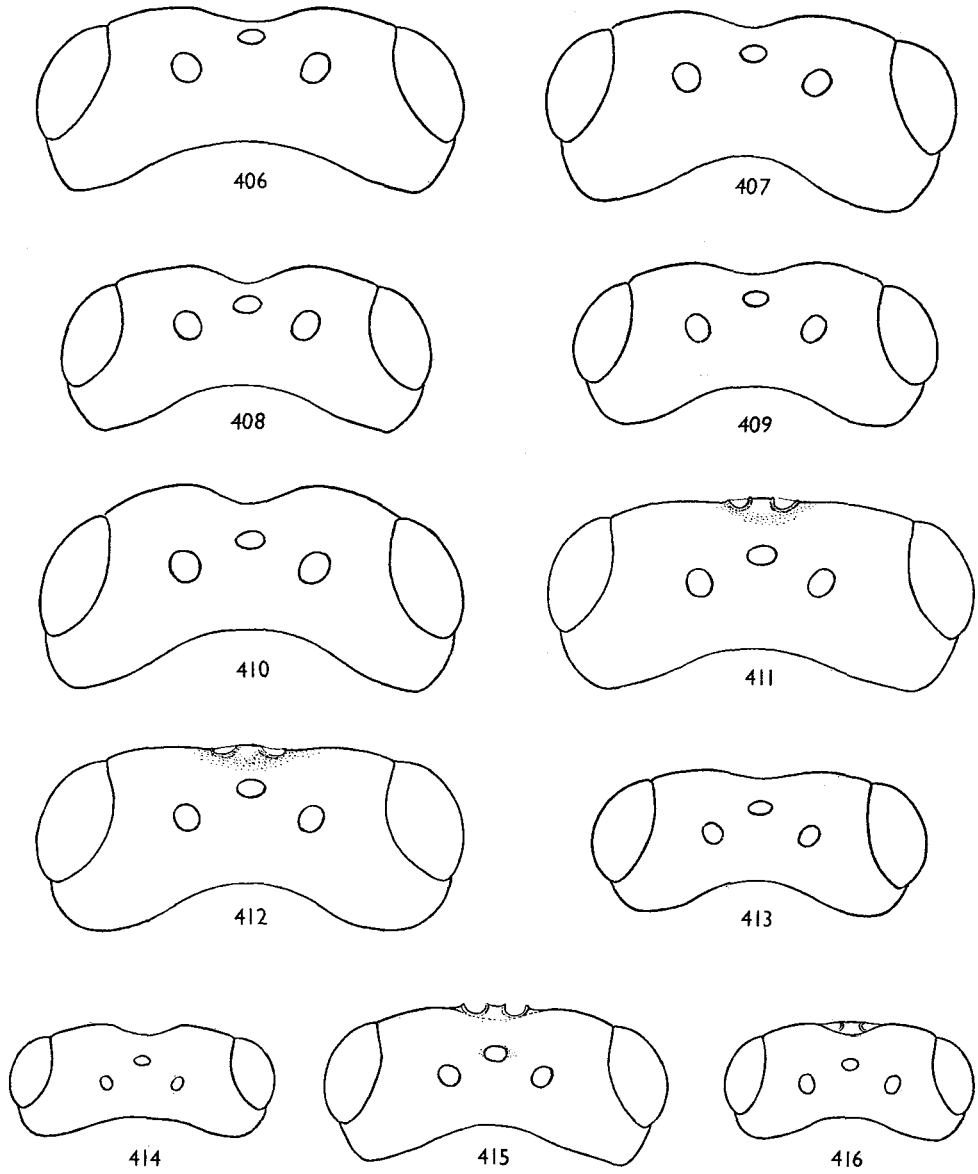
– Postmarginal vein slightly shorter than the marginal vein. Propodeum (Text-fig. 380) with median area relatively shiny, its sculpture, apart from some irregular wrinkles, weak ; median carina not raised into a tooth. Gaster from as long as, to 1·3 times as long as, head plus thorax ***H. myopitae*** sp. n. (p. 540)

46 (32) Postspiracular sclerite quite strongly reticulate except along its edges. Spiracles of propodeum small and oval, hardly 1·5 times as long as broad. Ocelli moderate-sized, the posterior ones separated by less than twice their major diameter from the eyes. Plicae of propodeum weak anteriorly ***H. conopidarum*** (Bouček) (p. 559)

– Postspiracular sclerite shiny, weakly and irregularly sculptured or partly smooth, with an impression along its front edge. Spiracles of propodeum relatively larger or more elongate. Ocelli small, the posterior ones separated by 2 to 2·5 times their major diameter from the eyes 47

47 (46) Propodeum with plicae sharply defined throughout. Tibiae broadly infuscate medially. Middle segments of gaster hardly tinged with purplish. Basal cell of fore wing with a few hairs distally, the basal vein also pilose. Scutellum rather more convex than in the following species. (Alten, Finmark) ***H. rhinthon*** (Walker) (p. 525)

– Propodeum (Text-fig. 381) with plicae weak or effaced in the middle or anteriorly. Tibiae usually wholly yellowish, rarely faintly infuscate medially. Middle segments (tergites two to four) of gaster mainly to entirely purplish. Basal cell of fore wing bare ; basal vein pilose or bare. Scutellum rather weakly convex 48



FIGS. 406–416. *Habrocytus* spp., heads. 406, *albipennis* (Walker), ♀ ; 407, *parietinae* sp. n., ♀ ; 408, *intermedius* (Walker), ♀ ; 409, *tripolii* sp. n., ♀ ; 410, *temporalis* sp. n., ♀ ; 411, *glabriculus* Thomson, ♀ ; 412, *ochrocerus* Thomson, lectotype ♀ ; 413, *isarchus* (Walker), ♀ ; 414, *microps* sp. n., ♀ ; 415, *crassinervis* Thomson, ♀ ; 416, ? *brachygaster* sp. n., ♂.

48 (47) Head in dorsal view (Text-fig. 412) 2·17 to 2·33 times as broad as long. Host on *Centaurea scabiosa* . . . . . ***H. ochrocerus*** Thomson (p. 526)

– Head in dorsal view 2·1 to 2·15 times as broad as long. Host on *Papaver* ***H. ? papaveris*** (Förster) (p. 526)

49 (14) The striations of the clypeus extend well up the genae, nearly to the lower corners of the eyes, and as far as the malar sulcus. Costal cell of fore wing with upper surface with a row of short hairs in the distal half, lower surface with two or three complete lines of hairs. Antennae with all funicular segments, except sometimes the first, slightly transverse ; scape not reaching the median ocellus. Hypopygium extending at least slightly more than half way along the gaster. Propodeum, medially, more than half as long as the scutellum, with a large reticulate nucha 93

– The striations of the clypeus extend at most slightly up the genae. Costal cell of fore wing with upper surface bare or with at most one or two hairs distally, lower surface usually with only one complete line, rarely two complete lines, of hairs. Antennae sometimes otherwise. Hypopygium extending at most about half way along the gaster. Propodeum often relatively shorter, or with a poorly-developed nucha 52

50 (10) Gaster 2·5 to 3·2 times as long as broad, average about three times ; last tergite 1·5 to 2 times as long as its basal breadth ***H. vibulenus*** (Walker) (p. 525)

– Gaster 2·3 to 2·5 times as long as broad ; last tergite from hardly as long, to 1·3 times as long, as its basal breadth 51

51 (50) Mesoscutum and scutellum more glittering. Propodeum (Text-fig. 382) with costula absent, or sharp only at the sides of the median area ***H. chlorospilus*** (Walker) (p. 524)

– Mesoscutum and scutellum rather dull. Propodeum with costula complete and sharp . . . . . ***H.*** sp. indet. A (p. 525)

52 (49) Propodeum (Text-fig. 378) with a strong costula ; panels of median area irregularly sculptured, with some wrinkles or longitudinal carinulae. Pronotal collar long, medially nearly or quite one fifth as long as mesoscutum. Marginal vein of fore wing 1·35 to 1·4 times as long as the stigmal vein. Gaster lanceolate, 2·5 to 2·7 times as long as broad, slightly longer than head plus thorax ; last tergite longer than its basal breadth. Head and thorax bright to dark blue or greenish blue . . ***H. berylli*** (Walker) (p. 544)

– Propodeum (Text-figs. 375, 383–389) nearly always without a costula, but if one is at all distinctly indicated then the panels of the median area are nearly uniformly reticulate, or the pronotal collar is relatively shorter, or the marginal vein is at least 1·5 times as long as the stigmal vein . . . 53

53 (52) Fore wing with distal quarter to one third of basal cell pilose ; marginal vein about 1·6 times as long as the stigmal vein. Gaster slightly longer than head plus thorax. Pronotal collar short medially, only about one ninth as long as mesoscutum. (Sweden : on *Picea*) . . . ***H.*** sp. indet. B (p. 531)

– Basal cell of fore wing with at most one to three isolated hairs, not counting any hairs which may be present on the basal vein 54

54 (53) Gaster usually obviously longer than head plus thorax, only slightly longer in some aberrant specimens. Fore wing with speculum, on upper surface of wing, extending only about as far as the beginning of the marginal vein, the latter only 1·15 to 1·35 times as long as the stigmal vein ; postmarginal vein distinctly longer than the marginal vein ; disc of wing beyond the speculum densely pilose, with fuscous hairs . . . ***H. bedeguaris*** Thomson (p. 527)

– If the gaster is longer than head plus thorax, then the speculum of the fore wing extends beneath at least the proximal half of the marginal vein ; in most

cases also the marginal vein is at least 1·5 times as long as the stigmal vein and the postmarginal vein is not longer than the stigmal 55

55 (54) Propodeum (Text-fig. 375) with posterior part of plicae converging slightly, but extending only a little way on to the sides of the nucha. Gaster hardly as long as head plus thorax. POL not or hardly greater than OOL. Postmarginal vein of fore wing slightly to distinctly longer than the marginal vein ***H. cioni*** Thomson (p. 526)

– Propodeum (Text-figs. 383–389) with posterior part of plicae either virtually parallel or, if converging somewhat, then extending nearly or quite to the hind edge of the nucha. Gaster sometimes longer than head plus thorax. POL sometimes distinctly greater than OOL. Postmarginal vein often not longer than the marginal vein 56

56 (55) Antennal scape virtually as long as an eye, and reaching to, or even slightly above, level of vertex 57

– Antennal scape distinctly shorter than an eye, and not always reaching the level of the vertex 58

57 (56) Gaster at least as long as, but usually longer than, head plus thorax. Left mandible usually with three teeth, rarely with four 58

– Gaster at least slightly shorter than head plus thorax. Both mandibles with four teeth 88

58 (57) Pronotal collar sharply margined over at least the middle third, sometimes throughout 59

– Pronotal collar imarginate, or at most very weakly margined in the middle . 72

59 (58) Gaster lanceolate, slightly to much longer than head plus thorax. Marginal vein of fore wing 1·6 to 2 times as long as the stigmal vein. Antennal scape, except in one species, reaching to or above the level of the vertex . . 60

– Gaster not longer than head plus thorax. Marginal vein often less than 1·6 times as long as the stigmal vein. Antennal scape often not reaching the level of the vertex 70

60 (59) Combined length of pedicellus and flagellum slightly less than the breadth of the head 61

– Combined length of pedicellus and flagellum equal to, or slightly greater than, the breadth of the head 62

61 (60) Gaster 1·8 to 2·3 times as long as broad, only slightly longer than head plus thorax ; tergites bright green to blue-green. First funicular segment of antenna (Text-fig. 390) at least slightly shorter than the pedicellus. Both mandibles with four teeth . . . . . ***P. procerus*** sp. n. (p. 492)

– Gaster 2·5 to 3·7 times as long as broad, slightly to much longer than head plus thorax ; tergites 2–3 (–4) partly to entirely purplish bronze. First funicular segment usually as long as, or longer than, the pedicellus. Left mandible with three teeth . . . . . ***H. dispar*** (Curtis) (p. 532)

62 (60) Antennal scape not quite reaching the level of the vertex 63

– Antennal scape reaching the level of the vertex or even slightly above it . 64

63 (62) Gaster distinctly longer than head plus thorax. Combined length of pedicellus and flagellum usually not greater than breadth of head, very slightly greater in occasional dwarfs.

Propodeum, Text-fig. 383 . . . . . ***H. dispar*** (Curtis) (p. 532)

– Gaster hardly longer than head plus thorax. Combined length of pedicellus and flagellum slightly greater than breadth of head . . ***H.*** sp. indet. C (p. 531)

64 (62) Propodeum with nucha occupying rather more than one third the total length, strongly reticulate, rather more coarsely so than the panels of the median area ; median area hardly 1·5 times as broad as long, its reticulation composed of nearly isodiametric areoles ; occasionally some trace of a costula

present. Gaster conical, clearly longer than head plus thorax. Basal vein of fore wing with about six hairs . . ***H.? tereus*** (Walker) (p. 531)

– Propodeum (Text-figs. 384, 385) with reticulation of nucha not coarser, and often finer, than that of the panels of the median area, with its areoles more or less lengthened in the transverse axis ; costula absent. Basal vein of fore wing sometimes bare or nearly so 65

65 (64) Gaster nearly to quite twice as long as the thorax, acuminate ; last tergite 1·7 to 2·5 times as long as its basal breadth.
Pronotal collar very short medially, one ninth to one eighth as long as the mesoscutum 68

– Gaster distinctly less than twice as long as the thorax, less acuminate, with last tergite relatively shorter 66

66 (65) Pronotal collar, medially, usually one seventh to one sixth as long as the mesoscutum ; if shorter then the gaster has well-defined purplish fasciae on the middle tergites, the disc sometimes entirely purplish bronze. Body most often dull or bronze- (occasionally bright) green 67

– Pronotal collar medially shorter, one ninth to one eighth as long as the mesoscutum. Gaster without, or with poorly-defined, purplish fasciae. Body usually bright green to blue, sometimes brassy. Species associated with sawfly galls on *Salix* 69

67 (66) Propodeum (Text-fig. 384) with median area only about 1·5 times as broad as long ; the median length of the propodeum slightly more than half that of the scutellum ; nucha occupying slightly more than one third the total length of the propodeum ; plicae, on sides of nucha, hardly converging. Marginal vein of fore wing 1·65 to 1·8 times as long as the stigmal vein ***H. grandis*** (Walker) (p. 528)

– Propodeum (Text-fig. 385) with median area 1·7 to 1·8 times as broad as long ; the median length of the propodeum about half that of the scutellum ; nucha occupying slightly more than one quarter the total length of the propodeum ; plicae, on sides of nucha, converging somewhat. Marginal vein of fore wing 1·35 to 1·6 times as long as the stigmal vein ***H. semotus*** (Walker) (p. 529)

68 (65) Gaster nearly to quite twice as long as the thorax, acuminate ; last tergite 1·8 to 2·5 times as long as its basal breadth ; hypopygium extending one third or slightly less than one third along the gaster. Median area of propodeum only 1·5 to 1·6 times as broad as long ***H. capreae*** (L.) Thomson (p. 533)

– Gaster usually distinctly less than twice as long as the thorax ; if nearly twice then the median area of the propodeum is nearly twice as broad as long. Gaster with its last tergite 1·3 to 1·8 times as long as basally broad ; hypopygium extending somewhat more than one third along the gaster . 69

69 (68) Gaster somewhat, to considerably, less than twice as long as the thorax ; last tergite 1·3 to 1·6 times as long as its basal breadth. Median area of propodeum 1·5 to 1·65 times as broad as long. Femora usually pale, rarely all of them mainly dark . . . . ***H. dolichurus*** Thomson (p. 533)

– Gaster nearly twice as long as thorax ; last tergite 1·7 to 1·8 times as long as its basal breadth. Median area of propodeum 1·8 to 2 times as broad as long. All femora mainly black . . . . . ***H.*** sp. indet. D (p. 533)

70 (59) Pronotal collar sharply margined throughout, or except just at the sides. Propodeum much like that of *altus* (cf. Text-fig. 387), the nucha relatively short and separated from the median area by a deep, longitudinally costate constriction. Antennal scape reaching to or above the level of the vertex 71

– Pronotal collar usually at most weakly margined in the middle ; but if at all

sharply margined, then the propodeum has a longer nucha which is separated from the median area by a shallower and less obviously costate constriction ; often the antennal scape does not reach the level of the vertex . . . 72

71 (70) Body green to golden green. Combined length of pedicellus and flagellum fully equal to breadth of head. Gaster as long as, or slightly longer than, head plus thorax. Scutellum and mesoscutum moderately convex. Femora and tibiae yellow . . . . ***H. chlorogaster*** Thomson (p. 534)

– Body mainly coppery, with some parts, especially the gaster, fiery red. Combined length of pedicellus and flagellum slightly less than breadth of head. Gaster slightly shorter than head plus thorax. Mesoscutum tending to be somewhat flat ; scutellum weakly convex. Femora reddish to brown ; tibiae usually partly reddish . . ***H. aureolus*** Thomson (p. 535)

72 (70) Gaster much longer than head plus thorax. Propodeum (Text-figs. 385, 386) with posterior part of plicae converging somewhat. Antennae with first funicular segment usually as long as, or longer than, the pedicellus ; scape reaching the level of the vertex or even slightly above it . . . 73

– Gaster at most slightly longer than head plus thorax 74

73 (72) Pronotal collar sloping forwards, in profile forming a slightly obtuse angle with the pronotal neck, tending to be somewhat rounded off in front. Upper surface of mesoscutum in profile appearing distinctly curved. Marginal vein of fore wing 1·7 to 1·85 times as long as the stigmal vein ***H. fasciatus*** Thomson (p. 538)

– Pronotal collar nearly horizontal, abrupt in front, forming a right angle with the neck. Upper surface of mesoscutum in profile appearing hardly curved. Marginal vein of fore wing 1·35 to 1·6 times as long as the stigmal vein ***H. semotus*** (Walker) (p. 529)

74 (72) Median produced part of clypeus only very shallowly emarginate, without (Text-fig. 395) an impression above the emargination. Propodeum medially distinctly less than half as long as the scutellum, its nucha (Text-fig. 387) relatively short and with sculpture composed of transversely-lengthened areoles. Pronotal collar sloping down somewhat, hence in profile forming an obtuse angle with the neck 75

– Median produced part of clypeus either more distinctly emarginate (as in Text-fig. 394) ; or, if only slightly so, then the propodeum is at least slightly more than half as long as the scutellum, and has a larger nucha whose sculpture is composed of more nearly isodiametric areoles . . 78

75 (74) Antennae with scape reaching to level of vertex, or even slightly above it ; toruli slightly nearer to median ocellus than to anterior margin of clypeus ; proximal segments of funicle slightly longer than broad, the first slightly longer than the pedicellus, distal segments at most slightly transverse ***H.*** sp. indet. E (p. 538)

– Antennae with scape reaching only to about level of middle of the median ocellus ; toruli about equidistant from the median ocellus and the anterior margin of the clypeus ; proximal segments of funicle usually subquadrate with the first not longer than the pedicellus, occasionally the first is slightly longer than broad and a little longer than the pedicellus ; distal segments distinctly transverse 76

76 (75) Marginal vein of fore wing 1·75 to 1·8 times as long as the stigmal vein ; postmarginal vein distinctly shorter than the marginal (Austria) ***H.*** sp. indet. F (p. 538)

– Marginal vein 1·4 to 1·6 times as long as the stigmal vein ; postmarginal vein nearly or quite as long as the marginal 77

77 (76) Malar space virtually, or fully, half the length of an eye
Propodeum, text-fig. 387 . . . . . ***H. altus*** (Walker) (p. 537)

– Malar space slightly less than half the length of an eye. (Slovakia)
H. sp. indet. G (p. 538)

78 (74) Fore wing (Text-fig. 404) with parastigma notably thickened, its breadth about equal to the greatest breadth of the marginal vein ; marginal vein 1·6 to 1·7 times as long as the stigmal vein. Antennal scape reaching only to about middle of median ocellus
Propodeum, Text-fig. 388 ; head, Text-fig. 415
H. crassinervis Thomson (p. 537)

– Fore wing with parastigma not notably thickened ; marginal vein sometimes shorter relative to the stigmal vein. Antennal scape sometimes reaching level of vertex 79

79 (78) Antennae with scape much shorter than an eye, reaching at most to level of middle of median ocellus ; combined length of pedicellus and flagellum at least slightly less than breadth of head 80

– Antennae with scape nearly as long as an eye, reaching to level of vertex or even above it ; combined length of pedicellus and flagellum most often equal to, occasionally slightly less than, the breadth of the head. . . . 84

80 (79) Scutellum in profile appearing weakly convex or virtually flat. Marginal vein only 1·15 to 1·35 times as long as the stigmal vein. Mandibular formula 4.4.
Body dark bluish or bluish bronze . . . ***P. venustus*** Walker (p. 491)

– Scutellum in profile appearing moderately to strongly convex. Marginal vein 1·3 to 1·7 times as long as the stigmal vein. Mandibular formula almost always 3.4 (4.4 only in rare aberrations) 81

81 (80) Genae much compressed, though not sharp-edged ; temples posteriorly appearing angulate, much as in ♂, cf. Text-fig. 419, and converging only slightly. Head and thorax bronze- or olive-green. Propodeum (Text-fig. 375) with nucha with areoles lengthened in the transverse axis ; posterior part of plicae extending only a little way on to sides of nucha. POL not or hardly greater than OOL . . . . . ***H. cioni*** Thomson (p. 526)

– Genae at most slightly compressed ; temples usually less angulate and converging more distinctly, but if approaching the shape seen in *cioni* then head and thorax green to blue-green and nucha with more isodiametric areoles. Propodeal plicae usually extending farther along sides of nucha. POL slightly greater than OOL 82

82 (81) Propodeum medially half or slightly less than half as long as scutellum ; median area 1·6 to 1·7 times as broad as long. Head in dorsal view (Text-fig. 413) 2·2 to 2·3 times as broad as long. Marginal vein 1·3 to 1·55 times as long as the stigmal vein. Head and thorax, and gaster mainly, bronze
H. isarchus (Walker) (p. 527)

– Propodeum medially slightly more than half as long as scutellum ; median area 1·3 to 1·5 times as broad as long. Head in dorsal view 2 to 2·15 times as broad as long. Marginal vein 1·5 to 1·7 times as long as the stigmal vein. Head and thorax, and gaster mainly, dull to bright green or blue . 83

83 (82) Head in dorsal view with temples fully, or even slightly more than, one third as long as the eyes. Upper triangular area of mesepisternum polished and smooth. All femora, at least proximally, infuscate or black. Flagellum brown or subtestaceous . . . . ***H. hieracii*** Thomson (p. 536)

– Head in dorsal view with temples hardly one third as long as eyes. Upper triangular area of mesepisternum having its dorsal part delicately alutaceous. Femora reddish, or slightly infuscate proximally. Flagellum blackish . . . . . ***Sceptrothelys parviclava*** sp. n. (p. 487)

84 (79) Gaster as long as, or slightly longer than, head plus thorax. POL 1·15 to 1·5 OOL. Mandibular formula 3.4 or 4.4 85

– Gaster not or only slightly longer than the thorax. POL usually not or hardly greater than OOL. Mandibular formula 4.4 88

85 (84) POL hardly greater than OOL. Mandibular formula 4.4. Body with obscure bronze, bluish, and greenish tints. Marginal vein of fore wing only 1·2 to 1·35 times as long as the stigmal vein. Propodeum slightly more than half as long as the scutellum . . . . . ***P. bifoveolatus*** Förster (p. 490)

– Either POL 1·25 to 1·5 OOL *and* mandibular formula 3.4 ; or else body bright green to blue-green, *and* marginal vein 1·4 to 1·7 times as long as the stigmal vein. Propodeum often not more than half as long as the scutellum . 86

86 (85) Combined length of pedicellus and flagellum equal to or slightly greater than breadth of head. Marginal vein of fore wing 1·35 to 1·5 times as long as the stigmal vein. Mandibular formula 3.4. Head and thorax most often bronze or bronze-green 87

– Combined length of pedicellus and flagellum slightly less than breadth of head. Marginal vein 1·4 to 1·7 times as long as the stigmal vein. Mandibular formula 4.4. Body bright green to blue-green 90

87 (86) Propodeum (Text-fig. 385) with nucha shorter, its length hardly one third the median length of the propodeum ; spiracles large, nearly twice as long as broad, nearly touching the metanotum. Basal vein of fore wing usually bare, occasionally with one to three hairs . ***H. semotus*** (Walker) (p. 529)

– Propodeal nucha longer, its length one third that of the propodeum or slightly more ; spiracles smaller, about 1·5 times as long as broad, separated by a short space from the hind margin of the metanotum. Basal vein of fore wing with two to nine hairs . . . ***H. helenomus*** sp. n. (p. 535)

88 (84) Antennae inserted unusually high on the head, their toruli slightly nearer to the median ocellus than to the anterior margin of the clypeus ; combined length of pedicellus and flagellum slightly greater than breadth of head ; flagellum slender, hardly stouter than the pedicellus when the latter is seen in dorsal view ; scape reaching well above level of vertex. Propodeum medially only about half as long as the scutellum . ***P.*** sp. indet. A (p. 429)

– Antennae inserted rather less high on the head, their toruli about equidistant from the median ocellus and the anterior margin of the clypeus, or a little nearer to the latter ; combined length of pedicellus and flagellum at most equal to breadth of head ; flagellum rather less slender, than in above ; scape not always reaching above vertex. Propodeum medially a little more than half as long as the scutellum. 89

89 (88) Fore wing with marginal vein 1·4 to 1·7 times as long as the stigmal vein. POL 1·15 to 1·25 OOL. Body bright green or blue-green. 90

– Fore wing with marginal vein 1·1 to 1·3 times as long as the stigmal vein. POL not or hardly greater than OOL. Body sometimes with more obscure, bronze-green to bronze or dark bluish, tints 91

90 (89) Gaster lanceolate or sublanceolate, 1·8 to 2·3 times as long as broad, usually as long as or slightly longer than head plus thorax, only occasionally a little shorter. Antennae (Text-fig. 390) with funicular segments relatively shorter ; the first at least slightly shorter than the pedicellus. Propodeum, text-fig. 389 . . . . ***P. procerus*** sp. n. (p. 492)

– Gaster ovate, 1·55 to 1·6 times as long as broad, slightly shorter than head plus thorax. Antennae (Text-fig. 391) with funicular segments relatively longer ; the first as long as the pedicellus . . ***P. smaragdus*** sp. n. (p. 494)

91 (89) Head in dorsal view twice or hardly more than twice as broad as long ; POL tending to be slightly less than OOL ; temples about two thirds as long as

the eyes. Mesoscutum more coarsely reticulate, especially posteriorly where its reticulation is much coarser than that of the scutellum. Head and thorax green . . . . . ***P. squamifer*** Thomson (p. 491)

– Head in dorsal view 2·2 to 2·35 times as broad as long ; POL equal to or very slightly greater than OOL ; temples at most slightly more than half as long as the eyes. Mesoscutum usually more finely sculptured with the reticulation of its posterior part not much coarser than that of the scutellum, if much coarser, then the head and thorax are dark green or bronze . . 92

92 (91) Gaster at least slightly longer than the thorax, acute at apex. Propodeum usually with some trace of a median carina. Postmarginal vein 1·2 to 1·35 times as long as the marginal vein . . ***P. bifoveolatus*** Förster (p. 490)

– Gaster usually slightly shorter than the thorax, occasionally as long as the thorax in small specimens, bluntly pointed at apex. Propodeum with median carina nearly always absent, rarely very vaguely indicated in part. Postmarginal vein 1·1 to 1·2 times as long as the marginal vein ***P. puparum*** (L.) (p. 489)

93 (49) Fore wing with basal cell, at least mainly, bare ; speculum open below. Hind wing with costal cell bare to level of beginning of marginal vein. Gena without a hollow above the base of the mandible. Head and dorsum of thorax slightly shiny, with relatively weaker sculpture ***H. platyphilus*** (Walker) (p. 524)

– Fore wing with basal cell hairy all over ; speculum closed below except proximally. Hind wing with costal cell with a few hairs before the beginning of the marginal vein. Gena with a narrow hollow above the base of the mandible. Head and dorsum of thorax duller with relatively stronger sculpture . . . . . ***H. crassicornis*** (Zetterstedt) (p. 523)

HABROCYTUS and *PTEROMALUS*

KEY TO MALES OF SOME EUROPEAN SPECIES

1 Edge of oral fossa, on either side of the clypeus, with a projecting flange rather like that of *Rohatina inermis* (Text-fig. 572) ; breadth of oral fossa about twice the malar space. Antenna with flagellum with subdecumbent hairs ; segments of funicle often annulated, each segment partly pale, partly fuscous ; combined length of pedicellus and flagellum less than breadth of head. Propodeum more than half as long as the scutellum, with a distinct reticulate nucha . . . . . ***H. ? platyphilus*** (Walker) (p. 524)

– Edge of oral fossa without projections. Antennal flagellum often with moderately outstanding hairs ; segments of funicle not annulated with contrasting colours ; combined length of pedicellus and flagellum most often as great as, or greater than, the breadth of the head. Propodeum sometimes shorter, or with a less distinctly developed nucha 2

2 (1) Base of mandible forming a large convex plate (as in Text-fig. 337) with only a narrow lunate gap between it and the gena ; oral fossa enlarged, its breadth about six times the malar space. Postspiracular sclerite fairly strongly reticulate except along its edges ***H. conopidarum*** (Bouček) (p. 559)

– Base of mandible normal, not forming a large convex plate ; breadth of oral fossa not more than 4·3 times the malar space except in two species which have a large subcircular pit (Text-fig. 338) between base of mandible and gena. Postspiracular sclerite more weakly and irregularly sculptured, sometimes nearly smooth 3

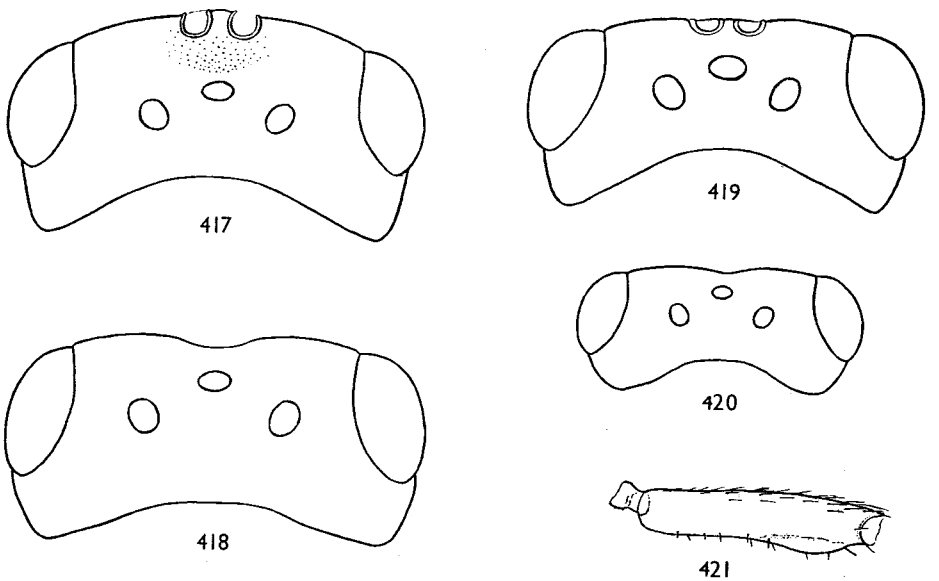
3 (2) Oral fossa extremely wide, reaching nearly to the eyes, its breadth 11 to 34 times the malar space. Base of mandible separated from edge of gena by a large subcircular pit (Text-fig. 338) which is membranous at the bottom. Ocelli moderate-sized, the posterior ones separated by about twice their major diameter from the eyes 4

– Oral fossa not nearly reaching the eyes, its breadth at most 4·3 times the malar space. Usually there is no large subcircular pit between base of mandible and gena, but if such a pit is present then the ocelli are small, the posterior ones separated by about three times their major diameter from the eyes 5

4 (3) Head in dorsal view with temples converging strongly and only one sixth as long as the eyes or less ; the head relatively more transverse. POL greater than OOL. Fore wing with postmarginal vein nearly 1·5 times as long as the marginal vein ; the latter equal in length to, or slightly shorter than, the stigmal vein . . . . . ***P. bifoveolatus*** Förster (p. 490)

– Head in dorsal view with temples converging only slightly and about one third as long as the eyes ; the head relatively less transverse. POL hardly greater than OOL. Fore wing with postmarginal vein only slightly longer than the marginal vein ; the latter slightly longer than the stigmal vein ***P. squamifer*** Thomson (p. 491)

5 (3) Base of mandible separated from gena by a large subcircular or semicircular membranous area. Oral fossa large, its breadth 2·5 to 4·3 times the malar space. POL about equal to OOL ; posterior ocelli small, separated by about three times their major diameter from the eyes 6



FIGS. 417–421. *Habrocytus* and *Pteromalus* spp., ♂. 417, *H. berylii* (Walker), ♂, head ; 418, *H. elevatus* (Walker), ♂, head ; 419, *H. cioni* Thomson, ♂, head ; 420, *P. venustus* (Walker), ♂, head ; 421, *H. dolichurus* Thomson, ♂, scape of right antenna.

– Base of mandible in most species separated from gena by only a narrow lunate membranous area ; if this area is large and semicircular, then the breadth of the oral fossa is only about twice the malar space, POL is greater than OOL, and the ocelli are relatively larger. 7

6 (5) Breadth of oral fossa 4 to 4·3 times the malar space. Mandibular formula 3.4. Eyes small, separated by about 1·8 times their length. Propodeum less than half as long as the scutellum ; plicae converging fairly strongly at sides of nucha, the latter a narrow transversely-aciculate strip. Antenna with scape not reaching above vertex ; funicular segments subquadrate ***H. microps*** sp. n. (p. 556)

– Breadth of oral fossa 2·5 to 3 times the malar space. Mandibular formula 4.4. Eyes separated by 1·5 to 1·6 times their length. Propodeum somewhat more than half as long as the scutellum ; plicae subparallel posteriorly, on sides of nucha ; nucha partly reticulate. Antenna with scape reaching slightly above the vertex ; funicular segments tending to be slightly longer than broad . . . . . ***P. procerus*** sp. n. (p. 492)

7 (5) Anterior margin of clypeus (Text-fig. 393) incised medially 8

– Anterior margin of clypeus at most moderately emarginate, sometimes truncate, medially (Text-figs. 394, 395) 10

8 (7) Propodeal spiracles small and subcircular. Fore wing with postmarginal vein longer than the marginal vein. Pronotal collar medially very short, its front edge sharply margined. [No species as yet known, but the male of *janssoni* sp. n. might be expected to have these characters] . . .

– Propodeal spiracles large, long-oval or sublinear. Fore wing with postmarginal vein at most as long as the marginal vein. Pronotal collar relatively longer medially, its front edge usually not sharply margined . 9

9 (8) Pronotal collar, medially, from one-sixth, to nearly one-fifth, as long as the mesoscutum . . . . . ***H. sequester*** (Walker) (p. 554)

– Pronotal collar, medially rather shorter than in the above ***H. ? cionobius*** (Erdös) (p 555)

10 (7) Gena, near base of mandible, so strongly compressed that it forms a sharp edge Strigose sculpture of clypeus extending up the sides of the face to near the eyes. Pronotal collar, medially, long, about one fifth as long as the mesoscutum, its front margin raised and almost reflexed. Propodeum more than half as long as the scutellum, with a fairly large nucha, uniformly reticulate, without a costula. Antenna with combined length of pedicellus and flagellum slightly greater than breadth of head ***H. chrysos*** (Walker) (p. 527)

– Gena, although sometimes moderately compressed, always rounded even near the base of the mandible. Strigose sculpture usually extending less far up the face. The other characters usually not all agreeing with the above 11

11 (10) Anterior margin of clypeus (Text-fig. 395) truncate or even slightly curved forwards, without an impression in the middle 12

– Anterior margin of clypeus (Text-fig. 394) at least slightly emarginate medially, very often with an impression just above the emargination . . 14

12 (11) Antenna with scape reaching the vertex, its length slightly greater than the transverse diameter of an eye ; combined length of pedicellus and flagellum slightly greater than breadth of head ; all funicular segments, except sometimes the sixth, longer than broad. (Czechoslovakia) . ***H.*** sp. indet. E (p. 538)

– Antenna with scape not reaching the vertex, its length barely or just equal to the transverse diameter of an eye ; combined length of pedicellus and flagellum approximately equal to breadth of head ; at most segments one to three of funicle slightly longer than broad, the distal segments quadrate (or the sixth very slightly transverse) 13

13 (12) Fore wing with postmarginal vein slightly shorter than the marginal vein, the latter 1·45 to 1·6 times as long as the stigmal vein ; wing hyaline. Malar space approximately 0·4 length of eye. (Czechoslovakia) ***H.*** sp. indet. G (p. 538)

– Fore wing with postmarginal vein slightly longer than the marginal vein, the latter 1·3 to 1·35 times as long as the stigmal vein ; wing sometimes slightly infuscate. Malar space about 0·47 length of eye. (Britain) ***H. altus*** (Walker) (p. 537)

14 (11) Fore wing (cf. Text-fig. 404) with parastigma notably thickened, nearly or quite as thick as the broadest part of the marginal vein ; the other veins relatively thick ; marginal vein 1·65 to 1·75 times as long as the stigmal vein. Base of mandible separated from gena by a nearly semicircular membranous space. Antenna : combined length of pedicellus and flagellum equal to, or hardly greater than, breadth of head ***H. crassinervis*** Thomson (p. 537)

– Fore wing with parastigma not so obviously thickened ; marginal vein often shorter relative to the stigmal vein. Base of mandible separated from gena by only a narrow lunate space 15

15 (14) Antenna with combined length of pedicellus and flagellum about 1·75 times breadth of head ; all funicular segments about 2·5 times as long as broad ***H. tereus*** (Walker) (p. 531)

– Antenna with combined length of pedicellus and flagellum at most about 1·4 times breadth of head ; first funicular segment at most 2·3 times, sixth at most barely twice, as long as broad 16

16 (15) Antennae, and legs, not counting coxae, entirely bright yellow to orange. Propodeum more than half as long as the scutellum ; its median area uniformly or nearly uniformly reticulate, without a costula or with at most a trace of one 40

– Antennae and legs never both entirely bright yellow or orange ; at least the flagellum, or the femora, more or less infuscate or brownish . . . 17

17 (16) Propodeum with a distinct costula ; plicae posteriorly, at sides of nucha, converging only moderately strongly. Species parasitic on Diptera Trypetidae 23

– Either the propodeum lacks a costula ; or else the plicae posteriorly converge strongly 18

18 (17) Propodeum distinctly less than half as long as the scutellum ; plicae posteriorly, at sides of nucha, converging strongly or moderately strongly, reaching or nearly reaching the hind edge of the propodeum ; costula often indicated 20

– Propodeum from nearly half, to more than half, as long as the scutellum ; plicae posteriorly usually converging less strongly, sometimes not nearly reaching the hind edge of the propodeum ; costula rarely present . . 19

19 (18) Propodeum with plicae posteriorly, at sides of nucha, converging strongly, reaching or virtually reaching the hind edge of the nucha ; the propodeum is at most half as long as the scutellum, but usually slightly less than half 20

– Propodeum with plicae posteriorly either subparallel or only converging slightly ; or else not nearly reaching the hind edge of the nucha ; propodeum at least slightly more than half as long as the scutellum 40

20 (19) Propodeum with plicae sharp only posteriorly, absent or hardly traceable in the middle, though represented at the base of the propodeum by a pair of foveae . . . . . ***H. ? ochrocerus*** Thomson (p. 526)

– Propodeum with plicae traceable from base to hind edge of propodeum, distinct, and sometimes sharp, throughout 21

21 (20) Antennal scape as long or virtually as long as an eye. Species not parasitic on Diptera Trypetidae. . . . . ***H. semotus*** (Walker) (p. 529)

– Antennal scape distinctly, sometimes much, shorter than an eye. Species (so far as known) parasitic on Diptera Trypetidae 22

22 (21) Pronotal collar, medially, about one quarter as long as the mesoscutum. (Madeira) . . . . . ***H. integer*** (Walker) (p. 538)

– Pronotal collar, medially, at most slightly more than one fifth as long as the mesoscutum. European species 23

23 (22) Antennal flagellum very slender, not or hardly stouter than the pedicellus when the latter is seen in dorsal view ; funicular segments long, the first 2 to 2·25 times, the sixth 1·6 to 1·7 times, as long as broad. Propodeum slightly more than half as long as the scutellum. Antennal scape reaching a little above the vertex. Gaster immaculate . . ***H. parietinae*** sp. n. (p. 553)

– Antennal flagellum at least somewhat stouter than the pedicellus in dorsal view ; funicular segments rarely so long. Propodeum rarely more than half as long as the scutellum ; if so, then the scape does not reach the vertex, and the gaster has a yellowish spot 24

24 (23) Combined length of pedicellus and flagellum about 1·3 times breadth of head ; funicular segments long, the first 1·6 to 1·8 times as long as the pedicellus, sixth distinctly, usually about 1·5 times, longer than broad. Gaster either with a pale dorsal spot, or with the ventral plica pale medially. Row of hairs on lower surface of costal cell of fore wing complete . ***H.*** sp. indet. (p. 542)

– Either combined length of pedicellus and flagellum not or hardly greater than breadth of head, and funicular segments relatively shorter ; or gaster including the ventral plica immaculate 25

25 (24) Gaster with at least a small pale dorsal spot, or with the ventral plica pale in the middle. Head and thorax usually bright green to blue-green, occasionally bronze-green 26

– Gaster, including its ventral plica, immaculate 27

26 (25) Fore wing with postmarginal vein fully as long as, or slightly longer than, the marginal vein. Pronotal collar, medially, slightly more than one fifth as long as the mesoscutum . . . . ***H. ? intermedius*** (Walker) (p. 542)

– Fore wing with postmarginal vein slightly shorter than the marginal vein. Pronotal collar, medially, from slightly more than one sixth, to one fifth, as long as the mesoscutum . . . . . ***H. patro*** (Walker) (p. 547)

27 (25) Antenna with combined length of pedicellus and flagellum about 1·3 times the breadth of the head 28

– Combined length of pedicellus and flagellum not or hardly greater than the breadth of the head 29

28 (27) Fore wing with row of hairs on lower surface of costal cell widely interrupted in the middle. Antenna with scape reaching the vertex ; funicular segments relatively long, the first 1·7 to 2 times, the sixth about 1·5 times, as long as broad . . . . . ***H. tripolii*** sp. n. (p. 551)

– Row of hairs on lower surface of costal cell complete. Antenna with scape reaching at most to level of middle of median ocellus ; funicular segments often relatively shorter 39

29 (27) Fore wing with row of hairs on lower surface of costal cell interrupted medially, sometimes widely so 30

– Fore wing with row of hairs on lower surface of costal cell complete . . 32

30 (29) Head in dorsal view (Text-figs. 417, 418) with temples half or even slightly more than half as long as the eyes, converging only slightly ; frons projecting somewhat, the antennal toruli visible from above ; occiput deeply excavated. Antennal scape reaching the vertex 31

– Head in dorsal view with temples relatively shorter, converging more strongly, more rounded ; frons not projecting medially, toruli hardly visible from above ; occiput less deeply excavated. Antennal scape hardly reaching the vertex 33

31 (30) Head and thorax blue or greenish blue. Row of hairs on lower surface of costal cell only narrowly interrupted medially ***H. berylli*** (Walker) (p. 544)

– Head and thorax green or bronze-green. Row of hairs on lower surface of costal cell widely interrupted medially . . ***H. temporalis*** sp. n. (p. 547)

32 (29) Head in dorsal view (Text-fig. 417) hardly twice as broad as long ; temples half or even slightly more than half as long as eyes, converging only slightly ; frons projecting somewhat, the antennal toruli visible from above ; occiput deeply excavated. Antennal scape reaching the vertex ***H. berylli*** (Walker) (p. 544)

– Head in dorsal view at least twice as broad as long ; temples usually shorter and converging more distinctly, if nearly half as long as the eyes then (Text-fig. 418) frons not projecting medially, toruli not visible from above, occiput less deeply excavated, scape not reaching the vertex. 33

33 (32) Fore wing with speculum, on upper surface of wing, extending as a bare strip below the marginal vein and nearly or quite reaching the base of the stigmal vein. Head and thorax usually bright green to blue, occasionally a more bronzy green 34

– Fore wing with speculum, on upper surface of wing, extending below the marginal vein to at most about half way along this vein, not reaching the stigmal vein. Head and thorax most often bronze- or dark bluish green, only occasionally a brighter green 36

34 (33) Fore wing with postmarginal vein very slightly longer than the marginal vein, the latter only 1 to 1·22 times as long as the stigmal vein. Small species, 1·5 to 2 mm. Median area of propodeum nearly uniformly reticulate ; costula absent or hardly indicated . . ***H. ? brachygaster*** sp. n. (p. 549)

– Fore wing with postmarginal vein only as long as, or slightly shorter than, the marginal vein ; the latter 1·3 to 1·45 times as long as the stigmal vein. Species sometimes larger. Propodeum with median area sometimes unevenly sculptured ; costula sometimes distinct 35

35 (34) Smaller species, 1·7 to 2 mm. Antenna with first funicular segment not or hardly longer than the pedicellus, at most 1·3 times as long as broad ; funicular segments, except the first and sometimes the second, quadrate. Propodeum with costula absent or hardly traceable ***H. ? decipiens*** sp. n. (p. 548)

– Larger species, 2·2 to 2·8 mm. Antenna with first funicular segment 1·2 to 1·5 times as long as the pedicellus, 1·4 to 1·6 times as long as broad ; usually at least some of the funicular segments in addition to the first and second are slightly longer than broad. Propodeum with costula, except in very small specimens, usually distinct . . . ***H. albipennis*** (Walker) (p. 544)

36 (33) Head in dorsal view (Text-fig. 415) with temples rounded and hence appearing to converge more strongly 37

– Head in dorsal view (Text-fig. 418) with temples less rounded and converging less strongly 38

37 (36) Small species, 1·5 to 2 mm., with head and thorax bright green or blue-green ; antennal flagellum most often testaceous beneath. Median area of propodeum nearly uniformly reticulate ; costula absent or at most very vaguely indicated 34

– Species usually more than 2 mm. in length ; if only 2 mm., then head and thorax dark blue-green or bronze-green, and flagellum brown to blackish. Median area of propodeum irregularly sculptured, sometimes partly smooth anteriorly ; costula nearly always indicated, sometimes strong . . 38

38 (37) Antennal scape reaching the top of the median ocellus, or nearly to the vertex. Fore wing with postmarginal vein as long as, or slightly longer than, the marginal vein. Head distinctly broader than the mesoscutum. Combined

length of pedicellus and flagellum about equal to breadth of head. Reticulation of disc of scutellum about as coarse as that of the frenum
H. musaeus (Walker) (p. 540)

– Antennal scape reaching at most slightly above the lower edge of the median ocellus, if reaching slightly above the lower edge, then postmarginal vein slightly shorter than the marginal vein, and combined length of pedicellus and flagellum 1·25 to 1·3 times breadth of head. Reticulation of disc of scutellum very fine, at least slightly finer than that of the frenum . . 39

39 (38) Antenna with combined length of pedicellus and flagellum barely or just equal to breadth of head ; scape not quite reaching lower edge of median ocellus ; hairs of flagellum very short and standing out only slightly. Head hardly broader than the mesoscutum. Propodeum, in front of the costula, for the most part distinctly sculptured . . ***H. elevatus*** (Walker) (p. 538)

– Antenna with combined length of pedicellus and flagellum 1·25 to 1·3 times breadth of head ; scape reaching to, or slightly above, the lower edge of the median ocellus ; hairs of flagellum longer, their length more than one third the breadth of the segments and standing out at 30° to 40°. Head slightly broader than the mesoscutum. Propodeum, in front of the costula, weakly sculptured or almost smooth . . . . ***H. myopitae*** sp. n. (p. 540)

40 (16) Antennae entirely citron-yellow, or with the flagellum orange-yellow ; legs, except the hind coxae and sometimes the mid and fore coxae, bright yellow 41

– Antennal flagellum testaceous with darker incisures, or infuscate dorsally, or wholly brown to black ; scape often more or less infuscate ; femora often more or less infuscate, sometimes also the tibiae ; usually all the coxae are dark 44

41 (40) Gaster with a yellow spot or transverse band. Fore, and sometimes mid, coxae often partly or entirely yellow. Postmarginal vein often not longer than the marginal vein 42

– Gaster immaculate. All coxae black with a metallic tinge. Postmarginal vein at least slightly longer than the marginal vein 44

42 (40) Fore wing with postmarginal vein longer than the marginal vein. All coxae black with a metallic tinge . . . . . ***H. cioni*** Thomson (p. 526)

– Fore wing with postmarginal vein not longer than the marginal vein. Fore, and even mid, coxae often more or less yellow 43

43 (42) Antenna with scape reaching above the vertex, nearly as long as an eye ; first funicular segment slightly to quite distinctly longer than the pedicellus, sixth about 1·5 times as long as broad. Larger species, up to 2·7 mm. in length . . . . . ***H. dispar*** (Curtis) (p. 532)

– Antenna with scape barely reaching the vertex, much shorter than an eye ; first funicular segment not or only very slightly longer than the pedicellus, sixth quadrate or only slightly longer than broad. Smaller species, at most 2·3 mm. in length . . . . ***H. hieracii*** Thomson (p. 536)

44 (41) Antenna with combined length of pedicellus and flagellum less than, or at most equal to, the breadth of the head 45

– Antenna with combined length of pedicellus and flagellum at least slightly greater than the breadth of the head 50

45 (44) Fore wing with postmarginal vein at least slightly longer than the marginal vein, the latter at most 1·25 times as long as, sometimes not longer than, the stigmal vein. Antenna with hairs of flagellum most often subdecumbent or standing out only slightly 46

– Fore wing with postmarginal vein not longer, sometimes slightly shorter, than the marginal vein, the latter sometimes more than 1·25 times as long as the the stigmal vein. Antenna with hairs of flagellum often standing out at a

moderate angle 54

46 (45) Fore wing with speculum, on upper surface of wing, extending nearly or quite to the stigmal vein. Genae strongly compressed. Head in dorsal view (Text-fig. 419) with temples converging only slightly. Antennal scape reaching the vertex. Gaster with a distinct yellow spot. Propodeum with plicae hardly extending on to sides of nucha, as in female, Text-fig. 375. Antennae yellowish with pedicellus and flagellum more or less infuscate dorsally. Femora and tibiae yellow, the hind femora sometimes infuscate. Mandibular formula 3.4 . . . . . ***H. cioni*** Thomson (p. 526)

– Fore wing with speculum, on upper surface of wing, not reaching the stigmal vein, extending below the marginal vein for at most half the length of the latter. Genae not strongly compressed. Either the head in dorsal view has the temples (Text-fig. 420) converging quite strongly ; or else the antennal scape does not reach the vertex. Gaster usually immaculate, with a pale spot in some *bedeguaris*. Propodeal plicae usually extending on to sides of nucha and often reaching its hind edge. Mandibular formula 3.4 or 4.4 47

47 (46) Antennal scape reaching slightly above the vertex. Legs, except coxae, yellow. Head and thorax bright or golden green. Antennal flagellum rather slender ; all funicular segments, except sometimes the sixth, at least slightly longer than broad. Mandibular formula 4.4 . . . . . ***P. puparum*** (Linnaeus) (p. 489)

– Antennal scape not or only just reaching the vertex. Legs with all femora more or less infuscate. Head and thorax tending towards a dull blue or blue-green. Antennal flagellum sometimes rather stouter, sometimes with distal segments of funicle not longer than broad 48

48 (47) Antennal toruli slightly nearer to anterior margin of clypeus than to median ocellus. Head in dorsal view with temples converging only slightly ; the head 2 to 2·15 times as broad as long. Pronotal collar, medially, slightly more than one fifth as long as mesoscutum. Fore wing with stigma rather small, separated by 2·6 to 3 times its height from costal edge of wing. Antennal flagellum usually testaceous with darker incisures, sometimes infuscate dorsally. Mandibular formula 3.4 . ***H. vibulenus*** (Walker) (p. 525)

– Antennal toruli about equidistant from anterior margin of clypeus and median ocellus. Head in dorsal view normally with the temples converging more strongly (as in Text-fig. 420), and rather more transverse. Pronotal collar, medially, from one sixth to nearly one fifth as long as the mesoscutum. Fore wing with stigma rather larger, separated by only 2 to 2·5 times its height from costal edge of wing 49

49 (48) Mandibular formula 3.4. Scutellum moderately convex. Antenna with combined length of pedicellus and flagellum about equal to breadth of head ; funicular segments variable, sometimes short as in *venustus* (see below), sometimes with the first segment up to twice as long as broad and distinctly longer than the pedicellus, and the sixth slightly longer than broad ***H. bedeguaris*** Thomson (p. 527)

– Mandibular formula 4.4. Scutellum rather weakly convex. Antenna with combined length of pedicellus and flagellum slightly less than breadth of head ; first funicular segment at most 1·5 times as long as broad, not or only slightly longer than the pedicellus, sixth quadrate or slightly transverse ***P. venustus*** Walker (p. 491)

50 (44) Antenna with combined length of pedicellus and flagellum only very slightly greater than breadth of head 51

– Antenna with combined length of pedicellus and flagellum distinctly greater

than breadth of head 52

51 (50) Fore wing with postmarginal vein about as long as, or slightly shorter than, the marginal vein 54

– Fore wing with postmarginal vein distinctly longer than the marginal vein 52

52 (51) Fore wing with row of hairs on lower surface of costal cell interrupted medially 22

– Fore wing with row of hairs on lower surface of costal cell complete . . 53

53 (52) Fore wing with speculum, on upper surface of wing, extending hardly beyond the base of the marginal vein, the latter at most 1·25 times as long as, and sometimes not longer than, the stigmal vein. Antennal scape just reaching the vertex ; combined length of pedicellus and flagellum hardly greater than breadth of head. Gaster immaculate or with a small pale spot ***H. bedeguaris*** Thomson (p. 527)

– Fore wing: either the speculum, on upper surface of the wing, extends below the marginal vein for at least half the length of the latter ; or else the marginal vein is at least 1·5 times as long as the stigmal vein. Antennal scape sometimes not reaching, or reaching above the vertex ; combined length of pedicellus and flagellum often distinctly greater than breadth of head. Gaster often with a distinct pale spot 54

54 (53) Median area of propodeum as long as broad, about two-thirds as long as the scutellum ; nucha large, its length slightly more than one third that of the propodeum, its sculpture composed of strong reticulation with subcircular areoles ; posterior portions of plicae, on sides of nucha, parallel and relatively long. Antennal scape distinctly shorter than an eye, hardly reaching the vertex ; combined length of pedicellus and flagellum slightly greater than breadth of head ; flagellum fuscous. Gaster oblong, at least twice as long as broad . . . . . ?***Sceptrothelys parviclava*** sp. n. (p. 487)

– Median area of propodeum at least slightly broader than long, relatively shorter than in the above ; nucha occupying at most one third the length of the propodeum, its sculpture composed of weaker reticulation whose areoles are more or less lengthened in the transverse axis ; posterior portions of plicae, on sides of nucha, often converging slightly, sometimes relatively short 55

55 (54) Antennal scape (Text-fig. 421) with a small boss-like expansion on its front edge, above the middle ; the scape reaching virtually to, or slightly above, the vertex 64

– Antennal scape without an expansion on its front edge, sometimes not reaching the vertex 56

56 (55) Antennal scape distinctly shorter than an eye 57

– Antennal scape as long or virtually as long as an eye 65

57 (56) Gaster immaculate 58

– Gaster with at least a small yellowish spot, or with the ventral plica pale medially 59

58 (57) Antenna with combined length of pedicellus and flagellum about 1·3 times the breadth of the head ; flagellum very slender, hardly stouter than the pedicellus in dorsal view ; funicular segments elongate, the first 2 to 2·25 times, the sixth 1·6 to 1·7 times, as long as broad. Head and thorax green ***H. parietinae*** sp. n. (p. 553)

– Antenna with combined length of pedicellus and flagellum only 1·1 to 1·15 times the breadth of the head ; either the flagellum is less slender, or has shorter funicular segments. Head and thorax most often bronze-green or bronze 60

59 (57) Antenna with combined length of pedicellus and flagellum about 1·3 times the breadth of the head ; clava at least slightly shorter than funicular

segments five plus six ; funicular segments long, the sixth rather more than 1·5 times as long as broad 24

– Antenna with combined length of pedicellus and flagellum 1·1 to 1·2 times the breadth of the head ; clava as long as, or longer than, funicular segments five plus six ; funicular segments often relatively shorter 60

60 (59) Gaster oval, shorter than the thorax, less than twice as long as broad ; usually with a pale spot. Head and thorax mainly dull green, bronze-green, or bronze . . . . . ***H. isarchus*** (Walker) (p. 527)

– Gaster oblong, hardly shorter than the thorax, at least twice as long as broad. Head and thorax usually mainly green or blue-green 61

61 (60) Antenna with first funicular segment only slightly longer than the pedicellus ; proximal funicular segments only slightly longer than broad, distal segments subquadrate ; combined length of pedicellus and flagellum about 1·1 times the breadth of the head. Darker species : all femora infuscate, scape and tegulae partly so ; gaster with a hardly visible pale spot. Fore wing with postmarginal vein about as long as the marginal vein, the latter hardly 1·5 times as long as the stigmal vein. Propodeum with plicae curved, but only weakly sinuate posteriorly, at sides of nucha ; median area hardly 1·5 times as broad as long . . . . . ***H. sophax*** (Walker) (p. 560)

– Antenna with first funicular segment distinctly longer than the pedicellus ; all funicular segments longer than broad, even the sixth at least slightly so ; combined length of pedicellus and flagellum 1·15 to 1·2 times the breadth of the head. Species usually brighter in colour : usually at most the hind femora more or less infuscate ; scape usually, tegulae sometimes, wholly testaceous ; gaster with a distinct pale spot 62

62 (61) Head in dorsal view with temples converging only slightly. Pronotal collar, medially, only one ninth as long as the mesoscutum or rather less, sharply margined except at the sides . . . . . ***H. ortalus*** (Walker) (*?*=***aureolus*** Thomson) (p. 535)

– Head in dorsal view with temples converging quite strongly. Pronotal collar, medially, about one seventh as long as the mesoscutum or rather more, weakly margined or immarginate 63

63 (62) Fore wing with postmarginal vein slightly shorter than the marginal vein ***H. fasciatus*** Thomson (p. 538)

– Fore wing with postmarginal vein about as long as the marginal vein ***H.? helenomus*** sp. n. (p. 535)

64 (55) Antennal scape (Text-fig. 421) with a small boss-like expansion on its front edge, just above the middle ; the scape slightly shorter than an eye and hardly reaching the vertex . . . . . ***H. dolichurus*** Thomson (p. 533)

– Antennal scape either lacking a boss-like expansion, or else as long as an eye and reaching distinctly above the vertex 65

65 (56) Front edge of antennal scape with a small boss near its apex. All femora usually yellow, the hind ones sometimes slightly infuscate. Antennal flagellum testaceous or yellowish with darker incisures, sometimes also darkened dorsally. Pale spot of gaster usually large ***H. grandis*** (Walker) (p. 528)

– Front edge of antennal scape without a boss. Hind femora mainly black, fore and mid femora usually more or less infuscate. Antennal flagellum brown to blackish. Pale spot of gaster small or absent ***H. semotus*** (Walker) (p. 529)

THE *PLATYPHILUS*-GROUP

Habrocytus crassicornis (Zetterstedt) **comb. n.**

Pteromalus crassicornis Zetterstedt, 1838 : 424, ♀.

Type material. One female, LECTOTYPE (probably holotype), labelled in Zetterstedt's handwriting " P. crassicornis. ♀. Kengis ".

SWEDEN (Lapland) ; only the type ♀ known to me.

Biology. Unknown.

Habrocytus platyphilus (Walker)

Pteromalus amplus Walker, 1836 : 480, ♀ [*nec* 1835 : 480].
Pteromalus platyphilus Walker, 1874 : 317, ♀.
Pteromalus amplissimus Dalla Torre, 1898 : 110 [n. n. for *amplus* Walker, 1836, *nec* 1835].
Habrocytus platyphilus (Walker) Bouček, 1965*e* : 8.

Type material. *Pteromalus amplus* Walker, 1836. One female, LECTOTYPE, labelled " Isle of Wight " and also bearing a Waterhouse label.

Pteromalus platyphilus Walker. One female, LECTOTYPE (Type Hym. 5. 732), labelled " 142 ", " Amurland. Coll. F. Walker 1913–71 " and (in Walker's handwriting) " Pteromalus platyphilus ".

EUROPE (Britain, Czechoslovakia, Moldavian S.S.R.) ; ASIA (Amurland).

Biology. A female in BM(NH) was reared from an egg-sac of the spider *Dictyna arundinacea* (L.) (Dictynidae) on 12.vi.1952, England, Surrey, Bookham Common (*A. E. Le Gros*). Imagines appear in the field May–August and I have found some females during the winter amongst the foliage of coniferous trees, evidently hibernating.

The male of *platyphilus* has not been described ; but I have seen some males in Dr. Bouček's collection which he considers to belong to this species.

THE *CHLOROSPILUS*-GROUP

Habrocytus chlorospilus (Walker) **comb. n.**

(Text-fig. 382)

Eutelus chlorospilus Walker, 1834 : 368, ♂ ♀.
Pteromalus servulus Walker, 1836 : 481, ♀, **syn. n.**
Pteromalus obscuratus Walker, 1836 : 493, ♀, **syn. n.**
? Pteromalus Ormenus Walker, 1839 : 269, ♂.

Type material (all lectotypes bear Waterhouse labels).

Eutelus chlorospilus Walker. Syntypes, 1 ♂, 2 ♀. LECTOTYPE, the first female specimen.

Pteromalus servulus Walker. One female, LECTOTYPE (possibly holotype).

Pteromalus obscuratus Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen.

Pteromalus ormenus Walker. Syntypes, 2 ♂ mounted on the same card, bearing a small green ticket (indicating Irish origin) ; LECTOTYPE, the right-hand specimen, which is complete and mounted with the dorsal surface uppermost.

BRITAIN, IRELAND.

Biology. I have examined a female which is said to have been reared, England, Surrey, Ashtead Common, 11.v.1946 (*M. Niblett*) from *Trypeta* [=*Orellia*] *ruficauda* F. on *Cirsium palustre* (L.) Scop. Imagines have been captured in the field in May, June, and September.

Habrocytus sp. indet. A

ENGLAND : Oxfordshire, near Oxford, 1 ♀ reared from pupa on Knapweed (*Centaurea* sp.), 2.vi.1919 (*A. H. Hamm*), Hope Dept., University Museum, Oxford.

Habrocytus vibulenus (Walker) **comb. n.**

Ormocerus Vibulenus Walker, 1839 : 205, ♂.
Habrocytus blunckii (Nowicky MS.) Blunck, 1944 : 480, ♂ ♀, **syn. n.**
Habrocytus sp. (Arbeitsnummer Chalc. 36), Blunck, 1944 : 485, ♂ ♀.

Type material. *Ormocerus vibulenus* Walker. Syntypes, 2 ♂. LECTOTYPE, the second specimen ; Waterhouse label.

Habrocytus blunckii Blunck. Syntypes, 2 ♀, 4 ♂, in Naturhistorisches Museum, Vienna. LECTOTYPE, a female labelled " Habrocytus sp " and " 42/226 B_2. 13. 12. 42 Ch. 36 ". I presume that the name is valid. The species was actually described as " Habrocytus sp." by Blunck (1944 : 485), though in the same paper (p. 480) the name *H. blunckii* Nowicky is mentioned and seems to refer to the species described on page 485.

BRITAIN, IRELAND, GERMANY, CZECHOSLOVAKIA.

Biology. Reared in Germany (under the name *blunckii*) as a hyperparasite of *Pieris brassicae* (L.) through *Apanteles glomeratus* (L.) ; see Blunck, 1944. I have also examined the following specimens reared in England :—1 ♀, emerged vii.1931 from *Salebria obductella* F.R., Kent, reared (*H. C. Huggins*). Cambridgeshire, The Devil's Dyke, 2 ♀ reared from flower-heads of *Centaurea nemoralis* Jord., on 21.vi. 1932 and viii.1935, the latter specimen being labelled " on *Euxanthis* " [Lep., Tortricidae] ; 2 ♀ reared 31.v.1934 from heads of *Centaurea scabiosa* L. (*G. C. Varley*). Berkshire, Cothill, 1 ♀ reared 12.vi.1957 from *Isocolus rogenhoferi* Wachtl (*M. F. Claridge*). Berkshire, Cumnor Hill, 3 ♀ from cocoons of *Zygaena filipendulae* (L.), July 1943 (*G. D. H. Carpenter*) ; this is the species recorded doubtfully as *Habrocytus trypetae* Thomson by Carpenter (1945 : 282–283). Imagines appear in the field most often from July until September (some in June or even May).

Habrocytus rhinthon (Walker) **comb. n.**

Pteromalus Rhinthon Walker, 1844*a* : 341, ♀.

Type material. One female LECTOTYPE, Waterhouse label.

NORWAY (Finmark).

Biology. Unknown.

THE *OCHROCERUS*-GROUP

Habrocytus ochrocerus Thomson

Pteromalus ovatus Walker, 1835*a* : 77, ♂ ♀ [*nec* Nees, 1834].
? Pteromalus Bienna Walker, 1848 : 125, 195, ♂.
Habrocytus ochrocerus (Dalman MS.) Thomson, 1878 : 114, ♂ ♀.
Pteromalus ovatulus Dalla Torre, 1898 : 139 [n. n. for *P. ovatus* Walker *nec* Nees], **syn. n.**

Type material. *Pteromalus ovatus* Walker. 6 specimens under the name *ovatulus*, bearing Waterhouse labels " *Pteromalus ovatus* Nees " [*sic*]. Two of these at least are syntypes of *ovatus* Walker ; LECTOTYPE, third in series.

Pteromalus bienna Walker. One male, LECTOTYPE ; Waterhouse label. It might well be the male of *ochrocerus* Thomson but I am not absolutely certain.

Habrocytus ochrocerus Thomson. Syntypes, 8 specimens. LECTOTYPE, a female bearing a tiny white ticket, also a label " ochrocerus Dalm.".

BRITAIN, SWEDEN.

Biology. 3 ♀ were reared in Cambridgeshire on 13.vi.1932, from galls of *Isocolus rogenhoferi* Wachtl on *Centaurea scabiosa* L. (*G. C. Varley*), material in Hope Dept., University Museum, Oxford. Imagines occur in the field May–July.

Habrocytus* ? *papaveris (Förster)

? Pteromalus papaveris Förster, 1841 : 21, ♂ ♀.
? Habrocytus papaveris (Förster) Kurdjumov, 1913 : 20.

Type material. Syntypes (not seen) in Naturhistorisches Museum, Vienna. I have examined a Förster specimen in the collection of Zoologische Sammlung des Bayerischen Staates, Munich.

? BRITAIN ; GERMANY.

Biology. Reared in England : Sussex, Peacehaven, 24.iv.1929, from *Aylax papaveris* (Perris) on *Papaver rhoeas* L. (*M. Niblett*).

The British specimens are hardly distinguishable from females of *ochrocerus* Thomson except that they have the postmarginal vein only as long as the marginal vein, the head very slightly less transverse, and the antennal flagellum a little stouter. The variation and host-range of *ochrocerus* needs to be studied in detail before one can be sure if the species here presumed to be *papaveris* is really distinct.

Species sola

Habrocytus cioni Thomson

Habrocytus cioni Thomson, 1878 : 115, ♂ ♀.
Habrocytus cioni Thomson ; Otten, 1940 : 184.

Type material. Syntypes, 2 ♂, 2 ♀. LECTOTYPE, a female labelled " Sm." [Småland], " Bhn " [Boheman] and " Cioni Ths ".

BRITAIN, GERMANY, SWEDEN.

Biology. Reared from *Cionus* sp. (Col., Curculionidae) on *Scrophularia* sp. at Wytham Wood, Berkshire, England (*G. R. Gradwell*). Otten (1940 : 184) reared it in Germany from pupae of *Cionus tuberculosus* (Scop.) ; he obtained up to 7 of the parasites from a single host-pupa, though in most cases 3–5, in a single case only 1. Imagines July–August.

The *BEDEGUARIS*-Group

Habrocytus bedeguaris Thomson

Habrocytus bedeguaris Thomson, 1878 : 123, ♂ ♀.
Habrocytus bedeguaris Thomson; Callan, 1944 : 90–91.

Type material. Syntypes, 6 specimens. LECTOTYPE, a female labelled " Jvg 12/6 " and " Bedeguaris Ths ".

Widely distributed in Europe ; Canada, U.S.A. (introduced into the latter two countries).

Biology. A well-known parasite of *Diplolepis rosae* L. (Hym., Cynipidae). Imagines in May, June and August.

Habrocytus isarchus (Walker) **comb. n.**

Pteromalus Isarchus Walker, 1839 : 216, ♂.

Type material. 4 ♂ stand under this name, but one is probably not original material ; LECTOTYPE, the fourth specimen, bearing a Waterhouse label.

Britain, Sweden.

Biology. Reared in England from *Xestophanes potentillae* Vill. on *Potentilla reptans* L. (Dr. *M. F. Claridge*). I have captured the species where no *P. reptans* was present but *P. erecta* (L.) Rausch. was common, so that it probably also parasitises a host on the latter plant. Imagines Aug.–Sept. (one record for May).

Species sola

Habrocytus chrysos (Walker)

Pteromalus chrysos Walker, 1836 : 491, ♀.
Pteromalus inclusus Walker, 1836 : 493, ♀, **syn. n.**
Pteromalus Zipaetes Walker, 1839 : 213, ♂, **syn. n.**
Pteromalus Telon Walker, 1839 : 216, ♂, **syn. n.**
? Pteromalus eucerus Ratzeburg, 1848 : 198, ♂ ♀.
Habrocytus acutigena Thomson, 1878 : 117, ♂ ♀. **syn. n.**
? Habrocytus distinguendus Masi, 1908*a* : 113–115, ♀.
? Habrocytus hyponomeutae Masi, 1909 : 13–15, ♀.
? Habrocytus metallifemur Bukovskij, 1938 : 157–159, ♂ ♀.
Habrocytus eucerus (Ratzeburg) Otten, 1942*a* : 122–124, pl. 5, figs. 1, 4, 6 : pl. 6, fig. 4, ♂ ♀.
Habrocytus cf. *eucerus* (Ratzeburg) ; Blunck, 1944 : 483–485, ♂ ♀.
Habrocytus eucerus (Ratzeburg) ; Ferrière, 1952*a* : 171.
Habrocytus chrysos (Walker) Bouček, 1965*e* : 8.

Type material (all Walker lectotypes bear Waterhouse labels).

Pteromalus chrysos Walker. Syntypes, 2 ♀. LECTOTYPE, the first specimen (the second is var. β).

Pteromalus incusus Walker. Syntypes, 1 ♂, 2 ♀. LECTOTYPE, the first female specimen.

Pteromalus zipaetes Walker. Syntypes, 2 ♂. LECTOTYPE, the second specimen.

Pteromalus telon Walker. One male, LECTOTYPE (possibly holotype).

Pteromalus eucerus Ratzeburg. Syntypes, Germany, 2 ♂ and 1 ♀ from cocoons of *Microgaster* on *Bombyx salicis*, presumed destroyed. The types were examined by Otten (1942*a* : 122) and the species was redescribed by him from material compared with them ; it is clear from his redescription and figures that his *eucerus* is the same as *chrysos* (Walker). Actually Ratzeburg's original description of *eucerus* suggests rather that it was the same as *semotus* (Walker), and the material identified as such in some collections, e.g., in BM(NH), is mainly *semotus*. It is perhaps best, however, to accept Otten's identification of *eucerus*, which agrees with that of Ferrière (1952*a*).

Habrocytus acutigena Thomson. Syntypes, 23 specimens. LECTOTYPE, a female labelled " Hbg " [Hälsingborg] and " acutigena Ths ".

Habrocytus distinguendus Masi. Holotype ♀, Italy, Umbria, Bevagna, reared from cocoon of *Angitia armillata*, in Museo Civico di Storia Naturale, Genoa (not seen). The description and host suggests that it is almost certainly the same as *chrysos* (Walker).

Habrocytus hyponomeutae Masi. Syntypes, 5 ♀, Italy, Umbria, Bevagna, reared from larva of *Hyponomeuta malinellus*, in Museo Civico di Storia Naturale, Genoa (not seen). From the description and host it is very probably the same as *chrysos*.

Habrocytus metallifemur Bukovskij. Location of syntypes, Russia, Crimea, reared from *Tortrix viridana* L., unknown to me. The combination of characters mentioned in Bukovskij's description, particularly the striation of the clypeus which is said to extend nearly to the eyes, and the host, suggest to me that *metallifemur* may well be the same as *chrysos* (Walker).

Widely distributed in EUROPE.

Biology. Reared in Sweden as a hyperparasite of *Hyponomeuta padellus* (L.) through *Angitia* [=*Diadegma*] *armillata* (Grav.) (*S. Johanssen*) ; from *Tortrix viridana* L. by the same collector ; in England from *Pieris rapae* L. (possibly as a hyperparasite) (*G. D. H. Carpenter*). Also recorded as a parasite of *Thaumatopoea pityocampa* in Italy (Secrétariat, etc., 1966 : 119, 129). Imagines occur in the field from May until October (Britain). Walker (1848*a* : 77) recorded *Pteromalus zipaetes* as a parasite of " *Bruchus* in *Vicia sepium* " but the parasite involved seems more likely to have been *Habrocytus semotus*.

THE *DISPAR*-GROUP

Habrocytus grandis (Walker)

(Text-fig. 384)

Pteromalus grandis Walker, 1835 : 487, ♀.
Pteromalus latipennis Walker, 1835*a* : 96, ♀, **syn. n.**

? Pteromalus tenuicornis Förster, 1841 : 16, ♀.
? Pteromalus tenuicornis Förster ; Kurdjumov, 1912 : 230–231, ♂ ♀.
? Habrocytus tenuicornis (Förster) Kurdjumov, 1913 : 21.
Habrocytus grandis (Walker) Bouček, 1965*e* : 8.

Type material (Walker types bear a Waterhouse label). *Pteromalus grandis* Walker. Syntypes, 4 ♀. LECTOTYPE, the third specimen.

Pteromalus latipennis Walker. One female, LECTOTYPE.

Pteromalus tenuicornis Förster. Types in Naturhistorisches Museum, Vienna (not seen). Kurdjumov (1913) transferred *tenuicornis* to *Habrocytus* and stated that it was identical with specimens reared from *Anthonomus pomorum* [Col., Curculionidae]. Earlier (1912) he had redescribed *tenuicornis* and synonymized *Habrocytus chlorogaster* Thomson with it, although he had not seen the type-material of the latter. His redescription of *tenuicornis* agrees well with the species here identified as *grandis* (Walker), and the host cited by him supports the idea that the two are identical.

BRITAIN, FRANCE, ? SWEDEN, GERMANY, CZECHOSLOVAKIA, MOLDAVIAN S.S.R., U.S.S.R.

Biology. Parasite of *Anthonomus* spp. (Col., Curculionidae). I have examined the following reared material of *grandis* (in BM(NH), determined as *tenuicornis* Förster):—ENGLAND : Kent, East Malling, ♀♀ reared 15.vi.1936 from *Anthonomus pomorum* (L.) ; Sussex, Stonegate, ♀♀ reared in 1936 from the same host. FRANCE : Lyon, St. Genis Laval, ♂♂, ♀♀ reared in June 1930 from *Anthonomus spilotus* Redt. The specimens recorded from *A. pomorum*, under the name *tenuicornis* Förster, by Kurdjumov (1913) were almost certainly *grandis*. Imagines have been reared, or captured in the field, in April and June–August.

Habrocytus semotus (Walker)

(Text-fig. 385)

Eutelus semotus Walker, 1834 : 367, ♀.
Pteromalus imbutus Walker, 1835*a* : 96, ♀, **syn. n.**
Pteromalus solutus Walker, 1835*a* : 199, ♀, **syn. n.**
Pteromalus cupreus Walker, 1835*a* : 200, ♀, **syn. n.** [*nec* Nees, 1834].
Pteromalus lugubris Walker, 1835*a* : 205, ♀, **syn. n.**
Pteromalus maerens Walker, 1836 : 474, ♀, **syn. n.**
Pteromalus thalassinus Walker, 1836 : 485, ♀, **syn. n.**
Pteromalus equestris Walker, 1836 : 495, ♀, **syn. n.**
Pteromalus Pione Walker, 1839 : 224, ♂, **syn. n.**
? Pteromalus Mutia Walker, 1839 : 246, ♂.
Pteromalus variabilis Ratzeburg, 1844*a* : 201, ♀.
Pteromalus Glautias Walker, 1848 : 124, 181, ♀, **syn. n.**
Pteromalus Amnisos Walker, 1848 : 124, 182, ♀, **syn. n.**
Habrocytus parvinucha Thomson, 1878 : 117, ♀, **syn. n.**
Pteromalus cupreicolor Dalla Torre, 1898 : 119 [n. n. for *cupreus* Walker, *nec* Nees].
? Habrocytus microgastris Kurdjumov, 1912 : 231, ♂ ♀.
Habrocytus remotus [sic] (Walker) Kurdjumov, 1913 : 20.
Habrocytus poecilopus (Crawford) ; Blunck, 1944 : 478, 480.
Habrocytus milleri Delucchi & Verbeke, 1953 : 1–14, ♂ ♀, **syn. n.**
Habrocytus semotus (Walker) ; Bouček, 1965*e* : 8, 35.

Type material (all Walker lectotypes bear Waterhouse labels, unless otherwise stated).

Eutelus semotus Walker. Syntypes, 4 ♀. LECTOTYPE, the second specimen.

Pteromalus imbutus Walker. 10 specimens (possibly some are not original material). LECTOTYPE ♀, the third specimen.

Pteromalus solutus Walker. One female, LECTOTYPE.

Pteromalus cupreus Walker. Syntypes, 3 ♀. LECTOTYPE, the second specimen.

Pteromalus lugubris Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen.

Pteromalus maerens Walker. Syntypes, 3 ♀. LECTOTYPE, one marked " Type CF " [C. Ferrière].

Pteromalus thalassinus Walker. One female, LECTOTYPE (possibly holotype).

Pteromalus equestris Walker. One female, LECTOTYPE (possibly holotype) ; it is recognizable, though much damaged.

Pteromalus pione Walker. Syntypes, 3 ♂. LECTOTYPE, a specimen labelled only " Pione " in Walker's handwriting.

Pteromalus mutia Walker. Syntypes, 3 ♂. LECTOTYPE, the third specimen ; it has shorter funicular segments and scape than typical males of *semotus* but it may be conspecific with it.

Pteromalus variabilis Ratzeburg. Location of holotype ♀ unknown (probably destroyed). In my opinion it is most likely to have been the same as *semotus* (Walker) ; Bouček (1965*e* : 35) also takes this view.

Pteromalus glautias Walker. One female, LECTOTYPE.

Pteromalus amnisos Walker. One female, LECTOTYPE.

Habrocytus parvinucha Thomson. Syntypes on 11 pins. LECTOTYPE, a female labelled " Hbg " [Hälsingborg] and " parvinucha Ths " ; it is a very small specimen.

Habrocytus microgastris Kurdjumov. Syntypes, Russia, province of Charkov, Krasnokutsk, 1907, reared from *Apanteles glomeratus* L. and *A. pieridis* Bouché ; location unknown to me. The description suggests that the species is identical with *semotus* (Walker).

The specimens recorded by Blunck (1944) as *Habrocytus poecilopus* (Crawford) are identical with *semotus*. I am not able to say whether Blunck's determination was correct because I have not seen the type of *poecilopus*. Crawford described this species (1910 : 21–22, ♂, ♀, as *Hypopteromalus poecilopus*) from material from Europe ; the type is catalogued as no. 12974 in U.S.N.M. The description is inadequate for recognition of the species.

Habrocytus milleri Delucchi & Verbeke. Type ♀ in European Laboratory of C.I.B.C., Feldmeilen, Zurich ; paratypes in Institut Royal des Sciences naturelles de Belgique, Brussels. Described from material reared at Virton, Luxemburg, and at Montmédy, France, in Aug.–Sept. 1951. I have examined the types, which are conspecific with *semotus* (Walker).

EUROPE (widely distributed).

Biology. This species develops chiefly as a primary parasite or a hyperparasite, of various lepidoptera ; it has also been reared in association with certain Coleoptera, but in these cases it is not known whether it was a primary or secondary

parasite. It was reared under the name *H. milleri* (Del.) in Belgium and France, as an ectoparasite of mature larvae of *Coleophora frischella* L., by Delucchi who described (1953) its life-history in detail. He stated that it is generally a solitary, occasionally slightly gregarious, parasite. In two cases larvae of *milleri* were found to be hyperparasitic on the *Coleophora* through *Bracon osculator* Nees. Blunck (1944) reared specimens (determined as *poecilopus* Crawf.) in Germany from *Pieris brassicae* L. through *Apanteles glomeratus* L. ; I have examined his material. ♂♂ and ♀♀ were reared in England (Oxford, Cumnor Hill, 1–3.viii.1942) from *Apanteles* sp. (probably *zygaenarum* Marsh.) found amongst a colony of *Zygaena filipendulae* L., (*G. D. H. Carpenter*), material in Hope Dept. On 5.vii.1960 I reared it from a *Hyponomeuta* (probably *padellus* L.) on *Prunus spinosa* L. found at Otmoor, Oxfordshire ; and I have seen specimens reared in 1956 (Germany, Berlin) from *Hyponomeuta evonymellus* L. Another ♀ is labelled as having been reared in England (Yorkshire, Bawtry) on 13.vii.1948 from *Evetria purdeyi* (Durrant) (Lep., Tortricidae) on Corsican Pine (*H. S. Hanson*). The BM(NH) collection contains a ♀ obtained at Blekinge, Sweden, in 1936, from pine shoots infested by *Evetria buoliana* (Schiff.). In the same collection there are also specimens from Germany and Czechoslovakia said to have been reared from cocoons of *Neodiprion sertifer* (Geoffr.) (Hym., Diprionidae). Both sexes were reared near Oxford in Aug. and Sept. 1951 " from *Apion pomonae* (F.) in Vetch pod ", (*G. R. Gradwell*). In April 1966 I reared 1 ♂, 1 ♀ from pods of *Lathyrus pratensis* L. infested by *Bruchus loti* Payk., collected near London. Imagines most often July–October, occasionally earlier.

Habrocytus tereus (Walker) **comb. n.**

Pteromalus Tereus Walker, 1839 : 255, ♂.

Type material. One male, LECTOTYPE, bearing a Waterhouse label.

The female is not yet definitely associated, though I have a female from England which may belong to it and have included the characters of this specimen tentatively in my key. The male is easily recognized because of its extraordinary long antennal flagellum.

BRITAIN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.
Biology. Unknown. Imagines in July.

Habrocytus sp. indet. B

I cannot find a name for this species, which is probably undescribed.

SWEDEN: Skåne, Dalbyhagen, 1 ♀, 1.viii.1959, beaten from spruce (*Picea*) (*Graham*). I have seen a female which appears to be conspecific, reared in Czechoslovakia from *Neodiprion sertifer* (Geoffr.), in the collection of Dr. Bouček.

Habrocytus sp. indet. C

ENGLAND : Oxfordshire, Bald Hill, near Lewknor, 1 ♀, 15.ix.1957 (*Graham*).

Habrocytus dispar (Curtis) **comb. n.**

(Text-fig. 383)

Colas dispar Curtis, 1827 : folio 166, ♂ ♀.
Diplolepis Braconidis Bouché, 1834 : 171, ♂ ♀, **syn. n.**
Pteromalus basalis Walker, 1835*a* : 185, ♀, **syn. n.**
Pteromalus mesochlorus Walker, 1835*a* : 201, ♀, **syn. n.**
Pteromalus Cabarnos Walker, 1839 : 211, ♂, **syn. n.**
Pteromalus cubarmes Walker ; Blanchard, 1840 : 271 [*lapsus*].
Pteromalus Saravus Walker, 1845 : 262, "♂" [*recte* ♀], **syn. n.**
Pteromalus Jaravus Walker, 1846*c* : 157–158, ♀, **syn. n.**
? Pteromalus Jouanensis Ratzeburg, 1848 : 199, ♂ ♀.
Habrocytus radialis Thomson, 1878 : 119, ♂ ♀, **syn. n.**
Habrocytus braconidis (Bouché) Kurdjumov, 1913 : 18.
Habrocytus tenuicornis (Förster) Kurdjumov, 1913 : 21.

Type material. *Colas dispar* Curtis. Syntypes in Curtis coll., National Museum of Victoria, Melbourne ; also 1 ♂ and 1 ♀ in coll. Westwood, Oxford (recorded in Westwood's entomological diary as having been received from Curtis in exchange for other material). No lectotype selected at present. The material of *dispar* used in the preparation of my key to species was compared both with the syntypes in the collection of Curtis and that of Westwood.

Diplolepis braconidis Bouché. Types presumed lost ; they are not mentioned in Sachtleben's report on the remains of Bouché's collection in Deutsche Entomologische Institut (1944 : 65–76). The description suggests that the species was the same as *dispar* (Curtis).

Pteromalus basalis Walker. One female, LECTOTYPE, bearing a Waterhouse label.

Pteromalus mesochlorus Walker. Syntypes, 4 specimens. LECTOTYPE, the second, bearing a Waterhouse label.

Pteromalus cabarnos Walker. Syntypes, 4 ♂. LECTOTYPE, the fourth, a complete specimen bearing a Waterhouse label.

Pteromalus saravus Walker. One female, LECTOTYPE ; Waterhouse label " Saravus ". It seems clear that Walker's statement "♂" in his 1845 paper was an error ; also that the name "*jaravus*" in his paper of 1846*c* was a *lapus* or misprint for *saravus* (another obvious error in the same paper is "*Scladerma*" for *Seladerma*). I conclude that both descriptions refer to the same specimen or specimens, which were female.

Pteromalus jouanensis Ratzeburg. Syntypes presumed destroyed. Kurdjumov (1913 : 21) who saw the types, synonymized it [as "*jouaensis*"] with *tenuicornis* Förster. The original description suggests rather that it may have been the same as *dispar*.

Habrocytus radialis Thomson. Syntypes on 16 pins. LECTOTYPE, a female labelled " Hbg " [Hälsingborg].

Widely distributed in EUROPE ; ? PAKISTAN.

Biology. I have examined specimens of *dispar* which were reared in southern

Sweden (Mr. *Sven Johanssen*), from *Macrocentrus linearis* (Nees) (Hym., Braconidae) ; also some reared 14.viii.1940 from cocoons of *Apanteles glomeratus* (L.) on *Pieris brassicae* L. collected at Shotover, Oxford (*E. Taylor* and *P. M. Miles*). A female in the BM(NH) from Pakistan (determined as *radialis* Thomson and reared from a larva of the Pyralid *Notarcha ruralis* Scop. on *Urtica dioica* L.) appears to be identical with *dispar* (Curtis). Imagines July–Sept.

Ruschka (1924 : 12) recorded *Habrocytus radialis* Thomson as having been reared from *Anthonomus varians* Payk. in Sweden, and stated that he had compared his specimens with a Thomson specimen in Vienna. There is reason to suppose that he misidentified *radialis* ; a female in the BM(NH) determined by him as *radialis* is not that species but probably *fasciatus* Thomson.

The *CAPREAE*-Group

Habrocytus capreae (Linnaeus) *sensu* Thomson

Cynips capreae Linnaeus, 1761 : 388, no. 1531.
Etroxys (*Habrocytus*) *capreae* (Linnaeus) Thomson, 1878 : 122, ♂ ♀.
? Habrocytus capreae (Swederus) ; Peck, 1963 : 725. [nec *Pteromalus capreae* Swederus, 1795.]

Type material. I cannot locate any possible types either in the Linnean collection or elsewhere. Under these circumstances it seems advisable to select a neotype. In Thomson's collection 8 specimens stand as *capreae* ; one of them, a female labelled " Dlc " [Dalecarlia] " Bhn " [Boheman] and " Capreae Lin " could be designated neotype of *Cynips capreae* Linnaeus, 1761, but it will be necessary to apply to the Commission to have this selection validated.

? Britain (Blood coll., Oxford : 2 ♀, unlocalized but probably British ; Sweden, Finland, Italy ; but no doubt more widely distributed in Europe. Recorded from Alaska according to Peck (1963).

Biology. Reared in Italy from galls of *Pontania viminalis* L. on *Salix* sp. (Prof. *E. Tremblay*, Portici) ; I have examined the specimens.

Habrocytus sp. indet. D

England : Buckinghamshire, Hell Coppice, 1 ♀, 2.viii.1953 (*Graham*).

Habrocytus dolichurus Thomson

(Text-fig. 421)

? Entedon albipes Zetterstedt, 1838 : 430, ♂.
? Pteromalus excrescentium Ratzeburg, 1848 : 197 [*ex parte*].
Habrocytus dolichurus Thomson, 1878 : 119, ♂ ♀.
Habrocytus capreae Thomson ; Carleton, 1939 : 597, 611–615, fig. 9 [*nec* Thomson].

Type material. *Entedon albipes* Zetterstedt. TYPE ♂ in Zetterstedt collection, mounted on the same pin as the types of *Cynips tibialis* Zett. and *Eulophus aethiops* Zett. It bears a comprehensive label in Zetterstedt's handwriting, reading " 1. Cyn.

tibialis. 2. E. aethiops ♀. 3. idem 6 ♀. 4 E. albipes Lyngen ". I think that the type of *albipes* is probably a male of *Habrocytus dolichurus* Thomson.

Pteromalus excrescentium Ratzeburg. Types presumed destroyed. The original description suggests that the species is identical with *dolichurus* Thomson, particularly the fact that one of the syntypic males was reared with " *Eulophus Tischbeinii* " [=*Pnigalio nemati* Westw.] from galls of " *Nematus Saliceti* " [=*Pontania proxima* LeP.] on willow leaves. Thomson (1878 : 122) considered that *excrescentium* was probably the same as *capreae* (L.) ; but Ratzeburg's description of the female of *excrescentium* states that the female gaster is one and a quarter times as long as the head and thorax, which agrees better with the female of *dolichurus* Thomson, the female of *capreae* having a relatively much longer gaster.

Habrocytus dolichurus Thomson. Syntypes on 18 pins. LECTOTYPE, a female labelled " L-d " [Lund], bearing also a tiny pale blue ticket and a label " dolichurus Ths.".

BRITAIN, SWEDEN, ? GERMANY.

Biology. Recorded (under the name *capreae* Thomson) by Carleton (1939) as a common parasite of *Pontania proxima* (LeP.) on *Salix triandra* L. and S. *viminalis* L. ; I have seen some of these specimens, which are *dolichurus* Thomson. Carleton stated that there are probably two broods in the year, emerging from a week to a fortnight after the host. I have reared *dolichurus* from galls of *Pontania proxima* on *Salix fragilis* L. in England, Berkshire, Wytham, 10.vii.1960 ; and from galls of *P. bridgmanii* (Cam.) on *S. cinerea* L., Scotland, Isle of Rhum, 14.viii.1962. I have also swept specimens from foliage of *Salix aurita* L. and *S. purpurea* L.; galls of *Pontania viminalis* (L.) were common on the latter plant, and the *Habrocytus* may have been parasitizing that insect. Imagines chiefly July–Sept. (occasionally June).

Otten (1940 : 186) recorded " *Pteromalus excrescentium* Ratzeburg " as a parasite of *Pontania viminalis* (L.) in Germany ; his records very probably refer to *Habrocytus dolichurus* Thomson.

Habrocytus chlorogaster Thomson

Habrocytus chlorogaster Thomson, 1878 : 119, ♂ ♀.

Type material. Syntypes mounted on 4 pins. The first pin carries a female and a male and bears labels reading " Lund " and " chlorogaster Ths " ; the female is designated LECTOTYPE.

The lectotype of *chlorogaster* differs only slightly from females of *dolichurus* Thomson. It has the median area of the propodeum slightly more transverse (length 20, breadth 38) and the nucha more delicately reticulate, the spiracular sulci deeper, and very strongly punctate ; the scutellum relatively broader (length 46, breadth 50) ; the gaster, which is slightly longer than head plus thorax, is rather less acuminate, with the last tergite relatively shorter (length 33, basal breadth 31). These differences are small, but I think *chlorogaster* may be a valid species. On

27.vii.1959, I swept a ♀ at Falsterbo, Skåne, Sweden, which has the gaster only about equal in length to the head plus thorax, but otherwise agrees with the lectotype.

SWEDEN.

Biology. Unknown.

Habrocytus aureolus Thomson

? Pteromalus Ortalus Walker, 1839 : 241, ♂.
Habrocytus aureolus Thomson, 1878 : 125, ♀.

Type material. *Pteromalus ortalus* Walker. Syntypes, 6 specimens. LECTOTYPE, the third specimen, bearing a Waterhouse label. I think it quite possible that the lectotype is a male of *aureolus* Thomson but as I have seen no bred males of the latter, I cannot be sure.

Habrocytus aureolus Thomson. Syntypes, 2 ♀. LECTOTYPE labelled " Sm " [Småland] and " Bhn " [Boheman].

BRITAIN, SWEDEN, GERMANY, CZECHOSLOVAKIA ; rather rare. New to Britain : Berkshire, Wytham Wood, 2 ♀, 8.vii.1956, 7.x.1956 (*Graham*) ; Kent, Lewisham, 1 ♀, 29.v.1892 (*A. J. Chitty*).

Biology. Reared in Germany, Neuenburg, June 1964, by Dr. H. Pschorn-Walcher, from *Lycaota xylostei* (Giraud), a sawfly which forms galls on *Lonicera xylosteum* L. Dr. Bouček showed me specimens from Czechoslovakia which he had obtained from a host on *Ligustrum*. Imagines June–October (one record for May).

The female of this beautiful species is easily recognized by the coppery or purplish copper colour of the body, the margined pronotal collar, somewhat flattened thorax, and the form of the propodeum.

Species sola

***Habrocytus helenomus* sp. n.**

(Text-fig. 397)

♀. Head and thorax bronze, the front of the head greenish ; propodeum often olive or bluish-tinged ; basal tergite of gaster partly green, rest of gaster bronze with some weak greenish reflections. Antennal scape testaceous, usually more or less infuscate apically ; pedicellus and flagellum fuscous. Coxae concolorous with thorax ; trochanters mainly testaceous ; femora fuscous, rather broadly pale apically ; rest of legs testaceous with tips of tarsi brown ; mid and hind tibiae sometimes slightly brownish medially. Tegulae testaceous to brown. Wings subhyaline ; venation testaceous with the parastigma and stigma slightly darker. Length 2·3 to 2·9 mm.

Head slightly broader than the mesoscutum, in dorsal view hardly more than twice as broad as long ; temples slightly more than one third as long as eyes, converging moderately strongly and rather straight ; POL 1·25 to 1·3 OOL. Head in frontal view transversely oval ; eyes separated by 1·3 to 1·35 times their length. Malar space one third the length of an eye or slightly more. Anterior margin of clypeus moderately deeply emarginate, with an impression in the middle. Head finely reticulate ; clypeus strigose, the striae extending slightly on to the face and genae. Antennae (Text-fig. 397) inserted distinctly above the level of the ventral

edge of the eyes ; scape more than three quarters as long as an eye, reaching the level of the vertex or slightly above it ; combined length of pedicellus and flagellum about equal to breadth of head ; pedicellus (profile) 1·8 to 2 times as long as broad, from slightly shorter to very slightly longer than the first funicular segment ; funicle cylindrical or nearly so, slightly stouter than the pedicellus ; first funicular segment 1·3 to 1·7 times as long as broad, sixth quadrate ; clava slightly longer than funicular segments five plus six ; sensilla fairly numerous, in two rows on each funicular segment, or in one irregular row on the distal segments.

Thorax 1·4 to 1·5 times as long as broad. Pronotal collar distinctly less wide than the mesoscutum, medially from one seventh to slightly more than one sixth as long as the mesoscutum, rather coarsely reticulate especially in the middle, subhorizontal, its front edge abrupt and often weakly and irregularly margined in the middle. Mesoscutum 1·6 to 1·7 times as broad as long, finely reticulate, rather more coarsely on the disc. Scutellum about as broad as long, with reticulation like that of the mesoscutum, but on the front part of the scutellum rather finer. Propodeum in general shape much like that of *dispar* (Text-fig. 383), medially about half as long as the scutellum and distinctly produced beyond the bases of the hind coxae ; median area 1·5 to 1·7 times as broad as long, its panels not very shiny, very finely and almost uniformly reticulate ; costula absent ; median carina complete, or incomplete and irregular ; plicae distinct throughout, basally subparallel, strongly sinuate medially, then becoming subparallel on the sides of the nucha ; nucha occupying one third the length of the propodeum or slightly more, with very fine, slightly raised reticulation whose areoles are slightly elongated in the transverse axis ; spiracles oval, about 1·5 times as long as broad, slightly separated from the metanotum ; spiracular sulci distinctly impressed, with some punctures or transverse costulae ; callus alutaceous, rather shiny, moderately thickly pilose. Postspiracular sclerite narrow, shiny, nearly smooth, with an impression along its front edge. Mesepisternum moderately finely, though strongly, reticulate, with a mainly smooth subtriangular area below the base of the hindwing ; mesepimeron and metapleuron rather more coarsely reticulate. Legs rather short, moderately stout. Fore wing with upper surface of costal cell bare, lower surface with a complete row of hairs and some additional ones scattered over the distal third ; basal cell bare, open below ; basal vein with two to nine hairs ; speculum open below, on upper surface of wing not extending below the marginal vein except as an extremely narrow bare line ; wing beyond the speculum moderately thickly pilose, the area between the postmarginal and stigmal veins pilose ; apical margin ciliate ; marginal vein 1·35 to 1·5 times as long as the stigmal vein ; postmarginal vein as long as, or slightly longer than, the marginal ; stigmal vein slightly curved, stigma small and oval or subcircular.

Gaster long-ovate or sublanceolate, as long as or slightly longer than head plus thorax, 2 to 2·25 times as long as broad, acute and usually slightly acuminate apically, not or only slightly narrower than the thorax ; basal tergite occupying about one quarter of the total length ; last tergite slightly shorter than, or as long as, its basal breadth ; ovipositor sheaths slightly exserted ; hypopygium extending about half way along the gaster.

♂. Unknown.

Holotype ♀. ENGLAND : Oxfordshire, Otmoor, 8.ix.1956, swept from flowers of *Angelica sylvestris* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype ♀, 1 ♀, 25.viii.1956, 1 ♀, 29.viii.1956, 2 ♀, 8.ix.1956, 1 ♀, 20.ix.1956, all swept from flowers of *Angelica sylvestris* L. (*Graham*), in Graham collection.

Species sola

Habrocytus hieracii Thomson

? Pteromalus aurantiacus Ratzeburg, 1852 : 242 "♀" [*recte* ♂].
Habrocytus hieracii Thomson, 1878 : 128, ♂ ♀.

Type material. *Pteromalus aurantiacus* Ratzeburg. Types presumed destroyed. The description suggests the male of *Habrocytus hieracii* Thomson, which has a rather distinctive coloration.

Habrocytus hieracii Thomson. Syntypes on 9 pins. The first pin carries 4 ♀ (one LECTOTYPE) and is labelled " Lhw 9/6 " ; " in Gall. G. Hieracii " ; and " Hieracii Ratz " [*sic*].

BRITAIN, SWEDEN ; no doubt more widely distributed in Europe.

Biology. Reared in England from *Phanacis centaureae* Först. on *Centaurea scabiosa* L. (*M. Niblett*). Thomson (1878 : 129) stated that it had been reared in Sweden from " *Cynips hieracii* and *tragopoginis* " [=*Aulacidea hieracii* (Bouché) and *A. tragopogonis* Thoms.]. Imagines in May, July, and Sept.

Species sola

Habrocytus crassinervis Thomson

Habrocytus crassinervis Thomson, 1878 : 118, ♂ ♀.

Type material. Several syntypes. The first pin of the series carries 2 ♀ and 1 ♂ and is labelled " Bås " [Båstad] and " crassinervis " ; the uppermost of the two females is designated LECTOTYPE.

SWEDEN, CZECHOSLOVAKIA.

Biology. Reared in Sweden by Hedqvist and in Czechoslovakia by Bouček, from *Miarus campanulae* (L.) on *Campanula* (unpublished information kindly supplied by Dr. Bouček). Imagines July–August.

The species described as *crassinervis* by Masi (1909 : 15–17) from material reared from an Ichneumonid parasitizing *Heliothis peltigera* Schiff. was probably not the true *crassinervis*.

THE *ALTUS*-GROUP

Habrocytus altus (Walker)

(Text-figs. 387, 395)

Eutelus altus Walker, 1834 : 367, ♂ ♀.
Eutelus fuscipennis Walker, 1834 : 368, ♀, **syn. n.**
Eutelus altus Walker ; Kurdjumov, 1913 : 21.
Habrocytus altus (Walker) Bouček, 1965*e* : 8.

Type material. *Eutelus altus* Walker. Syntypes, 1 ♂, 1 ♀. LECTOTYPE, the female specimen, bearing a Waterhouse label.

Eutelus fuscipennis Walker. Syntypes, 1 ♂, 3 ♀. LECTOTYPE, a female bearing a Waterhouse label ; also, on the lower surface of the card, the letter " W " [probably standing for Windsor Forest, the type-locality].

BRITAIN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Unknown. Imagines May–July.

Habrocytus sp. indet. E

CZECHOSLOVAKIA : Moravia, Pavlovské Kopce, 1 ♀, 6.v.1961 (*A. Hoffer*).

Habrocytus sp. indet. F

AUSTRIA : Tirol, Igls, 1 ♀, 1.vii.1953 (*J. Vockeroth*).

Habrocytus sp. indet. G

CZECHOSLOVAKIA : Sturovo-Nána, 2 ♀, 8.vi.1958 (*A. Hoffer*). This may be just a form of *altus*.

Species sola

Habrocytus fasciatus Thomson

(Text-fig. 386)

Habrocytus fasciatus Thomson, 1878 : 115, ♂ ♀.

Type material. Syntypes on 9 pins. LECTOTYPE, a female labelled " Ö " [Öland].

SWEDEN.

Biology. Unknown.

THE *ALBIPENNIS*-GROUP

Habrocytus integer (Walker) **comb. n.**

Pteromalus integer Walker, 1872*b* : 119, ♂ ♀.
Pteromalus contaminatus Walker, 1872*b* : 120, " ♀ " [*recte* ♂], **syn. n.**

Type material. *Pteromalus integer* Walker. Syntypes, 1 ♂, 2 ♀. LECTOTYPE. a female (Type Hym. 5. 720), labelled " Madeira Is. Porto Santo Wollaston " and " Pteromalus integer ".

Pteromalus contaminatus Walker. One male (Type Hym. 711), LECTOTYPE, labelled " Madeira Is. Porto Santo Wollaston " and " Pteromalus contaminatus ".

MADEIRA ; only the syntypic material known.

Biology. Unknown.

This species may be recognized by its unusually long pronotal collar in both sexes, in addition to the other characters given for the female in my key to species. In most respects it is near to *intermedius* (Walker).

Habrocytus elevatus (Walker)

(Text-figs. 379, 418)

Eutelus elevatus Walker, 1834 : 366, ♀.
Pteromalus Ceropasades Walker, 1839 : 214, ♂, **syn. n.**
Pteromalus Boreus Walker, 1839 : 245, ♂, **syn. n.**

Pteromalus Deucetius Walker, 1839 : 245, ♂, **syn. n.**
Pteromalus elevatus Walker, 1848*a* : 77.
Habrocytus dentifer Thomson, 1878 : 113, ♂ ♀, **syn. n.**
Habrocytus elevatus (Walker) Kurdjumov, 1913 : 19.
Habrocytus trypetae Varley, 1937 : 129–130 [*nec* Thomson, 1878].
Habrocytus trypetae Varley; Varley, 1947 : 143, 168–171, fig. 10, B, ♂ ♀ [*nec* Thomson].
Habrocytus elevatus (Walker) ; Bouček, 1965*e* : 8.

Type material (the Walker lectotypes all bear a Waterhouse label).

Eutelus elevatus Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen, mounted on its side.

Pteromalus ceropasades Walker. One male, LECTOTYPE.

Pteromalus boreus Walker. One male, LECTOTYPE.

Pteromalus deucetius Walker. Syntypes, 2 ♂. LECTOTYPE, the first specimen ; the other is var. γ.

Habrocytus dentifer Thomson. Syntypes on 21 pins. LECTOTYPE, a female labelled " L-d " [Lund].

BRITAIN, SWEDEN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R. ; NEWFOUNDLAND.

Biology. *H. elevatus* is a parasite of Trypetid flies on certain Compositae. Varley (1937, 1947) recorded it [under the name of *Habrocytus trypetae* Thomson] as an ectoparasite of *Urophora* (=*Euribia*) *jaceana* (Hering) in galled florets of Knapweed (*Centaurea nemoralis* Jord.) and described its life-history in detail. He stated that the eggs are laid in gall-cells containing larvae or puparia of the gall-fly, or in gall-cells already containing other parasites ; many eggs may be laid on a single host, but invariably only one larva matures because newly-hatched larvae destroy any other eggs or larvae which they find. He remarked (1937 : 129) that the parasite " is not very particular in its choice of hosts in the galls . . . and may attack the larvae of *Eurytoma curta* [=*tibialis* Boh.], and other parasites too if it encounters them ". Varley found that there were two or three generations per annum, depending on weather conditions ; in 1935 adults emerged mainly in May, July and September, but in the cold year 1936 they emerged in June and September. The *Habrocytus* was not found to attack non-gall-forming Trypetidae which occurred in the Knapweed. Newly-emerged females feed on the blood of the host through a suction-tube. The following specimens of *elevatus* reared by Prof. Varley from *U. jaceana* are in the BM(NH) : Cambridgeshire, Madingley, females emerged August 1934 and June 1936 ; Suffolk, Barton Mills, females em. June and July 1934 ; Yorkshire E., Rudston, female em. June 1934. Other specimens, mostly reared in subsequent years, are in the Hope Dept., Oxford. Besides the material of *elevatus* on which Varley's account was based, I have checked specimens reared in England by other workers from different Trypetid hosts, as follows :—Males and females reared from *Urophora stylata* (F.) on *Cirsium vulgare* (Savi) Ten., Buckinghamshire, Oakley, 5.v.1957 (*M. F. Claridge*) ; Surrey, Ashtead Common, v. 1946 (*M. Niblett*). Females reared from *Urophora cardui* (L.), Oxfordshire, Wolvercote, 27.vii.1956, (*M. F. Claridge*) ; and (as " *trypetae* ? ") from galls of the same fly, reared June 1930, at Bookham, Surrey (*K. G. Blair*).

Males and females reared from *Urophora cuspidata* Mg. in florets of *Centaurea scabiosa* L., Cambridgeshire, Burwell, Devil's Ditch, vii.1939 (*M. Niblett*). All the above Trypetidae form galls, either in the florets or in the stem of the host plant. Dr. O. Peck sent me specimens of *elevatus*, labelled as follows : " St. John's, Newfoundland, 12.v.1958, Ray F. Morris, ex Knapweed seed pod ". It is interesting to note that as early as 1848 Walker recorded that *elevatus* " Destroys *Trypeta pugillata* " [sic] and that *ceropasades* " Destroys *Trypeta pupillata* and *T. marginata* " [*Hoplochaeta pupillata* Fln. and ? *Sphenella marginata* (Fln.)] ; but these records cannot now be checked. Imagines of *elevatus* may be found in the field from May until August or (occasionally) September.

Habrocytus musaeus (Walker) **comb. n.**

Pteromalus tarsatus Zetterstedt, 1838 : 422, ♀, **syn. n.** [primary homonym of *P. tarsatus* Nees, 1834].
Pteromalus Musaeus Walker, 1844*a* : 340, ♀.
Habrocytus trypetae Thomson, 1878 : 112, ♀, **syn. n.**

Type material. *Pteromalus tarsatus* Zetterstedt. Syntypes, 2 ♀. LECTOTYPE labelled in Zetterstedt's handwriting " P. tarsatus ♀. Kengis ".

Pteromalus musaeus Walker. One female, LECTOTYPE, remounted on a card-point and bearing a Waterhouse label.

Habrocytus trypetae Thomson. Syntypes on 28 pins. The first pin bears labels " L-d 27/6 ", " exclus. e Tephritis serratulae " and " Trypetae Ths " ; it carries 3 males and 2 females, of which the lowermost female is designated LECTOTYPE.

BRITAIN, SWEDEN (but no doubt widely distributed in Europe).

Biology. I have examined many specimens which were reared in England ; Berkshire, Cumnor Hill, near Oxford in March 1941 (Prof. *G. D. H. Carpenter*), from heads of Spear Thistle (*Cirsium vulgare* (Savi) Ten.) infested by *Terellia serratulae* (L.) ; and some from the same host on *Carduus nutans* L. (*M. Niblett*) (material in the Hope Dept., Oxford). Thomson reared it in Sweden (Skåne, Lund), also from the same host. Imagines appear in the field May–July.

Habrocytus cardui (Erdös) **comb. n.**

Cecidostiba cardui Erdös, 1953 : 228, 230–231, ♂ ♀.

Type material. Syntypes, Kalocsa, Hungary, reared 18.viii.1946 from inflorescences of *Carduus acanthoides* L., in coll. Erdös. I have not seen the types but believe I have interpreted the species correctly.

BRITAIN, CZECHOSLOVAKIA, HUNGARY.

Biology. See above. Imagines in August.

Habrocytus myopitae **sp. n.**

(Text-fig. 380)

♀. Body black with rather weak metallic reflections ; thorax bronze, olive, or dark bluish,

head similar but tending most often towards dark bluish or olive ; basal tergite of gaster more or less tinged with bronze, brassy, or coppery. Antennae fuscous ; scape more or less testaceous basally. Coxae, and femora except their tips, concolorous with the thorax ; trochanters mainly dark ; tibiae mainly fuscous to black, their bases and tips testaceous ; tarsi testaceous proximally, brown distally, the fore tarsi usually wholly brown. Tegulae black with a metallic tinge. Wings slightly greyish ; venation testaceous to fuscous. Length 2·6 to 3·2 mm.

Head only slightly broader than the mesoscutum ; in dorsal view shaped much as in *albipennis*, but with the temples hardly one third as long as the eyes. Eyes separated by about 1·3 times their length. Malar space hardly half as long as an eye. Sculpture of head, and structure of clypeus, much as in *albipennis*. Antennae inserted distinctly above the level of the ventral edge of the eyes ; scape about three quarters as long as an eye, reaching only to the level of the lower edge of the median ocellus ; combined length of pedicellus and flagellum only very slightly less than breadth of head ; pedicellus in profile 1·6 to 1·7 times as long as broad, as long as or slightly longer than the first funicular segment ; funicle slightly stouter than the pedicellus, cylindrical or weakly clavate ; first funicular segment quadrate or slightly, up to 1·3 times, longer than broad, distal segments quadrate, or the sixth slightly transverse ; clava hardly twice as long as broad, slightly longer than the combined length of the two preceding funicular segments ; sensilla fairly numerous, usually in two irregular rows on at least the proximal segments of the funicle, sometimes in only one irregular row.

Thorax, excluding propodeum, similar to that of *albipennis*. Propodeum (Text-fig. 380) about one third as long as the scutellum ; median area 2·25 to 2·5 times as broad as long, its panels shiny with some longitudinal costulae or coarse wrinkles, but with little fine reticulation ; costula fairly distinct, strongly angulate in the middle, where it nearly touches the base of the propodeum ; median carina usually absent, occasionally extending as far as the nucha ; other details much as in *albipennis*. Fore wing with lower surface of costal cell with one complete row of hairs, and some other hairs scattered over the distal third of the cell ; basal vein usually with some (up to six) hairs ; speculum open below, extending below the marginal vein for at most half the length of the latter ; wing beyond the speculum moderately thickly pilose, the area between the postmarginal and stigmal veins mainly pilose ; apical margin of wing ciliate ; marginal vein 1·35 to 1·4 times as long as the stigmal vein ; postmarginal vein at least very slightly shorter than the marginal.

Gaster lanceolate, as long as or longer than, up to 1·3 times, head plus thorax, 2·5 to 2·8 times as long as broad, somewhat compressed though usually only a little narrower than the thorax ; basal tergite occupying hardly one quarter of the total length, its hind margin usually distinctly emarginate medially, rarely entire ; last tergite as long as, or slightly longer than, its basal breadth ; ovipositor sheaths distinctly exserted, often to a length equal to about half that of the last tergite ; hypopygium extending about half way along the gaster.

♂. Differs from the female as follows :

Antennae with combined length of pedicellus and flagellum 1·1 to 1·2 times the breadth of the head ; pedicellus in profile 1·5 to 1·6 times as long as broad, slightly shorter than or as long as the first funicular segment ; flagellum moderately stout, slightly stouter than the pedicellus when the latter is seen in dorsal view, cylindrical ; first funicular segment 1·2 to 1·5 times as long as broad, sixth usually quadrate or very slightly longer than broad, very slightly transverse in dwarfs ; clava 2·7 to 2·8 times as long as broad, slightly longer than the combined length of the two preceding funicular segments ; most of the hairs clothing the flagellum stand out at rather less than 45°, the length of the hairs is about equal to half the breadth of the segments that bear them. Gaster oval, slightly shorter and narrower than the thorax, with a ventral plica.

The female of *myopitae* sp. n. most closely resembles that of *cardui* (Erdös), but differs in having the propodeum slightly longer, its median area less strongly transverse with the costula distinctly angulate in the middle and less strong ;

also the longitudinal costulae situated in the panels of the median area are less regular and usually do not reach the transverse costula.

Holotype ♀. ENGLAND : Isle of Wight, Yarmouth, 21.v.1938, reared from *Myopites blotii* Bréb., on *Inula* sp. (*M. Niblett*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality and host as holotype ♀, 3 ♂, 19.v.1938, 3 ♂, 21.v.1938, ♂♂, ♀♀, 30.v.1938, 2 ♀, 4.vi.1938, 3 ♂, 10.vi.1938 (*M. Niblett*), in Hope Department, University Museum, Oxford.

Habrocytus glabriculus Thomson

(Text-figs. 374, 400, 411)

Habrocytus glabriculus Thomson, 1878 : 113–114, ♀.

Type material. Syntypes, 3 ♀. LECTOTYPE labelled " Lp. in. " ; " Bhn " ; and bearing my lectotype label. I have not seen any additional material.

SWEDEN.

Biology. Unknown.

Habrocytus sp. indet. H

ENGLAND : Surrey, Ashstead Common, ♂ ♀ em. vii.1963 from stem galls on Mugwort (*Artemisia vulgaris* L.) (*A. F. Amsden*) ; Oxfordshire, Thatcham Reeds, near Newbury, 28.viii.1964, ♀♀ on the same plant species (*Graham*).

This is very near to *glabriculus* Thomson, but not I think within the range of variation of that species.

Habrocytus ? lactucae (Erdös & Szelényi) **comb. n.**

? Cecidostiba lactucae Erdös & Szelényi, in Erdös, 1953 : 228, 231–232, ♂ ♀.

Type material. Syntypes, Hungary, Heves, Átány, 15–17.vii.1935, from inflorescences of *Lactuca sativa* L., with *Trypanea amoena* Frauenf. ; Kalocsa, 24–25.vii.1946, 13–17.vii.1948 together with the host, in Hungarian National Museum and in the Phytopathological Institute, Budapest, also in the collections of Novitzky and Ferrière. I have seen some specimens, said to be syntypes, from the Hungarian National Museum, but these do not seem to fit the description well. Before selecting a lectotype it will be necessary to examine all the syntypes, since the possibility that the series is a mixed one cannot be overlooked.

HUNGARY.

Biology. Parasite of *Trypanea amoena* (Frauenf.) (Dipt., Trypetidae).

Habrocytus intermedius (Walker)

(Text-fig. 408)

Eutelus intermedius Walker, 1834 : 366, ♀.

? Pteromalus impeditus Walker, 1835*a* : 187, ♀.
? Habrocytus obscurus Thomson, 1878 : 113, ♀.
Habrocytus intermedius (Walker) Kurdjumov, 1913 : 20.

Type material. *Eutelus intermedius* Walker. Syntypes, 2 ♀. LECTOTYPE labelled " Walker coll. 1904–120 " and (in Walker's handwriting) " intermedius " ; on the lower surface of the card are the letters " IW " [standing for Isle of Wight, the type-locality].

Pteromalus impeditus Walker. Syntypes, 2 ♀. LECTOTYPE, the second ; Waterhouse label. Probably small *intermedius* with distorted gaster.

Habrocytus obscurus Thomson. Syntypes on 36 pins. LECTOTYPE labelled " Bås " [Båstad] and " obscurus Dalm." [*sic*]. The lectotype differs from that of *intermedius* only in small details and I believe it may fall within the range of variation of *intermedius*.

BRITAIN, SWEDEN.

Biology. Reared from stems of *Artemisia vulgaris* L. (*A. F. Amsden*) [unpublished information], perhaps a parasite of *Oxyna parietina* L.; I have also found *intermedius* in some numbers on the above plant during August and September, in southern England. Imagines occur in the field July–Sept.

Habrocytus albidovenosus (Walker) **comb. n.**

Pteromalus albidovenosus Walker, 1874 : 317, ♀.

Type material. Syntypes, 2 ♀. LECTOTYPE, Type Hym. 5.724, labelled " 142 " ; " Amurland. Coll. F. Walker. 1913–71 " ; and (in Walker's handwriting) " Pteromalus albovenosus " [*sic*].

ASIA (Amurland) ; only the syntypes known.

Biology. Unknown.

The female of *albidovenosus* is extremely close to that of *intermedius* (Walker) but has the body rather more slender, the temples in dorsal view slightly shorter and more convergent, the ocelli smaller, the genae perhaps a little more buccate, and the disc of the mesoscutum rather more coarsely reticulate. It is not possible to decide, without seeing fresh material from the type locality, whether it is a form of *intermedius* or a distinct species.

Habrocytus alternipes (Walker) **comb. n.**

Pteromalus alternipes Walker, 1872*b* : 120, ♀.

Type material. One female, LECTOTYPE (Type Hym. 5. 712) labelled " Madeira Id. Porto Santo Wollaston " and (in Walker's handwriting) " Pteromalus alternipes ".

MADEIRA.

Biology. Unknown.

The female of *alternipes* closely resembles that of *intermedius* (Walker) but differs as follows : pronotal collar shorter, its front edge not raised ; funicular segments relatively shorter ; gaster narrower, coppery bronze, with slight greenish reflections only at the base and apex.

Habrocytus berylli (Walker) **comb. n.**

(Text-figs. 378, 417)

Pteromalus berylli Walker, 1835*a* : 199, ♀.
Pteromalus Ariomedes Walker, 1839 : 210, ♂, **syn. n.**
Habrocytus ariomedes (Walker) Bouček, 1965*e* : 8.

Type material (lectotypes bear a Waterhouse label).
Pteromalus berylli Walker. Syntypes, 2 ♀ ; LECTOTYPE, the first specimen.
Pteromalus ariomedes Walker. Syntypes, 3 ♂ ; LECTOTYPE, the first specimen.

BRITAIN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Not definitely ascertained, but probably a parasite of Trypetid flies. Walker (1848*a* : 77) recorded it as reared from *Trypeta parietina* [*Oxyna parietina* L.] but this record cannot now be checked. Imagines June–July.

Habrocytus albipennis (Walker)

(Text-figs. 394, 403, 406)

Pteromalus coeruleus Dalman, 1820 : pl. 7, figs. 29–31.
Pteromalus cingulipes Walker, 1835*a* : 197, ♂ ♀, **syn. n.**
Pteromalus albipennis Walker, 1835*a* : 198, ♀.
Pteromalus plenus Walker, 1835*a* : 199, ♂ ♀, **syn. n.**
Pteromalus albipennis Zetterstedt, 1838 : 424, ♀, **syn. n.**
? Pteromalus Hedymeles Walker, 1839 : 215, ♂.
Pteromalus Zelus Walker, 1839 : 270, ♂, **syn. n.**
? Pteromalus Suia Walker, 1848 : 124, 181, ♂.
Pteromalus Coeno Walker, 1848 : 124, 186, ♂, **syn. n.**
? Pteromalus Larymna Walker, 1848 : 126, 204, ♀.
Pteromalus Priansos Walker, 1848 : 126, 208, ♀, **syn. n.**
Pteromalus Orthagus Walker, 1848 : 126, 209, ♀, **syn. n.**
Pteromalus Diomedon Walker, 1848 : 126, 209, ♀, **syn. n.**
Habrocytus albipennis (Walker) Thomson, 1878 : 110, ♂ ♀.
Habrocytus beryllinus Thomson, 1878 : 112, ♂ ♀, **syn. n.**
Habrocytus albipennis (Walker) ; Varley, 1947 : 170.
Habrocytus albipennis (Walker) ; Bouček, 1965*e* : 8.

Type material (all Walker lectotypes bear Waterhouse labels).
Pteromalus coeruleus Dalman. This species was figured by Dalman but not described (the name merely included in a list). I have not located any specimens so named ; but probably Thomson saw the original material, since he synonymized *coeruleus* with *albipennis* (1878 : 110) without question.
Pteromalus cingulipes Walker. Syntypes, 3 ♂, 2 ♀. LECTOTYPE, the third specimen, a female ; it is within the range of variation of *albipennis* although it has an unusually short gaster.

Pteromalus albipennis Walker. Syntypes, 2 ♀. LECTOTYPE, the first specimen.

Pteromalus plenus Walker. Syntypes, 1 ♂, 1 ♀. LECTOTYPE, the female specimen ; it has an unusually short gaster but is I think the same as *albipennis*.

Pteromalus albipennis Zetterstedt. Syntypes, 2 ♀. LECTOTYPE labelled in Zetterstedt's handwriting " Pt. albipennis ♀. Kengis ". Zetterstedt described it without any reference to Walker's earlier name *albipennis*, so presumably it was thought to be a new species.

Pteromalus hedymeles Walker. Syntypes, 2 ♂. LECTOTYPE, the first specimen ; it probably belongs to *albipennis*.

Pteromalus zelus Walker. One male, LECTOTYPE (possibly holotype).

Pteromalus suia Walker. One male, LECTOTYPE. This may be a male of *albipennis*.

Pteromalus coeno Walker. One male, LECTOTYPE.

Pteromalus larymna Walker. One female, LECTOTYPE. It appears to be a small specimen of *albipennis*.

Pteromalus orthagus Walker. One female, designated LECTOTYPE.

Pteromalus priansos Walker. Syntypes, 2 ♀ ; LECTOTYPE, the first specimen, a dwarf of *albipennis*.

Pteromalus diomedon Walker. One female, LECTOTYPE.

Habrocytus beryllinus Thomson. Syntypes on 10 pins. LECTOTYPE, a female labelled " Lund ".

The name *albipennis* (Walker) was adopted for this species by Thomson (1878) and is now generally accepted. As it is the type-species of *Habrocytus*, and because there are some other apparently valid species which are difficult to distinguish from it, I give a redescription below.

(Redescription). ♀. Body green to blue, sometimes with violet reflections in places. Antennal scape usually more or less testaceous at the base ; flagellum fuscous to black, occasionally somewhat testaceous beneath. Coxae, and femora except their tips, concolorous with the body ; trochanters dark, trochantelli at least partly yellowish ; tibiae varying from entirely yellowish, through testaceous, often more or less broadly brownish to fuscous medially ; tarsi pale yellowish, brown distally, fore tarsi sometimes wholly brown. Wings hyaline or whitish hyaline ; veins usually pale yellowish, sometimes pale fulvous, the parastigma and stigma sometimes fulvous to brownish. Length 2·5 to 4·3 mm.

Head in dorsal view (Text-fig. 406) from hardly broader than, to 1·1 times as broad as, the mesoscutum, 2·15 to 2·25 times as broad as long ; temples from nearly to slightly more than one third as long as eyes, moderately convergent ; POL 1·5 to 1·7 OOL. Head in frontal view subtrapeziform, with genae slightly buccate ; eyes about 1·5 times as long as broad, separated by 1·4 to 1·5 times their length. Malar space from hardly half, to somewhat more than half, the length of an eye. Anterior margin of clypeus shallowly emarginate, with a depression in the middle touching the emarginate edge. Head finely reticulate, especially on the temples and genae. Clypeus (Text-fig. 394) radiately strigose, the striae extending a little way up the genae and face. Antennae inserted well above the level of the ventral edge of the eyes ; scape fully three quarters as long as an eye, reaching about level with the middle of the median ocellus ; combined length of pedicellus and flagellum slightly less than the breadth of the head ; pedicellus (in profile) about 1·7 times as long as broad, usually somewhat shorter than, or as long as, the first funicular segment, slightly longer in small females ; funicle slightly stouter than the pedicellus, usually cylindrical, very weakly clavate in the smallest specimens ; first funicular

segment 1·1 to 1·6 times as long as broad, sixth quadrate to slightly transverse, sometimes also the fifth and even the fourth are quadrate ; clava usually collapsing slightly and then appearing slightly broader than the funicle, 1·8 to 2·3 times as long as broad, its length slightly greater than the combined length of the two preceding funicular segments ; sensilla numerous, usually in two, sometimes irregular, rows on each funicular segment, sometimes only one row on the distal segments or, in very small specimens, on all the segments ; hairs of flagellum mostly subadpressed.

Thorax about 1·4 times as long as broad. Pronotal collar somewhat less wide than the mesoscutum, appearing hardly longer at the sides than in the middle, subhorizontal, its front edge abrupt or weakly irregularly margined in the middle ; one seventh to one sixth as long as the mesoscutum, somewhat more coarsely reticulate than the front part of the latter. Mesoscutum 1·5 to 1·65 times as broad as long, rather dull, very finely reticulate, slightly more coarsely in the middle posteriorly. Scutellum about as broad as long, very finely reticulate, slightly more coarsely on the frenum. Inner angles of axillae with rather coarser reticulation than that of the scutellum. Propodeum about one third as long as the scutellum or slightly more, sloping at an angle of about 45° to the plane of the mesoscutum and scutellum ; median area 2 to 2·6 times as broad as long, its panels somewhat shiny, irregularly sculptured, partly finely reticulate, with some carinulae or wrinkles, with some longitudinal carinulae at the base ; median carina complete and sharp, slightly raised basally though not dentiform ; there is a large oval fovea on each side of the median area, touching the base of the propodeum ; costula more or less indicated, usually represented by a slightly raised reticulate ridge, but rarely at all sharp ; nucha about one third the median length of the propodeum, separated from the median area by a deep and longitudinally-costate furrow, the nucha with very fine reticulation whose areoles are broader than long ; plicae anteriorly subparallel and forming convex elevations just outside the basal foveae, posteriorly sharp and extending along the sides of the nucha to its hind edge, the part on the sides of the nucha converging strongly towards the median line ; callus lightly and finely reticulate ; spiracles large, sublinear, touching or almost touching the metanotum ; spiracular sulci distinctly impressed, punctate or with some transverse costulae. Postspiracular sclerite narrow, very weakly sculptured and shiny, with an impression along its front border. Mesepisternum finely reticulate, with a mainly to wholly smooth area below the base of the hind wing ; mesepimeron finely reticulate ; metapleuron rather more finely reticulate than the mesepimeron. Legs rather short ; femora relatively stout. Fore wing with upper surface of costal cell bare, lower surface with a row of widely-spaced hairs (Text-fig. 403) which is interrupted in or before the middle, often very widely ; basal cell bare, basal vein bare or virtually so ; speculum open below, on upper surface of wing extending below the marginal vein for more than half the length of the latter, or even as far as the stigmal vein ; wing beyond speculum with its pilosity not dense, the area between the postmarginal and stigmal veins partly bare ; marginal vein 1·35 to 1·6 times as long as the stigmal vein ; postmarginal vein usually a little shorter than the marginal ; stigmal vein slightly curved, forming an angle of 40° to 45° with the postmarginal ; stigma small, obliquely suboval ; apical margin of wing ciliate in fresh specimens, but tending to lose the cilia later so that the margin becomes at least partly bare.

Gaster lanceolate, 1·1 to 1·3 times as long as head plus thorax, slightly to distinctly narrower than the thorax, acute and sometimes slightly acuminate apically, 2·2 to 3 times as long as broad ; hind margin of basal tergite entire or very weakly emarginate medially ; last tergite from as long as, to slightly longer than, its basal breadth, its front third to half bare ; hypopygium extending about half way along the gaster ; ovipositor sheaths projecting slightly so that their tips are visible in dorsal view.

♂. Antennal scape often wholly dark, rarely with more than its proximal half testaceous in British specimens, reaching about to level of middle of median ocellus. Gaster immaculate. In structure much like the female, but with the propodeum somewhat longer, its median area less transverse ; antennae and gaster different. Antennae with combined length of pedicellus and flagellum slightly greater than breadth of head ; flagellum not slender, distinctly stouter

than the pedicellus when the latter is seen in dorsal view ; pedicellus about 1·5 times as long as broad ; first funicular segment from slightly longer than, to about 1·5 times as long as, the pedicellus, 1·25 to 1·6 times as long as broad, sixth segment quadrate or slightly longer than broad. Row of hairs on lower surface of costal cell complete or somewhat interrupted.

BRITAIN, IRELAND, SWEDEN, GERMANY, CZECHOSLOVAKIA.

Biology. Varley (1947 : 170) found that *albipennis* attacked *Chaetostomella cylindrica* R.-D. (=*onotrophes* Loew) and *Chaetoriella jaceae* (R.-D.), two non-gall-forming Trypetid flies occurring in the flower-heads of *Centaurea nemoralis* Jord.; I have examined Professor Varley's material. Other specimens which I have identified as *albipennis* were reared in England by Mr. M. Niblett, from the following hosts (according to their labels) :—*Tephritis bardanae* Schr. and *Trypeta* [=*Orellia*] *tussilaginis* F. on *Arctium lappa* L.; *Trypeta* [=*Orellia*] *winthemi* Mg. on *Carduus crispus* L. (material in Hope Dept., Oxford). Imagines occur in the field June–August (occasionally some appear in May).

***Habrocytus temporalis* sp. n.**

(Text-fig. 410)

♀. Very close to *albipennis* (Walker) and *intermedius* (Walker). Differs from *albipennis* as follows:

Head in dorsal view (Text-fig. 410) slightly less transverse, only 2 to 2·05 times as broad as long ; temples longer, nearly half as long as the eyes, converging only slightly. Fore wing with postmarginal vein longer, 1·1 to 1·25 times as long as the marginal vein ; marginal vein 1·25 to 1·4 times as long as the stigmal vein. Pronotal collar rather longer, medially about one fifth as long as the mesoscutum, its front edge sharp.

From *intermedius* it differs in the characters given in the key to females (see couplet 20).

♂. Differs from that of *albipennis* in having a pale subbasal spot on the gaster ; antennal scape reaching the level of the vertex ; temples, in dorsal view of head, longer and less convergent. From that of *berylli* (Walker) it differs in the characters given in my key to males of *Habrocytus*.

Holotype ♀. Sweden : Holland, Snöstorp, 17.vii.1954 (*H. Andersson* : serial no. M408), in Universitetets Zoologiska Institution, Lund.

Paratypes. Same locality, 1 ♂, 14.vii.1954, 1 ♀, 17.vii.1954 (*H. Andersson*).

Biology. Unknown.

***Habrocytus patro* (Walker) comb. n.**

Pteromalus Patro Walker, 1848 : 125, 195, ♂.

The male of *patro* is easy to distinguish from that of *albipennis* ; but the female here associated with it (I presume correctly) is very similar to that of *albipennis*.

♀. Differs from that of *albipennis* as follows : Gaster on the average slightly longer, 3·2 to 3·5 times as long as broad, 1·25 to 1·3 times as long as head plus thorax, rather more compressed. Venation more fulvous in colour.

Malar space somewhat more than half as long as an eye. Length of body, 3·5 to 3·7 mm.

♂. Differs from that of *albipennis* as follows : Gaster with a yellowish subbasal spot. Antennal scape reaching the level of the vertex, entirely testaceous or darkened only distally ; flagel-

lum testaceous, somewhat brownish dorsally, the segments brownish at their bases. Pronotal collar margined in the middle, the front edge sometimes strongly raised. Length 2·3 to 2·8 mm.

One male (now designated LECTOTYPE) stands under the name *patro* in Walker's collection ; it bears a Waterhouse label.

Additional material :—

ENGLAND : Surrey, Mickleham Downs, ♂♂, ♀♀ emerged 18.iv.1938, from *Orellia winthemi* (Mg.) on *Carduus crispus* L., reared by (*M. Niblett*), material in the Hope Dept., University Museum, Oxford.

Habrocytus caudiger sp. n.

♀. Differs from that of *albipennis* (Walker) as follows : Length 4 to 4·8 mm. Fore wing with marginal vein 1·65 to 1·9 times as long as the stigmal vein ; venation fulvous, the parastigma and stigma sometimes brownish testaceous. Gaster relatively longer, 1·3 to 1·5 times as long as head plus thorax, 3·4 to 4 times as long as broad, more compressed, conical, broadest at about the level of the apex of the basal tergite, in *albipennis* usually with its broadest part somewhat farther back ; last tergite 1·35 to 1·55 times as long as its basal breadth. Malar space from somewhat more than half, to nearly two thirds, the length of an eye.

♂. Resembles that of *albipennis* but is larger (length 3·4 to 3·5 mm.).

Holotype ♀. England : Berkshire, Hinksey, emerged 2.vi.1925, from *Terellia longicauda* (Mg.), in flower-head of *Cirsium eriophorum* L. (*E. G. R. Waters*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality and host as holotype, 1 ♂, 1 ♀ 1–2.vi.1925 (*E. G. R. Waters*) ; Wytham, ♀♀ emerged 31.iii.1953, 3.v.1953, 4.v.1953 from flower-heads of *C. eriophorum* (*G. C. Varley*) ; Oxfordshire, Shotover, 1 ♀, emerged 1.vi.1925 from *Terellia longicanda* on the same host-plant (*A. H. Hamm*), in Hope Department, University Museum, Oxford.

Habrocytus decipiens sp. n.

(Text-fig. 398)

♀. Differs from that of *albipennis* as follows : Flagellum most often distinctly testaceous beneath. Size relatively less (length 1·8 to 2·5 mm). Head in dorsal view with temples only one quarter as long as eyes or hardly more, and converging rather more strongly Flagellum (Text-fig. 398) distinctly clavate, strongly so in small specimens ; pedicellus at least very slightly longer than the first funicular segment, usually obviously longer ; first funicular segment quadrate or hardly longer than broad, the following segments quadrate, or the sixth, sometimes also the fifth, slightly transverse ; sensilla relatively less numerous, arranged in one, sometimes irregular, row on each funicular segment. Fore wing with row of hairs on lower surface of costal cell often complete ; marginal vein only 1·27 to 1·45 times as long as the stigmal vein. Gaster relatively shorter, ovate-lanceolate, from nearly as long as, to slightly longer than, head plus thorax, 1·65 to 2·1 times as long as broad, not compressed and nearly or quite as broad as the thorax ; last tergite at most as long as, but usually shorter than, its basal breadth.

♂. Not definitely associated.

Holotype ♀. ENGLAND : Berkshire, Thatcham Reeds, near Newbury, 29.viii.1964, swept from flowers of *Artemisia vulgaris* L. (*Graham*), Hope Dept., University Museum, Oxford.

Paratypes. Same locality and plant as holotype, 11 ♀, 26.viii.1964, 7 ♀, 29.viii.1964 (*Graham*).

Biology. Unknown.

Habrocytus brachygaster sp. n.

(Text-fig. 416)

♀. Body dark green to dark blue-green ; occipital surface of head, pronotal neck, mesopleuron partly, and sometimes disc of gaster, bluish black. Antennal scape more or less testaceous at base, otherwise blackish with a metallic tinge, like the pedicellus ; flagellum fuscous, not distinctly paler beneath excepting the sensilla. Coxae, and femora except their tips, black with a metallic tinge ; trochanters mainly to entirely dark ; legs otherwise testaceous with at least the mid and hind tibiae more or less broadly infuscate medially ; tarsi fuscous at tips, fore tarsi mainly fuscous. Tegulae blackish with a metallic tinge. Wings hyaline ; venation pale yellowish to fulvous, the parastigma and stigma sometimes slightly darker. Length 2 to 2·2 mm.

Head only slightly broader than the mesoscutum ; in dorsal view 2·25 to 2·3 times as broad as long, with temples hardly more than one quarter as long as eyes and rounded off ; POL 1·65 to 1·8 OOL. Head in front view suboval with genae moderately buccate. Eyes separated by about 1·5 times their length. Malar space slightly less than, or nearly, half the length of an eye. Structure of clypeus, and sculpture of head, as in *albipennis* ; frons rather more coarsely reticulate than rest of head. Antennal scape more than three quarters as long as an eye, reaching level with the lower edge or the middle of the median ocellus ; combined length of pedicellus and flagellum much less than breadth of head ; pedicellus in profile about 1·6 times as long as broad, as long as or distinctly longer than the first funicular segment ; flagellum only moderately clavate, proximally distinctly stouter than the pedicellus ; first funicular segment quadrate or subquadrate, following segments subquadrate, the sixth, sometimes also the fifth, very slightly transverse ; clava about twice as long as broad, as long as two and a half or three of the preceding funicular segments ; sensilla fairly numerous, in one row on all the funicular segments.

Thorax barely 1·5 times as long as broad. Pronotal collar slightly less wide than the mesoscutum, about as long medially as at the sides, one fifth or slightly more than one fifth as long as the mesoscutum, coarsely reticulate in the middle, more finely so at the sides ; its front edge abrupt, sometimes weakly and irregularly margined in the middle. Mesoscutum 1·6 to 1·65 times as broad as long, finely reticulate at the sides, more coarsely so discally. Scutellum hardly longer than broad, finely reticulate, the frenum slightly more coarsely than the rest. Propodeum, medially, slightly more than one third as long as the scutellum ; median area 2 to 2·2 times as broad as long, similar to that of *scandiae* sp.n. but rather more shiny and more irregularly sculptured, the plicae rather more distinct anteriorly, the callus more shiny, alutaceous. Postspiracular sclerite, meso- and metapleuron much as in *scandiae*. Fore wing much like that of *scandiae*, but having the row of hairs on the lower surface of the costal cell usually complete, occasionally narrowly broken, marginal vein only 1·15 to 1·35 times as long as the stigmal vein ; postmarginal vein usually as long as or slightly longer than the marginal, rarely very slightly shorter.

Gaster short-ovate, as long as or slightly longer than the thorax, about as broad as the thorax and not compressed, 1·4 to 1·9 times as long as broad, acute though not acuminate apically ; basal tergite occupying about one third of the total length ; last tergite only about half as long as its basal breadth ; ovipositor sheaths slightly exserted ; hypopygium extending about half way along the gaster.

♂. Not definitely associated. Some males taken in company with the above females may be conspecific with them ; they are much like those of *albipennis* (Walker) but smaller (Text-fig. 416).

Holotype ♀. ENGLAND : Berkshire, Thatcham Reeds, near Newbury, 29.viii.1964, swept from plants of *Artemisia vulgaris* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality and host-plant as holotype, 5 ♀, 29.viii.1964, 2 ♀, 31.viii.1964 (*Graham*), in Graham collection.

Biology. Unknown.

Habrocytus tibiellus (Zetterstedt) comb. n.

Pteromalus tibiellus Zetterstedt, 1838 : 425, ♀.

Type material. One female, LECTOTYPE, labelled in Zetterstedt's handwriting " Pt. tibiellus ♀ Joh. Ro." The specimen was partly covered with mould but I have managed to determine its characters fairly well. The male is unknown.

BRITAIN, SWEDEN. England [new record] : Oxford, 1 ♀, 27.ix.1954 (*Graham*) ; this appears to be identical with the lectotype of *tibiellus*.

Biology. Unknown.

Habrocytus scandiae sp. n.

(Text-fig. 399)

♀. Head and thorax mainly dark green ; occipital surface of head, pronotal neck, mesopleuron mainly, mesoscutum sometimes partly, bluish black ; basal tergite of gaster green, the rest of the gaster varied with greenish and bronze, the disc bronze or purplish. Antennal scape blackish with a metallic tinge, testaceous basally ; pedicellus blackish, paler apically ; flagellum brown, slightly paler beneath. Coxae, and femora except their tips rather narrowly, concolorous with the thorax ; trochanters mainly dark ; tibiae fuscous except at base and apex ; remaining parts of legs testaceous, with tips of tarsi fuscous. Tegulae black with a metallic gloss. Wings hyaline ; venation fulvous to testaceous, parastigma and stigma sometimes slightly darker. Length 1·7 to 2 mm.

Head about 1·2 times as broad as mesoscutum, in dorsal view about 2·2 times as broad as long ; temples hardly more than one quarter as long as eyes, converging strongly and curved ; POL 1·5 to 1·6 OOL. Head in frontal view suboval ; eyes separated by 1·5 to 1·55 times their length. Malar space from barely half to slightly more than half, the length of an eye. Clypeus finely strigose, its anterior margin shallowly emarginate and with a slight impression in the middle, the striae extending only slightly on to the genae and face. Head finely reticulate, the frons rather more coarsely. Antennae (Text-fig. 399) with scape slightly more than three quarters the length of an eye, but reaching only to the level of the lower edge of the median ocellus ; combined length of pedicellus and flagellum much less than breadth of head ; pedicellus (profile) about 1·6 times as long as broad, distinctly longer than the first funicular segment ; flagellum proximally not stouter than the pedicellus, but thickening distad so as to be rather strongly clavate ; first and second funicular segments quadrate or slightly longer than broad, the following subquadrate, or the sixth, and sometimes the fifth, very slightly transverse ; clava about twice as long as broad, its length equalling two and a half to two and three quarters of the preceding funicular segments ; sensilla not very numerous, in one row on each funicular segment.

Thorax about 1·5 times as long as broad. Pronotal collar slightly less wide than the mesoscutum, about as long medially as at the sides, from slightly less than to about one fifth as long

as the mesoscutum, rather coarsely reticulate in the middle, more finely at the sides ; front edge very abrupt, sometimes weakly and irregularly margined in the middle. Mesoscutum about 1·6 times as broad as long, finely reticulate, rather more coarsely on the disc. Scutellum hardly longer than broad, finely reticulate, the frenum hardly more coarsely than the rest. Propodeum somewhat more than one third as long as the scutellum ; median area 1·8 to 2 times as broad as long, its panels not very shiny, very finely and fairly uniformly reticulate, with some longitudinal carinulae at the base ; median carina complete but usually not very strong ; costula subobsolete ; plicae traceable throughout but only sharp posteriorly where they converge strongly on the sides of the nucha ; nucha about one quarter as long as the median area, delicately transversely strigose-reticulate, separated from the median area by a transverse impression which has some longitudinal costulae ; spiracles long-oval, nearly touching the metanotum ; spiracular sulci distinct ; callus alutaceous, not very shiny, rather sparsely pilose. Postspiracular sclerite and mesepisternum as in *albipennis*. Mesepimeron more coarsely reticulate than the mesepisternum. Metapleuron somewhat shiny, finely reticulate. Fore wing with upper surface of costal cell bare, lower surface with the row of hairs usually widely broken, but complete in one female ; basal cell bare, open below, basal vein bare ; speculum open below, on upper surface of wing extending below marginal vein to fully half the length of the latter ; wing beyond speculum not very thickly pilose, the area between postmarginal and stigmal vein partly bare ; apical margin of wing ciliate ; marginal vein 1·5 to 1·75 times as long as the stigmal vein ; postmarginal vein distinctly shorter than the marginal ; stigmal vein slightly curved, stigma small and suboval.

Gaster ovate, about as long and as broad as the thorax, not compressed, 1·5 to 1·6 times as long as broad, acute but not acuminate apically ; basal tergite occupying rather more than one third the total length ; last tergite distinctly shorter than its basal breadth ; tips of ovipositor sheaths just visible in dorsal view ; hypopygium extending about half way along the gaster.

♂. Unknown.

The female is nearest to that of *tibiellus* (Zetterstedt), but differs in having the antennal flagellum more clavate, more slender proximally, gaster shorter, marginal vein longer relative to the stigmal vein.

Holotype ♀. SWEDEN : Skåne, Falsterbo, 27.vii.1959, swept from sand-dune vegetation (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype ♀, 6 ♀, in Graham collection.

Biology. Unknown.

Habrocytus tripolii sp. n.

(Text-figs. 377, 402, 409)

♀. Head and thorax usually bright green to blue, sometimes with strong brassy or coppery reflections ; occipital surface of head and neck of pronotum bluish black. Antennal scape testaceous basally ; flagellum fuscous, sometimes obscurely testaceous beneath. Legs coloured much as in *albipennis* (Walker). Tegulae black with a metallic tinge. Wings hyaline ; venation fulvous to testaceous. Length 2·7 to 3·1 mm.

Head in dorsal view (Text-fig. 409) shaped much as in *albipennis* ; POL 1·4 to 1·5 OOL. Eyes separated by about 1·5 times their length. Sculpture of head, and structure of clypeus, as in *albipennis*. Antennae (Text-fig. 402) inserted distinctly above level of ventral edge of eyes ; scape slightly more than three quarters as long as an eye, reaching the level of the middle or the top of the median ocellus ; combined length of pedicellus and flagellum distinctly less than the breadth of the head ; pedicellus in profile about 1·6 times as long as broad, slightly shorter than or as long as the first funicular segment ; funicle rather slender, but slightly

stouter than the pedicellus, nearly cylindrical ; first funicular segment 1·1 to 1·5 times as long as broad, the following segments slightly shorter, the sixth quadrate or very slightly transverse ; clava hardly twice as long as broad, slightly longer than the combined length of the two preceding funicular segments ; sensilla usually numerous and in two irregular rows on at least the proximal segments of the funicle, in small females sparser and in only one row.

Thorax like that of *albipennis*, but with the pronotal collar a little longer and rather more abrupt in front ; and propodeum different. Pronotal collar medially from slightly more than one sixth, to slightly more than one fifth, as long as the mesoscutum. Propodeum (Text-fig. 377) medially a little less than half as long as the scutellum, rather more strongly produced posteriorly than in *albipennis* ; median area 1·75 to 1·9 times as broad as long, its panels rather dull, mainly finely and rather uniformly reticulate, with some longitudinal carinulae at the base ; costula hardly indicated ; plicae rather more distinct in their posterior half than in *albipennis* ; median carina often irregular, weak, or even absent ; callus finely and lightly reticulate. Fore wing much as in *albipennis* ; row of hairs on lower surface of costal cell widely broken medially ; marginal vein 1·4 to 1·6 times as long as the stigmal vein ; apical margin of the wing ciliate.

Gaster short-ovate, about as long as, or slightly shorter than, the thorax, about as broad as the latter, 1·2 to 1·6 times as long as broad, acute but not acuminate apically ; basal tergite occupying one third to two fifths of the total length ; last tergite slightly to very distinctly shorter than its basal breadth ; ovipositor sheaths projecting at most very slightly beyond the top of the last tergite ; hypopygium extending about half way along the gaster, but usually overlapped by the tergites and not visible.

♂. Differs from the female as follows :

POL 1·6 to 1·65 OOL. Antennae with combined length of pedicellus and flagellum 1·3 to 1·35 breadth of head ; pedicellus about 1·5 times as long as broad, from half to two thirds as long as the first funicular segment ; flagellum cylindrical, distinctly stouter than the pedicellus ; first funicular segment 1·7 to 2 times as long as broad, following segments slightly shorter though all longer than broad, the sixth about 1·5 times as long as broad ; clava nearly or quite three times as long as broad, hardly longer than the combined length of the two preceding funicular segments ; hairs of flagellum standing out at an angle of about 45°, their length about half the breadth of the segments that bear them. Propodeum slightly longer, its median area less transverse. Fore wing with marginal vein 1·35 to 1·4 times as long as the stigmal vein. Gaster oblong-obovate, slightly shorter and narrower than the thorax, with a ventral plica.

The female of this species is similar to that of *albipennis* (Walker) in many respects, but differs from it particularly in its much shorter gaster ; other differences are mentioned in the description.

The male of *tripolii* differs from that of *albipennis* in having the flagellum rather longer, the funicular segments relatively more elongate.

Holotype ♀. ENGLAND : Kent, Stone Marshes, 18.vii.1935, emerged from *Paroxyna plantaginis* (Hal.), in flower-heads of *Aster tripolium* L. (*M. Niblett*), in Hope Department, University Museum, Oxford.

Paratypes. ENGLAND : Same data as holotype, 3 ♀, 18.vii.1935, in Hope Dept., University Museum, Oxford ; Dorset, Lodmoor, near Weymouth, ♂♂, ♀♀, swept in a salt-marsh, 13.ix.1962 (*Graham*), in Graham collection.

IRELAND : Co. Dublin, Swords Estuary, 3 ♀, 26.viii.1954 (*Stelfox*), North Bull, several ♀♀, 13.viii.1962, collected in the salt-marsh (Mrs. *Healy*) ; Co. Wicklow, The Murrough, 2 ♀, 25.viii.1955 (*Stelfox*), in Graham collection.

Aster tripolium was seen in the other localities mentioned, and it is probably the main host-plant of *tripolii*.

Habrocytus conformis sp. n.

♀. Head and thorax with a weak bluish, bronze, or olive tinge ; gaster bronze with the basal tergite more or less brassy, green, or coppery. Antennae blackish with the scape sometimes testaceous proximally. Coxae, and femora except their tips, concolorous with the thorax ; trochanters mainly dark ; rest of legs testaceous with the mid and hind tibiae more or less infuscate medially, tips of tarsi brown, the fore tarsi more extensively so. Wings subhyaline ; venation testaceous with the parastigma and stigma slightly darker. Length 2·5 to 3·1 mm.

Differs structurally from the female of *tripolii* as follows :

Pronotal collar slightly shorter medially, at most slightly more than one sixth as long as the mesoscutum. Propodeum slightly shorter, about two fifths as long as the scutellum, its median area 1·85 to 2 times as broad as long, the panels less uniformly reticulate and with some longitudinal or oblique carinulae in addition to those present at the base of the propodeum. Gaster slightly longer than the thorax, 1·5 to 1·85 times as long as broad, more acute, and slightly acuminate, apically ; last tergite as long as or slightly longer than its basal breadth.

♂. Unknown.

Holotype ♀. ENGLAND : Buckinghamshire, Hell Coppice, near Oakley, 25.vii.1957, swept from grassy vegetation (*Graham*), in Hope Department, University Museum, Oxford.

Paratype. ENGLAND : Oxfordshire, Otmoor, 1 ♀, 29.viii.1956, on a flower-head of *Angelica sylvestris* L. (*Graham*), in Graham collection.

Biology. Unknown.

Habrocytus parietinae sp. n.

(Text-figs. 376, 401, 407)

♀. Colour much as in *tripolii* sp. n., but antennae and legs paler. Antennal scape often more extensively, sometimes entirely, testaceous ; flagellum testaceous at least beneath, sometimes testaceous with only a little infuscation dorsally ; pedicellus often pale beneath and apically. Tibiae usually entirely bright testaceous, occasionally the hind ones slightly infuscate medially. Tegulae testaceous to fuscous. Body green to blue, without brassy or coppery tints. Length 2·6 to 3·1 mm.

Structurally, differs from *tripolii* as follows :

Head in dorsal view (Text-fig. 407) 2·05 to 2·1 times as broad as long ; temples longer, only slightly less than half as long as the eyes. Antennal scape (Text-fig. 401) more than three quarters as long as an eye, reaching the level of the top of the median ocellus or even the vertex ; combined length of pedicellus and flagellum hardly less than the breadth of the head ; pedicellus about 1·6 times as long as broad, slightly to distinctly shorter than the first funicular segment ; funicle slender, proximally only slightly stouter than the pedicellus, weakly clavate ; first funicular segment 1·8 to 2 times as long as broad, the following segments relatively shorter though all longer than broad, except the sixth which is quadrate ; clava about twice as long as broad, slightly longer than the combined length of the two preceding funicular segments.

Propodeum (Text-fig. 376) medially almost or quite half as long as the scutellum ; median area 1·55 to 1·75 times as broad as long, its panels more irregularly sculptured with some coarse wrinkles, some of them longitudinal, mixed with the reticulation ; costula rather more distinct ; median carina distinct and sharp as far as the costula. Fore wing with lower surface of costal cell with a complete row of hairs, also a few other hairs scattered over the distal quarter of the cell ; speculum extending below the marginal vein for at most half the length of the latter ; wing beyond the speculum more thickly pilose, the area between the postmarginal and stigmal veins almost wholly pilose ; marginal vein 1·4 to 1·6 times as long as the stigmal vein ; postmarginal vein from slightly shorter, to somewhat longer, than the marginal.

Gaster longer than in *tripolii*, 1·55 to 1·9 times as long as broad, longer than the thorax though slightly shorter than head plus thorax, slightly more acute apically ; basal tergite occupying about one third of the total length ; last tergite less transverse ; ovipositor sheaths projecting more distinctly.

♂. Differs from the ♀ as follows :

POL 1·6 to 1·7 OOL. Combined length of pedicellus and flagellum about 1·3 times breadth of head ; pedicellus about 1·5 times as long as broad, half or slightly more than half as long as the first funicular segment ; flagellum subcylindrical, not or hardly stouter than the pedicellus when the latter is seen in dorsal view ; first funicular segment 2 to 2·25 times as long as broad, the following segments relatively shorter though all longer than broad, the sixth 1·6 to 1·7 times as long as broad ; clava about three times as long as broad, about as long as the combined length of the two preceding funicular segments ; hairs of flagellum standing out at about 45°, their length about half the breadth of the segments that bear them. Marginal vein 1·35 to 1·4 times as long as the stigmal vein ; postmarginal vein as long as or slightly longer than the marginal. Gaster oval, slightly shorter and distinctly narrower than the thorax, with a ventral plica.

On the whole *parietinae* most resembles *tripolii* sp. n.; the differences between the two have been mentioned in the description.

Holotype ♀. ENGLAND : Kent, Eltham, 16.vi.1943, reared from *Oxyna parietina* (L.), on *Artemisia vulgaris* L. (*M. Niblett*), in Hope Department, University Museum, Oxford.

Paratypes. ENGLAND : Same data as holotype, 2 ♀, in Hope Department, University Museum, Oxford ; Surrey, Richmond, ♂♂, ♀♀, 8.vi.1961, swept from *Artemisia vulgaris* L. (*Graham*), in Graham collection.

THE *SEQUESTER*-GROUP

Habrocytus sequester (Walker)

(Text-figs. 372, 393)

Pteromalus varius Walker, 1835 : 494–495, ♀, **syn. n.**
Pteromalus sequester Walker, 1835 : 495, ♀.
Pteromalus infectus Walker, 1835*a* : 186, ♀, **syn. n.**
Pteromalus placidus Walker, 1835*a* : 187, ♀, **syn. n.**
? Pteromalus epimelas Walker, 1836 : 486, ♀.
Pteromalus simulans Walker, 1836 : 495, ♀, **syn. n.**
Pteromalus Oroetes Walker, 1839 : 211, ♂, **syn. n.**
? Semiotus apionis Goureau, 1847 : 252, pl. 3, no. 2, figs. 13–15.
Pteromalus Eulimene Walker, 1848 : 124, 179, ♀, **syn. n.**
Pteromalus Leguminum Ratzeburg, 1852 : 234, ♂ ♀, **syn. n.**
Pteromalus insularis Walker, 1872*b* : 100, ♀, **syn. n.**
Habrocytus sequester (Walker) Kurdjumov, 1913 : 21.

Type material (Walker types bear a Waterhouse label unless otherwise stated) :

Pteromalus varius Walker. Syntypes, 3 ♀. LECTOTYPE, the third.

Pteromalus sequester Walker. Syntypes, 4 ♀. LECTOTYPE, the first specimen.

Pteromalus infectus Walker. Syntypes, 2 ♀. LECTOTYPE, the second.

Pteromalus placidus Walker. Syntypes, 3 specimens. LECTOTYPE, the third, a ♀.

Pteromalus epimelas Walker. Three females stand under this name, but none agrees well with the description ; all are the same as *sequester*.

Pteromalus simulans Walker. One female, LECTOTYPE (possibly holotype).

Pteromalus oroetes Walker. Syntypes, 5 ♂. Lectotype labelled " 38. 7. 12. 184 ".

Semiotus apionis Goureau. Type material possibly lost ; I could find none so named amongst the Goureau material in Paris and in Oxford. The description is very brief but fits the female of *Habrocytus sequester* quite well ; and *apionis* was reared from *Apion ulicis*, which has also been recorded as a host for *sequester* (see below).

Pteromalus eulimene Walker. One female, LECTOTYPE.

Pteromalus leguminum Ratzeburg. Types presumed destroyed. The description, and the presumed host material (*Apion* or *Bruchus* on *Spartium scoparium*) convince me that it must have been the same as *sequester*.

Pteromalus insularis Walker. One female, LECTOTYPE, labelled " Marshall coll. 1904–120 " ; " insularis Wlk. (Corsica) " ; and (on the lower surface of the card) " Corsica ".

BRITAIN, FRANCE, CORSICA, CZECHOSLOVAKIA.

Biology. Reared in France from galls of *Asphondylia mayeri* Lieb. (Dipt., Cecidomyiidae) on *Sarothamnus scoparius* (L.) Wimmer, Varengeville, S. Mar., 27.vii.1953 (*J. Steffan*) ; also *Oedaule italica* Masi in pods of *Calycotome spinosa* Link, Menton, A. M., vi.1952 (*J. Steffan*). In the BM(NH) there are specimens from Brussels, Belgium, reared from larvae of *Apion fuscirostre* (F.) in seeds of *Sarothamnus* (Prof. *P. Gerard*). The species recorded in Britain by Davies (1928 : 284), under the name *Spintherus leguminum* Ratzeburg, as a parasite of *Apion ulicis* (Forst.), was *Habrocytus sequester*. Imagines June–Sept.; I have also found females during the winter, amongst dead foliage of *Ulex europaeus* L.

Habrocytus cionobius (Erdös) comb. n.

? Habrocytus cionicida Lichtenstein, 1921 : 733-735, fig. ; 1416–1417.
Cecidostiba cionobia Erdös, 1953 : 228–230, ♂ ♀.

Type material. *Habrocytus cionicida* Lichtenstein. Location of original material unknown. This species was not formally described, but the name is available because it was accompanied by an " indication " (in this case an account of its biology). Judging from its host, *Cionus thapsi* (F.) it may well have been the same as *cionobius* (Erdös). Because the types are not available and the adult was not described, I reject the name in favour of *cionobius*.

Cecidostiba cionobia Erdös. Syntypes, ♂ and ♀, Hungary, Högyész, 21–23.viii. 1947, in coll. Erdös (not seen).

HUNGARY ; ? CZECHOSLOVAKIA, ? FRANCE.

Biology. Reared in Hungary from cocoons of *Cionus thapsi* (F.) in fruits of *Verbascum phlomoides* L., near Högyész, 21–23.viii.1947 (*J. Erdös*). Imagines ? July ; August.

Dr. Erdös placed this species in *Cecidostiba*. It is indeed very like some species of that genus, but differs in the following combination of characters : anterior margin of clypeus incised medially ; anterior margin of pronotal collar rather irregularly and not very sharply margined ; mesoscutum with few and very indistinct piliferous punctures. Those species of *Cecidostiba* which have an incised clypeus, *hilaris* (Walker) and *adana* Askew, have the pronotal collar evenly and sharply, even though finely, margined, whilst the mesoscutum has numerous and fairly distinct piliferous punctures. The other species of *Cecidostiba* have the anterior margin of the clypeus subtruncate ; and they either have the pronotal collar evenly and sharply margined, or else have numerous distinct piliferous punctures on the mesoscutum. In its wing-venation, and in other small details of structure, as well as the above characters, *cionobia* accords best with the *sequester*-group of *Habrocytus*.

Habrocytus sp. indet. I

CZECHOSLOVAKIA : Slovakia, Kovačov, near Sturova, 1 ♀, 23.vii.1963 (*Graham*).

Habrocytus sp. indet. J

CZECHOSLOVAKIA : Slovakia, Sturova, 1 ♀, 22.vii.1963 (*Graham*).

Habrocytus medicaginis Gahan

Habrocytus medicaginis Gahan, 1914 : 163–164, ♀.
Habrocytus medicaginis Gahan ; Nikol'skaya, 1932 : 107–113 [not seen].
Habrocytus medicaginis Gahan ; Peck, 1963 : 727.

This species, well known in America as a parasite of *Bruchophagus* spp. (Hym., Eurytomidae), was recorded from Poltava, U.S.S.R, by Nikol'skaya (1932). It seems to belong to the *sequester*-group and might even be identical with one of the species mentioned above, but I have not seen the type of *medicaginis* and so cannot decide this question.

Species sola

Habrocytus sp. indet. K

CZECHOSLOVAKIA : Slovakia, Sturova, 1 ♀, 22.vii.1963 (*Graham*). A rather isolated species, though in some respects resembling those of the *sequester*-group.

Species sola

Habrocytus microps **sp. n.**

(Text-figs. 371, 414)

♀. Body green with or without golden reflections, or blue. Antennal scape fuscous, testaceous basally and sometimes beneath ; pedicellus fuscous, paler beneath ; flagellum slightly to conspicuously testaceous beneath, infuscate dorsally. Coxae and femora except their tips,

concolorous with the thorax ; trochanters partly dark ; rest of legs testaceous with tips of tarsi fuscous, the fore tarsi mainly brownish ; tibiae in one specimen very slightly darkened medially. Tegulae testaceous anteriorly, dark posteriorly. Wings hyaline ; venation yellowish or testaceous. Length 2·6 to 3 mm.

Head about 1·2 times as broad as mesoscutum ; in dorsal view (Text-fig. 414) about 2·25 times as broad as long ; temples slightly more than one third as long as eyes, rounded off ; ocelli unusually small, the posterior ones separated by 3 to 3·5 times their major diameter from the eyes, POL hardly greater than (at most 1·1) OOL. Head in front view subtrapeziform with the genae only slightly curved ; eyes separated by 1·5 times their length or slightly more. Malar space nearly or quite two thirds as long as an eye. Breadth of oral fossa 1·9 to 2 times the malar space. Clypeus radiately strigose, its anterior margin shallowly emarginate and hardly impressed in the middle. Head finely reticulate, very finely on the genae ; malar sulcus absent, its position partly indicated by a band of excessively fine reticulation. Antennae inserted low on the head, the lower edge of the toruli at or hardly above the level of the ventral edge of the eyes ; scape only slightly shorter than an eye, reaching about level with the middle of the median ocellus ; combined length of pedicellus and flagellum slightly less than breadth of head, in one female virtually equal to it ; pedicellus in profile 1·7 to 1·8 times as long as broad, at least slightly longer than the first funicular segment ; flagellum slightly clavate ; funicle proximally slightly stouter than the pedicellus, its first segment quadrate to 1·25 times as long as broad, the following segments quadrate or hardly longer than broad, the fifth and sixth sometimes very slightly transverse ; clava about 2·5 times as long as broad, its length about equal to two and a half of the preceding funicular segments ; sensilla not very numerous, in one row on each funicular segment.

Thorax nearly 1·5 times as long as broad. Pronotal collar much less wide than the mesoscutum, medially much shorter than at the sides, from slightly more than one eighth, to one seventh, as long as the mesoscutum, moderately finely reticulate, more or less distinctly margined over the middle third, or almost throughout. Mesoscutum 1·6 to 1·7 times as broad as long, finely reticulate, slightly less finely on the disc posteriorly. Scutellum hardly longer than broad, very finely reticulate, the frenum more coarsely. Axillae very finely reticulate. Propodeum (Text-fig. 371) medially slightly more than one third as long as the scutellum and only slightly produced beyond the bases of the hind coxae ; median area 1·9 to 2·2 times as broad as long, its panels moderately shiny and very finely obliquely strigose-reticulate ; median carina complete, usually strong ; costula absent ; plicae distinct throughout, curved and hardly sinuate, their posterior part, on sides of nucha, converging quite strongly ; nucha very short, transversely aciculate ; spiracles long-oval, separated by about one third their length from the metanotum ; spiracular sulci distinctly impressed, punctate or with a few transverse costulae ; callus alutaceous, shiny, rather sparsely pilose. Postspiracular sclerite narrow, shiny, weakly sculptured, with an impressed line along its front margin. Mesepisternum moderately finely reticulate, with a mainly smooth area below the base of the hind wing ; mesepimeron usually rather less finely reticulate ; metapleuron finely, and sometimes weakly, reticulate. Legs not very slender. Fore wing with upper surface of costal cell bare, lower surface with a complete row of hairs and a few additional ones in the distal third ; basal cell bare, open below ; basal vein bare or with a few hairs ; speculum open below, on upper surface of wing extending below the marginal vein for about half the length of the latter ; wing beyond the speculum moderately thickly pilose, the area between the postmarginal and stigmal veins sometimes bare at the base ; apical margin of wing ciliate ; marginal vein 1·5 to 1·6 times as long as the stigmal vein ; postmarginal vein slightly shorter than, or at most as long as, the marginal vein ; stigmal vein straight or slightly curved, stigma small and suboval.

Gaster lanceolate, 1·15 to 1·4 times as long as head plus thorax, only slightly compressed and usually not or only slightly narrower than the thorax, 2·7 to 3·5 times as long as broad ; basal tergite occupying about one fifth the total length ; last tergite slightly to considerably, up to 1·7 times, longer than its basal breadth ; ovipositor sheaths slightly exserted ; hypopygium extending about half way along the gaster.

♂. Easily recognized by the characters of the oral fossa, mandibles, ocelli, antennae and propodeum, for which see my key to ♂ *Habrocytus*. In other, non-sexual, characters it much resembles the ♀, but has the head less transverse, the gaster oval and hardly longer than the thorax.

The ♀ of this species may be known from those of all the other described species of *Habrocytus* by the combination of the following characters : low insertion of antennae, very small ocelli, unusually long malar space and small eyes, and the almost undeveloped propodeal nucha.

Holotype ♀. IRELAND : Co. Down, Glasdrumman, 21.viii.1956 (*Stelfox*), in Graham collection.

Paratypes. IRELAND : Co. Down, same data as holotype, 1 ♀ ; Benagh, 1 ♀, 1.vii.1957 (*Stelfox*) ; Co. Dublin, Swords Estuary, 1 ♂, 2 ♀, 26.viii.1954 (*Stelfox*), in Graham collection. BRITAIN (unlocalized) : 1 ♀, reared from *Gymnetron antirrhini* (Paykull) (*K. G. Blair*), in B. S. Doubleday coll., Hope Department, University Museum, Oxford.

Species sola

Habrocytus janssoni sp. n.

♀. Body green to blue ; disc of gaster purplish. Mandibles testaceous with darker teeth. Antennae black ; scape testaceous at extreme base. Coxae, and femora except their tips, concolorous with the thorax ; trochanters partly pale ; tibiae fuscous, testaceous at base and apex ; fore tarsi mainly fuscous, mid and hind tarsi testaceous at base and becoming fuscous distally. Tegulae partly testaceous. Wings subhyaline ; venation brown or blackish. Length 2 to 2·1 mm.

Head in dorsal view 2·15 to 2·2 times as broad as long ; temples about one quarter as long as eyes, strongly rounded off ; POL about 1·5 OOL. In frontal view the head is subtrapeziform, with genae slightly buccate. Eyes separated by about 1·4 times their length. Malar space about 0·45 the length of an eye. Clypeus strigose, the strigosity hardly extending on to the face or genae, its anterior margin deeply incised so as to appear almost bidentate. Rest of head moderately shiny, finely reticulate. Lower edge of antennal toruli distinctly above the level of the ventral edge of the eyes ; scape slightly more than three quarters the length of an eye, reaching to about the middle of the median ocellus ; combined length of pedicellus and flagellum about 1·1 times breadth of head ; pedicellus in profile slightly less than twice as long as broad, from slightly to distinctly longer than the first funicular segment ; flagellum nearly filiform ; funicle proximally slightly stouter than the pedicellus ; all the funicular segments subquadrate, or the proximal ones up to 1·3 times as long as broad ; clava about as long as two and a half of the preceding funicular segments ; sensilla fairly numerous.

Thorax 1·5 to 1·6 times as long as broad. Pronotal collar finely though sharply margined throughout, medially extremely short, only one eighteenth to one sixteenth as long as the mesoscutum. Mesoscutum 1·5 to 1·6 times as broad as long, moderately shiny, finely reticulate, a little less finely in the middle of its front part. Scutellum convex, slightly shorter than the mesoscutum, about as broad as long, moderately shiny and very finely reticulate, like the axillae. Propodeum medially one third or slightly more than one third as long as the scutellum, much resembling that of *microps* sp. n. (Text-fig. 371) in shape ; medially hardly produced beyond the bases of the hind coxae ; median area 2 to 2·5 times as broad as long ; median carina distinct ; plicae sharp only posteriorly where they are strongly convergent, otherwise indistinct except near the basal foveae ; nucha a mere transverse ridge ; panels of median area moderately shiny, weakly obliquely strigose-reticulate ; spiracular sulci shallow and

nearly smooth ; spiracles short-oval, separated by about half their length from hind margin of metanotum ; callus sparsely haired. Postspiracular sclerite for the most part irregularly reticulate, with a curved oblique impression. Lower part of mesepisternum, and mesepimeron, rather coarsely reticulate, the metapleuron rather more finely. Legs rather slender. Fore wing slightly more than twice as long as broad ; upper surface of costal cell bare except for a few hairs near its apex, lower surface with a complete row of hairs plus some scattered hairs in the distal third ; basal vein pilose throughout, also a few hairs in the distal third of the basal cell, the latter open below ; speculum partly open below, on upper surface of wing extending a little beyond the beginning of the marginal vein ; marginal vein 1·5 to 1·6 times as long as the stigmal vein, the latter only very slightly curved and with a moderate-sized subrectangular stigma ; postmarginal vein slightly longer than the marginal ; apical margin of wing ciliate throughout, the fringe fairly long.

Gaster long-ovate, about as long as head plus thorax, 2 to 2·3 times as long as broad ; basal tergite occupying about a quarter of the total length ; last tergite about as long as its basal breadth ; ovipositor sheaths slightly projecting ; hypopygium extending about half way along the gaster.

♂. Unknown.

Holotype ♀. SWEDEN : Närke, Örebro, 18.vii.1947 (*A. Jansson*), in Naturhistoriska Riksmuseum, Stockholm.

Paratype. SCOTLAND : Mid Perth, Kenmore, 1 ♀, 19.vii.1954 (*Graham*), in Graham collection.

In the collection of the late Dr. A. Jansson there is another, slightly deformed, specimen, captured at Örebro on 26.vii.1952. It is mainly female, but has peculiar antennae with the scapes broader than in the normal female, and the left scape very broadly expanded above the middle ; it may be an imperfect gynandromorph, and is not included in the above description.

Biology. Unknown.

This species is rather isolated in *Habrocytus*, as may be seen from the characters used in the key to species, and is almost intermediate between that genus and *Cecidostiba*.

Species sola

Habrocytus conopidarum (Bouček) **comb. n.**

Dirhicnus subcoeruleus Postner, 1951 : 79 [*nec* Thomson, 1878].
Dirhicnus conopidarum Bouček, 1961*a* : 445–449, ♂ ♀.

Type material. Holotype ♀, Czechoslovakia, Bohemia, Filipov, 6.viii.1959, ex *Physocephala vittata* (F.) in adult *Bombus lapidarius*, in Národní Museum, Prague (Cat. no. 2975) ; paratypes in the same museum and in Deutsches Entomologisches Institut, Berlin.

This interesting species is rather difficult to place generically. Bouček referred it to *Dirhicnus* but admitted that the characters by which it differed from the type-species of that genus might be great enough for it to be considered generically distinct. I do not think it is satisfactorily placed in *Dirhicnus* ; in particular the form of the gaster in the female differs considerably from that of *Dirhicnus pirus*. On the other hand it is not easy to separate from *Habrocytus*, although it has a

larger and more distinctly sculptured postspiracular sclerite, and a rather different propodeum. These differences are, however, small. The male has the gena deeply excised above the base of the mandible, so that the malar space is short. This character, however, occurs in the males of some *Habrocytus* and *Pteromalus* (as well as in other genera).

HOLLAND, GERMANY, CZECHOSLOVAKIA.

Biology. Parasite of *Physocephala vittata* (F.) and *Ph.* sp. (Dipt., Conopidae), developing as endoparasites of adult bumble-bees, e.g., *Bombus lapidarius* L. and *B. agrorum* F. Details of its life-history were given by de Meijere (1904), Postner (1951) and Bouček (1961*a*). According to Postner often more than 40 of the chalcids develop in one Conopid puparium and emerge by a single hole. The Conopids are probably attacked shortly before pupation. Usually the fully-grown chalcid larvae hibernate within the host puparium and emerge the following summer, though when reared indoors they may emerge the same autumn.

Species *incertae sedis*

Habrocytus sophax (Walker) **comb. n.**

Pteromalus Sophax Walker, 1839 : 249, ♂.

Type material. One ♂, LECTOTYPE, bearing a Waterhouse label.

This species is included in my key to males of *Habrocytus* from characters observed in the lectotype. It appears to be a valid species, but so far I have not definitely associated any female with this male.

BRITAIN : Cornwall, Land's End (Walker, 1839) ; a ♂ taken by me at Marazion, 7.vii.1955, appears to be conspecific with the lectotype.

Biology. Unknown.

Extra-limital species which belong to *Habrocytus*

The following appear to be very near the European species *H. intermedius* (Walker) :

Habrocytus unca (Walker) **comb. n.**

Pteromalus Unca Walker, 1839*a* : 28, ♀.

Type locality. TASMANIA, " Hobart Town, Van Diemen's Land ". Syntypes, 2 ♀, which are probably conspecific (Types Hym. 5. 736a, b).

Habrocytus niphe (Walker) **comb. n.**

Pteromalus Niphe Walker, 1839*a* : 29, ♀.

Type locality. TASMANIA, " Hobart Town, Van Diemen's Land ". One female, Type Hym. 5. 746.

Habrocytus baton (Walker) **comb. n.**

Pteromalus Baton Walker, 1839*a* : 32, ♂.

Type localities. TASMANIA, " Hobart Town, Van Diemen's Land" ; AUSTRALIA, Sydney, New South Wales. A male and a female stand under this name but no female was described. LECTOTYPE, the male specimen, Type Hym. 5. 742b. The female may well be conspecific with the lectotype.

Habrocytus epicles (Walker) **comb. n.**

Pteromalus Epicles Walker, 1847*a* : 394–395, ♀.

Type locality. North America. One female, Type Hym. 5. 758.

The following species may belong to the species group of *albipennis* (Walker), s. lat.:

Habrocytus damo (Walker) **comb. n.**

Pteromalus Damo Walker, 1847*a* : 395.

Type locality : North America. Type Hym. 5. 759, a female lacking the head.

Species wrongly placed in *Habrocytus* :

Habrocytus morio Masi

Habrocytus morio Masi, 1917 : 174–175, ♂ ♀ (Seychelles).

Syntypes in BM(NH), 2 ♀ (Types Hym. 5. 787a, b). The species is not a true *Habrocytus*, but should probably form a new genus near *Psilocera* Walker.

PHAENOCYTUS **gen. n.**

(Text-fig. 315)

(Derivation : Greek φαινο, to appear + part of the generic name *Habrocytus*. Gender : masculine.)

Type-species : *Pteromalus glechomae* Förster, 1841 : 21 [*sensu* Giraud].

Head notably wide, 1·3 to 1·4 times as wide as the mesoscutum ; occiput not margined ; genae without a hollow ; clypeus strigose, its anterior margin shallowly emarginate. Left mandible with three teeth, right mandible with four. Antennae inserted distinctly above the level of the ventral edge of the eyes, 11263 ; sutures of clava not oblique, but the micropilosity of the clava present on the third and part of the second segment.

Pronotal collar not margined, not abrupt in front but somewhat rounded off into the neck. Notauli incomplete. Propodeum reticulate ; plicae represented only by foveae at the base of the propodeum and a short carina on each side of the nucha ; spiracular sulci very shallow, subobsolete ; spiracles small, about 1·5 times as long as broad, separated by slightly less than their length from the metanotum ; nucha moderate-sized, lightly reticulate, not very sharply defined in front ; callus sparsely pilose. Postspiracular sclerite as in *Habrocytus*. Mesepisternum with a mainly smooth area below the base of the hind wing. Hind coxae bare dorsally ; hind tibiae with one spur. Fore wing with basal vein bare ; speculum moderate-sized ; marginal vein (Text-fig. 315) longer than the stigmal vein ; postmarginal vein about as long as the marginal ; stigma moderate-sized, subcircular.

Petiole inconspicuous, transverse, subconical, smooth. Female gaster lanceolate, longer than

head plus thorax, acuminate, with tips of ovipositor sheaths just visible in dorsal view ; bristles of pygostyles not very dissimilar in length.

This genus is very close to *Habrocytus* Thomson, but differs by the following combination of characters :

Fore wing (Text fig. 315) with stigma larger. Propodeum with plicae incomplete ; spiracular sulci subobsolete ; spiracles smaller than in the majority of *Habrocytus* and more widely separated from the metanotum.

Phaenocytus glechomae (Förster) **comb. n.**

(Text-fig. 315)

Pteromalus glechomae Förster, 1841 : 21, no. 138 ♂ ♀, [*sensu* Giraud].

♀. (Redescription). Head and thorax dark to bright blue ; frons sometimes more greenish ; gaster dorsally with basal tergite mainly green to blue, the remaining tergites varied with purplish, bronze, and greenish ; ventrally the gaster is reddish at least at the base, but often extensively. Antennal scape testaceous, somewhat darkened distally ; pedicellus and flagellum fuscous, the pedicellus sometimes paler beneath. Coxae mainly blue, but having their inner aspect, and sometimes their apices, usually reddish ; rest of legs pale yellow to testaceous with tips of tarsi brown ; femora often infuscate basally, sometimes mainly so. Tegulae testaceous to brown. Wings subhyaline, but often with a brownish discal cloud at the outer limit of the speculum ; venation testaceous to brownish, stigma usually slightly darker. Length 2·9 to 4 mm.

Head in dorsal view 2·2 to 2·25 times as broad as long, 1·3 to 1·4 times as wide as the mesoscutum ; temples about one third as long as eyes, rather straight, converging moderately ; POL 1·15 to 1·2 OOL. Head in frontal view subtrapeziform, with genae curved and converging moderately strongly. Eyes separated by 1·35 times their length. Malar space about two fifths the length of an eye. Clypeus with fine striae which extend a little way up the genae and face ; rest of head with very fine reticulation, that of the frons slightly coarser. Antennal scape slightly more than three quarters as long as an eye, reaching level with the middle of the median ocellus ; combined length of pedicellus and flagellum virtually equal to breadth of head ; pedicellus about twice as long as broad, slightly shorter than the first funicular segment ; flagellum not stout, though slightly stouter than the pedicellus, nearly cylindrical ; first funicular segment 1·7 to 2 times as long as broad, the following segments slightly shorter though all are usually longer than broad, except the sixth which is quadrate, sometimes also the fifth is quadrate ; clava somewhat longer than the combined length of the two preceding funicular segments, 2·5 to 2·8 times as long as broad, pointed apically ; ventrally the clava has a line of micropilosity which extends the whole length of its third segment, and about half way along the second ; sensilla of funicle moderately numerous, usually in two rows on each segment, sometimes only one row on the distal segments.

Thorax about 1·6 times as long as broad. Pronotal collar medially about one seventh as long as the mesoscutum, finely reticulate with only a very narrow smoother line along its hind edge. Mesoscutum 1·6 to 1·8 times as broad as long, finely reticulate at the front and sides, more coarsely on the disc ; notauli distinctly impressed to about half way across the mesoscutum. Axillae moderately finely reticulate at their inner ends, very finely so externally. Scutellum about as broad as long, strongly convex, finely reticulate, the frenum hardly more coarsely than the rest. Dorsellum alutaceous. Propodeum about half as long as the scutellum, medially somewhat produced beyond the bases of the hind coxae ; median area very finely reticulate ; median carina usually distinct as far as the nucha but sometimes irregular ; plicae incomplete ; costula sometimes indicated ; nucha delicately aciculate-reticulate with transverse areoles, its length about one third that of the propodeum. Postspiracular sclerite narrow, weakly

sculptured. Metapleuron finely, mesepimeron more coarsely, reticulate ; mesepisternum, apart from the smooth area below the base of the hind wing, rather finely reticulate. Mesosternal mesolcus subobsolete. Fore wing (Text-fig. 315) with upper surface of costal cell bare, lower surface with a complete row of hairs and some additional hairs scattered over the distal third ; basal cell bare, open below ; basal vein bare or with one to two isolated hairs ; speculum open below, on upper surface of wing reaching only to the base of the marginal vein ; wing beyond the speculum rather densely pilose ; marginal vein 1·5 to 1·6 times as long as the stigmal vein ; postmarginal vein as long as, or slightly shorter than, the marginal ; stigmal vein straight or very slightly curved, stigma moderate-sized and subcircular, with a very short uncus.

Gaster lanceolate, 2·6 to 3·3 times as long as broad, acuminate, 1·2 to 1·3 times as long as head plus thorax, slightly narrower than the thorax ; last tergite 1·5 to 2·2 times as long as its basal breadth ; hypopygium extending from one third to two fifths along the gaster.

♂. Differs from the female as follows :

Fore wing immaculate ; gaster not reddish-marked. Combined length of pedicellus and flagellum 1·1 to 1·15 times the breadth of the head ; pedicellus 1·6 to 1·7 times as long as broad, distinctly shorter than the first funicular segment ; distal segments of funicle relatively longer, even the sixth is usually a little longer than broad, sometimes quadrate ; flagellum clothed with hairs which stand out at an angle of 40° to 45°, the length of the hairs equal to about half the breadth of the segments that bear them. Marginal vein 1·4 to 1·6 times as long as the stigmal vein ; stigma a little smaller than in the female ; basal vein with up to four hairs. Gaster sublinear, as long as but much narrower than the thorax, convex or hardly sunken dorsally, with a strong plica ventrally.

Material examined. ENGLAND : Berkshire, Wytham, 1 ♀, 29.vi.1958, swept on calcareous grassland (*Graham*) ; Surrey, Oxshott, 1 ♀, 9.viii.1893 (*A. J. Chitty*).

FRANCE (unlocalized) : several ♂, ♀ in the collection of J. Giraud (Muséum Nationale d'Histoire Naturelle, Paris).

Biology. Reared from *Aulax glechomae* (L.) (Hym., Cynipidae) (*Giraud*) ; see Giraud & Laboulebène, 1877 : 429.

TRICOLAS Bouček

Tricolas Bouček, 1967 : 644. Type-species : *T. xylocleptis* Bouček, by monotypy and original designation.

This genus is very similar to *Habrocytus*, but the female differs from those of *Habrocytus* in having 3 transverse anelli, whilst the male differs from those of *Habrocytus* in having the first funicular segment shorter than the second.

Tricolas xylocleptis Bouček

Tricolas xylocleptis Bouček, 1967 : 644–646, ♂ ♀.

Type material. Holotype ♀, Bohemia, Praha-Bubeneč, 1959 (*Z. Hostounský*), in Národní Museum, Prague ; paratypes in the same institution and in Zoologische Staatssammlung, Munich.

GERMANY, CZECHOSLOVAKIA.

Biology. Parasites of the bark-beetle *Xylocleptes bispinus* (Duft.) in *Clematis vitalba* L. (Bouček, 1967).

CECIDOSTIBA Thomson

Etroxys sgen. *Cecidostiba* Thomson, 1878 : 87, 92. Type-species : *C. rugifrons* Thomson, by designation of Ashmead, 1904 : 316.
Cecidostiba Thomson ; Mayr, 1903 : 395–397, [*ex parte*].
Cecidostiba Thomson ; Ashmead, 1904 : 316.
Cecidostiba Thomson ; Schmiedeknecht, 1909 : 316, 317, 320, [*ex parte*].
Cecidostiba Thomson ; Kurdjumov, 1913 : 8, 16 [*ex parte*].
Cecidostiba Thomson ; Nikol'skaya, 1952 : 227.
Cecidostiba Thomson ; Erdös, 1953 : 228, [*ex parte*].
Cecidostiba Thomson ; Graham, 1956*b* : 256–257.
Cecidostiba Thomson ; Delucchi, 1957 : 140, 150–153.
Cecidostiba Thomson ; Askew, 1961 : 58–65.
Cecidostiba Thomson ; Peck *et al.*, 1964 : 56.

Key to European Species

(Females)

All the species have the gaster lanceolate, at least as long as the head plus thorax, but usually longer than this.

1 Pronotal collar not margined, or with at most a trace of a carina visible in some lights. Basal cell of fore wing having its distal third or more pilose. Antennae with all funicular segments, except sometimes the first, at least slightly transverse. Ocelli small, the hind ones separated by 2 to 2·5 times their own major diameter from the eyes. Body mainly bronze to coppery bronze ; fore wing infumate, especially discally, sometimes quite strongly so. Anterior margin of clypeus subtruncate. (*ANASTIBA* **sgen. n.**) ***geganius*** (Walker) (p. 565)

– Pronotal collar with a fine sharp carina throughout, or except just at the sides. Basal cell of fore wing bare or with at most a few isolated hairs. Antennae usually with some of the funicular segments besides the first quadrate or longer than broad. Ocelli larger, the hind ones separated by at most about 1·5 times their own major diameter from the eyes. Body mainly green to blue ; fore wing not infumate, though sometimes with a fuscous cloud below or across the stigma (*CECIDOSTIBA* s.str.) . . 2

2 (1) Anterior margin of clypeus quite deeply emarginate, almost incised, medially. Fore wing immaculate ; stigma not or only slightly longer than high. Body usually bright green to blue-green, occasionally bronze-green . 3

– Anterior margin of clypeus truncate or curved slightly forwards. Fore wing often with a fuscous cloud, proceeding from or lying across the stigma, the latter usually longer than high 4

3 (2) Propodeum medially only one fifth to one quarter as long as the scutellum ; its median area 2·6 to 3·5 times as broad as long . ***hilaris*** (Walker) (p. 567)

– Propodeum medially from slightly more than one quarter, to nearly one third, as long as the scutellum ; its median area 2·2 to 2·7 times as broad as long ***adana*** Askew (p. 568)

4 (2) Eyes large, separated by their own length or hardly more ; ocelli large, the hind ones separated by only about their own major diameter from the eyes. Fore wing with speculum closed or almost closed below ; stigma moderate-sized, separated by 2 to 2·5 times its height from the costal edge of the wing. Combined length of pedicellus and flagellum slightly less than breadth of head. Head and thorax mainly dark blue . . ***docimus*** (Walker) (p. 566)

– Eyes smaller, separated by about 1·25 times their own length ; ocelli smaller, the hind ones separated by slightly more than, usually about 1·5 times, their own major diameter from the eyes. Fore wing with speculum open below ; stigma smaller, separated by 3 to 3·5 times its height from the costal edge of the wing. Combined length of pedicellus and flagellum equal to breadth of head. Head and thorax bright green to bronze-green ***semifascia*** (Walker) (p. 566)

(MALES)

1 Pronotal collar not margined, or with at most a trace of a carina visible in some lights. Basal cell of fore wing having its distal third or more pilose. Antennae with combined length of pedicellus and flagellum slightly less than breadth of head ; all funicular segments, except sometimes the first, at least slightly transverse. Body mainly greenish bronze to coppery (*ANASTIBA* **sgen. n.**) . . . . . ***geganius*** (Walker) (p. 565)

– Pronotal collar sharply margined throughout, or except just at the sides. Basal cell of fore wing bare, or with relatively few hairs distally. Antennae with combined length of pedicellus and flagellum about equal to, or slightly greater than, breadth of head ; at least some of the funicular segments, besides the first, quadrate or longer than broad. Body mainly green to blue (*CECIDOSTIBA* s.str.) 2

2 (1) Anterior margin of clypeus deeply emarginate or incised medially. Fore wing with stigma usually about as high as long, sometimes slightly longer than high . . . . . ***hilaris*** (Walker) (p. 567)

– Anterior margin of clypeus truncate or slightly curved forwards. Fore wing with stigma slightly to very distinctly longer than high 3

3 (2) Fore wing with speculum closed below ; basal cell closed below except at base. Eyes separated by only 1·15 to 1·2 times their length. Head and thorax dark to bright blue. Combined length of pedicellus and flagellum about equal to breadth of head. Mesoscutum thickly clothed with dark bristles ***docimus*** (Walker) (p. 566)

– Fore wing with speculum open below at least proximally ; basal cell open below. Eyes separated by 1·4 to 1·45 times their length. Head and thorax mainly some shade of green. Combined length of pedicellus and flagellum slightly greater than breadth of head. Mesoscutum less thickly clothed with dark bristles . . . . ***semifascia*** (Walker) (p. 566)

CECIDOSTIBA (ANASTIBA) sgen. n.

(Derivation : Greek ανα, towards, + part of the generic name *Cecidostiba*. Gender : feminine).

Type-species. *Gastrancistrus geganius* Walker, 1848.

For characters, see key (pp. 564, 565).

Cecidostiba (Anastiba) geganius (Walker)

Gastrancistrus Geganius Walker, 1848 : 105, 157, ♂.
Cecidostiba geganius (Walker) Askew, 1961 : 59, 60, ♂ ♀.

Type material. Type male in BM(NH), bearing a Waterhouse label ; recognized by Graham, validated by Askew (1961 : 60) who redescribed the species.

BRITAIN, FRANCE.

Biology. Reared from galls of *Andricus quercusradicis* (F.) in France (see Askew, 1961 : 62). Imagines in May and June.

CECIDOSTIBA (CECIDOSTIBA) Thomson

Cecidostiba (Cecidostiba) docimus (Walker) **comb. n.**

Pteromalus Docimus Walker, 1839 : 217, ♂.
Pteromalus jucundus Förster, 1841 : 13, ♂ ♀, **syn. n.**
Cecidostiba fasciata Askew, 1961 : 59, 62–63, ♀, **syn. n.**
Cecidostiba jucundus (Förster) Askew, 1963 : 275–276.

Type material. *Pteromalus docimus* Walker. One male, accepted as TYPE ; Waterhouse label.

Pteromalus jucundus Förster. Syntypes (not seen) in Naturhistorisches Museum, Vienna, under the name "*Pteromalus aceris*" (Förster MS.), labelled "jucundus m. olim " (see Delucchi, 1958*a* : 52). I have examined specimens from Giraud's collection named as *jucundus* Förster and believe they are correctly identified.

Cecidostiba fasciata Askew. Holotype ♀, France, La Rochelle, July 1960 (*R. Foilliot*), in Hope Department, University Museum, Oxford.

BRITAIN, FRANCE, GERMANY.

Biology. Reared from galls of *Pediaspis aceris* Förster (see Askew, 1961 : 63). Imagines in July.

Delucchi (1958*a* : 52) transferred *Pteromalus jucundus* Förster to the genus *Trychnosoma* Graham. Askew (1963 : 276) preferred to place it in *Cecidostiba*.

In my opinion the species is not congeneric with *punctipleura* Thomson, the type-species of *Trychnosoma* ; I agree with Askew that it is better placed in *Cecidostiba*.

Cecidostiba (Cecidostiba) semifascia (Walker)

? Cynips fungosus Fourcroy, 1785 : 380.
Pteromalus semifascia Walker, 1835 : 494, ♀.
Pteromalus mundus Walker, 1836 : 479, ♀, **syn. n.**
Pteromalus Pronax Walker, 1839 : 220, ♂, **syn. n.**
Pteromalus perditor Förster, 1841 : 27, ♂.
Pteromalus gallicus Ratzeburg, 1848 : 193.
Etroxys (Cecidostiba) truncata Thomson, 1878 : 94, ♂ ♀.
Cecidostiba gallica (Ratzeburg) Erdös, 1953 : 228.
Cecidostiba semifascia (Walker) Graham, 1956*b* : 257.
Cecidostiba semifascia (Walker) ; Askew, 1961 : 65, ♂ ♀.

Type material. *Cynips fungosus* Fourcroy. Types not located (probably lost). Kurdjumov (1913 : 19) considered it to be the same as *semifascia* (Walker), probably on the basis of two specimens identified by Förster as *fungosus*. Delucchi (1958*a* : 53) thought this synonymy very doubtful. From the original description, *fungosus* might have been either *semifascia* (Walker) or *hilaris* (Walker).

Pteromalus semifascia Walker. Lectotype female designated by Graham (1956*b* : 257).

Pteromalus mundus Walker. Syntypes, 2 ♀. LECTOTYPE, the first specimen, bearing a Waterhouse label. It is a very small, and slightly aberrant, specimen.

Pteromalus pronax Walker. One male, LECTOTYPE ; Waterhouse label.

Pteromalus perditor Förster. Type male (not seen) in Naturhistorisches Museum, Vienna ; it was examined by Delucchi who placed it in synonymy with *semifascia* (1958*a* : 53).

Pteromalus gallicus Ratzeburg. Types presumed destroyed. The species was put in synonymy with *semifascia* by Graham (1956*b* : 257).

Etroxys (*Cecidostiba*) *truncata* Thomson. Syntypes on 14 pins. LECTOTYPE, a female labelled " Thn 5/7 " ; " truncata Ths " ; and " gallica Ratz. V. Delucchi det.".

Widely distributed in EUROPE.

Biology. Reared from galls of *Biorrhiza pallida* (Oliv.). For details of its biology see Askew (1961 : 65). Askew stated that rearing showed *semifascia* to be bivoltine. I have captured imagines in the field from June to September (inclusive).

Cecidostiba (Cecidostiba) hilaris (Walker) **comb. n.**

(Text-fig. 316)

Pteromalus hilaris Walker, 1836 : 489, ♀.
Pteromalus leucopezus Ratzeburg, 1844*a* : 204, ♂, **syn. n.**
Pteromalus anomalicornis Förster, 1841 : 15, ♂.
Pteromalus Naubolus Walker, 1845 : 263, ♂ ♀.
Pteromalus meconotus Ratzeburg, 1848 : 206, ♀.
Cecidostiba rugifrons Thomson, 1878 : 92, ♂ ♀.
Pteromalus leucopygus [sic] Ratzeburg ; Dalla Torre, 1898 : 133.
Cecidostiba leucopezus (Ratzeburg) Mayr, 1903 : 395–396.
Cecidostiba leucopyga [sic] Ratzeburg ; Nikol'skaya, 1952 : 227.
Cecidostiba leucopeza (Ratzeburg) ; Erdös, 1953 : 228, ♂ ♀.
Cecidostiba leucopeza (Ratzeburg) ; Graham, 1956*b* : 256.
Cecidostiba leucopeza (Ratzeburg) ; Delucchi, 1957 : 151, 152–153, ♂ ♀.
Cecidostiba leucopeza (Ratzeburg) ; Askew, 1961 : 64–65, ♂ ♀.

Type material. *Pteromalus hilaris* Walker. Syntypes, 3 females. LECTOTYPE, the first specimen, bearing a Waterhouse label ; it is a dwarf.

Pteromalus leucopezus Ratzeburg. Types presumed lost. The interpretation of Erdös (1953 : 228) was followed by me in my paper of 1956*b* and has been accepted by Askew. Ratzeburg's original description does not convey very much but fits the present species. Later (1848 : 204) he described the female and referred to its extremely short propodeum ; this is very characteristic and leaves no doubt regarding the identity of his female, this could not have been *adana*, which has a longer propodeum. Delucchi (1957 : 153) proposed the lectotype of *Cecidostiba rugifrons* Thomson as neotype of *leucopezus* Ratzeburg (but did not publish a valid lectotype selection for the former).

Pteromalus naubolus Walker. Lectotype female designated by Graham (1956*b* : 256).

Pteromalus meconotus Ratzeburg. Type presumed lost. The species was placed in synonymy with *leucopezus* Ratzeburg by Mayr (1903 : 395).

Etroxys (*Cecidostiba*) *rugifrons* Thomson. Syntypes, 12 specimens. LECTOTYPE, a female labelled " Nat 15/7 " and " rugifrons Ths ".

Thompson (1958, *Cat. Paras. Predat. Ins. Pests*, sect. **2**, pt. 5 : 589) stated that " Ratzeburg is not known to have described a species under the name " *leucopeza* " ; the species referred to is probably *C. leucopyga* Ratz., described in the genus *Pteromalus* ". This statement is erroneous, and the fictitious name " *leucopyga* " was previously cited by Dalla Torre (1898 : 133) and Nikol'skaya (1952).

Widely distributed in EUROPE.

Biology. Probably associated specifically with the galls of *Biorrhiza pallida* (Oliv.), according to Askew (1961 : 65) who found its larvae feeding on those of *Olynx skianeuros* (Ratzeburg) in these galls. Mayr (1903 : 395–396) listed other Cynipids as hosts [of *leucopeza*], but these records need checking in view of the recognition of a second species (*adana* Askew) closely related to *hilaris*. I have captured imagines of *hilaris* in the field from May to July. Askew (1961 : 64–65) says that there are two annual generations, emerging May–June and July–September.

Cecidostiba (Cecidostiba) adana Askew

Cecidostiba adana Askew, 1961 : 60, 63, ♂ ♀.

Type material. Holotype ♀, France : Rennes, reared from gall of *Andricus calicis* Burgsd. (*R. Folliot*), in Hope Department ; paratypes in the same collection.

FRANCE.

Biology. Reared from galls of *Andricus calicis* Burgsd., *A. kollari* Htg., and *Cynips longiventris* Htg. Imagines April–May.

At first I felt doubtful whether *adana* was really distinct from *hilaris* (Walker). However, its relatively longer propodeum, as well as its biology, indicate that it is a valid species. Dr. Askew pointed out to me that *adana* is known only from the Continent of Europe and attacks *Andricus kollari* amongst other hosts. In Britain *hilaris* does not seem to attack *kollari* at all, which one might expect it to do if *adana* and *hilaris* were merely forms of one species. The relative curvature of the dorsal surface of the thorax, as seen in profile, appears to me to be variable and not a reliable character for separating *adana* and *hilaris*.

Note. The North American species (*Dinotus acutus* Provancher, *Cecidostiba dendroctoni* Ashmead, and probably the others mentioned) placed in *Cecidostiba* by Peck (*in* Muesebeck, Krombein and Townes, 1951 : 557) and Peck (1963 : 699–700) do not belong to this genus. They should be placed in or near the genus *Dinotiscus* Ghesquière.

HOBBYA Delucchi

Hobbya Delucchi, 1957 : 142. Type-species : *Pteromalus stenonotus* Ratzeburg, by original designation.
Hobbya Delucchi ; Askew, 1959 : 69–70.
Hobbya Delucchi ; Peck *et al.*, 1964 : 55.

Hobbya stenonota (Ratzeburg)

(Text-fig. 307)

Pteromalus stenonotus Ratzeburg, 1848 : 206, ♀, pl. 3, fig. 3.
Etroxys (*Cecidostiba*) *collaris* Thomson, 1878 : 93, ♂ ♀.
Cecidostiba collaris Thomson ; Mayr, 1903 : 396.
Hobbya stenonota (Ratzeburg) Delucchi, 1957 : 142, ♂ ♀.
Hobbya kollari Askew, 1959 : 69–70, ♂ ♀, **syn. n.**
Hobbya stenonota (Ratzeburg) ; Askew, 1961 : 65–66.
Hobbya kollari Askew ; Askew, 1961 : 66.

Type material. *Pteromalus stenonotus* Ratzeburg. Original material presumed destroyed ; neotype (a female in coll. Thomson standing under the name *collaris* Thomson) designated by Delucchi (1957 : 143).

Etroxys (*Cecidostiba*) *collaris* Thomson. Syntypes, 8 specimens. LECTOTYPE, a female labelled " Bök " [? Bökebergsslätt] and, in Delucchi's handwriting, " Cecidostiba collaris Ths=syn. stenonotus R."

Hobbya kollari Askew. Holotype female in Hope Department, University Museum, Oxford. I have re-examined the holotype and paratypes of *kollari* and consider it to be an unusually large and robust form of *stenonota* (Ratzeburg).

BRITAIN, SWEDEN, GERMANY, AUSTRIA.

Biology : A common parasite of *Biorrhiza pallida* (Oliv.) ; occasionally reared from cells of *Synergus reinhardi* Mayr in the galls of *Andricus kollari* Htg. (Askew, 1961 : 66). Mayr (1903) gave a list of other Cynipid hosts for this species (under the name *collaris* Thomson). Askew (1961 : 66) stated that *stenonota* is bivoltine. In the field I have captured specimens in May–June and Aug.–Sept.

CAENACIS Förster

Caenacis Förster, 1856 : 64. Type-species : *C. grandiclava* Thomson, 1878, by designation of Ashmead, 1904 : 316.
Etroxys sgen. *Caenacis* Förster ; Thomson, 1878 : 87, 94.
Caenacis Förster ; Mayr, 1903 : 397.
Caenacis Förster ; Ashmead, 1904 : 316.
Caenacis Förster ; Schmiedeknecht, 1909 : 316, 317, 320 [*ex parte*].
Caenacis Förster ; Kurdjumov, 1913 : 8, 16.
Caenacis Förster ; Nikol'skaya, 1952 : 227 [*ex parte*].
Cecidostiba Erdös, 1953 : 228 [*ex parte*].
Caenacis Förster ; Delucchi, 1957 : 140, 153–157.
Caenacis Förster ; Askew, 1961 : 57–58.
Caenacis Förster ; Peck *et al.*, 1964 : 56.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Gaster ovate, 1·55 to 1·7 times as long as broad, slightly shorter than head plus thorax. Propodeum medially nearly or about half as long as the scutellum ; its median area about 1·5 times as broad as long ; costula usually sharp. Fore wing with basal cell, not counting the basal vein, bare, or with at most one to three isolated hairs distally, open below ; stigmal vein forming a less acute angle (about 45°) with the postmarginal vein, stigma moderate sized . . . ***lauta*** (Walker) (p. 570)

– Gaster sublanceolate, 2 to 2·6 times as long as broad, as long as or slightly longer than head plus thorax. Propodeum medially about two fifths as long as the scutellum; its median area nearly twice as broad as long ; costula weak and irregular. Fore wing with basal cell with hairs scattered over its distal third or more ; stigmal vein forming a more acute angle (35° to 40°) with the postmarginal vein, stigma rather smaller than in *lauta* . . . . . . ***inflexa*** (Ratzeburg) (p. 571)

(MALES)

1 Antenna with hairs of flagellum virtually decumbent ; funicle with numerous sensilla which are arranged in more than one row on each segment. Wing-characters as in female, but the stigma tends to be relatively a little larger ***lauta*** (Walker) (p. 570)

– Antenna with hairs of flagellum standing out at an angle of about 30° ; funicle with sparser sensilla, arranged in one, sometimes irregular, row on each segment. Wing-characters as in female . . . . . ***inflexa*** (Ratzeburg) (p. 571)

Caenacis lauta (Walker) **comb. n.**

Pteromalus lautus Walker, 1835*a* : 186, ♀.
Pteromalus divisus Walker, 1836 : 480, ♀, **syn. n.**
Pteromalus strenuus Förster, 1841 : 11, ♀, **syn. n.**
Pteromalus nervosus Förster, 1841 : 15, ♂, **syn. n.**
Pteromalus humilis Förster, 1841 : 15, ♂, **syn. n.**
?Pteromalus capnopterus Ratzeburg, 1848 : 189.
Pteromalus incrassatus Ratzeburg, 1852 : 243, ♂, **syn. n.**
Etroxys (*Caenacis*) *grandiclava* Thomson, 1878 : 95, ♂ ♀, **syn. n.**
Caenacis grandiclava Thomson ; Mayr, 1903 : 397.
Caenacis divisa (Walker) Delucchi, 1957 : 157, ♂ ♀.
Caenacis divisa (Walker) ; Askew, 1961 : 58.

Type material. *Pteromalus lautus* Walker. One female, LECTOTYPE ; Waterhouse label.

Pteromalus divisus Walker. Four males and one female stand under this name (but only the female was described) ; LECTOTYPE, the female specimen, bearing a Waterhouse label.

Pteromalus strenuus Förster, *P. nervosus* Förster and *P. humilis* Förster were placed in synonymy with *divisa* (Walker) by Delucchi (1958*a* : 55) and I accept his opinion. I have not seen the types of these species, which are in the Naturhistorisches Museum, Vienna.

Pteromalus capnopterus Ratzeburg. Types presumed destroyed. Kurdjumov (1913 : 16) placed it in *Caenacis*. The description certainly suggests that it might be the same as *lauta* (Walker).

Pteromalus incrassatus Ratzeburg. Types presumed destroyed. The species was synonymized with *Caenacis grandiclava* by Mayr (1903 : 397) and this was accepted by Delucchi (1957 : 157) ; according to Ratzeburg's description it appears to be correct.

Etroxys (*Caenacis*) *grandiclava* Thomson. Syntypes on 13 pins. LECTOTYPE, a female labelled " 17 " and " Esp " [Esperöd] ; the lectotype has a Cynipid gall attached to its pin.

Widely distributed in EUROPE.

Biology. Mayr (1903 : 397) recorded several Cynipidae as hosts of this species, under the name *Caenacis grandiclava* Thomson, mainly species of *Andricus* and *Dryophanta*. Askew (1961) gave an account of the biology (as *divisa*) as observed in Britain. Imagines July–August (reared specimens may emerge earlier).

Caenacis inflexa (Ratzeburg)

Pteromalus inflexus Ratzeburg, 1848 : 196, pl. 3, fig. 5, ♂ ♀.
Caenacis punctulata Thomson, 1878 : 96, ♂ ♀.
Cecidostiba inflexus (Ratzeburg) Kurdjumov, 1913 : 16.
Habrocytus periclisti Callan, 1944 : 91–92, ♂ ♀.
Cecidostiba inflexa (Ratzeburg) ; Erdös, 1953 : 228.
Caenacis inflexa (Ratzeburg) Delucchi, 1957 : 156–157, ♂ ♀.
Caenacis inflexa (Ratzeburg) ; Askew, 1961 : 57–58.

Type material. *Pteromalus inflexus* Ratzeburg. Types presumed destroyed. Delucchi (1957 : 157) proposed as neotype the lectotype of *Caenacis punctulata* Thomson.

Caenacis punctulata Thomson. Syntypes, 1 ♀ and 2 ♂. LECTOTYPE, the female specimen, labelled " Gl Belf." [Gottland, Belfrage] and " punctulata Ths " ; also labelled by Delucchi " Caenacis punctulata " and " Caenacis inflexa Ratz.".

Habrocytus periclisti Callan. Holotype, allotype and paratypes in BM(NH), paratypes in U.S.N.M.; England, various localities in south Buckinghamshire, reared from galls of *Rhodites rosae* (L.) as a parasite of *Periclistus brandtii* Ratz., 470 females and 488 males, May–June 1935 (*E. McC. Callan*).

BRITAIN, SWEDEN, CENTRAL EUROPE.

Biology. Parasitic on the larvae of the Cynipid *Periclistus brandtii* Ratzeburg in the galls of *Diplolepis* (=*Rhodites*) *rosae* (L.) ; see Callan (1944), Askew (1961). Valkeila (1959 : 181) recorded it from Finland as a parasite of *Periclistus caninae* (Htg.) in galls of *Diplolepis mayri* (Schlect.) on *Rosa cinnamomea* L. Imagines July–August.

DINOTOIDES Bouček

Dinotoides Bouček, 1957 : 161. Type-species : *D. bicalcaratus* Bouček, by monotypy and original designation.
Dinotoides Bouček ; Peck *et al.*, 1964 : 44.

This genus is very near to *Ablaxia* Delucchi but its single species differs from

those of *Ablaxia* in having the anterior margin of the clypeus incised, and in its shorter propodeum which has a less distinct costula. It is also very close to *Apelioma* Delucchi but differs in its incised clypeus, also in the antennal clava of the female which has only a small area of micropilosity. These genera are very close to one another and some or all of them may eventually have to be united.

Dinotoides tenebricus (Walker) **comb. n.**

Amblymerus tenebricus Walker, 1834 : 351, ♀.
Pteromalus Carcinus Walker, 1839 : 229, ♂ ♀, **syn. n.**
Pteromalus Ariovistus Walker, 1839 : 244, ♂, **syn. n.**
Pteromalus Antho Walker, 1845 : 262, ♂, **syn. n.**
Dinotoides bicalcaratus Bouček, 1957 : 162–164, ♂ ♀, **syn. n.**

Type material (all the Walker species bear a Waterhouse label).
Amblymerus tenebricus Walker. One female, LECTOTYPE (possibly holotype).
Pteromalus carcinus Walker. One male, LECTOTYPE.
Pteromalus ariovistus Walker. One male, LECTOTYPE (possibly holotype).
Pteromalus antho Walker. One male, LECTOTYPE ; it is a dwarf of *tenebricus*.
Dinotoides bicalcaratus Bouček. Holotype ♀, Czechoslovakia, north-eastern Bohemia, Holovousy, May 1954, reared from twigs of *Malus silvestris* Mill. (*H. Hostounský*) in Národní Museum, Prague (Cat. no. 3088).

BRITAIN, CZECHOSLOVAKIA, SARDINIA.
Biology. Reared from twigs of *Malus silvestris* Mill. with *Magdalis ruficornis* (L.), *Tetrops praeusta* (L.) and *Scolytus* sp. in Czechoslovakia (see Bouček, 1957 : 164) ; also recorded [under the name *Dinotoides bicalcaratus*] as a parasite of *Magdalis barbicornis* Latr. in Sardinia (1963, *Entomophaga* **8** : 343, 356). In England I have beaten it from the foliage of *Quercus robur* L. Imagines in May (Czechoslovakia), Aug.–Sept. (Britain).

ABLAXIA Delucchi

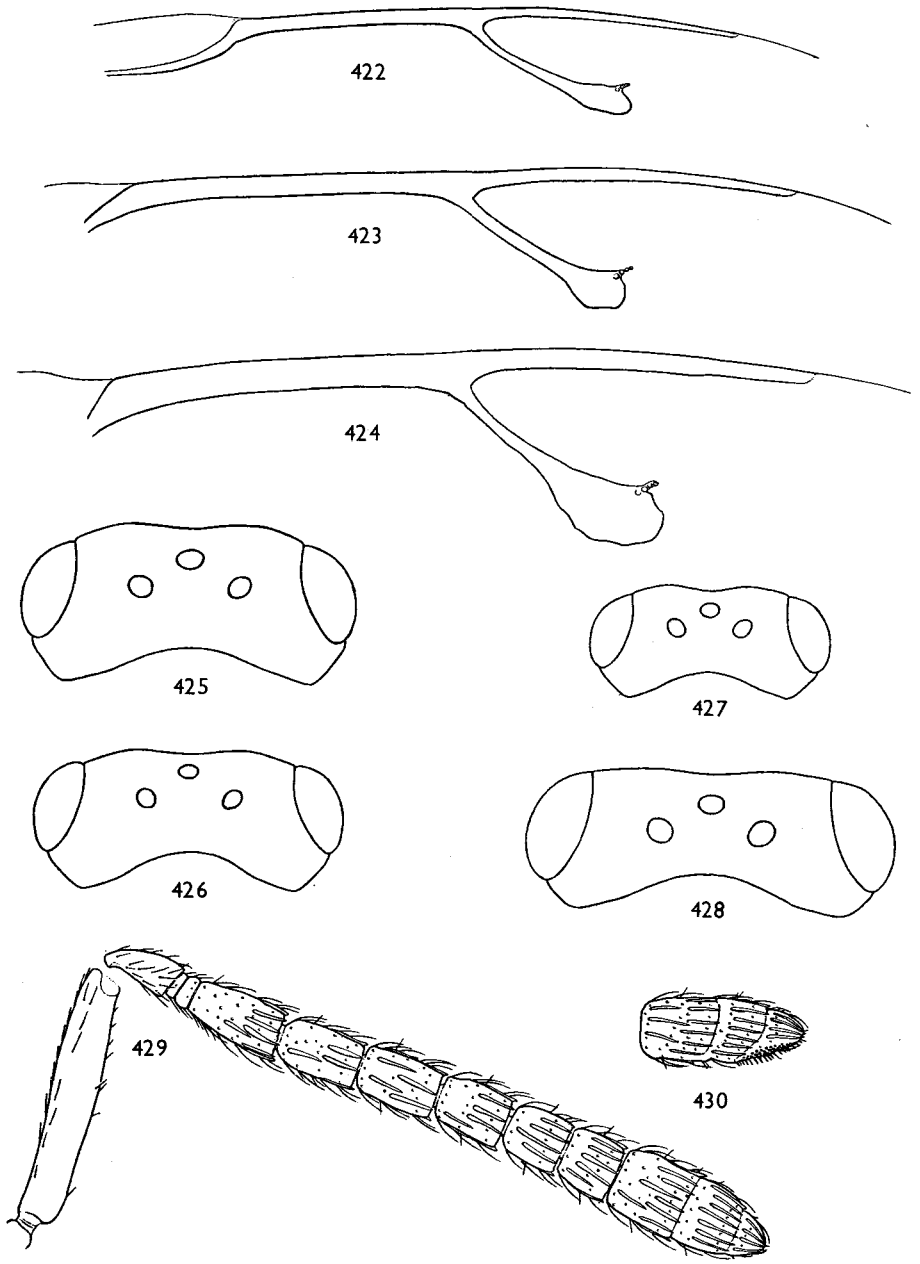
Etroxys sgen. *Caenacis* Förster ; Thomson, 1878 : 98–100 [*ex parte*].
Ablaxia Delucchi, 1957 : 143. Type-species : *Etroxys* (*Caenacis*) *squamifera* Thomson, 1878, by original designation.
Ablaxia Delucchi ; Peck *et al.*, 1964 : 56.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Antennae with anelli not strongly transverse, their combined length nearly as great as that of the first funicular segment. Fore wing (Text-fig. 422) with marginal vein only 1·3 to 1·4 times as long as the stigmal vein, the latter forming a very acute angle (about 30°) with the postmarginal vein. Gaster ovate, not longer than the thorax . . . . ***anaxenor*** (Walker) (p. 576)

– Antennae with anelli strongly transverse, their combined length much less than that of the first funicular segment. Fore wing with marginal vein 1·4 to 1·8 times as long as the stigmal vein, the latter usually forming a less



FIGS. 422–430. 422, *Ablaxia anaxenor* (Walker), ♀, fore wing venation ; 423, *Ablaxia parviclava* (Thomson), lectotype ♀, fore wing venation ; 424, *Ablaxia crassicornis* (Thomson), type ♀, fore wing venation ; 425, same, head ; 426, *Ablaxia parviclava* (Thomson), lectotype ♀, head ; 427, *Ablaxia squamifera* (Thomson), lectotype ♀, head ; 428, *Aggelma violacea* (Zetterstedt), ♀, head ; 429, *Apelioma restrictum* Graham, ♀, antenna ; 430, same, antennal clava, profile.

acute angle with the postmarginal vein. Gaster sometimes relatively longer 2

2 (1) Sutures of antennal clava (Text-fig. 430) strongly oblique ; clava slightly more than twice as long as broad. Propodeum with costula usually weak, not quite straight but more or less angulate in the middle
Apelioma restrictum Graham (p. 583)

– Sutures of antennal clava not, or only slightly oblique ; clava 1·3 to 1·9 times as long as broad. Propodeum with costula relatively strong, straight . 3

3 (2) Gaster 2 to 2·5 times as long as broad ; from nearly as long as, to slightly longer than, head plus thorax. Head in dorsal view with temples converging rather strongly, about one-third as long as the eyes or slightly more 4

– Gaster ovate, 1·4 to 1·7 times as long as broad ; not or only slightly longer than the thorax. Head in dorsal view with temples sometimes converging less strongly and relatively longer 6

4 (3) Fore wing (Text-fig. 423) with stigma rather small, separated by slightly more than twice its height from the costal edge of the wing. Scutellum slightly broader than long, rather weakly convex. Antennae with pedicellus at least very slightly longer than the first funicular segment ; funicular segments relatively short, the first 1 to 1·5 times as long as broad, third quadrate to very slightly transverse, fifth slightly transverse, sixth very distinctly so.
Propodeum about two thirds as long as the scutellum ; costula situated slightly before the middle. Head, Text-fig. 426 ***parviclava*** (Thomson) (p. 577)

– Fore wing with stigma larger (cf. Text-fig. 424), separated by hardly twice its height from the costal edge of the wing. Scutellum slightly longer than broad, moderately convex. Antennae with pedicellus shorter than, or about as long as, the first funicular segment ; funicular segments relatively longer, the first 1·7 to 2 times as long as broad 5

5 (4) Propodeum (medially) hardly more than half as long as the scutellum ; costula placed in, or slightly behind, the middle. Antennae with first funicular segment about 1·5 times as long as the pedicellus and about twice as long as broad ; sensilla in two rows on all the segments of the funicle
megachlora (Walker) (p. 576)

– Propodeum (medially) nearly two thirds as long as the scutellum ; costula placed slightly in front of the middle. Antennae with first funicular segment about as long as the pedicellus and about 1·7 times as long as broad ; sensilla in two imperfect rows on the proximal segments of the funicle, in only one row on the distal segments. (Sweden) . . . . . sp. indet.

6 (3) Head in dorsal view (Text-fig. 427) with temples converging more strongly and hardly more than one third as long as the eyes. Antennae with first funicular segment at least very slightly, but often much, shorter than the pedicellus. Scutellum as broad as, or slightly broader than, long. Smaller species, up to 2·5 mm. in length, less robust than the following
squamifera (Thomson) (p. 576)

– Head in dorsal view (Text-fig. 425) with temples converging less strongly and distinctly more than one third as long as the eyes. Antennae with first funicular segment about as long as, or slightly longer than, the pedicellus. Scutellum tending to be a little longer than broad. Larger, more robust species, up to 3·2 mm. in length 7

7 (6) Propodeum (medially) only slightly more than half as long as the scutellum. Antennal scape barely reaching the level of the lower edge of the median ocellus, its length hardly greater than the transverse diameter of an eye. Temples, in dorsal view of head (Text-fig. 425) somewhat less than half as

long as eyes ; the latter separated by 1·6 times their length. Base of scutellum only about one quarter the distance which separates the outer edges of the axillae. Antennae with pedicellus relatively a little broader ; funicle proximally rather stouter. Stigmal vein forming a rather less acute angle with the postmarginal vein . ***crassicornis*** (Thomson) (p. 579)

– Propodeum (medially) about two thirds as long as the scutellum. Antennal scape reaching about to middle of median ocellus, its length distinctly greater than the transverse diameter of an eye. Temples, in dorsal view of head virtually half as long as the eyes ; the latter separated by 1·4 to 1·5 times their length. Base of scutellum a little broader than in the above. Antennae with pedicellus rather more slender ; funicle proximally rather less stout. Stigmal vein forming a rather more acute angle (about 35°) with the postmarginal vein . . . . . ***temporalis*** sp. n. (p. 577)

KEY TO SOME MALES

1 Antenna with anelli subquadrate or only slightly transverse, their combined length as great as that of the first funicular segment ; flagellum subclavate ; combined length of pedicellus and flagellum somewhat less than breadth of head ; clava obtuse apically, barely twice as long as broad ; flagellum usually extensively testaceous. Fore wing with marginal vein only 1·25 to 1·3 times as long as the stigmal vein, the latter forming an acute angle (about 35°) with the postmarginal vein, which is distinctly longer than the marginal . . . . . ***anaxenor*** (Walker) (p. 576)

– Antenna with anelli strongly transverse, their combined length much less than that of the first funicular segment ; flagellum filiform ; combined length of pedicellus and flagellum variable, often greater than breadth of head ; clava pointed apically, 2·5 to 3 times as long as broad ; flagellum fuscous to black. Fore wing with marginal vein 1·4 to 1·7 times as long as the stigmal vein, the latter usually forming a relatively less acute angle with the postmarginal vein, which is not or hardly longer than the marginal 2

2 (1) Fore wing with postmarginal vein distinctly shorter than the marginal vein. Propodeum with costula usually weak, slightly angulate forwards in the middle. Antenna with combined length of pedicellus and flagellum 1·25 to 1·3 times breadth of head ; first funicular segment at least slightly longer than the pedicellus, sixth slightly longer than broad. Head and thorax greenish . . . . . ***Apelioma restrictum*** Graham (p. 583)

– Fore wing with postmarginal vein as long, or virtually as long, as the marginal vein. Propodeum with costula usually distinct, forming a straight or virtually straight transverse ridge. 3

3 (2) Head in dorsal view (cf. Text-fig. 425) with temples only moderately convergent, more than one third as long as the eyes. Antennal flagellum slightly stouter than the pedicellus, even when the latter is seen in dorsal view. Fore wing with stigma moderate-sized, separated by only 1·5 to 1·6 times its height from the costal edge of the wing. First funicular segment distinctly longer than the pedicellus ; combined length of pedicellus and flagellum about 1·2 times breadth of head. Larger species, 2·4 to 2·7 mm. Propodeum only about half as long as the scutellum ? ***temporalis*** sp. n. or ***crassicornis*** (Thomson) (pp. 577, 579)

– Head in dorsal view (cf. Text-fig. 427) with temples converging strongly, less than one-third as long as the eyes. Antennal flagellum proximally at most as stout as the pedicellus in dorsal view. Fore wing with stigma usually relatively smaller. First funicular segment sometimes not longer than the pedicellus. Smaller species, 1·6 to 2 mm. 4

4 (3) Antenna with combined length of pedicellus and flagellum equal to, or hardly greater than, the breadth of the head ; first funicular segment as long as, or very slightly shorter than, the pedicellus, sixth quadrate to slightly transverse. Propodeum with costula situated slightly before the middle. Fore wing with stigma small, separated by about twice its height from the costal edge of the wing. Propodeum about two thirds as long as the scutellum. Head and thorax mainly dark bluish ; gaster with a small pale spot, or immaculate . . . . . ***parviclava*** (Thomson) (p. 577)

– Antenna with combined length of pedicellus and flagellum 1·2 to 1·25 times the breadth of the head ; first funicular segment usually slightly longer than the pedicellus, sometimes barely as long as the pedicellus, sixth segment quadrate to somewhat longer than broad. Propodeum with costula in or slightly behind the middle. Gaster with a distinct pale spot . . . 5

5 (4) Fore wing with stigma small, separated by about twice its height from the costal edge of the wing. Propodeum about two thirds as long as the scutellum. Head and thorax mainly a fairly bright green ***squamifera*** (Thomson) (p. 576)

– Fore wing with stigma moderate-sized, separated by about 1·7 times its height from the costal edge of the wing. Propodeum hardly more than half as long as the scutellum. Head and thorax mainly dark blue-green . sp. indet.

Ablaxia anaxenor (Walker) **comb. n.**

(Text-fig. 422)

Pteromalus Anaxenor Walker, 1845 : 262, ♀.
Pteromalus Anaxenor Walker, 1846*b* : 271, ♀.
Pteromalus Anaxenor Walker, 1846*c* : 158, ♀.

Type material. One female, LECTOTYPE, bearing a Waterhouse label.

BRITAIN : " England. From the collection of the Rev. G. T. Rudd " (Walker, 1846*c* : 158). The Rev. G. T. Rudd collected chiefly in Yorkshire, so that his *anaxenor* may have been taken in that county. Berkshire, Wytham Wood, 15.xi.1955, 1 ♀, 25.x.1955, 1 ♂, 19.ix.1956, 1 ♀, 18.viii.1957, 1 ♀ (*Graham*) in Graham collection.

Biology. Unknown.

Ablaxia megachlora (Walker) **comb. n.**

Pteromalus megachlorus Walker, 1835 : 486–487, ♀.

Type material. Syntypes, 2 ♀ ; LECTOTYPE, the second specimen, bearing a Waterhouse label.

BRITAIN : " near London " (Walker, 1835 : 487) ; two females (syntypes) in BM(NH). I have not seen any other material.

Biology. Unknown.

Ablaxia squamifera (Thomson)

(Text-fig. 427)

Etroxys (*Caenacis*) *squamifera* Thomson, 1878 : 99, ♀.
Ablaxia squamifera (Thomson) Delucchi, 1957 : 146, ♀.

Type material. One female, LECTOTYPE (possibly holotype), labelled " Gl. " [Gottland] ; " Bhn " [Boheman] ; " squamifera Ths." ; (in A. Jansson's handwriting) " Lectotype des. by A. Jansson " ; and " ABLAXIA squamifera Ths. V. Delucchi det ".

BRITAIN, SWEDEN, MOLDAVIAN S.S.R. New records :—England : Oxfordshire, Otmoor, ♀♀, 25.viii.1956, 8.ix.1956, in a lane near oak trees (*Quercus robur* L.).

The male of *squamifera* has not yet been described. I have a male which probably belongs to this species but do not think it appropriate to describe it at present.

Biology. Has been reared in England in association with wood-boring beetles (*Magdalis*, *Scolytus*, etc.) of which it is probably a parasite. Imagines Aug.–Sept.

Ablaxia parviclava (Thomson)

(Text-figs. 423, 426)

Etroxys (*Caenacis*) *parviclava* Thomson, 1878 : 99, ♀.
? Etroxys (*Caenacis*) *planiscuta* Thomson, 1878 : 99, ♀.
Ablaxia parviclava (Thomson) Delucchi, 1957 : 146, ♀.
? Ablaxia planiscuta (Thomson) Delucchi, 1957 : 146, ♀.

Type material. *Etroxys* (*Caenacis*) *parviclava* Thomson. Lectotype ♀ designated by Delucchi (1957 : 146).

E. (*C.*) *planiscuta* Thomson. Two specimens stand under this name but one disagrees with the description and is a *Habrocytus*. LECTOTYPE, a female labelled " Lp. in. " [Lapponia inferioris] ; " Bhn " [Boheman] ; " planiscuta Ths. V. Delucchi det." ; and " LECTOTYPE " on a red label. The head and gaster are now missing. The character " scutello subdepresso " to which Thomson refers (1878 : 99) is an artefact ; the scutellum of the lectotype is squashed and would originally have been slightly convex, also the pin goes through the hinder half of the mesoscutum and has caused its surface to be abnormally depressed.

BRITAIN, SWEDEN. New records.—England : Buckinghamshire, Hell Coppice, near Oakley, ♀♀, 25.viii.1958, 30.viii.1958 (*Graham*).

Biology. Unknown. Imagines Aug.–Sept.

I believe that *planiscuta* Thomson is probably a form of *parviclava* Thomson. The lectotype of *planiscuta* differs from that of *parviclava* [not counting the characters of the flattened mesoscutum and scutellum, which are produced by distortion] in having the pronotal collar slightly shorter medially, the mesoscutum rather more coarsely reticulate, the plicae and costula of the propodeum weaker and the median carina weaker, fine and irregular. These differences could in my opinion be within the range of variation of a single species.

Ablaxia temporalis sp. n.

♀. Head and dorsum of thorax dull green, the scutellum more or less tinged with brassy or coppery, in one specimen the vertex and most of the thoracic dorsum are coppery ; sides and ventral parts of thorax black with greenish, bronze and bluish reflections ; gaster with strong

green or brassy reflections dorsally, especially upon the basal tergite ; hind margins of tergites two to six each with a broad purplish bronze band, sometimes this colour extends over the whole surface of these tergites except their extreme bases. Mandibles chestnut-red with darker teeth. Antennae black ; scape weakly metallic-tinged, more or less testaceous proximally. Legs blackish with varied metallic reflections like those on the sides of the thorax ; trochanters partly or wholly, extreme tips of femora, and bases and tips of the tibiae, testaceous ; fore tarsi fuscous, mid and hind tarsi pale or whitish testaceous proximally, fuscous distally. Tegulae fuscous. Wings hyaline ; venation fuscous, except the submarginal vein, not counting the parastigma, of the fore wing, which is more testaceous ; and the veins of the hind wing, which are mainly pale. Length 2·9 to 3·2 mm.

Head in dorsal view 2·1 to 2·15 times as broad as long, with temples approximately half as long as the eyes and converging only moderately ; POL about 1·3 times OOL. Eyes separated by 1·4 to 1·5 times their length. Genae slightly buccate ; malar space from half to three fifths the length of an eye. Clypeus striate, the striae extending a little way on to the face, its anterior margin broadly but very shallowly emarginate. Head finely reticulate, the genae very finely so, clothed with pale hairs. Left mandible with three teeth, right mandible with four, the teeth acute, the inner tooth of the left mandible obliquely truncate and less acute than the others. Antennae with scape reaching about level with the middle of the median ocellus, its length distinctly greater than the transverse diameter of an eye ; combined length of pedicellus and flagellum slightly less than breadth of head ; pedicellus slightly less than twice as long as broad, slightly shorter than or as long as the first funicular segment ; flagellum distinctly clavate ; funicle proximally slightly stouter than the pedicellus when the latter is seen in dorsal view ; first funicular segment 1·4 to 1·6 times as long as broad, second and third segments slightly longer than broad or quadrate, fourth quadrate, fifth slightly transverse, sixth about 1·5 times as broad as long ; clava 1·6 to 1·8 times as long as broad, about as long as two and a half of the preceding funicular segments ; sensilla fairly numerous, in one row on each funicular segment, sometimes irregular on the proximal segments.

Pronotal collar variable in length, medially from one eighth, to about one fifth, as long as the mesoscutum, finely though sharply margined anteriorly. Mesoscutum 1·3 to 1·4 times as broad as long, finely reticulate, with pale hairs. Scutellum about as broad as long, or very slightly longer than broad, moderately convex, very finely reticulate. Propodeum (medially) nearly or quite two thirds as long as the scutellum, very finely reticulate ; costula placed in the middle, strong ; median carina single or double. Fore wing with basal cell closed below except proximally ; basal vein pilose ; speculum open below ; marginal vein 1·5 to 1·65 times as long as the stigmal vein ; postmarginal vein about as long as the marginal vein ; stigmal vein forming a relatively acute angle (about 35°) with the postmarginal vein ; stigma moderate-sized, oblong and nearly twice as long as high, separated by 2·3 to 2·6 times its own height from the costal edge of the wing.

Gaster ovate, not or barely as long as the thorax, 1·4 to 1·6 times as long as broad, about as broad as the thorax ; basal tergite occupying about one third the total length, its hind edge entire or very weakly emarginate medially ; last tergite somewhat shorter than its basal breadth ; ovipositor sheaths hardly projecting beyond the last tergite ; hypopygium extending half or slightly more than half way along the gaster.

♂. Unknown.

Holotype ♀. England : Oxfordshire, Otmoor, 19.ix.1956, swept from foliage of *Quercus robur* L. (Graham), in Hope Department, University Museum, Oxford.

Paratypes. Same locality and host plant as holotype, 1 ♀, 4.ix.1955, 1 ♀, 15.ix. 1956, 1 ♀, 19.ix.1956 (*Graham*), in Graham collection ; Kent, Lewisham, 1 ♀, ix.1890 (*A. J. Chitty*), in Hope Department, University Museum, Oxford.

The female of *A. temporalis* is very close to that of *crassicornis* (Thomson), from which it differs in a few small characters which are listed in the key to species.

Ablaxia crassicornis (Thomson)

(Text-fig. 424)

Etroxys (*Caenacis*) *crassicornis* Thomson, 1878 : 98, ♀.
Ablaxia crassicornis (Thomson) Delucchi, 1957 : 147, ♀.

Type material. LECTOTYPE ♀, labelled " Rsiö " [Ringsjö] ; " crassicornis Ths "; " Caenacis crassicornis Ths. ♀ Lectotype des. by A. Jansson "; " ABLAXIA crassicornis Ths. V. Delucchi det " ; and " LECTOTYPE " on a red label.

SWEDEN ; probably MOLDAVIAN S.S.R. (recorded, probably correctly, by Bouček, 1965*e* : 8).

Biology. Unknown.

Note. The following extra-limital species belong to *Ablaxia* :

Pteromalus Prothous Walker, 1839*a* : 87, ♀ (Chiloe). Syntypes, 2 ♀. LECTOTYPE, Type Hym. 5. 770 b, bearing a green-bordered type label, also one reading " Isle of Chiloe " and a Waterhouse label. (= *Ablaxia prothous* (Walker) **comb. n.**).

Pteromalus Traulus Walker, 1839*a* : 88, ♀. Type Hym. 5. 771, a female lacking head and antennae ; it bears a green-bordered type label, one reading " Isle of Chiloe " and a Waterhouse label. In my opinion it could be a small female of *prothous* Walker (=*Ablaxia traulus* (Walker). **comb. n.**).

Note. The following species belong to *Ablaxia* but probably form a distinct subgenus :

Ablaxia discalis (Wollaston), **comb. n.**

Pteromalus discalis Wollaston, 1858 : 26, ♀.

Type material. LECTOTYPE ♀, Type Hym. 5. 722. Type locality : Madeira " occurring in the sylvan districts (Lombo dos Pecegueiros, &c.) of intermediate altitudes " (Wollaston, ibid.).

Ablaxia tinctipennis (Walker) **comb. n.**

Pteromalus tinctipennis Walker, 1872*b* : 118–119, ♀.

Type material. LECTOTYPE ♂, Type Hym. 5. 721. Type locality : Madeira.

Ablaxia obumbrata (Walker) **comb. n.**

Pteromalus obumbratus Walker, 1872*b* : 122–123, ♀.

Type material. LECTOTYPE ♀, Type Hym. 5. 717. Type locality : Madeira.

Ablaxia basicyanea (Walker) **comb. n.**

Pteromalus basicyaneus Walker, 1872*b* : 123–124, ♀.

Type material. LECTOTYPE ♀, Type Hym. 5. 719. Type locality : Madeira.

AGGELMA Delucchi

Etroxys sgen. *Caenacis* Förster ; Thomson, 1878 : 96–98 (*ex parte*).
Aggelma Delucchi, 1956*b* : 70. Type-species : *A. abdominalis* Delucchi, by original designation.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Gaster lanceolate, 4·5 to 5·5 times as long as broad, 1·5 to 1·9 times as long as head plus thorax ; last tergite twice or more than twice as long as its basal breadth, the penultimate tergite nearly twice as long as broad, the antepenultimate about as long as broad ; basal tergite with a short, transverse basal fovea. Head in dorsal view only 2 to 2·1 times as broad as long . 2

– Gaster at most hardly three times as long as broad, at most 1·4 times as long as head plus thorax ; last tergite at most 1·3 times as long as its basal breadth, the two preceding tergites relatively shorter than in the alternate couplet ; basal tergite with a long, subtriangular basal fovea which reaches nearly half way towards the hind margin of the tergite. Head in dorsal view 2·25 to 2·55 times as broad as long 3

2 (1) Propodeum (medially) fully two thirds as long as the scutellum and produced well behind the level of the bases of the hind coxae ; plicae distinct, and rather sharp both at the front and hind margins of the propodeum ; costula distinct. Antennal scape reaching only to the median ocellus ; combined length of pedicellus and flagellum only slightly greater than breadth of head ; first funicular segment about twice as long as broad, sixth quadrate ; sensilla in one row on all segments of the funicle. Fore wing with postmarginal vein somewhat shorter than the marginal vein, the latter more than twice as long as the stigmal vein . . . . . ***agrili*** Bouček (p. 581)

– Propodeum (medially) only about one third as long as the scutellum and produced only slightly behind the level of the bases of the hind coxae ; plicae sharp at hind margin only ; costula absent. Antennal scape reaching above the level of the vertex ; combined length of pedicellus and flagellum about 1·4 times breadth of head ; first funicular segment somewhat more than twice as long as broad, sixth slightly longer than broad ; sensilla numerous, arranged in three to four rows on the proximal segments, in two rows on the distal segments, of the funicle. Fore wing with postmarginal vein slightly longer than the marginal vein, the latter hardly twice as long as the stigmal vein . . . . ***abdominalis*** Delucchi (p. 580)

3 (1) Head in dorsal view 2·25 to 2·35 times as broad as long ; temples nearly one third as long as eyes. Propodeum shorter, medially rather more than one third as long as the scutellum. Dorsellum weakly reticulate, the sculpture hardly raised above the general surface, rather shiny. Antennae with first funicular segment as long as the clava and about twice as long as broad ***spiracularis*** (Thomson) (p. 581)

– Head in dorsal view (Text-fig. 428) 2·5 to 2·55 times as broad as long ; temples about one quarter as long as eyes. Propodeum longer, medially rather more than half as long as the scutellum. Dorsellum strongly reticulate, relatively dull. Antennae with first funicular segment somewhat shorter than the clava, and at most 1·7 times as long as broad ***violacea*** (Zetterstedt) (p. 581)

The ♂♂ of *Aggelma* are unknown to me.

Aggelma abdominalis Delucchi

Aggelma abdominalis Delucchi, 1956*b* : 70, ♀.

Type material. Syntypes, Czechoslovakia, Moravia, Ungarschütz, 7–8.v.1907, on *Pinus montana* (*Wachtl*) ; Austria, Piesting, 21.iv. and 6.v.1869, in Naturhistorisches Museum, Vienna. One of these specimens is the holotype but Delucchi does not specify which.

AUSTRIA, CZECHOSLOVAKIA.

Biology. Unknown ; some specimens have been found on *Pinus mugo* Turra (=*montana* Mill.).

Aggelma agrili Bouček

Aggelma agrili Bouček, 1965*e* : 23–26, ♀.

Type material. Holotype ♀, Moldavian S.S.R., Plot', 27.vi.1959, reared from *Agrilus viridis* (L.) (*V. I. Talitzki*), in Národní Museum, Prague (Cat. no. 26.007).

MOLDAVIAN S.S.R.

Biology. Host *Agrilus viridis* (L.) in twigs of black currant (Bouček, 1965*e* : 25).

Aggelma spiracularis (Thomson)

Etroxys (*Caenacis*) *spiracularis* Thomson, 1878 : 96, ♀.
Aggelma spiracularis (Thomson) Delucchi, 1957 : 150, ♀.

Type material. One female, LECTOTYPE (probably holotype), labelled " Gl." [Gottland] ; " Belf." [Belfrage] ; " spiracularis Ths " ; " AGGELMA spiracularis Ths. V. Delucchi det." ; and " LECTOTYPE " (on a red label).

BRITAIN, SWEDEN ; apparently rare. New to Britain ; England, Lancashire, Grange-over-Sands, 1 ♀, 4.ix.1949 (*A. E. Wright*), in BM(NH) collection.

Biology. Unknown.

Aggelma violacea (Zetterstedt), **comb. n.**

(Text-fig. 428)

Pteromalus violaceus Zetterstedt, 1838 : 423, ♀.
Etroxys (*Caenacis*) *pilosella* Thomson, 1878 : 97, ♀, **syn. n.**
Aggelma pilosella (Thomson) Delucchi, 1957 : 149–150, ♀.

Type material. *Pteromalus violaceus* Zetterstedt. One female, LECTOTYPE, mounted on a pin together with the type of *Pteromalus petiolatus* Zett. and bearing a comprehensive label in Zetterstedt's handwriting " P. violaceus ♀. P. petiolatus ♀. Wittang ".

Etroxys (*Caenacis*) *pilosella* Thomson. Five specimens stand under this name but some bear the wrong locality data. LECTOTYPE, a pinned female labelled " Hlm " [Holmiae] and " Stål ". Delucchi previously (1957 : 150) designated a lectotype for *pilosella* in the following words " Lectotypus Nv.alp./Bhn etikettiert ". This specimen cannot be the type as it comes from Norway [" Nv. alp."] wheras the localities given by Thomson (1878 : 98) were " norra och medlersta Sverige ".

I can see no valid structural differences between the lectotype of *violaceus* Zetterstedt and that of *pilosella* Thomson. The head and thorax vary from mainly olive-green as in the type of *pilosella*, to blue with a violet tinge in places as in the type of *violaceus* ; some of Thomson's specimens are intermediate in colour.

SWEDEN, NORWAY.

Biology. Reared in Germany from *Magdalis violacea* L. by M. Postner, the material determined by Dr. Delucchi (Secrétariat, etc., 1957 : 319, 324.)

APELIOMA Delucchi

Apelioma Delucchi, 1956*b* : 68–70. Type-species : *Dinotus pteromalinus* Thomson, 1878, by original designation.
Apelioma Delucchi ; Graham, 1961 : 171–173.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Hind coxae pilose dorsally in their basal half. Antenna with combined length of pedicellus and flagellum 1·3 to 1·4 times the breadth of the head ; line of micropilosity on the clava extending nearly to its base. Anterior margin of clypeus distinctly emarginate. Fore wing with marginal vein shorter than, or at most as long as, the postmarginal vein . . . ***pteromalinum*** (Thomson) (p. 582)
– Hind coxae bare dorsally in their basal half or more. Antenna (Text-fig. 429) with combined length of pedicellus and flagellum only slightly greater than breadth of head ; line of micropilosity on the clava (Text-fig. 430) extending hardly half way to the base. Anterior margin of clypeus very shallowly emarginate, almost truncate. Fore wing with marginal vein a little longer than the postmarginal vein ***restrictum*** Graham (p. 583)

(MALES)

1 Hind coxae pilose dorsally in their basal half. Combined length of pedicellus and flagellum 1·5 to 1·65 times the breadth of the head. Anterior margin of clypeus distinctly emarginate . . . . . ***pteromalinum*** (Thomson) (p. 582)
– Hind coxae bare dorsally in their basal half or more. Combined length of pedicellus and flagellum about 1·25 times the breadth of the head. Anterior margin of clypeus very shallowly emarginate, almost truncate . . . ***restrictum*** Graham (p. 583)

For other small differences between these two species see Graham (1961 : 172).

Apelioma pteromalinum (Thomson)

Dinotus pteromalinus Thomson, 1878 : 40, ♂ ♀.
Apelioma pteromalinum (Thomson) Delucchi, 1956*b* : 69–70.
Apelioma pteromalinum (Thomson) ; Graham, 1961 : 171, ♂ ♀.

Type material. Syntypes, 3 ♀, 1 ♂. Lectotype ♀ selected by Delucchi (1956*b* : 69).

BRITAIN, SWEDEN.

Biology. Unknown. Imagines captured in June and August.

Apelioma restrictum Graham

(Text-figs. 429, 430)

Apelioma restrictum Graham, 1961 : 171–172, ♂ ♀.

Type material. Holotype ♀, England, Lancashire, Freshfield, 7.ix.1960 (*Graham*), in Hope Department, University Museum, Oxford.

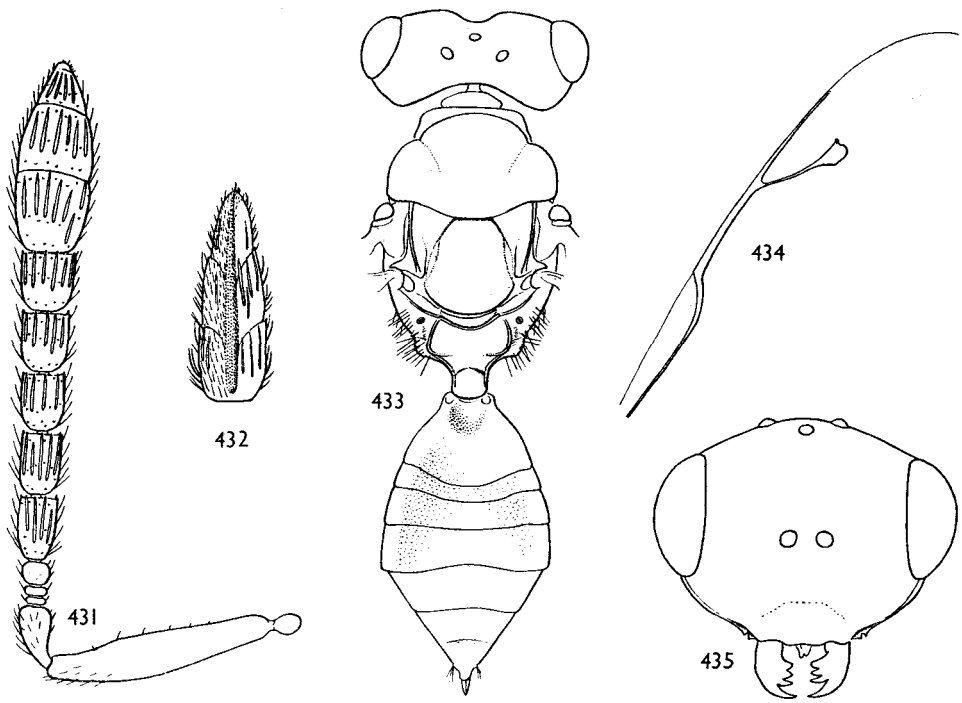
BRITAIN, SWEDEN.

Biology. Unknown ; the species appears to be associated with *Pinus*. Imagines captured in June, July and Sept.

SYNEDRUS Graham

Synedrus Graham, 1956 : 97. Type-species : *S. cavigena* Graham, by monotypy and original designation.

Only one species known.



FIGS. 431–435. *Synedrus transiens* (Walker), ♀. 431, antenna ; 432, antennal clava, ventral ; 433, body ; 434, fore wing venation ; 435, head, frontal view.

Synedrus transiens (Walker) **comb. n.**

(Text-figs. 431–435)

Pteromalus transiens Walker, 1835*a* : 192, ♀.
Synedrus cavigena Graham, 1956 : 97, ♂ ♀, **syn. n.**

Type material. *Pteromalus transiens* Walker. One female, LECTOTYPE (probably holotype), bearing a Waterhouse label.

Synedrus cavigena Graham. Holotype ♀, England, Berkshire, Wytham Wood, 25.ix.1953, on *Quercus* (*Graham*), in Hope Department, University Museum, Oxford.

BRITAIN.

Biology. Unknown ; the species appears to be associated with *Quercus* as I have several times swept it from the foliage of oak-trees. Imagines June and September.

HOLCAEUS Thomson

Etroxys Förster, 1856 : 66, 71 [nec *Hetroxys* Westwood, 1833].
Etroxys sgen. *Etroxys* Thomson, 1878 : 88, 100.
Etroxys sgen. *Holcaeus* Thomson, 1878 : 88, 104. Type-species : H. *dichrous* Thomson, by designation of Ashmead, 1904 : 313.
Holcaeus Thomson ; Ashmead, 1904 : 313, 314.
Etroxys Schmiedeknecht, 1909 : 309, 310, 311 [*ex parte, nec* Westwood].
Holcaeus Thomson ; Schmiedeknecht, 1909 : 209, 310, 312 [*ex parte*].
Etroxys Kurdjumov, 1913 : 8, 16 [*nec* Westwood].
Holcaeus Thomson ; Kurdjumov, 1913 : 8, 17 [*ex parte*].
Etroxys Nikol'skaya, 1952 : 230 [*nec* Westwood].
Holcaeus Thomson ; Nikol'skaya, 1952 : 230.
Holcaeus Thomson ; Graham, 1956*a* : 79–80.
Holcaeus Thomson ; Peck *et al.*, 1964 : 51, 55.

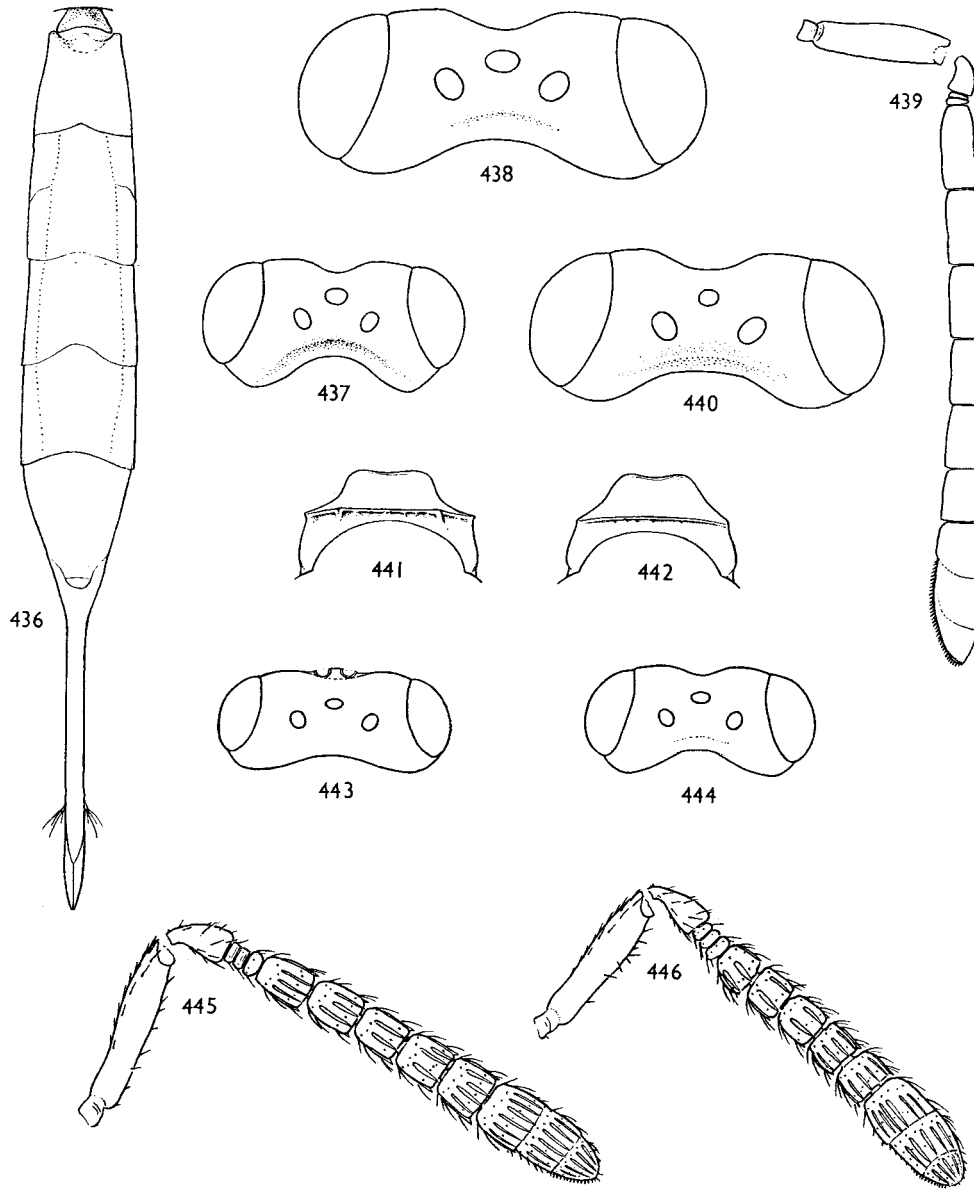
The biology of this genus is unknown. The species occur most often in woods, particularly in shady places.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Clypeus finely reticulate. Antennae short, combined length of pedicellus and flagellum about equal to breadth of head ; funicle conspicuously stouter than the pedicellus, all its segments transverse, the first clearly shorter than the pedicellus ; scape, not counting the radicula, at least slightly longer than the clava ; clava 2 to 2·25 times as long as broad. Gaster ovate, not longer than the thorax, its last tergite shorter than its basal breadth ; tip of hypopygium (valvula ventralis) situated at two thirds the length of the gaster as measured from the base. Spur of mid tibia half as long as the first tarsal segment. Small species, length 1·8 to 2·1 mm. ; body mainly dark bluish ; femora extensively darkened, tibiae sometimes more or less so ; median carina of propodeum absent or weak and irregular

calligetus (Walker) (p. 588)



FIGS. 436–446. 436, *Holcaeus stylatus* sp. n., ♀, petiole and gaster ; 437, same, head ; 438, *Holcaeus varro* (Walker), ♀, head ; 439, same, ♀ antenna (hairs and sensilla omitted) ; 440, *Holcaeus breviusculus* (Thomson), lectotype ♀, head ; 441, *Holcaeus stenogaster* (Walker), ♀, pronotum ; 442, *Holcaeus compressus* (Walker), ♀, pronotum ; 443, *Cricellius repandus* sp. n., ♀, head ; 444, *Cricellius gracilis* (Walker), head ; 445, *Cricellius* sp.indet. A, ♀, antenna ; 446, *Cricellius repandus* sp. n., ♀, antenna.

– Clypeus strigose, except sometimes in the middle. Antennae longer, combined length of pedicellus and flagellum distinctly greater than breadth of head ; none of the funicular segments, or at most the fifth and sixth, transverse, the proximal segments nearly always elongate, rarely nearly quadrate ; first funicular segment usually as long as or longer than the pedicellus, rarely slightly shorter ; scape usually equal in length to the clava, occasionally slightly longer ; clava 2·3 to 2·5 times as long as broad. Gaster ovate-lanceolate to lanceolate, at least somewhat, usually very much, longer than the thorax, its last tergite not shorter than its basal breadth ; tip of hypopygium situated at least slightly less than half the length of the gaster. Spur of mid tibia less than half as long as the first tarsal segment. Length usually greater ; median carina of propodeum usually distinct . 2

2 (1) Gaster (Text-fig. 436) 2·2 to 2·4 times as long as the thorax ; last tergite strongly compressed, in dorsal view appearing linear throughout most of its length, which is nearly or quite one third that of the whole gaster, its proximal half reddish. Fore wing with basal cell closed below throughout its length by a line of hairs on the cubital vein.

Head and pronotum much as in *stenogaster* (cf. Text-fig. 441)

stylatus sp. n. (p. 589)

– Gaster at most about twice as long as the thorax ; last tergite shorter, less strongly compressed, in dorsal view tapering gradually from base to apex, at most reddish at the base. Fore wing with basal cell open below, or at most closed in the distal half by a line of hairs on the cubital vein . . . 3

3 (2) Antenna (Text-fig. 439) with sixth funicular segment at least slightly longer than broad, the segments proximal to this more distinctly elongate, first funicular segment obviously longer than the pedicellus. Head in dorsal view (Text-fig. 438) strongly transverse (2·4 to 2·5 times as broad as long), temples very strongly convergent and very short ; vertex with only a weak transverse ridge behind the ocelli . . . . . ***varro*** (Walker) (p. 589)

– Antenna with sixth funicular segment quadrate to very slightly transverse, fifth subquadrate, fourth at most slightly longer than broad ; first funicular segment at most slightly longer, sometimes even shorter, than the pedicellus. Head in dorsal view usually less transverse, the temples often less convergent ; often the vertex has a more distinct transverse ridge behind the ocelli 4

4 (3) Vertex without, or with at most a very indistinct ridge behind the ocelli ; temples very strongly narrowed behind the eyes and the head strongly transverse, almost as in *varro* cf. Text-fig. 438. Propodeum short, its median length hardly more than one third that of the scutellum. Fore wing with basal cell usually open below ; marginal vein 1·6 to 1·8 times as long as the stigmal vein ; postmarginal distinctly longer than the stigmal. Head and thorax usually bluish, less often bronze-, black. Pronotum as in *compressus* (cf. Text-fig. 442). . . . . ***gorgasus*** (Walker) (p. 588)

– Vertex (Text-fig. 440) with a distinct, sometimes rather sharp, ridge behind the ocelli ; temples usually less strongly narrowed, head usually less transverse. Propodeum longer, slightly less than half as long as the scutellum . . 5

5 (4) Gaster elongate, twice or nearly twice the length of the thorax, strongly acuminate ; last tergite two to three times as long as its basal breadth, and longer than the basal tergite. Pronotum (Text-fig. 441) with sides of collar nearly parallel, slightly toothed anteriorly at the points where the transverse carina (or " margin ") meets them ; the carina distinctly raised, slightly angled towards each side, and usually with a short longitudinal costula behind each angle . . . . ***stenogaster*** (Walker) (p. 590)

– Gaster shorter, distinctly less than twice the length of the thorax, less acu-

minate ; last tergite varying from slightly longer than, to nearly twice its basal breadth. Pronotum (Text-fig. 442) with sides of collar converging forwards, not or hardly toothed anteriorly ; the transverse carina (" margin ") fine and only slightly raised, forming an even curve. 6

6 (5) Head (Text-fig. 440) more transverse (breadth to overall length 2·3 to 2·35) ; temples strongly narrowed and short . . ***breviusculus*** (Thomson) (p. 591)

– Head less transverse (breadth to overall length 2·1 to 2·15) ; temples less strongly narrowed . . . . . ***compressus*** (Walker) (p. 590)

Key to Most European Species of *Holcaeus* Thomson and *Cricellius* Thomson

(Males)

1 Antennae with first funicular segment at least very slightly shorter than the second segment, the latter 1·5 to 1·8 times as long as broad . . . 2

– Antennae with first funicular segment as long as, or usually slightly longer than, the second segment, the latter occasionally quadrate 4

2 (1) Vertex without, or with at most a very weak transverse ridge behind the ocelli. Pronotal collar having its anterior transverse carina only slightly raised 3

– Vertex with a distinct transverse ridge behind the ocelli. Pronotal collar having its anterior transverse carina fairly strongly raised ***H. compressus*** (Walker) (p. 590)

3 (2) Postmarginal vein of fore wing slightly shorter than, or at most as long as, the marginal vein. Head in dorsal view 1·9 to 2 times as broad as long ***C. gracilentus*** (Bouček) (p. 593)

– Postmarginal vein 1·1 to 1·2 times as long as the marginal vein. Head in dorsal view 2·05 to 2·1 times as broad as long . ***C. gracilis*** (Walker) (p. 592)

4 (1) Combined length of pedicellus and flagellum only 1·2 to 1·3 times the breadth of the head ; pedicellus as long as, or longer than, the first funicular segment ; all the funicular segments quadrate, or at most the proximal segments slightly longer than broad. Vertex without, or with at most a weak, transverse ridge behind the ocelli. Anterior transverse carina of pronotal collar not strongly raised 5

– Either the combined length of the pedicellus and flagellum is 1·5 to 1·6 times the breadth of the head ; or else the pedicellus is at least slightly shorter than the first funicular segment, the latter 1·5 to 3 times as long as broad. Vertex often with a distinct transverse ridge behind the ocelli. Anterior transverse carina of pronotal collar often strongly raised 6

5 (4) Anterior margin of clypeus slightly curved forwards. Spur of mid tibia slightly more than half the length of the first tarsal segment. Antennal flagellum as stout as, or even slightly stouter than, the pedicellus when the latter is seen in dorsal view . . . . ***H. calligetus*** (Walker) (p. 588)

– Anterior margin of clypeus usually shallowly emarginate, rarely truncate. Spur of mid tibia only about half the length of the first tarsal segment. Antennal flagellum, proximally, usually slightly less stout than the pedicellus when the latter is seen in dorsal view (dwarfs of *gorgasus*) . . . 6

6 (5) Combined length of pedicellus and flagellum only 1·25 to 1·3 times the breadth of the head ; funicular segments relatively shorter, the first at most 1·5 times as long as the pedicellus and at most twice as long as broad, sixth not or hardly longer than broad ; flagellum proximally usually as stout as or a little stouter than the pedicellus in dorsal view. Vertex without, or with at most a weak, transverse ridge behind the ocelli. Lateral front

angles of pronotal collar not prominent ; anterior transverse carina of collar not strongly raised . . . . . ***H. gorgasus*** (Walker) (p. 588)

– Combined length of pedicellus and flagellum 1·5 to 1·6 times the breadth of the head ; funicular segments relatively longer, the first 1·5 to 2·5 times as long as the pedicellus and two to three times as long as broad, the sixth usually slightly longer than broad ; flagellum proximally often rather less stout than the pedicellus in dorsal view. Vertex often with a distinct ridge. Lateral front angles of pronotum often prominent ; anterior transverse carina of collar often strongly raised 7

7 (6) Head in dorsal view (cf. Text-fig. 438) 2·15 to 2·35 times as broad as long ; vertex without, or with only a weak, transverse ridge. Pronotal collar with lateral front angles not prominent ; anterior transverse carina only moderately raised. First funicular segment 2·5 to 3 times as long as broad, and 2·2 to 2·5 times as long as the pedicellus. Basal cell of fore wing closed below over at most its distal half, and sometimes completely open ***H. varro*** (Walker) (p. 589)

– Head in dorsal view (cf. Text-fig. 437) differently shaped, 2 to 2·15 times as broad as long ; vertex with a distinct, sometimes very strong, transverse ridge. Pronotal collar with lateral front angles prominent or dentiform ; anterior transverse carina strongly raised, sometimes with its edge waved or almost dentate. First funicular segment 2 to 2·7 times as long as broad, at most twice as long as the pedicellus. Basal cell of fore wing usually closed below, sometimes closed only in its distal half 8

8 (7) Marginal vein of fore wing 1·8 to 2 times as long as the stigmal vein. Anterior margin of clypeus tending to be shallowly emarginate ***H.? stylatus*** sp. n. (p. 589)

– Marginal vein 1·6 to 1·75 times as long as the stigmal vein. Anterior margin of clypeus truncate or slightly curved forwards ***H. stenogaster*** (Walker) (p. 590)

Holcaeus calligetus (Walker)

Pteromalus Calligetus Walker, 1839 : 222, ♂.
Holcaeus calligetus (Walker) Bouček, 1965*e* : 8.

Type material. One male, LECTOTYPE (possibly holotype), bearing a Waterhouse label.

BRITAIN, CZECHOSLOVAKIA, MOLDAVIAN SSR ; uncommon.

Biology. Unknown. Imagines June–Aug. (one female captured in April).

Holcaeus gorgasus (Walker) **comb. n.**

Pteromalus Gorgasus Walker, 1839 : 229, ♂.
Etroxys (*Holcaeus*) *dichrous* Thomson, 1878 : 104, ♂ ♀, **syn. n.**

Type material. *Pteromalus gorgasus* Walker. Syntypes, 2 ♂. LECTOTYPE, the first specimen, bearing a Waterhouse label.

Etroxys (*Holcaeus*) *dichrous* Thomson. Syntypes, 5 specimens. Lectotype not yet selected.

Widely distributed in EUROPE ; fairly common.

Biology. Unknown. Imagines May–June (occasionally July).

Holcaeus varro (Walker) **comb. n.**

(Text-figs. 438, 439)

Pteromalus Varro Walker, 1839*c* : 233, ♂.

Type material. One male, LECTOTYPE (possibly holotype) in Greville coll., Edinburgh, labelled " Pteromal. Varro W. n. sp. Fide Wk. Edinb." and " Greville 1936–50. 292 ".

BRITAIN : England [new records] : Berkshire, Bagley Wood, 1 ♂, 4.v.1957, 1 ♀, 21.vii.1957 ; Buckinghamshire, Hell Coppice, near Oakley, 1 ♂, 1 ♀, 12.viii.1960 (*Graham*). Scotland : near Edinburgh (Walker, 1839*c* : 233).

Biology. Unknown. Imagines May–Sept. ; but the species is uncommon.

Holcaeus stylatus **sp. n.**

(Text-figs. 436, 437)

♀. Head bronze, the face in one specimen greenish. Thorax black, the mesoscutum, axillae and scutellum brassy green, the propodeum tending more towards bluish, remainder of thorax with weak metallic tints. Gaster fuscous or black with weak metallic reflections ; the petiole, proximal part of venter more or less, and about the proximal half of the last tergite, reddish testaceous. Mandibles red with blackish teeth. Antennal scape testaceous, slightly darker at the apex ; rest of antenna blackish. Legs testaceous ; coxae sometimes darkened basally and the hind coxa metallic-tinged ; pretarsus and claws brown. Tegulae and wing-venation testaceous ; wings subhyaline. Length 3·6 to 4·45 mm.

Head in dorsal view (Text-fig. 437) twice or hardly more than twice as broad as its maximum length ; temples converging moderately strongly, relatively long, about one quarter to one fifth the length of the eyes ; vertex with a strong ridge behind the ocelli, extending laterally as far as the upper part of the temples. Antenna with combined length of pedicellus and flagellum about 1·5 times the breadth of the head ; flagellum similar to that shown in Text-fig. 439, but with the funicular segments slightly shorter, the sixth very slightly longer than broad.

Pronotum like that of *stenogaster* (cf. Text-fig. 441) in outline ; collar sharply margined throughout, the carina quite strongly raised. Propodeum short, its median length about one third that of the scutellum ; plicae sharp in the posterior half of the sclerite. Fore wing with basal vein pilose, basal cell completely closed below by a line of hairs on the cubital vein ; speculum open below ; marginal vein 2·2 to 2·3 times as long as the stigmal vein ; postmarginal vein equal in length to the marginal.

Gaster (Text-fig. 436) elongate, 2·2 to 2·4 times as long as the thorax, but much narrower than the latter ; last tergite strongly compressed almost from its base, thus appearing linear, the length of this tergite is nearly or quite one third that of the whole gaster ; ovipositor sheaths distinctly exserted.

♂. Not definitely associated. I have two ♂♂ which may belong to this species ; the characters which distinguish them from males of *stenogaster* are noted in the key to males.

Holotype ♀. ENGLAND : Berkshire, Wytham Wood, 2.viii.1958 (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. ENGLAND : Berkshire, Wytham Wood, 2 ♀, 2.vi.1962, 19.vii.1964 (*Bouček*) ; Oxfordshire, Chiltern Hills at Swyncombe Down, 1 ♀, 3.vi.1956 (*Graham*) ; Yorkshire, V.C.64, Malham Tarn, 1 ♀, 9.viii.1956 (*W. D. Hincks*).

SCOTLAND : West Inverness, Isle of Rhum, Papadil, 1 ♀, 4.vii.1962 (*P. Wormell*).
CZECHOSLOVAKIA : Bohemia, Stěchovice near Prague, 2 ♀, 20.vii.1957, on a stump (*L. Masner*) ; Velký Vřeštov, 1 ♀, vi.1954 (*Bouček*) ; Eastern Slovakia, Zádiel, 1 ♀, vi.1956 (*L. Masner*).
WESTERN GERMANY : München, 1 ♀, 14.v.1961 (*Bachmeier*). Paratypes in the Graham collection, in that of the Manchester Museum and in that of the National Museum, Prague.

This species is near *stenogaster* (Walker) but may be distinguished from it and from the other described species by its longer gaster, and especially by the form and colour of the last tergite ; and by the basal cell of the fore wing, which is closed below.
Biology. Unknown.

Holcaeus stenogaster (Walker) **comb. n.**

(Text-fig. 441)

Pteromalus stenogaster Walker, 1836*a* : 11, ♀.
? Pteromalus Styrus Walker, 1839 : 243, ♂.
? Pteromalus Cabades Walker, 1839 : 264, ♂.
? Gastrancistrus Amnisos Walker, 1848 : 105, 182, ♀.
Etroxys longicauda Thomson, 1878 : 102, ♂ ♀, **syn. n.**

Type material (all Walker types bear a Waterhouse label).
Pteromalus stenogaster Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen ; Waterhouse label " Hetroxys stenogaster Walker ".
Pteromalus styrus Walker. One male, LECTOTYPE.
Pteromalus cabades Walker. Syntypes, 2 ♂. LECTOTYPE labelled " 38. 7. 12. 191 ".
Gastrancistrus amnisos Walker. One male, LECTOTYPE, with a printed label " GASTRANCISTRUS Amnisos ".
Etroxys longicauda Thomson. Syntypes on 7 pins. The first pin bears a male and a female, labelled " Hg " [Hälsingborg] on a pale green label, also " longicauda Ths." The female is designated LECTOTYPE.
I consider *styrus* Walker and *cabades* Walker to be probably the males of *stenogaster* (I am not absolutely certain of the distinctions between the males of *stenogaster* and *compressus*).

Widely distributed in EUROPE and fairly common.
Biology. Unknown. On one occasion I captured a female upon a bracket-fungus (*Polyporus* sp.) but there may be no particular significance about this. Imagines Apr.–July.

Holcaeus compressus (Walker) **comb. n.**

(Text-fig. 442)

Pteromalus compressus Walker, 1836 : 477, ♀.
Pteromalus fuscescens Walker, 1836*a* : 12, ♀, **syn. n.**

? Pteromalus Ection Walker, 1845 : 262, ♂.
Pteromalus Hyrtacus Walker, 1848 : 127, 214, ♀, **syn. n.**
Etroxys elongatus Thomson, 1878 : 100, ♂ ♀, **syn. n.**

Type material (Walker types bear a Waterhouse label).

Pteromalus compressus Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen.

Pteromalus fuscescens Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen ; Waterhouse label " Hetroxys fuscescens Walker ".

Pteromalus ection Walker. One male, LECTOTYPE ; I think it is probably the male of *compressus*. Dalla Torre (1898 : 122) listed this species as " *eciton* Walk." in error.

Pteromalus hyrtacus Walker. One female, LECTOTYPE.

Etroxys elongatus Thomson. Syntypes on 28 pins. LECTOTYPE, a female labelled " Rsiö " [Ringsjö] and remounted by A. Jansson.

Widely distributed in EUROPE ; in BRITAIN the commonest species of this genus.

Biology. Unknown. Imagines Apr.–Aug.

Holcaeus breviusculus (Thomson) **comb. n.**

Etroxys breviusculus Thomson, 1878 : 102, ♀.

Type material. Syntypes. 3 ♀. LECTOTYPE labelled " Bh." [Bohuslän] and " Bhn " [Boheman].

SWEDEN ; only the type material known to me. It is very close to *compressus* (Walker) and might be a form of it but as slight differences are present I retain it tentatively as a valid species.

Biology. Unknown.

CRICELLIUS Thomson

Etroxys subgen. *Cricellius* Thomson, 1878 : 88, 102. Type-species : *C. decipiens* Thomson, by monotypy.
Cricellius Thomson ; Ashmead, 1904 : 313, 314.
Cricellius Thomson ; Schmiedeknecht, 1909 : 309, 310, 312.
Cricellius Thomson ; Kurdjumov, 1913 : 6.
Cricellius Thomson ; Nikol'skaya, 1952 : 225.
Dibrachella Bouček, 1954 : 55. Type-species : *D. gracilenta* Bouček, by monotypy and original designation.
Cricellius Thomson ; Bouček, 1958*a* : 401.
Cricellius Thomson ; Peck *et al.*, 1964 : 54.

Bouček himself (1958*a* : 401) synonymized his genus *Dibrachella* with *Cricellius* Thomson.

This genus is extremely close to *Holcaeus* Thomson and may eventually have to be united with it. Females of the two genera may be distinguished easily, but the limits between certain males of *Holcaeus* and *Cricellius* are very slight.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Scutellum distinctly duller than the mesoscutum, with very fine and dense reticulation. Head, mesoscutum, axillae, and scutellum bright to dark blue, the vertex and scutellum sometimes dark violet or violet-bronze. Clypeus relatively dull, with moderately strong reticulation. Antennae with combined length of pedicellus and flagellum approximately equal to, or very slightly less than, breadth of head ; scape beneath, sometimes entirely, testaceous. Gaster slightly shorter than head plus thorax, 1·7 to 1·9 times as long as broad. Head in dorsal view 2·2 to 2·4 times as broad as long . . . 2

– Scutellum not or hardly less shiny than the mesoscutum, with relatively less fine and less dense reticulation. Head, mesoscutum, axillae, and scutellum greenish or bronze-green, the scutellum sometimes bronze. Clypeus, except in one species which has the antennal scape dark, with delicate alutaceous sculpture and relatively shiny. Proportions of flagellum, gaster, and head sometimes otherwise than in the above 3

2 (1) Fore wing with marginal vein 1·45 to 1·5 times as long as the stigmal vein ; postmarginal 1·15 to 1·2 times as long as the marginal; stigmal vein forming an angle of about 40° or slightly less with the postmarginal . ***decipiens*** Thomson (p. 594)

– Fore wing with marginal vein about 1·7 times as long as the stigmal vein ; postmarginal approximately equal in length to the marginal ; stigmal vein forming an angle of about 45° with the postmarginal. Antenna, Text-fig. 445 . sp. indet.

3 (2) Clypeus relatively dull, with rather strong reticulation which is slightly raised above the general surface. Postmarginal vein approximately equal in length to the marginal. Head in dorsal view 2·2 to 2·25 times as broad as long. Antenna (Text-fig. 446) with combined length of pedicellus and flagellum barely equal to breadth of head. Gaster 1·65 to 1·9 times as long as broad, hardly as long as head plus thorax . . . . ***repandus*** sp. n. (p. 593)

– Clypeus relatively shiny, with delicate alutaceous sculpture which is not raised above the general surface. The other characters not all present in combination 4

4 (3) Fore wing with postmarginal vein 0·85 to 1·05 times the length of the marginal vein. Head in dorsal view 1·92 to 2·05 times as broad as long. Gaster 1·7 to 2 times as long as broad, at least slightly shorter than head plus thorax ***gracilentus*** (Bouček) (p. 593)

– Fore wing with postmarginal vein 1·1 to 1·2 times the length of the marginal vein. Head in dorsal view (Text-fig. 444) 2·1 to 2·2 times as broad as long. Gaster 2 to 2·55 times as long as broad, as long as, or even very slightly longer than, head plus thorax . . . . . ***gracilis*** (Walker) (p. 592)

Males are included in my key to ♂ *Holcaeus* (q.v.). (p. 587)

Cricellius gracilis (Walker) **comb. n.**

(Text-fig. 444)

Pteromalus gracilis Walker, 1836 : 477, ♀ [nec *Eutelus gracilis* Walker, 1834].
? Pteromalus Alcman Walker, 1839 : 265, ♂.

Type material. *Pteromalus gracilis* Walker. Lectotype ♀ designated by Graham (*in* Graham & Claridge, 1965 : 284).

Pteromalus alcman Walker. Syntypes, 3 ♂. LECTOTYPE, the second specimen, bearing a Waterhouse label ; I believe it is the male of *gracilis*.

BRITAIN : local, in woods, particularly in shady areas.
Biology. Unknown. Imagines Apr.–Aug.

Cricellius gracilentus (Bouček)

Dibrachella gracilenta Bouček, 1954 : 55–57, ♂ ♀.
Cricellius gracilentus Bouček, 1958*a* : 401.

Type material. Holotype ♀, Czechoslovakia, Bohemia, neighbourhood of Velký Vřeštov, in the second half of August, 1953 (*Bouček*), in Národní Museum, Prague (Cat. no. 3005).

CZECHOSLOVAKIA.
Biology. Unknown. Imagines July–Aug.

I have seen a number of specimens of *gracilentus* (including the holotype) and have checked the differences mentioned in my key below, between it and *gracilis* (Walker), by measurements. I feel sure that they are distinct, although close, species.

Cricellius repandus sp. n.

(Text-figs. 443, 446)

♀. Head and dorsum of thorax dull green, the occipital surface more bluish, the scutellum slightly tinged with bronze ; sides and venter of thorax dark bluish. Gaster bronze, with some greenish reflections, especially on the basal tergite. Antennae fuscous. Coxae dark blue ; trochanters dark, trochantelli paler ; femora black, narrowly testaceous at apex ; tibiae mainly fuscous, their bases and tips testaceous ; tarsi testaceous, their tips brown, the fore tarsi mainly brown. Tegulae fuscous ; wings subhyaline, venation brown to fuscous. Length 2 to 2·1 mm.

Head in dorsal view (Text-fig. 443) 2·2 to 2·25 times as broad as long (and 1·2 to 1·25 times as broad as mesoscutum) ; temples converging strongly, barely one quarter as long as eyes ; posterior ocelli separated by about 1·5 times their major diameter from the eyes. Eyes separated by about 1·5 times their length. Malar space nearly three fifths the length of an eye. Clypeus rather dull, mainly reticulate with the sculpture slightly raised above the general surface, its anterior margin slightly curved forwards. Head somewhat shiny, finely reticulate. Antenna (Text-fig. 446) with scape reaching to about middle of median ocellus ; combined length of pedicellus and flagellum barely equal to breadth of head ; pedicellus 1·6 to 1·8 times as long as broad ; the three anelli together about as long as the first funicular segment, the first and second anelli subequal in length and breadth, the third slightly longer and broader ; flagellum clavate, funicle stout, proximally nearly 1·5 times as stout as the pedicellus ; funicular segments one to four quadrate or very slightly transverse, five slightly transverse ; clava 1·6 to 1·8 times as long as broad, somewhat longer than the combined length of the two preceding funicular segments, obtuse apically, its first suture not oblique, the second very slightly so ; ventrally there is a line of micropilosity extending along the whole of the third segment, and encroaching very slightly on the second. Sensilla of funicle not very numerous, in one row on each segment.

Thorax about 1·6 times as long as broad. Pronotal collar with its sides converging slightly forwards ; sharply margined in front, but the carina fine and not strongly raised. Mesoscutum 1·4 to 1·5 times as broad as long, moderately shiny, finely reticulate, more coarsely on the disc posteriorly, the reticulation distinctly but not strongly raised above the general surface. Axillae very finely reticulate, moderately shiny. Scutellum about as broad as long, hardly less shiny than the mesoscutum, very finely reticulate ; base of scutellum relatively broad.

Propodeum medially slightly more than half as long as the scutellum, finely and irregularly reticulate. Fore wing with upper surface of costal cell bare, lower surface with one complete

row of hairs, and a few others in the distal half of the cell ; basal cell with a few hairs scattered over its distal quarter to one-third, basal vein pilose ; speculum open below, extending as far as the beginning of the marginal vein ; the latter 1·7 to 1·75 times as long as the stigmal vein ; postmarginal vein as long as, or hardly longer than, the marginal ; stigmal vein forming an angle of about 45° with the postmarginal.

Gaster ovate, 1·65 to 1·9 times as long as broad, slightly shorter than head plus thorax, about as broad as the thorax ; last tergite slightly shorter than its basal breadth ; hypopygium extending about half way along the gaster.

♂. Unknown.

Holotype ♀. SCOTLAND : West Inverness, Isle of Rhum, Kinloch, 29.viii.1961, swept from foliage of *Betula* sp. (*Graham*), in Hope Department, University Museum, Oxford.

Paratype ♀. ENGLAND : Middlesex, Southgate, 20.viii.1964 (*Graham*), in Graham collection.

This species is very close to *gracilis* (Walker) and *gracilentus* (Bouček). It differs from the former in having the postmarginal vein slightly shorter, body rather less slender ; gaster shorter than head plus thorax ; flagellum slightly shorter and distinctly stouter, funicular segments a little shorter ; clypeus duller and more strongly reticulate.

From *gracilentus* it differs in its rather more transverse head, rather shorter flagellum, duller clypeus ; also its darker antennae and legs, the colour-features, however, might be due to regional variation.

It differs from *decipiens* Thomson and its closest ally in its mainly greenish head and thorax, darker scape, less dense sculpture of the scutellum, which is therefore more shiny, and rather shorter and stouter flagellum.

Cricellius decipiens Thomson

Cricellius decipiens Thomson, 1878 : 103, ♀.

Type material. Thomson's collection contains 2 ♀, neither of which bears the correct locality data [Småland] ; they agree, however, with the description, especially the second specimen labelled " Nv. alp. Bhn " [Norvegia alpina. Boheman] which is taken as an indication of the identity of *decipiens*.

SWEDEN, NORWAY.

Biology : Jansson (1952*a* : 181) recorded the rearing of two specimens of *C. decipiens*, from thin lime-twigs attacked by insect larvae, by Prof. O. Lundblad at Harparbol, Uppland, Sweden, in 1951. He mentioned four species of predatory beetles reared from the lime-twigs and suggested that the *Cricellius* might have been attacking the larvae of one of them, or else those of some Ipid or Anobiid beetle, or other insect living on the plant in question.

TRYCHNOSOMA Graham

Trychnosoma Graham, 1957*c* : 140–141. Type-species : *Etroxys* (*Habrocytus*) *punctipleura* Thomson, by monotypy and original designation.

Trychnosoma punctipleura (Thomson)

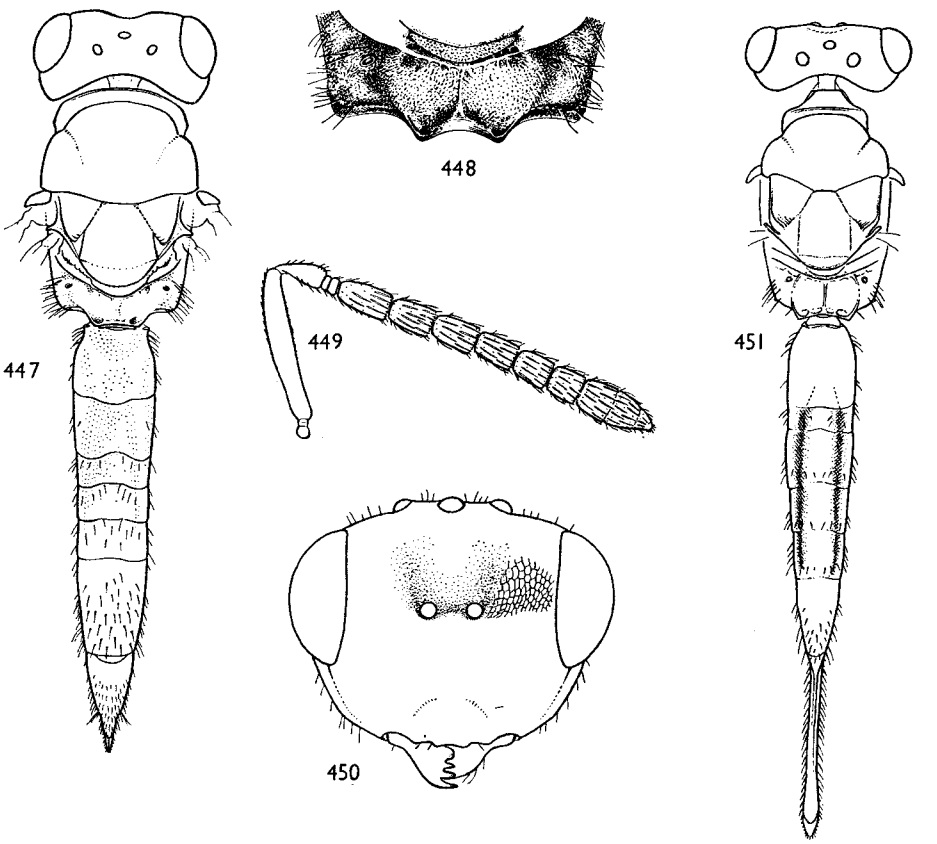
(Text-figs. 447–449)

Etroxys (*Habrocytus*) *punctipleura* Thomson, 1878 : 122–123, ♀.
Trychnosoma punctipleura (Thomson) Graham, 1957*c* : 141–142, ♀.

Type material. Syntypes, 2 ♀. Lectotype designated by Graham (1957*c* : 142). Male unknown.

ENGLAND, SWEDEN.

Biology. Unknown.



FIGS. 447–451. 447, *Trychnosoma punctipleura* (Thomson), ♀, body ; 448, same, dorsellum and propodeum ; 449, same, ♀, antenna ; 450, *Eulonchetron torymoides* (Thomson), ♀, head, frontal view ; 451, same, body.

LONCHETRON Graham

Lonchetron Graham, 1956*a* : 80. Type-species *L. fennicum* Graham, by original designation.
Lonchetron Graham ; Bouček, 1961 : 79.
Lonchetron Graham ; Peck *et al.*, 1964 : 55.

Lonchetron fennicum Graham

(Text-figs 463–467)

Lonchetron fennicum Graham, 1956*a* : 81–83, ♂ ♀.

Type material. Holotype ♀, Finland, EH., Vanaja, 1954 (*E. Valkeila*), in Zoological Museum, Helsinki.

FRANCE, FINLAND, CZECHOSLOVAKIA.

Biology. Parasite of *Spilomena enslini* Blüthgen (Hym., Sphecoidea) ; see Graham, 1956*a* : 83. Imagines July–Aug.

KALEVA Graham

Kaleva Graham, 1957*a* : 72. Type-species : *K. livida* Graham, by original designation.

KEY TO EUROPEAN SPECIES

(FEMALES)

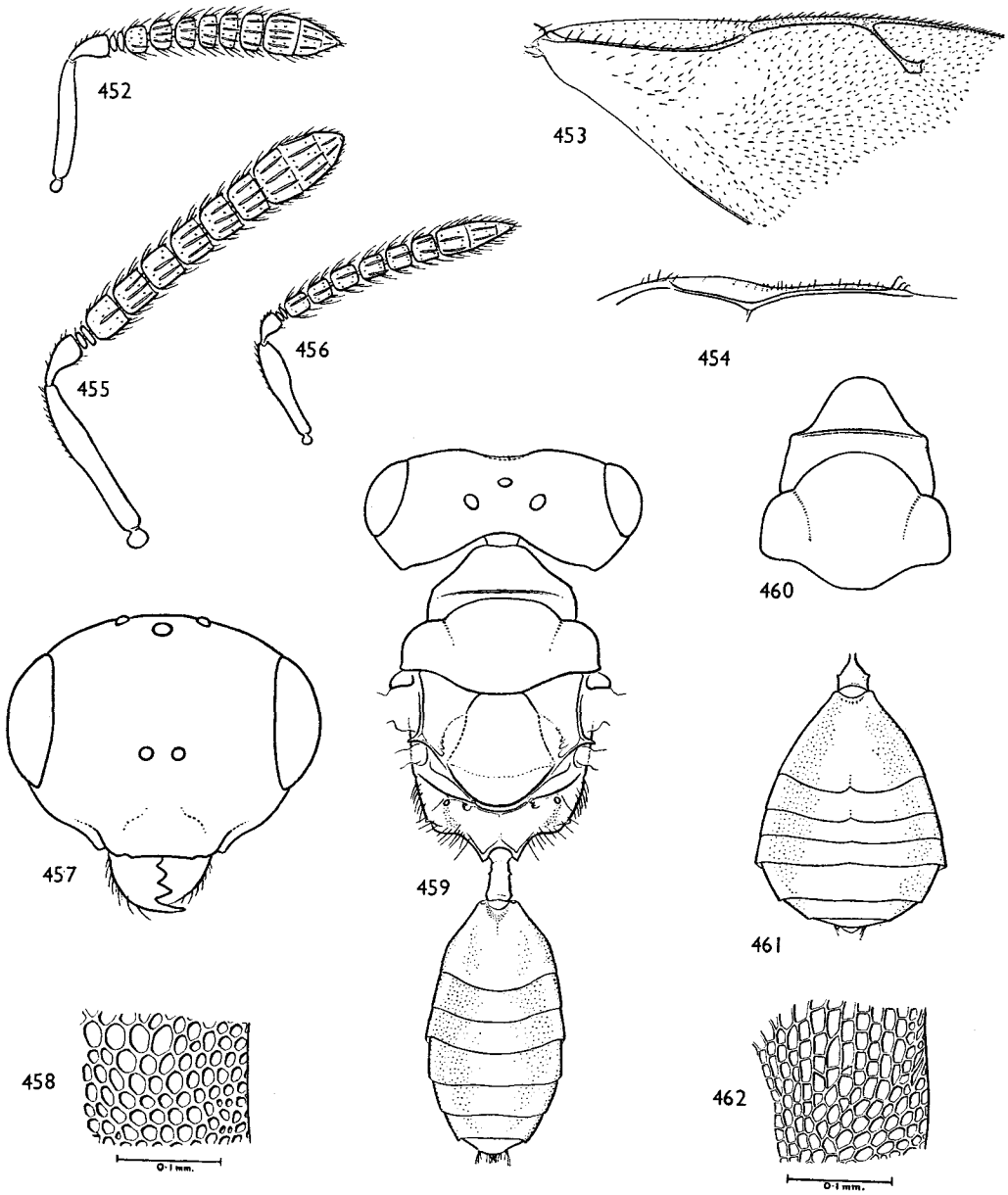
1 Mesopleuron entirely reticulate. Antenna (Text-fig. 452) with flagellum strongly clavate ; first funicular segment slightly transverse, the following segments more strongly so, the sixth nearly twice as broad as long. Head in dorsal view hardly twice as broad as long ; POL greater than OOL. Thorax about 1·75 times as long as broad. Head and thorax black with very weak violet and bronze reflections. Antennal scape black. Femora usually mainly fuscous. Structural features, text-figs. 452–454, 460–462 . . . . . ***corynocera*** Graham (p. 598)

– Mesepisternum with a partly to wholly smooth triangular area below the base of the hind wing. Antenna (Text-fig. 455) with flagellum only slightly clavate, the funicle nearly cylindrical ; funicular segments subquadrate, or the distal segments very slightly transverse. Head in dorsal view (Text-fig. 459) 2·15 to 2·2 times as broad as long ; POL less than OOL. Thorax about 1·5 times as long as broad. Head and thorax dark blue or greenish blue. Antennal scape mainly to wholly testaceous. Legs, except coxae, testaceous, with the femora at most slightly darkened. Other structural features, text-figs. 457, 458 . ***livida*** Graham (p. 598)

(MALES)

1 Mesopleuron entirely reticulate. Antenna with combined length of pedicellus and flagellum much less than breadth of head ; flagellum distinctly clavate ; first funicular segment quadrate to distinctly transverse, sixth from 1·7 times to nearly twice as broad as long ; scape hardly expanded distally, with only an indistinct boss . . . . ***corynocera*** Graham (p. 598)

– Mesepisternum with a partly to wholly smooth triangular area below the base of the hind wing. Antenna (Text-fig. 456) with combined length of pedicellus and flagellum nearly equal to breadth of head ; flagellum hardly clavate, only the clava slightly broader than the rest ; funicular segments quadrate, or the proximal ones slightly longer than broad ; scape slightly expanded in its upper half, with a long shiny boss which extends half way down . . . . ***livida*** Graham (p. 598)



FIGS. 452–462. *Kaleva* spp. 452, *corynocera* Graham, ♀, antenna ; 453, same, fore wing, part ; 454, same, hind wing, costal cell ; 455, *livida* Graham, ♀, antenna ; 456, same, ♂, antenna ; 457, same, ♀, head, frontal view ; 458, same, ♂, sculpture of frons between scrobe and eye ; 459, same, ♀, body ; 460, *corynocera* Graham, ♀, pronotum and mesoscutum ; 461, same, ♀, petiole and gaster ; 462, same, ♀, sculpture of frons between scrobe and eye.

Kaleva livida Graham

(Text-figs. 455–459)

Kaleva livida Graham, 1957*a* : 72–75, ♂ ♀.

Type material. Holotype ♀, Finland, EH, Hameenlinna, 1954 (*E. Valkeila*), in Zoological Museum of Helsinki University.

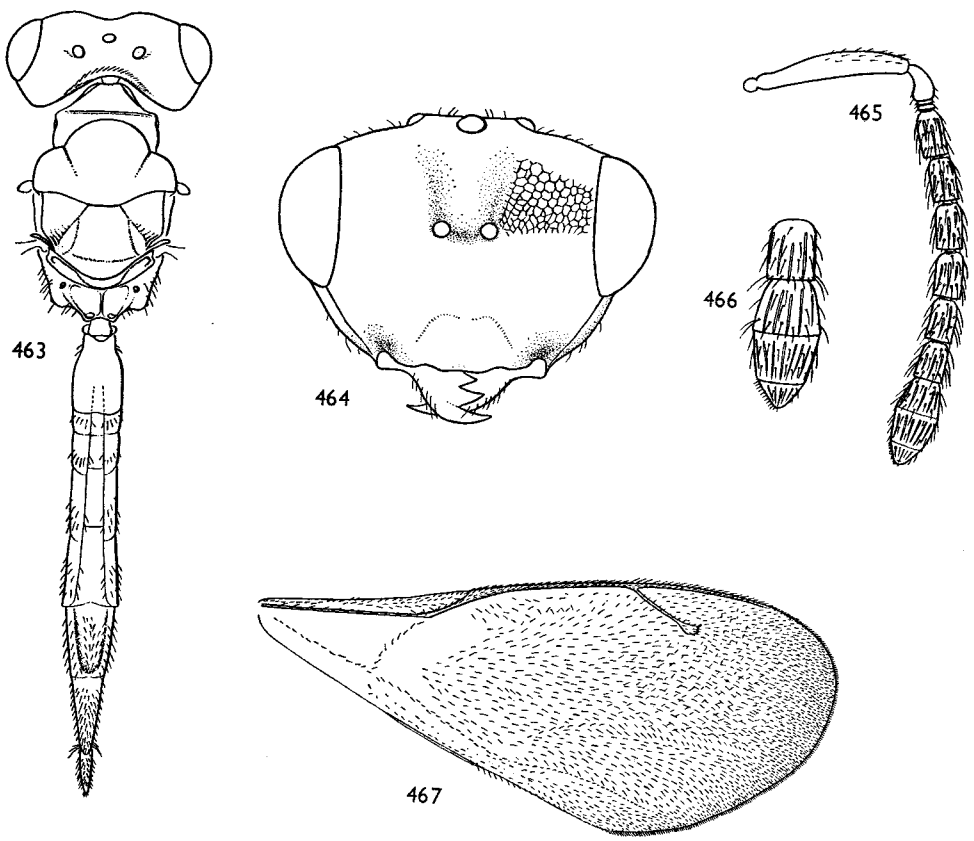
FINLAND.

Biology. Reared from *Spilomena enslini* Blüthgen in Finland, by E. Valkeila (Graham, 1957*a*).

Kaleva corynocera Graham

(Text-figs. 452–454, 460–462)

Kaleva corynocera Graham, 1957*a* : 75–76 "♂" [*recte* ♀].
Kaleva corynocera Graham ; Bouček, 1961 : 79.



FIGS. 463–467. *Lonchetron fennicum* Graham, ♀. 463, body ; 464, head, frontal view ; 465, antenna ; 466, sixth funicular segment and clava ; 467, fore wing.

Type material. Holotype ♀ [originally described in error as a male], Czechoslovakia, Hradec Králové, 25.viii.1955 (*Bouček*), in Národní Museum, Prague (Cat. no. 3028).

BRITAIN, SWEDEN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. I have reared two specimens of *corynocera*, together with *Spilomena troglodytes* (v.d.L.), from the decayed branch of an old oak (*Quercus robur* L.) found at East Wretham, Norfolk ; the parasites, which emerged in late July, 1963, may have been attacking the *Spilomena*. Imagines July–Aug.

The original specimens of *corynocera* were described as male. Bouček (1961 : 79) pointed out that this was an error and that they were really females. The reason for this mistake was that the ovipositor of female *corynocera* is very fine and concealed by the hypopygium ; whilst the gaster ventrally is unusually flat, more like that of some male Pteromalidae.

EULONCHETRON Graham **stat. n.**

Etroxys sgen. *Holcaeus* Thomson 1878 : 88, 106 [*ex parte*].
Lonchetron Graham, 1956*a* : 80, *ex parte*.
Lonchetron Graham ; Askew, 1962 : 1–3.
Lonchetron sgen. *Eulonchetron* Graham, 1966*a* : 290–291. Type-species : *Etroxys* (*Holcaeus*) *torymoides* Thomson, 1878, by original designation.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Gaster extremely elongate, including the ovipositor sheaths 3·3 to 3·7 times as long as the thorax ; distance from base of last tergite to tips of ovipositor sheaths about equal to the combined length of the preceding tergites. Legs rather more slender, especially the femora . . . . . ***scalprum*** (Askew) (p. 600)

– Gaster (Text-fig. 451) less elongate, including the ovipositor sheaths at most 2·5 times as long as the thorax ; distance from base of last tergite to tips of ovipositor sheaths distinctly less than the combined length of the preceding tergites. Legs rather less slender, especially the femora . . . . ***torymoides*** (Thomson) (p. 600)

Note. Askew (1962 : 3) stated that in female *torymoides* the antennal scape " extends well above vertex ", while in *scalprum* it " extends only slightly above vertex ". I cannot detect any real difference between the two species in this respect. The head is sometimes distorted so that the vertex is abnormally raised and the scape in consequence appears to reach less far above the vertex ; this is so in some of the type specimens in Dr. Askew's original series. I have other specimens in which the head is not at all distorted, and in these the scape reaches well above the level of the vertex.

(MALES)

1 Legs rather more slender, especially the femora ; hind femur, not counting the trochantellus, 5·3 to 5·7 times as long as broad . . ***scalprum*** (Askew) (p. 600)

– Legs rather less slender, especially the femora ; hind femur, not counting the trochantellus, about 4·5 times as long as broad . . . ***torymoides*** (Thomson (p. 600)

Eulonchetron scalprum (Askew)

Lonchetron scalprum Askew, 1962 : 1–3, ♂ ♀.
Eulonchetron scalprum (Askew), Graham, 1966*a* : 291, ♂ ♀.

Type material. Holotype ♀, England, Oxford, near Marston Ferry, July or August 1960, from gall of *Pontania viminalis* (L.) on *Salix purpurea* L., and paratypes in Hope Dept., University Museum, Oxford ; other paratypes in the collections of Askew and Graham.

BRITAIN, CZECHOSLOVAKIA ; CANADA.

Biology. Reared in England from galls of *Pontania viminalis* (L.) on *Salix purpurea* L. and *S. viminalis* × *purpurea* (*Askew, Graham*) and in Czechoslovakia (*Bouček*, unpublished). In the BM(NH) there are 4 ♀ reared from *Pontania* galls on *Salix discolor* Muhl., collected at Churchill, Manitoba, Canada, v.1958 (*Eva Beckett*). In Britain imagines appear in July and August (occasionally Sept.).

Eulonchetron torymoides (Thomson)

(Text-figs. 450, 451)

Etroxys (*Holcaeus*) *torymoides*, Thomson, 1878 : 106–107, ♂ ♀.
Lonchetron torymoides (Thomson) Graham, 1956*a* : 81, ♂ ♀.
Eulonchetron torymoides (Thomson) Graham, 1966*a* : 290–291.

Type material. Syntypes, 9 specimens. LECTOTYPE, a pinned ♀ labelled " Lp. in." [Lapponia inferioris] ; " Bhn." [Boheman] ; and " Torymoides Ths ".

BRITAIN, SWEDEN, CZECHOSLOVAKIA.

Biology. Reared from galls of *Pontania collactanea* Förster on *Salix repens* L. in Britain (see Graham, 1966a). Imagines July–Aug.

STENOMALINA Ghesquière

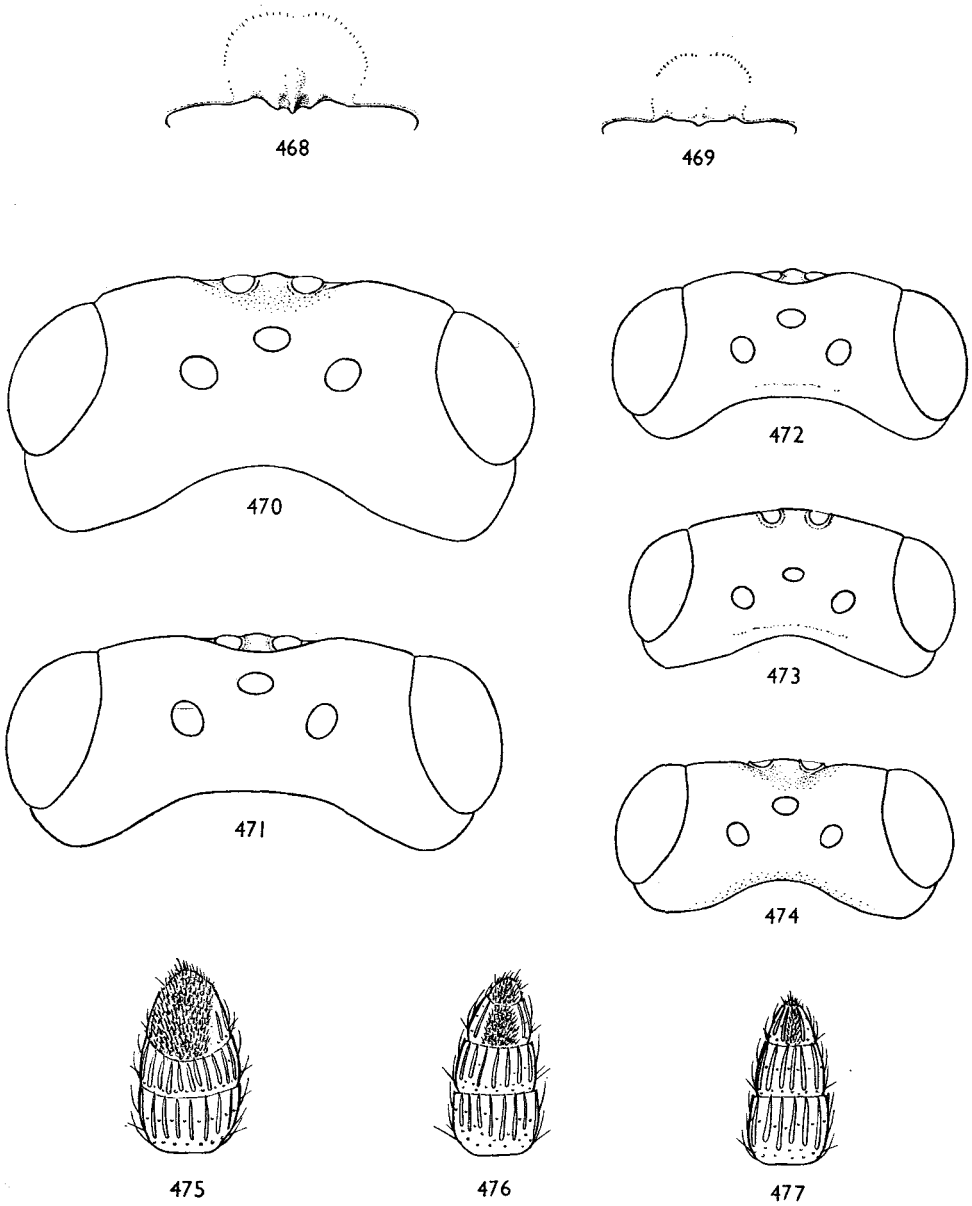
Etroxys sgen. *Stenomalus* Thomson, 1878 : 87, 88. Type-species : *S. crassicornis* Thomson, by designation of Ashmead, 1904 : 316 [pre-occ. by *Stenomalus* Gemminger & Harold, 1872].
Stenomalus Thomson ; Ashmead, 1904 : 316.
Stenomalus Thomson ; Schmiedeknecht, 1909 : 316, 317, 319–320.
Stenomalus Thomson ; Kurdjumov, 1913 : 7, 13–15.
Stenomalina Ghesquière, 1946 : 370 [n. n. for *Stenomalus* Thomson, *nec* Gemminger & Harold].
Stenomalus Thomson ; Nikol'skaya, 1952 : 226.
Stenomalina Ghesquière ; Peck *et al.*, 1964 : 51, 58.
Stenomalina Ghesquière ; Graham & Claridge, 1965 : 268–285.

For a revision of the European species of the genus, see Graham & Claridge (1965).

KEY TO EUROPEAN SPECIES

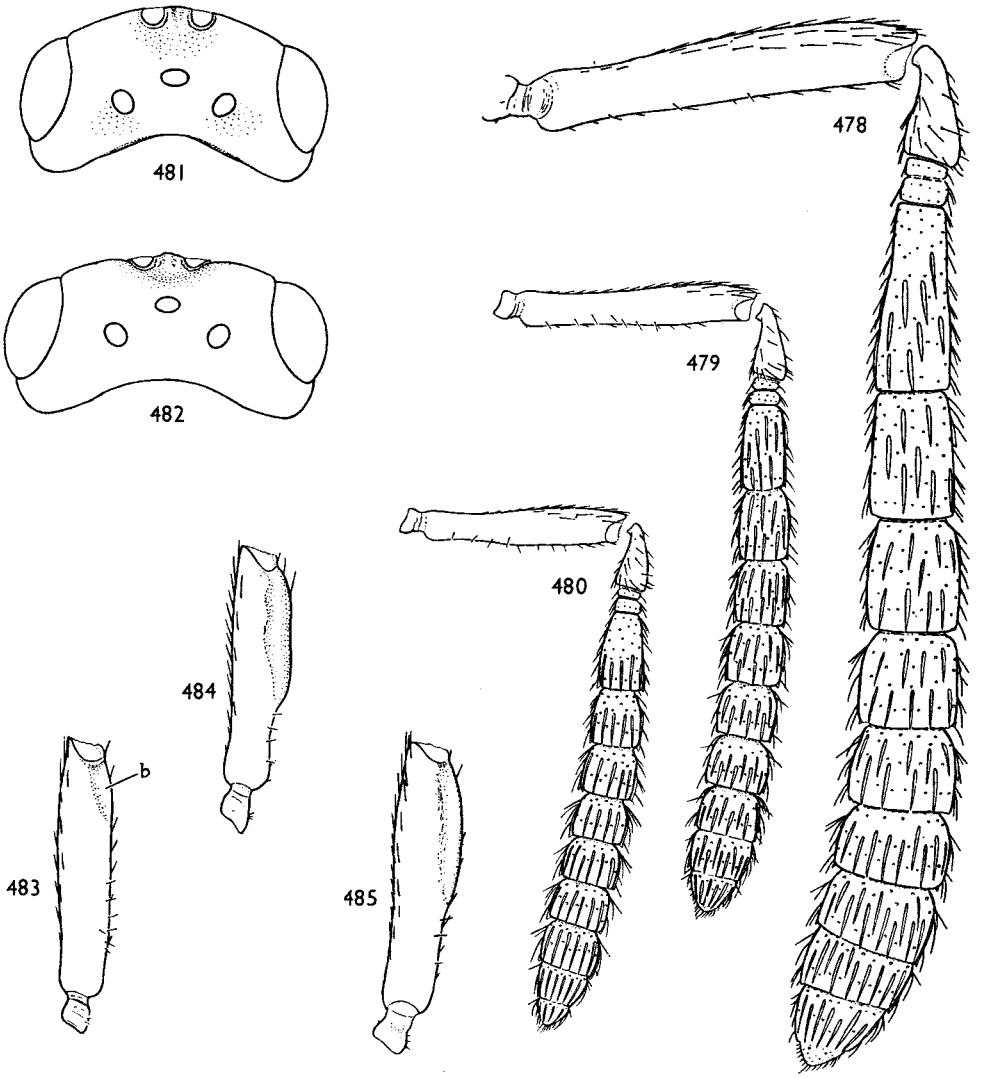
(FEMALES)

1 Anterior margin of clypeus (Text-fig. 469) with a small median tubercle only ; antennal scape unusually short, its length at most equal to the transverse diameter of an eye, not or hardly reaching the median ocellus.



FIGS. 468–477. *Stenomalina* and *Chlorocytus* spp. 468, *S. micans* (Olivier), ♀, clypeus ; 469, *C. formosus* (Walker), ♀, clypeus ; 470, *S. liparae* (Giraud), ♀, head ; 471, *S. fervida* Graham, ♀, head ; 472, *S. favorinus* (Walker), ♀, head ; 473, *S. micans* (Olivier), ♀, head ; 474, *S. muscarum* (L.) auctt., ♀, head ; 475, *S. favorinus* (Walker), ♀, antennal clava, ventral ; 476, *S. micans* (Olivier), ♀, antennal clava, ventral ; 477, *S. continua* (Walker), ♀, antennal clava, ventral.

Antenna (Text-fig. 501) with flagellum only slightly clavate ; clava in profile having the dividing lines between its segments not oblique ; first funicular segment not longer than the pedicellus ; postmarginal vein of fore wing obviously shorter than the marginal vein, the latter 2·2 to 2·5 times as long as the stigmal vein . cf. ***Chlorocytus formosus*** (Walker) (p. 619)



FIGS. 478–485. *Stenomalina* spp. 478, *fervida* Graham, ♀, antenna ; 479, *micans* (Olivier), ♀, antenna ; 480, *epistena* (Walker), ♀, antenna ; 481, *fontanus* (Walker), ♂, head ; 482, *favorinus* (Walker), ♂, head ; 483, *continua* (Walker), ♂, scape of right antenna; 484, *fontanus* (Walker), ♂, scape; 485, *illudens* (Walker), ♂ scape.

– Anterior margin of clypeus normally (Text-fig. 468) with a median tooth and a projection on either side of it, in runts of *muscarum* the lateral projections may be virtually absent, but this species has the antennal scape nearly as long as an eye and reaching slightly above the vertex 2

2 (1) Gaster conical, acuminate, much longer than head plus thorax, 3 to 3·7 times as long as broad ; last tergite 2 to 2·5 times as long as its basal breadth ; ovipositor sheaths distinctly exserted.
Antennal clava with its sutures not oblique ; tuft of micropilosity on its third segment small, extending over at most about one third the length of the clava ; fourth funicular segment quadrate . ***oxygyne*** (Walker) (p. 607)

– Gaster ovate to lanceolate-ovate, not longer than head plus thorax, at most about 2·5 times as long as broad ; last tergite at most slightly longer than its basal breadth 3

3 (2) Fourth funicular segment of antenna distinctly elongate, usually about 1·3 to 1·5 times as long as broad ; fifth usually slightly elongate, sixth most often quadrate or very slightly elongate ; combined length of pedicellus and flagellum usually distinctly greater than the breadth of the head . . 4

– Fourth funicular segment of antenna, often also the third, quadrate to slightly transverse ; fifth and sixth more or less transverse, sometimes about 1·5 times as broad as long ; combined length of pedicellus and flagellum, except in some *micans*, not greater than the breadth of the head 6

4 (3) Temples, in dorsal view of the head (Text-fig. 470), converging only slightly behind the eyes, slightly more than one third as long as the eyes. Malar space slightly more than half the length of an eye. Large species, 3·8 to 5·3 mm. . . . . ***liparae*** (Giraud) (p. 607)

– Temples converging quite strongly behind the eyes (Text-figs. 471–474), less than one third as long as the eyes. Malar space rarely so long. Size usually less 5

5 (4) First funicular segment 1·4 to 1·7 times as long as the pedicellus, 2·2 to 2·6 times as long as broad ; flagellum fusiform or clavate, fairly stout ***laticeps*** (Walker) (p. 607)

– First funicular segment at most slightly longer than the pedicellus and at most twice as long as broad ; flagellum only feebly clavate . . . 10

6 (3) Antennal clava with the dividing lines between its segments oblique as seen in profile, the patch of micropilosity (Text-fig. 475) larger and extending about half way along the clava 7

– Antennal clava with the dividing lines between its segments not or hardly oblique, the patch of micropilosity (Text-figs. 476, 477) smaller and extending over at most slightly more than one third the length of the clava 10

7 (6) Third funicular segment (Text-fig. 478) slightly to distinctly elongate, except in small specimens. Temples (Text-fig. 471) about one quarter as long as the eyes. Malar space 0·44 to 0·47 the length of an eye. Basal vein of fore wing usually bare, in one specimen with a single hair. Large species, 3·1 to 4·8 mm. Head and thorax not dark blue or bluish black ; only the fore and mid femora more or less infuscate . . ***fervida*** Graham (p. 608)

– Third funicular segment usually quadrate, rarely very slightly elongate. Temples (Text-fig. 472) about one fifth as long as the eyes. Malar space 0·37 to 0·4 times the length of an eye. Basal vein of fore wing bare or with one to nine hairs; in *favorinus*, which often has the basal vein bare, the head and thorax are dark blue to bluish black and all the femora are mainly black. Species usually smaller (1·9 to 3·9 mm.) 8

8 (7) Head and thorax dark blue to bluish black. Postmarginal vein of fore wing not, or only slightly, shorter than the marginal vein, the latter 1·65 to 1·85

times the length of the stigmal vein ; basal vein bare or with one to two hairs. All femora mainly black with a metallic tinge . ***favorinus*** (Walker) (p. 608)

– Head and thorax varying from bright blue to bronze-green, bronze, or coppery bronze. Postmarginal vein of fore wing slightly to very distinctly shorter than the marginal vein, the latter 1·8 to 2 times the length of the stigmal vein ; basal vein with two to ten hairs 9

9 (8) Head and thorax bronze to brassy or coppery bronze, rarely somewhat tinged with olive-greenish in places ; femora sometimes wholly reddish to fulvous, though often more or less infuscate, in which case the fore femora are most heavily so, the hind femora having at most a fuscous patch on their external aspect and a dark interno-dorsal stripe. Scutellum not or hardly longer than broad. Gaster 1·55 to 1·75 times as long as broad, as long as or slightly longer than the thorax. Basal vein of fore wing with two to four hairs ***dives*** (Walker) (p. 608)

– Head and thorax varying from bright blue to green or bronze-green ; femora very variable in colour, the range of coloration much as in *dives* but sometimes all the femora mainly black. Scutellum slightly longer than broad. Gaster 1·7 to 2·4 times as long as broad, somewhat longer than the thorax. Basal vein of fore wing with one to ten hairs . . ***illudens*** (Walker) (p. 608)

10 (5, 6) Combined length of pedicellus and flagellum slightly less than the breadth of the head 11

– Combined length of pedicellus and flagellum at least slightly greater than the breadth of the head 12

11 (10) Antennal toruli slightly farther from the median ocellus than from the anterior margin of the clypeus ; scape (Text-fig. 480) relatively shorter, not reaching above the ocellus ; pronotal collar less sharply margined, usually sharply margined only over about the middle third, sometimes immarginate ; marginal vein of fore wing 2 to 2·1 times as long as the stigmal vein ; femora mainly black ; tibiae often more or less broadly infuscate medially ; median area of propodeum uniformly reticulate, the median carina usually straight and sharp . . . . . ***epistena*** (Walker) (p. 610)

– Antennal toruli slightly nearer to the median ocellus than to the anterior margin of the clypeus ; scape relatively longer, reaching slightly above the vertex ; pronotal collar sharply margined except just at the sides ; marginal vein of fore wing 2·2 to 2·5 times as long as the stigmal vein ; femora usually reddish testaceous, sometimes partly or mainly brown ; tibiae pale; median area of propodeum usually with some strong wrinkles as well as the reticulation, the median carina tending to be irregular, or crossed by one to two crests . . . . . ***continua*** (Walker) (p. 610)

12 (10) Antennal toruli slightly farther from the median ocellus than from the anterior margin of the clypeus ; head in dorsal view (Text-fig. 474) with the frons not protuberant ; legs slender, mid tibia nine to ten times, first segment of mid tarsus 8 to 8·5 times, as long as broad, spur of mid tibia somewhat less than half the length of the first tarsal segment ; marginal vein of fore wing 2·2 to 2·5 times as long as the stigmal vein . ***muscarum*** (L.) auctt. (p. 611)

– Antennal toruli about equidistant from the median ocellus and the anterior margin of the clypeus, or nearer to the ocellus ; head (Text-fig. 473) with the frons somewhat protuberant ; legs stouter, mid tibia 7·5 to 8 times, first segment of mid tarsus six to seven times, as long as broad, spur of mid tibia rather more than half as long as the first tarsal segment ; marginal vein of fore wing 1·7 to 2·2 times as long as the stigmal vein . . . 13

13 (12) Antennal toruli slightly nearer to the median ocellus than to the anterior

margin of the clypeus ; flagellum virtually filiform, with sixth funicular segment quadrate.

Malar space fully half the length of an eye or even slightly more sp. indet. A. (p. 609)

– Antennal toruli about equidistant from the median ocellus and the anterior margin of the clypeus ; flagellum (Text-fig. 479) thickening slightly distad, sixth funicular segment quadrate to slightly transverse 14

14 (13) Malar space slightly less than half the length of an eye ; pronotal collar often weakly margined, if sharply so, then rarely over more than about the middle third . . . . . ***micans*** (Olivier) (p. 609)

– Malar space half the length of an eye ; pronotal collar very sharply and strongly margined, except just at the sides . . . ***iera*** (Walker) (p. 609)

(MALES)

1 Anterior margin of clypeus (Text-fig. 469) with a median tubercle only. Antennal scape slightly shorter than the transverse diameter of an eye, not or only just reaching the level of the lower edge of the median ocellus. Marginal vein of fore wing more than twice as long as the stigmal vein ; postmarginal vein obviously shorter than the marginal. All coxae metallic ; legs fairly stout ; spur of mid tibia half the length of the first tarsal segment cf. ***Chlorocytus formosus*** (Walker) (p. 619)

– Anterior margin of clypeus (Text-fig. 468) with a median tooth and a small projection on each side of it, some dwarfs of *muscarum* have these projections very weak, but in this species the antennal scape is much longer, and the fore and mid coxae are flavous. Marginal vein of fore wing often rather less than twice as long as the stigmal vein ; postmarginal vein sometimes hardly shorter than the marginal 2

2 (1) Fore and mid coxae flavous. Mesosternum, except the fore coxal acetabula, thickly clothed with subadpressed white hairs, these being particularly dense just in front of the mid coxae. Antennal scape virtually as long as an eye, reaching slightly above the vertex, tending to be a little broader in its lower part. Marginal vein of fore wing rather more than twice the length of the stigmal vein ; postmarginal vein distinctly shorter than the marginal . . . . . ***muscarum*** (L.) auctt. (p. 611)

– All the coxae metallic, or at most the fore coxae testaceous or reddish on their inner aspect. Mesosternum with a bare patch on either side of the mesolcus ; the hairs that clothe the rest of the surface are not so thickly distributed as in *muscarum*, and are slightly outstanding. Antennal scape at least very slightly shorter than an eye, not broadest in its lower part, though often slightly expanded in its upper part 3

3 (2) Temples, in dorsal view of the head, converging only slightly, more than one third as long as the eyes. Malar space half the length of an eye or even rather more. Large species, usually 4 to 5 mm. in length ; head and thorax green varied with coppery or crimson . . ***liparae*** (Giraud) (p. 607)

– Temples converging relatively strongly, and relatively shorter than in the above. Malar space often less than half the length of an eye. Species usually smaller than the above, or else the head and thorax without coppery or crimson tints 4

4 (3) Antennal scape nearly as long as an eye, with a slightly projecting shiny carina or boss extending over the upper half of its anterior edge ; antennal toruli placed approximately midway between the anterior margin of the clypeus and the median ocellus ; marginal vein of fore wing 1·8 to 1·85 times as long

as the stigmal vein ; femora and tibiae yellow, or at most the mid and hind femora reddish to brownish . . . . . ***oxygyne*** (Walker) (p. 607)

– Antennal scape clearly shorter than an eye, sometimes without a projecting carina on its anterior edge ; antennal toruli placed at least slightly nearer to the median ocellus than to the anterior margin of the clypeus ; legs often darker 5

5 (4) Antennal scape (Text-fig. 483) without a projecting carina, merely with a small shiny area (*b*) ; antennae inserted relatively high, in front view of head the toruli are not or hardly below the level of the middle of the eyes ; gaster with a distinct, often rather large, yellow spot ; legs, apart from the coxae, often wholly or mainly yellow ; marginal vein of fore wing 2 to 2·3 times as long as the stigmal vein 6

– Antennal scape (Text-figs. 484, 485) with a long slightly projecting shiny carina or boss in its upper part ; toruli situated at least slightly below the middle of the eyes ; pale spot of gaster usually indistinct, sometimes absent, rarely large ; legs often darker ; marginal vein of fore wing often shorter relative to the stigmal vein 7

6 (5) Antennal toruli situated at about level of middle of eyes ; legs, apart from coxae, yellow, with hind, less often mid, femora reddish to fuscous ***continua*** (Walker) (p. 610)

– Antennal toruli slightly below level of middle of eyes ; femora, especially mid and hind ones, often more or less infuscate ; tibiae sometimes with a fuscous band . . . . . ***epistena*** (Walker) (p. 610)

7 (5) Head in exact dorsal view (Text-fig. 481) only 1·8 to 1·9 times as broad as its maximum length, with the frons projecting in an even curve and the antennal toruli clearly visible. Flagellum rather slender, hardly as stout as the pedicellus in dorsal view ; combined length of pedicellus and flagellum 1·7 to 1·8 times the breadth of the head ; funicular segments relatively long, the first 2·5 to 3 times as long as broad ; carina of scape (Text-fig. 484) extending over nearly two-thirds of its length . ***fontanus*** (Walker) (p. 609)

– Head in dorsal view (Text-fig. 482) 2 to 2·2 times as broad as its maximum length, the frons not projecting medially. Flagellum sometimes relatively shorter and stouter, or with relatively shorter funicular segments ; carina of scape usually extending over about half its length 8

8 (7) Combined length of pedicellus and flagellum 1·7 to 1·8 times the breadth of the head ; flagellum slender, not or hardly stouter than the pedicellus when the latter is seen in dorsal view ; funicular segments relatively long, the first 2·5 to 3 times, sixth 1·6 to 1·8 times, as long as broad 9

– Either the combined length of pedicellus and flagellum is only 1·4 to 1·6 times the breadth of the head, or the funicular segments are relatively shorter, the first 1·6 to 2·5 times, sixth 1·2 to 1·6 times, as long as broad 11

9 (8) Length of antennal scape only about equal to the transverse diameter of an eye ; smaller species, 2 to 3·4 mm.
Head, text-fig. 482 . . . . . ***favorinus*** (Walker) (p. 608)

– Length of antennal scape at least slightly greater than the transverse diameter of an eye ; larger species, 3·2 to 4·5 mm. 10

10 (9) Hind femora mainly fuscous to black, mid femora more or less so beneath ; head, including occipital surface, dark blue, or partly bluish ; postmarginal vein of fore wing as long as or slightly longer than the marginal vein ***laticeps*** (Walker) (p. 607)

– Femora fulvous to reddish, the fore femora sometimes more or less infuscate ; head varied with greenish and bronze, the occipital surface sometimes bluish ;

postmarginal vein of fore wing usually slightly shorter than the marginal vein
fervida Graham (p. 608)

1 (8) Length of antennal scape (Text-fig. 485) at least slightly greater than the transverse diameter of an eye ; flagellum somewhat stouter than the pedicellus when the latter is seen in dorsal view ; combined length of pedicellus and flagellum 1·4 to 1·6 times the breadth of the head
illudens (Walker) (p. 608)

– Length of antennal scape only about equal to the transverse diameter of an eye ; flagellum sometimes rather more slender, or relatively longer . . 12

12 (11) Antennal scape 3·5 to 3·7 times as long as broad . ***favorinus*** (Walker) (p. 608)

– Antennal scape about three times as long as broad . . sp. indet. B (p. 610)

Stenomalina oxygyne (Walker)

Pteromalus oxygyne Walker, 1835 : 486, ♀.
Pteromalus dorsalis Walker, 1836 : 478, ♀.
Stenomalina oxygyne (Walker) Graham & Claridge, 1965 : 272–273, ♂ ♀.

For synonymy and designation of lectotypes see Graham & Claridge (1965 : 272–273).

BRITAIN. Uncommon.
Biology. Unknown. Imagines June–July (one record for September).

Stenomalina liparae (Giraud)

(Text-fig. 470)

? Pteromalus spectabilis Förster, 1841 : 20, ♀.
Pteromalus liparae Giraud, 1863 : 1271, ♂ ♀.
Stenomalus liparae (Giraud) Kurdjumov, 1913 : 14.
Stenomalina liparae (Giraud) Graham & Claridge, 1965 : 269, 271, 273, ♂ ♀.

For synonymy, and designation of lectotype for *liparae*, see Graham & Claridge (1965 : 273).

Probably widely distributed in EUROPE ; I have seen specimens from BRITAIN, FRANCE, DENMARK, SWEDEN, FINLAND, GERMANY and CZECHOSLOVAKIA.

Biology. A local species, associated with *Phragmites communis* Trin.; it is a solitary larval endoparasite of *Lipara lucens* Mg. (see Claridge, *in* Graham & Claridge, 1965 : 273 for further biological details and figures of the larval head). Imagines in June.

Stenomalina laticeps (Walker)

Pteromalus laticeps Walker, 1848 : 117 [*nom. nud.*].
Pteromalus laticeps (Förster MS.) Walker, 1850 : 128, ♀.
Stenomalina laticeps (Walker) Graham & Claridge, 1965 : 269, 272, 273–274, ♂ ♀.

For designation of lectotype see Graham & Claridge (1965 : 273).

BRITAIN, GERMANY ; apparently rare.
Biology. Unknown. Imagines July–Aug.

Stenomalina fervida Graham

(Text-figs. 471, 478)

Stenomalina fervida Graham, *in* Graham & Claridge, 1965 : 269, 272, 275, ♂ ♀.

BRITAIN, CZECHOSLOVAKIA ; very local, perhaps associated with *Calamagrostis*.
Biology. Unknown. Imagines in August.

Stenomalina favorinus (Walker)

(Text-figs. 472, 475, 482)

Pteromalus Favorinus Walker, 1839 : 263, ♂.
Stenomalina favorinus (Walker) Graham & Claridge, 1965 : 269, 272, 276–277, ♂ ♀.

Type material. Holotype ♂, England, Isle of Wight, in Walker coll., bearing a Waterhouse label.

BRITAIN, IRELAND, CZECHOSLOVAKIA.
Biology. Unknown ; the species appears to be associated with calcareous formations. Imagines June–July.

Stenomalina dives (Walker)

Pteromalus dives Walker, 1835 : 489, ♀.
Pteromalus Mesapos Walker, 1848 : 126, 204, ♀.
Stenomalina dives (Walker) Graham & Claridge, 1965 : 269–270, 277, ♀.

For synonymy and designation of lectotypes see Graham & Claridge (1965 : 277).

BRITAIN, IRELAND ; MOLDAVIAN S.S.R. ; uncommon.
Biology. Unknown. Imagines June–Sept.

Stenomalina illudens (Walker)

(Text-fig. 485)

Pteromalus illudens Walker, 1836 : 470, ♀.
Pteromalus gaudens Walker, 1836 : 473, ♀.
Pteromalus Hyloe Walker, 1848 : 123, 176, ♀.
Stenomalus crassicornis Thomson, 1878 : 89, [*ex parte*, lectotype ♀].
Stenomalina illudens (Walker) Graham & Claridge, 1965 : 270, 272, 278–279, ♂ ♀.

For synonymy and designation of lectotypes, see Graham & Claridge (1965 : 278–279).

Probably widely distributed in EUROPE ; very common in Britain. In summer it often gathers in swarms on the foliage of trees.

Biology. The species has been obtained from shoots of barley (see Graham & Claridge, 1965 : 279) but no more definite biological information is available. Imagines June–Oct.

Stenomalina micans (Olivier)

(Text-figs. 468, 473, 476, 479)

Chalcis micans Olivier, 1813 : 20, figs. 12, 12*a*, 12*b*, ♂ ♀.
Pteromalus bellus Walker, 1836 : 466, ♂ ♀.
? Pteromalus chloris Walker, 1836 : 467, ♂.
Stenomalus micans (Olivier) Kurdjumov, 1913 : 14–15, ♂ ♀.
Stenomalina micans (Olivier) Graham & Claridge, 1965 : 270, 279–280, ♀.

For a discussion of the synonymy and designation of lectotypes, see Graham & Claridge (1965 : 279).

The male of *micans* has not been definitely identified and breeding experiments are necessary to settle this question.

Widely distributed in EUROPE.

Biology. The species has been reared in Sweden from *Chlorops pumilionis* (Bjerk.) (see Graham & Claridge, 1965 : 280). Kurdjumov, who figured the larva and redescribed the adult, reared it as an external parasite of the larva of *Meromyza saltatrix* Mg. in stems of wheat.

Stenomalina fontanus (Walker)

(Text-figs. 481, 484)

Pteromalus Fontanus Walker, 1839 : 262, ♂.
Pteromalus Cosingas Walker, 1839 : 263, ♂.
Stenomalina fontanus (Walker) Graham & Claridge, 1965 : 272, 281, ♂.

For synonymy and designation of lectotypes see Graham & Claridge (1965 : 281)

The males here referred to as *fontanus* may actually belong to *micans* (Olivier) but this is not certain and needs to be ascertained by breeding experiments.

BRITAIN ; uncommon.

Biology. Unknown.

Stenomalina iera (Walker)

Pteromalus Iera Walker, 1844*a* : 339, ♂ ♀.
Stenomalina Iera (Walker) Graham & Claridge, 1965 : 270, 281, ♀.

Type material. Lectotype ♀ designated by Graham (*in* Graham & Claridge, 1965 : 281).

NORWAY (Alten, Finmark) ; only the syntypic material known.

Biology. Unknown.

Stenomalina sp. indet. A

Stenomalina sp. indet. A, Graham & Claridge, 1965 : 270, 281, ♀.

ENGLAND : Dorsetshire, Studland, 1 ♀, 4.vi.1950 (*A. W. Stelfox*).

Biology. Unknown.

Stenomalina sp. indet. B

Stenomalina sp. indet. B, Graham & Claridge, 1965: 272, 281, ♂.

ENGLAND : Oxfordshire, Otmoor, 1 ♂, 28.viii.1963 (*M. W. R. de V. Graham*).
Biology. Unknown.

Stenomalina epistena (Walker)

(Text-fig. 480)

Pteromalus epistenus Walker, 1835 : 493, ♀.
Pteromalus linearis Walker, 1836 : 189, ♀.
Pteromalus Crotus Walker, 1839 : 252, ♂.
Pteromalus Elyros Walker, 1848 : 125, 197, ♂.
Pteromalus Themiso Walker, 1848 : 126, 206, ♀.
Stenomalus subfumatus Thomson, 1878 : 90, ♀.
Stenomalina epistena (Walker) Graham & Claridge, 1965 : 270, 272, 281–282, ♂ ♀.

For synonymy and designation of lectotypes see Graham & Claridge (1965 : 281–282).

BRITAIN, IRELAND, SWEDEN, MOLDAVIAN S.S.R. ; rather uncommon.
Biology. Unknown. Imagines July–Sept.; females then overwinter in the foliage of coniferous trees, débris on the boles of *Quercus*, cavities in old Cynipid galls, and similar situations.

Stenomalina continua (Walker)

(Text-figs. 477, 483)

Pteromalus continuus Walker, 1836 : 471, ♀.
Pteromalus bifrons Walker, 1836 : 485, ♀.
Pteromalus Mycale Walker, 1839 : 253, ♂.
Pteromalus Nyctimus Walker, 1839 : 257, ♂.
? Pteromalus Dercyllus Walker, 1839 : 259, ♂.
Pteromalus Erasippus Walker, 1839 : 261, ♂.
Pteromalus Cerycus Walker, 1848 : 124, 178, ♀.
Stenomalus rugosus Thomson, 1878 : 90, ♀.
Stenomalus laetus Ruschka, 1912 : 242, ♂ ♀.
Stenomalus continuus (Walker) Kurdjumov, 1913 : 13.
Stenomalina continua (Walker) Claridge & Graham, 1965 : 270, 272, 282–283, ♂ ♀.

For synonymy and designation of lectotypes, see Graham & Claridge (1965 : 282–283).

Probably widely distributed in EUROPE.
Biology. Reared in Sweden from *Chlorops pumilionis* (Bjerk.) by H. Andersson (see Graham & Claridge, 1965 : 283). Imagines June–Aug.; females overwinter in the foliage of coniferous trees and similar situations.

Stenomalina muscarum (Linnaeus) auctt.

(Text-fig. 474)

Pteromalus muscarum (Linnaeus) *sensu* Walker, 1835*a* : 184, ♀ [nec *Ichneumon muscarum* Linnaeus, 1758 : 567].
Eutelus gracilis Walker, 1834 : 365, ♀.
Pteromalus aurifer Walker, 1835 : 487, ♀.
Pteromalus Thessalus Walker, 1839 : 268, ♂.
Etroxys (*Stenomalus*) *muscarum* (Linnaeus) Thomson, 1878 : 91, ♂ ♀.
Stenomalina muscarum (Linnaeus) ; Herrström, 1964 : 447, 448.
Stenomalina muscarum (Linnaeus) ; v. Rosen, 1964 : 453–454.
Stenomalina muscarum (Linnaeus) auctt. ; Graham & Claridge, 1965 : 270, 271, 283–285, ♂ ♀.

Type material. For synonymy and designation of lectotypes, see Graham & Claridge (1965 : 283–284). In that paper it was shown (pp. 283–284) that the present species could not have been the *Ichneumon muscarum* of Linnaeus ; but since the name has been consistently used in that sense, it seems desirable to maintain the usage.

Widely distributed in EUROPE and very common.

Biology. Reared in Britain from puparium of *Melanagromyza symphyti* Griff. on *Symphytum officinale* (L.) and from *Phytomyza ramosa* Hd. (see Graham & Claridge, 1965 : 284–285). Fulmek (1962 : 35, 42, 64) records the following hosts : *Agromyza apfelbecki* Strobl in Italy and Spain, *Chlorops pumilionis* (Bjerk.) in Poland, *Napomyza lateralis* (Fln.) in Belgium, *Phytomyza cineracea* Hend. in Denmark and *Tylomyza pinguis* (Fln.) in Belgium. Herrström, and von Rosen (1964), in their studies on the parasites associated with Rape (Raps) in Sweden, mentioned its having been obtained in rearings ; von Rosen (1964 : 454) suggested that it may have been attacking *Phytomyza rufipes* Mg. Imagines of both sexes may be found from June until October ; females overwinter in buildings and amongst the foliage of evergreens. Before and after hibernation, swarms of females sometimes appear in old houses, particularly on windows and ceilings (see Graham & Claridge, 1965 : 285). The species is sometimes transported on boats ; for example, on 29.ix.1956, I collected females from the windows of a deckhouse on a ferry boat going from the Isle of Wight to Lymington in Hampshire.

CHLOROCYTUS Graham

Chlorocytus Graham, 1956 : 92. Type-species : *Pteromalus pulchripes* Walker, 1836, by original designation.
Chlorocytus Graham ; Peck *et al.*, 1964 : 58.
Chlorocytus Graham ; Graham & Claridge, 1965 : 285–308.

The genus has been revised by Graham & Claridge (1965) ; for descriptions and detailed biological information see that paper. These authors remarked (1965 : 264) on the fact that no species belonging to the group of genera to which *Chlorocytus* belongs had been recorded from the Nearctic region. Since then Dr. George Wallace has sent me some species of the genus from the U.S.A., so I feel sure it will eventually be discovered also in Canada.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Anterior margin of clypeus (Text-fig. 469) with a small median tubercle or tooth. Postmarginal vein of fore wing obviously shorter than the marginal vein. Spur of mid tibia half as long as the first tarsal segment. Antenna (Text-fig. 501) inserted distinctly above ventral edge of eyes ; scape hardly reaching the median ocellus ; clava, viewed in profile, symmetrical, the lines separating its segments not oblique . . . ***formosus*** (Walker) (p. 619)

– Anterior margin of clypeus (Text-figs. 495, 496) shallowly emarginate or subtruncate medially, without any tubercle or tooth. Postmarginal vein of fore wing usually about as long as the marginal vein, though slightly shorter in two or three species. Spur of mid tibia sometimes less than half as long as the first tarsal segment. Antennal scape reaching at least to the level of the median ocellus, except, in *Ch. breviscapus*, in which the antennae are inserted practically level with the ventral edge of the eyes and the clava in profile is asymmetrical 2

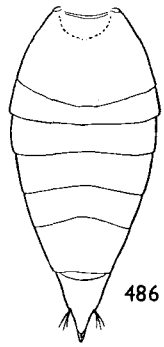
2 (1) Antenna (Text-fig. 502) with scape short, not nearly reaching the level of the median ocellus ; antennae inserted relatively low on the face, the lower edge of their toruli being hardly above the ventral edge of the eyes. Size and build much as in *Ch. pulchripes* ; combined length of pedicellus and flagellum clearly less than breadth of head, anelli relatively large, clava asymmetrical ; fore wing (Text-fig. 507) with veins rather thick, basal vein thickly pilose, usually two, three or even four irregular rows of hairs on the vein ; gaster with posterior half of basal tergite nearly always alutaceous, remaining tergites entirely or almost entirely so ***breviscapus*** Graham (p. 624)

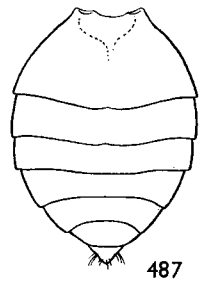
Antennal scape reaching at least the level of the lower edge of the median ocellus ; antennae inserted distinctly above the ventral edge of the eyes. Species sometimes slender with an elongate gaster ; combined length of pedicellus and flagellum often equal to or slightly greater than breadth of head ; anelli less conspicuous ; clava sometimes symmetrical ; fore wing with veins less thick, basal vein with at most one complete row of hairs, sometimes bare ; gaster with basal tergite usually smooth, sometimes weakly alutaceous along its hind margin, the three following tergites with a broad strip, behind the row of hairs, which is nearly smooth and more shiny than the rest . . 3

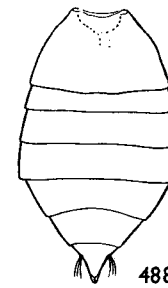
3 (2) Antennae (Text-fig. 503) inserted far above the ventral edge of the eyes, the lower edge of their toruli is situated exactly half way between the anterior margin of the clypeus and the front edge of the median ocellus ; scape reaching well above the median ocellus and usually slightly above the vertex ; funicle very slender, filiform ; clava, viewed in profile, symmetrical, the lines separating its segments not oblique ***longiscapus*** Graham (p. 619)

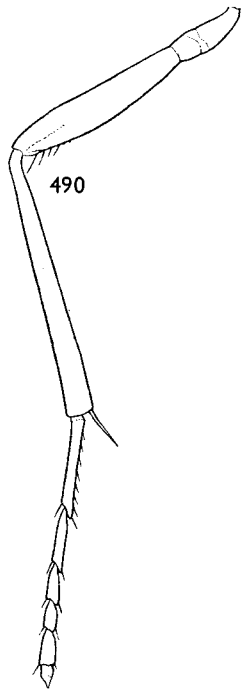
– Antennae inserted less far above ventral edge of eyes, the lower edge of their toruli situated distinctly nearer to the anterior margin of the clypeus than to the front edge of the median ocellus ; scape rarely reaching above the top of this ocellus, or if so (*phalaridis*, Text-fig. 498) then the funicle is stouter and the clava, viewed in profile, is asymmetrical, the lines separating its segments slightly oblique 4

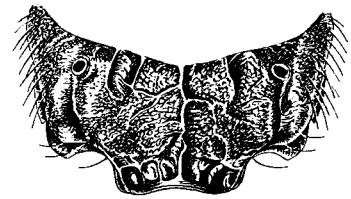
4 (3) Gaster (Text-fig. 494) lanceolate, four to five times as long as broad and nearly or quite 1·5 times the length of head plus thorax ; last tergite 1·7 to 2 times as long as its basal breadth. Propodeum much as in Text-fig. 492, about one third or slightly less than one third as long as the scutellum ; its median area hardly produced beyond the level of the hind edges of the supracoxal flanges (which are only slightly curved), weakly sculptured,

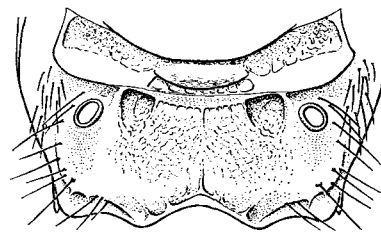


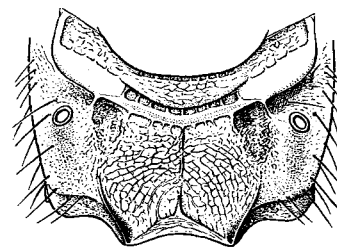


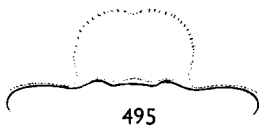


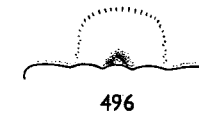












FIGS. 486–496. *Chlorocytus* spp. 486. *phalaridis* Graham, ♀, gaster ; 487, *pulchripes* (Walker), ♀, gaster ; 488, *deschampsiae* Graham, ♀, gaster ; 489, *spicatus* (Walker), ♀, gaster ; 490, same, ♀, left mid leg, excluding coxa ; 491, *pulchripes* (Walker), ♀, propodeum ; 492, *diversus* (Walker), ♀, metanotum and propodeum ; 493, *spicatus* (Walker), ♀, metanotum and propodeum ; 494, *longicauda* (Thomson), ♀, gaster ; 495, *pulchripes* (Walker), ♀, clypeus ; 496, *diversus* (Walker), ♀, clypeus.

relatively shiny, its hind margin deeply emarginate ; plicae absent, or indicated only posteriorly 20

– Gaster short ovate to lanceolate (1·4 to 3·6 times as long as broad), from about as long as the thorax to slightly longer than head plus thorax ; but even in examples having the longest gasters, the last tergite is at most 1·5 times as long as its basal breadth. Except in *Ch. diversus* Walker, the propodeum (Text-figs. 491, 493) is about half as long as the scutellum, with its median area distinctly produced behind the level of the supracoxal flanges (which are strongly curved) and more strongly sculptured, its hind margin shallowly emarginate ; the plicae are usually distinct.

Ch. diversus, in which the propodeum is like that described in the alternate part of the couplet, has the gaster at most 3·2 times as long as broad, and the last tergite hardly longer than its basal breadth. 5

5 (4) Mid leg with tibial spur half, or even slightly more than half, as long as the maximum length of the first tarsal segment ; legs relatively short and stout. In most species the antennal clava (Text-figs. 497–500) is short, in profile asymmetrical, the dorsal edge being more strongly curved than the ventral edge, with the dorsal surface of its second and third segment more densely hairy than the rest. Costal cell of fore wing without hairs upon its upper surface. Gaster often less than twice as long as broad. . . 6

– Mid leg (Text-fig. 490) with tibial spur obviously less than half the maximum length of the first tarsal segment ; legs long and slender. Antennal clava (Text-figs. 504, 506) appearing symmetrical in profile with the dorsal surfaces of its second and third segments not more densely hairy than the rest, except in *Ch. pilosus*, in which the fore wing (Text-fig. 508) has a few hairs upon the upper surface of the costal cell near its apex. Gaster 2·3 to 3·6 times as long as broad 19

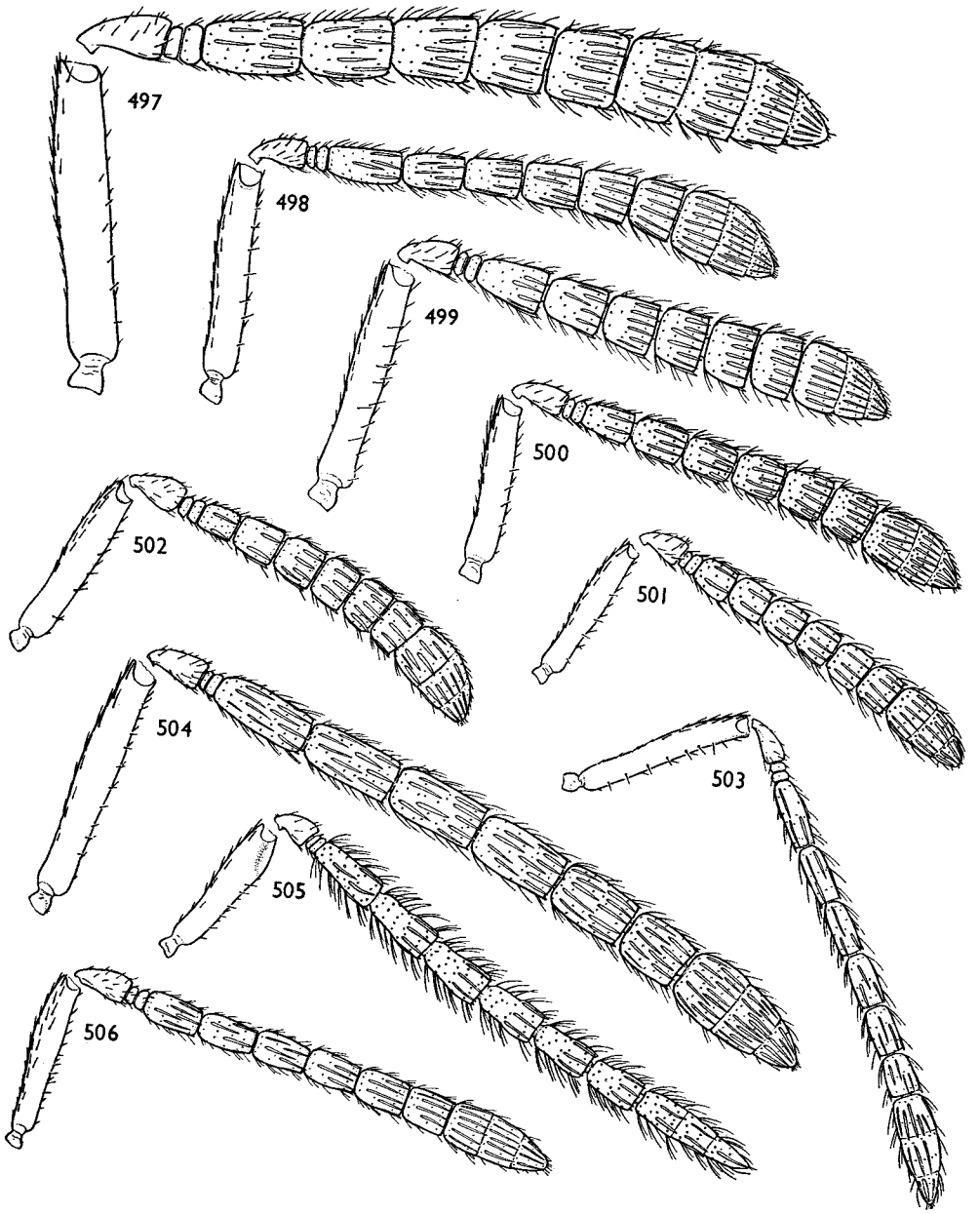
6 (5) Antennal clava (Text-figs. 497–500) in profile appearing asymmetrical, the dorsal surface of its second and third segments clothed with a dense pile of hairs ; the clava itself short, not or hardly twice as long as broad, the lines separating its segments tending to be oblique. Combined length of pedicellus and flagellum usually equal to or less than the breadth of the head, rarely very slightly greater. Pronotal collar as a rule less distinctly margined, the margin often irregular, or sharp only medially 7

– Antenna (Text-fig. 506) ; clava in profile appearing symmetrical, the dorsal surface of its second and third segments without dense pilosity ; combined length of pedicellus and flagellum usually slightly greater than, at all events not less than, the breadth of the head. Pronotal collar, except just at the sides, with a fine but sharp margin 13

7 (6) Gaster (Text-fig. 486) ovate-lanceolate to lanceolate, two to three times as long as broad, nearly or quite as long as head plus thorax, or even longer in some specimens of *phalaridis*, especially those under 2·5 mm. in length ; last tergite usually as long as, or longer than, its basal breadth ; distance from base of eighth tergite to tip of gaster usually obviously greater than the length of the basal tergite 8

– Gaster (Text-figs. 487, 488) ovate, less than twice as long as broad and not longer than the thorax ; last tergite shorter than its basal breadth ; distance from base of eighth tergite to tip of gaster less than the length of the basal tergite 9

8 (7) Tip of hypopygium situated at about one third, or slightly less, the length of the gaster. Antenna (Text-fig. 498) with proximal funicular segments relatively elongate, the fourth distinctly longer than broad ; length of



FIGS. 497–506. *Chlorocytus* spp., antennae. 497, *pulchripes* (Walker), ♀ ; 498, *phalaridis* Graham, ♀ ; 499, *deschampsiae* Graham, ♀ ; 500, *ultonicus* Graham, ♀ ; 501, *formosus* (Walker), ♀ ; 502, *breviscapus* Graham, ♀ ; 503, *longiscapus* Graham, ♀ ; 504, *longicauda* (Thomson), ♀ ; 505, *laogore* (Walker), ♂ ; 506, *spicatus* (Walker), ♀.

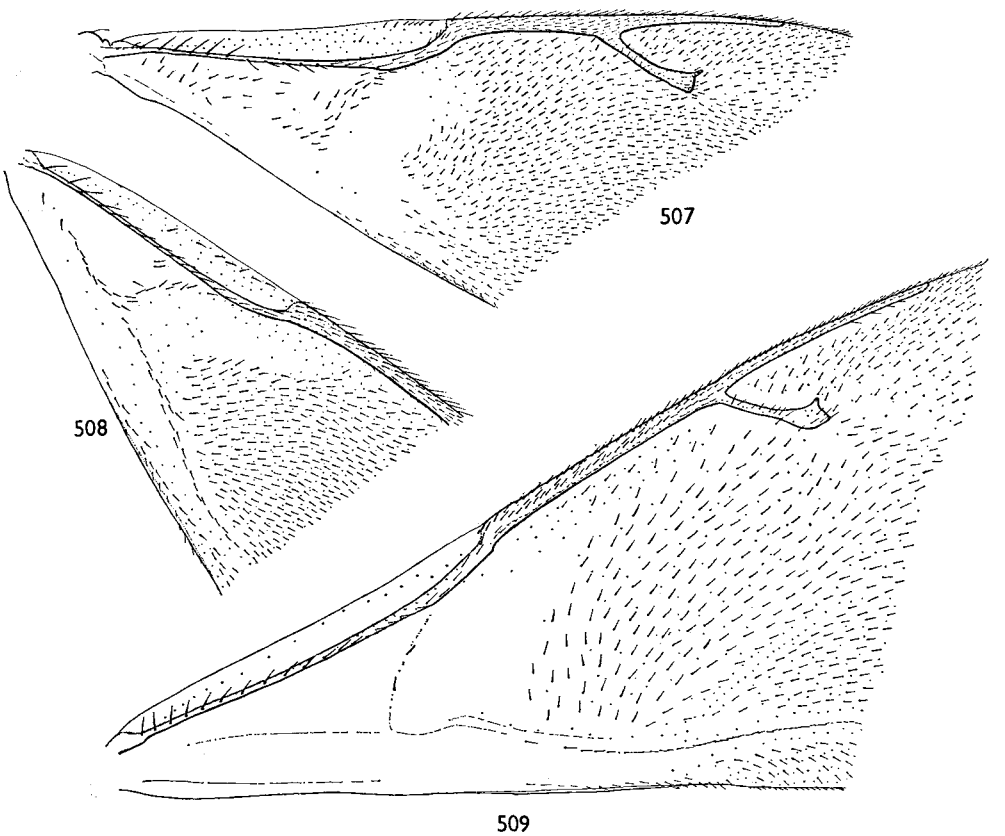
scape obviously greater than the transverse diameter of an eye. Pronotal collar sharply margined except just at the sides.

Fore wing with basal vein normally with 6 to 13 hairs, fewer in dwarfs, which have the gaster longer than head plus thorax ***phalaridis*** Graham (p. 623)

– Either the tip of the hypopygium is situated at nearly or quite half the length of the gaster ; or else the fourth funicular segment of the antenna is not longer than broad. Pronotal collar often less sharply margined . . 9

9 (8) Antenna with fourth funicular segment 1·3 to 1·5 times as long as broad, fifth very slightly elongate or quadrate. Gaster 1·4 to 1·7 times as long as broad, at most as long as the thorax ; distance from base of eighth tergite to tip of gaster less than the length of the basal tergite. Femora usually fulvous to red, occasionally infuscate basally ; mesoscutum with close-meshed reticulation, hence rather dull ; basal vein of fore wing with four to ten hairs. Large species, length 3·0 to 4·2 mm. . ***harmolitae*** Bouček (p. 622)

– Either the fourth funicular segment is quadrate or hardly longer than broad ; or the gaster is at least somewhat longer than the thorax, with the combined length of tergites eight and nine equal to or greater than the length of the



FIGS. 507–509. *Chlorocytus* spp., fore wings, part. 507, *breviscapus* Graham, ♀ ; 508, *pilosus* Graham, ♀ ; 509, *longicauda* (Thomson), ♀.

basal tergite, and the mesoscutum has wider-meshed reticulation and is more glittering. Femora often broadly infuscate basally 10

10 (9) Fore wing with basal vein bare or with one to four scattered hairs ; femora nearly always fulvous or red, rarely slightly infuscate basally. Gaster (Text-fig. 487) 1·4 to 1·7 times as long as broad, at most as long as the thorax ; distance from base of tergite eight to tip of gaster less than the length of the basal tergite. Mesoscutum with close-meshed reticulation, hence rather dull. Propodeum having well-marked spiracular sulci which are often more or less costulate transversely ; plicae short, beginning at hind margin of propodeum and curving outwards towards the spiracular sulci, where they end. Antenna with fourth funicular segment quadrate or hardly elongate.

Antenna, Text-fig. 497 . . . . . ***pulchripes*** (Walker) (p. 622)

– Either the basal vein of the fore wing has a regular row of 6 to 13 hairs ; or else all the femora are more or less broadly infuscate proximally, the gaster (Text-fig. 488) is relatively longer, with the combined length of tergites eight and nine equal to or greater than the length of the basal tergite, and the mesoscutum has wider-meshed reticulation and is more glittering. Propodeum with spiracular sulci usually shallow, sometimes nearly absent ; plicae often traceable to near the base of the propodeum, their posterior portion nearly straight 11

11 (10) Antenna (Text-fig. 500) with fourth funicular segment slightly elongate, fifth quadrate ; combined length of pedicellus and flagellum equal to breadth of head ; flagellum slender proximally, hardly stouter than the pedicellus. Antennal scape reaching to middle, or at most to the top, of median ocellus. Fore wing with basal vein bare or with up to nine hairs ***ultonicus*** Graham (p. 623)

– Antenna (Text-fig. 499) with fourth funicular segment quadrate, or even very slightly transverse, fifth slightly transverse. Flagellum sometimes rather stouter and the combined length of pedicellus and flagellum less than the breadth of the head ; if not, then the basal vein of the fore wing has a more regular row of 6 to 13 hairs 12

12 (11) Antenna with combined length of pedicellus and flagellum equal to breadth of head . . . . . ***agropyri*** Graham (p. 624)

– Antenna (Text-fig. 499) with combined length of pedicellus and flagellum slightly to distinctly less than breadth of head ***deschampsiae*** Graham (p. 623)

13 (6) All coxae mainly testaceous. Malar space short, only slightly more than one third the length of an eye.

Anterior margin of clypeus curved slightly forwards. (Pakistan) ***murriensis*** Graham (p. 621)

– At most the fore coxae partly pale. Malar space relatively longer.

European species 14

14 (13) Anterior margin of clypeus curved forwards slightly ; head in dorsal view barely twice as broad as long ; marginal vein of fore wing fully 2·5 times as long as the stigmal vein . . . . . sp. indet. A. (p. 621)

– Anterior margin of clypeus truncate or shallowly emarginate ; head in dorsal view at least slightly more than twice as broad as long ; marginal vein of fore wing usually less than 2·5 times as long as the stigmal vein . . . 15

15 (14) Propodeum (Text-fig. 492) shiny, weakly sculptured to nearly smooth, short, its median length somewhat less than half that of the scutellum, its middle part hardly produced caudad of the level of the hind edges of the supracoxal flanges ; plicae absent or indicated at the hind margin only . . . 16

– Propodeum (cf. Text-fig. 493) not so shiny, distinctly reticulate, relatively

longer, its median length from nearly half, to slightly more than half, the length of the scutellum, its middle part at least slightly produced caudad of the supracoxal flanges ; plicae sharp over at least the posterior half of the propodeum, sometimes traceable to its base 17

16 (15) Fore wing with marginal vein nearly 2·5 times as long as the stigmal vein. Clypeus without a depression in the middle of its front edge. (Czechoslovakia) . . . . . sp. indet. B. (p. 620)

– Fore wing with marginal vein 1·7 to 2 times as long as the stigmal vein. Clypeus (Text-fig. 496) with a depression in the middle of its front edge ***diversus*** (Walker) (p. 619)

17 (15) Propodeum (Text-fig. 493) medially more distinctly produced caudad of the level of the supracoxal flanges, the latter being strongly curved. Metapleuron for the most part more weakly sculptured than the mesepimeron . . . . . ***spicatus*** (Walker) (p. 621)

– Propodeum medially only slightly produced caudad of the supracoxal flanges, the latter only moderately curved 18

18 (17) Metapleuron for the most part as strongly, though more finely, reticulate than the mesepimeron. Gaster slightly longer than head plus thorax, 2·5 to 2·7 times as long as broad . . . . . ***laogore*** (Walker) (p. 620)

– Metapleuron for the most part more weakly sculptured than the mesepimeron. Gaster not or hardly longer than head plus thorax . ***inchoatus*** Graham (p. 620)

19 (5) Fore wing (Text-fig. 508) with costal cell with a short row of hairs on its upper surface in the distal half ; basal cell closed below except at its base. Antenna with combined length of pedicellus and flagellum equal to breadth of head ; flagellum distinctly clavate ; clava, in profile, appearing asymmetrical, the dorsal surface of its second and third segments with dense pilosity. Gaster similar to that of *spicatus* (q.v.) . ***pilosus*** Graham (p. 621)

– Fore wing with upper surface of costal cell glabrous (as in Text-fig. 509) ; basal cell sometimes partly open below. Antenna (Text-fig. 506) with combined length of pedicellus and flagellum a little greater than breadth of head ; flagellum only very slightly clavate ; clava, in profile, appearing practically symmetrical, without dense pilosity upon its second and third segments. Gaster (Text-fig. 489) . . . . . ***spicatus*** (Walker) (p. 621)

20 (4) Antenna with combined length of pedicellus and flagellum equal to the breadth of the head ; distal funicular segments shorter, the sixth quadrate. Legs relatively shorter and stouter ; spur of mid tibia nearly half as long as the first tarsal segment, the latter only about six times as long as its maximum thickness. Fore wing with marginal vein about 2·3 times the length of the stigmal vein . . . . . ***spenceri*** Graham (p. 622)

– Antenna (Text-fig. 504) with combined length of pedicellus and flagellum distinctly greater than the breadth of the head ; distal funicular segments relatively longer, even the sixth being slightly longer than broad. Legs longer and more slender ; spur of mid tibia distinctly less than half the length of the first tarsal segment, the latter about 7·5 times as long as thick. Fore wing (Text-fig. 509) with marginal vein 2·5 to 2·8 times as long as the stigmal vein . . . . . ***longicauda*** (Thomson) (p. 622)

Note. One species, *Ch. tenellus* (Walker) is known only from the damaged female type specimen, and has therefore been omitted from the key. I regret that it is not possible at present to give a practical key to the males of *Chlorocytus*.

Chlorocytus formosus (Walker)

(Text-figs. 469, 501)

Pteromalus formosus Walker, 1835*a* : 189, ♀.
Chlorocytus formosus (Walker) Graham & Claridge, 1965 : 268, 271, 285, 289–291, ♂ ♀.

Type material. Lectotype ♀ designated by Graham (*in* Graham & Claridge, 1965 : 290). The species was redescribed by Graham in the same paper (1965 : 289–290).

BRITAIN, IRELAND ; widely distributed but local ; AMURLAND, BM(NH) coll., one female under a Walker manuscript name " aequalis ").

Biology. Reared from stems of *Brachypodium sylvaticum* (Huds.) Beauv., together with *Tetramesa fulvicollis* (Walker), the latter possibly being its host (see Claridge *in* Graham & Claridge, 1965 : 290–291). Imagines chiefly June and July (occasionally August).

Chlorocytus longiscapus Graham

(Text-fig. 503)

? *Trigonoderus Polichna* Walker, 1848 : 128, 218, ♂.
Chlorocytus longiscapus Graham *in* Graham & Claridge, 1965 : 286, 291–292, ♀.

Type material. *Trigonoderus polichna* Walker. One male, LECTOTYPE, bearing a Waterhouse label " Hetroxys Polichna " also a printed label " Polichna ". This specimen appears to be identical with a male in my collection which may well be that of *Chlorocytus longiscapus* ; they show the unusual feature of the middle tibia being somewhat darkened medially. In view of the difficulty of associating the sexes of some *Chlorocytus* without reared material, I am not proposing a definite synonymy for the present.

Chlorocytus longiscapus Graham. Holotype ♀, England, Berkshire, Wytham Wood, 3.viii.1952 (*Graham*), in Hope Department, University Museum, Oxford.

BRITAIN, IRELAND, SWEDEN, AUSTRIA.

Biology. Unknown. Imagines July–Sept.

Chlorocytus diversus (Walker)

(Text-fig. 492)

Pteromalus diversus Walker, 1836 : 483, ♀.
Pteromalus Rhytium Walker, 1848 : 125, 198, ♂.
Pteromalus Sybritia Walker, 1848 : 126, 203, ♀.
Etroxys (*Habrocytus*) *laeviusculus* Thomson, 1878 : 121, ♂ ♀.
Chlorocytus diversus (Walker) Graham, 1956 : 94.
Chlorocytus diversus (Walker) ; Graham & Claridge, 1965 : 289, 292–294, ♂ ♀.

Type material. For synonymy and designation of lectotypes, see Graham and Claridge (1965 : 293–294) ; the species was redescribed by Graham in the same paper (1965 : 293).

BRITAIN, IRELAND, SWEDEN.

Biology. A common parasite of *Phanacis centaureae* Förster in the stems of *Centaurea* species, particularly *C. scabiosa* L. Other specimens have been reared as a parasite of the early instar larva of *Hartigia xanthostoma* Eversm.; these are morphologically indistinguishable from *diversus* reared from *Phanacis centaureae* and I consider them to be conspecific. Dr. Claridge, however, thinks that two species may be involved since the host-range is unusual (see Claridge *in* Graham & Claridge, 1965 : 295). The larva of *diversus* is figured by Claridge in the same paper (1965, figs. 5, 6). Imagines June to August.

Chlorocytus sp. indet. B.

Chlorocytus sp. indet. B, Graham, *in* Graham & Claridge, 1965 : 289, 295, ♀.

CZECHOSLOVAKIA.

Biology. Unknown.

Chlorocytus inchoatus Graham

Chlorocytus inchoatus Graham, *in* Graham & Claridge, 1965 : 289, 295–296, ♀.

Type material. Holotype ♀, England, Oxfordshire, Yarnton district, 29.iv.1957, reared from puparia of *Melanagromyza dettmeri* Hering in stem of *Centaurea nigra* L., (*M. F. Claridge*) in Hope Department, University Museum, Oxford.

BRITAIN.

Biology. Reared in Britain by Dr. Claridge, from *Melanagromyza dettmeri* Hering in stems of *Centaurea nigra* L.; and from *M. cirsii* Rond. in stems of *Senecio jacobaea* L. The larval head has been figured by Claridge (*in* Graham & Claridge, 1965, figs. 3, 4) and further remarks on the biology of the species are given by him (op. cit. : 296).

Chlorocytus laogore (Walker)

(Text-fig. 505)

Pteromalus terminalis Walker, 1836 : 476, ♀.
Pteromalus Laogore Walker, 1839 : 267, ♂.
Pteromalus terminalis Walker, 1846 : 44 [*nec* Walker, 1848 : 114].
Chlorocytus laogore (Walker) Graham & Claridge, 1965 : 289, 296–298, ♂ ♀.

Type material. For discussion of synonymy and designation of lectotypes, see Graham & Claridge (1965 : 296–298) ; in that discussion I have explained why the name *laogore* was adopted in preference to *terminalis*.

BRITAIN.

Biology. Reared as a parasite of the larvae of *Apion* sp. in the stems of *Rumex* spp. (see Claridge, *in* Graham & Claridge, 1965 : 298). Imagines in June.

[*Chlorocytus tenellus* (Walker)

Hetroxys tenellus Walker, 1874 : 319, ♀.
Chlorocytus tenellus (Walker) Graham & Claridge, 1965 : 298, ♀.

Type material. Lectotype designated by Graham (*in* Graham & Claridge, 1965 : 298) ; some descriptive notes are also given in the same place.

ASIA : Amurland (only the type material known).
Biology. Unknown.]

[*Chlorocytus murriensis* Graham

Chlorocytus murriensis Graham, *in* Graham & Claridge, 1965 : 288, 298–299, ♀.

Type material. Holotype ♀. Pakistan, Murree, 26.vi.1961, reared from pupa in stem of *Urtica* sp., in BM(NH).
Biology. See above.]

Chlorocytus sp. indet. A.

Chlorocytus sp. indet. A, Graham, *in* Graham & Claridge, 1965 : 288, 299, ♀.

ENGLAND : Berkshire, Wytham, 19.vi.1955 (*Graham*).
Biology. Unknown.

Chlorocytus spicatus (Walker)

(Text-figs. 489, 490, 493, 506)

Pteromalus spicatus Walker, 1835*a* : 97, ♀.
Pteromalus junceus Walker, 1835*a* : 182, ♀.
Pteromalus filicornis Walker, 1835*a* : 183, ♀.
Pteromalus Abila Walker, 1839 : 252, ♂.
Etroxys (*Habrocytus*) *simulans* Thomson, 1878 : 121, ♀.
Chlorocytus spicatus (Walker) ; Graham & Claridge, 1965 : 289, 299–300, ♂ ♀.

Type material. For synonymy, designation of lectotypes, and redescription of the species, see Graham & Claridge (1965 : 299–300). In that paper (p. 300) I stated that the lectotype of *Etroxys simulans* Thomson bore a label " 23 " ; this was a mistake, the specimen in fact having a pale green label " Hg " [Halsingborg].

BRITAIN, IRELAND, SWEDEN.
Biology. Reared in Britain from larvae of *Melanagromyza angelicae* (Frost) in stem of *Angelica sylvestris* L., and of *Melanagromyza lappae* Loew (see Graham & Claridge, 1965 : 300). Imagines May–July (occasionally August).

Chlorocytus pilosus Graham

(Text-fig. 508)

Chlorocytus pilosus Graham, *in* Graham & Claridge, 1965 : 289, 300–301, ♀.

Type material. Holotype ♀, England : Berkshire, Bagley Wood, 30.v.1957 (*Graham*) in Hope Department, University Museum, Oxford.

ENGLAND.
Biology. Unknown. Imagines May–June.

Chlorocytus longicauda (Thomson)

(Text-figs. 494, 504, 509)

Etroxys (*Habrocytus*) *longicauda* Thomson, 1878 : 122, ♀.
Chlorocytus longicauda (Thomson) Graham, 1956 : 94.
Chlorocytus longicauda (Thomson) ; Graham & Claridge, 1965 : 289, 301–302, ♀.

Type material. Lectotype designated by Graham (*in* Graham & Claridge, 1965 : 301).

BRITAIN, SWEDEN.
Biology. Reared in Britain from *Melanagromyza angelicae* (Frost) in stems of *Angelica sylvestris* L. and from *M. cirsii* Rond. in stems of *Senecio jacobaea* L. (see Claridge, *in* Graham & Claridge, 1965 : 301–302). Imagines June–August.

Chlorocytus spenceri Graham

Chlorocytus spenceri Graham, *in* Graham & Claridge, 1965 : 289, 302, ♀.

Type material. Holotype ♀, Spain : Barcelona, Casteldefels, 26.v.1958, reared from *Melanagromyza foeniculi* Spencer (*K. A. Spencer*) in BM(NH).

SPAIN.
Biology. See above.

Chlorocytus pulchripes (Walker)

(Text-figs. 487, 491, 495, 497)

Eutelus planus Walker, 1834 : 365, ♀.
Pteromalus pulchripes Walker, 1836 : 470, ♀.
Pteromalus Aglaope Walker, 1839 : 261, ♂.
Chlorocytus pulchripes (Walker) Graham, 1956 : 93, ♂ ♀.
Chlorocytus pulchripes (Walker) ; Graham & Claridge, 1965 : 288, 302–303, ♂ ♀.

Type material. For synonymy and designation of lectotypes, see Graham, 1956 : 94 ; 1965, *in* Graham & Claridge : 303. The species was also redescribed in the latter paper.

BRITAIN.
Biology. A parasite on stem-living Eurytomidae, mostly *Tetramesa angustipennis* (Walker) in stems of *Alopecurus pratensis* L. and *A. geniculatus* L. (see Claridge, *in* Graham & Claridge, 1965 : 303). Imagines May–June (rarely some in July).

Chlorocytus harmolitae Bouček

Chlorocytus harmolitae Bouček, 1957 : 156, figs. 1–3, ♂ ♀.
Chlorocytus harmolitae Bouček ; Graham & Claridge, 1965 : 287, 304, ♂ ♀.

Type material. Holotype ♀, Czechoslovakia, Hradec Králové-Piletice 1.vi.1952 (*Bouček*), in Národní Museum, Prague (Cat. no. 3044).

BRITAIN, FRANCE, CZECHOSLOVAKIA.

Biology. Parasite of *Tetramesa eximia* (Giraud) in stems of *Calamagrostis* spp. (see Claridge, *in* Graham & Claridge, 1965 : 304). Imagines May and June.

Chlorocytus ultonicus Graham

(Text-fig. 500)

Chlorocytus ultonicus Graham, *in* Graham & Claridge, 1965 : 288, 304–305, ♀.

Type material. Holotype ♀, England : Berkshire, Wytham Wood, 29.vi.1958 (*Graham*) in Hope Department, University Museum, Oxford.

ENGLAND, IRELAND.

Biology. Not definitely known ; some *Chlorocytus* reared from stems of *Phleum* sp. by Dr. Claridge may belong to *ultonicus*, but this is not certain.

Chlorocytus phalaridis Graham

(Text-figs. 486, 498)

Chlorocytus phalaridis Graham, *in* Graham & Claridge, 1965 : 287, 305–306, ♂ ♀.

Type material. Holotype ♀, England : Buckinghamshire, Oakley Wood, reared 5.v.1957 from shoots of *Phalaris arundinacea* L. (*M. F. Claridge*) in Hope Department, University Museum, Oxford.

BRITAIN, IRELAND.

Biology. Dr. Claridge has found that this species normally attacks *Tetramesa longicornis* (Walker) in the upper internodes of *Phalaris arundinacea* L. (see Claridge, *in* Graham & Claridge, 1965 : 306). Imagines mainly May–August (occasionally some in April).

Chlorocytus deschampsiae Graham

(Text-figs. 488, 499)

Chlorocytus deschampsiae Graham, *in* Graham & Claridge, 1965 : 288, 306–307, ♂ ♀.

Type material. Holotype ♀, England: Buckinghamshire, Oakley Wood, reared 28.v.1958 from culm of *Deschampsia* (*M. F. Claridge*), in Hope Department, University Museum, Oxford.

BRITAIN.

Biology. Parasite of some of the Eurytomid species, especially *Tetramesa petiolata* (Walker), whose larvae live above the internodes (without gall-formation) in the stems of *Deschampsia caespitosa* (L.) Beauv. (see Claridge, *in* Graham & Claridge, 1965 : 307). Imagines May–June.

Chlorocytus agropyri Graham

Chlorocytus agropyri Graham, *in* Graham & Claridge, 1965 : 288, 307, ♀.

Type material. Holotype ♀, England : Buckinghamshire, Oakley Wood, reared 6.v.1958 from culm of *Agropyron repens* (L.) Beauv. (*M. F. Claridge*), in Hope Department, University Museum, Oxford.

ENGLAND.

Biology. This species attacks the non-gall-forming Eurytomid larvae associated with *Agropyron* species, particularly *A. repens* (L.) Beauv.; its chief host is *Tetramesa cornuta* (Walker) (see Claridge, *in* Graham & Claridge, 1965 : 307). Imagines May–June.

Chlorocytus breviscapus Graham

(Text-figs. 502, 507)

Chlorocytus breviscapus Graham, *in* Graham & Claridge, 1965 : 286, 307–308, ♂ ♀.

Type material. Holotype ♀, England : Buckinghamshire, Hell Coppice, near Oakley, reared 9.v.1958 from *Calameuta filiformis* Eversm., in stem of *Calamagrostis* (*M. F. Claridge*), in Hope Department, University Museum, Oxford.

BRITAIN, HUNGARY.

Biology. Reared from *Calameuta filiformis* Eversm. in stems of *Calamagrostis epigeios* L. and from *Calameuta* in stems of *Phalaris arundinacea* L. (see Claridge, *in* Graham & Claridge, 1965 : 308).

ISOCYRTUS Walker

Isocyrtus Walker, 1833 : 462. Type-species : *I. laetus* Walker, by monotypy.
Kodysia Bouček, 1954 : 65. Type-species : *K. tibialis* Bouček, by monotypy and original designation.
Isocyrtus Walker ; Graham, 1956*b* : 255.
Isocyrtus Walker ; Peck *et al.*, 1964 : 41.
Isocyrtus Walker ; Graham & Claridge, 1965 : 308.

Kodysia Bouček was placed in synonymy with *Isocyrtus* Walker by Graham (1956*b* : 255). *Isocyrtus* was wrongly interpreted by Thomson (1878).

So far only one species of the genus is known.

Isocyrtus laetus Walker

Isocyrtus laetus Walker, 1833 : 466, ♀.
Chrysolampus contractus Nees, 1834 : 130, ♀.
Kodysia tibialis Bouček, 1954 : 29 (426) : 65, ♂ ♀.
Isocyrtus laetus Walker ; Graham, 1956*b* : 255.
Isocyrtus laetus Walker ; Graham & Claridge, 1965 : 308–309, ♂ ♀.

Type material. *Isocyrtus laetus* Walker. One female and one male stand under

this name, but the male was not described. LECTOTYPE, the female specimen, bearing a Waterhouse label.

Chrysolampus contractus Nees. Type material lost. Placed in synonymy with *laetus* (Walker) by Bouček (1961 : 72) ; this synonymy seems reasonable and is followed here. It is supported by a manuscript note in Walker's annotated copy of his *List of Hymenopterous Insects in the British Museum* (part 1, 1846) ; on page 34 he has written against *Isocyrtus laetus* " =*Chrysolampus contractus*". As the Nees collection was for some years on loan to Westwood, the latter may have informed Walker of the synonymy.

Kodysia tibialis Bouček. Holotype ♀, Western Moravia, Hodice at Jihlava, 7.vi.1953 (*Kodys*), in Národní Museum, Prague (Cat. no. 3013).

BRITAIN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Unknown ; the species occurs in grassy situations and is probably associated with some host on Gramineae. Imagines May–June in England and Czechoslovakia ; into July in Scotland.

PSILONOTUS Walker

Psilonotus Walker, 1834 : 168, 179. Type-species : *Ps. adamas* Walker, by monotypy.
Psilonotus Walker; Förster, 1856 : 60, 62.
Eutelus sgen. *Psilonotus* Walker ; Thomson, 1878 : 70, 81–83.
Psilonotus Walker ; Ashmead, 1904 : 317.
Psilonotus Walker ; Schmiedeknecht, 1909 : 322, 324.
Psilonotus Walker ; Kurdjumov, 1913 : 4.
Psilonotus Walker ; Nikol'skaya, 1952 : 224.
Janvartsovia Nikol'skaya, 1954 : 412. Type-species : *J. betulae* Nikol'skaya, by monotypy and original designation.
Psilonotus Walker ; Graham, 1957*d* : 230–232.
Janvartsovia Nikol'skaya ; Graham, 1958 : 120.
Psilonotus Walker ; Peck *et al.*, 1964 : 52.

The genus *Janvartsovia* was synonymized with *Psilonotus* by Graham (1958 : 120). In my earlier paper (1957*d* : 231–232) I stated that none of the types of Walker's *Psilonotus* species could be found. Since then I have located all of them ; some had been placed (probably by J. Waterston) in a drawer apart from the main collection of the BM(NH), whilst another was found in Haliday's collection in Dublin. The synonymy can therefore be completed and the species objectively defined.

All the species occur on *Betula* spp.

KEY TO EUROPEAN SPECIES

(MALES AND FEMALES)

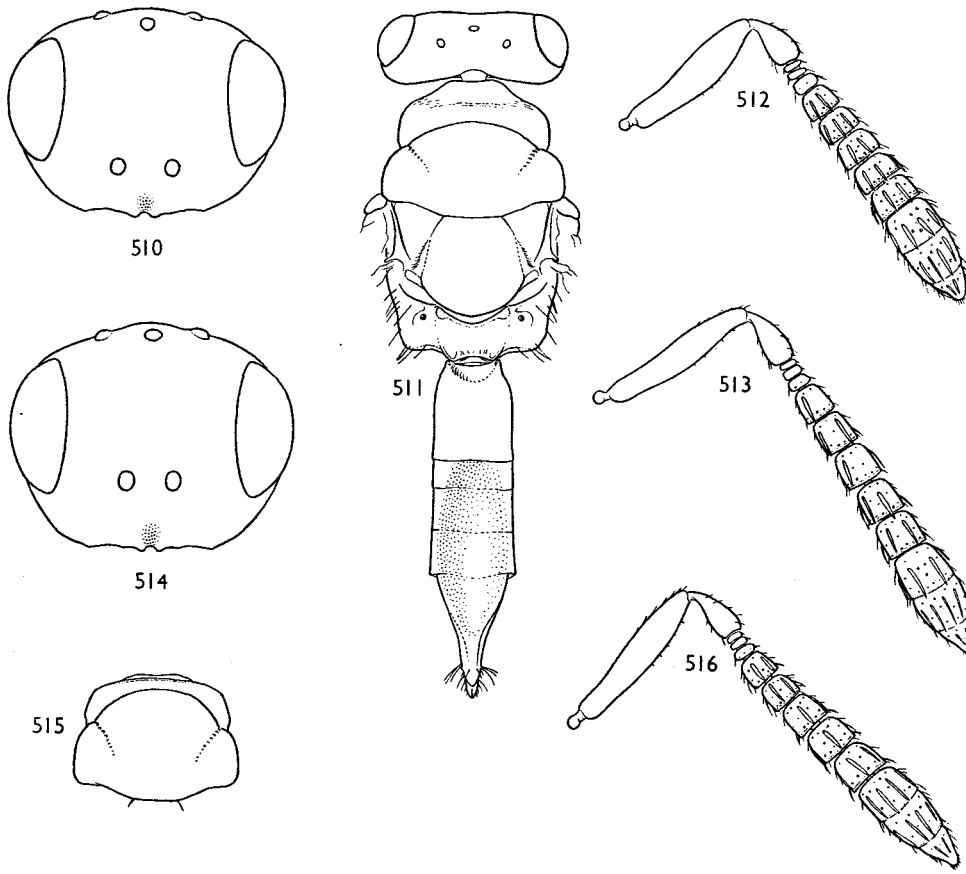
1 *Both sexes* with pronotum (Text-fig. 511) longer ; the collar longer medially, not distinctly margined in front, but almost rounded off into the pronotal neck, which does not slope vertically; antenna (Text-fig. 512) with combined length of pedicellus and flagellum at most equal to breadth of head, scape relatively broad, flagellum relatively more clavate, distal segments of funicle

strongly transverse ; plicae of propodeum incomplete or absent. *Female* only with scutellum nearly flat . . . . . ***adamas*** Walker (p. 627)

– *Both sexes* with pronotum (Text-fig. 515) short, the collar very short medially, finely margined in front hence sharply marked off from the pronotal neck, which slopes almost vertically ; antennae (Text-figs. 513, 516) with scape relatively more slender, flagellum less clavate, distal segments of funicle not or only slightly transverse ; plicae of propodeum usually complete, sometimes quite sharp. *Female* with scutellum relatively more convex . . 2

2 (1) *Female* with antennae (Text-fig. 513) inserted slightly below level of ventral edge of eyes (as in *adamas*, text-fig. 510) ; combined length of pedicellus and flagellum slightly greater than breadth of head ; flagellum more slender with all the segments of the funicle subquadrate ; scutellum weakly convex, as broad as long. *Male* with antennae inserted at or slightly below the level of the ventral edge of the eyes . . . . . ***achaeus*** Walker (p. 627)

– *Female* with antennae (Text-fig. 516) inserted slightly above level of ventral



FIGS. 510–516. *Psilonotus* spp. 510, *adamas* Walker, ♀, head ; 511, same, ♀, body ; 512, same, ♀, antenna ; 513, *achaeus* Walker, ♀, antenna ; 514, *hortensia* Walker, ♀, head ; 515, same, ♀, pronotum and mesoscutum ; 516, same, ♀, antenna.

edge of eyes (Text-fig. 514) ; combined length of pedicellus and flagellum not greater than breadth of head ; flagellum less slender with distal segments of funicle slightly transverse ; scutellum moderately convex, slightly longer than broad. *Male* with antennae inserted slightly above the level of the ventral edge of the eyes . . . . . ***hortensia*** Walker (p. 628)

Psilonotus adamas Walker

(Text-figs. 510–512)

Psilonotus Adamas Walker, 1834 : 179, ♀.
Psilonotus Adamas Walker ; Haliday, 1841–1842 : v, pl. B, fig. 2, ♀.
Psilonotus catuli Förster, 1856 : 62, ♀.
Eutelus (*Psilonotus*) *aureolus* Thomson, 1878 : 82, ♀.
Janvartsovia betulae Nikol'skaya, 1954 : 413, ♂ ♀.
Psilonotus adamas Walker ; Graham, 1957*d* : 230, 232, ♂ ♀.
Psilonotus adamas Walker ; Graham, 1958 : 120.

Type material. *Psilonotus adamas* Walker. Syntypes, 2 ♀ ; LECTOTYPE, the second, bearing a Waterhouse label. It agrees with my earlier interpretation (1957*d* : 230, 231) of the species.

Psilonotus catuli Förster. Syntypes, a mixed series in Förster coll., Vienna. Lectotype ♀ designated by von Rosen (1958 : 237) ; it is labelled " Frankf. Birkenkätzchen " and marked with a red ticket.

Eutelus (*Psilonotus*) *aureolus* Thomson. Lectotype ♀ designated by Graham (1957*d* : 230).

Janvartsovia betulae Nikol'skaya. Syntypes, 1 ♀ and 3 ♂, Russia, Yanvartsevo, near R. Ural, 2.viii.1950, reared (*A. V. Vyrshikovskaya*), in Zoological Museum, Leningrad. The species was placed in synonymy with *Psilonotus adamas* Walker by Graham (1958 : 120).

BRITAIN, SWEDEN, GERMANY, U.S.S.R.

Biology. Reared from seeds of *Betula*, which bore gall-like swellings and were infested by the Cecidomyiid fly *Semudobia betulae* Winn., in U.S.S.R. (Nikol'skaya, 1954). Earlier Mayr (1903 : 387, footnote) recorded having reared *Psilonotus catuli* Förster from birch catkins deformed by the above Cecidomyiid. Imagines June–Aug. (one record for Oct.).

Psilonotus achaeus Walker

(Text-fig. 513)

Psilonotus Achaeus Walker, 1848 : 105, 161, ♀.
Pteromalus Cyamon Walker, 1848 : 123, 176, ♂.
Psilonotus viridulus Thomson, 1878 : 83, ♀.
Psilonotus achaeus Walker ; Graham, 1957*d* : 231, 232, ♂ ♀.

Type material. *Psilonotus achaeus* Walker. One female, LECTOTYPE bearing a Waterhouse label, was found in BM(NH).

Pteromalus cyamon Walker and *Psilonotus viridulus* Thomson. Lectotypes designated by Graham (1957*d* : 231).

BRITAIN, SWEDEN, GERMANY.

Biology. Associated with *Betula* but host not yet determined. Imagines June–August.

Psilonotus hortensia Walker

(Text-figs. 514–516)

Psilonotus Hortensia (Haliday MS.) Walker, 1846*a* : 113, ♂ ♀.
Psilonotus alticornis Graham, 1957*d* : 232, ♂ ♀, **syn. n.**

Type material. *Psilonotus hortensia* Walker. There is one female so labelled in BM(NH) but it disagrees with the description in having the legs much too dark. LECTOTYPE, a ♀ in the Haliday collection (no. 1708), bearing a white label " hortensia " in Haliday's handwriting.

Psilonotus alticornis Graham. Holotype ♀, England : Berkshire, Bagley Wood, 31.vii.1954, in Hope Department, University Museum, Oxford.

BRITAIN.

Biology. Unknown ; the species occurs with *adamas* and *achaeus* on *Betula*, but is more uncommon. Imagines June–Sept.

Note. Eutelus betulae Girault (1917*b* : 93) from Albany, New York, U.S.A., host *Semudobia betulae*, might well belong to *Psilonotus*. I have not seen the species.

ANOGMUS Förster

Anogmus Förster, 1856 : 59, 61. Type-species : *A. strobilorum* Thomson, 1878, by subsequent reference.
Anogmus Förster, Giraud, 1877 : 427.
Roptrocerus sgen. *Anogmus* Förster ; Thomson, 1878 : 83, 85.
Eutelus (*Platytermus*) Thomson, 1878 : 77 [*ex parte*].
Anogmus Förster ; Ashmead, 1904 : 323.
Anogmus Förster ; Kurdjumov, 1913 : 3.
Anogmus Förster ; Erdös, 1948*a* : 2–7, 9.
Platythorax Erdös, 1948*a* : 4, 6. Type-species : *Eutelus piceae* Ruschka, by original designation.
Anogmus Förster ; Nikol'skaya, 1952 : 214.
Anogmus Förster ; Bakke, 1955 : 177–187.
Anogmus Förster ; Graham, 1957*d* : 233–235.
Anogmus Förster ; Peck *et al.*, 1964 : 49, 52.
Anogmus Förster ; Bouček, 1966*a* : 52–57.

The genus has just been revised by Bouček (1966*a*) who gives a key to the European species, one of which is described as new, information on distribution and biology, and a discussion of some synonymy. My own key to the European species was produced independently and to a slight extent uses characters not employed by Bouček. I think it will be a useful complement to his key ; I have modified it to include his new species.

All the European species develop in cones of coniferous trees, where they attack

Cecidomyiidae or (occasionally) other insects. Five of the species are associated mainly with spruce (*Picea*), one with larch (*Larix*).

Key to European Species

(Females)

1 Upper subtriangular area of mesepisternum, below base of hind wing, more weakly sculptured and more shiny than the rest of the mesopleuron, with delicate engraved reticulation, or partly smooth. Antennal formula 11353 or 11263 2

– Entire mesopleuron relatively dull, with strong reticulation which is slightly raised above the general surface. Antennal formula 11353 . . 5

2 (1) Lower edge of antennal toruli below the level of the ventral edge of the eyes ; antennal formula 11353 ; combined length of pedicellus and flagellum virtually equal to breadth of head ; funicular segments slightly longer than broad, or at most the distal segments quadrate. Frons with numerous distinct piliferous punctures amongst the reticulation ***hungaricus*** (Erdös) (p. 630)

– Lower edge of antennal toruli at or slightly above the level of the ventral edge of the eyes ; antennal formula 11353 or 11263 ; combined length of pedicellus and flagellum less than breadth of head ; proximal segments of funicle quadrate to slightly transverse, distal segments at least slightly transverse. Frons with less numerous and less distinct piliferous punctures 3

3 (2) Ovipositor sheaths strongly exserted, to a length at least slightly more than one third that of the hind tibia. Antennal formula 11353 ***strobilorum*** Thomson (p. 630)

– Ovipositor sheaths only slightly exserted. Antennal formula 11353 or 11263 4

4 (3) Antennal formula 11353. Combined length of dorsellum and propodeum, in the median line, about two thirds that of the scutellum. Antennae and legs fuscous, only the knees, apices of tibiae, and bases of tarsi pale ***laricis*** Bouček (p. 631)

– Antennal formula 11263. Combined length of dorsellum and propodeum only about half that of the scutellum. Antennal scape normally more or less testaceous, legs relatively paler than in *laricis* ***hohenheimensis*** (Ratzeburg) (p. 631)

5 (1) Gaster 1·3 to 1·5 times as long as head plus thorax, 2 to 2·5 times as long as broad. Fore wing with marginal vein about twice as long as the stigmal vein ; postmarginal vein shorter than the marginal. Legs darker ; femora, and sometimes the tibiae, extensively darkened . ***piceae*** (Ruschka) (p. 632)

– Gaster not or only slightly longer than head plus thorax, 1·5 to 1·8 times as long as broad. Fore wing with marginal vein about 1·7 times as long as the stigmal vein ; postmarginal vein hardly shorter than the marginal. Legs paler ; femora and tibiae testaceous, or only the hind femora darkened ***vala*** (Walker) (p. 632)

(Males)

1 Upper subtriangular area of mesepisternum, below base of hind wing, more weakly sculptured and more shiny than the rest of the mesopleuron, with delicate engraved reticulation, or partly smooth. Genae curved as seen in frontal view of head. Either the antennal formula is 11263 ; or the lower edge of the toruli is below the level of the ventral edge of the eyes . . 2

– Entire mesopleuron relatively dull, with strong reticulation which is slightly raised above the general surface. Genae, in frontal view of head, appearing prominent or angulate just above the bases of the mandibles. Antennal

formula 11353 ; lower edge of toruli slightly above the ventral edge of the eyes 5

2 (1) Antennae with lower edge of toruli below level of ventral edge of eyes ; antennal formula 11353 ; flagellum relatively slender ; proximal segments of funicle quadrate to slightly elongate, distal segments at most very slightly transverse. Oral fossa large, its breadth 3·5 to 4 times the malar space ***hungaricus*** (Erdös) (p. 630)

– Antennae with lower edge of toruli level with or slightly above the ventral edge of the eyes ; antennal formula 11263 ; flagellum, except in *laricis*, relatively stouter ; sometimes all the funicular segments are slightly transverse. Oral fossa relatively smaller, its breadth 2·5 to 3 times the malar space. 3

3 (2) Antenna with funicle yellowish at least distally, the clava black ; all funicular segments usually slightly transverse . . ***strobilorum*** Thomson (p. 630)

– Antenna with flagellum, at least dorsally, uniformly brown or fuscous ; proximal segments of funicle subquadrate or slightly longer than broad . . 4

4 (3) Combined length of dorsellum and propodeum (in median line) somewhat more than half that of the scutellum. Pronotal collar sharply margined over about its middle third. Antennal flagellum relatively slender ; most of the funicular segments tending to be slightly longer than broad ***laricis*** Bouček (p. 631)

– Combined length of dorsellum and propodeum only about half that of the scutellum. Pronotal collar usually weakly margined. Antennal flagellum relatively thick ; funicular segments usually quadrate ***hohenheimensis*** (Ratzeburg) (p. 631)

5 (1) Antenna with scape distinctly dilated above the middle ; clava dark except apically, but the fifth segment of the funicle pale . ***piceae*** (Ruschka) (p. 632)

– Antenna with scape not or hardly dilated ; fifth segment of funicle, as well as the clava, dark . . . . . ***vala*** (Walker) (p. 632)

Anogmus strobilorum Thomson

Roptrocerus (*Anogmus*) *strobilorum* Thomson, 1878 : 85, ♂ ♀.
Anogmus strobilorum Thomson ; Erdös, 1948*a* : 4, 5, 6, 7, 9, ♂ ♀.
Anogmus strobilorum Thomson ; Bakke, 1955 : 184–187, ♂ ♀.
Anogmus strobilorum Thomson ; Graham, 1957*d* : 233.
Anogmus strobilorum Thomson ; Bouček, 1966*a* : 53, 56, ♂ ♀.

Type material. Several specimens on 6 pins ; a lectotype has not yet been selected.

BRITAIN, SWEDEN, NORWAY, GERMANY, CZECHOSLOVAKIA, HUNGARY, ? RUMANIA, U.S.S.R.

Biology. Reared in Norway, probably from *Kaltenbachiola strobi* (Winn.), on *Picea*, by Bakke (1955, 1956, 1963) ; and in Bavaria, probably as parasite of *Plemeliella abetina* Seitn. (Holste, 1922). There are specimens in BM(NH) which are said to have been reared in Scotland from *Megastigmus spermatrophus* Wachtl ; it is desirable to have this record confirmed, as it seems likely to be incorrect.

Anogmus hungaricus (Erdös)

Platythorax hungaricus Erdös, 1948*a* : 4, 5, 7, 8–9, ♂ ♀.
Anogmus hungaricus (Erdös) Bakke, 1956 : 43–45, ♂ ♀.

Anogmus hungaricus (Erdös) ; Graham, 1957*d* : 235.
Anogmus hungaricus (Erdös) ; Bouček, 1966*a* : 53, 56, ♂ ♀.

Type material (not seen). Syntypes in coll. Erdös, Tompa, Hungary.

SWEDEN, NORWAY, GERMANY, HUNGARY, U.S.S.R.

Biology : Parasite of *Kaltenbachiola strobi* (Winn.) and *Coprodiplosis coni* Kieff. in the Carpathian Basin, according to Györfi (1956) ; Bakke (1963) records only the former host in Norway.

Anogmus hohenheimensis (Ratzeburg)

Pteromalus Hohenheinensis Ratzeburg, 1844*a* : 198 [*hohenheimensis* in Index, p. 222].
Platythorax conobius Erdös, 1948*a* : 4, 5, 7–8, ♂ ♀.
Anogmus hohenheimensis (Ratzeburg) Bakke, 1956 : 46–47, ♂ ♀.
Anogmus hohenheimensis (Ratzeburg) ; Bouček, 1966*a* : 53, 54–55, ♂ ♀.

Type material. *Pteromalus hohenheimensis* Ratzeburg. Types presumed lost.

Platythorax conobius Erdös. Location of type material not known to me (possibly some in coll. Erdös).

Von Rosen (1959 : 133) used the name *einersbergensis* (Ratzeburg) for the present species, following Kurdjumov (1913 : 10), who had, without further comment, placed *Pteromalus hohenheimensis* Ratzeburg in synonymy with *P. einersbergensis* Ratzeburg, 1844. When describing *P. einersbergensis* Ratzeburg (1844*a* : 198) stated that he had two females, one of which emerged from leaf-galls on beech (*Fagus*), the other being taken on spruce [Fichte]. Clearly the first-mentioned female could not have belonged to *Anogmus*, while the identity of the female from spruce is far from clear. On the other hand *P. hohenheimensis*, reared " aus Fichtenzapfen " (Ratzeburg, 1844*a* : 198) appears well substantiated. Bouček (1966*a* : 54) who also discusses the question, holds the same view.

NORWAY, GERMANY, POLAND, CZECHOSLOVAKIA, HUNGARY, RUMANIA, U.S.S.R.

Biology. The true host of *hohenheimensis* is *Plemeliella abietina* Seitner, according to the careful researches of Madziara-Borusiewicz in Poland (1965), although other hosts have been recorded (see Bouček, 1966*a* : 55).

Anogmus laricis Bouček

Anogmus laricis Bouček, 1966*a* : 53, 55, ♂ ♀.

Type material. Holotype ♀, Italy, South Tyrol, Ahrntal, St. Peter, from larch cones, 1963 (*E. Schimitschek*), in Národní Museum, Prague ; 3 paratypes in the same collection.

ITALY (South Tyrol).

Biology. Reared from cones of larch (*Larix* sp.), probably from the larch-seed fly *Chortophila laricicola* Macq. (Dipt., Anthomyiidae) ; see Bouček (1966*a* : 55).

Anogmus piceae (Ruschka)

Eutelus piceae Ruschka, 1922 : 161, ♂ ♀.
Platythorax piceae (Ruschka) Erdös, 1948*a* : 4, 5, 7, ♂ ♀.
Eutelus piceae Ruschka ; Bakke, 1955 : 177–181, ♂ ♀.
Anogmus piceae (Ruschka) Graham, 1957*d* : 233–234, ♂ ♀.
Anogmus piceae (Ruschka) ; Bouček, 1966*a* : 53, 54, ♂ ♀.

Type material. Lectotype ♀ designated by Graham (1957*d* : 233).

NORWAY, SWEDEN, GERMANY, AUSTRIA, CZECHOSLOVAKIA, HUNGARY, RUMANIA, U.S.S.R.

Biology. Develops in spruce-cones as a parasite of *Kaltenbachiola strobi* (Winn.) in Norway, according to Bakke (1955 : 180, although other hosts have been recorded (see Bouček, 1966*a* : 54).

Anogmus vala (Walker)

Pteromalus Vala Walker, 1839 : 234, ♂.
? *Pteromalus complanatus* Ratzeburg, 1844*a* : 197, ♀, [*ex parte*].
Eutelus (*Platytermus*) *specularis* Thomson, 1878 : 88, ♀.
? *Dirhicnus complanatus* (Ratzeburg) Kurdjumov, 1913 : 16.
Eutelus strobicola Ruschka, 1922 : 161, ♂ ♀.
Eutelus strobicola Ruschka ; Bakke, 1955 : 181–184, ♂ ♀.
Anogmus vala (Walker) Graham, 1957*d* : 233, 234, ♂ ♀.
Anogmus vala (Walker) ; Bouček, 1966*a* : 53–54, ♂ ♀.

Type material. Lectotypes of *Pteromalus vala* Walker, *Eutelus specularis* Thomson and *Eutelus strobicola* Ruschka, designated by Graham (1957*d* : 233), who established the above synonymy.

Pteromalus complanatus Ratzeburg. Types presumed lost. Placed as a doubtful synonym of *vala* (Walker) by Bouček (1966*a* : 53). Part of Ratzeburg's original material was obtained from spruce-cones, so that the synonymy seems possible ; see discussion p. 782, under the genus *Diglochis*.

BRITAIN, SWEDEN, NORWAY, FINLAND, GERMANY, AUSTRIA, CZECHOSLOVAKIA.

Biology. Develops in spruce-cones ; Bakke (1963) considered after careful investigation that *Kaltenbachiola strobi* (Winn.) was the true host of *vala* ; other hosts have been recorded but are somewhat doubtful (see Bouček, 1966*a* : 53–54).

KARPINSKIELLA Bouček

Karpinskiella Bouček, 1954*a* : 86–87. Type-species : *K. pityophthori* Bouček by original designation.
Karpinskiella Bouček ; Peck *et al.*, 1964 : 42.

Only the type species is known.

Karpinskiella pityophthori Bouček

Karpinskiella pityophthori Bouček, 1954*a* : 87, ♂ ♀.
Karpinskiella pityophthori Bouček ; Bakke, 1956 : 41.
Karpinskiella pityophthori Bouček ; Hedqvist, 1963 : 117–118, ♂ ♀.

Type material. Holotype ♀ and allotype ♂ in Národní Museum, Prague (Cat. nos. 3053, 3054) ; paratypes in Forest Research Institute, Warsaw ; Poland, Pieniny, Polish Carpathians, reared in 1948 from *Pityophthorus polonicus* Karp., (*J. J. Karpinski*).

NORWAY, SWEDEN, FINLAND, POLAND.

Biology. Parasite of Coleoptera Scolytidae, e.g., *Pityophthorus polonicus* Karp. (Bouček, 1954*a*), *Pityogenes quadridens* (Htd.) Bakke, 1956 ; Hedqvist, 1963), *Pityogenes chalcographus* (L.) (Nuorteva, 1957 ; Hedqvist, 1963).

EUMACEPOLUS Graham

Eumacepolus Graham, 1957*c* : 137–138. Type-species : *Pteromalus saxeseni* (Ratzeburg) *sensu* Thomson, 1878, by monotypy and original designation [=*Eumacepolus grahami* v. Rosen, 1960].
Eumacepolus Graham ; v. Rosen, 1960*a* : 48.
Eumacepolus Graham, 1961 : 173–176.

When the genus was described, the type-species was designated as "*Pteromalus saxeseni* (Ratzeburg) Thomson (=*Habrocytus saxeseni* (Ratz.) Thomson, 1878)". My reason for specifying that the type-species was *saxeseni* Ratzeburg in the sense of Thomson was that I felt some doubts as to whether Thomson had correctly interpreted Ratzeburg's species. My action proved to be well-founded because von Rosen (1959 : 134–6) showed that Thomson's interpretation of *Pteromalus saxesenii* Ratzeburg was in fact incorrect ; consequently (1960*a* : 48) he renamed the type-species of *Eumacepolus* as *E. grahami* v. Rosen. Because of the way in which I originally formulated my designation of the type-species, the genus name remains valid.

The mandibles are exceptionally variable in this genus. In *pulcher*, both mandibles may have 4 teeth ; or the left mandible may have 3 and the right one 4. In the specimens of *obscurior* so far captured, both mandibles have 3 teeth (the inner tooth being broadly truncate in both mandibles). In *grahami* the mandibular formula is 3.4.

The female recorded by me (1961 : 175) as being probably that of *obscurior*, does not belong to it but evidently represents an undescribed species. The characters of what is almost certainly the true female of *obscurior* are given in the accompanying key.

Eumacepolus presents some taxonomic problems. The species *grahami* differs in several respects from the others (see key) and appears to be very close to *Mesopolobus* ; it differs from all our species of *Mesopolobus*, however, in having only 2 anelli followed by a relatively elongate first funicular segment. In *Mesopolobus*, when only two anelli are present, the first funicular segment is relatively short, subquadrate to transverse, and often shorter than the second funicular segment.

On the other hand, *Eumacepolus pulcher* and *E. obscurior* appear to be less close to *Mesopolobus* and to resemble in some ways certain species of *Ablaxia* ; they seem more appropriately placed in a distinct subgenus of *Eumacepolus*.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Antennae (Text-fig. 517) inserted lower on head, the lower edge of their toruli level with ventral edge of eyes. Fore wing with marginal vein twice, or slightly more than twice, as long as the stigmal vein ; stigma small, separated by about three times its height from the costal edge of the wing ; basal vein with scattered hairs. Gaster 2 to 2·5 times as long as broad, about as long as head plus thorax. Median area of propodeum (Text-fig. 522) shiny, irregularly reticulate with some wrinkles. Pronotal collar with its anterior carina only moderately raised. (*EUMACEPOLUS* s. str.)
grahami v. Rosen (p. 636)

– Antennae inserted higher, the lower edge of their toruli slightly above the level of the ventral edge of the eyes. Fore wing (Text-fig. 519) with marginal vein 1·4 to 1·6 times as long as the stigmal vein ; stigma larger, separated by at least slightly less than three times its height from the costal edge of the wing ; basal vein pilose throughout, basal cell also with a few scattered hairs distally. Gaster 1·3 to 1·6 times as long as broad, only slightly longer than the thorax. Median area of propodeum duller, uniformly reticulate. Pronotal collar with a very sharp and strongly raised (sometimes almost reflexed) anterior carina. (*OXYCEPOLUS* **sgen. n.**) 2

2 (1) Antenna with scape as long as an eye, reaching level with top of median ocellus; pedicellus (dorsal view) 2·5 to 2·8 times as long as broad ; anelli quadrate ; flagellum only very weakly clavate with proximal funicular segments obviously longer than broad, and at most the sixth slightly transverse. Propodeum medially slightly more than half as long as the scutellum ; median area only about 1·25 times as broad as long. Femora and tibiae yellow, or at most the femora dark at the base. Large species, length up to 4 mm. Fore wing, Text-fig. 519 . ***pulcher*** Graham (p. 636)

– Antenna with scape shorter than an eye, reaching only level with lower edge of median ocellus ; pedicellus 2 to 2·2 times as long as broad ; anelli slightly transverse ; flagellum distinctly clavate ; first funicular segment quadrate to slightly longer than broad, fifth and sixth distinctly transverse, sometimes the fourth slightly so. Propodeum medially only about two fifths as long as the scutellum ; median area 1·7 to 1·8 times as broad as long. Femora mainly dark ; tibiae more or less infuscate medially. Smaller species, length 1·9 to 2·5 mm. . . . ***obscurior*** Graham (p. 636)

(MALES)

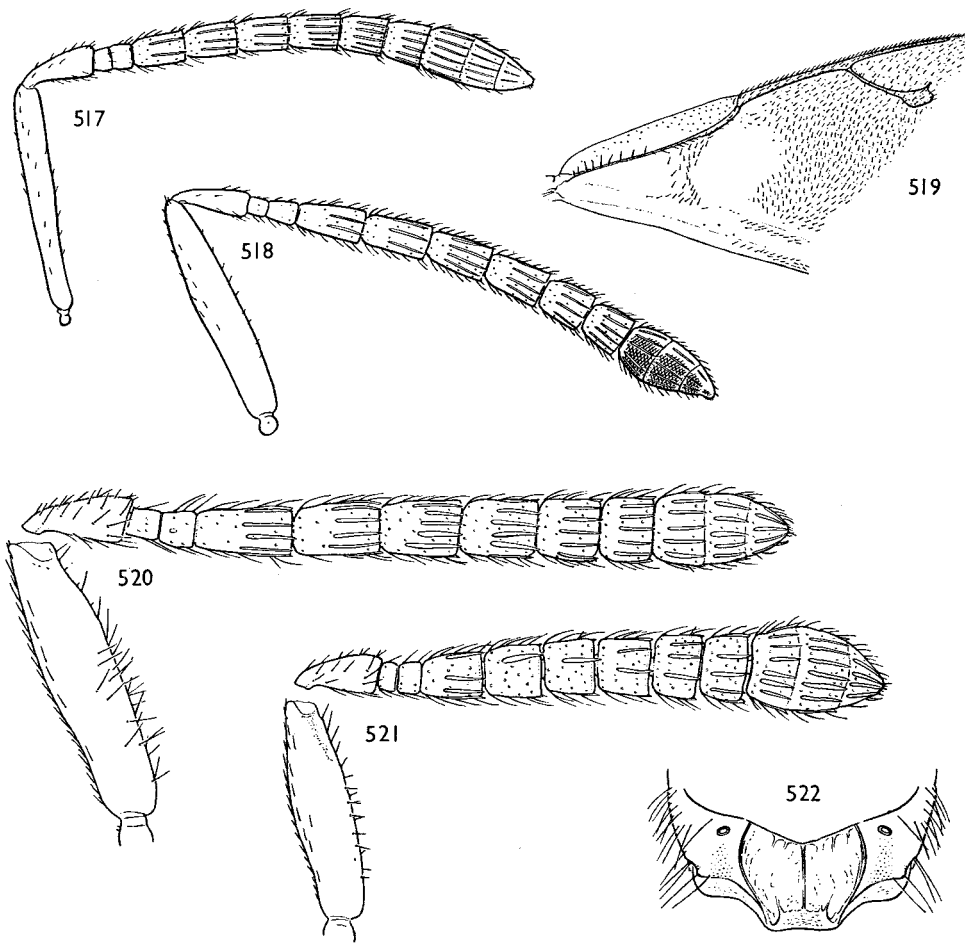
1 Lower edge of antennal toruli about level with ventral edge of eyes ; scape (Text-fig. 518) slightly longer than an eye. Fore wing with marginal vein 1·7 to 1·8 times as long as the stigmal vein ; stigma small, separated by fully three times its height from the costal edge of the wing ; basal cell bare or nearly so, basal vein with a single row of hairs, often only a few. Median area of propodeum shiny, weakly and irregularly reticulate. Gaster with a yellowish spot or transverse band. (*EUMACEPOLUS* s. str.)
grahami v. Rosen (p. 636)

– Lower edge of antennal toruli slightly above level of ventral edge of eyes ; scape (Text-figs. 520, 521) slightly shorter than an eye. Fore wing with marginal vein 1·25 to 1·4 times as long as the stigmal vein ; stigma rather larger than in alternate ; basal vein thickly pilose, basal cell with some scattered hairs next to the basal vein. Median area of propodeum duller,

more strongly and uniformly reticulate. Gaster immaculate. (*OXYCEPOLUS* **sgen. n.**) 2

2 (1) Antenna (Text-fig. 520) with flagellum more slender ; combined length of pedicellus and flagellum slightly greater than breadth of head ; anelli quadrate ; first funicular segment nearly or quite twice as long as broad, segments two to four longer than broad, five and six subquadrate. Head and thorax bright green varied with golden ; flagellum orange, the anelli often dusky. Legs, except coxae, clear yellow, or with at most the hind femora slightly infuscate. Larger species, 3 to 3·7 mm. ***pulcher*** Graham (p. 636)

– Antenna (Text-fig. 521) with flagellum more clavate ; combined length of pedicellus and flagellum equal to breadth of head ; anelli slightly transverse ; first and second funicular segments only slightly longer than broad,



FIGS. 517–522. *Eumacepolus* spp. 517, *grahami* v. Rosen, ♀, antenna ; 518, same, ♂, antenna ; 519, *pulcher* Graham, ♀, fore wing, part ; 520, same, ♂, antenna ; 521, *obscurior* Graham, ♂, antenna ; 522, *grahami* v. Rosen, ♀, propodeum.

three and four subquadrate, five and six transverse. Head and thorax duller green ; flagellum infuscate dorsally ; all femora mainly dark. Smaller species, not more than 2·5 mm. in length . ***obscurior*** Graham (p. 636)

Sgen. *EUMACEPOLUS* s. str.

Eumacepolus (*Eumacepolus*) *grahami* von Rosen

(Text-figs. 517, 518, 522)

Etroxys (*Habrocytus*) *Saxeseni* (Ratzeburg), *sensu* Thomson, 1878 : 126–127, ♂ ♀ [nec *Pteromalus Saxesenii* Ratzeburg, 1844*a* : 203].
Eumacepolus saxeseni (Ratzeburg) *sensu* Thomson; Graham, 1957*c* : 138–140, ♂ ♀.
Eumacepolus grahami v. Rosen, 1960*a* : 48 [n. n. for *saxeseni* Thomson *nec* Ratzeburg].

Type material. Syntypes, 2 ♀ in Thomson collection ; 1 ♂, 1 ♀ in Domenichini coll. (Milan). LECTOTYPE ♀ in Thomson collection, labelled " Scan " [Scania].

SWEDEN, GERMANY, CZECHOSLOVAKIA.

Biology. Reared from *Mikiola fagi* (Hartig) by Schmiedeknecht (see Graham, 1957*c* : 140).

OXYCEPOLUS sgen. n.

Derivation : Greek ὀξύσ, sharp, + part of *Eumacepolus*. Gender : masculine.
Type-species. *Eumacepolus pulcher* Graham, 1961.
For characters, see key above.

Eumacepolus (Oxycepolus) pulcher Graham

(Text-figs. 519–520)

Eumacepolus pulcher Graham, 1961 : 173–175, ♂ ♀.

Type material. Holotype ♂, Ireland, Co. Dublin, The Furry Glen, 26.ix.1937 (*Stelfox*), in Graham collection.

IRELAND, DENMARK.

Biology. Unknown.

Eumacepolus (Oxycepolus) obscurior Graham

(Text-fig. 521)

Eumacepolus obscurior Graham, 1961 : 175, ♂ (*nec* ♀).

Type material. Holotype ♂, Ireland, Co. Down, Donard Lodge Woods, near Newcastle, 25.ix.1958 (*Graham*), in Graham collection.

When describing *obscurior* I mentioned (1961 : 175, 176) a female specimen which I supposed might be conspecific with the type ♂ ; but I have now decided that it is not. I have, however, since collected other females which certainly belong to *obscurior*, hence I have included this sex in my revised key to the species (see above).

BRITAIN : Scotland (new records) : Perthshire, Lawers, 1 ♀, 13.vii.1954, East Inverness-shire, Granish, near Aviemore, 1 ♀, 17.vi.1965 (*Graham*). IRELAND : holotype ♂ (see data above).

Biology. Unknown. Imagines captured in June, July, and Sept.

STUROVIA Bouček

Sturovia Bouček, 1961 : 86. Type-species : *S. tenuicornis* Bouček, by monotypy and original designation.

Females of the type-species of *Sturovia*, *squamifera* Thomson (=*tenuicornis* Bouček), differ from those of all the species of *Mesopolobus* in the shape of the head, particularly when seen in frontal view. If this character alone were considered, one might regard *Sturovia* as a genus distinct from, though very close to, *Mesopolobus*. However, in males of *squamifera* the shape of the head is more like that of some *Mesopolobus*. Moreover, the female of *albitarsus* (Walker), although it has essentially the same type of venation, antennae, and thorax (particularly the propodeum) as *squamifera*, has the head shaped much as in some species of *Mesopolobus*. This bridges the gap between *Sturovia* and *Mesopolobus*. Undoubtedly *squamifera* and *albitarsus* are closely allied, and share a combination of characters (striate clypeus and face, venation, structure of propodeum, and coloration) which mark them off as a group rather distinct from *Mesopolobus*. Provisionally I am treating this group as a distinct genus, although it might be better regarded as a species-group, or at most a subgenus, of *Mesopolobus*. The species are included in my keys to *Mesopolobus*.

Sturovia squamifera (Thomson)

(Text-fig. 523)

Eutelus (*Amblymerus*) *squamifer* Thomson, 1878 : 81.
Sturovia tenuicornis Bouček, 1961 : 87–88, ♀.
Sturovia squamifera (Thomson) Bouček, 1965*e* : 35.

Type material. *Eutelus* (*Amblymerus*) *squamifer* Thomson. One female, accepted as type (probably holotype), labelled " Hbg " [Hälsingborg] and " squamifer Ths ".

Sturovia tenuicornis Bouček. Holotype ♀, Southern Slovakia, between Kamenica nad Hronom and Kováčov, near Stúrovo, 19.v.1960 (*Bouček*), in Národní Museum, Prague (Cat. no. 2973). The species was synonymized with *Eutelus squamifer* Thomson by Bouček (1965*e*).

BRITAIN : New record, Buckinghamshire, Hell Coppice, near Oakley, 1 ♀, 19.viii. 1960 (*Graham*) ; SWEDEN, CZECHOSLOVAKIA.

Biology. This species has been reared in Czechoslovakia from twigs of oak (" aus Eichenzweigen ") according to Bouček (1961 : 88) ; my British specimen was swept from foliage of *Quercus robur* L. Imagines April–May and Aug.–Sept.

Sturovia albitarsus (Walker) comb. n.

(Text-fig. 524)

Amblymerus albitarsus Walker, 1834 : 346, ♀.
Pteromalus Corion Walker, 1848 : 124, 186, ♀.
Eutelus (*Amblymerus*) *pedunculi* Thomson, 1878 : 81, ♀.
Platymesopus albitarsus (Walker) Graham, 1957*d* : 230.
Mesopolobus albitarsis (Walker) v. Rosen, 1958 : 232–233, ♀.
Mesopolobus albitarsus (Walker); v. Rosen, 1960*a* : 20–21, ♂ ♀.

Type material. For synonymy and designation of lectotypes see (Graham (1957*d*). In that paper I designated as lectotype of *Eutelus pedunculi* Thomson the second specimen in the series, labelled " Hbg " [Halsingborg]. Later von Rosen (1958 : 233) disputed my selection, stating that the specimen in question lacked the antennal flagella. He selected another female, the fourth in the series, labelled " Rsiö " [Ringsjo] as lectotype. Thomson cited Tvedöra as type-locality, and von Rosen pointed out that Ringsjö is nearer to Tvedöra than Hälsingborg. I am willing to accept his lectotype designation.

BRITAIN, SWEDEN ; very local and apparently rather rare.

Biology. Reared in England from *Andricus curvator* (see Askew, 1961*b* : 172). The species is apparently univoltine (imagines June–July).

I have seen some female *Mesopolobus* from Central Europe which have a fuscous cloud on the fore wing, below and touching the stigma, but which do not appear to differ in other respects from *albitarsus*. They may be a form of that species.

MESOPOLOBUS Westwood

Mesopolobus Westwood, 1833*a* : 443. Type-species : *M. fasciiventris* Westwood, by monotypy.
Platymesopus Westwood, 1833*a* : 444. Type-species : *P. tibialis* Westwood, by monotypy.
Platyterma Walker, 1834 : 303. Type-species : *P. nobile* Walker, by designation of Westwood, 1839 : 70.
Amblymerus Walker, 1834 : 303, 306. Type-species : *A. amaenus* Walker, by designation of Westwood, 1839 : 70.
Eutelus Walker, 1834 : 351, 356. Type-species : *E. dilectus* Walker, by designation of Westwood, 1839 : 71.
Xenocrepis Förster, 1856 : 64. Type-species : *X. pura* Mayr, 1904, by subsequent reference.
Asemantus Förster, 1878 : 51. Type-species : *A. amphibolus* Förster, by monotypy and original designation.
Syntomocera Förster, 1878 : 52. Type-species : *S. clavicornis* Förster, by monotypy and original designation.
Disema Förster, 1878 : 54. Type-species : *D. pallipes* Förster, by monotypy and original designation.
Platytermus Thomson, 1878 : 75 [emendation].
Amblymerus Walker ; Ashmead, 1904 : 317.
Eutelus Walker ; Ashmead, 1904 : 317.
Platymesopus Westwood ; Ashmead, 1904 : 317.
Platyterma Walker ; Ashmead, 1904 : 317, 318.
Mesopolobus Westwood ; Ashmead, 1904 : 317, 318.
Amblymerus Walker ; Schmiedeknecht, 1909 : 322, 323 [*ex parte*].
Eutelus Walker ; Schmiedeknecht, 1909 : 322, 324–325 [*ex parte*].

Platymesopus Westwood ; Schmiedeknecht, 1909 : 322 325.
Platyterma Walker ; Schmiedeknecht, 1909 : 323, 326, [*ex parte*].
Mesopolobus Westwood ; Schmiedeknecht, 1909, ibid. : 323, 326–327.
Eutelus Walker ; Kurdjumov, 1913 : 4, 11.
Amblymerus Walker ; Kurdjumov, 1913 : 4.
Baeoponerus Masi, 1924*a* : 222, **syn. n.** Type-species : *B. aeneus* Masi by monotypy.
Euamblymerus Hincks, 1944 : 37 [n. n. for *Amblymerus* partim].
Syntomocerella Ghesquière, 1946 : 369 [n. n. for *Syntomocera* Förster, 1878, *nec* Schiner, 1861].
Disemisca Ghesquière, 1946 : 369 [n. n. for *Disema* Förster, 1878, *nec* Maeklin, 1875].
Eutelus Walker ; Nikol'skaya, 1952 : 224.
Amblymerus Walker ; Nikol'skaya, 1952 : 225.
Ahlbergiella v. Rosen, 1955 : 88. Type-species : *Eutelus aequus* Walker, 1834, by original designation.
Mesopolobus Westwood ; Graham, 1957*d* : 220–221.
Platyterma Walker; Graham, 1957*d* : 221–222.
Ahlbergiella v. Rosen ; Graham, 1957*d* : 222–223.
Platymesopus Westwood ; Graham, 1957*d* : 223–230.
Mesopolobus Westwood ; v. Rosen, 1958 : 203–240.
Mesopolobus Westwood ; v. Rosen, 1958*a* : 51–54.
Mesopolobus Westwood ; v. Rosen, 1959 : 131–146.
Mesopolobus Westwood ; v. Rosen, 1959*a* : 146–162.
Mesopolobus Westwood ; v. Rosen, 1960 : 1–29.
Mesopolobus Westwood ; v. Rosen, 1960*a* : 1–48.
Mesopolobus Westwood ; v. Rosen, 1961 : 116–122.
Mesopolobus Westwood ; v. Rosen, 1962 : 141–148.
Mesopolobus Westwood ; v. Rosen, 1966 : 76–84.

Key to Most European Species
(Females)

1 Marginal vein of fore wing only 1·1 to 1·2 times as long as the stigmal vein. Clypeus (Text-figs. 523, 524) mainly to entirely strigose ; the lower part of the face and the genae also with some striae, or strigose-reticulate. Head and thorax deep blue or greenish blue to violet-black ; femora mainly black, tibiae more or less infuscate. Median area of propodeum uniformly reticulate ; plicae sharp in at most the hinder half of the propodeum.

Antennae with flagellum slender, proximally not or hardly stouter than the pedicellus in profile ; funicular segments quadrate or slightly longer than broad. Gaster with tip of hypopygium situated slightly to quite distinctly beyond the middle (*Sturovia* Bouček) 2

– Marginal vein rarely so short relative to the stigmal vein, if so then the clypeus is mainly reticulate, the face and genae have no trace of strigose sculpture, the head and thorax are green, bright blue, or bronze, and the legs are more extensively yellowish. Median area of propodeum often irregularly or weakly sculptured ; plicae most often complete. (*Mesopolobus* Westwood) 3

2 (1) Head in frontal view (Text-fig. 523) almost circular, with genae buccate ; in dorsal view approximately twice as broad as long. Breadth of oral fossa only 1·3 to 1·5 times the malar space. Gaster only slightly longer than thorax, 1·35 to 1·6 times as long as broad. Antennae with scape not reaching the median ocellus ; first funicular segment hardly as stout as the pedicellus, even when the latter is seen in profile. Scutellum very slightly broader than long . . . ***Sturovia squamifera*** (Thomson) (p. 637)

– Head in frontal view (Text-fig. 524) trapeziform with the oral edge subtruncate and the genae only slightly curved ; in dorsal view 2·1 to 2·15 times

as broad as long. Breadth of oral fossa about 1·8 times the malar space. Gaster nearly as long as head plus thorax, 1·7 to 2 times as long as broad. Antennae with scape reaching or virtually reaching the median ocellus ; first funicular segment as stout as, or even a little stouter than, the pedicellus when the latter is seen in profile. Scutellum very slightly longer than broad ***Sturovia albitarsus*** (Walker) (p. 638)

3 (1) Genae (Text-fig. 525) converging strongly towards the oral fossa, the breadth of the latter only about 1·5 times the malar space. Marginal vein only 1·25 to 1·5 times as long as the stigmal vein. Pronotal collar not distinctly margined. Mesoscutum with several shallow but distinct piliferous punctures 4

– Either the genae converge (Text-fig. 527) less strongly so that the breadth of the oral fossa is nearly or quite twice the malar space ; or else the marginal vein is about twice as long as the stigmal vein. Pronotal collar often margined. Mesoscutum sometimes without piliferous punctures . . 5

4 (3) Tip of hypopygium situated somewhat beyond the middle of the gaster ; the latter long-oval, 1·8 to 2·4 times as long as broad, usually slightly longer than, occasionally only as long as, head plus thorax ***incultus*** (Walker) (p. 654)

– Tip of hypopygium situated about in the middle of the gaster ; the latter broad-oval, 1·35 to 1·6 times as long as broad, usually only slightly longer than the thorax, occasionally as long as head plus thorax ***morys*** (Walker) (p. 653)

5 (3) Antennae inserted distinctly above the level of the ventral edge of the eyes, their toruli only slightly nearer to the anterior margin of the clypeus than to the median ocellus. Breadth of oral fossa only about 1·7 times the malar space. Pronotal collar not sharply defined in front. Marginal vein of fore wing about twice as long as the stigmal vein ***aequus*** (Walker) (p. 655)

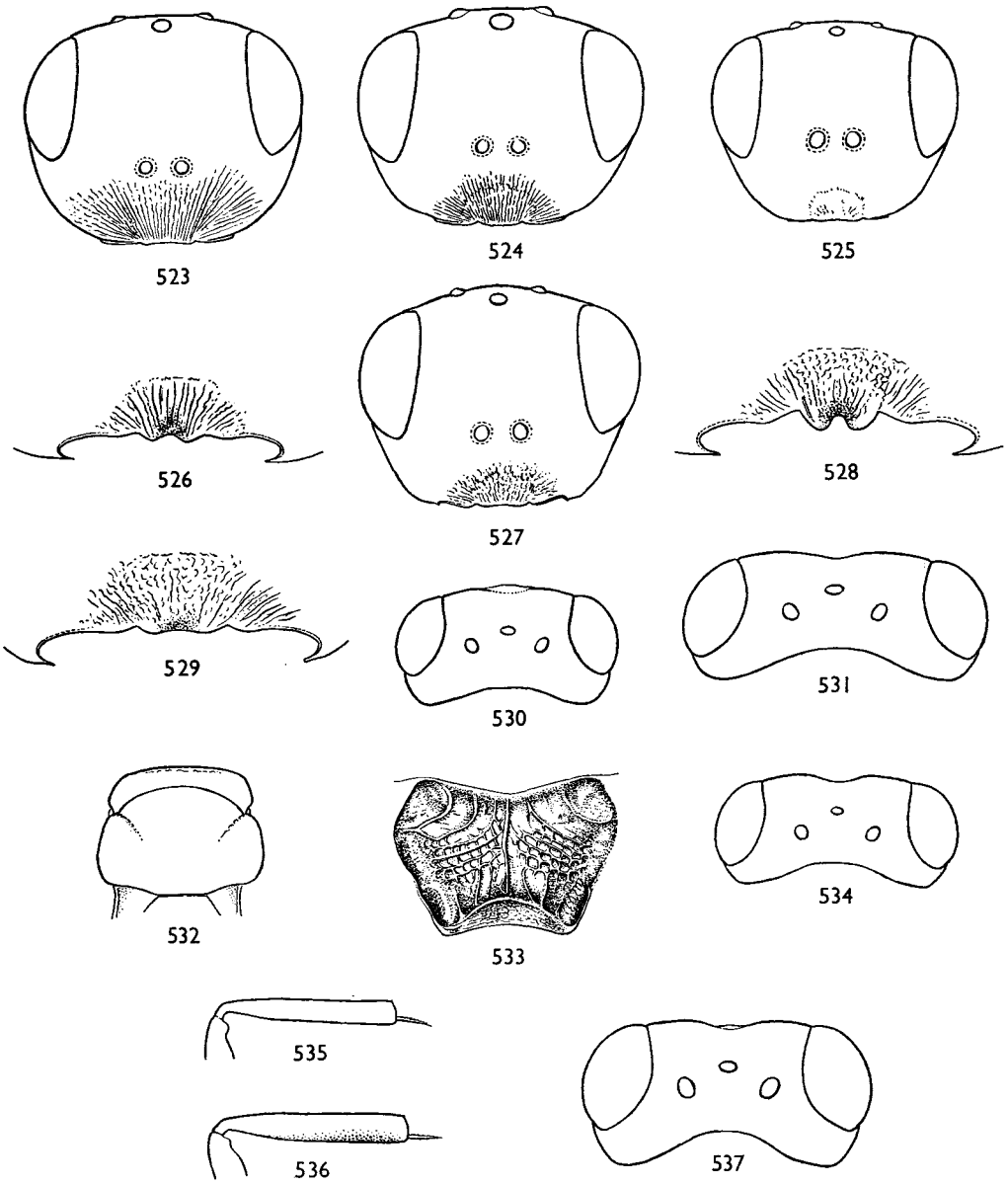
– Antennae usually inserted lower, so that the lower edge of their toruli is about at the level of the ventral edge of the eyes ; if inserted a little above this level, then still distinctly nearer to the anterior margin of the clypeus than to the median ocellus, and the pronotal collar with a sharp front edge, or margined 6

6 (5) Hind margin of scutellum with a tubercle or small tooth in the middle ; frenum distinctly marked off from the rest of the scutellum, except sometimes just in the middle, by an impressed line. Median area of propodeum nearly always with a transverse ridge (costula) a little in front of the nucha. Antennae, except in dwarfs, with two anelli and six funicular segments. Gaster lanceolate, longer than head plus thorax. Marginal vein 2 to 2·5 times as long as the stigmal vein . . . ***phragmitis*** (Erdös) (p. 664)

– Hind margin of scutellum without a tubercle or tooth ; frenum not distinctly marked off by an impressed line, except just at the sides. Median area of propodeum without a costula, though sometimes with oblique wrinkles. Antennae most often with three anelli and five funicular segments. Gaster and marginal vein often relatively shorter 7

7 (6) Fore wing : distal third to half of basal cell, on upper surface of wing, pilose. Small (2 to 2·3 mm.) species ; propodeum only about one third as long as the scutellum, with plicae sharp only posteriorly, otherwise weak or absent ; upper triangular area of mesepisternum smooth ; gaster lanceolate, longer than head plus thorax, with ovipositor sheaths very distinctly exserted, to about the length of the first segment of the hind tarsus ***anogmoides*** sp. n. (p. 678)

– Basal cell of fore wing usually bare ; if conspicuously pilose distally, then larger and less slender species, with propodeum relatively longer and having its plicae distinct throughout, the upper triangular area of the mesepisternum mainly reticulate, and the ovipositor sheaths hardly exserted . . . 8



FIGS. 523–537. *Sturovia* and *Mesopolobus* spp. 523, *S. squamifera* (Thomson), ♀, head ; 524, *S. albitarsus* (Walker), ♀, head ; 525, *M. incultus* (Walker), ♀, head ; 526, *M. amaenus* (Walker), ♀, clypeus ; 527, *M. aspilus* (Walker), ♀, head ; 528, *M. jucundus* (Walker), ♀, clypeus ; 529, *M. longicollis* sp. n., ♀, clypeus ; 530, *M.* ? *semiclavatus* (Ratzeburg), ♀, head ; 531, *M. fuscipes* (Walker), ♀, head ; 532, *M. longicollis* sp. n., ♀, anterior part of thorax ; 533, *M. subfumatus* (Ratzeburg), ♀, median area of propodeum ; 534, *M. diffinis* (Walker), ♀, head ; 535, *M. mediterraneus* (Mayr), ♀, right mid tibia ; 536, *M. diffinis* (Walker), ♀, right mid tibia ; 537, *M. fasciiventris* Westwood, ♀, head.

8 (7) Basal cell of fore wing with at least a few hairs distally, as well as those on the basal vein. Dorsellum, at least mainly, reticulate and dull. Upper triangular area of mesepisternum at least mainly reticulate. Large species, length 2·5 to 3·7 mm. Gaster not longer than thorax (if about as long as head plus thorax, see *pinus* Hussey, p. 680) ***spermotrophus*** Hussey (p. 680)

– Basal cell of fore wing, not counting any hairs which may be present on the basal vein, usually bare ; if with a very few isolated hairs distally, then the dorsellum is mainly shiny and weakly sculptured or smooth, and the upper triangular area of the mesepisternum is mainly smooth. Species often relatively smaller 9

9 (8) Antennae with two anelli and six funicular segments, the third flagellar segment sometimes shorter than the fourth but always provided with sensilla 10

– Antennae with three anelli and five funicular segments, the third flagellar segment not only distinctly shorter than the fourth but also lacking sensilla 13

10 (9) Head in dorsal view (Text-fig. 531) relatively strongly transverse, 2·2 to 2·4 times as broad as long. Gaster not or hardly longer than head plus thorax. Lower edge of antennal toruli at level of ventral edge of eyes, the toruli about twice as far from the median ocellus as from the anterior margin of the clypeus 30

Head in dorsal view usually only 1·8 to 2 times as broad as long ; if slightly more than the gaster lanceolate and much longer than head plus thorax, and the lower edge of the antennal toruli slightly above the ventral edge of the eyes 11

11 (10) Antennae with combined length of pedicellus and flagellum equal to breadth of head. Gaster lanceolate, acuminate, much longer than head plus thorax ; last tergite much longer than its basal breadth. Pronotal collar weakly margined. Thorax 1·5 to 1·6 times as long as broad. Head and thorax bronze-green to bronze . . . ***juniperinus*** v. Rosen (p. 670)

– Combined length of pedicellus and flagellum slightly less than breadth of head. Gaster at most slightly longer than head plus thorax ; last tergite at most slightly longer than its basal breadth. Pronotal collar sharply margined, the carina sometimes strongly raised. Thorax 1·7 to 1·75 times as long as broad. Head and thorax bright green to blue, or golden green . . 12

12 (11) Anterior margin of clypeus shallowly to moderately deeply emarginate medially. Fore wing with stigmal vein slightly bisinuate or nearly straight ; parastigma usually somewhat darker than the rest of the venation, sometimes also the stigmal vein. Head, Text-fig. 537.
fasciventris Westwood (p. 666)

– Anterior margin of clypeus (Text-fig. 528) deeply incised medially. Fore wing with stigmal vein evenly curved ; parastigma not darker than the rest of the venation . . . . . ***jucundus*** (Walker) (p. 667)

13 (9) Mesoscutum only 1·2 to 1·25 times as broad as long, strongly reticulate and rather dull. Antenna (Text-fig. 538) with three anelli and five funicular segments ; the third anellus about quadrate. Anterior margin of clypeus very shallowly emarginate, almost truncate. Upper triangular area of mesepisternum having its lower part reticulate ***mesostenus*** sp. n. (p. 664)

– Either the mesoscutum is at least 1·35 times as broad as long ; or the antennae have two anelli and six funicular segments ; or the third anellus is transverse ; or the anterior margin of the clypeus is distinctly emarginate . . 14

14 (13) Tip of hypopygium situated at two thirds to three quarters the length of the gaster, and sometimes very prominent ; the gaster not or hardly longer than head plus thorax 15

– Tip of hypopygium situated at most slightly more than half way along the gaster, but usually not more than half way ; the gaster sometimes much longer than head plus thorax 16

15 (14) Mesoscutum with several shallow but distinct piliferous punctures visible amongst the reticulation, 1·6 to 1·8 times as broad as long. Thorax squat, hardly 1·5 times as long as broad 29

– Mesoscutum without piliferous punctures, 1·3 to 1·5 times as broad as long. Thorax 1·6 to 1·7 times as long as broad. 42

16 (14) Gaster at least slightly longer than head plus thorax, usually more than twice as long as broad 17

– Gaster not longer than head plus thorax, at most twice as long as broad. . 27

17 (16) Anterior margin of clypeus deeply emarginate or incised medially (Text-figs. 526, 528) 18

– Anterior margin of clypeus shallowly emarginate medially 19

18 (17) Gaster 1·5 to 1·6 times as long as head plus thorax ***maculicornis*** (Giraud) (p. 667)

– Gaster at most about 1·2 times as long as head plus thorax . . . 12

19 (17) Marginal vein of fore wing normally only 1·3 to 1·6 (rarely 1·7) times as long as the stigmal vein. Combined length of pedicellus and flagellum nearly equal to breadth of head. Head and thorax usually bronze to coppery, occasionally green.
Median area of propodeum, text-fig. 542 . . ***aspilus*** (Walker) (p. 669)

– Marginal vein 1·8 to 2·3 times as long as the stigmal vein. Combined length of pedicellus and flagellum usually slightly less than breadth of head . . 20

20 (19) Gaster 3 to 3·5 times as long as broad, 1·3 to 1·5 times as long as head plus thorax. Pedicellus in dorsal view about 2·5 times as long as broad. Head in dorsal view (Text-fig. 545) 2·15 to 2·25 times as broad as long. Propodeum medially less than half as long as the scutellum ; its median area 1·8 to 2 times as broad as long (Text-fig. 541) . ***rhabdophagae*** (Graham) (p. 667)

– Either the gaster is at most 2·7 times as long as broad ; or, if longer, then the pedicellus in dorsal view is only 1·8 to 2 times as long as broad, and the head is only 1·9 to 2 times as broad as long, sometimes also the propodeum is about half as long as the scutellum with its median area at most 1·5 times as broad as long 21

21 (20) Pronotal collar (cf. Text-fig. 532) relatively long, medially one seventh to slightly more than one sixth as long as the mesoscutum, rather coarsely reticulate. Combined length of pedicellus and flagellum nearly or quite equal to breadth of head. Head and thorax bright green to blue-green. Head in dorsal view only 1·9 to 2 times as broad as long. 22

– Either the pronotal collar, medially, is only one eleventh to one eighth as long as the mesoscutum ; or if about one seventh, then the combined length of the pedicellus and flagellum is distinctly less than the breadth of the head, whilst the head and thorax are bronze- to coppery green . . . 23

22 (21) Propodeum medially about half as long as the scutellum ; its median area only 1·35 to 1·4 times as broad as long. Head in dorsal view with temples about one quarter as long as eyes . . ***pseudofuscipes*** v. Rosen (p. 667)

– Propodeum medially less than half as long as the scutellum ; its median area 1·7 to 1·9 times as broad as long. Head in dorsal view (fig. 530) with temples about one third as long as eyes . . *? **semiclavatus*** (Ratzeburg) (p. 671)

23 (21) Eyes relatively large, separated by only about their own length. Head and thorax golden green, green, or blue-green. Marginal vein 2·2 to 2·3 times as long as the stigmal vein 12

– Eyes relatively smaller, separated by 1·15 to 1·2 times their own length. Head

and thorax sometimes tinged with bronze or coppery. Marginal vein sometimes relatively shorter. 24

24 (23) Malar space only about one third the length of an eye, the latter 1·5 to 1·6 times as long as broad. Flagellum, not counting pedicellus, very short, its length hardly greater than distance between eyes. Head and thorax bronze-green to bronze or coppery . . ***citrinus*** (Ratzeburg) (p. 673)

– Malar space at least somewhat more than one third the length of an eye, the latter 1·25 to 1·35 times as long as broad. Either the length of the flagellum is somewhat greater than the distance between the eyes ; or the head and thorax are golden green to blue 25

25 (24) Head and thorax olive-green to bronze, the mesoscutum and scutellum usually tinged with bronze or coppery, sometimes other parts of these colours. Pale parts of legs tending to be testaceous or brownish testaceous. Malar space nearly or quite half the length of an eye 26

Head and thorax golden green to green or blue. Pale parts of legs most often yellow or yellowish testaceous. Malar space sometimes relatively shorter, or longer, than in the alternate 41

26 (25) Thorax relatively squat (1·5 to 1·55 times as long as broad) ; median area of propodeum 1·75 to 2 times as broad as long. Scutellum, including frenum, with extremely fine reticulation. Antennal funicle proximally slightly stouter than the pedicellus, and thickening only slightly distad. Mesoscutum anteriorly with at least some trace of shallow scattered piliferous punctures . . . . . ***typographi*** (Ruschka) (p. 673)

– Thorax relatively longer (1·7 to 1·8 times as long as broad) ; median area of propodeum about 1·6 times as broad as long. Scutellum with rather less fine reticulation. Antennal funicle more slender proximally, the first segment hardly stouter than the pedicellus, but thickening distinctly distad. Mesoscutum without piliferous punctures . . . sp. indet. A (p. 673)

27 (16) Head in dorsal view with temples nearly three quarters as long as eyes. Malar space more than half the length of an eye.

Anterior margin of clypeus deeply emarginate medially. Gaster ovate. ***apicalis*** (Thomson) (p. 677)

– Head in dorsal view with temples appearing one quarter to one third as long as eyes. Malar space often relatively shorter than in above . . . 28

28 (27) Pronotal collar very long, medially from nearly one fifth, to fully one quarter, as long as the mesoscutum. Anterior margin of clypeus (Text-fig. 526) deeply emarginate medially, with a distinct impression above the emargination. Gaster ovate, about as long as thorax, less than twice as long as broad ***amaenus*** (Walker) (p. 676)

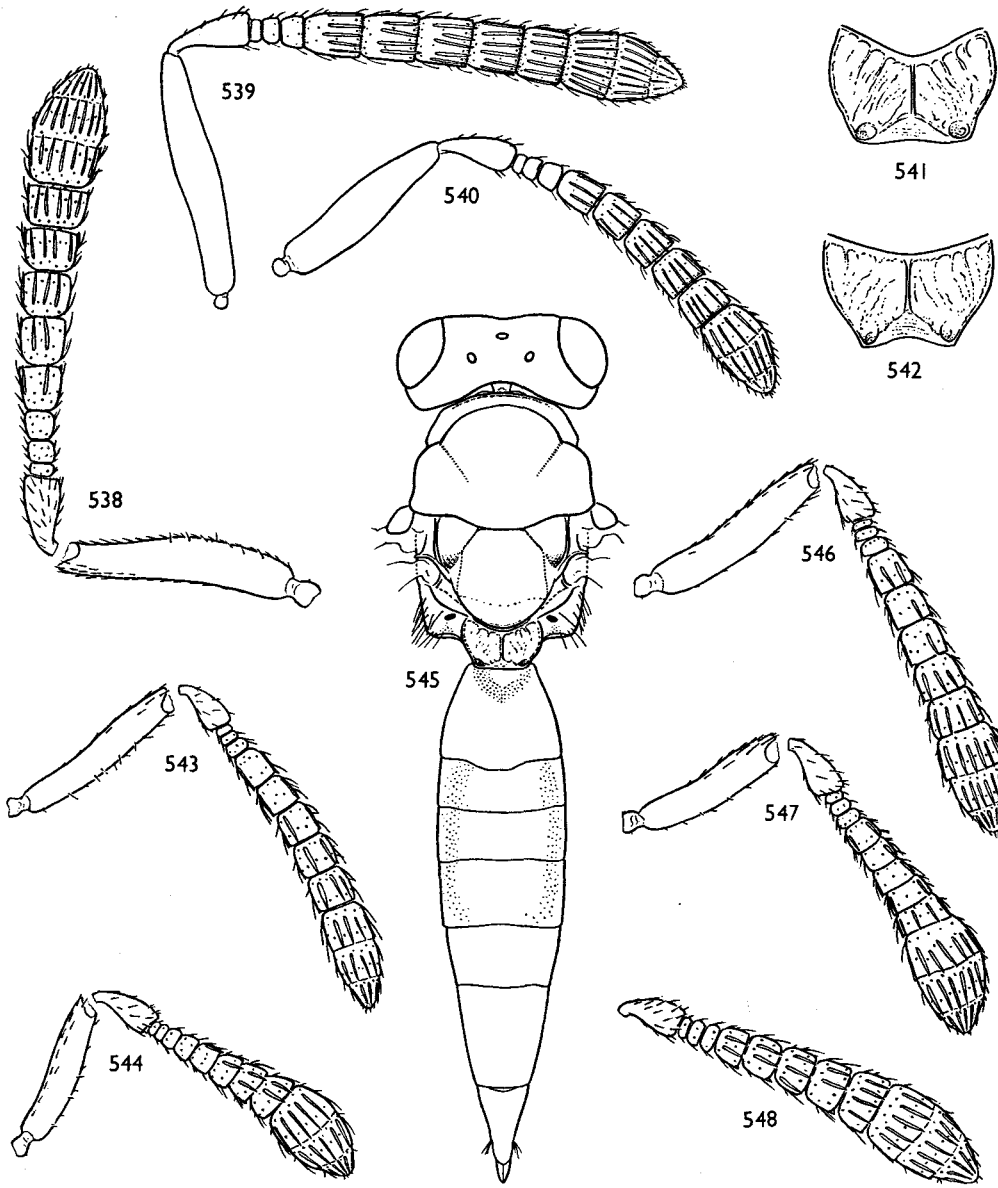
– Pronotal collar rarely approaching the above in length ; if so then either the anterior margin of the clypeus is shallowly emarginate, or the gaster is relatively longer 31

29 (15) Tip of hypopygium situated at about three quarters the length of the gaster. Antennae with scape testaceous ; pedicellus and flagellum more or less testaceous at least beneath . . . . ***xanthocerus*** (Thomson) (p. 675)

– Tip of hypopygium situated at about two thirds the length of the gaster. Antennae with scape brownish to fuscous ; flagellum brown to blackish ***fuscipes*** (Walker) (p. 675)

30 (10) Antenna with third flagellar segment not or only slightly shorter than the fourth, provided with sensilla. Head in dorsal view 2·2 to 2·4 times as broad as long . . . . . ***tibialis*** (Westwood) (p. 676)

– Antennae with third flagellar segment at most half as long as the fourth and without sensilla. Head in dorsal view 2 to 2·25 times as broad as long . 31



FIGS. 538–548. *Mesopolobus* spp. 538, *mesostenus* sp. n., ♀, antenna ; 539, *rhabdophagae* Graham, ♀, antenna ; 540, same, ♂, antenna ; 541, same, ♀, median area of propodeum ; 542, *aspilus* (Walker), ♀, median area of propodeum ; 543, *longicollis* sp. n., ♀, antenna ; 544, *teliformis* (Walker), ♀, antenna ; 545, *rhabdophagae* Graham, ♀, body ; 546, *nobilis* (Walker), ♀, antenna ; 547, *prasinus* (Walker), ♀, antenna ; 548, *teliformis* f. *cincticornis* (Walker), ♀, antenna, excluding scape.

31 (30) Sculpture of median area of propodeum about as strong as that on the disc of the scutellum. Pronotal collar often sharply margined except at the sides 32

– Sculpture of median area of propodeum distinctly weaker than that on the disc of the scutellum. Pronotal collar sometimes weakly margined, occasionally margined in the middle only 33

32 (31) Plicae, in their posterior half, straight or slightly sinuate inwards. Fore wing usually with a small brownish cloud on, or below but touching, the stigmal vein . . . . . ***subfumatus*** (Thomson) (p. 678)

– Plicae of propodeum almost evenly curved. Fore wing immaculate sp. indet. B (p. 673)

33 (31) Mesoscutum with some shallow though distinct piliferous punctures, most clearly visible on its front part 34

– Mesoscutum without piliferous punctures 36

34 (33) Mesoscutum with several piliferous punctures, 1·6 to 1·8 times as broad as long. Median area of propodeum with moderately strong, reticulate or obliquely strigose-reticulate sculpture. Species associated with Cynipid galls on *Quercus* 35

– Mesoscutum with only a few piliferous punctures in its front part ; either the mesoscutum is relatively less transverse, or the median area of the propodeum is shiny with very weak sculpture. Species not associated with Cynipid galls on *Quercus* 36

35 (34) Tip of hypopygium situated at nearly two thirds the length of the gaster. Legs very dark, the femora mainly to entirely black, the tibiae heavily infuscate. Median area of propodeum rather shiny, with delicate sculpture ***fuscipes*** (Walker) (p. 675)

– Tip of hypopygium situated hardly beyond the middle of the gaster. Legs relatively paler. Median area of propodeum with relatively strong reticulate or strigose reticulate sculpture . . . ***dubius*** (Walker) (p. 674)

36 (34) Pronotal collar (Text-fig. 532) long, medially one seventh to one sixth as long as the mesoscutum, coarsely reticulate. Squat species with gaster slightly shorter than head plus thorax, and at least slightly less than twice as long as broad. Head and thorax golden green to blue ***longicollis*** sp. n. (p. 671)

– Either the pronotal collar, medially, is at most one eighth as long as the mesoscutum ; or the gaster is about as long as head plus thorax and at least twice as long as broad, and the head and thorax are bronze-green to bronze 37

37 (36) Marginal vein of fore wing 1·4 to 1·6 (rarely 1·7) times as long as the stigmal vein. Thorax 1·4 to 1·5 times as long as broad 38

– Marginal vein usually 2 to 2·2 times as long as the stigmal vein, rarely somewhat less than 2 times, but then the thorax nearly 1·7 times as long as broad 39

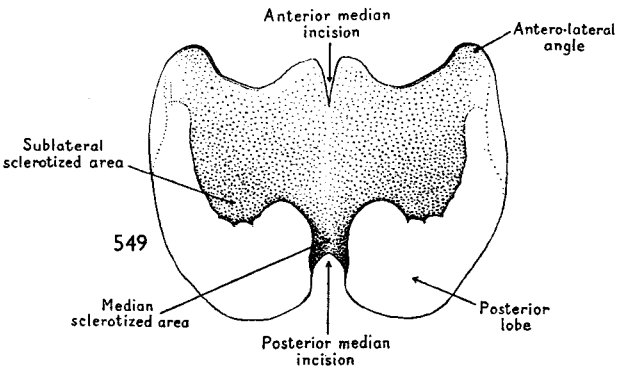
38 (37) Mid tibia (Text-fig. 536) six to seven times as long as broad, usually with a dark stripe along its inner edge. Malar space from two fifths, to nearly half, the length of an eye. Median area of propodeum slightly more than twice as broad as long. Head in dorsal view usually 2·05 to 2·25 times as broad as long (Text-fig. 534) . . . . . ***diffinis*** (Walker) (p. 669)

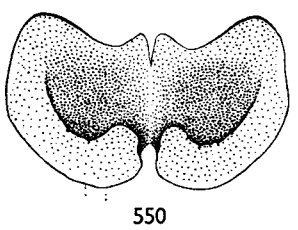
– Mid tibia (Text-fig. 535) eight to nine times as long as broad, without a distinct dark stripe on its inner edge. Malar space two fifths the length of an eye or slightly less. Median area of propodeum about twice as broad as long. Head in dorsal view 1·95 to 2·05 times as broad as long ***mediterraneus*** (Mayr) (p. 668)

39 (37) Malar space only about one third the length of an eye, the latter about 1·6 times as long as broad. Face with a prominent boss just below the antennal toruli. Body greenish bronze to bronze ; legs brownish testaceous with

dark femora. Antennae with combined length of pedicellus and flagellum only about 0·7 times the breadth of the head ; flagellum strongly clavate ; first funicular segment quadrate to slightly transverse, fifth strongly transverse . . . . . ***citrinus*** (Ratzeburg) (p. 673)

– Malar space from somewhat more than one third, to fully half, the length of an eye. Eyes 1·25 to 1·4 times as long as broad. Face below antennal toruli not noticeably prominent. Head and thorax usually green to blue ; less often greenish bronze to bronze, in which case the antennal flagellum has its distal segments at most slightly transverse 40

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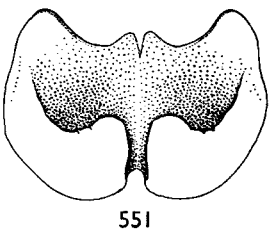
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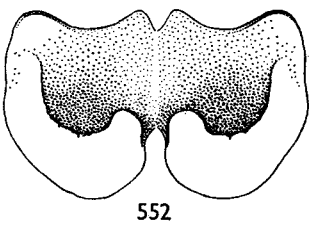
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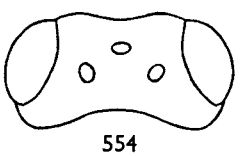
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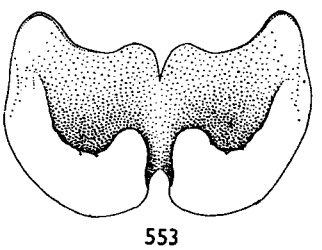
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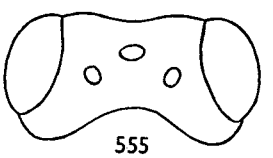
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FIGS. 549–555. *Mesopolobus* spp. 549, *decorus* (Walker), ♀, hypopygium ; 550, *prasinus* (Walker), ♀, hypopygium ; 551, *teliformis* (Walker), ♀, hypopygium ; 552, *laticornis* (Walker), ♀, hypopygium ; 553, *pseudolaticornis* v. Rosen, ♀, hypopygium ; 554. *nobilis* (Walker), ♂, head ; 555, *agropyricola* v. Rosen, ♂, head.

40 (39) Head and thorax greenish bronze to bronze ; all femora heavily infuscate, sometimes also the tibiae. Antennal flagellum rather slender ; funicular segments quadrate, or at most the fourth and fifth slightly transverse
sp. indet. A (p. 673)

– Head and thorax golden green to green or blue ; femora and tibiae usually clear yellow, the femora sometimes infuscate but rarely the tibiae. Antennal flagellum sometimes stouter, sometimes with the distal funicular segments strongly transverse 41

41 (40) Eyes larger, separated by approximately their own length. Antennae with third flagellar segment quadrate or only slightly transverse, usually rather more than half as long as the fourth segment. Species associated with Cynipid galls on *Quercus* 12

– Eyes smaller, separated by 1·1 to 1·2 times their own length. Antennae with third flagellar segment nearly or quite twice as broad as long, usually less than half as long as the fourth segment. Species associated with Gramineae 42

42 (41) Tip of hypopygium, which is prominent, situated at about three quarters length of gaster, the latter not or only slightly longer than head plus thorax. Median carina of propodeum sharp at base but tending to fork or become indistinct in the middle . . . . . ***agropyricola*** v. Rosen (p. 674)

– Tip of hypopygium situated at most about half way along the gaster, the latter slightly to much longer than head plus thorax. Median carina of propodeum usually sharp and distinct as far as the nucha. 43

43 (42) Gaster at least slightly less than twice as long as broad, not quite as long as head plus thorax 44

– Gaster at least twice as long as broad, at least as long as head plus thorax . 45

44 (43) Median area of propodeum fairly strongly strigose-reticulate, half or slightly more than half as long as the scutellum . . . . . sp. indet. B (p. 673)

– Median area of propodeum shiny, with only weak traces of reticulation, or virtually smooth, one third or slightly more than one third as long as the scutellum 48

45 (43) Antennae (Text-figs. 546, 548) with flagellum only moderately clavate ; first funicular segment quadrate or only very slightly transverse, usually as long as the second, rarely very slightly shorter ; fifth funicular segment at most 1·6 times as broad as long ; clava at most as long as the three preceding funicular segments together, often more than 1·7 times as long as broad . 46

– Antennae (Text-figs. 544, 547) with flagellum strongly clavate ; first funicular segment usually more or less transverse (only occasionally quadrate), often shorter than the second segment ; fifth funicular segment 1·6 to 2 times as broad as long ; clava most often as long as 3·5 to 4 of the preceding funicular segments together, only 1·5 to 1·7 times as long as broad 48

46 (45) Antennal scape virtually as long as an eye, reaching or virtually reaching the lower edge of the median ocellus. Fore wing with postmarginal vein more than three quarters as long as the marginal vein. Malar space slightly more than half the length of an eye . . . . ***graminum*** (Hårdh) (p. 663)

– Antennal scape distinctly shorter than an eye, not reaching the median ocellus. Fore wing with postmarginal vein at most three quarters as long as the marginal vein. Malar space 0·42 to 0·5 the length of an eye . . 47

47 (46) Antenna (Text-fig. 546) with pedicellus not quite as long as anelli plus first funicular segment. Gaster 2 to 2·8 times as long as broad. Malar space 0·42 to 0·45 length of eye. Hypopygium as in Text-fig. 549.
nobilis (Walker) (p. 655)

– Antenna (Text-fig. 544) with pedicellus as long as anelli plus first funicular segment. Gaster 2·4 to 3·5 times as long as broad. Malar space 0·45 to 0·5 length of eye. Hypopygium (Text-fig. 551) . . . ***teliformis*** (Walker) (p. 659)

48 (45) Gaster 1·75 to 2·1 times as long as broad, not or only slightly longer than head plus thorax ; last tergite shorter than its basal breadth. Antenna (Text-fig. 547) with first funicular segment as long as or very slightly longer than the second, quadrate to slightly transverse ; pedicellus in dorsal view about twice as long as broad, or even slightly more than twice ***prasinus*** (Walker) (p. 657)

– Gaster 2·4 to 4·3 times as long as broad, 1·1 to 1·5 times as long as head plus thorax ; last tergite usually as long as or longer than broad, only occasionally slightly broader than long. Antenna (cf. Text-fig. 544) with first funicular segment at least a little shorter than the second, slightly to strongly transverse ; pedicellus in dorsal view often somewhat less than twice as long as broad . . . . . ***laticornis*** (Walker), agg. (p. 658)

(MALES)

1 Penultimate segment of maxillary palpi conspicuously dilated, and usually somewhat spatulate. Head in dorsal view only 1·65 to 1·8 times as broad as long 2

– Penultimate segment of maxillary palpi at most very slightly dilated. Head in dorsal view usually more transverse than in above 4

2 (1) Terminal segment of maxillary palpi inserted near the apex of the penultimate segment, the latter dilated but hardly spatulate. Antennae with scape broadest below the middle and narrowing upwards, longer than an eye ; flagellum with one anellus and seven funicular segments, yellow with the last funicular segment and the clava marked with black. Anterior margin of clypeus very shallowly emarginate . . ? ***mesostenus*** sp. n. (p. 664)

– Terminal segment of maxillary palpi inserted near the base of the penultimate segment, the latter spatulate. Antennal scape broadest about in the middle, hardly as long as an eye ; flagellum with two anelli and six funicular segments, wholly yellow 3

3 (2) External edge of mid tibia, just before the apex, with a triangular process which is fringed with dark hairs. Anterior margin of clypeus shallowly emarginate. Venation of fore wing infuscate at the junction of the submarginal and marginal veins, also on the stigmal and postmarginal veins ***fasciiventris*** Westwood (p. 666)

– External edge of mid tibia without any process. Anterior margin of clypeus deeply emarginate medially. Venation of fore wing entirely yellowish ***jucundus*** (Walker) (p. 667)

4 (1) Mid tibia conspicuously expanded, at most four times as long as broad, and flattened ; sometimes also with a black callosity at its apex, or with a process on its external edge.
Antennal scape broadest below the middle and tapering upwards . . 5

– Mid tibia neither conspicuously flattened nor expanded, at least six times as long as broad, without a black apical callosity or process on its external edge.
In *diffinis* the mid tibia is slightly expanded and flattened, but is about six times as long as broad 8

5 (4) Mid tibia less broadly expanded, about four times as long as broad, without a process on its external edge, yellowish with a dusky stripe. Antennal flagellum slender ; none of the funicular segments transverse, or at most the last one slightly so . . . . . ***pseudofuscipes*** v. Rosen (p. 667)
Mid tibia either more broadly expanded, about three times as long as broad or, if rather less than three times as long as broad, then with a triangular sub-

apical process on its external edge ; the tibia yellow with a reddish stripe or stripes. Antennal flagellum stouter ; at least the fifth funicular segment distinctly transverse, sometimes also the fourth and even the third . . 6

6 (5) Mid tibia with a triangular blackish subapical process on its external edge ; fore tibia hardly swollen and not flattened, about five times as long as broad. Antenna with funicle testaceous ; clava mainly brown to fuscous, rather pointed apically, more than 1·5 times as long as broad ; third flagellar segment often distinctly shorter than the fourth and often lacking sensilla ***xanthocerus*** (Thomson) (p. 675)

– Mid tibia without a subapical process, though in *tibialis* with a circular black callosity at apex on its outer edge ; fore tibia slightly to distinctly swollen, sometimes flattened. Antenna with funicle usually having one or more of its distal segments marked with black at least above ; clava large, black, subobtuse apically, hardly 1·5 times as long as broad ; third flagellar segment usually not or hardly shorter than the fourth and often with sensilla 7

7 (6) Mid tibia with a circular black callosity at apex on its outer edge ; fore tibia expanded and flattened, hardly four times as long as broad. Antennae with seventh flagellar segment subquadrate, slightly longer than the sixth or the eighth, the latter less than twice as broad as long ***tibialis*** (Westwood) (p. 676)

– Mid tibia without a black callosity ; fore tibia slightly swollen but not flattened. Antennae with flagellar segments six to eight distinctly transverse, eight about twice as broad as long, these segments subequal in length ***fuscipes*** (Walker) (p. 675)

8 (4) Mid tibia slightly expanded and flattened, only about six times as long as broad ; length of mid tibial spur hardly as great as the maximum breadth of the tibia. Gaster with a yellowish spot or transverse band . . . 9

– Mid tibia neither expanded nor flattened, usually more than six times as long as broad, if hardly more than six times, then the length of its apical spur slightly greater than the maximum breadth of the tibia 10

9 (8) Mid tibia with a dark stripe or spot on its inner edge. Hind wing often with two fuscous spots, which are sometimes joined ; sometimes one or both of these spots are absent. Marginal vein 1·3 to 1·45 times as long as the stigmal vein. Upper triangular area of mesepisternum mainly or wholly smooth. Small species, length 1·2 to 1·7 mm . ***diffinis*** (Walker) (p. 669)

– Mid tibia yellow. Hind wing immaculate. Marginal vein 1·7 to 1·9 times as long as the stigma vein. Upper triangular area of mesepisternum having its lower half or more finely reticulate. Larger species, length 2 to 3 mm. ***spermotrophus*** Hussey (p. 680)

10 (8) Antennae inserted relatively high on the head, their toruli hardly nearer to the anterior margin of the clypeus than to the median ocellus. Marginal vein 2·2 to 2·7 times as long as the stigmal vein. Antennae with combined length of pedicellus and flagellum slightly greater than breadth of head ; flagellum slender, proximally distinctly more slender than the pedicellus, its third segment usually slightly longer than broad, quadrate in dwarfs, the following segments, except the last one, usually at least slightly longer than broad. . . . . ***aequus*** (Walker) (p. 655)

– Antennae inserted relatively lower down, the lower edge of their toruli level with ventral edge of eyes or only slightly above this, but the toruli always distinctly nearer to the anterior margin of the clypeus than to the median ocellus. Marginal vein 1·0 to 2·2 times as long as stigmal vein. Antennae with combined length of pedicellus and flagellum at most equal to breadth

of head ; third flagellar segment most often transverse, rarely longer than broad 11

11 (10) Marginal vein strongly inflated, convex, hardly five times as long as its maximum breadth.
Antennae with three anelli and five funicular segments. Head and thorax green ; antennal scape, and legs except coxae yellow. Plicae of propodeum usually sharp only posteriorly . . ***morys*** (Walker) (p. 653)

– Marginal vein not inflated, relatively thinner, at least six times as long as its maximum breadth 12

12 (11) Antennal flagellum yellow with its sixth segment, occasionally also the fifth or seventh, brown to black ; clava extensively infuscate, sometimes mainly dark.
Gaster often with a pale transverse band or spot 13

– Antennal flagellum differently coloured ; never with one or more of its middle segments alone dark ; clava sometimes less extensively infuscate . . 14

13 (12) Pronotal collar longer, medially from slightly more than one sixth, to nearly one quarter, as long as mesoscutum. Antennae with shiny boss on front edge of scape extending at most half way down ; third flagellar segment often similar to the fourth, in such cases the funicle has six segments. Anterior margin of clypeus rather deeply emarginate. Fore femora often with a dark spot at the base beneath . . ***amaenus*** (Walker) (p. 676)

– Pronotal collar shorter, medially from hardly one seventh, to one sixth, as long as the mesoscutum. Antennae with shiny boss on front edge of scape extending more than half way down ; third flagellar segment anelliform, at most slightly more than half as long as the fourth segment, without sensilla. Anterior margin of clypeus less deeply emarginate. Fore femora wholly yellow . . . . . ***dubius*** (Walker) (p. 674)

14 (12) Pronotal collar unusually long, medially from slightly more than one sixth, to nearly one quarter, as long as the mesoscutum. Anterior margin of clypeus (Text-fig. 526) rather deeply emarginate ***amaenus*** (Walker)(p. 676)

– Pronotal collar usually relatively shorter medially, if approaching the above then the anterior margin of the clypeus is shallowly emarginate. . . 15

15 (14) Gaster with a yellowish transverse band, or a distinct yellowish spot . . 16

– Gaster nearly always immaculate, rarely with an extremely small and faint spot visible by transmitted light 21

16 (15) Antennal clava large, only a little longer than broad, obtuse apically, black or blue-black. Length of mid tibial spur not greater than the maximum breadth of the tibia . . . . . ***mediterraneus*** (Mayr) (p. 668)

– Antennal clava smaller, 1·7 to 2 times as long as broad, more or less pointed apically, usually only partly black or brown. Length of mid tibial spur, except in *aspilus*, greater than the maximum breadth of the tibia . . 17

17 (16) Length of mid tibial spur hardly as great as the maximum breadth of the tibia. Marginal vein at most 1·5 times as long as the stigmal vein. Antennal funicle yellowish, usually slightly infuscate proximally ***aspilus*** (Walker) (p. 669)

– Length of mid tibial spur slightly greater than the maximum breadth of the tibia. Marginal vein usually 1·7 to 1·9 (occasionally only 1·6) times as long as the stigmal vein. Antennal funicle entirely yellow 18

18 (17) Antennae with third flagellar segment quadrate or distinctly longer than broad, often provided with sensilla, the funicle therefore six- or virtually six-segmented ; distal segments of funicle quadrate ; some of the other proximal segments of the funicle usually longer than broad . . . 19
Antennae with third flagellar segment anelliform, distinctly transverse,

without sensilla, funicle therefore five-segmented ; at least the last segment of the funicle slightly to distinctly transverse 20

19 (18) Median area of propodeum quite strongly sculptured. Antennae with third flagellar segment longer than broad, as long as the fourth, with sensilla ; flagellum less slender than in *juniperinus* ***zetterstedti*** (Dalla Torre) (p. 678)

– Median area of propodeum more weakly sculptured. Antennae with third flagellar segment quadrate or slightly longer than broad, usually slightly shorter than the fourth and sometimes lacking sensilla ; flagellum relatively slender . . . . . ***juniperinus*** v. Rosen (p. 670)

20 (18) Median area of propodeum with relatively strong strigose-reticulate sculpture. Pronotal collar sharply margined throughout, or except just at the sides. Fore wing usually with a small brownish cloud below and touching the stigmal vein . . . . . ***subfumatus*** (Ratzeburg) (p. 678)

– Median area of propodeum with relatively weak sculpture. Pronotal collar at most sharply margined in the middle. Fore wing immaculate ***longicollis*** sp. n. (p. 671)

21 (15) Fore wing with marginal vein 1 to 1·4 times as long as the stigmal vein ; postmarginal vein often a little longer than the marginal vein . . . 22

– Fore wing with marginal vein 1·6 to 2·2 times as long as the stigmal vein ; postmarginal vein at most as long as, but usually shorter than, the marginal vein 24

22 (21) Clypeus and face reticulate ; breadth of oral fossa only 1·5 to 1·7 times the malar space. Pronotal collar not distinctly margined, occasionally some trace of a margin in the middle. Median area of propodeum weakly and irregularly sculptured, or smooth. Marginal vein of fore wing 1·2 to 1·4 times as long as the stigmal vein. Head and thorax green to blue-green, or bronze-green ; femora and tibiae usually yellow or testaceous, the femora sometimes slightly infuscate . . . . . ***incultus*** (Walker) (p. 654)

– Clypeus and face strigose or strigose-reticulate ; breadth of oral fossa 1·8 or more times the malar space. Pronotal collar with a fine though sharp margin. Median area of propodeum relatively uniformly reticulate. Marginal vein of fore wing 1 to 1·2 times as long as the stigmal vein. Head and thorax varying from dark blue or blue-green to violet-black ; femora mainly black, tibiae usually infuscate (*Sturovia* Bouček) 23

23 (22) Anterior margin of clypeus very shallowly emarginate ; breadth of oral fossa about 1·8 times the malar space . ***Sturovia squamifera*** (Thomson) (p. 637)

– Anterior margin of clypeus curved slightly forwards ; breadth of oral fossa more than twice the malar space . . ***Sturovia albitarsus*** (Walker) (p. 638)

24 (21) Hind margin of scutellum with a small tooth or tubercle in the middle ; frenum marked off as an area of coarser sculpture. Antennae with third flagellar segment sometimes more than half as long as the fourth and often with sensilla . . . . . ***phragmitis*** (Erdös) (p. 664)

– Hind margin of scutellum without a tooth or tubercle ; frenum often less distinctly defined. Antennae with third flagellar segment, except in *maculicornis*, anelliform and lacking sensilla 25

25 (24) Anterior margin of clypeus deeply emarginate medially. Antennae with two anelli and six funicular segments. . . ***maculicornis*** (Giraud) (p. 667)

– Anterior margin of clypeus shallowly emarginate or subtruncate. Antennae with three anelli and five funicular segments 26

26 (25) Antennae with funicular segments not transverse, or at most the fourth and fifth slightly so ; the proximal segments often slightly longer than broad 27

– Antennae with at least the distal segments of the funicle moderately to strongly transverse, the proximal segments sometimes slightly so . . 28

27 (26) Antennae with pedicellus in dorsal view 2 to 2·4 times as long as broad ; scape, except in some *typographi*, nearly as long as an eye and about 4·5 times as long as broad. Malar space half, or slightly more than half, the length of an eye 28

– Antennae with pedicellus in dorsal view distinctly less than twice as long as broad ; scape distinctly shorter than an eye. Malar space slightly less than half the length of an eye 30

28 (27) Parasite of bark beetles. Antennae with third anellus quadrate or only very slightly transverse. Scutellum, including the frenum, with extremely fine reticulation. Median area of propodeum 1·6 to 1·75 times as broad as long. Fore wing with postmarginal vein not, or only very slightly, shorter than the marginal vein ; basal cell often with a few hairs in its distal part ***typographi*** (Ruschka) (p. 673)

– Not parasitic on bark beetles. Antennae with third anellus distinctly transverse. Scutellum with rather less fine reticulation, that of the frenum often a little coarser than the rest. Median area of propodeum 1·4 to 1·6 times as broad as long. Fore wing with postmarginal vein sometimes distinctly shorter than the marginal vein ; basal cell, not counting any hairs on the basal vein, bare or virtually so 29

29 (28) Parasite of *Rhabdophaga* (Dipt., Cecidomyiidae) on *Salix*. Pedicellus in dorsal view 2·1 to 2·4 times as long as broad ***rhabdophagae*** (Graham) (p. 667)

– Species living in grasses. Pedicellus in dorsal view twice as long as broad ***graminum*** (Hårdh) (p. 663)

30 (27) Antenna with pedicellus in dorsal view virtually twice as long as broad ; flagellum moderately strongly clavate ; first funicular segment subquadrate to slightly transverse, as long as or very slightly longer than the second, fifth segment strongly transverse ; clava about as long as the three preceding funicular segments together. Malar space half, or very slightly more than half, the length of an eye . . . ***prasinus*** (Walker) (p. 657)

– Antenna with pedicellus in dorsal view distinctly less than twice as long as broad ; the other characters not all present in combination . . . 31

31 (30) Antennae with flagellum strongly clavate ; all funicular segments transverse, the fifth strongly so ; clava as long as 3·5 to 4 of the preceding funicular segments . . . . . ***laticornis*** (Walker) agg. (p. 658)

– Antennae with flagellum moderately clavate ; proximal segments of funicle at most slightly transverse, the fifth only moderately so ; clava at most as long as the three preceding funicular segments together 32

32 (31) Malar space only slightly more than one third the length of an eye. Head in dorsal view (Text-fig. 555) with the temples rather strongly convergent, and the occiput rather more deeply excavated . ***agropyricola*** v. Rosen (p. 664)

– Malar space 0·4 to 0·48 the length of an eye. Head in dorsal view (Text-fig. 554) with the temples converging only moderately, the occiput less deeply excavated, than in the above 33

33 (32) Marginal vein of fore wing 1·8 to 2·1 times as long as the stigmal vein ***nobilis*** (Walker) agg. (p. 654)

– Marginal vein of fore wing 1·55 to 1·8 times as long as the stigmal vein (f. *cincticornis*) . . . . . ***teliformis*** (Walker) part. (p. 659)

Mesopolobus morys (Walker)

Pteromalus Morys Walker, 1848 : 125, 197, ♂.
Disema pallipes Förster, 1878 : 54, ♂.
Xenocrepis pura Mayr, 1904 : 584, ♂.

Xenocrepis morys (Walker) Graham, 1957*d* : 235.
Xenocrepis morys (Walker) ; v. Rosen, 1958 : 235, ♂ ♀.
Mesopolobus morys (Walker) ; v. Rosen, 1960 : 9–11, ♂ ♀.
Mesopolobus morys (Walker) ; v. Rosen, 1960*a* : 32–33, ♂ ♀.

Type material. *Pteromalus morys* Walker. Lectotype designated by Graham (1957*d* : 235).

Disema pallipes Förster. Placed in synonymy with *morys* by V. Rosen (1960*a* : 32–33) on the basis of a Förster male in Berlin Museum.

Xenocrepis pura Mayr. Type ♂ (not seen) in Naturhistorisches Museum, Vienna. Placed in synonymy with *morys* by Graham (1957*d* : 235).

BRITAIN, FRANCE, SWEDEN, GERMANY, SWITZERLAND, MOLDAVIAN S.S.R.

Biology. Parasite of *Ceuthorrhyncus assimilis* Payk. (Col., Curculionidae), also recorded in Sweden as a parasite of *Dasyneura brassicae* (Winn.) (Dipt., Cecidomyiidae) (see v. Rosen, 1960 : 11). Imagines July–August.

Mesopolobus incultus (Walker)

(Text-fig. 525)

Platyterma incultum Walker, 1834 : 340, ♂.
Platyterma femorale Walker, 1834 : 341, ♂ ♀.
Amblymerus stupidus Walker, 1834 : 348, ♀.
Ormocerus Trasullus Walker, 1839 : 207, ♀.
Pteromalus Leodocus Walker, 1839 : 237, ♂.
Pteromalus Ergias Walker, 1839 : 238, ♂.
Pteromalus Amyntor Walker, 1845 : 263, ♀.
Pteromalus Urgo Walker, 1845 : 263, ♀.
Pteromalus Belesis Walker, 1848 : 125, 189, ♂.
Pteromalus Berecynthos Walker, 1848 : 125, 190, ♂.
Pteromalus Lissos Walker, 1848 : 125, 196, ♂.
? Pteromalus clavicornis Walker, 1874 : 318, ♀.
Eutelus (*Amblymerus*) *crassicornis* Thomson, 1878 : 80, ♂ ♀.
Platymesopus incultus (Walker) Graham, 1957*d* : 229.
Xenocrepis inculta (Walker) v. Rosen, 1958 : 236, ♂ ♀.
Mesopolobus incultus (Walker) v. Rosen, 1960*a* : 26–28.

Type material. For synonymy, and designation of lectotypes for nearly all of the above species, see Graham (1957*d* : 229–230).

Pteromalus clavicornis Walker. One female, the TYPE (Type Hym. 5. 726) ; this specimen lacks the antennal flagella, but I think it is probably the same as *incultus*.

M. incultus has been redescribed (as *Xenocrepis inculta*) by von Rosen (1958 : 236).

Widely distributed in EUROPE ; SYRIA.

Biology. Chiefly a hyperparasite (sometimes a primary parasite) of *Apion* spp. on *Trifolium repens* L. in Sweden (see von Rosen, 1962 : 141–142). It has also been reared in England, Cornwall, Looe, 29.vii.1957 (*P. J. Osborne*) from a weevil in seeds of *Plantago* (the host probably *Gymnetron pascuorum* Gyll. or *Mecinus* sp.). Females overwinter amongst the foliage of coniferous trees and in similar situations.

On 29.ix.1956 I captured two females in a window of a ferry boat going from the Isle of Wight to Lymington, Hampshire.

Mesopolobus aequus (Walker)

Eutelus aequus Walker, 1834 : 364, ♀.
Pteromalus purpureus Walker, 1835 : 493, ♀.
Pteromalus contractus Walker, 1836 : 188, ♀.
Pteromalus Leogoras Walker, 1839 : 269, ♂.
Pteromalus Odites Walker, 1845 : 261, ♀.
Pteromalus Temesa Walker, 1848 : 124, 188, ♂, **syn. n.**
Metastenus purus Walker, 1872*b* : 118, ♀.
Eutelus (*Platytermus*) *decipiens* Thomson, 1878 : 77, ♀.
Mormoniella oviphaga Ahlberg, 1925 : 82.
Amblymerus graminum Hårdh, 1950 : 88, ♀ [nec ♂].
Ahlbergiella aequa (Walker) v. Rosen, 1955 : 88–90, ♂ ♀.
Ahlbergiella aequa (Walker) ; v. Rosen, 1956 : 1–72, [*passim*].
Ahlbergiella aequa (Walker) ; Graham, 1957*d* : 222–223.
Mesopolobus aequus (Walker) v. Rosen, 1958 : 230–231, ♂ ♀.
Mesopolobus aequus (Walker) ; v. Rosen, 1960*a* : 19–20, ♂ ♀.

Type material. For synonymy, also designation of lectotypes for most Walker and the Thomson species, see Graham (1957*d*). *Mormoniella oviphaga* was synonymized with [*Ahlbergiella*] *aequa* by von Rosen (1955) who had examined the slide-mounted types of *oviphaga*. *M. aequus* was redescribed by von Rosen (1958).
Pteromalus temesa Walker. One male, LECTOTYPE ; Waterhouse label.

Widely distributed : probably the whole of EUROPE ; MADEIRA ; U.S.A.

Biology. A predator in grasses, feeding on the eggs and larvae of other insects (von Rosen, 1955, 1956) ; also reared from *Achillea millefolium* L. and *Medicago sativa* L. (v. Rosen, 1960*a* : 19). Females pass the winter amongst the foliage of coniferous trees and similar situations ; sometimes they appear on the windows of buildings.

Mesopolobus nobilis (Walker)

Platyterma nobile Walker, 1834 : 304, ♀.
? Platyterma decorum Walker, 1834 : 342, ♂ [*? nec* ♀].
? Platyterma citripes Ashmead, 1896 : 223, ♀.
Platyterma nobile Walker ; Graham, 1957*d* : 221.
Mesopolobus nobilis (Walker) v. Rosen, 1958 : 212–213, ♂ ♀.
Mesopolobus nobilis (Walker) ; v. Rosen, 1960*a* : 33–34, ♂ ♀ [separatum].
Mesopolobus nobilis (Walker) ; v. Rosen, 1966 : 82–83, ♂ ♀.

Type material. For synonymy and designation of lectotypes for the above Walker species see Graham (1957*d*). *Platyterma citripes* Ashmead was synonymized with *nobilis* by von Rosen (1959*a* : 160) after examining a female determined as *citripes* by Dr. Burks. Ashmead, however, described the female of *citripes* as having all the funicular segments of the antenna transverse, which does not agree with the female of *nobilis*.

A good redescription of the typical form of *nobilis* was given by von Rosen (1958), who later added some useful notes and photomicrographs of the female hypopygium (1966 : 82, fig. 2).

Von Rosen (1966 : 82) mentioned having reared several particularly large and fine examples of *nobilis* from *Avena* [=*Helictotrichon*] *pubescens* and *A.* [=*H.*] *pratensis* in Sweden. He stated that slight differences could be found between the female hypopygium of this form and that of typical *nobilis*, which he illustrated by photomicrographs (1966, fig. 2). On 18.vi.1960 I captured a number of both sexes of this large form of *nobilis* on *Helictotrichon* sp. at Bald Hill, near Lewknor, Oxfordshire. The males of this large form agree well with the lectotype of *Platyterma decorum* Walker and are clearly conspecific with it. The females of this form have a hypopygium which does appear to differ slightly from that of female *nobilis*, and agrees with von Rosen's figure. It seems just possible that the large form from *Helictotrichon* spp. may represent a species distinct from (although extremely close to) *nobilis* ; if this form subsequently proves to be distinct, the name *decorus* (Walker) will be available for it.

The following notes on the typical form of *nobilis* are intended to supplement von Rosen's redescription :

♀. Head and thorax varying from bronze-green through green to blue. Antennae varying from testaceous with only the pedicellus infuscate proximally, to wholly brown. Legs, excepting coxae and tips of tarsi, sometimes yellow, sometimes with the femora more or less testaceous, brown, or fuscous ; rarely the fore and mid tibiae are slightly darkened medially. In Scottish and Irish specimens all the femora are sometimes mainly fuscous. Length 1·9 to 2·8 mm.

Antenna (Text-fig. 546) with all five funicular segments usually subequal in length, with the first segment subquadrate and the fifth moderately transverse, at most 1·6 times as broad as long ; in some specimens the first funicular segment is very slightly longer, in others very slightly shorter, than the second ; the first segment is always much longer (two to three times) than the third anellus ; in large specimens the proximal segments of the funicle tend to be very slightly longer than broad, in small ones very slightly transverse ; the clava is at most about as long as the three preceding funicular segments. Malar space 0·42 to 0·46 the length of an eye. Median area of propodeum varying from nearly smooth to lightly obliquely strigose-reticulate. Marginal vein 2 to 2·3 times as long as the stigmal vein, the latter weakly curved or straight, the stigma small. Gaster long-ovate to lanceolate, 2 to 2·8 times as long as broad. from as long as, to 1·3 times as long as, head plus thorax. Hypopygium much as in text-fig. 549 with anterolateral angles relatively prominent ; median sclerotized area long, reaching much farther back than the level of the hind edges of the sublateral sclerotized areas ; posterior lobes relatively long.

♂. Femora apparently always yellow. Malar space 0·4 to 0·46 length of eye. Funicular segments much as in ♀. Marginal vein 1·8 to 2·11 times as ong as the stigmal vein.

The form *decorus* (Walker) is on the average slightly larger than typical *nobilis* (♂ up to 2·8 mm., ♀ up to 3·2 mm., in length) and tends to be more richly coloured ; the male often has the gaster extensively suffused with purple, whilst sometimes the antennal clava and pedicellus, and even the base of the funicle, are conspicuously infuscate so that the antenna appears variegated. The median area of the propodeum tends to be more distinctly, and sometimes strongly, strigose-reticulate.

BRITAIN, IRELAND, SWEDEN, GERMANY, AUSTRIA, CZECHOSLOVAKIA.

Biology. Von Rosen (1962 : 144) stated that *nobilis* lives in the seeds of grasses and that he had reared it from *Avena elatior* [=*Arrhenatherum elatius* (L.) Beauv.] and *Bromus inermis* [=*Zerna inermis* (Leyss.) Lindm.]. Later, however (1966 : 82) he suggested that those reared from the latter plant might represent a distinct species. He also (1966 : 82) reared specimens from *Avena* [=*Helictotrichon*] *pubescens* (Huds.) Pilger and *A.* [=*H.*] *pratensis* (L.) Pilger which he thought might be another distinct species ; from his description these specimens evidently belong to the form referred to above as *decorus* (Walker). Imagines June–July.

Mesopolobus prasinus (Walker)

(Text-figs. 547–550)

Platyterma prasinum Walker, 1834 : 305, ♀.
Asemantus amphibolus Förster, 1878 : 51, ♀.
Platyterma prasinum Walker ; Graham, 1957*d* : 221.
Mesopolobus prasinus (Walker) v. Rosen, 1958 : 214, ♂ ♀.
Mesopolobus prasinus (Walker); v. Rosen, 1960*a* : 33–34, 35 [separatum].
Mesopolobus prasinus (Walker) ; v. Rosen, 1962 : 145–146.
Mesopolobus prasinus (Walker) ; v. Rosen, 1966 : 82–83.

Type material. *Platyterma prasinum* Walker. Lectotype designated by Graham (1957*d*).

Asemantus amphibolus Förster. Type ♀ (not seen by the writer) in Zoologischen Museum der Humboldt-Universität, Berlin, according to von Rosen (1962 : 146) who then considered it to be the same as *prasinus* (Walker).

In 1957 I noted some differences between the type females of *nobilis* (Walker) and *prasinus* (Walker). Von Rosen thought (1960*a*) that the latter might be a form of *nobilis*, but later (1962, 1966) decided to leave the question an open one. In 1966 (fig. 2) he illustrated slight differences between the female hypopygia of *nobilis* and *prasinus*.

Since the above papers were published I have examined a series of females captured in southern England within 50 miles of the type locality, which fit the syntypes of *prasinus* perfectly (incidentally all 5 of the syntypes are very similar and could have been captured together). A study of this material shows that *prasinus* is without doubt a species distinct from *nobilis* ; in fact it is usually possible to recognize females of *prasinus* by their general facies, without detailed examination. The antennae (Text-fig. 547) of *prasinus* are particularly characteristic. The following redescription has been made from all the above specimens.

♀. Body and coxae varying from bright golden green through green to blue ; legs otherwise yellow to fulvous with the femora usually more or less infuscate proximally, the hind ones often dark with only their bases and tips pale, and the tips of the tarsi darkened. Antennae sometimes fulvous with only the pedicellus more or less infuscate proximally ; sometimes with the scape and the proximal part of the flagellum, slightly infuscate. Wings hyaline ; venation yellowish to testaceous. Tegulae partly to wholly yellow. Length 1·5 to 2·5 mm.

Head in dorsal view 1·9 to 2 times as broad as long ; temples slightly less than one third as long as the eyes. Malar space half, or very slightly more than half, the length of an eye. Clypeus strigose or strigose-reticulate. Antennal scape (Text-fig. 547) shorter than an eye, not

reaching the median ocellus ; pedicellus in dorsal view about twice as long as broad, therefore slightly longer than in *nobilis* ; flagellum strongly clavate and relatively short, combined length of pedicellus and flagellum 0·75 to 0·85 breadth of head ; first funicular segment very slightly longer than the second segment, varying from quadrate to slightly transverse ; second segment slightly transverse, the following segments progressively more so, the fifth varying from 1·6 to 1·9 times as broad as long, the latter segment also is slightly longer than any of the preceding ones ; clava short and broad, on the average about 1·6 times as long as broad, its second suture oblique.

Pronotal collar very short medially, only one fifteenth to one twelfth the length of the mesoscutum, not or only indistinctly margined. Propodeum medially one third or slightly more than one third as long as the scutellum ; median area 1·9 to 2·1 times as broad as long, its panels shiny and nearly smooth or with traces of weak reticulation. Fore wing with row of hairs on lower surface of costal cell complete, or else broken in the middle, sometimes widely so ; basal vein with three to six hairs ; marginal vein 1·85 to 2·15 times as long as the stigmal vein ; postmarginal vein from two thirds to nearly three quarters as long as the marginal vein ; stigma tending to be a little larger and more subcircular than in *nobilis*. Legs rather short ; femora stout.

Gaster ovate, 1·75 to 2·1 times as long as broad, from slightly shorter than, to 1·15 times as long as, head plus thorax ; last tergite somewhat shorter than its basal breadth, usually about 1·5 times as broad as long ; hind margin of basal tergite sometimes rather distinctly emarginate medially ; gaster ventrally only moderately convex, the hypopygium extending nearly or quite to half its length. Hypopygium (Text-fig. 550) with anterolateral angles rather less prominent than in *nobilis* ; median sclerotized area rather shorter and broader, reaching only a little farther back than the level of the hind edges of the sublateral sclerotized areas.

The most reliable distinctions from the female of *nobilis* seem to be the relatively longer malar space of *prasinus*, and the shorter and more strongly clavate flagellum with relatively shorter funicular segments of which the distal ones are more strongly transverse. The gaster of *prasinus* is on the average shorter than that of *nobilis*. Small females of *nobilis* may approach those of *prasinus* in the shape of the antennal flagellum, but they have the distal segments of the funicle less transverse, whilst their malar space is relatively shorter.

♂. Similar to the female, but femora pale or brown at the base only ; scape stouter ; flagellum with rather more conspicuous hairs ; clava beneath with a large collapsed area which extends nearly to the base, this area and the last funicular segment thickly clothed with rather short, outstanding hairs.

BRITAIN, SWEDEN, AUSTRIA.

Biology. Von Rosen (1966 : 83) recorded having reared 4 ♂ from a laboratory culture of *Agropyron repens* (L.) Beauv. infested with frit-fly, and according to him imagines appear in Sweden in the spring. In England *prasinus* has so far been captured in the field only in September : Isle of Wight (Walker, 1834) ; Dorsetshire, Lodmoor, near Weymouth, 13.ix.1962, several ♂♂ and ♀♀ swept from a stand of *Agropyron* (*Graham*). Possibly the species has two generations per annum.

Mesopolobus laticornis (Walker), agg.

This aggregate includes several puzzling forms which might prove to be " sibling species " ; von Rosen (1966) in fact recognized 4 of the latter, all of which had been

reared from the seeds of various grasses. Morphological differences between forms reared from different species of grass apparently exist but are very slight, particularly in males. Von Rosen drew attention to small differences in the hypopygia (valvulae ventrales) of their respective females and illustrated them by photographs. I have examined the hypopygia of the forms occurring in Britain, and find small differences which are suggestive and seem to be consistent with those visible in von Rosen's figures. Even so I regard the problem as being far from settled. The hypopygia of large number of reared specimens will have to be compared to ascertain whether the differences are constant. Also, it has not been so far determined whether any of the forms will cross with one another, nor are the details of their biology known. Von Rosen has done very useful pioneer work in studying this complex, but much still remains to be learnt. Keeping an open mind, I list here the forms which he regards as sibling species, mentioning the characters which appear to have some significance. If further research shows that some of the forms are conspecific, the synonymy can be adjusted accordingly.

Mesopolobus teliformis (Walker)

(Text-figs. 544, 548, 551)

Platyterma teliforme Walker, 1834 : 305, ♂ ♀.
Platyterma cincticorne Walker, 1834 : 306, ♂ (*nec* ♀).
Pteromalus placidus Förster, 1841 : 11, ♀ [*nec* Walker, 1835*a*].
Eutelus (*Platytermus*) *brevicornis* Thomson, 1878 : 77, ♂ ♀.
Pteromalus suavis Dalla Torre, 1898 : 149 [n. n. for *placidus* Förster *nec* Walker].
Platyterma teliforme Walker ; Graham, 1957*d* : 222.
Mesopolobus cincticornis (Walker) v. Rosen, 1958 : 213–214, ♂ ♀.
Mesopolobus teliformis (Walker) v. Rosen, 1958 : 214–215, ♂ ♀.
Mesopolobus laticornis (Walker) v. Rosen, 1960 : 16–22 [*ex parte*]
Mesopolobus laticornis (Walker) ; v. Rosen, 1960*a* : 29 [*ex parte*].
Mesopolobus teliformis (Walker) ; v. Rosen, 1962 : 142–144.

Type material. *Platyterma teliforme* Walker and *Eutelus brevicornis* Thomson ; lectotypes designated by Graham (1957*d*).

Platyterma cincticorne Walker. Two males and one female stand under this name, but the female disagrees with the description of that sex, which suggests a different species. LECTOTYPE, the second male, bearing a Waterhouse label. Von Rosen first (1958) regarded it as a distinct species, then (1960) synonymized it with *laticornis*, and finally (1962) treated it as a form of *teliformis*. From the evidence which he has presented, and from a study of the lectotype and my own material, I also believe that it is a form of *teliformis*. The form *cincticornis* comprises large specimens of *teliformis* in which the flagellum is rather less clavate, and the first funicular segment relatively larger, than in typical *teliformis*.

Pteromalus placidus Förster. Syntypes presumably in Naturhistorisches Museum, Vienna. The species was synonymized with *teliformis* (Walker) by von Rosen (1962 : 142).

The following notes on the characters of *teliformis* are intended to supplement the redescription given by von Rosen (1958) :

♀. Head and thorax varying from bright golden green through green to blue. Legs, except coxae and tips of tarsi, usually wholly yellow, occasionally with the hind femora dark at the base, rarely the fore and mid femora slightly brownish at base. Length 1·8 to 3·2 mm.

Head in dorsal view 1·75 to 2 times as broad as long, tending to be relatively less transverse in smaller specimens ; temples nearly or quite one third as long as eyes ; malar space 0·4 to 0·5 length of eye, but rarely less than 0·45. Antennae with scape shorter than an eye, not reaching the median ocellus ; pedicellus in dorsal view usually less than twice as long as broad, virtually twice in some small specimens ; flagellum relatively short, in most specimens strongly clavate, though in some large ones rather less so and thus approaching that of *nobilis* ; first funicular segment, except in some large specimens, at least a little shorter than the second segment, varying from strongly transverse (smaller specimens) to quadrate (large specimens) ; distal segments strongly transverse ; clava 1·5 to 1·7 times as long as broad, in average-sized and small specimens as long as 3·5 to 4 of the preceding funicular segments, in some large specimens hardly longer than the three preceding segments. In some females, especially small ones, there is hardly any distinction between the anelli and the proximal funicular segments, as they all increase gradually in length ; in such specimens the third anellus may be three quarters as long as the first funicular segment. In very large females, however, the third anellus may be hardly more than one-third as long as the first funicular segment, and the latter may be quadrate.

Gaster 2·7 to 4·3 times as long as broad, 1·25 to 1·5 times as long as head plus thorax. The hypopygium appears to be characteristic (Text-fig. 551) ; anterolateral angles very prominent ; median sclerotized area rather narrow and long, reaching much farther back than the level of the hind edges of the sublateral sclerotized areas.

♂. Femora apparently always yellow. Malar space 0·42 to 0·48 length of eye.

The female of *teliformis* differs from that of *laticornis* in its paler femora, in its gaster, which is on the average longer, and especially in its hypopygium.

Most females are easy to distinguish from those of *nobilis*, having relatively shorter and strongly clavate flagellum and shorter proximal funicular segments (Text-fig. 544). Large females of the form *cincticornis* (Walker), which have the antennal flagellum (Text-fig. 548) less strongly clavate and the proximal funicular segments longer, are sometimes not easy to distinguish from some females of *nobilis*, however. The best diagnostic character in such cases appears to be the hypopygium ; as compared with female *nobilis*, those of the form *cincticornis* have a relatively longer gaster, rather longer malar space, and slightly longer pedicellus, but there is some overlap in the ranges of variation.

BRITAIN, SWEDEN, FRANCE, GERMANY, CZECHOSLOVAKIA, U.S.S.R.

Biology. Von Rosen (1960 : 16–17) stated that he had obtained *teliformis* in Sweden from inflorescences of *Agropyron repens* (L.) Beauv.; also that he had received specimens reared in U.S.S.R. from seeds of *A. cristatum* [(L.) ? J. Gaertn.]. I have found it to be abundant on *A. junceiforme* A. & D. Löve. In Britain imagines may be found from late June to early September, peak period apparently July–August.

Mesopolobus laticornis (Walker)

(Text-fig. 552)

Platyterma laticorne Walker, 1834 : 304, ♀.
Platyterma laticorne Walker ; Graham, 1957*d* : 221–222.
Mesopolobus laticornis (Walker) v. Rosen, 1958 : 215, ♀.
Mesopolobus laticornis (Walker) ; v. Rosen, 1960 : 16–22, [*ex parte*].
Mesopolobus laticornis (Walker) ; v. Rosen, 1960*a* : 29, [*ex parte*].
Mesopolobus laticornis (Walker) ; v. Rosen, 1962 : 142–144.
Mesopolobus laticornis (Walker) ; v. Rosen, 1966 : 78, fig. 1, ♂ ♀.

Type material. Lectotype designated by Graham (1957*d*).

In my paper of 1957*d* I suggested that *laticornis* might be only a colour form of *teliformis*, although I provisionally kept the two separate. Von Rosen at first (1958) followed this view, later (1960) united them ; still later (1962) he found differences between the hypopygia of their respective females and once more regarded them as distinct species. These oscillations of opinion reflect the difficulties inherent in a study of this species-complex. My latest research confirms von Rosen's view that *teliformis* and *laticornis* are distinct.

♀. Differs from that of *teliformis* in its darker femora, on the average shorter gaster, and hypopygium ; from *clavicornis* (Förster) in the shape of its hypopygium ; and from that of *pseudolaticornis* in its hypopygium, and in having the femora on the average more extensively infuscate. Head and thorax often more obscurely metallic than in *teliformis*, tending towards bronze-green in some specimens ; fore and mid femora infuscate at least basally, hind femora with at least their basal half fuscous to black with a metallic tinge, often wholly so except their tips. Length 1·6 to 2·7 mm. Gaster 2·4 to 3 times as long as broad, 1·1 to 1·3 times as long as head plus thorax. Hypopygium (Text-fig. 552) with anterolateral angles not very prominent ; median sclerotized area broad and short, reaching at most slightly farther back than the level of the hind edges of the sublateral sclerotized areas ; the whole hypopygium appearing rather strongly transverse.

♂. Femora more or less infuscate, at least the hind femora dark at base ; but most often the fore and mid femora have at least a dark spot at the base beneath. Malar space 0·47 to 0·5 length of eye.

BRITAIN, IRELAND, SWEDEN.

Biology. Von Rosen (1966 : 78) recorded having reared *laticornis* in Sweden from *Avena elatior* [=*Arrhenatherum elatius* (L.) Presl.] ; in Britain imagines appear from mid-June until early September.

Mesopolobus clavicornis (Förster)

Syntomocera clavicornis Förster, 1878 : 53, ♂ ♀.
Mesopolobus laticornis (Walker) v. Rosen, 1960*a* : 29, [*ex parte*].
Mesopolobus clavicornis (Förster) v. Rosen, 1966 : 81–82, ♂ ♀.

Type material. Lectotype ♂ (in Zoologisches Museum der Humboldt-Universität, Berlin) selected by Novitzky and validated by von Rosen (1960*a* : 29). It is labelled " 17/291, 30/6 Montjoie, Frst, *Syntomocera clavicornis* Först. ♂ ♀ Typi Det. S. Novickij ". There are two female paratypes in the same collection.

In 1960 von Rosen recognized *clavicornis* which he synonymized with *laticornis* (Walker) ; in 1966, however, he indicated differences between the female hypopygia of *laticornis* and the species which he determined as *clavicornis*, consequently he separated them as distinct species. It is unfortunate that a female was not selected as lectotype of *clavicornis*, because then the hypopygial characters could have been confirmed ; the male is very difficult to separate from that of *laticornis*.

According to von Rosen (1966) the female of *clavicornis* is very similar to that of *laticornis* but differs in the shape of its hypopygium, also in being smaller (mostly 1·5–1·9 mm., seldom 2 mm. or more, in length) and darker. Males are even smaller, and relatively darker. He stated that *clavicornis* could be distinguished from *pseudolaticornis* only with the aid of its colour, absolute size, and flight-period. Hypopygium with anterolateral angles prominent ; median sclerotized area narrower and longer than in *laticornis*, reaching somewhat farther back than the level of the hind edges of the sublateral sclerotized areas ; the whole hypopygium appearing less transverse than in *laticornis*.

? BRITAIN ; SWEDEN ; FRANCE.

Biology. Von Rosen (1966) stated that he captured specimens in June and July in Sweden, on panicles of *Avena* [=*Helictotrichon*] *pubescens* (Hud.) Pilger and (less frequently) on those of *A.* [=*H.*] *pratense* (L.) Pilger ; and that he had taken other specimens in August.

Mesopolobus pseudolaticornis v. Rosen

(Text-fig. 553)

Mesopolobus pseudolaticornis v. Rosen, 1966 : 78–81, fig. 1, ♂ ♀.

Type material. Holotype ♀ and allotype ♂, Sweden, Skåne, Lomma, 13.viii.1963, in Universitetets Zoologiska Institutionen, Lund ; paratypes in Statens Växtskyddsanstalt, Stockholm (not seen by the writer).

Von Rosen states that the female of *pseudolaticornis* differs from that of *laticornis* (Walker) in the shape of its hypopygium, also in being rather more slender, with the mesoscutum more flattened, and in having the femora only slightly darkened. The female of *teliformis* (Walker) is said to differ from that of *pseudolaticornis* in having the antennae in general longer and the pronotal collar more sharply margined, but the latter distinction is not evident in smaller specimens. The male of *pseudolaticornis*, in which the femora are said to be always pale, cannot be distinguished with certainty from those of *laticornis* and *teliformis*, according to the same author. His figure of the female hypopygium of *pseudolaticornis* shows a structure which does not differ greatly from that of *clavicornis* (Förster) and *teliformis* (Walker).

On 13.ix.1962 I captured several specimens of a *Mesopolobus* which agree with the description of *pseudolaticornis*, in a marsh at Lodmoor, near Weymouth, Dorset, England. The females of this series have the femora more or less suffused with brown ; in some the fore femora are wholly pale ; one has the mid femora also pale ;

but the rest have about the basal half of the fore and mid femora, and the basal two thirds of the hind femora, brownish. The gaster is 2·4–2·85 times as long as broad. The pronotal collar is indistinctly margined, and the mesoscutum in some of the specimens is flattened. The structure of the hypopygium (Text-fig. 553) agrees with that shown in von Rosen's photomicrograph of *pseudolaticornis*.

These British specimens differ recognizably from my British females of *laticornis*, particularly in the shape of the hypopygium. It is more difficult to be sure whether they are really different from *teliformis* or *clavicornis*, however. They have the femora paler than in typical examples of the former, darker than in females of the latter. Their hypopygia do not differ very much from those of *teliformis* which I have dissected, nor from those of *clavicornis*. I am willing to regard *pseudolaticornis* provisionally as a distinct species, but further investigation is desirable.

BRITAIN, SWEDEN.

Biology. The type material was reared from seeds of *Festuca arundinacea* Schreb. by von Rosen, who suggested that it was not impossible (though unlikely) that the species is phytophagous and produces more than one brood per annum. He also (1966 : 80) reared, from *Dactylis glomerata* L., some specimens which he considered might belong to the same species.

Mesopolobus graminum (Hårdh)

Amblymerus graminum Hårdh, 1950 : 88, ♂ [*nec* ♀].
Amblymerus graminum Hårdh ; v. Rosen, 1956 : 18.
Platymesopus graminum (Hårdh) Graham, 1957*d* : 229.
Mesopolobus graminum (Hårdh) v. Rosen, 1958 : 215–216, ♂ ♀.
Mesopolobus graminum (Hårdh) ; v. Rosen, 1960 : 25–28, ♂ ♁.
Mesopolobus graminum (Hårdh) ; v. Rosen, 1960*a* : 26, ♂ ♀.

Type material. Lectotype ♂ designated by von Rosen (1956 : 18) who synonymized the species with *Eutelus elongatus* Thomson ; but this synonymy was later corrected and *graminum* shown to be a valid species (Graham, 1957*d* : 228–229). The female syntype of *graminum* belongs to a different species (*aequus* Walker).

BRITAIN, DENMARK, SWEDEN, FINLAND, U.S.S.R.

Biology. An account was given by von Rosen (1960 : 25–28). In Sweden he found *graminum* living as a predator on eggs of *Calligypona* [=*Delphacodes*] *pellucida* (F.) (Hemipt., Delphacidae) in grass culms ; also parasitizing larvae of the Eurytomid species *Eurytoma suecica* v. Rosen and *Tetramesa angustipennis* (Walker), and their parasites *Pedobius eubius* (Walker) and *Chlorocytus pulchripes* (Walker) ; he also reared it from galls of *Tetramesa hyalipennis* (Walker) and *T. linearis* (Walker) on *Agropyron repens*. He recorded an interesting case where a few specimens of *graminum* were reared from galls of the Cynipid *Trigonaspis synaspis* (Hartig) on an oak-seedling hardly half a metre in height, growing amongst tall grasses. In Britain *graminum* has been reared from cells of *Tetramesa calamagrostidis* (Hed.) by Claridge (see Graham, 1957*d*). Imagines chiefly June–July (some specimens in May and August in Britain).

Mesopolobus agropyricola von Rosen
(Text-fig. 555)

Mesopolobus agropyricola von Rosen, 1960 : 22–25, ♂ ♀.

Type material. Holotype ♀ in Universitetets Zoologiska Institutionen, Lund ; paratypes in Statens Växtskyddsanstalt, Stockholm. Described from material reared in Sweden (Uppland, Solna) in 1958–1959, from *Agropyron*, and swept from the same plant.

BRITAIN [new record] : Berkshire, Wytham, 2 ♂, 7.viii.1956 (*G. R. Gradwell*) ; SWEDEN.

Biology. Reared from stems of *Agropyron repens* L. in Sweden (von Rosen, 1960). Imagines July–August.

Mesopolobus phragmitis (Erdös)

Eutelus phragmitis Erdös, 1957 : 63, fig. 5, ♀.
Mesopolobus phragmitis (Erdös) v. Rosen, 1960*a* : 34–35, ♀.
Mesopolobus phragmitis (Erdös) ; v. Rosen, 1962 : 146–147, ♂ ♀.

Type material. Type ♀ and paratype ♀, Hungary, Gárdony, 14.v.1955, from *Thomasiella arundinis* Schin. in lateral shoots of *Phragmites communis* Trin. (*Erdös*), in coll. Erdös.

BRITAIN, IRELAND, DENMARK, SWEDEN, HUNGARY, MOLDAVIAN S.S.R. ; evidently widely distributed, but very local (probably only in old reed-beds). New record : England, Dorsetshire, Lodmoor, near Weymouth, a few ♀♀, 13.ix.1962, captured in a reed-bed (*Graham*).

Biology. Parasitic on *Thomasiella arundinis* (Schin.) (Dipt., Cecidomyiidae), see Erdös (1957). Imagines May, Aug.–Sept.

Mesopolobus mesostenus sp. n.
(Text-fig. 538)

♀. Head and thorax green, with some brassy reflections which may invade the whole of the dorsal surface ; gaster brassy, varying towards greenish in places, or towards coppery.

Antennae testaceous ; pedicellus more or less infuscate dorsally ; anelli and proximal segments of funicle slightly brownish, the other funicular segments sometimes a little darkened dorsally. Coxae concolorous with thorax ; legs otherwise yellowish with the tips of the tarsi brownish, the femora and tibiae sometimes testaceous medially. Tegulae yellowish, sometimes a little darkened posteriorly. Wings subhyaline ; venation yellowish to testaceous. Length 2·5 to 2·9 mm.

Head about 1·25 times as broad as the mesoscutum ; in dorsal view approximately twice as broad as long ; temples hardly more than one quarter as long as eyes, converging rather strongly, nearly straight ; POL 1·8 to 2 times OOL. Head in front view subtrapeziform with the oral edge truncate, genae slightly buccate. Eyes separated by 1·2 to 1·25 times their length. Malar space half, or very slightly more than half, the length of an eye. Breadth of oral fossa about 1·8 times the malar space. Clypeus reticulate, or with only traces of striation, its anterior

margin very shallowly emarginate. Face, just below antennal toruli, slightly prominent. Antennal scrobes extremely shallow. Head moderately finely reticulate, the genae finely, the frons rather more coarsely so. Antennae (Text-fig. 538) inserted low on the head, the lower edge of their toruli at or hardly above the level of the ventral edge of the eyes ; combined length of pedicellus and flagellum somewhat less than breadth of head ; pedicellus (profile) about twice as long as broad, slightly longer than the three anelli together ; flagellum proximally less stout than the pedicellus, but strongly clavate distally ; first anellus short, moderately transverse ; second slightly longer and less transverse ; third still longer, subquadrate ; first funicular segment quadrate or a little longer than broad, second and third segments subquadrate, fourth slightly transverse, fifth very distinctly so ; clava slightly broader than the funicle, slightly less than twice as long as broad, as long as or slightly longer than the three preceding funicular segments together ; sensilla sparse on the funicular segments, more numerous on the clava, in one row on each segment.

Thorax elongate, nearly twice as long as broad. Pronotal collar slightly less wide than the mesoscutum, fairly long medially, one eighth as long as the mesoscutum or slightly more, and still longer at the sides, somewhat coarsely reticulate, its front edge very sharp throughout and with a slightly raised margin. Mesoscutum only 1·2 to 1·25 times as broad as long, strongly and somewhat coarsely reticulate discally, more finely at the sides. Scutellum rather weakly convex, slightly longer than broad, finely reticulate, like the axillae. Dorsellum a narrow almost smooth transverse crest which is separated from the scutellum by a longitudinally costate suture. Propodeum about half as long as the scutellum, medially somewhat produced beyond the bases of the hind coxae ; median area 1·1 to 1·2 times as broad as long, well-defined laterally, the plicae being very distinct, and often sharp, throughout ; panels of median area finely, obliquely strigose-reticulate, with some short carinulae at the base ; median carina irregular ; nucha almost smooth, separated from the median area by a groove which has some longitudinal costulae ; spiracles oval, separated by about half their length from the metanotum. Postspiracular sclerite rather shiny, irregularly, and in its upper part rather weakly, reticulate. Mesepisternum moderately finely reticulate ; its upper triangular area only partly smooth, its lower part being very finely reticulate. Mesepimeron rather more coarsely reticulate than the mesepisternum ; metapleuron more weakly sculptured than the mesepimeron. Legs rather short and not slender. Fore wing with costal cell having its upper surface bare, lower surface with a complete row of hairs and with some additional hairs scattered over the distal third ; basal cell and basal vein bare ; speculum, on upper surface of wing, extending below the marginal vein for about one third the length of the latter ; surface beyond the speculum moderately densely pilose ; marginal vein 2·1 to 2·5 times as long as the stigmal vein, and 1·1 to 1·25 times as long as the postmarginal ; stigmal vein slightly curved, stigma small and obliquely suboval.

Gaster long-ovate, from nearly as long as, to somewhat longer than, the head plus thorax, 2 to 2·5 times as long as broad ; basal tergite occupying one quarter of the total length, or slightly less, its hind edge weakly emarginate medially ; last tergite slightly shorter than, or as long as, its basal breadth ; hypopygium extending about half way along the gaster.

♂. Not definitely associated (see note below).

Holotype ♀. ENGLAND : Marston Ferry, near Oxford, 23.ix.1960, swept from foliage of *Salix purpurea* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 1 ♀, 21.ix.1960, 1 ♀, 23.ix.1960, 1 ♀, 5.vi.1961, swept from foliage of *Salix purpurea* L. (*Graham*), in Graham collection.

Biology. Unknown.

This species appears to be most closely allied to *fasciiventris* Westwood and *jucundus* (Walker), which it resembles in the shape of the head, pronotum, sculpture of mesepisternum, and venation of fore wings. It differs from both in its longer

genae, smaller and anelliform third flagellar segment, rather longer and more strongly sculptured median area of propodeum, and stronger and coarser sculpture of the mesoscutum. It also differs from *jucundus* in having the anterior margin of the clypeus shallowly, instead of deeply, emarginate.

A male specimen swept from *Salix purpurea* in the type-locality on 19.vi.1961, very probably belongs to this species, but I prefer to await confirmatory evidence. It is a very handsome insect, resembling *fasciiventris* in general facies and having the maxillary palpi modified as in that species ; but it differs in having the mid tibiae simple ; the antennal scape longer than an eye ; broadest below the middle and narrowing upwards ; the flagellum strongly clavate but proximally very slender, much less stout than the pedicellus ; only the first flagellar segment small and transverse, the second segment being slightly longer than broad and only slightly shorter than the third, thus the funicle is almost 7-segmented ; the last segment of the funicle, and the clava, are marked with blue-black.

Mesopolobus fasciiventris Westwood

(Text-fig. 537)

Mesopolobus fasciiventris Westwood, 1833*a* : 443, ♂.
Eutelus fulvicornis Walker, 1834 : 363, ♀.
Eutelus flavipes Walker, 1834 : 364, ♀.
Pteromalus fasciculatus Förster, 1841 : 11, ♂.
Pteromalus Saxesenii Ratzeburg, 1844*a* : 203, ♀.
Mesopolobus fasciiventris Westwood ; Graham, 1957*d* : 220–221.
Mesopolobus fasciiventris Westwood ; v. Rosen, 1958 : 208–210, ♂ ♀.
Mesopolobus fasciiventris Westwood ; v. Rosen, 1960 : 1–7, ♂ ♀.
Mesopolobus fasciiventris Westwood ; v. Rosen, 1960*a* : 24–25, ♂ ♀.

Type material. For most of the above synonymy, and designation of lectotypes, see Graham (1957*d* : 220–221). In the above paper (p. 221) I cited *Eutelus flavipes* Walker as a possible synonym of *Mesopolobus jucundus* (Walker) but mentioned that none of the specimens in Walker's collection agreed with the description of *flavipes*. Later von Rosen (1959*a* : 150) found a Walker female in the collections of the Muséum Nationale d'Histoire Naturelle, Paris, and designated it as type of *flavipes*.

Pteromalus saxesenii Ratzeburg. Original material presumed lost. Placed in synonymy with *fasciiventris*, and a neotype designated, by von Rosen (1960*a* : 48). Ratzeburg's species was wrongly interpreted by Thomson (1878 : 126) ; see note below, under *Eumacepolus grahami*. The neotype of *saxesenii* is a female in the Saxesen collection, Forstzoologischer Institute, Hannover, Münden, Germany.

Widely distributed (probably the whole of EUROPE).

Biology. Reared from many different Cynipid galls, see references in von Rosen, 1958 : 212 ; also Askew, 1961*b* : 163–165 for host-list and detailed biological observations. The species attacks either the larvae or pupae of Cynipids, or those of other Chalcidoidea occurring in their galls ; according to Askew (1961*b* : 172) it shows a preference for small leaf-galls. Bivoltine ; adults (in Britain) April–Nov.

Mesopolobus jucundus (Walker)

(Text-fig. 528)

Eutelus jucundus Walker, 1834 : 358, ♂.
Eutelus flavipes Walker, 1834 : 364, ♀, [*ex parte*].
Eutelus (*Platytermus*) *simplex* Thomson, 1878 : 221, ♂ ♀.
Mesopolobus jucundus (Walker) Graham, 1957*d* : 221.
Mesopolobus jucundus (Walker) ; v. Rosen, 1958 : 212, ♂ ♀.
Mesopolobus jucundus (Walker) ; v. Rosen, 1960*a* : 28, ♂ ♀.

Type material. For synonymy and designation of lectotypes, see Graham (1957*d*).

Widely distributed (probably the whole of EUROPE).

Biology. Similar to that of *fasciiventris* ; see Askew (1961*b* : 163–165) for detailed information. According to Askew *jucundus* shows a preference for the larger leaf-galls, and bud-galls. Bivoltine : adults Apr.–Nov. A species which is morphologically indistinguishable from *jucundus* has been found associated with the gall of *Diplolepis rosae* L. (see Askew, 1961*b* : 160).

Mesopolobus pseudofuscipes v. Rosen

Mesopolobus pseudofuscipes v. Rosen, 1958*a* : 51–54, ♂ ♀.
Mesopolobus pseudofuscipes v. Rosen, 1960*a* : 35, ♂ ♀.

Type material. Type ♀, Sweden, Halland, Enslöv, 29.v.1954 (*H. Andersson*), in Universitetets Zoologiska Institutionen, Lund.

SWEDEN, AUSTRIA.

Biology. Reared from galls of *Rhabdophaga dubiosa* Kieff. and *R. salicis* (Schr.) on *Salix aurita* L. (von Rosen, 1958 : 52–53).

Mesopolobus rhabdophagae (Graham)

(Text-figs. 539–541, 545)

Platymesopus rhabdophagae Graham, 1957*d* : 227–228, ♂ ♀.
Mesopolobus rhabdophagae (Graham) v. Rosen, 1958 : 217.

Type material. Holotype ♀, England : Berkshire, Wallingford, 1.vii.1938, in Hope Department, University Museum, Oxford.

BRITAIN, SWEDEN, CENTRAL EUROPE.

Biology. Reared from *Rhabdophaga salicis* (Schrank) in Britain (see Graham, 1957*d* : 228). Imagines July–Aug.

Mesopolobus maculicornis (Giraud)

Pteromalus maculicornis Giraud, 1863*a* : 1303, ♂ ♀.
Mesopolobus maculicornis (Giraud) v. Rosen, 1958 : 217–218, ♂ ♀.
Mesopolobus maculicornis (Giraud) ; v. Rosen, 1960*a* : 30, ♂ ♀.

Type material. Syntypes (holotype and allotype) in Muséum Nationale d'Histoire Naturelle, Paris (von Rosen, 1958 : 218).

WESTERN and SOUTHERN EUROPE (not found in Britain).

Biology. Reared from *Craneiobia corni* (Giraud) by Giraud and others (see von Rosen, 1958 : 218).

Mesopolobus flaviclavatus (Ferrière)

Amblymerus flaviclavatus Ferrière, 1952 : 168–169, fig. 2, ♀.
Mesopolobus flaviclavatus (Ferrière) v. Rosen, 1958 : 218, ♀.
Mesopolobus flaviclavatus (Ferrière); v. Rosen, 1960 : 25, ♀.

I have not seen the types of this species ; the female has been redescribed from a paratype by von Rosen (1960).

ITALY.

Biology. Unknown.

Mesopolobus mediterraneus (Mayr)
(Text-fig. 535)

Eutelus mediterraneus Mayr, 1903 : 388, 389, ♂ ♀.
Mesopolobus mediterraneus (Mayr) v. Rosen, 1958 : 227–228, ♂ ♀.
Mesopolobus mediterraneus (Mayr) ; v. Rosen, 1960*a* : 31–32, ♂ ♀.

Type material. Syntypes in Naturhistorisches Museum, Vienna ; lectotype ♂ designated by von Rosen (1961 : 31).

The species was redescribed by von Rosen (1958 : 227–228) and notes on its variation were published by the same author (1960*a* : 31–32). The female of *mediterraneus* is very difficult to distinguish from that of *diffinis* (Walker), though their respective males are very different.

BRITAIN, SWEDEN, CENTRAL and SOUTHERN EUROPE, TURKEY.

Biology. A polyphagous species ; recorded hosts (see von Rosen, 1958 : 227–228) include species of various genera of Cecidomyiidae (Dipt.), Tortricidae, Hyponomeutidae, Pyralidae and Pieridae (Lep.), and *Apanteles glomeratus* (L.) (Hym.). Probably it is often hyperparasitic (e.g., on the larvae of Lepidoptera). Imagines June–July.

Mesopolobus heterotomus (Thomson)

Eutelus heterotomus Thomson, 1878 : 74, ♂ ♀.
Mesopolobus heterotomus (Thomson) v. Rosen, 1958 : 228–229, ♂ ♀.
Mesopolobus heterotomus (Thomson) ; v. Rosen, 1960*a* : 26, ♂ ♀.

Type material. Syntypes, 5 specimens. LECTOTYPE, a female labelled " Hbg " [Hälsingborg] and " heterotomus Ths ", also bearing Dr. A. Jansson's lectotype label.

The female of *heterotomus* is extremely close to those of *mediterraneus* (Mayr) and *diffinis* (Walker). When examining the lectotype female of *heterotomus* selected by Jansson, I thought it was probably the same as *diffinis*. Von Rosen (1958 : 229), however, considers that it is the same as *mediterraneus*.

SWEDEN.

Biology. Unknown.

Mesopolobus diffinis (Walker)

(Text-figs. 534, 536)

Amblymerus latus Walker, 1834 : 343, ♀.
Amblymerus pusillus Walker, 1834 : 347, ♀.
Amblymerus fulvipes Walker, 1834 : 348, ♀.
Amblymerus linearis Walker, 1834 : 348, ♀.
Amblymerus stenomerus Walker, 1834 : 350, ♀.
Eutelus pygmeus Walker, 1834 : 358, ♂.
Eutelus diffinis Walker, 1834 : 358, ♂.
Eutelus vagans Walker, 1834 : 369, ♀.
Pteromalus exilis Walker, 1836 : 487, ♀.
Pteromalus Aenicus Walker, 1846 : 38 [n. n. ?].
Pteromalus Leuce Walker, 1848 : 127, 214, ♀.
Platymesopus diffinis (Walker) Graham, 1957*d* : 226–227.
Mesopolobus diffinis (Walker) v. Rosen, 1958 : 229–230, ♂ ♀.
Mesopolobus diffinis (Walker) ; v. Rosen, 1960*a* : 23, ♂ ♀.
Mesopolobus diffinis (Walker) ; v. Rosen, 1961 : 118, ♂ ♀.

Type material. For synonymy and designation of lectotypes see Graham (1957*d*) ; in that paper the name *diffinis* was adopted for the species although some of the other names have page priority. The species was redescribed by von Rosen (1958 : 229–230).

BRITAIN, IRELAND, DENMARK, SWEDEN, MOLDAVIAN S.S.R. In Britain it appears to be rather local, occurring mainly in rough grassland habitats ; on several occasions it has been found on the sea coast.

Biology. Reared in Denmark from galls of *Misospatha tubifex* (Bouché) on *Artemisia campestris* L. according to von Rosen (1961 : 118). Barnes (1939 : 505) recorded it (under the name *Eutelus diffinis*) as having been reared in England from galls of *Diarthronomyia chrysanthemi* Ahlberg, the Chrysanthemum-midge. This midge was apparently introduced into Europe from North America with imported plants and cannot be the chief host of *diffinis*. I have not seen Barnes's specimens of *diffinis* and so cannot be sure if the identification is correct. Imagines Aug.–Sept. in Britain, earlier in some parts of the Continent.

Mesopolobus aspilus (Walker)

(Text-figs. 527, 542)

Pteromalus aspilus Walker, 1835*a* : 485, ♀.
Eutelus elongatus Thomson, 1878 : 75, ♀, **syn. n.**

Platymesopus aspilus (Walker) Graham, 1957*c* : 227.
Platymesopus elongatus (Thomson) Graham, 1957*d* : 228.
Mesopolobus aspilus (Walker) von Rosen, 1958 : 218, ♀.
Mesopolobus elongatus (Thomson) v. Rosen, 1959*a* : 153–160, ♂ ♀.
Mesopolobus elongatus (Thomson) ; v. Rosen, 1960*a* : 24, ♂ ♀.

Type material. *Pteromalus aspilus* Walker. Lectotype ♀ designated by Graham (1957*c* : 227).

Eutelus elongatus Thomson. Lectotype designated by Graham (1957*d* : 228–229).

When writing my earlier paper (1957*d*: 228–229) I regarded *aspilus* (Walker) and *elongatus* (Thomson) as distinct species ; at that time nothing was known about the biology of either. Von Rosen (1959*a* : 153–160) published a valuable account of the biology and variation of *M. elongatus* (Thomson) with a redescription of the species, many specimens of which he had bred in Sweden from galls of *Oligotrophus juniperinus* (L.) on twigs of *Juniperus*. These specimens were compared with the lectotype of *elongatus* and found to be the same. Early in 1960 I gathered a number of the galls made by *Taxomyia taxi* (Inchb.) on shoots of *Taxus baccata* L. growing wild on the slopes of the Chiltern Hills, near Lewknor, Oxfordshire. During April, May and June several *Mesopolobus* emerged from the above galls and I was able to ascertain that they were parasitizing the *Taxomyia*. I found that these *Mesopolobus* agreed with my notes on the lectotype of *elongatus* (Thomson) and also with von Rosen's (1959*a*) redescription of that species. In most of these specimens the body is a rather bright green, some (especially small examples) tending towards bronze-green. Von Rosen (1959*a* : 157) mentioned that his specimens from *Oligotrophus juniperinus* were " mehr smaragdgrün ". I am convinced that the material from both *Taxomyia* and *Oligotrophus* can be referred to *aspilus*. At the beginning of October, 1960, in the same locality in Oxfordshire, I observed many females of a *Mesopolobus* on terminal shoots of wild *Taxus* trees and collected a number of them. Most of them agreed exactly with the lectotype of *Mesopolobus aspilus* (Walker) and had the body bronze or coppery-tinged. In May 1965, I reared a female which also agrees with *aspilus*, from a gall of *Taxomyia taxi*. After comparing all these specimens I consider that *elongatus* (Thomson) must be a form of *aspilus* (Walker). The colour of the body varies from bright green to copper ; the legs may be mainly pale, or on the other hand rather extensively infuscate ; and the relative length of the gaster varies considerably. In all these respects, however, variation appears to be continuous.

BRITAIN, SWEDEN.

Biology. See discussion above. Besides the Cecidomyiidae mentioned as hosts, von Rosen (1959*a* : 153) says that he saw two females reared from *Euura amerinae* (L.) (Hym., Tenthredinidae) which agreed well with his specimens of *elongatus* from *Oligotrophus*.

Mesopolobus juniperinus v. Rosen

Mesopolobus juniperinus v. Rosen, 1958 : 218–220, ♂ ♀.
Mesopolobus juniperinus v. Rosen, 1960*a* : 28–29, ♂ ♀.

Type material. Holotype and allotype, Sweden, Uppland, Solna, reared from galls of *Oligotrophus juniperinus* (L.), in Universitetets Zoologiska Institution, Lund.

DENMARK, SWEDEN, eastern EUROPE.

Biology. Reared from galls of *Oligotrophus juniperinus* (L.) on *Juniperus* (*von Rosen*). Imagines in June and August.

Mesopolobus ? *semiclavatus* (Ratzeburg)

(Text-fig. 530)

? *Pteromalus semiclavatus* Ratzeburg, 1848 : 202, ♂, ? ♀.

Type material. Presumed destroyed.

A few years ago Mr. von Rosen kindly sent me from Sweden both sexes of a species which he had named *semiclavatus* Ratzeburg. Later, however, he told me that he was not sure if his specimens were really *semiclavatus*. In my opinion they agree quite well with Ratzeburg's description (this author described both sexes, but was not sure whether the single ♀ he possessed was conspecific with his ♂). Hence I am using the name *semiclavatus* as possibly the correct one.

BRITAIN : Scotland, West Inverness, Arisaig, from a *Betula-Salix aurita* association, 2 ♂, 1 ♀, 2.vii.1961 (*Graham*). SWEDEN : Skåne, Falsterbo, ♂ and ♀, 22.vii.1963 (*v. Rosen*).

Biology. Unknown.

Mesopolobus longicollis sp. n.

(Text-figs. 529, 532, 543)

♀. Body green, sometimes with golden reflections ; gaster bronze-black discally, some of the tergites occasionally with blue or violet flecks. Antennae testaceous ; pedicellus proximally, and some of the proximal funicular segments, sometimes a little infuscate. Coxae concolorous with the thorax, legs otherwise yellowish or testaceous with the femora usually infuscate at least proximally, sometimes mainly so, the tips of the tarsi fuscous, occasionally some or all of the tibiae slightly infuscate medially. Tegulae yellow, usually slightly infuscate posteriorly. Wings hyaline ; venation pale yellow. Length 1·4 to 1·8 mm.

Head 2·1 to 2·15 times as broad as mesoscutum ; in dorsal view 1·9 to 2 times as broad as long, with temples rounded off and slightly more than one third as long as eyes ; POL 1·9 to 2 times OOL. Head in front view suboval with the genae slightly buccate. Eyes separated by about 1·2 times their length. Malar space slightly less than half the length of an eye. Breadth of oral fossa 2 to 2·25 times the malar space. Clypeus strigose-reticulate, its anterior margin rather shallowly emarginate, with a slight impression just above the emargination. Head moderately finely reticulate, more finely on face, genae, and middle of vertex. Antennae (Text-fig. 543) inserted low on head, lower edge of toruli at or hardly above level of ventral edge of eyes ; scape almost as long as an eye, reaching lower edge of median ocellus ; combined length of pedicellus and flagellum hardly less than breadth of head ; pedicellus (profile) about twice as long as broad, about as long as anelli plus half the first funicular segment, or slightly less than this ; flagellum rather weakly clavate, proximally as stout as or slightly stouter than the pedicellus ; first and second anelli short, twice or rather more than twice as broad as long, third anellus longer and about 1·5 times as broad as long ; funicular segments subquadrate,

the proximal ones sometimes very slightly longer than broad, the distal ones occasionally very slightly transverse ; clava rather more than twice as long as broad, nearly as long as the three preceding funicular segments together ; sensilla in one row on each segment, sparse on the funicle, more numerous on the clava.

Thorax about 1·6 times as long as broad. Pronotal collar (Text-fig. 532) moderately long medially, one seventh to one sixth as long as mesoscutum, and much longer at the sides, strongly and coarsely reticulate, very slightly margined in the middle anteriorly. Mesoscutum 1·45 to 1·5 times as broad as long, rather coarsely reticulate discally, more finely laterally, without piliferous punctures. Scutellum virtually as broad as long, moderately convex, finely reticulate, the frenum rather more coarsely. Axillae finely reticulate. Dorsellum a narrow, alutaceous transverse crest which is separated from the scutellum by a longitudinally-costate suture. Propodeum medially slightly less than half as long as the scutellum ; median area 1·5 to 1·65 times as broad as long, well-defined laterally, the plicae distinct throughout and sharp over at least their hinder half ; median carina distinct, straight ; panels of median area finely, slightly irregularly reticulate ; nucha transversely aciculate, separated from the median area by an impressed line which has a few longitudinal costulae ; posterior foveae, at sides of nucha, large and deep ; spiracles short-oval, separated by nearly half their length from the metanotum. Postspiracular sclerite narrow, shiny, weakly and irregularly sculptured. Mesepisternum moderately finely reticulate, its upper triangular area very finely reticulate below but smooth above ; mesepimeron rather more coarsely reticulate than the mesepisternum, metapleuron more finely so. Legs rather short ; femora rather stout ; mid tibiae fairly slender, seven to eight times as long as their maximum breadth. Fore wing rather broad ; costal cell fairly broad, its upper surface bare, lower surface with a complete row of hairs and some additional hairs scattered over the distal third to half ; basal cell bare, open below ; basal vein bare or with one to two hairs ; speculum open below, on upper surface of wing extending below the marginal vein for about half the length of the latter ; surface beyond the speculum thickly pilose ; marginal vein 1·65 to 2 times as long as the stigmal vein ; postmarginal vein slightly shorter than the marginal.

Gaster ovate, slightly longer than the thorax, as broad as or slightly broader than the thorax, 1·5 to 1·85 times as long as broad ; basal tergite occupying from slightly more than one quarter, to nearly one third, the total length ; last tergite somewhat shorter than its basal breadth ; ovipositor sheaths projecting at most very slightly ; hypopygium reaching a little beyond the middle of the gaster.

♂. Not identified with certainty. Some males were taken in company with the females described here, but they may belong to the species mentioned under the name " *? semiclavatus* (Ratzeburg) "

Holotype ♀. SCOTLAND : West Inverness, Arisaig, 5.vii.1961, on *Salix aurita* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 1 ♀, 29.vi.1961 (probably on *Salix aurita*), 1 ♀, 30.vi.1961, on *Betula*, 1 ♀, 5.vii.1961, on *Salix aurita* ; Isle of Rhum, Kinloch, 1 ♀, 4.ix.61, on *Betula*, 2 ♀, 5.ix.1961, on *Salix aurita*, 1 ♀, 24.vii.1962, on *Salix aurita* (*Graham*), in Graham collection.

The female of *longicollis* sp. n. is extremely close to that of the species listed above as " *? semiclavatus* ", which appears to differ only in having a longer gaster, lanceolate, slightly longer than head plus thorax, 2·3–2·7 times as long as broad, with the basal tergite relatively shorter than in *longicollis* and the last tergite about as long as its basal breadth. Exceptionally small females of *amaenus* (Walker) might be mistaken for *longicollis* ; however, they have the anterior margin of the clypeus (Text-fig. 526) rather deeply emarginate and with a distinct impression in

the middle ; whilst the antennal clava is shorter and broader, rather less than twice as long as broad ; also they have the pronotal collar at least slightly longer than in *longicollis*.

Biology. Unknown.

Mesopolobus typographi (Ruschka)

Eutelus typographi Ruschka, 1924 : 13–14, ♂ ♀.
Mesopolobus typographi (Ruschka), v. Rosen, 1960*a* : 38, ♂ ♀.

Type material. Syntypes (not seen by the writer) in the Hochschule für Bodenkultur and Naturhistorisches Museum, Vienna ; in Swedish Forestry Academy, and in coll. Ruschka.

CENTRAL and NORTH-WESTERN EUROPE (not yet found in Britain).

Biology. Ectoparasite of *Tomicobia seitneri* (Ruschka), hence hyperparasite of *Ips typographus* L. and other species of *Ips* (see Sachtleben, 1952 : 175–179).

M. typographi has been redescribed by von Rosen (1960*a*) who pointed out how it differs from *elongatus*, with which he had incorrectly synonymized it (1958 : 216).

Mesopolobus citrinus (Ratzeburg)

Pteromalus citrinus Ratzeburg, 1848 : 248, ♂ ♀.
Mesopolobus citrinus (Ratzeburg) v. Rosen, 1959 : 136–139, ♂ ♀.
Mesopolobus citrinus (Ratzeburg) ; v. Rosen, 1960*a* : 23, ♀.

Type material. Presumed destroyed. The original description is very short, but mentions that the species was reared from *Lasioptera* [=*Helicomyia*] *saliciperda*. Von Rosen found a series in Vienna, reared from *Helicomyia saliciperda* (Duf.), which agreed with Ratzeburg's description ; he designated these specimens as neotypes of *citrinus*. He selected two of them as type ♀ and allotype ♂, marking them with red tickets ; they are labelled " *C. saliciperda*, Eisgrub 1916, Fulmek, *E. citrinus* Ratz., det. Ruschka ". The same author (1958) gave a detailed redescription of the species.

BRITAIN, GERMANY, AUSTRIA, SWEDEN (Lapland) ; ? ITALY. New to Britain, Oxfordshire, Otmoor, 8.ix.1956, ♀ swept from foliage of *Salix fragilis* L. (*Graham*).

Biology. Reared from *Helicomyia saliciperda* (Duf.) (Dipt., Cecidomyiidae) by Ruschka (see above). Von Rosen thought that the " *Eutelus* sp. " reared in Italy from *Rhabdophaga saliciperda* by Cecconi (1912 : 328) was probably *citrinus*.

Mesopolobus sp. indet. A

ENGLAND : Berkshire, Wytham, 1 ♀, 24.v.1961 (*Graham*). This seems to be near *citrinus*.

Mesopolobus sp. indet. B

IRELAND : Co. Down, Sliddery Ford, 1 ♀, 22.viii.1957 (*Stelfox*).

Mesopolobus mayetiolae (Gahan)

Eutelus mayetiolae Gahan, 1919*a* : 128, ♂ ♀.
Amblymerus mayetiolae Gahan, 1933 : 65–67, ♂ ♀.
Mesopolobus mayetiolae (Gahan) v. Rosen, 1958 : 228.
Amblymerus mayetiolae (Gahan) ; Peck, 1963 : 661.

Type material. Type ♀, U.S.A., California, Salinas, in U.S.N.M. (not seen by the writer).

NORTH AMERICA. Von Rosen's statement (1957 : 228) that it has been recorded from Russia was a mistake. There seems to be no reason, however, why it should not eventually be found in Europe.

Biology. Reared from *Mayetiola destructor* (Say) (Dipt., Cecidomyiidae) ; *Ceuthorhynchus assimilis* Payk. (Col., Curculionidae) ; and *Tetramesa* sp. (Hym., Eurytomidae) in *Phalaris arundinacea* L. (see Gahan, 1933 ; Peck, 1963).

Mesopolobus dubius (Walker)

Amblymerus dubius Walker, 1834 : 308, ♀.
Amblymerus validus Walker, 1834 : 308, ♀.
Amblymerus ruralis Walker, 1834 : 343, ♀, **syn. n.**
Amblymerus truncatellus Walker, 1834 : 344, ♀.
Amblymerus fulvipennis Walker, 1834 : 344, ♀.
Amblymerus trossulus Walker, 1834 : 350, ♀.
Eutelus signatus Walker, 1834 : 357, ♂, **syn. n.**
Pteromalus pinguis Walker, 1835 : 490, ♀.
Platymesopus dubius (Walker) Graham, 1957*d* : 224–225.
Mesopolobus dubius (Walker) v. Rosen, 1958 : 221–222, ♂ ♀.
Mesopolobus dubius (Walker) ; v. Rosen, 1960*a* : 23–24, ♂ ♀.

Type material. For synonymy, and designation of lectotypes for most of the species, see Graham (1957*d* : 224–225).

Amblymerus ruralis Walker. Syntypes, 2 ♀ ; LECTOTYPE, the first specimen, bearing a Waterhouse label.

Eutelus signatus Walker. Previously (1957*d* : 225) I regarded this as a doubtful species because neither of the two syntypes agreed with the description. The latter, however, fits the male of *Mesopolobus dubius* (Walker) very well and I feel confident in placing *signatus* as a synonym of that species.

Mesopolobus dubius was redescribed by von Rosen (1958 : 221–222).

BRITAIN, SWEDEN ; probably widely distributed in EUROPE.

Biology. Reared in England from galls of *Cynips divisa* Hartig, *Neuroterus quercusbaccarum* (L.) f. *lenticularis* and *Biorrhiza pallida* (Oliv.) (see Askew, 1961*b* : 171, for host-list and detailed biological observations). Bivoltine : June, and July–Sept. with some females passing the winter as adults and living until the following April.

Mesopolobus fuscipes (Walker)

(Text-fig. 531)

Amblymerus fuscipes Walker, 1834 : 346, ♀.
Amblymerus humilis Walker, 1834 : 346, ♀.
Cinips luteicornis Fonscolombe, 1840 : 189, ♂, **syn. n.**
Platymesopus Erichsonii Ratzeburg, 1844*a* : 206, ♂.
? Baeoponerus aeneus Masi, 1924*a* : 223–225, ♀.
Platymesopus fuscipes (Walker) Graham, 1957*d* : 224.
Mesopolobus fuscipes (Walker) v. Rosen, 1958 : 222, ♂ ♀.
Mesopolobus fuscipes (Walker) ; v. Rosen, 1960*a* : 25–26.

Type material. For synonymy and designation of lectotypes of Walker species, see Graham (1957*d* : 224).

Cinips luteicornis Fonscolombe. No material found. From the description and biology I consider that it must have been the same as *Mesopolobus fuscipes*.

Baeoponerus aeneus Masi. Holotype ♀, Italy, Isle of Giglio, iv.1900, in Museo Civico di Storia naturale, Genoa, not seen by the writer ; from the description it would appear to be very near or identical with *Mesopolobus fuscipes*.

Mesopolobus fuscipes has been redescribed by von Rosen (1958 : 222).

Widely distributed in EUROPE.

Biology. Reared from various Cynipid galls, especially of *Neuroterus* spp., *Andricus* spp., *Cynips longiventris* Hartig and *C. quercusfolii* L. ; early bud-galls are most heavily attacked (see Askew, 1961*b* : 165–166, for host-list and detailed biological observations). Univoltine : Apr.–July, with females overwintering as adults outside the galls. According to Askew (1961*b* : 165) females pass the winter chiefly in twigs and debris on the boles of *Quercus*, and not amongst the foliage of coniferous trees ; I have, however, occasionally found them on the latter.

Mesopolobus xanthocerus (Thomson)

Eutelus xanthocerus (Dalman MS.) Thomson, 1878 : 72, ♂ ♀.
Platymesopus xanthocerus (Thomson) Graham, 1957*d* : 225.
Mesopolobus xanthocerus (Thomson) v. Rosen, 1958 : 222, ♂ ♀.
Mesopolobus xanthocerus (Thomson) ; v. Rosen, 1960*a* : 39.

Type material. Lectotype ♂ in Universitetets Zoologiska Institution, Lund, selected by Graham (1957*d* : 225).

BRITAIN, IRELAND, DENMARK, SWEDEN, MOLDAVIAN S.S.R., and probably more widely distributed in Europe.

Biology. Reared from the galls of various Cynipids on *Quercus*, especially those forming catkin-galls and early bud-galls (see Askew, 1961*b* : 169). Apparently univoltine, most imagines recorded in July and August ; females then overwinter amongst the foliage of coniferous trees.

Mesopolobus tibialis (Westwood)

Platymesopus tibialis Westwood, 1833*a* : 444, fig. 5, ♂.
Eutelus platycerus Walker, 1834 : 360, ♀.
Eutelus bicolor Walker, 1834 : 361, ♀.
Eutelus platynotus Walker, 1834 : 361, ♀.
Eutelus sobrinus Walker, 1834 : 362, ♀.
Pteromalus anticus Walker, 1835 : 494, ♀.
? Cinips fuscicornis Fonscolombe, 1840 : 189, ♀.
Platymesopus Westwoodii Ratzeburg, 1844*a* : 206 [♂].
Pteromalus platymesopus Reinhard, 1856 : 108 [n. n.].
Platymesopus apicalis Westwood, 1882 : 326, pl. 14, figs. 21, 22, ♂.
Platymesopus tibialis Westwood ; Graham, 1957*d* : 223–224.
Mesopolobus tibialis (Westwood) v. Rosen, 1958 : 220–221, ♂ ♀.
Mesopolobus tibialis (Westwood) ; v. Rosen, 1960*a* : 37–38, ♂ ♀.

Type material. For synonymy and designation of lectotypes see Graham (1957*d* : 223–224). The species was redescribed by von Rosen (1958 : 220–221).

Cinips fuscicornis Fonscolombe. No material found. The description and biology suggests that *fuscicornis* may have been the same as *Mesopolobus tibialis*.

Widely distributed, probably the whole of EUROPE ; SYRIA.

Biology. Reared from various Cynipid galls, especially of *Neuroterus* spp. and *Andricus* spp. (for host-list and detailed biological observations, see Askew, 1961*b* : 166–169). According to Askew, *tibialis* shows a preference for Cynipids which cause leaf-galls, but occasionally attacks those in bud-galls. Normally bivoltine, the two generations appearing in spring and summer, rarely a partial third generation in autumn.

Mesopolobus amaenus (Walker)

(Text-fig. 526)

Amblymerus amaenus Walker, 1834 : 307, ♀.
Platyterma remotum Walker, 1834 : 342, ♀, **syn. n.**
Amblymerus nanus Walker, 1834 : 349, ♀.
Eutelus dilectus Walker, 1834 : 356, ♂.
Eutelus immaculatus Walker, 1834 : 357, ♂.
Eutelus eximius Walker, 1834 : 360, ♀.
Eutelus catenatus Walker, 1834 : 362, ♀.
? Pteromalus Lebene Walker, 1848 : 125, 190–191, ♀.
Eutelus collaris Thomson, 1878 : 73, ♂ ♀.
? Eutelus lichtensteini Mayr, 1903 : 388, 390, ♂ ♀.
Platymesopus amaenus (Walker) Graham, 1957*d* : 225–226.
Mesopolobus amaenus (Walker) v. Rosen, 1958 : 225–226, ♂ ♀.
Mesopolobus amaenus (Walker) ; v. Rosen, 1960*a* : 21–22, ♂ ♀.
Mesopolobus amaenus (Walker) ; Askew, 1961*b* : 171.

Type material. For designation of lectotypes, and most of the above synonymy, see Graham (1957*d* : 225–226).

Platyterma remotum Walker. In my paper (1957*d* : 226) I placed this as doubtfully the same as *amaenus* (Walker). I have re-examined the type ♀ and am now

convinced that it is a small and rather slender specimen of *amaenus* ; in the form of the clypeus and in other respects it agrees with typical examples of that species.

Pteromalus lebene Walker. One female, accepted as TYPE. It has the clypeus rather deeply emarginate and may be a somewhat aberrant *amaenus*, though the pronotal collar is rather shorter than in any females which I definitely regard as that species.

Eutelus lichtensteini Mayr. Type ♂, France, Montpellier, May and June, from galls of the Cecidomyiid *Dryomyia lichtensteini* Lw., in Naturhistorisches Museum, Vienna. This species was placed in synonymy with *amaenus* (Walker) by von Rosen (1958 : 225). Askew (1961*b*) considered that *lichtensteini* might represent a distinct species. He stated that the type ♂ differed from males of *amaenus* in having the antennal funicle wholly yellow, and in its relatively shorter pronotal collar. In British males of *amaenus* the antennal flagellum has its sixth segment at least slightly marked with fuscous, and often wholly of that colour. I have, however, examined some specimens reared in Italy from *Plagiotrochus* sp., males of which have a very long pronotal collar and appear to belong to *amaenus* ; one of these males has the sixth segment of the flagellum fuscous, another has the funicle entirely yellow. The colour of the funicle is therefore not a reliable character for separating males of *lichtensteini* from those of *amaenus*. The shorter pronotal collar of male *lichtensteini* might be a valid distinction, but it will be necessary to re-examine the type male and other material in order to decide whether it is a good species.

M. amaenus was redescribed by von Rosen (1958).

Widely distributed in EUROPE.

Biology. Reared from various Cynipid galls, chiefly bud-galls (for host-list and detailed biological information see Askew, 1961*b*). *M. lichtensteini* was reared from galls of *Dryomyia lichtensteini* Loew (Dipt., Cecidomyiidae) on *Quercus ilex* L., by Loew and Mayr ; Frediani (1955, *Redia* **40** : 174) stated that it was an ectophagous parasite of the Cecidomyiid.

Mesopolobus apicalis (Thomson)

Eutelus apicalis Thomson, 1878 : 74, ♂ ♀ [nec *Pteromalus apicalis* Nees, 1834].
Eutelus thomsonii Dalla Torre, 1898 : 93 [nom. n.]
Mesopolobus apicalis (Thomson) v. Rosen, 1958 : 231, ♂ ♀.
Mesopolobus apicalis (Thomson) ; v. Rosen, 1959 : 131–132.
Mesopolobus apicalis (Thomson) ; v. Rosen, 1960*a* : 22.

Type material. 4 ♂ and 1 ♀ stand under the name *apicalis* in Thomson's collection, but only one male and the female agree with the description ; the male was selected as lectotype by me and validated by von Rosen (1958 : 231), who also redescribed the species.

SWEDEN.

Biology. Unknown.

Mesopolobus zetterstedti (Dalla Torre) **comb. n.**

Pteromalus apicalis Zetterstedt, 1838 : 426, ♂ [*nec* Nees, 1834].
Pteromalus zetterstedtii Dalla Torre, 1898 : 154 [n. n. for *Pteromalus apicalis* Zetterstedt, *nec* Nees].

Type material. One male, LECTOTYPE, labelled in Zetterstedt's handwriting " P. apicalis ♂. Kengis ".

I cannot correlate this male at present with any female. No other material agreeing with it has been seen.

LAPLAND.

Biology. Unknown.

Mesopolobus subfumatus (Ratzeburg)

(Text-fig. 533)

Pteromalus subfumatus Ratzeburg, 1852 : 236, ♀.
Eutelus punctiger Thomson, 1878 : 75, ♀.
Platyterma ecksteini Wolff, 1916 : 166, 168–169, figs. 1–19, ♂ ♀.
Amblymerus subfumatus (Ratzeburg) Nowicki, 1939 : 473.
Amblymerus subfumatus (Ratzeburg) ; Otten, 1942*a* : 114–117.
Mesopolobus subfumatus (Ratzeburg) v. Rosen, 1958 : 223–224, ♂ ♀.
Mesopolobus subfumatus (Ratzeburg) ; v. Rosen, 1960*a* : 36–37, ♂ ♀.
Amblymerus subfumatus (Ratzeburg) ; Peck, 1963 : 661–662.

Type material. *Pteromalus subfumatus* Ratzeburg. Types presumed destroyed ; but the name has became generally accepted, following its recognition by Nowicki (1939) and Otten (1942*a*). The latter author probably saw the types.

Eutelus punctiger Thomson. Syntypes, 4 ♀. LECTOTYPE labelled " Sm. Bhn " [Småland, Boheman].

Platyterma ecksteini Wolff. Syntypes, Germany," in sylvis Borussiae. Hospes : Lophyrus pini L.; coluit Prof. Dr. C. Eckstein ", presumably in Deutsches Entomologisches Institut, Eberswalde. The species was synonymized with *subfumatus* Ratzeburg by Nowicki (1939).

The species was redescribed by von Rosen (1958 : 223–224).

Widely distributed in EUROPE (not yet found in the British Isles) ; CANADA (introduced).

Biology. Chiefly a primary parasite of *Diprion* spp. (Hym., Diprionidae), attacking the cocoons ; occasionally hyperparasitic through Ichneumonidae or Braconidae. The majority of imagines have been reared in August and September ; but there is probably an earlier generation emerging in May and June (see Otten, 1942*a*).

Mesopolobus anogmoides **sp. n.**

♀. Head and thorax green to blue-green ; gaster with weaker reflections of the same tints, dorsally bronze-black on the disc and the hinder part of the basal tergite. Antennal scape

proximally, to wholly, testaceous ; pedicellus and flagellum infuscate dorsally, more or less testaceous beneath. Coxae, and femora except their tips, concolorous with the thorax ; trochanters dark, trochantelli and rest of legs testaceous, the tibiae usually broadly infuscate medially, the tips of the tarsi, the fore tarsi mainly, brownish. Tegulae more or less testaceous anteriorly, fuscous posteriorly. Wings slightly tinged with grey ; venation testaceous or brownish. Length 2 to 2·3 mm.

Head only slightly broader than the mesoscutum ; in dorsal view approximately twice as broad as long, with temples rounded off and only about one quarter as long as eyes ; POL 1·85 to 2 times OOL. Head in frontal view subtrapeziform, with genae converging towards the oral fossa and nearly straight ; eyes separated by about 1·1 times their length ; malar space slightly less than half the length of an eye. Clypeus mainly striate, its anterior margin narrowly shiny and nearly truncate. Rest of head finely reticulate, the frons rather more coarsely. Antennae with lower edge of toruli at about level of ventral edge of eyes ; combined length of pedicellus and flagellum very slightly less than breadth of head ; pedicellus (profile) about twice as long as broad, about as long as anelli plus half of the first funicular segment ; flagellum proximally hardly stouter than the pedicellus but clavate distally ; anelli distinctly though not very strongly tranvserse, the first and second very short, the third longer and 1·5 to 1·7 times as broad as long ; proximal segments of funicle subquadrate, distal segments slightly transverse ; clava broader than fifth funicular segment, hardly twice as long as broad, virtually as long as the three preceding funicular segments together ; sensilla sparse, in one row on each segment of the funicle.

Thorax about 1·6 times as long as broad. Pronotal collar somewhat less wide than the mesoscutum, extremely short medially, from one sixteenth to one twelfth as long as the mesoscutum, but quite long at the sides, finely reticulate, its front edge with a trace of a fine margin in the middle. Mesoscutum 1·4 to 1·5 times as broad as long, moderately convex, finely reticulate, a little more coarsely posteriorly, and rather dull, with some small and shallow piliferous punctures which are not easily seen amongst the reticulation. Scutellum slightly longer than broad, rather weakly convex, but with its surface appearing distinctly curved in profile, very finely reticulate like the axillae. Dorsellum a convex transverse strip which is separated from the scutellum by a non-costate suture. Propodeum only about one third as long as the scutellum, medially produced only slightly beyond the bases of the hind coxae ; median area very finely reticulate, not distinctly defined laterally, the plicae being weak or obsolete in front, and sharp only posteriorly, with the basal foveae small and transversely oval, the posterior foveae, at sides of nucha, large and deep ; median carina weak or indistinct ; spiracles short-oval, separated by about half their length from the metanotum. Postspiracular sclerite fairly broad, mainly very finely, though quite strongly, reticulate. Mesepisternum and mesepimeron finely reticulate, the mesepisternum with a mainly smooth triangle below the base of the hind wing ; metapleuron more finely and weakly reticulate than the mesepimeron, especially dorsally. Fore wing with costal cell rather narrow, its upper surface bare or virtually so, its lower surface with a complete row of hairs and some additional hairs scattered over the distal third ; basal cell on upper surface of wing with its distal third to half pilose ; speculum open or partly open below, on upper surface of wing extending only to the base of the marginal vein ; surface beyond the speculum rather densely, and nearly uniformly, pilose ; marginal vein 1·75 to 1·85 times as long as the stigmal vein ; postmarginal as long as, or even a little longer than, the marginal.

Gaster, including ovipositor sheaths, 1·25 to 1·4 times as long as head plus thorax, somewhat compressed and narrower than the thorax ; basal tergite occupying about one fifth of the total length, its hind margin entire ; last tergite 1·4 to 1·7 times as long as its basal breadth, its posterior portion, behind the pygostyles, sublinear and closely applied to the ovipositor sheaths, the latter very distinctly exserted, their projecting part nearly or about as long as the first segment of the hind tarsus ; hypopygium extending nearly half the distance from base of gaster to tips of ovipositor sheaths.

♂. Unknown.

Holotype ♀. ENGLAND : Berkshire, Bagley Wood, on foliage of *Larix decidua* Mill., 3.ix.1954 (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotypes, 1 ♀, 4.vi.1954, 1 ♀, 3.vi.1962 (*Graham*), in Graham collection.

This very distinct species may be known from the other described species by the combination of the extensively pilose basal cell of the fore wing, short propodeum which has rather weak plicae, and lanceolate gaster having the ovipositor sheaths distinctly exserted.

In the pilosity and venation of the fore wing it much resembles *Anogmus strobilorum* Thomson ; in the sculpture of the dorsum of the thorax, the shape of the thorax, and in the propodeum, it somewhat resembles *Trychnosoma punctipleura* (Thomson).

Biology. Unknown.

Mesopolobus spermotrophus Hussey

Amblymerus apicalis Hussey, 1955 : 147–150, ♂ ♀ [*nec* Thomson, 1878].
Mesopolobus sp., v. Rosen, 1960 : 40–41, ♂ ♀.
Mesopolobus spermotrophus Hussey, 1960 : 237, ♂ ♀.

Type material. Holotype ♀, and paratypes, ♂ ♀, Scotland : Ross-shire, Rosehaugh, i.1952, from seeds of *Pseudotsuga douglasii* Carrière infested with *Megastigmus spermotrophus* Wachtl, parasitizing the latter in BM(NH).

SCOTLAND.

Biology. A detailed account was given by Hussey (1955).

Mesopolobus pinus Hussey

Mesopolobus pinus Hussey, 1960 : 237–238, ♂ ♀.

Type material. Holotype ♀ and paratypes, ♂ ♀, Scotland : Aberdeenshire, Blackhall, 1953, from seeds of *Abies procera* Rehd. infested with *Megastigmus pinus* Parfitt, stated to be in BM(NH), but I cannot locate them.

I am not certain of the identity of this species, which appears to be a valid one. I have seen a ♀ which fits the description and may be *pinus* ; it is very like *spermotrophus* Hussey but has the gaster about as long as head plus thorax.

SCOTLAND.

Biology. See above.

Mesopolobus maculipennis (Mercet)

Eutelus (*Amblymerus*) *maculipennis* Mercet, 1923 : 105, ♂. Mercet, 1924 : 429–430, ♀.
Mesopolobus maculipennis (Mercet) v. Rosen, 1958 : 232, ♂.
Mesopolobus maculipennis (Mercet); v. Rosen, 1960*a* : 30–31, ♂ ♀.

I have not seen the type-material of this species. Von Rosen (1960*a*) gave a redescription of both sexes from material (not the types) determined by Mercet

himself. The species is not included in my key and reference should be made to von Rosen's papers for information.

SPAIN.

Biology. Unknown. Mercet (1924) took the male and female *in copulâ*, on *Olea europea*.

MERAPORUS Walker

Meraporus Walker, 1834 : 298. Type-species : *M. graminicola* Walker, by designation of Westwood, 1839 : 70.
Pteromalus sgen. *Meraporus* ; Thomson, 1878 : 146, 150.
Meraporus Walker ; Ashmead, 1904 : 319, 321.
Meraporus Walker ; Schmiedeknecht, 1909 : 328, 330, 334–335.
Meraporus Walker ; Kurdjumov, 1913 : 7, 13 [*ex parte*].
Meraporus Walker ; Nikol'skaya, 1952 : 226.
Meraporus Walker ; Graham, 1957*d* : 217–218.
Meraporus Walker ; Peck *et al.*, 1964 : 30, 54.

There has been some confusion in the literature regarding the identity of *Meraporus*. This arose partly because Curtis (1860 : pl. K, fig. 19) figured *Meraporus graminicola* Walker, and at the same time stated (op. cit. : 322) that a parasite which he had obtained from a grain of Ancona wheat [probably as a parasite of some grain weevil] was the same as, or closely allied to, *graminicola*. In fact it cannot have been *graminicola* or even a *Meraporus* species at all, but was probably *Lariophagus distinguendus* (Förster), as Waterston (1921 : 11–12) suggested. The latter author discussed the question in detail and stated (ibid.: 11) " So far as I know no parasite of grain pests is a true *Meraporus* ". Unfortunately Kloet and Hincks (1945 : 293) misinterpreted Waterston's account and wrongly cited *Lariophagus* as a synonym of *Meraporus*, as I have already pointed out (Graham, 1957d : 217). The North American species *Meraporus requisitus* Tucker is retained in *Meraporus* by Peck (1963 : 695) ; this species is a parasite of the Curculionid beetle *Sitophilus oryza* (L.) in rice, and seems unlikely to be a true *Meraporus*. The type-species of *Meraporus, graminicola* Walker, is not known to occur in stored products, but is very common amongst grasses and has been reared from the Hessian fly, *Mayetiola destructor* (Say).

The genus *Parmicromelus* Girault (1917*c* : 4) was synonymized with *Meraporus* Walker by Peck (*in* Muesebeck *et al.*, 1951 : 556). This synonymy is almost certainly incorrect. The original description of the type-species of *Parmicromelus, europaeus* Girault (France, Lille) includes the statements that the male has the " abdomen orange between base and middle " and " one mandible 3-dentate ", both characters that disagree with those of the known European species of *Meraporus*. It seems likely that *Parmicromelus* comes somewhere near *Anisopteromalus*.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Median area of propodeum 2 to 2·5 times as broad as long, its panels reticulate or

obliquely strigose-reticulate ; plicae curved, not strongly raised, and sometimes weak. Pronotal collar anteriorly often with indications of a fine carina. Length rarely more than 2 mm. Wings fully developed or rudimentary. Widespread in Europe . . . . . ***graminicola*** Walker (p. 682)

– Median area of propodeum about three times as broad as long, its panels irregularly sculptured and with some longitudinal carinulae ; plicae strongly raised and outwards-angulate in their middle. Pronotal collar not margined. Length 2·4 mm. Wings rudimentary in the single known female. Bulgaria ***rambouseki*** Bouček (p. 684)

(MALES)

Only that of *graminicola* Walker is known. It resembles the female in the characters of the propodeum, pronotum, and wings, but differs in having a striking pattern on the head formed by smooth sinuous lines (Text-fig. 325) ; this pattern is slightly variable, as shown by Delucchi (1962 : 124, figs. 13–18) but always maintains its essential character. The antennae and gaster also differ slightly from those of the female. Notes on the variation of the male are given in the text.

Meraporus graminicola Walker

(Text-fig. 325)

Meraporus graminicola Walker, 1834 : 299, ♂ ♀.
Meraporus alatus Walker, 1834 : 300, ♂.
Amblymerus modestus Walker, 1834 : 344, ♀.
Amblymerus hebes Walker, 1834 : 348, ♀.
Amblymerus temperatus Walker, 1834 : 349, ♀.
Amblymerus iners Walker, 1834 : 350, ♀.
Pteromalus tenuiscapus Förster, 1841 : 18, "♂" [*recte* ♀].
Pteromalus pulex Förster, 1861 : 36, ♂.
Pteromalus micropterus Förster, 1861 : 36, ♀.
Pteromalus Myle Walker, 1848 : 125, 198, "♀" [*recte* ♂], **syn. n.**
Pteromalus Allutius Walker, 1848 : 126, 207, ♀.
Pteromalus Gigon Walker, 1848 : 126, 208, ♀, **syn. n.**
Pteromalus (*Meraporus*) *graminicola* Walker ; Thomson, 1878 : 150–151, ♂ ♀.
? Meraporus crassicornis Kurdjumov, 1914 : 4, ♂ ♀.
Meraporus crassicornis Kurdjumov ; Gahan, 1933 : 70–71, ♀.
Meraporus graminicola Walker ; Graham, 1957*d* : 217–218.
Meraporus graminicola Walker ; Bouček, 1961 : 90–92.
Meraporus graminicola Walker ; Delucchi, 1962 : 124, figs. 13–18, ♂ ♀.

Type material. For synonymy, and designation of lectotypes for most of the above Walker species, see Graham (1957*d* : 217–218). It should be noted that the reference to the original description of *Amblymerus modestus* Walker [cited above] was accidentally omitted from the synonymy given in that paper. Other species, not dealt with in the above paper, are the following :

Pteromalus tenuiscapus Förster. The type (not seen) in Naturhistorisches Museum, Vienna, is in reality a female in poor condition, according to Delucchi (1958*a* : 55).

Pteromalus pulex Förster and *P. micropterus* Förster. Types in Naturhistorisches Museum, Vienna (not seen) ; according to Delucchi (1955*a* : 173–174) who saw the types, they are the same as *graminicola* Walker.

Pteromalus myle Walker. One male, LECTOTYPE, bearing a Waterhouse label.

Pteromalus gigon Walker. One female, LECTOTYPE, bearing a Waterhouse label.

Meraporus crassicornis Kurdjumov. Types (not seen) ? in Zoological Museum, Leningrad. Bouček (1961 : 90) considers that *crassicornis* is very probably the same as *graminicola* ; I had also reached the same conclusion.

Parmicromelus europaeus Girault, 1917, was synonymized with *Meraporus graminicola* Walker by Peck (*in* Muesebeck *et al.*, 1951 : 556) but as I have already noted above under my discussion of the genus, this cannot be correct.

Gahan (1933) gave a good redescription of the female of *graminicola* (under the name *crassicornis* Kurdjumov).

Micropterous and macropterous forms occur in both sexes of *graminicola*. In the British Isles, macropterous specimens appear to be rather less common than micropterous individuals, especially in the male sex.

Some notes on the variation of *graminicola* may be useful (particularly that of the male, so as to facilitate recognition of the unknown male of *rambouseki*) :

♂. Length 0·8 to 1·8 mm. Wings either fully developed, or rudimentary ; in macropters hyaline or subhyaline. Head and thorax varying from green through bronze-green to bronze or coppery bronze ; antennae sometimes entirely testaceous, but more often having the scape, pedicellus, and base of the flagellum more or less infuscate, occasionally with the whole flagellum brown ; legs, not counting coxae and tips of tarsi, often wholly testaceous, sometimes with the femora infuscate, occasionally with the tibiae more or less so, in exceptionally dark forms the legs may be almost wholly fuscous. First funicular segment usually somewhat shorter than the second, occasionally hardly two thirds its length, usually transverse but occasionally quadrate; second segment quadrate or slightly transverse ; fifth distinctly transverse. Pronotal collar anteriorly with as a rule some indication of a fine transverse carina, at least in the middle. Median area of propodeum 1·5 to 2·1 times as broad as long. Gaster varying from circular to oval. The pattern (Text-fig. 325) formed by the smooth sinuous lines on the head is somewhat variable ; Delucchi (1962, figs. 13–18) has illustrated some of the variations. The smooth lines in text-figs. 325-327 (fv, facial vittae ; tv, temporal vittae) are discussed fully in Graham (1957*d* : 218).

♀. Length 1·5 to 2·1 mm. Wings either fully developed, or rudimentary ; in macropters the wings are hyaline or infumate. Head and thorax varying in colour much as in the male. Antennae fuscous to black with the scape usually more or less testaceous. Legs, not counting coxae and tips of tarsi, sometimes wholly testaceous, but usually with the femora infuscate, sometimes with the tibiae also more or less so ; in very dark specimens the legs are mainly fuscous. Details of propodeum and pronotal collar are given in my key to the species.

EUROPE (widely distributed and one of the commonest species of Pteromalidae) ; ICELAND ; NORTH AFRICA. Delucchi (1962 : 124) said that it was cosmopolitan, but this is an overstatement because material from regions other than the above has not been critically examined.

Biology. Reared in U.S.S.R. from puparia of the Hessian fly, *Mayetiola destructor* (Say) according to Gahan (1933 : 70–71, as *Meraporus crassicornis* Kurdj.) ; Delucchi (1962) recorded it from the same host, and from *Mayetiola avenae* Marchal, in North Africa. It may well prove to have other hosts. In Britain imagines occur in the field from June until October ; in North Africa it appears earlier (Feb.–April according to Delucchi, 1962).

Meraporus rambouseki Bouček

Meraporus rambouseki Bouček, 1961 : 92–93, ♀.

Type material. Holotype ♀, Bulgaria, Midžor, Stara Planina-mountains, 1.ix.1923 (*F. Rambousek*), in Národní Museum, Prague (Cat. no. 2974).

BULGARIA.

Biology. Unknown.

PEGOPUS Förster

Prosopon Walker, 1837 : 356. Type-species : *P. montanum* Walker, by monotypy [pre-occupied by *Prosopon* Meyer, 1835].
Prosopon Walker ; Förster, 1856 : 47, 51.
Pegopus Förster, 1856 : 145 [n. n. for *Prosopon* Walker *nec* Meyer].
Arthrolytus sect. C ; Thomson, 1878 : 160.
Pegopus Förster ; Ashmead, 1904 : 285 [♂ only].
Pegopus Förster ; Schmiedeknecht, 1909 : 157, 168 [♂ only].
Meraporus Walker ; Kurdjumov, 1913 : 7, 13 [*ex parte*].
Pegopus Förster ; Graham, 1956*b* : 252–254.
Pegopus Förster ; Peck *et al.*, 1964 : 48, 56.

Prosopon was described originally in the neighbourhood of some genera of Cleonymidae and Eupelmidae, being no doubt placed there because of the expanded mid tibiae and tarsi of the male. Förster (1856) and Ashmead (1904) included it in Cleonymidae. Thomson (1878) correctly placed the type-species in Pteromalinae, although he did not recognize the generic name. Ashmead (1904) and Schmiedeknecht (1909) continued to place *Pegopus* (=*Prosopon*) in Cleonymidae, and incorrectly attributed the characters of the modified mid legs to the female as well as the male. Graham (1956*b* : 254) pointed out that *Pegopus* was very close to *Meraporus*. These two genera are in fact so close that they might eventually be united.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Fore wing with marginal vein 1·65 to 1·9 times as long as the stigmal vein ; distal third to half of basal cell pilose. Antennae with scape distinctly shorter than an eye ; flagellum stout ; first funicular segment as stout as or slightly stouter than the pedicellus in dorsal view, second segment slightly transverse, sixth quite strongly so. Eyes separated by about 1·2 times their own length. Mid tibia slightly expanded, about 6·5 times as long as broad . ***inornatus*** (Walker) (p. 685)

– Fore wing with marginal vein 1·35 to 1·4 times as long as the stigmal vein ; basal cell rather less pilose distally. Antennae with scape fully as long as an eye ; flagellum rather slender proximally, first funicular segment barely as stout as the pedicellus in dorsal view, segments one to four quadrate or hardly transverse, sixth only slightly transverse. Eyes separated by about 1·5 times their own length. Mid tibia not expanded, about 8·5 times as long as broad ***leptomerus*** sp. n. (p. 685)

(MALES)

1 Mid tibia strongly expanded and flattened in its distal half, only about 4·5 times as

long as its maximum breadth ; first segment of mid tarsus expanded and flattened, only about 2·5 times as long as broad, second segment slightly expanded. Marginal vein of fore wing 1·5 to 1·7 times as long as the stigmal vein
inornatus (Walker) (p. 685)

– Mid tibia neither expanded nor flattened, 8 to 8·5 times as long as its maximum breadth ; mid tarsus neither expanded nor flattened. Marginal vein of fore wing 1·25 to 1·3 times as long as the stigmal vein . . . ***leptomerus*** sp. n. (p. 685)

Pegopus inornatus (Walker)

Eutelus inornatus Walker, 1834 : 363, ♀.
Pteromalus sobrius Walker, 1836 : 484, ♀.
Prosopon montanum Walker, 1837 : 356, ♂.
Prosopon montanum (Walker) Haliday, 1841–1842 : pl. D., fig. 4, ♂.
Pteromalus Pyttalus Walker, 1844*a* : 340, ♀.
Pteromalus Aollius Walker, 1845 : 262, ♂, **syn. n.**
Prosopon montanum Walker, 1850 : 132–133, ♀.
Arthrolytus rugifrons Thomson, 1878 : 160, ♀.
Pegopus inornatus (Walker) Graham, 1956*b* : 254.

For most of the above synonymy, and designation of lectotypes for all the above species except the two mentioned below, see Graham (1956*b* : 254).

Pteromalus aollius Walker. Syntypes, 2 ♂ ; LECTOTYPE, the first specimen, bearing a Waterhouse label.

Arthrolytus rugifrons Thomson. Syntypes, 8 ♀ ; LECTOTYPE, one labelled " Dlc " [Dalecarlia] and " Bhn " [Boheman]. The species was synonymized with *inornatus* by Graham (1956*b* : 254).

BRITAIN, IRELAND, SWEDEN, GERMANY, SWITZERLAND, CZECHOSLOVAKIA. In Britain it occurs only on moorland, often at relatively high altitudes. I have taken it up to 2,500 feet.

Biology. Unknown. Imagines July–September.

Pegopus leptomerus sp. n.

(Text-figs. 556–558)

♀. Body bronze-black. Mandibles reddish, darker at the base. Antennae black ; scape and pedicellus with a weak bronze tinge. Coxae concolorous with the body ; legs otherwise blackish with the knees reddish. Wings subhyaline ; venation brown, parastigma and stigma darker. Length 1·7 to 1·8 mm.

Head in front view (Text-fig. 556) about 1·35 times as broad as high. Eyes 1·25 to 1·3 times as long as broad, separated by virtually 1·5 times their own length. Malar space slightly more than half the length of an eye. Head somewhat shiny, its reticulate sculpture rather less strong than that of *inornatus* (Walker). Antennae inserted relatively low, the lower edge of their toruli being about level with the ventral edge of the eyes ; scape equal in length to an eye, reaching distinctly above the level of the vertex ; flagellum more slender proximally than in *inornatus*, the first funicular segment barely as stout as the pedicellus when the latter is seen in dorsal view ; distal segments of funicle less transverse than in *inornatus*, funicular segments one to three or one to four are quadrate or hardly transverse, five and six are slightly transverse.

Pronotal collar sharply margined. Mesoscutum, axillae, and scutellum rather more shiny than

in *inornatus*, their reticulation a little less strong ; mesoscutum without piliferous punctures, its hairs arising from minute tubercles; the mesoscutum of *inornatus* has some shallow piliferous punctures. Fore wing with veins relatively thin ; marginal vein shorter than in *inornatus*, 1·35 to 1·4 times, instead of 1·65 to 1·9 times, as long as the stigmal vein ; postmarginal vein at most slightly longer than the marginal vein, 1·2 to 1·3 times as long in *inornatus* ; upper surface of costal cell with a row of four to six hairs at its apex ; basal vein pilose, basal cell with a few (up to nine) scattered hairs in its distal quarter ; disc of wing, beyond the speculum, thickly haired. Mid tibia not expanded, about 8·5 times as long as broad ; its apical spur distinctly longer than the maximum breadth of the tibia, hardly longer in *inornatus*.

Gaster oval, somewhat longer than the thorax but hardly as long as head plus thorax, as broad as the latter, 1·4 to 1·6 times as long as broad, pointed apically but not acute, its sides converging at about a right angle ; last tergite short, hardly as long as the preceding one, somewhat shorter than its basal breadth.

♂. Differs from the female as follows :-

Malar space slightly less than half the length of an eye. Eyes separated by 1·4 to 1·45 times their own length. Antenna (Text-fig. 557) with scape somewhat shorter than an eye, though reaching to the level of the vertex, or even slightly above it, its outer aspect not entirely reticulate but having a narrow shiny boss extending over about the distal third ; pedicellus shorter ; flagellum filiform or virtually so ; combined length of pedicellus and flagellum slightly greater than breadth of head ; first funicular segment nearly or quite as long as the pedicellus and 1·3 to 1·6 times as long as broad, following segments decreasing in length, the sixth about quadrate ; clava not broader than the funicle, tapering ; flagellum with long outstanding hairs. Fore wing with marginal vein only 1·2 to 1·3 times as long as the stigmal vein. Legs with mid tibia neither expanded nor flattened, 8 to 8·5 times as long as its maximum breadth ; length of mid tibial spur fully as great as, or slightly greater than, the breadth of the tibia ; mid tarsi neither expanded not flattened. Gaster oblong, nearly as long as but somewhat narrower than the thorax, with a ventral plica.

The male differs from that of *inornatus* (Walker) most obviously in the characters of the mid legs and fore wing (see key). It also differs from it in having the head rather more transverse, 2·15–2·2 times as broad as long in dorsal view ; about twice as broad as long in *inornatus* ; eyes more widely separated, in *inornatus* separated by only about 1·2 times their own length ; antennal scape with a shorter shiny boss, extending hardly more than one third down the scape, as against half way down in *inornatus* ; flagellum filiform or nearly so, blackish, in *inornatus* slightly clavate, brown or testaceous. The spur of the mid tibia in *inornatus* is distinctly shorter than the maximum breadth of the tibia, but in *leptomerus* sp. n. it is relatively longer.

Holotype ♀. SCOTLAND : Inverness-shire, Isle of Rhum, 31.viii.1961, beaten from foliage of birch (*Betula pubescens* Ehrh.) (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 1 ♀, 29.viii.1961, in Graham collection.

IRELAND : Co. Wicklow, Glending, 2 ♂, 19.viii.1954, swept from herbage in a deciduous wood (*Graham*), in Graham collection.

SWEDEN : Närke, Örebro district, 1 ♀, 25.vii.1953 (*A. Jansson*), in collection of the late Dr. A. Jansson.

CZECHOSLOVAKIA : Bohemia, Břehyně near Doksy, 19 ♀, 3 ♂, 8.x.1957 (*Bouček*), in Bouček collection.

Biology. Unknown.

LEPTOMERAPORUS Graham

Meraporus sgen. *Leptomeraporus* Graham, 1957*d* : 218. Type-species : *M.* (*L.*) *tenuicornis* Graham, by monotypy.
Leptomeraporus Graham ; Bouček, 1961 : 88.

Leptomeraporus nicaee (Walker) **comb. n.**

(Text-figs. 326–329)

Miscogaster Nicaee Walker, 1839 : 197, ♂.
Megorismus Aon Walker, 1848 : 109 [n. nud.].
Pteromalus Zagreus Walker, 1848 : 124, 183, ♀, **syn. n.**
Meraporus (*Leptomeraporus*) *tenuicornis* Graham, 1957*d* : 218, ♂, **syn. n.**
Meraporus tenuicornis Graham ; Bailey, 1960 : 40–43, ♀.
Leptomeraporus tenuicornis (Graham) ; Bouček, 1961 : 88–89, ♂ ♀.
Meraporus tenuicornis Graham ; Erdös, 1961 : 203–204, figs. 5, 6, ♂ ♀.

Type material. *Miscogaster nicaee.* None found. The description answers so well to the present species (especially the statements that the head is much broader than the thorax, antennae clavate and very slender, wings narrow and short) that I am sure it is interpreted correctly.

Pteromalus zagreus Walker. Syntypes, 2 ♀. LECTOTYPE, the second specimen (lacking gaster), bearing a Waterhouse label.

Meraporus (*Leptomeraporus*) *tenuicornis* Graham. Holotype ♂, Ireland, Co. Dublin, North Bull, 11.v.1949 (*Stelfox*), in coll. Graham.

Megorismus aon Walker is represented in his collection by a male specimen, but it was never described.

BRITAIN, IRELAND, CZECHOSLOVAKIA, HUNGARY.

Biology. Bailey (1960 : 40) recorded *nicaee* [under the name of *tenuicornis* Graham] as a parasite of *Tetramesa linearis* (Walker) and *Eurytoma flavimana* Boh. in the galls produced by the former on stems of *Agropyron repens* (L.) Beauv.; he also (ibid., fig. 1) figured the larva of *Leptomeraporus tenuicornis* Graham (=*nicaee* Walker). Erdös (1961) figured both sexes of *tenuicornis* and stated that he had reared it from galls of *Tetramesa hordei* (Harr.) on *Agropyron repens* L. Imagines appear in May–July and September.

LAMPOTERMA Graham

Metastenus Thomson, 1876*a* : 205 [*nec* Walker, 1834].
Lampoterma Graham, 1956*b* : 256. Type-species : *Metastenus viridis* Thomson, 1876*a*, by original designation.

This genus is not very distinct from *Stinoplus* Thomson, of which it may eventually be regarded as a subgenus.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Antenna with three anelli and five funicular segments ; combined length of pedicellus and flagellum less than breadth of head ; flagellum strongly clavate, all the funicular segments strongly transverse ; clava slightly longer than the three preceding funicular segments together ; both mandibles with three teeth
viride (Thomson) (p. 690)

– Antenna (Text-fig. 558) with two anelli and six funicular segments ; combined length of pedicellus and flagellum fully equal to, or slightly greater than, the breadth of the head ; flagellum slightly clavate, the funicular segments only slightly transverse ; clava slightly shorter than the three preceding funicular segments together ; left mandible with three teeth, right mandible with four.
Fore wing venation, Text-fig. 560 . . . . ***bianellatum*** sp. n. (p. 688)

(MALES)

1 Antenna with three anelli and five funicular segments ; combined length of pedicellus and flagellum barely equal to the breadth of the head ; all the funicular segments slightly transverse ; clava about as long as the three preceding funicular segments together ; both mandibles with three teeth . . . ***viride*** (Thomson) (p. 690)

– Antenna (Text-fig. 559) with two anelli and six funicular segments ; combined length of pedicellus and flagellum slightly greater than the breadth of the head ; funicular segments subquadrate ; clava slightly shorter than the three preceding funicular segments together ; left mandible with three teeth, right mandible with four . . . . . ***bianellatum*** sp. n. (p. 688)

Lampoterma bianellatum sp. n.

♀. Head, thorax and gaster green to bluish green, some parts occasionally tending towards brassy. Antennal scape and pedicellus black, the former distinctly, the latter faintly, metallic-tinged ; flagellum fuscous to black. Coxae concolorous with the thorax ; trochanters partly testaceous ; femora blackish with a metallic gloss, their tips testaceous; tibiae testaceous at base and apex, otherwise brownish, or mid and hind tibiae blackish with a metallic gloss ; tarsi testaceous with their fifth segment brown. Tegulae brown, or testaceous basally. Wings subhyaline ; venation greyish testaceous. Length 1·75 to 2 mm.

Head (dorsal view) about 1·25 times as broad as the mesoscutum, 2·1 to 2·15 times as broad as long ; temples rather strongly convergent, their outline curved, about one quarter as long as an eye ; ocelli in a triangle of about 120°, POL nearly twice OOL. Head (front view) subtrapeziform, about 1·25 times as broad as high ; eyes separated by about 1·25 times their own length, inner orbits almost parallel, hardly diverging ventrad ; malar space about 0·4 length of eye, genae converging moderately strongly towards the mouth, their outline only slightly curved ; breadth of mouth-opening about 2·5 times the malar space. Mandibles small, the left one with three, the right with four, teeth. Head somewhat glittering, the reticulation relatively fine, especially on the face, and not strongly raised ; the areoles composing it tend to be somewhat elongated transversely on the vertex, longitudinally on the frons and temples. Clypeus reticulate with only a slight tendency towards strigosity, its anterior margin more or less broadly smooth and polished. Antennae (Text-fig. 558) inserted distinctly above the ventral edge of the eyes, but a little nearer to the anterior margin of the clypeus than to the median ocellus ; scape hardly three quarters the length of an eye ; pedicellus about 1·7 times as long as broad ; combined length of pedicellus and flagellum about equal to, or slightly greater than, the breadth of the head ; funicle proximally slightly stouter than the pedicellus, becoming very slightly thicker distad, its segments slightly to distinctly transverse ; clava hardly more than twice as long as broad, slightly shorter than the three preceding funicular segments together. Flagellum with subdecumbent hairs.

Pronotum, viewed dorsally, very short and strongly transverse, wholly reticulate, with a transverse row of bristles close to its hind margin. Mesoscutum hardly 1·5 times as broad as long, moderately shiny, its reticulation rather fine, though tending to be wider-meshed on the disc, and only slightly raised above the general surface ; some scattered small punctures are visible amongst the reticulation ; notauli traceable about half way across the mesoscutum ; hind margin of the latter moderately strongly produced backwards in the middle, sinuate on either side of this. Scutellum hardly longer than broad, the breadth of its base about one-quarter the breadth of the mesoscutum ; moderately convex, sculptured like the mesoscutum but more finely. Axillae sculptured like the scutellum. Dorsellum not ridge-like, but forming a transverse convex band which is about four times as broad as long, weakly alutaceous and shiny, not narrowed laterally. Propodeum short, medially one quarter to about one third as long as the scutellum and nearly twice as long as the dorsellum, weakly reticulate and shiny ; raised in a roof-like manner in the middle ; the median part is hardly produced behind the level of the supracoxal flanges, which are extremely narrow ; median carina fairly distinct, plicae indicated at hind margin only ; nucha represented by a narrow transverse strip which is weakly reticulate ; spiracular sulci broad but very shallow, nearly smooth ; callus sparsely pilose. Postspiracular sclerite not very broad, irregularly reticulate. Reticulation of metapleuron very fine, that of the mesepimeron and mesepisternum coarser ; mesepisternum with a large subtriangular, almost smooth area below the base of the hind wing.

Fore wing with costal cell bare on its upper surface except for a short row of hairs at its apex, its lower surface with one complete row of hairs and two other partial rows in its distal third ; basal vein pilose, basal cell (upper surface) with several hairs in the distal third, but open below ; speculum more or less open below.

Gaster lanceolate, acuminate, 1·25 to 1·45 times as long as head plus thorax, compressed and narrower than the thorax, 2·7 to 4 times as long as broad ; last tergite 1·2 to 1·5 times as long as its basal breadth ; tips of ovipositor sheaths just visible in dorsal view ; tip of hypopygium situated at two fifths the length of the gaster or slightly more.

♂. Differs from the female as follows:

Length 1·6 mm. Eyes separated by about 1·15 times their own length. Antennal scape (Text-fig. 559) only about two thirds as long as an eye, more expanded, hardly four times as long as broad, slightly broader in its upper part than at the base ; pedicellus about 1·6 times as long as broad ; combined length of pedicellus and flagellum slightly greater than breadth of head ; flagellum nearly filiform, its segments subquadrate ; clava about 2·5 times as long as broad, more pointed than in the female ; flagellum clothed with short hairs which stand out at an angle of 30° to 45°.

Scutellum somewhat longer than broad. Propodeum, medially, rather more than one third the length of the scutellum. Fore wing with marginal vein about 1·5 times as long as the stigmal vein.

Gaster oblong, about as long as but narrower than the thorax, depressed dorsally, with a strong median plica ventrally.

Holotype ♀. ENGLAND : Oxfordshire, Otmoor, 21.viii.1955, on flowers of *Angelica sylvestris* L. (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 1 ♀, 21.viii.1955, 1 ♀, 8.ix.1956 ; Berkshire, Wytham, 1 ♂, 19.vii.1953, on flowers of *Angelica sylvestris* L. (*Graham*), in Graham collection. All taken in marshy places.

IRELAND : Antrim, Selshan, 1 ♀, 26.vi.1957, taken in marshy ground by the shore of Lough Neagh (*Graham*), in Graham collection.

The distinctions between this species and *viride* (Thomson) are summarized in the accompanying key.

Biology. Unknown.

Lampoterma viride (Thomson)

Metastenus viridis Thomson, 1875 (1876*a*) : 206, ♀.
Lampoterma viride (Thomson) Graham, 1956*b* : 256.

Type material. Syntypes, 6 ♀. LECTOTYPE labelled " Scōr " [Scanör].

BRITAIN, SWEDEN, MOLDAVIAN SSR ; local, in marshy places.

Biology. Unknown. Imagines chiefly May–June (one record for August).

STINOPLUS Thomson

Etroxys sgen. *Stinoplus* Thomson, 1878 : 88, 107. Type-species : *S. militaris* Thomson, by designation of Ashmead, 1904 : 314.
Stinoplus Thomson ; Ashmead, 1904 : 314, 315.
Stinoplus Thomson ; Schmiedeknecht, 1909 : 309, 310, 313.
Stinoplus Thomson ; Kurdjumov, 1913 : 8.
Stinoplus Thomson ; Nikol'skaya, 1952 : 230.
Stinoplus Thomson ; Peck *et al.*, 1964 : 58.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Head and thorax bright green to blue, or even violet-tinged in places ; all coxae, and gaster, entirely black with a metallic tint ; dorsellum distinctly reticulate ; malar space half the length of an eye ; antennal scape reaching only level with the lower edge of the median ocellus, its length slightly less than the transverse diameter of an eye ; large species (up to 3·75 mm.). Fore wing, Text-fig. 564 . . . . . ***militaris*** Thomson (p. 692)

– Head and thorax green varied with bronze and golden, the sides of the thorax at least partly purplish or coppery ; dorsellum smooth or virtually so ; malar space usually distinctly less than half the length of an eye, if nearly half then the antennal scape reaches level with the vertex; fore coxae usually more or less fulvous ; gaster usually more or less reddish at base, at least ventrally ; length at most 2·6 mm. 2

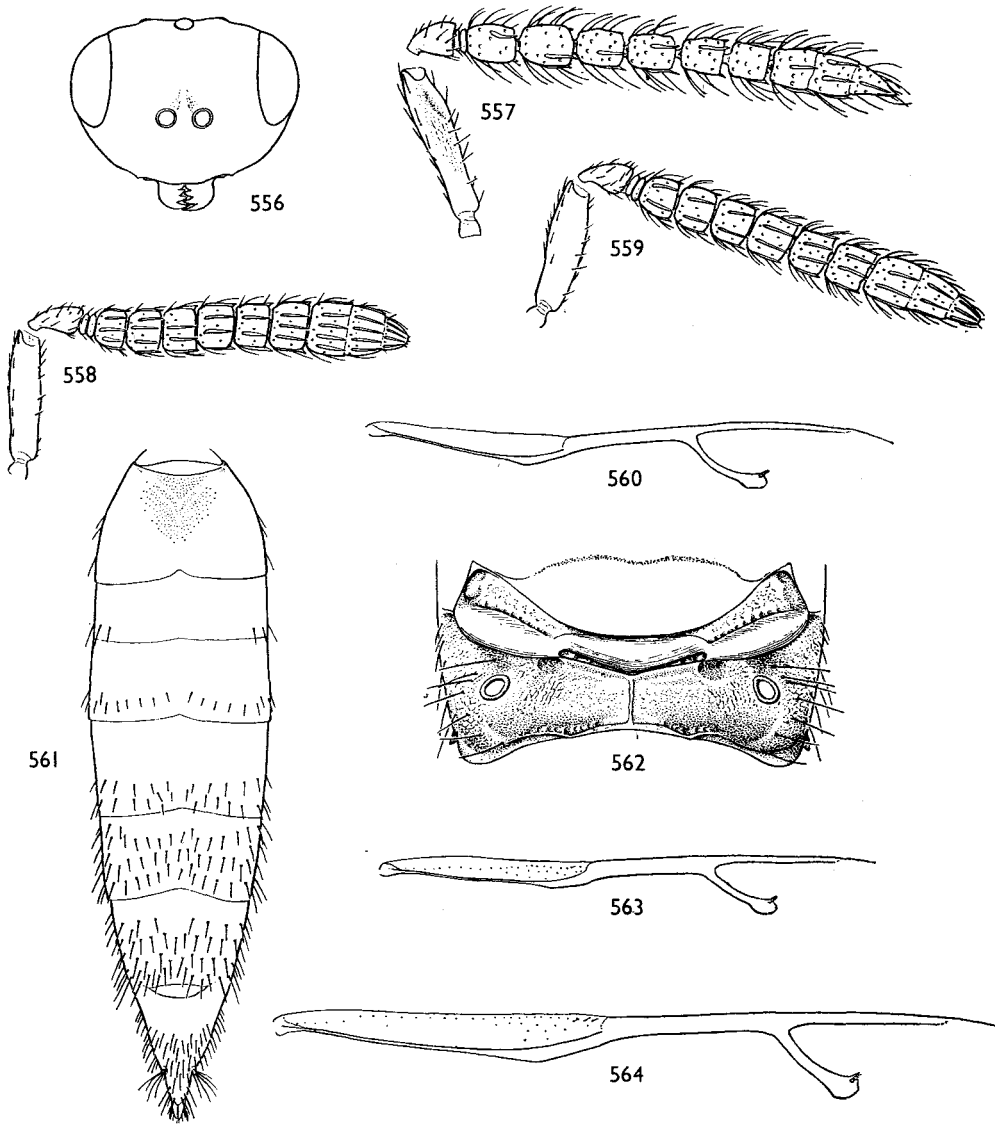
2 (1) Propodeum (Text-fig. 562) strongly transverse, short, medially one fifth to barely one quarter the length of the scutellum, and only about 1·5 times as long as the dorsellum ; marginal vein of fore wing 1·85 to 1·95 times as long as the stigmal vein, postmarginal vein slightly shorter than the marginal. Length of scape slightly less than the transverse diameter of an eye ; gaster lanceolate, 1·35 to 1·6 times as long as head plus thorax ***lapsanae*** sp. n. (p. 692)

– Propodeum less transverse, longer, medially nearly or quite one third the length of the scutellum, and about twice the length of the dorsellum ; marginal vein of fore wing 1·65 to 1·7 times as long as the stigmal vein ; postmarginal vein at most very slightly shorter than, sometimes as long as, the marginal. Length of scape equal to or greater than the transverse diameter of an eye ; gaster sometimes relatively shorter 3

3 (2) Length of antennal scape obviously greater than the transverse diameter of an eye ; malar space nearly half the length of an eye. Gaster distinctly longer than head plus thorax, red at base . . sp. indet.

– Length of antennal scape approximately equal to the transverse diameter of an eye ; malar space about two fifths length of eye or slightly more . . 4

4 (3) Gaster distinctly longer than head plus thorax, 2·7 to 3·4 times as long as broad . . . . . ***etearchus*** (Walker) (p. 693)



FIGS. 556–564. 556, *Pegopus leptomerus* sp. n., ♀, head ; 557, same, ♂, antenna ; 558, *Lampoterma bianellatum* sp. n., ♀, antenna ; 559, same, ♂, antenna ; 560, same, ♀, fore wing venation ; 561, *Stinoplus lapsanae* sp. n., ♀, gaster ; 562, same, metanotum and propodeum ; 563, *Stinoplus pervasus* (Walker), ♀, forewing venation ; 564, *Stinoplus militaris* Thomson, ♀, fore wing venation.

– Gaster at most as long as head plus thorax, 2 to 2·5 times as long as broad. Fore wing, part, Text-fig. 563 . . . . ***pervasus*** (Walker) (p. 693)

The males of *Stinoplus* are unknown to me.

Stinoplus militaris Thomson

(Text-fig. 564)

Stinoplus militaris (Dalman MS.) Thomson, 1878 : 107, ♂ ♀.
Stinoplus militaris Thomson ; Bouček, 1965*e* : 8.

Type material. Syntypes, 3 ♀, 1 ♂. LECTOTYPE, a female labelled " Gl " [Gottland] and " militaris Dalm.".

SWEDEN, MOLDAVIAN SSR.

Biology. Unknown.

Györfi (1941 : 88) recorded this species from Finland as a parasite of *Phthorophloeus spinulosus* Rey on spruce. Nuorteva (1957 : 69) suggested that the parasite had been wrongly identified, and this seems very probable.

Stinoplus lapsanae sp. n.

(Text-figs. 561, 562)

Pteromalus lapsanae Giraud MS.

♀. Head bronze ; thorax dorsally greenish, in some specimens varied with bronze or coppery bronze, more especially on the scutellum and axillae ; sides of thorax, especially the meso- and metapleuron, coppery to purplish coppery ; gaster tinged with bronze and purplish, its basal tergite more or less green ; ventrally the gaster is reddish at the base, sometimes the basal tergite is also slightly reddish basally. Antennal scape testaceous, more or less infuscate dorsally ; pedicellus, except sometimes beneath, and the flagellum, fuscous. Coxae fuscous, the fore coxae sometimes testaceous distally, with a purplish tinge especially on the hind coxae ; hind femora mainly fuscous, the fore and mid femora often more or less so proximally ; legs otherwise yellowish testaceous with the tips of the tarsi brown. Tegulae partly testaceous. Wings slightly yellowish-tinged ; veins bright testaceous. Length 2·3 to 2·5 mm.

Malar space about two fifths the length of an eye. Antennal scape reaching about level with the middle of the median ocellus, its length about equal to the transverse diameter of an eye ; pedicellus slightly longer than the first funicular segment ; funicle nearly filiform, thickening only very slightly distad, proximally a little stouter than the pedicellus ; funicular segments one to five usually slightly longer than broad, sometimes the fifth quadrate, six quadrate ; clava slightly broader than the funicle, about twice as long as broad, about as long as two and a half of the preceding funicular segments together ; sensilla of flagellum rather numerous ; some of the hairs of the flagellum standing out at an angle of about 45°.

Thorax barely 1·5 times as long as broad. Mesoscutum about 1·6 times as broad as long. Dorsellum convex, shiny, smooth or virtually so. Propodeum (Text-fig. 562) strongly transverse, short, medial length one fifth to barely one quarter that of the scutellum, and only about 1·5 times that of the dorsellum, its median carina usually indicated. Fore wing with marginal vein slightly thickened, 9 to 12 times as long as its breadth in the middle, 1·85 to 1·95 times as long as the stigmal vein ; postmarginal vein distinctly shorter than the marginal vein ; stigmal vein nearly straight with a small, suboval stigma.

Gaster (Text-fig. 561) lanceolate, 1·35 to 1·6 times as long as head plus thorax, 3·1 to 4 times as long as broad ; hind margin of basal tergite weakly excised medially ; last tergite somewhat

(up to 1·5 times) longer than its basal breadth ; hairs of dorsal surface numerous, especially on the last three tergites ; tip of hypopygium situated at about one third the length of the gaster, or slightly more.

♂ Unknown.

FRANCE : unlocalized, 10 ♀♀, the first two labelled " Pteromalus lapsanae m." in Giraud's handwriting ; one of the remaining females is the holotype and bears my determination label.

Holotype female and paratypes in Muséum Nationale d'Histoire Naturelle, Paris (Giraud coll.).

The main distinctions between *lapsanae* and the other described species are summarized in the accompanying key.

Biology. Reared from " *Aulax lapsanae*, sur *Lapsana communis* " (Giraud & Laboulbène, 1877 : 429).

Stinoplus etearchus (Walker) **comb. n.**

Pteromalus Etearchus Walker, 1848 : 126, 205, ♀.
Stinoplus aureolus Thomson, 1878 : 109, ♀, **syn. n.**

Type material. *Pteromalus etearchus* Walker. One female, LECTOTYPE, bearing a Waterhouse label.

Stinoplus aureolus Thomson. Syntypes on 9 pins. The third pin bears 3 ♀ and a pale green label " Hg " [Hälsingborg] ; the third specimen from the top is designated LECTOTYPE, and I have marked its card-point with a red line.

BRITAIN, IRELAND, SWEDEN.

Biology. Females were reared 1.vii.1923, Ireland, Co. Dublin, Rush (*A. W. Stelfox*) from *Hypochoeris radicata* L. together with several *Phanacis hypochoeridis* (Kieffer) which may have been their host.

Stinoplus pervasus (Walker) **comb. n.**

(Text-fig. 563)

Pteromalus pervasus Walker, 1836 : 489, ♀.
Pteromalus Tedanius Walker, 1845 : 262, ♀, **syn. n.**
Pteromalus Tedanius Walker, 1846*b* : 271, ♀.
Pteromalus Tedanius Walker, 1846*c* : 158–159, ♀.

Type material. *Pteromalus pervasus* Walker. One female, LECTOTYPE (but possibly holotype) ; a Waterhouse label.

Pteromalus tedanius Walker. One female, LECTOTYPE ; Waterhouse label.

BRITAIN.

Biology. Unknown. Imagines June–July.

PSEUDOCATOLACCUS Masi

Pseudocatolaccus Masi, 1908*a* : 138–142. Type-species : *P. asphondyliae* Masi, by monotypy.
Pseudocatolaccus Masi ; Schmiedeknecht, 1909 : 328, 330, 355.
Pseudocatolaccus Masi ; Kurdjumov, 1913 : 7.
Pseudocatolaccus Masi ; Nikol'skaya, 1952 : 226.
Pseudocatolaccus Masi ; Peck, 1963 : 708.
Pseudocatolaccus Masi ; Peck *et al.*, 1964 : 53.

There is apparently only one (rather variable) species in Europe ; another is known in North America.

Pseudocatolaccus nitescens (Walker)

Amblymerus nitescens Walker, 1834 : 347, ♀.
Pteromalus thoracicus Walker, 1835*a* : 200, ♀, **syn. n.**
Pteromalus Elymus Walker, 1839 : 212, ♂, **syn. n.**
Pteromalus Bebryce Walker, 1839 : 273, " ♀ " [*recte* ♂], **syn. n.**
Pteromalus euryops Förster, 1841 : 12, ♂.
Pteromalus polyphagus Förster, 1841 : 12, ♀, **syn. n.**
Pteromalus validus Förster, 1841 : 12, ♀, **syn. n.**
Pseudocatolaccus asphondyliae Masi, 1908*a* : 139–142, ♂ ♀ **syn. n.**
Pseudocatolaccus polyphagus (Förster) Kurdjumov, 1913 : 7.
Pseudocatalaccus [*sic*] *asphondyliae* Masi ; Parker, 1924 : 267, 291, 309.
Pseudocatalaccus [*sic*] *asphondyliae* Masi ; Parker & Thompson, 1928 : 430–431.
Pseudocatolaccus polyphagus (Förster) ; Delucchi, 1955*a* : 171–172.
Pseudocatolaccus thoracicus (Walker) Parnell, 1964 : 263–265.
Pseudocatolaccus thoracicus (Walker) ; Bouček, 1965*e* : 8.

Type material. *Amblymerus nitescens* Walker. One female, LECTOTYPE bearing a Waterhouse label. It has the median carina of the propodeum forked, represented by two straight carinae which diverge from the base of the propodeum and extend to the nucha ; the stigma of the fore wing is a little smaller than in the type of *thoracicus*. On account of these features I thought at first that the two might represent distinct species (see discussion of variation below).

Pteromalus thoracicus Walker. Syntypes, 2 ♀. LECTOTYPE, the first specimen, bearing a Waterhouse label.

Pteromalus elymus Walker. Syntypes, 4 ♂. LECTOTYPE, the second.

Pteromalus bebryce Walker. Syntypes, 2 ♂. LECTOTYPE, a specimen labelled " 38. 8. 13. 68 ", " South of France ", and bearing also a Waterhouse label. The lectotype has the genitalia slightly projecting so that the tip of the gaster appears pointed, whilst the ventral plica is very sharp ; these features cause the gaster to appear rather like that of a female, hence Walker's error regarding the sex.

Pteromalus euryops Förster. According to Delucchi (1955*a* : 172) two males stand under this name in Förster's collection (Vienna) ; the specimen which he considered to be the type has a forked median carina on the propodeum [similar to that of the type female of *nitescens* Walker]. The species was synonymized with *thoracicus* (Walker) by Bouček (1965*e* : 8).

Pteromalus polyphagus Förster. Syntypes, 7 ♀ in Naturhistorisches Museum, Vienna (Delucchi, 1955*a* : 171) ; no lectotype has so far been validated.

Pteromalus validus Förster. One damaged female in Naturhistorisches Museum, Vienna ; regarded as the type by Delucchi (1955*a* : 172), who synonymized *validus* with *euryops*.

Pseudocatolaccus asphonydyliae Masi. Syntypes, Italy, Nola, from galls of *Asphondylia* sp. on lupin, presumably in Museo Civico di Storia Naturale, Genoa, or in Laboratorio Naturale, Genoa, or in Laboratorio di Entomologia agraria, Portici. The species was synonymized with *polyphagus* (Förster) by Kurdjumov (1913 : 7).

I am able to recognize with certainty only one European species, *nitescens* (Walker), although there is considerable variation in the antennae, propodeum and wings of the specimens which I refer to it. At one time I thought that more than one species might be involved, but the variation does not appear to be discontinuous, whilst the characters occur in different combinations.

In the material now referred to *nitescens*, the following variation occurs:

♀. Length 2 to 4 mm. Colour of head and thorax varying from olive-green through bronze-green to bronze or even coppery bronze. Sculpture of propodeum variable : median carina usually absent or represented only at the front of the propodeum, behind this effaced or resolved into oblique carinulae, occasionally replaced by two carinae which diverge from the base of the propodeum, these carinae may be unequally developed ; panels of median area obliquely strigose, reticulate, or nearly smooth. The median length of the propodeum varies from slightly less than two fifths, to slightly more than two fifths, that of the scutellum. Pilosity of fore wing, beyond the speculum, usually rather dense, but sometimes relatively sparse ; stigma usually subcircular and large, separated by at least slightly less than twice its height from the costal edge of the wing, but sometimes rather smaller and suboval. As a rule the segments of the funicle are at least slightly longer than broad, the fifth is usually subquadrate, but in a few specimens the proximal segments are hardly longer than broad, whilst the fourth may be quadrate and the fifth slightly transverse.

♂. In very small males the first funicular segment may be slightly shorter than the second, though not anelliform ; but usually it is as long as the second, or even slightly longer than the second in large specimens.

Pseudocatolaccus americanus Gahan (1919 : 164–165, ♂, ♀) was said to differ from *asphondyliae* Masi in its smaller size (2·5 mm.), shorter malar space, shorter than height of eye, and slightly shorter funicular segments, the first about 1·5 times as long as broad, the fifth subquadrate or very slightly transverse. The malar space in *nitescens* is always distinctly shorter than the height of an eye, whilst the other characters mentioned for *americanus* occur also in some specimens of *nitescens*. It seems possible that the two species may be identical, but their respective types will have to be compared before this can be decided.

BRITAIN, IRELAND, FRANCE, ITALY, GREECE, SWEDEN, GERMANY, SWITZERLAND, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. The species has been recorded as a parasite of *Asphondylia* spp. (Dipt., Cecidomyiidae). Parker and Thompson (1928) reared it in the region of Hyères (Var), France, from *A. sarothamni* H. Loew and *A. calycotomae* Kieff. on *Calycotome spinosa* Link (Papilionaceae) ; they found it to be bi- or trivoltine, the first generation occurring in galls of *A. sarothamni* towards the end of February,

the second in galls of *A. calycotomae* in May, and a third in galls of *A. sarothamni* in September and October. They thought that adults of the parasite might pass the winter in sheltered situations, since they appeared as early as February. The immature stages were described (under the name *asphondyliae* Masi) by Parker (1924). Parnell (1964) described and figured the egg, first instar and mature larvae, and the pupa (as *thoracicus*). He found it to be an infrequent parasite of *A. sarothamni* on broom (*Sarothamnus scoparius* (L.) Wimmer) in southern England ; he suggested that it may be polyphagous and that the *Asphondylia* is not its chief host. According to Parnell the parasite larvae feed ectoparasitically on the prepupae or pupae of the host. Parker and Thompson, however, stated that the parasite larvae live in the body of the host. No doubt the species has other hosts ; Kurdjumov (1913 : 7) stated that it [as *polyphagus* Förster] had been reared from "*Asphondilia verbasci, ononidis, Cecidomyia ulicis* and others", according to material in Vienna.

APSILOCERA Bouček

Apsilocera Bouček, 1955 : 319–321. Type-species : *A. verticillata* Bouček, by original designation.
Apsilocera Bouček; Graham, 1966*c* : 301–304.

Key to European Species
(Males)

1 Anterior margin of clypeus produced, with a median tooth or tubercle. Malar space only half the length of an eye. Fore wing with marginal vein 2.3–2.7 times as long as the stigmal vein; postmarginal vein slightly shorter than, or at most as long as the marginal vein . . . . . ***verticillata*** Bouček (p. 696)
– Anterior margin of clypeus (cf. Text-fig. 566) having its produced part emarginate medially, but without a tooth. Malar space slightly more than half the length of an eye. Fore wing with marginal vein 1·7–2 times as long as the stigmal vein ; postmarginal vein slightly longer than the marginal vein . ***bramleyi*** Graham (p. 697)

The female of *bramleyi* only is known. That of *verticillata* may be expected to differ from it chiefly in the form of the clypeus, as does its male. Antenna and clypeus of ♀ *bramleyi*, Text-figs. 565, 566.

Apsilocera verticillata Bouček

Apsilocera verticillata Bouček, 1955 : 321–322, ♂.
Apsilocera verticillata Bouček, 1965*e* : 8.
Apsilocera verticillata Bouček ; Graham, 1966*c* : 301, 304, ♂.

Type material. Holotype ♂, Southern Slovakia, Gbelce (formerly Köbölkút), 29.viii.1955 (*Bouček*), in Národní Museum, Prague (Cat. n. 3086).

Czechoslovakia, Moldavian S.S.R.
Biology. Unknown.

Apsilocera bramleyi Graham

(Text-figs. 565, 566)

Apsilocera bramleyi Graham, 1966*c* : 301–304, ♂, ♀.

Type material. Holotype ♀ in Hope Dept., University Museum, Oxford ; paratypes in the Manchester Museum and in my own collection. Described from 2 ♂ and 6 ♀ reared in England, Yorkshire, Thornton-le-Dale, 5.v.1959 and 7.v.1959 (*W. G. Bramley*).

BRITAIN.

Biology. Reared from galls of *Mycocecis ovalis* Edw. (Dipt., Cecidomyiidae) ; see Graham (1966*c*).

HETEROPRYMNA Graham

Heteroprymna Graham, 1956*b* : 259. Type-species : *Pteromalus longicornis* Walker, 1835, by monotypy and original designation.
Heteroprymna Graham ; Peck *et al.*, 1964 : 56.

Only the type-species so far known.

Heteroprymna longicornis (Walker)

(Text-figs. 303, 567–569)

Pteromalus longicornis Walker, 1835*a* : 94, ♀.
Pteromalus Camma Walker, 1848 : 123, 175, ♀, **syn. n.**
Heteroprymna longicornis (Walker) Graham, 1956*b* : 259–260, ♀.
Heteroprymna longicornis (Walker) ; Bouček, 1965*e* : 8.

Type material. *Pteromalus longicornis* Walker. Lectotype female designated by Graham (1956*b* : 260) ; in this paper (ibid. : 259) the date of publication and page-reference to *longicornis* were misquoted.

Pteromalus camma Walker. One female, LECTOTYPE, bearing a Waterhouse label.

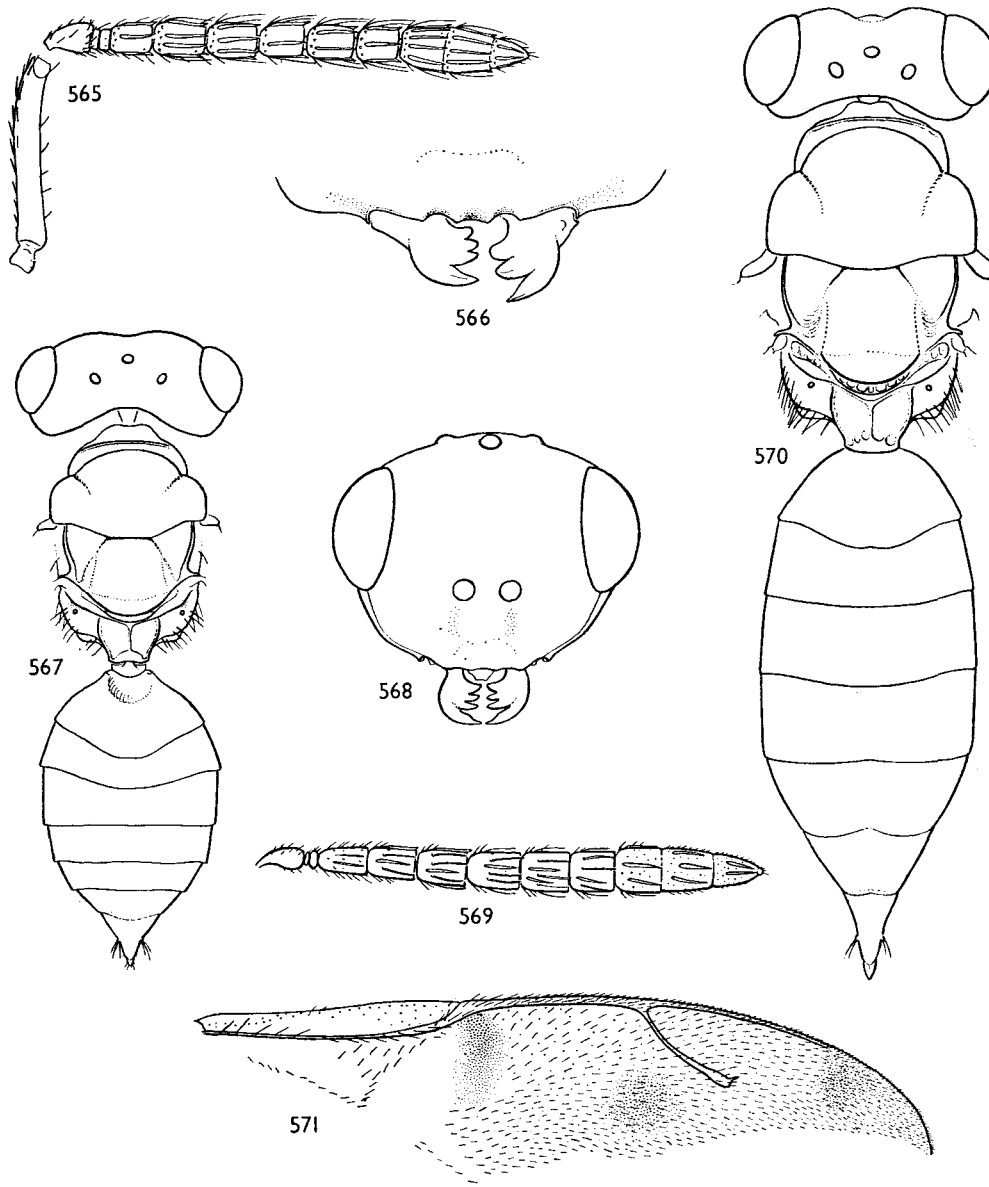
The female of *longicornis* was redescribed by Graham (1956*b* : 259–260) ; the male is still unknown.

BRITAIN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R. ; rather rare.

Biology. Unknown. In southern England I have swept the species on two different occasions from the foliage of lime trees (*Tilia* sp.) but it may not really have any closer association with these plants. Imagines July–August.

NEPHELOMALUS Graham

Nephelomalus Graham, 1956b : 251. Type-species : *Pteromalus conspersus* Walker, 1835, by original designation.



FIGS. 565–571. 565, *Apsilocera bramleyi* Graham, ♀, antenna ; 566, same, lower part of head ; 567, *Heteroprymna longicornis* (Walker), ♀, body ; 568, same, ♀, head ; 569, same, ♀, antenna excluding scape ; 570, *Nephelomalus conspersus* (Walker), ♀, body ; 571, same, ♀, fore wing, part.

Nephelomalus conspersus (Walker)

(Text-figs. 570, 571)

Pteromalus conspersus Walker, 1835 : 486, ♀.
Nephelomalus conspersus (Walker) Graham, 1956b : 252, ♀.

Type material. Lectotype ♀ designated by Graham (1956b : 252).

BRITAIN, IRELAND ; apparently rare. England : 3 ♀ in Walker collection, taken on windows, near London ; 1 ♀ in Dale coll. (Oxford) probably also a Walker specimen from southern England ; 1 ♀ in Rudd coll. (York) probably from Yorkshire. Ireland : Co. Wicklow, The Glen of the Downs, 1 ♀, 23.viii.1954 (*Graham*).

Biology. Unknown. Imagines June and August.

STAUROTHYREUS Graham

Staurothyreus Graham, 1956 : 86. Type-species : *S. cruciger* Graham, by original designation.

Staurothyreus cruciger Graham

(Text-fig. 314)

Staurothyreus cruciger Graham, 1956 : 87, ♀.

Type material. Holotype ♀, England, Berkshire, Wytham Wood, 9.xii.1951, in the Hope Department, University Museum, Oxford ; paratype in the writer's collection.

BRITAIN ; apparently rare.

Biology. Unknown. Imagines captured in August and (female) December (in the latter case evidently overwintering).

GBELCIA Bouček

Gbelcia Bouček, 1961 : 76. Type-species : *G. crassiceps* Bouček, by original designation.

Gbelcia crassiceps Bouček

(Text-fig. 304)

Gbelcia crassiceps Bouček, 1961 : 76, ♀.

Type material. Holotype ♀, Czechoslovakia, southern Slovakia, Gbelce (formerly Köbölkút), 29.vii.1955 (*Bouček*) in Národní Museum, Prague (Cat. no. 2970).

BRITAIN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R., in marshy places, very local. New record : England, Berkshire, Wytham, 2 ♀, 23.vi.1956, 30.vi.1956 (*Graham*).

Biology. Unknown. Imagines June–July.

ROHATINA Bouček

Rohatina Bouček, 1954 : 61. Type-species : *R. monstrosa* Bouček, by original designation.
Rohatina Bouček ; Peck *et al.*, 1964 : 41, 47.

Key to European Species

(Females)

1 Face, on either side of clypeus, with a large forwards-projecting tooth or tubercle, Reticulation of scutellum very slightly raised above the general surface. Marginal vein of fore wing about twice as long as the stigmal vein
monstrosa Bouček (p. 700)

– Face without conspicuous tubercles in this position, merely (Text-figs. 572, 573) with a small one on either side just above the edge of the oral fossa. At least the discal area and frenum of the scutellum with engraved sculpture . . 2

2 (1) Anterior margin of clypeus (Text-figs. 572, 573) produced medially, but with the projecting portion blunt or very weakly emarginate. Marginal vein about twice as long as the stigmal vein. Median area of propodeum with some trace of a costula. Head in dorsal view 2·1–2·15 times as broad as long
inermis Bouček (p. 700)

– Anterior margin of clypeus produced to form a sharp median tooth. Marginal vein 1·75–1·8 times as long as the stigmal vein. Median area of propodeum without a costula. Head in dorsal view 2·2 times as broad as long
denticulata sp. n. (p. 700)

The ♂ of *montrosa* only is known.

Rohatina monstrosa Bouček

Rohatina monstrosa Bouček, 1954 : 62–64, ♂ ♀.

Type material. Holotype ♀, North-eastern Bohemia, Velký Vřeštov, end of August 1953 (*Bouček*), in Národní Museum, Prague (Cat. no. 3009).

Czechoslovakia ; rare.
Biology. Unknown. Imagines July–Sept.

Rohatina inermis Bouček

(Text-figs. 572, 573)

Rohatina inermis Bouček, 1954 : 64, ♀.

Type material. Holotype ♂, Czechoslovakia, Velký Vřeštov, Aug. 1953 (*Bouček*) in Národní Museum, Prague (Cat. no. 3011).

Britain, Czechoslovakia, Austria, Hungary, Moldavian S.S.R. New record : Britain, Berkshire, Bagley Wood, 1 ♀, 3.ix.1954 (*Graham*).
Biology. Unknown. Imagines July–Sept. (one record for March).

Rohatina denticulata sp. n.

♀. Head and thorax dull blue-green ; gaster green at base, its disc violet-black. Antennal scape testaceous, darker at apex ; rest of antenna brown, the pedicellus paler beneath.

Mandibles reddish with darker teeth. Coxea concolorous with thorax ; legs otherwise testaceous, tips of tarsi brownish. Tegulae testaceous ; wings subhyaline, veins testaceous. Length 1·7 mm.

Differs from the female of *inermis* Bouček in the characters given in my key to species.

♂. Unknown.

Holotype ♀. ENGLAND : Berkshire, Wytham, 2.ix.1951, swept from vegetation at the edge of a *Phalaris-Glyceria maxima* marsh between Wytham Wood and the River Thames (*Graham*), in Graham collection.

Biology. Unknown.

PERIDESMIA Förster

Peridesmia Förster, 1856 : 65. Type-species : *Isocyrtus* (*Trichomalus*) *aquisgranensis* Mayr, 1903, by designation of Gahan, 1923 : 408.
Peridesmia Förster ; Mayr, 1903 : 394–395.
Peridesmia Förster ; Delucchi, 1955*b* : 147–150.
Peridesmia Förster ; Graham, 1956*b* : 246.
Peridesmia Förster ; Peck *et al.*, 1964 : 53.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Propodeum, medially, about two thirds as long as the scutellum, with a large rectangular nucha which is strongly reticulate, like the panels of the media area ; the nucha is separated from the median area by a groove but its front edge is not sharply-defined. Front edge of pronotal collar not very abrupt but tending to be somewhat rounded off ; the collar itself is much less wide than the mesoscutum. Eyes separated by hardly more than their own length. . ***congrua*** (Walker) (p. 702)

– Propodeum, medially, only about half as long as the scutellum ; nucha represented only by a very short subtriangular area which is very weakly sculptured, tending to be transversely aciculate, and has its front edge rather sharply-defined. Front edge of pronotal collar more abrupt ; the collar itself nearly as wide as the mesoscutum. Eyes separated by fully 1·5 times their own length ***discus*** (Walker) (p. 701)

(MALES)

1 Eyes larger, separated by about 1·2 times their length. Propodeum and pronotal collar as in female. Smooth shiny band of temple narrow, extending up the middle of the temple and leaving a reticulate strip on either side ; the smooth bands reach almost to the posterior ocelli (Text-fig. 574). Antennae bright testaceous with at most the clava and pedicellus slightly brownish ***congrua*** (Walker) (p. 702)

– Eyes smaller, separated by 1·6–1·65 times their length. Propodeum and pronotal collar as in female. Smooth band of temple broader, leaving only a narrow reticulate strip along the hind edge of the temple, its upper end touching the posterior orbit of the eye ; the smooth bands reach hardly to the level of the top of the eyes and therefore do not nearly reach the posterior ocelli. Antennal pedicellus and flagellum brown to blackish . . . ***discus*** (Walker) (p. 701)

Peridesmia discus (Walker)

Pteromalus discus Walker, 1835 : 482, ♀.
Pteromalus subquadratus Walker, 1836 : 478, " ♀ " [*recte* ♂].

Pteromalus Phyllus Walker, 1839 : 272, ♀, **syn. n.**
Peridesmia phytonomi Gahan, 1923 : 410, ♂ ♀.
Peridesmia discus (Walker) Graham, 1956*b* : 246.
Peridesmia discus (Walker) ; Peck, 1963 : 694–695.
Other important references are cited by Peck (1963).

Type material. *Pteromalus discus* Walker and *P. subquadratus* Walker. Lectotypes designated by Graham (1956*b* : 246).

Pteromalus phyllus Walker. One female, LECTOTYPE, bearing a Waterhouse label.

Peridesmia phytonomi Gahan. Syntypes, France, Hyères, in U.S.N.M. (not seen by the writer). Synonymized with *discus* (Walker) by Graham (1956*b*).

BRITAIN, FRANCE, ITALY, SICILY, MOLDAVIAN S.S.R. ; U.S.A. (introduced from Europe).

Biology. Reared from *Hypera postica* (Col., Curculionidae). Imagines in spring (May in Britain, earlier in S. Europe) and late summer.

Peridesmia congrua (Walker)

(Text-fig. 574)

Pteromalus congruus Walker, 1836 : 194, ♀.
Pteromalus Lucilla Walker, 1839 : 231, ♂.
? *Pteromalus Lentulus* Walker, 1839 : 232, ♂.
Pteromalus claripennis Förster, 1841 : 30, ♂.
Pteromalus Otos Walker, 1848 : 126, 202, ♀.
Isocyrtus (*Trichomalus*) *aquisgranensis* Mayr, 1903 : 394–395, ♂ ♀.
Peridesmia claripennis (Förster) Delucchi, 1955*b* : 148–150, ♂ ♀.
Peridesmia congrua (Walker) Graham, 1956*b* : 246.

Type material. For discussion of synonymy and designation of lectotypes for most of the above Walker species, see Graham (1956*b* : 246).

Pteromalus lentulus Walker. None found. The description suggests that *lentulus* was the ♂ of *Peridesmia congrua*.

Pteromalus claripennis Förster. Type ♂, Germany, near Aachen, in Naturhistorisches Museum, Vienna.

Isocyrtus (*Trichomalus*) *aquisgranensis* Mayr. Syntypes, ♂ and ♀, Germany, Lousberg near Aachen, in Naturhistorisches Museum, Vienna (not seen). The species was synonymized with *claripennis* (Förster) by Delucchi (1955*b* : 148).

BRITAIN, IRELAND, SWEDEN, GERMANY.

Biology. Unknown. Imagines July–Sept.

SPANIOPUS Walker

Spaniopus Walker, 1833 : 466. Type-species : *S. dissimilis* Walker, by monotypy.
Spaniopus Walker ; Förster, 1856 : 52, 56.
Polycelis Thomson, 1878 : 131, 143 [*nec* Ehrenberg, 1831]. Type-species : *Pteromalus conspersus* Walker, 1835, by designation of Ashmead, 1904 : 386.

Polyscelis Ashmead, 1849a : 52 [*nec* Girard, 1850].
Polyscelis Thomson ; Ashmead, 1904 : 319, 321, 386.
Polyscelis Thomson ; Kurdjumov, 1913 : 4.
Neopolycelis Hincks, 1944 : 38 [n. n. for *Polycelis* Thomson *nec* Ehrenberg].
Spaniopus Walker ; Graham, 1956*b* : 250.
Spaniopus Walker ; Peck *et al.*, 1964 : 53.

For a discussion of the generic synonymy, see Graham, 1956*b* : 250–251.

There appear to be several European species of *Spaniopus*, some of them not yet described. My friend Dr. Bouček has captured most of the species and would like to revise the genus ; hence I refer here in detail only to those species already found in north-western Europe, although I include some others in my keys in order that our own species may not be mistaken for them.

Key to British Species

(Females)

1 Head in dorsal view (Text-fig. 576) with temples one third as long as eyes, or hardly more. Mid tibia (Text-fig. 579) very slightly expanded and flattened in its distal third. Smaller species, 1·9–2·1 mm. Propodeum without a distinct costula. Fore wing tending to be rather narrow and short, sometimes not reaching beyond the apex of the gaster, immaculate or with a fuscous discal cloud
dissimilis Walker (p. 705)

– Head in dorsal view (Text-fig. 575) with temples two fifths to two thirds as long as eyes. Mid tibia not at all expanded distally. Larger species, 2·2–3·2 mm. Propodeum usually with a costula more or less indicated, often complete. Fore wing relatively broad, surpassing the apex of the gaster ; usually with a fuscous discal cloud and one or two other clouds beyond it, occasionally with only the discal cloud present, or the wing immaculate . . . ***polyspilus*** Graham (p. 706)

The females of *monospilus* (Thomson) and *amoenus* Förster are unknown to me.

Key to most European Species

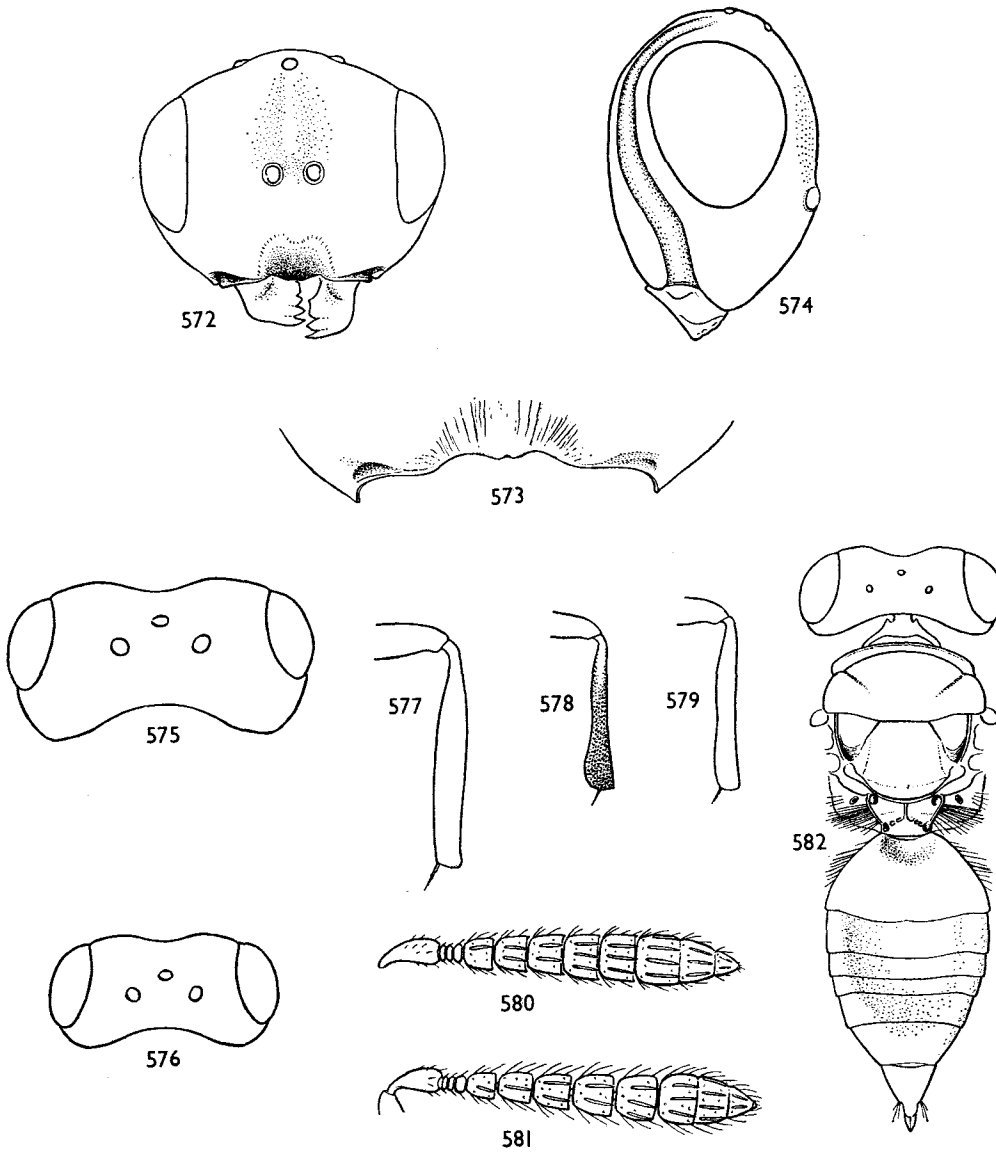
(Males)

1 Antennal funicle abnormal : segments 1, 3 and 5 narrower and shorter than the other segments, whitish ; segments 2, 4 and 6 annulated with fuscous distally. Mid tibia, on its external edge expanded into a flattened lobe just beyond the middle . . . . . ***monospilus*** (Thomson) (p. 706)

– Antennal funicle normal, subcylindrical, all its segments of approximately the same breadth ; if some of the funicular segments are annulated with fuscous, then the dark ring is situated on the middle of each segment. Mid tibia sometimes not expanded. 2

2 (1) Mid tibia (Text-fig. 577) simple, not expanded, its posterior surface flat. Antennal funicle pallid or testaceous, usually having some or all of the segments annulated with fuscous medially. Propodeum often with a distinct costula. Fore wing sometimes with a brownish spot in the middle
polyspilus Graham (p. 706)

– Mid tibia (Text-fig. 578) somewhat expanded and flattened distally, its posterior surface concave ; tibia pale at base but more or less broadly fuscous to black distally. Propodeum without a costula 3



FIGS. 572–582. 572, *Rohatina inermis* Bouček, ♀, head ; 573, same, ♀, clypeus and genae in a slightly more ventral view ; 574, *Peridesmia congrua* (Walker), ♂, head, profile ; 575, *Spaniopus polyspilus* Graham, ♀, head ; 576, *Spaniopus dissimilis* Walker, ♀, head ; 577, *Spaniopus polyspilus* Graham, ♂, mid tibia ; 578, *Spaniopus dissimilis* Walker, ♂, mid tibia ; 579, same, ♀, mid tibia ; 580, *Atrichomalus triannellatus* Graham, ♀, antenna excluding scape ; 581, same, ♂, antenna excluding scape ; 582, same, ♀, body.

3 (2) Antennal flagellum uniformly yellowish brown to fuscous, occasionally with some of the incisures between its segments slightly darker. Fore wing immaculate ***dissimilis*** Walker (p. 705)

– Antennal funicle pale with either the middle segments, or the distal segments, contrastingly dark ; clava dark. Fore wing sometimes with a fuscous cloud 4

4 (3) Flagellum yellowish with segments 5 and 6 of the funicle, and the clava, blackish. Fore wing immaculate . . . . . ***amoenus*** Förster (p. 706)

– Flagellum dark with segments 1–2 and 5–6 of the funicle pale. Fore wing with a fuscous cloud below the marginal vein . . . . . sp. indet.

Spaniopus dissimilis Walker

(Text-figs. 576, 578)

Spaniopus dissimilis Walker, 1933 : 466, ♂.
Polyscelis modestus Gahan, 1922 : 10–12, ♂ ♀ **syn. n.**
Polyscelis modestus Gahan, 1933 : 67–70, ♂ ♀.
Spaniopus dissimilis Walker ; Graham, 1956*b* : 251.
Spaniopus modestus (Gahan) Peck, 1963 : 695–696.

For discussion of synonymy, and designation of lectotype for *S. dissimilis* Walker see Graham (1956*b* : 251). This specimen (the only one in Walker's collection) may actually be the holotype, though this is not specifically stated by Walker.

Polyscelis modestus Gahan. Type, U.S.A., Pa., Hanover, in U.S.N.M., Cat. no., 22834 (not seen) ; I am now certain, from Gahan's description and figures, that it must be the same as *dissimilis*.

BRITAIN, IRELAND, SWEDEN, CZECHOSLOVAKIA ; CANADA, U.S.A.

Biology. An account was given (under the name *Polyscelis modestus*) by Gahan (1933). He stated that the species was normally a primary, solitary, external parasite of the larvae and pupae of *Mayetiola* (=*Phytophaga*) *destructor* (Say) (Dipt., Cecidomyiidae), but that it might develop as a secondary parasite through *Platygaster zosine* Walker and possibly other parasites of Diptera. The egg is placed upon the host within its puparium, and the parasite may develop either upon the larva or the pupa of the host. In Britain imagines occur in the field from May until September, probably more than one generation.

Spaniopus elegans Förster

Spaniopus elegans Förster, 1856 : 56, ♂.

Type material (? Germany) presumably in Naturhistorisches Museum, Vienna.

The male was briefly described as differing from *dissimilis* Walker in having the mid tibiae blackish brown with their base yellow, and in having the antennae clear yellow ; Förster stated that the male of *dissimilis* had straw-yellow legs and brown antennae, but as regards the colour of the legs he was mistaken because male *dissimilis* has the mid tibiae coloured as described for *elegans*. It seems just possible that *elegans* might be a form of *dissimilis* having the antennal flagellum paler than usual.

? GERMANY.

Biology. Unknown.

Spaniopus amoenus Förster

Spaniopus amoenus Förster, 1856 : 56, ♂.

Type material (? Germany) presumably in Naturhistorisches Museum, Vienna. The male of *amoenus* was briefly described as having the antennae yellow with the fifth and sixth funicular segments, and the clava, black. Dr. Bouček has some males which agree with this description and are probably the true *amoenus*. The female has not been described.

? GERMANY ; CZECHOSLOVAKIA.

Biology. Unknown. Dr. Bouček tells me that he finds it to be associated with xerothermic habitats.

Spaniopus monospilus (Thomson)

Polycelis monospila Thomson, 1878 : 145, ♂, ?♀.
? *Polyscelis Websteri* Ashmead, 1894*a* : 52–53, ♂ ♀.
Spaniopus monospilus (Thomson) Graham, 1956*b* : 251.

Type material. *Polycelis monospila* Thomson. Syntypes, 18 specimens. LECTOTYPE, a male labelled " KK " [Kinnekulle]. It is not certain whether the females in Thomson's series are conspecific with the male lectotype.

Polyscelis websteri Ashmead. Types, U.S.A., Indiana, Lafayette, in U.S.N.M. (not seen by the writer). In his key to the North American species of *Polyscelis*, Gahan (1922 : 10–11) mentioned some characters of the male of *P. websteri* which suggest that it must be very near to, if not identical with, *Spaniopus monospilus* (Thomson). Thus he stated that in male *websteri* the funicular segments of the antenna are alternatively white and dark brown ; whilst the third and fifth segments are subquadrate, narrower and much shorter than the other segments. Also he stated that the mid tibiae are strongly compressed and expanded between the middle and the apex.

SWEDEN ; ? U.S.A.

Biology. Unknown. The species may be associated like *polyspilus*, with Phragmiteta.

Spaniopus polyspilus Graham

(Text-figs. 575, 577)

Polycelis conspersa (Walker) *sensu* Thomson, 1878 : 143, ♀ [nec *Pteromalus conspersus* Walker, 1835].
Spaniopus polyspilus Graham, 1956*b* : 251, ♀ [n. n. for *conspersa* Thomson *nec* Walker].
? *Gyrinophagus peisonis* Erdös, 1957 : 64, ♂ ♀.

Type material. *Spaniopus polyspilus* Graham. Lectotype female in coll. Thomson, designated by Graham (1956*b* : 251).

Gyrinophagus peisonis Erdös. Type ♀ and allotype ♂, Hungary, Vörs (Kisbalaton), 16.vi.1955, from *Phragmites communis* Trin., in coll. Erdös (not seen by the writer). From the description it would appear to be probably the same as *polyspilus*.

BRITAIN, IRELAND, SWEDEN, CZECHOSLOVAKIA ; ? HUNGARY.

Biology. Associated with *Phragmites communis* Trin.; I have captured several specimens in a large reed-bed at Yddingen in Skåne, Sweden. Imagines (? June) July–August.

TRICHOMALUS Thomson

Isocyrtus sgen. *Trichomalus* Thomson, 1878 : 131, 134. Type-species : *T. punctinucha* Thomson, by designation of Ashmead, 1904 : 318.
Trichomalus Thomson ; Mayr, 1903 : 393–394.
Trichomalus Thomson ; Kurdjumov, 1913 : 4, 11.
Trichomalus Thomson ; Nikol'skaya, 1952 : 222.
Lanceosoma Erdös, 1953 : 234–235. Type-species : *L. althaeae* Erdös by monotypy and original designation.
Trichomalus Thomson ; Graham, 1956*b* : 247–250.
Trichomalus Thomson ; Delucchi & Graham, 1956 : 543–576.
Trichomalus Thomson ; Peck *et al.*, 1964 : 53.

Ashmead (1904) designated *T. punctinucha* Thomson as the type-species of *Trichomalus*. He actually misidentified the genus [see *Eupteromalus*] as pointed out by Kurdjumov (1913 : 12), although this does not invalidate his type selection.

I have not seen the type-species of *Lanceosoma* Erdös. Dr. Bouček has shown me a species which must be very near it and he thinks the genus must be the same as *Trichomalus*. The name *Lanceosoma* would then be applicable to a species-group of *Trichomalus* including *althaeae* (Erdös), *elongatus* Delucchi & Graham, and possibly other species.

Graham (1956*b*) revised the synonymy of *Trichomalus* and designated lectotypes for most of the Walker species. Delucchi & Graham (1956) redescribed the European species and provided a key to the females. Since that time the writer has made some changes in the nomenclature and added a few more synonyms. Previously no lectotypes had been designated for Thomson's species ; this is now done.

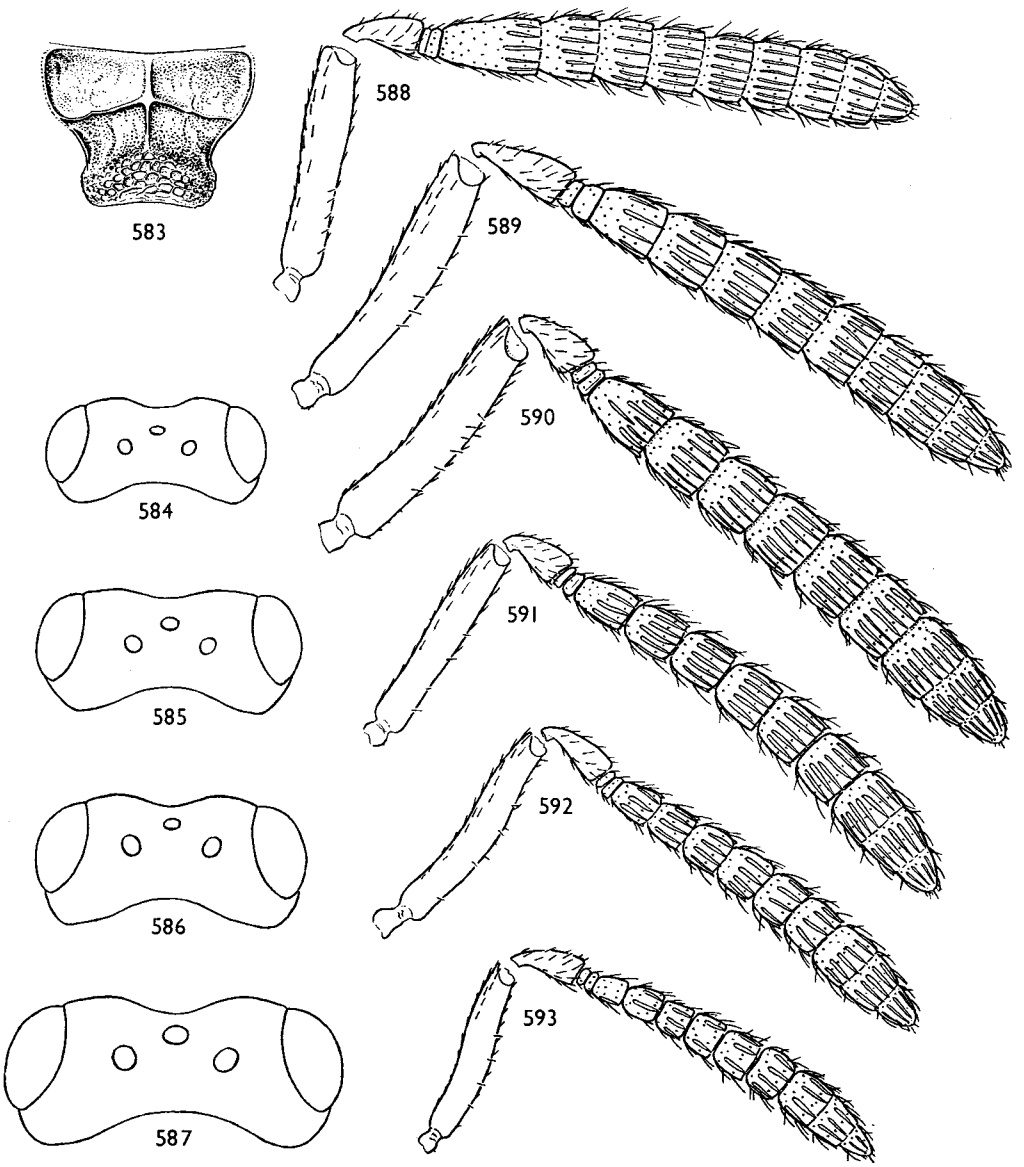
The key to European species given by Delucchi & Graham (1956 : 547–551) needs revision because some additional species have since been recognized, also because some changes in nomenclature are necessary (partly as a result of a redefinition of certain species). Since then I have been able to study much additional material and compare it with the respective types. Consequently I believe I have formed a better concept of the range of variation of the species, most of which can now be defined fairly satisfactorily. Some difficulties remain, chiefly concerning the group of *posticus* (Walker) which contains some rather variable species.

The males of *Trichomalus* are still rather imperfectly known. They would repay further investigation because they often show good characters ; in the case of some closely-allied species (e.g., *campestris* and *inops*) the males are easy to distinguish although their females are very similar. I am providing a tentative key to the males of some European species, so that at least a number of the more distinct ones may be recognized. Where particular males have been only doubtfully correlated with females, a query is inserted before the name.

Key to most European Species

(Females)

1		Fore coxae entirely reddish testaceous or (rarely) infuscate at extreme base only. Fore wing with basal vein bare ; marginal vein only 1·25–1·5 times as long as the stigmal vein ; surface beyond the speculum with relatively dense pilosity 33
–		Fore coxae in most species mainly to entirely black with a metallic tinge, rarely only black on their external aspect, in which case the basal vein of the fore wing is pilose. Fore wing with marginal vein sometimes longer in relation to the stigmal vein ; surface beyond the speculum often less densely pilose 2
2	(1)	Propodeum with nucha strongly reticulate, and often relatively large . . 3
–		Propodeum with nucha weakly reticulate, transversely aciculate, or alutaceous, often relatively short 11
3	(2)	Basal vein of fore wing bare . . . . . sp. indet. B (p. 736)
–		Basal vein of fore wing pilose 4
4	(3)	Propodeum: panels of median area relatively dull, strongly and nearly uniformly reticulate, nearly as strongly as the nucha, though rather more finely ; costula usually absent or vaguely indicated, if at all distinct then not straight. Gaster without purplish transverse fasciae on the tergites, though its disc is often indefinitely suffused with purplish or violet-bronze 5
–		Propodeum with panels of median area more weakly or irregularly sculptured, usually relatively shiny and sometimes nearly smooth ; costula nearly always present, straight and often sharp (Text-fig. 583) . Gaster most often with purplish or purplish bronze transverse fasciae on the hinder part of some of the tergites 9
5	(4)	Head in dorsal view (Text-fig. 585) with temples less strongly convergent, and one third or slightly more than one third as long as the eyes ; head about 1·3 times as broad as the mesoscutum. Antennal flagellum testaceous, at least beneath ; legs except coxae testaceous ; head and thorax tending towards bright green . . . . ***repandus*** (Walker) (p. 722)
–		Head in dorsal view (Text-fig. 584) with temples more convergent, from one fifth to hardly more than one quarter as long as eyes ; head at most 1·2 times as broad as the mesoscutum. Antennal flagellum fuscous to black ; legs often relatively darker ; head and thorax most often a dull or bronze-green, sometimes bronze or coppery 6
6	(5)	More elongate species : gaster lanceolate-ovate, slightly longer than head plus thorax, 2·2–2·5 times as long as broad, reaching level with the tips of the fore wings when these are laid back. . . ***oxygyne*** sp. n. (p. 720)
–		Less elongate species : gaster ovate, 1·5–2·0 times as long as broad, at least slightly shorter than head plus thorax, at least not quite reaching the tips of the fore wings when these are laid back 7



FIGS. 583–593. *Trichomalus* spp. 583, *flagellaris* sp. n., ♀, median area of propodeum ; 584, *oxygyne* sp. n., ♀, head ; 585, *repandus* (Walker), ♀, head ; 586, *gracilicornis* (Zetterstedt), ♀, head ; 587, *lucidus* (Walker), ♀, head ; 588, *flagellaris* sp. n., ♀, antenna ; 589, *apertus* (Walker), ♀, antenna ; 590, *perfectus* (Walker), ♀, antenna ; 591, *bracteatus* (Walker), ♀, antenna ; 592, *rufinus* (Walker), ♀, antenna ; 593, *fulvipes* (Walker), ♀, antenna.

7 (6) Median area of propodeum 1·35–1·5 times as broad as long. Antennae with combined length of pedicellus and flagellum distinctly less than breadth of head ; first funicular segment distinctly shorter than the pedicellus, quadrate to slightly transverse, segments 2–4 usually a little transverse ; scape barely reaching the lower edge of the median ocellus. Small species, length 1·6–2 mm. . . . . ***nanus*** (Walker) (p. 721)

– Median area of propodeum at most 1·25 times as broad as its median length. Antennae with combined length of pedicellus and flagellum slightly less than, or as great as, the breadth of the head ; funicular segments 1–3 (–4) quadrate, or 1–3 even slightly longer than broad ; scape sometimes reaching level of vertex. Species sometimes relatively larger . . . 8

8 (7) Fore wing with basal cell, not counting the hairs on the basal vein, bare, or with at most 1–2 hairs distally. Antennae with scape not quite reaching the level of the vertex ; combined length of pedicellus and flagellum usually not quite equal to breadth of head. Nucha occupying somewhat less than half the median length of the propodeum . ***posticus*** (Walker) (p. 718) and ***statutus*** (Förster) (p. 719)

– Fore wing with basal cell with 5–13 hairs scattered over its distal third. Antennae with scape reaching to level of vertex or even slightly above it ; combined length of pedicellus and flagellum equal to, or even a little greater than, the breadth of the head. Nucha occupying half the median length of the propodeum . . . . . ***coryphe*** (Walker) (p. 717)

9 (4) Thorax longer, 1·65–1·7 times as long as broad. Gaster 1·5–1·8 times as long as broad ; hind margin of basal tergite distinctly curved backwards. Antennae with first funicular segment only about two thirds the length of the pedicellus, quadrate or hardly longer than broad ***rugosus*** Delucchi & Graham (p. 724)

– Thorax shorter, 1·35–1·45 times as long as broad. Gaster 1·85–2·1 times as long as broad ; hind margin of basal tergite weakly curved. First funicular segment varying from slightly shorter, to slightly longer, than the pedicellus; usually longer than broad 10

10 (9) Median area of propodeum 1·6–1·85 times as broad as long. Pronotal collar (medially) from one ninth to one seventh as long as the mesoscutum. Gaster 1·85–2 times as long as broad . . . ***conifer*** (Walker) (p. 722)

– Median area of propodeum (Text-fig. 583) about 1·3 times as broad as long. Pronotal collar (medially) slightly more than one sixth as long as the mesoscutum. Gaster about 2·2 times as long as broad ***flagellaris*** sp. n. (p. 723)

11 (2) Fore wing with basal cell, on upper surface of wing, with at least a few hairs distally, as well as those on the basal vein, sometimes its distal third to half pilose ; surface beyond the speculum relatively densely pilose ; marginal vein at most 1·5 times as long as the stigmal vein . . . 28

– Fore wing with basal cell bare, at most the basal vein pilose ; surface beyond the speculum usually not densely pilose ; marginal vein often more than 1·5 times as long as the stigmal vein 12

12 (11) Fore wing with basal vein at least partly pilose, most often throughout . 13

– Fore wing with basal vein entirely bare 19

13 (12) Antennae with flagellum slender, proximally not or hardly stouter than the pedicellus, subclavate (Text-figs. 591, 593) 14

– Antennae with flagellum stout, even proximally distinctly stouter than the pedicellus, fusiform (Text-figs. 589, 590) 19

14 (13) Fore wing with marginal vein only 1·3–1·6 times as long as the stigmal vein ; basal vein, except in *lonchaeae*, pilose throughout. Thorax squat, about

1·5 times as long as broad or hardly more 29

– Either the marginal vein is 1·75–1·9 times as long as the stigmal vein ; or else the thorax is slender, 1·65–1·7 times as long as broad 15

15 (14) Head in dorsal view (Text-fig. 586) only 2–2·05 times as broad as long, at most 1·1 times as broad as the mesoscutum. Fore wing usually with a fuscous cloud surrounding the stigma ; marginal vein 1·4–1·75 times as long as the stigmal vein. Legs relatively dark, the femora mainly blackish, the tibiae often darkened. Dorsal surface of hind coxae rather densely hairy, the hairs extending nearly to their bases. Median area of propodeum with fairly strong, obliquely strigose-reticulate sculpture

gracilicornis (Zetterstedt) (p. 725)

– Head in dorsal view (Text-fig. 587) 2·15–2·3 times as broad as long, 1·1–1·25 times as broad as the mesoscutum. Fore wing immaculate ; marginal vein 1·75–1·9 times as long as the stigmal vein. Legs relatively paler, the tibiae not darkened and the femora often pale. Dorsal surface of hind coxae more sparsely pilose, the hairs not nearly extending to its base. Median area of propodeum often weakly sculptured 16

16 (15) Fore wing with basal vein with only 1–3 isolated hairs ; basal cell open below throughout. Legs, except coxae, reddish or fulvous. Gaster not longer than head plus thorax . . . . . ***tenellus*** (Walker) (p. 723)

– Fore wing with basal vein pilose throughout ; usually also the basal cell is closed below in its apical part. Legs sometimes having the femora darkened. Gaster usually longer than head plus thorax 17

17 (16) Gaster very elongate and acuminate, about twice as long as the thorax ; last tergite 1·7–2 times as long as its basal breadth ; penultimate tergite as long as, or even very slightly longer than, its basal breadth. Stigma of fore wing a little larger than in *bracteatus*

gynetelus (Walker) (p. 725)

– Gaster less elongate, at most 1·6 times as long as the thorax ; last tergite at most 1·3 times as long as its basal breadth ; penultimate tergite at least slightly shorter than its basal breadth 18

18 (17) Median area of propodeum 1·5–1·8 times as broad as long, fairly strongly sculptured, often with a costula more or less indicated. Gaster somewhat longer than head plus thorax. Antenna, Text-fig. 591

bracteatus (Walker) (p. 725)

– Median area of propodeum at most 1·35 times as broad as long, relatively more weakly sculptured, usually without a distinct costula. Gaster not or hardly longer than head plus thorax . . . ***lucidus*** (Walker) (p. 726)

19 (13) Gaster lanceolate, acuminate, 3·5–4 times as long as broad, nearly twice as long as the thorax. Antennal flagellum fusiform, stout, distinctly stouter than the pedicellus. Basal vein of fore wing bare or virtually so. Propodeum with panels of median area shiny, weakly and irregularly sculptured 20

– Gaster at most 3 times as long as broad, but usually less ; if as much as 3 times, then the antennal flagellum is slightly clavate, thinner proximally, the first funicular segment only slightly stouter than the pedicellus . . 21

20 (19) Marginal vein of fore wing 1·8–1·9 times as long as the stigmal vein. Segments of antennal funicle with relatively few sensilla. Body coppery bronze. (Madeira) . . . . . ***cupreus*** Delucchi & Graham (p. 727)

– Marginal vein 1·5–1·6 times as long as the stigmal vein. Segments of antennal funicle with numerous sensilla. Body greenish. (Europe)

acuminatus Delucchi & Graham (p. 727)

21 (19) Gaster 2·5–3 times as long as broad, acuminate ; last tergite 1·3–1·5 times as long as its basal breadth. Antennal flagellum rather slender proximally,

only slightly stouter than the pedicellus, subclavate. Basal vein of fore wing bare. Dorsal surface of hind coxae virtually bare. Legs (except coxae) testaceous. Propodeum with panels of median area shiny, weakly sculptured or virtually smooth . . ***elongatus*** Delucchi & Graham (p. 727)

– Either the gaster, and its last tergite, are relatively shorter ; or the antennal flagellum is stout and fusiform ; or the femora are mainly dark, and sometimes the tibiae are infuscate ; or the propodeum has the panels of its median area distinctly sculptured 22

22 (21) Propodeum with panels of median area smooth or virtually so, polished. Antennal flagellum subclavate, slender, funicle proximally hardly stouter than the pedicellus. Legs with femora mainly dark, the tibiae usually more or less infuscate. Head and thorax dorsally usually bronze or purplish bronze, sometimes dark green. Dorsal surface of hind coxae virtually bare . . . . . ***inscitus*** (Walker) (p. 728)

– Either the panels of the median area of the propodeum are distinctly sculptured ; or the antennal flagellum is stout, even proximally distinctly stouter than the pedicellus, and subfusiform ; or the legs are paler, with the tibiae pale and the femora not or hardly infuscate. Dorsal surface of hind coxae often thickly pilose, rarely nearly bare 23

23 (22) Marginal vein of fore wing 1·65–2 times as long as the stigmal vein. Antennal flagellum subclavate ; funicle relatively slender proximally, only slightly stouter than the pedicellus. Body bright green ; legs (except coxae) fulvous. Dorsal surface of hind coxae with few hairs. Propodeal callus somewhat sparsely pilose ; the hairs in its posterior half do not extend as far as the plicae . . . . . ***tenellus*** (Walker) (p. 732)

– Marginal vein 1·3–1·6 times as long as the stigmal vein ; if more than 1·4 times, then the antennal flagellum is stout, the maximum breadth of the funicle about 1·5 times the breadth of the pedicellus in dorsal view. Body often more obscurely coloured ; legs sometimes darker. Dorsal surface of hind coxae, and propodeal callus, moderately thickly to densely pilose ; in the posterior part of the propodeum the hairs extend virtually to the plicae . 24

24 (23) Fore wing with surface beyond the speculum densely pilose. Antenna (Text-fig. 592) with flagellum subclavate ; funicle proximally only slightly stouter than the pedicellus ; the latter fully twice as long as broad in dorsal view. Basal vein of fore wing bare.

Dorsal surface of hind coxae, propodeal callus, and sides of basal tergite of gaster densely pilose . . . . . ***rufinus*** (Walker) (p. 734)

– Fore wing with surface beyond the speculum rather less densely pilose. Antennae with flagellum (Text-fig. 590) relatively stout, subfusiform ; funicle proximally distinctly stouter than the pedicellus. Basal vein of fore wing sometimes pilose 25

25 (24) Antennae (Text-fig. 590) with pedicellus in dorsal view at least slightly less than twice as long as broad. Basal vein of fore wing pilose throughout or nearly throughout. Propodeum with panels of median area reticulate or strigose-reticulate . . . . . ***perfectus*** (Walker) (p. 729)

– Antennae with pedicellus in dorsal view 2–2·5 times as long as broad, if only twice as long as broad, then the basal vein ofthe fore wing is bare or nearly so 26

26 (25) Antennae with pedicellus in dorsal view only about twice as long as broad. Basal vein of fore wing bare, or with at most 2 hairs. Head and thorax usually bright green, sometimes bronze-green. Propodeum with panels of median area reticulate or strigose-reticulate, sometimes with a costula

lonchaeae Bouček (p. 730)

– Antennae with pedicellus in dorsal view 2·2–2·5 times as long as broad. Basal vein sometimes with more numerous hairs. Body sometimes more obscurely coloured. Propodeum with panels of median area sometimes smooth 27

27 (26) Propodeum with panels of median area smooth or having only traces of very weak sculpture. Basal vein of fore wing more or less pilose, at least in its upper half. Head and thorax olive- or bronze-green. Antenna, Text-fig. 589 . . . . . ***apertus*** (Walker) (p. 730)

– Propodeum with panels of median area quite strongly reticulate, or obliquely strigose-reticulate. Basal vein usually bare, occasionally with 1–2 hairs. Head and thorax bronze or greenish bronze . . ***robustus*** (Walker) (p. 730)

28 (11) Fore wing with distal third to half of basal cell pliose ; marginal vein only 1·1–1·15 times as long as the stigmal vein ; postmarginal vein as long as, or even a little longer than, the marginal vein . ***lepidus*** (Förster) (p. 734)

– Fore wing with basal cell, not counting the basal vein, usually bare, rarely with 1–4 scattered hairs distally, in which case the marginal vein is at least 1·3 times as long as the stigmal vein 29

29 (28) Basal vein of fore wing with only 1–3 isolated hairs. Antennal flagellum rather stout . . . . . ***lonchaeae*** Bouček (p. 730)

– Basal vein pilose throughout. Antennal flagellum more slender (Text-fig. 593) 30

30 (29) Propodeum with panels of median area shiny, smooth or virtually so, without a costula. Gaster sometimes more than twice as long as broad, sometimes distinctly longer than head plus thorax 31

– Propodeum : either the panels of the median area are reticulate, or else a costula is present. Gaster at most twice as long as broad ; slightly shorter than, or at most as long as, head plus thorax 32

31 (30) Gaster at most twice as long as broad, but usually somewhat less than twice, not or hardly longer than head plus thorax. Femora usually more or less infuscate, tibiae occasionally so . . . . ***helvipes*** (Walker) (p. 731)

– Gaster 2·2–2·5 times as long as broad, at least very slightly longer than head plus thorax. Femora fulvous to reddish ; tibiae pale. Antenna, Text-fig. 593 . . . . . ***fulvipes*** (Walker) (p. 733)

32 (30) Propodeum with panels of median area reticulate and not very shiny, without a distinct costula. Postmarginal vein of fore wing as long as, or slightly shorter than, the marginal vein . . . . ***pexatus*** (Walker) (p. 734)

– Propodeum with panels of median area weakly sculptured and shiny, with a distinct costula. Postmarginal vein of fore wing distinctly shorter than the marginal vein . . . . . ***exilis*** (Förster) (see *conifer*, p. 722)

33 (1) Fore wing with line of hairs on lower surface of costal cell distinctly broken in the middle, often widely so ; wing often with a fuscous discal cloud ***campestris*** (Walker) (p. 735)

– Fore wing with line of hairs on lower surface of costal cell complete ; wing immaculate . . . . . ***inops*** (Walker) (p. 735)

(MALES)

1 Antennae with flagellum somewhat flattened, fusiform, broadest at about the middle of the funicle and thence tapering to the tip of the clava ; first segment of funicle subquadrate and about as long as the second segment, segments 3–6 transverse, 4 nearly twice as broad as long ; combined length of pedicellus and flagellum equal to breadth of head ; flagellum with rather short and slightly outstanding whitish hairs ; antenna yellowish with the clava brown, the pedicellus and middle of the flagellum sometimes slightly brownish. Median area of propodeum irregularly strigose-reticulate, about

1·6 times as broad as long. Stigma of fore wing rather large, separated by about 2·5 times its height from costal edge of wing. . sp. indet A (p. 736)

– Antennae with flagellum not flattened ; either filiform, or more or less clavate with its broadest part beyond the middle of the funicle ; middle segments of funicle not or at most slightly transverse ; combined length of pedicellus and flagellum sometimes greater than breadth of head ; flagellum sometimes with longer hairs. Median area of propodeum usually less strongly transverse . . . . . .

2 (1) Antennae with combined length of pedicellus and flagellum distinctly greater than breadth of head ; flagellum filiform, its hairs usually outstanding ; first funicular segment nearly always as long as or longer than the second segment, and nearly always as long as or longer than the pedicellus, provided with sensilla ; sixth (last) funicular segment sometimes longer than broad. Gaster nearly always oblong 19

– Antennae with either combined length of pedicellus not greater than breadth of head, or flagellum at least slightly clavate ; first funicular segment often shorter than the second segment, sometimes anelliform and lacking sensilla, most often shorter than, and at most as long as, the pedicellus ; last funicular segment not longer than broad. Gaster often subcircular or shortly oval 3

3 (2) Fore coxae entirely yellow, or at most dark on their outer aspect or at extreme base ; mid and hind coxae sometimes partly yellow 4

– Fore coxae usually wholly black with a metallic tinge, occasionally with their tips pale 8

4 (3) Basal vein of fore wing bare or virtually so. Gaster usually with a reddish transverse band, sometimes reduced to a spot 5

– Basal vein of fore wing pilose. Gaster immaculate 9

5 (4) Antennae with scape very stout, only about 3 times as long as broad, slightly longer than an eye ; flagellum fuscous with funicular segments (4–) 5–6 yellow.

Fore coxae entirely yellow, or at most dusky at extreme base

campestris (Walker) (p. 735)

– Antennae with scape slender, 5–6 times as long as broad, approximately equal in length to an eye ; flagellum testaceous to brown, sometimes with the funicular segments more or less spotted with fuscous dorsally . . . 6

6 (5) Mid tibia with a fuscous or black subapical ring. Combined length of pedicellus and flagellum barely equal to breadth of head.

Fore coxae entirely yellow ; mid and sometimes hind coxae partly so

annulatus (Förster) (p. 735)

– Mid tibia entirely yellow. Combined length of pedicellus and flagellum very slightly greater than breadth of head 7

7 (6) Fore coxae entirely yellow, or at most slightly dusky at extreme base

inops (Walker) (p. 735)

– External aspect of fore coxae dark . . . . ***rufinus*** (Walker) (p. 734)

8 (3) Antennae with first segment of funicle anelliform, distinctly (often much) shorter than the second segment, lacking sensilla 10

– Antennae with first segment of funicle not anelliform, not or at most very slightly shorter than the second segment, provided with sensilla . . 9

9 (8) Antennal flagellum slightly to quite distinctly clavate ; first funicular segment much shorter than the pedicellus. Gaster subcircular or shortly oval, immaculate 10

– Antennal flagellum not clavate or, if slightly so, then gaster oblong, and usually with a pale spot. First funicular segment of antennae sometimes

nearly or quite as long as the pedicellus 16

10 (9) Fore wing with basal vein bare or virtually so. Gaster subcircular or shortly oval, usually with a reddish transverse fascia, occasionally only a spot. Antennal flagellum brownish . . . . . ***rufinus*** (Walker) (p. 734)

– Fore wing with basal vein pilose. Gaster either immaculate, or else oblong with a pale spot 11

11 (10) Gaster short and broad, shortly oval to subcircular, immaculate 12

– Gaster more oblong in shape with a yellowish spot or a transverse fascia . 15

12 (11) Antennal scape slightly shorter than an eye and not reaching the level of the vertex. Marginal vein of fore wing about 1·5 times as long as the stigmal vein. Basal tergite of gaster with few hairs at the sides ; propodeal callus not very thickly pilose.

Antennal flagellum brown, or testaceous with darker incisures between the segments . . . . . ? ***apertus*** (Walker) (p. 730)

– Antennal scape virtually or quite as long as an eye and reaching the level of the vertex, except in *lepidus*, in which the marginal vein is hardly longer than the stigmal vein, the sides of the basal tergite of the gaster have several hairs, and the propodeal callus is thickly pilose 13

13 (12) Antennal scape somewhat shorter than an eye and not reaching the level of the vertex ; flagellum brown or fuscous. Fore wing with distal third or so of basal cell pilose ; marginal vein hardly longer than the stigmal vein ***lepidus*** (Förster) (p. 734)

– Antennal scape virtually or quite as long as an eye and reaching the level of the vertex ; flagellum partly testaceous or yellow. Fore wing with basal cell often bare, if so extensively pilose, then marginal vein rather longer relative to the stigmal vein 14

14 (13) Marginal vein 1·15–1·35 times as long as the stigmal vein. Antenna with funicle testaceous, sometimes brownish proximally ; clava brown, except sometimes apically. Mandibles with a strong longitudinal crest in their basal half . . . . . ***pexatus*** (Walker) (p. 734)

– Marginal vein about 1·5 times as long as the stigmal vein. Antennal flagellum annulated, fuscous with the anelli, first funicular segment and funicular segments 4–6 at least beneath, yellowish. Mandibles with a small tubercle near their bases . . . . . ***placidus*** (Walker) (p. 736)

15 (11) Antennae with funicle proximally very slender, hardly more than half as thick as the pedicellus. Body bronzy green . . . ? ***fulvipes*** (Walker) (p. 733)

– Antennae with funicle proximally rather less slender than in the above. Body green . . . . . sp. indet. C (p. 737)

16 (9) Antennal flagellum with virtually decumbent hairs. Gaster subcircular or shortly oval, immaculate, typically green with its disc purplish or bronze. Median area of propodeum reticulate or smooth 17

– Antennal flagellum with hairs standing out at an angle of 20°–30°. Gaster oblong, most often with a pale spot. Median area of propodeum smooth or very weakly sculptured 18

17 (16) Median area of propodeum distinctly reticulate or strigose-reticulate. Usually at least the fore femora have a dark streak at base beneath, sometimes all the femora are darkened basally. Larger species, length 2–3 mm. Stigma of fore wing usually fuscous and often rather large ***robustus*** (Walker) (p. 730)

– Median area of propodeum virtually smooth. Femora yellow, immaculate. Smaller species, 1·5–2 mm. Stigma of forewing paler and smaller ? ***apertus*** (Walker) (p. 730)

18 (16) Head in dorsal view with temples nearly half as long as eyes. Antennal flagellum hardly stouter than the pedicellus, when the latter is seen in dorsal view, brownish. Hind coxae dorsally with very few hairs, or bare. Antennal scape, and legs, tending towards testaceous. Gaster with at most a faint pale spot . . . . . ***inscitus*** (Walker) (p. 728)

– Head in dorsal view with temples about one third as long as eyes. Antennal flagellum slightly stouter than the pedicellus in dorsal view, yellowish beneath, and often testaceous above. Hind coxae distinctly hairy dorsally. Antennal scape, and legs, flavous. Gaster usually with a distinct yellowish spot . . . . . ***helvipes*** (Walker) (p. 731)

19 (2) Antennae with flagellum with virtually decumbent hairs ; sensilla conspicuous, very numerous, arranged in 3 rows on each of the funicular segments, except the distal ones. Propodeum with median area with a costula, which is sometimes strong ; nucha fairly strongly reticulate ? ***flagellaris*** sp. n. (p. 723)

– Antennae with flagellum with hairs standing out at an angle of 30°–45° ; sensilla usually less conspicuous, sparser, arranged in 1 or 2 rows on each of the funicular segments. Propodeum with costula often absent ; nucha usually more weakly sculptured 20

20 (19) Propodeum with nucha with strong raised reticulation, relatively dull and large 21

– Propodeum with nucha with weak reticulation, alutaceous sculpture, or transversely strigose, relatively shiny, often short 22

21 (20) Propodeum with panels of median area relatively strongly and nearly uniformly reticulate 29

– Propodeum with panels of median area usually weakly sculptured or nearly smooth, if more strongly then the sculpture is composed of oblique strigose-reticulation 22

22 (21) Thorax in dorsal view only 1·5–1·55 times as long as broad. Head 1·25–1·3 times as broad as the mesoscutum. Antenna with first funicular segment as long as or slightly longer than the pedicellus ; scape distinctly shorter than an eye. Fore wing with marginal vein 1·55–1·6 times as long as the stigmal vein ; stigma small . . . . . ***conifer*** (Walker) (p. 722)

– Thorax in dorsal view 1·7–1·8 times as long as broad. Head usually rather less broad relative to the mesoscutum. The antennal and fore wing characters sometimes not agreeing with the above 23

23 (22) Antennae with first funicular segment slightly shorter than the second, and slightly shorter than the pedicellus ; flagellum subtestaceous ; scape as long as an eye, distinctly expanded above its middle. Fore wing usually with a brownish cloud around the stigma ; marginal vein about 1·5 times as long as the stigmal vein. Head in dorsal view only 1·85–1·9 times as broad as long . . . . . ***gracilicornis*** (Zetterstedt) (p. 725)

– Antennae with first funicular segment as long as or slightly longer than the second, as long as or longer than the pedicellus ; flagellum brown to black ; scape at least somewhat, sometimes much, shorter than an eye. Fore wing immaculate ; marginal vein sometimes rather longer relative to the stigmal vein. Head in dorsal view usually 2–2·15 times as broad as long 24

24 (23) Fore wing with marginal vein only 1·3–1·45 times as long as the stigmal vein ; basal vein pilose or bare ; stigma moderate-sized and tending to be dark, fuscous or brown 25

– Fore wing with marginal vein 1·55–1·9 times as long as the stigmal vein ; basal vein pilose ; stigma small or moderate-sized 26

25 (24) Dorsal surface of hind coxae hairy. Antennal scape reaching to about level of

middle of median ocellus, slightly expanded in its upper part. Basal vein of fore wing often pilose throughout . . ? ***perfectus*** (Walker) (p. 729)

– Dorsal surface of hind coxae bare or virtually so. Antennal scape reaching to about level of top of median ocellus, not expanded in its upper part. Basal vein of fore wing bare or virtually so . ***elongatus*** Delucchi & Graham (p. 727)

26 (24) Stigma of fore wing small, separated by about 3 times its height from the costal edge of the wing. Propodeum medially about half as long as the scutellum 27

– Stigma of fore wing larger, separated by 1·9–2·5 times its height from the costal edge of the wing 28

27 (26) Antennal scape slightly expanded in its upper part, its front edge with a shiny boss which extends fully half way down. Basal vein of fore wing pilose throughout ; basal cell usually closed below distally. Antennal scape often fuscous distally ; gaster immaculate or with a faint yellowish spot ***bracteatus*** (Walker) (p. 725)

– Antennal scape hardly expanded, with an indistinct boss which extends less than half way down. Basal vein of fore wing usually with only 1–4 hairs ; basal cell open below. Antennal scape yellow ; gaster with a distinct, often large, yellowish spot . . . . . ***tenellus*** (Walker) (p. 732)

28 (26) Propodeum medially slightly less than half as long as the scutellum ***gynetelus*** (Walker) (p. 725)

– Propodeum medially virtually half as long as the scutellum ***lucidus*** (Walker) (p. 726)

29 (21) Antennal flagellum yellowish beneath, sometimes also testaceous above. Gaster with a distinct yellowish spot . . . ***repandus*** (Walker) (p. 722)

– Antennal flagellum fuscous, or at most obscurely testaceous beneath. Gaster usually immaculate, sometimes with a small pale spot . . . 30

30 (29) Antennae with sixth funicular segment quadrate or hardly longer than broad ; scape barely reaching level of vertex . . . ***nanus*** (Walker) (p. 721)

– Antennae with funicular segments relatively longer, the sixth usually 1·5–1·7 times as long as broad ; scape sometimes reaching slightly above the level of the vertex 31

31 (30) Antennal scape not quite reaching the level of the vertex. Basal cell of fore wing bare or virtually so . . . . . ***posticus*** (Walker) (p. 718)

– Antennal scape reaching slightly to quite distinctly above the level of the vertex. Basal cell of fore wing with 5–7 hairs scattered over its distal part ***coryphe*** (Walker) (p. 717)

Trichomalus coryphe (Walker) comb. n.

Pteromalus Coryphe Walker, 1839 : 266, ♂.

Type material. One male, LECTOTYPE (but possibly holotype), bearing a Waterhouse label. It is very close to the male of *posticus* (Walker) but differs in small characters which are mentioned in my key to males (q.v.). I have males and females of a species which is certainly different from, although very close to *posticus*, and the males of this species appear to be identical with the lectotype of *coryphe*.

BRITAIN (new records) : Berkshire, Wytham, in a marshy place between the Wood and the River Thames, 1 ♀, 30.viii.1953 (*Graham*) ; Cheshire, Redesmere,

1 ♀, 4.iii.1951, amongst *Typha* (*S. Shaw*) ; Oxfordshire, Otmoor, 1 ♂, 1 ♀, 20.viii.1955 (*Graham*).

Biology. Unknown. All the above specimens were taken in marshy places.

Trichomalus posticus (Walker)

Eutelus posticus Walker, 1834 : 366, ♀.
? *Pteromalus Deudorix* Walker, 1839 : 225, ♂.
? *Pteromalus intestinarius* Förster, 1841 : 17–18, ♀.
? *Pteromalus cristatus* Förster, 1841 : 20, ♀.
Pteromalus Sunides Walker, 1845 : 261, ♂ ♀.
? *Pteromalus Xanthe* Walker, 1845 : 262, ♂.
Isocyrtus (*Trichomalus*) *punctinucha* Thomson, 1878 : 134, ♂ ♀.
? *Trichomalus cristatus* (Förster) Nikol'skaya, 1937 : 12–13, [*ex parte*].
Trichomalus posticus (Walker) Graham, 1956*b* : 247.
Trichomalus punctinucha Thomson ; Delucchi & Graham, 1956 : 548, 554–555, ♀.

Type material. For designation of lectotypes for most Walker species, see Graham (1956*b* : 247).

Pteromalus deudorix Walker. Syntypes, 3 ♂. LECTOTYPE, the third specimen, bearing a Waterhouse label ; it appears to be a male of *posticus*.

Pteromalus intestinarius Förster. One female, LECTOTYPE, labelled " Collect. G. Mayr " ; " Tr. intestinarius Förster Type " ; and (in Förster's handwriting) " intestudinarius [*sic*] m.". I think it is probably conspecific with *posticus* (Walker).

Pteromalus cristatus Förster. Types probably lost (see Delucchi & Graham, 1956 : 545). Meyer (1923 : 117) mentioned Ruschka's opinion that *cristatus* might be the same as *frontalis* Thomson [=*nanus* (Walker)], but some features in Förster's description of *cristatus* (" Beine rötlichgelb, Schenkel an der Basis grün . . . Lg. 1 1/4 Lin.") suggest rather that it might have been the same as *posticus* (Walker). Four specimens in the BM(NH) determined as *cristatus* by Ruschka, are actually *posticus*. The redescription of *cristatus* given by Nikol'skaya (1937), particularly the large size (" 2–3 mm.") suggests that she had *posticus* before her, although her figure of the male antenna is like that of *nanus* (Walker). Possibly the series from which the redescription was made was a mixed one.

Pteromalus xanthe Walker. One male, LECTOTYPE ; it is probably a male of *posticus*.

Isocyrtus (*Trichomalus*) *punctinucha* Thomson. Syntypes, 11 specimens. LECTOTYPE, a female labelled " Reft " [Reftera] and " punctinucha Ths ".

The description of the female of *punctinucha* (Thomson) [=*posticus* (Walker)] given by Delucchi and Graham (1956) did not take into account the variation of the species. Therefore a redescription, based on the types and on fresh material compared with them, is given here :

♀. Length 2·0–2·9 mm. Colour of head and thorax much as in *nanus* (Walker), but bright green and coppery specimens are less frequent ; femora sometimes entirely testaceous, sometimes more or less infuscate ; tibiae usually testaceous, occasionally slightly darkened medially. Basal cell of fore wing usually bare, occasionally with 1–2 isolated hairs in its distal part. Gaster ovate, 1·6–1·9 times as long as broad, somewhat longer than the thorax, but at least

slightly shorter than head plus thorax ; length of last tergite from about two thirds, to as long as, its basal breadth, therefore on the average rather longer than in *nanus*. Propodeum and antennal segments as described in my key to species (q.v.).

BRITAIN, IRELAND, SWEDEN, ? GERMANY, ? U.S.S.R.

Biology. Very probably the species is parasitic on Chloropid flies. *T. cristatus* (Förster), which is probably a synonym of *posticus* (Walker), has been recorded as parasitizing *Oscinosoma Oscinella*] *frit* (L.) and *Chloropisca notata* (Mg.) ; see Nikol'skaya, 1937. These records need confirmation. Imagines appear July–September.

Trichomalus statutus (Förster)

Pteromalus fertilis Förster, 1841 : 20, ♀, **syn. n.**
Pteromalus statutus Förster, 1841 : 20, ♀.
Trichomalus statutus (Förster) Delucchi & Graham, 1956 : 552–554, ♀ [*ex parte*].

Type material : *Pteromalus fertilis* Förster. Syntypes, 2 ♀. LECTOTYPE, a specimen labelled " Collect. G. Mayr " ; " Tr. fertilis Förster Type " ; " fertilis m." (in Förster's handwriting) ; " Trichomalus fertilis Fö. ♀. V. Delucchi det. 54 " ; and (on a red label) " TYPE ". The specimen lacks the wings and one antenna, but agrees in other respects with the type of *statutus*.

Pteromalus statutus Förster. Syntypes, 2 ♀. LECTOTYPE labelled " Collect. G. Mayr " ; " Pt. statutus Förster Type " ; " statutus m." (in Förster's handwriting) ; " Trichomalus statutus Fö. V. Delucchi det. " ; and (on a red label) " TYPE ".

The redescription of the female of *statutus* in Delucchi & Graham (1956) is incorrect in some respects. Thus the gaster was said to be " aussi long ou peu plus long que le thorax, une fois et demie plus long que large " ; but in the lectotype (which I have re-examined) it is nearly as long as the head plus thorax and twice as long as broad. The gaster of the lectotype of *fertilis* is very similar, but just a little less elongate. In the same paper (p. 552) *lucidus* Förster, *versutus* Förster, and *frontalis* Thomson, were cited as synonyms of *statutus* ; but as a result of further study, I now regard all these as synonyms of *nanus* (Walker).

I have examined a few females from Czechoslovakia which agree with the lectotypes of *statutus* and *fertilis*. They differ from those of *nanus* (Walker) in their longer gaster, slightly different propodeum, and antennae ; and from those of *oxygyne* in their slightly shorter gaster. They are in fact very close to the females of *posticus* (Walker) and might prove to be a form of that species ; however, they have the gaster slightly more acuminate than in any of my British *posticus*, and appear to be doubtfully within the range of variation of that species. At present *statutus* is kept separate until its status can be confirmed.

GERMANY, CZECHOSLOVAKIA.

Biology. This species was recorded (Secrétariat, etc., 1966 : 121, 131) as a parasite of *Oscinella frit* (L.) (Dipt., Chloropidae) in Czechoslovakia, but the record needs to be checked in view of the confusion between *statutus* (Förster) and *nanus* (Walker).

Trichomalus oxygyne sp. n.

(Text-fig. (584))

♀. Body greenish bronze or dark bluish ; disc of gaster bronze-black. Antennae fuscous ; scape testaceous at base, or mainly so. Coxae concolorous with thorax ; trochanters testaceous ; femora fuscous, their tips fairly broadly testaceous ; tibiae and tarsi testaceous, the tibiae usually somewhat infuscate medially, tips of tarsi brown. Tegulae fuscous, or partly testaceous. Wings slightly tinged with grey ; venation brownish testaceous, the stigma a little darker. Length 2·5–2·8 mm.

Head barely 1·2 times as broad as mesoscutum ; in dorsal view 2·1–2·2 times as broad as long, with temples converging rather strongly and one quarter as long as eyes or slightly more ; POL 1·5–1·65 OOL. Eyes separated by about 1·4 times their length. Malar space slightly less than half the length of an eye. Clypeus strigose, its anterior margin truncate or very weakly emarginate. Head moderately finely reticulate, the genae finely so. Antennae with toruli about equidistant from the anterior margin of the clypeus and the median ocellus ; scape almost reaching the vertex ; combined length of pedicellus and flagellum approximately equal to breadth of head ; pedicellus virtually twice as long as broad, slightly longer than the first funicular segment ; flagellum rather slender, subclavate ; funicle proximally only slightly stouter than the pedicellus ; funicular segments subquadrate, or the proximal segments very slightly longer than broad, the sixth, and sometimes the fifth, very slightly transverse ; sensilla not very numerous, in one row on each segment.

Thorax 1·6–1·8 times as long as broad. Mesoscutum 1·6–1·7 times as broad as long, finely reticulate laterally, rather more coarsely so on the disc. Scutellum slightly longer than broad ; slightly more finely, or as coarsely, reticulate as the disc of the mesoscutum. Propodeum medially about two thirds as long as the scutellum and produced well beyond the bases of the hind coxae ; median area 1·3–1·4 times as broad as long ; median carina strong, often raised ; panels of median area strongly though finely, nearly uniformly reticulate ; costula sometimes slightly indicated ; nucha occupying about one third the median length of the propodeum, convex, strongly and more coarsely reticulate than the panels of the median area ; callus, except around the spiracle, thickly pilose. Hind coxa thickly pilose dorsally. Fore wing with basal cell bare, or with a few hairs distally, open below ; basal vein pilose ; speculum open below ; surface beyond the speculum moderately thickly pilose ; marginal vein 1·6–1·9 times as long as the stigmal vein, and 1·2–1·35 times as long as the postmarginal vein.

Gaster lanceolate, slightly longer than head plus thorax, 2·2–2·5 times as long as broad ; last tergite as long as, or slightly longer than (up to 1·3 times) its basal breadth ; sides of basal tergite with a conspicuous patch of whitish hairs at the base, the hind margin of the tergite entire or hardly at all emarginate medially.

♂. Unknown.

Holotype ♀. ENGLAND : Berkshire, Wytham, 22.ix.1951 (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 1 ♀, 31.v.1952 (*Graham*), in Graham collection.

SCOTLAND : Mid Perth, Lawers, 1 ♀, 19.vii.1952 (*Graham*), in Graham collection.

Closely resembles the female of *posticus* (Walker) but differs in its longer gaster ; in *posticus* this is ovate, 1·6–1·9 times as long as broad, at least slightly shorter than head plus thorax.

Biology. Unknown.

Trichomalus nanus (Walker)

Pteromalus nanus Walker, 1836 : 472, ♀.
? *Pteromalus Cerpheres* Walker, 1839 : 255, ♂.
Pteromalus lucidus Förster, 1841 : 18, ♀, **syn. n.** [*nee* Walker, 1835].
? *Pteromalus Aglaus* Walker, 1845 : 263, ♂.
Pteromalus Dipoenos Walker, 1848 : 124, 180, ♀, **syn. n.**
Pteromalus versutus Förster, 1861 : 36, ♀, **syn. n.**
Isocyrtus (*Trichomalus*) *frontalis* Thomson, 1878 : 136, ♂ ♀.
Pteromalus speciosus Dalla Torre, 1898 : 148, **syn. n.** [n. n. for *P. lucidus* Förster, *nec* Walker].
? *Trichomalus cristatus* (Förster) Meyer, 1923 : 113, 117.
? *Trichomalus cristatus* (Förster) ; Nikol'skaya, 1937 : 12–13, [*ex parte*].
Trichomalus nanus (Walker) Graham, 1956*b* : 247.
Trichomalus statutus (Förster) Delucchi & Graham, 1956 : 548, 552–554, ♂ ♀, [*ex parte*].

Type material. *Pteromalus nanus* Walker. Lectotype female designated by Graham (1956*b* : 247).

Pteromalus cerpheres Walker. Syntypes, 3 ♂ ; LECTOTYPE, the second specimen, which I consider is probably a male of *nanus*, bearing a Waterhouse label.

Pteromalus lucidus Förster. Syntypes, 3 ♀. LECTOTYPE labelled " Collect. G. Mayr " ; " Pt. lucidus Förster Type " and (in Förster's handwriting) " lucidus m ".

Pteromalus aglaus Walker. One male, LECTOTYPE, bearing a Waterhouse label.

Pteromalus dipoenos Walker. One female, accepted as TYPE, bearing a Waterhouse label. It is aberrant in having the propodeal costula stronger than usual.

Pteromalus versutus Förster. Syntypes, a male and a female, pinned and staged on a pith block. LECTOTYPE, the female, labelled " Roseggthal " (in Förster's handwriting) ; " Collect. G. Mayr " ; " Pt. versutus Förster Type " ; " Pteromal. versutus III. N. 109. ♂. ♀ ".

Isocyrtus (*Trichomalus*) *frontalis* Thomson. Syntypes on 35 pins. LECTOTYPE, a female labelled " Lpl " [Lapland], " frontalis Ths ", and (on a red label) " Type ".

♀ (redescription). Length 1·6–2 mm. Head and thorax varying in colour from a rather bright green through bronze-green to coppery bronze ; legs with femora more or less infuscate, often mainly so, tibiae often infuscate medially, sometimes mainly. Basal cell of fore wing often with a few scattered hairs in its distal part. Gaster short-ovate, as long as or somewhat longer than the thorax, 1·5–1·75 times as long as broad ; last tergite at least slightly shorter than its basal breadth, sometimes hardly more than half as long as broad. Propodeum and antennae as described in my key to species.

The female differs from that of *posticus* (Walker) mainly in its rather smaller size, somewhat shorter antennal flagellum, and rather more transverse median area of the propodeum ; from that of (?) *coryphe* (Walker) in the same characters and in its shorter antennal scape ; and from that of *statutus* (Förster) particularly in its shorter gaster and antennal flagellum.

BRITAIN, SWEDEN, GERMANY, AUSTRIA, SWITZERLAND, CZECHOSLOVAKIA, ? U.S.S.R.

Biology. Not definitely known, but possibly the species is parasitic on Chloropid

flies. Some of the host records for *Trichomalus cristatus* (Förster) mentioned by Nikol'skaya (1937) might refer to the species here called *nanus*. In Britain imagines have been captured in the field from May until October ; I have also taken a female in December and another in March, which suggests that females hibernate. If so, the life-cycle of *nanus* differs somewhat from that of *posticus* (Walker) because I have never found females of the latter during the winter months.

Trichomalus repandus (Walker)

(Text-fig. 585)

Pteromalus repandus Walker, 1835 : 501, ♀.
Pteromalus stenotelus Walker, 1836 : 487, ♀.
Pteromalus Samus Walker, 1839 : 221, ♂.
Pteromalus cryptophagus Förster, 1841 : 14, ♀.
Pteromalus praetermissus Förster, 1841 : 19, ♀, **syn. n.**
Isocyrtus (*Trichomalus*) *pallicornis* Thomson, 1878 : 136, ♂ ♀.
Trichomalus cryptophagus (Förster) Mayr, 1903 : 393.
Trichomalus repandus (Walker) Graham, 1956*b* : 247.
Trichomalus repandus (Walker) ; Delucchi & Graham, 1956 : 547–548, 551–552, ♂ ♀.

Type material. For designation of lectotypes for, and synonymy of, the above Walker species, see Graham (1956*b* : 247).

Pteromalus cryptophagus Förster. Syntypes, 2 ♀. LECTOTYPE labelled " Collect. G. Mayr " ; " Pt. cryptophagus Förster Type " ; and, in Förster's handwriting, " cryptophagus m ". The species was synonymized with *repandus* (Walker) by Delucchi & Graham (1956 : 551).

Pteromalus praetermissus Förster. Three females in Förster collection (Vienna). Only one (LECTOTYPE) agrees well with the description in having its thorax coppery-tinged ; but only the thorax, left wings, fore legs, and one mid leg remain. It is labelled " Collect. G. Mayr " ; " Pt. praetermissus Förster Type ". Delucchi & Graham (1956 : 545) stated that the type was indeterminable because of its damaged state. However, I have re-examined the lectotype and am convinced it is the same as *repandus* (Walker). One of the other syntypes, which is in good condition but has the thorax green, and so disagrees with the description, is also a female of *repandus*, which supports my conclusion.

Isocyrtus (*Trichomalus*) *pallicornis* Thomson. Syntypes on 27 pins. LECTOTYPE, female labelled " Reft " [Reftera].

BRITAIN, SWEDEN, GERMANY ; uncommon.

Biology. Unknown. Imagines May–July.

Trichomalus conifer (Walker) **comb. n.**

Pteromalus laticornis Walker, 1836 : 475 ♂ [*nec* ♀], **syn. n.**
Pteromalus conifer Walker, 1836 : 484, ♀.
? *Pteromalus exilis* Förster, 1841 : 13, ♀ [*nec* Walker, 1836].
? *Pteromalus germanus* Dalla Torre, 1898 : 127 [n. n. for *exilis* Förster *nec* Walker].
? *Trichomalus exilis* (Förster) Mayr, 1903 : 393.
? *Trichomalus exilis* (Förster) ; Delucchi & Graham, 1956 : 549, 564–565, ♀.

Type material. *Pteromalus conifer* Walker. Syntypes, 3 ♀. LECTOTYPE, the first specimen, bearing a Waterhouse label ; it is unusually large and has the first funicular segment about 1·6 times as long as broad.

Pteromalus laticornis Walker. Syntypes, 1 ♀, 2 ♂. LECTOTYPE, a ♂ ; Waterhouse label.

Pteromalus exilis Förster. One female, LECTOTYPE, in Naturhistorisches Museum, Vienna ; it is card-pointed and labelled " Collect. G. Mayr " ; " Tr. exilis Förster Type " ; and, in Förster's handwriting, " exilis m.". The redescription of *exilis* in Delucchi & Graham (1956 : 564–565) applies well to smaller females of *conifer*, except that the propodeum is said to be slightly more than half as long as the scutellum. In spite of this *exilis* may be identical with *conifer*. However, I have not been able to re-examine the lectotype of *exilis* and therefore only cite it as a possible synonym of *conifer*.

Redescription (♀).—Head, thorax, and basal tergite of gaster green to bronze-green ; remainder of gaster purplish black with at most a few greenish flecks. Antennal scape, except sometimes its tip, and legs except mid and hind coxae and the fore coxae externally or wholly, reddish testaceous. Length 1·7–2 mm.

Head very broad, 1·25–1·31 times as broad as the mesoscutum, in dorsal view 2·05–2·15 times as broad as long ; temples one quarter length of eyes or somewhat more. Antennal scape not reaching the median ocellus; combined length of pedicellus and flagellum nearly equal to breadth of head ; pedicellus in profile nearly twice as long as broad ; flagellum moderately clavate, proximally slightly stouter than the pedicellus ; first funicular segment from slightly shorter than, to slightly longer than, the pedicellus, 1·2–1·6 times as long as broad, second segment at least slightly shorter than the first, subquadrate, distal segments slightly transverse ; sensilla fairly numerous, in one row on each of the segments except sometimes the first, which has two rows in large specimens.

Thorax squat, 1·35–1·45 times as long as broad. Pronotal collar, medially, one ninth to one seventh as long as the mesoscutum, the latter about 1·9 times as broad as long. Scutellar frenum with coarse reticulation. Propodeum medially somewhat less than half as long as the scutellum ; median area 1·6–1·85 times as broad as long ; costula present, sometimes very strong ; panels of median area shiny, smooth or weakly wrinkled, often with a few longitudinal costulae at the base ; nucha marked off by a deep constriction, occupying about half the median length of the propodeum, with rather coarse raised reticulation ; spiracles oval ; callus with only moderately dense pilosity. Fore wing with basal cell virtually bare ; basal vein pilose throughout ; speculum open below ; disc beyond speculum quite densely pilose ; marginal vein 1·55–1·75 times as long as the stigmal vein ; postmarginal vein slightly shorter than the marginal.

Gaster conic-ovate, broadest near the base, acutely pointed apically, 1·9–2·1 times as long as broad, nearly as long as head plus thorax ; dorsal surface often convex, sometimes slightly sunken ; hind margin of basal tergite nearly straight.

BRITAIN : " Found near London " (Walker, 1836 : 484) ; Oxfordshire, Bald Hill, near Lewknor, 1 ♀, 18.vi.1958 (Graham) ; unlocalized, 2 ♀ (certainly Walker specimens) in the Dale collection, Oxford. ? GERMANY : ? type of *exilis* (Förster).

Biology. Unknown.

Trichomalus flagellaris sp. n.

(Text-figs. 583, 588)

♀. Body greenish with bronze reflections on the mesoscutum and scutellum ; pleura of thorax more bluish ; middle tergites of gaster with faint purplish transverse fasciae. Antennae

black ; scape, and pedicellus beneath, reddish. Coxae concolorous with thorax ; rest of legs reddish, the knees and tarsi slightly paler ; tarsi brownish apically. Wings subhyaline ; venation testaceous. Length 2·75 mm.

Head in dorsal view about twice as broad as long, with temples converging moderately strongly, rather straight, slightly more than one-third as long as eyes ; POL 1·35 OOL. Eyes relatively large, separated by only 1·3 times their length. Malar space slightly more than one third the length of an eye. Clypeus strigose, the striae extending some way up the face and genae, its anterior margin slightly emarginate medially. Head finely reticulate, the frons more coarsely so. Antennae (Text-fig. 588) very characteristic : toruli placed well above level of ventral edge of eyes, and hardly nearer to the anterior margin of the clypeus than to the median ocellus ; scape not quite reaching level of vertex ; combined length of pedicellus and flagellum not quite equal to breadth of head ; pedicellus about twice as long as broad, slightly shorter than the first funicular segment ; flagellum stout, subfusiform ; first funicular segment much stouter than the pedicellus, constricted proximally much as in some *Arthrolytus* species, about 1·6 times as long as broad, with a row of sensilla in its distal third ; second segment hardly transverse, the following segments distinctly so, each with a row of sensilla in its distal part ; clava hardly twice as long as broad, nearly as long as the three preceding funicular segments together.

Thorax about 1·6 times as long as broad. Pronotal collar, medially, rather more than one sixth as long as the mesoscutum. Mesoscutum nearly twice as broad as long. Scutellum about as broad as long. Propodeum medially about two thirds as long as the scutellum and produced well beyond the bases of the hind coxae ; median area (Text-fig. 583) about 1·3 times as broad as long ; median carina distinct ; panels of median area shiny, with only traces of weak sculpture, but traversed by a distinct costula which is angulate medially ; nucha occupying slightly more than one third the median length of the propodeum, convex, strongly reticulate ; callus, except around the spiracle, thickly pilose. Hind coxae thickly pilose dorsally. Fore wing with basal cell bare, open below ; basal vein pilose ; speculum open below ; surface beyond the speculum rather thickly pilose ; marginal vein 1·6 times as long as the stigmal vein and 1·15 times as long as the postmarginal vein.

Gaster lanceolate, slightly acuminate, about as long as head plus thorax, about 2·2 times as long as broad ; last tergite slightly longer than its basal breadth ; basal tergite with a conspicuous patch of whitish hairs at base laterally, its hind margin slightly curved and entire.

♂. Unknown.

Holotype ♀. ENGLAND : Berkshire, Wytham Wood, 24.viii.1952 (*Graham*), in Graham collection.

Closely resembles the female of *conifer* (Walker) from which it differs mainly in the much less transverse median area of the propodeum, in its rather longer pronotal collar, and slightly longer gaster.

Biology. Unknown.

Trichomalus rugosus Delucchi & Graham

Trichomalus rugosus Delucchi & Graham, 1956 : 548, 555–556, ♀.

Type material. Holotype ♀. Leitha-Au, Vimpacs, lower Austria, 27.vi.1951 (*Ruschka*), in Naturhistorisches Museum, Vienna.

BRITAIN ; AUSTRIA ; apparently rare. New record : England, Berkshire, Wytham Wood, 3 ♀, 27.viii.1952 (*Graham*).

Biology. Unknown. Imagines in June and August.

Trichomalus gracilicornis (Zetterstedt) **comb. n.**

(Text-fig. 586)

Pteromalus gracilicornis Zetterstedt, 1838 : 423–424, ♀.
Isocyrtus (*Trichomalus*) *punctiger* Thomson, 1878 : 137, ♂ ♀, **syn. n.**
Trichomalus punctiger Thomson ; Graham, 1956*b* : 249.
Trichomalus punctiger Thomson ; Delucchi & Graham, 1956 : 550, 570–571, ♂ ♀.

Type material. *Pteromalus gracilicornis* Zetterstedt. One female, LECTOTYPE (possibly holotype), labelled in Zetterstedt's handwriting " P. gracili-cornis ♀. Giebostad." ; the antennae are aberrant for the species in having the first funicular segment unusually small.

Isocyrtus (*Trichomalus*) *punctiger* Thomson. Syntypes, 7 specimens. LECTOTYPE, a female labelled " Lp. in " [Lapponia inferioris] and " Bhn ".

BRITAIN, SWEDEN ; uncommon. The females of *gracilicornis* overwinter amongst the foilage of coniferous trees and in spring may be found visiting the catkins of *Salix* species.

Biology. Unknown. Imagines captured in July in Britain (females also throughout winter, and in spring).

Trichomalus gynetelus (Walker)

Pteromalus gynetelus Walker, 1835 : 483, ♀.
Trichomalus gynetelus (Walker) Graham, 1956*b* : 247, ♀.
Trichomalus gynetelus (Walker) ; Delucchi & Graham, 1956 : 550, 568–570, ♂ ♀.

Type material. Lectotype designated by Graham (1956*b* : 247).

BRITAIN, IRELAND, SWEDEN ; not uncommon. The females of this species, like those of *bracteatus* and *lucidus*, overwinter amongst the foilage of coniferous trees.

Biology. Unknown.

Trichomalus bracteatus (Walker)

(Text-fig. 591)

Pteromalus bracteatus Walker, 1835 : 483, ♀.
Pteromalus herbidus Walker, 1835 : 484, ♀.
Pteromalus flammiger Walker, 1835 : 485, ♀.
Pteromalus attenuatus Walker, 1836 : 479, ♀.
Pteromalus balux Walker, 1836 : 488, ♀.
Pteromalus longulus Walker, 1836 : 491, ♀.
? *Pteromalus Daimenes* Walker, 1839 : 250, ♂.
? *Pteromalus Automedon* Walker, 1839 : 254, ♂.
? *Pteromalus Acraea* Walker, 1839 : 266, ♂.
Pteromalus fasciatus Förster, 1841 : 12, ♀.
? *Pteromalus stigmatizans* Walker, 1872*b* : 123, ♂.
Trichomalus bracteatus (Walker) Graham, 1956*b* : 247.
Trichomalus bracteatus (Walker) ; Delucchi & Graham, 1956 : 568, ♂ ♀.

Type material. For synonymy of most of the above Walker species, and designa-

tion of lectotypes, see Graham, 1956b : 247–248. Species not dealt with in that paper are:

Pteromalus daimenes Walker. Syntypes, 3 ♂. LECTOTYPE, the third ; Waterhouse label. It may belong to *bracteatus*.

Pteromalus automedon Walker. Syntypes, 2 ♂ ; LECTOTYPE, the second specimen, bearing a Waterhouse label.

Pteromalus fasciatus Förster. Syntypes, 2 ♀. LECTOTYPE labelled " Collect. G. Mayr " ; " Pt. fasciatus Förster Type " ; " 73.51. fasciatus 14.".

Pteromalus stigmatizans Walker. One male, Type Hym. 5. 718, LECTOTYPE ; labelled " Madeira Wollaston " and (in Walker's handwriting) " Pteromalus stigmatizans ".

BRITAIN, IRELAND ; SWEDEN, GERMANY, AUSTRIA, ? MADEIRA ; common in Britain.

Biology. Unknown. Imagines July–August, females also Sept.–April, overwintering in the same situations as *gynetelus*.

Trichomalus lucidus (Walker)

(Text-fig. 587)

Pteromalus lucidus Walker, 1835 : 484, ♀.
Pteromalus chalceus Walker, 1835 : 491, ♀.
Pteromalus brevicornis Walker, 1835 : 491, ♀.
Pteromalus despectus Walker, 1835 : 491, ♀.
Pteromalus rusticus Walker, 1836 : 482, ♀.
Pteromalus mundus Förster, 1841 : 12, ♂.
Pteromalus Lyttus Walker, 1848 : 125, 194, ♀.
Isocyrtus (*Trichomalus*) *fasciatus* Thomson, 1878 : 139, ♂ ♀ [*nec* Förster, 1841].
Trichomalus lucidus (Walker) Graham, 1956*b* : 248.
Trichomalus lucidus (Walker) ; Delucchi & Graham, 1956 : 572–573, ♂ ♀.

Type material. For synonymy, and designation of lectotypes for Walker species, see Graham (1956*b* : 248). Species for which no lectotypes have so far been designated are :

Pteromalus mundus Förster. One card-pointed male, LECTOTYPE ; it is labelled " Collect. G. Mayr " ; " Pt. mundus Förster Type " ; and, in Förster's handwriting, " mundus m.".

Isocyrtus (*Trichomalus*) *fasciatus* Thomson. Syntypes on 27 pins. LECTOTYPE, a female labelled " Lhn " [Lindholmen] and " fasciatus Ths ".

BRITAIN, IRELAND, SWEDEN, GERMANY ; fairly common.

Biology. Unknown ; imagines July–August, females also Sept.–April.

Trichomalus althaeae (Erdös) **comb. n.**

Lanceosoma althaeae Erdös, 1953 : 235, ♂ ♀.

Type material. Syntypes in coll. Erdös, Hungary, Calocsa, May 1947, 1 ♂, 6 ♀,

reared from cells of *Apion validum* Germ. in stems of *Athaea officinalis* L. (Dr. *J. Erdös*).

This species is very close to *elongatus* D. & G., but differs in the relatively longer gaster of the female.

HUNGARY.

Biology. Reared from cocoons of *Apion validum* Germ. in stems of *Althaea officinalis* L. (Dr. *J. Erdös*).

Trichomalus elongatus Delucchi & Graham

Trichomalus elongatus Delucchi & Graham, 1956 : 559–560, ♀.

Type material. Holotype and 4 paratypes in Naturhistorisches Museum, Vienna ; one paratype in coll. Delucchi, another in coll. Graham.

BRITAIN ; ? AUSTRIA.

Biology. Reared with *Eurytoma* sp. from stems of *Althaea rosea* (L.) Cav., probably as a parasite of *Apion radiolus* Marsh., Sept. 1874 (*G. Mayr*). Imagines chiefly Aug.–Sept. (One record for April).

Lanceosoma cardui Masi, (1953 : 391) might be near *T. elongatus*.

Trichomalus acuminatus Delucchi & Graham

Trichomalus acuminatus Delucchi & Graham, 1956 : 556–557, ♀.

Type material. Holotype and one paratype in Naturhistorisches Museum, Vienna ; one paratype in coll. Delucchi, another in coll. Graham.

CZECHOSLOVAKIA (Moravia), Frain, 3–16.viii.1883.

Biology. Reared from *Gymnetron villosulum* Gyll. on *Linaria* sp. (see Delucchi & Graham, 1956 : 557).

Trichomalus cupreus Delucchi & Graham

? *Pteromalus consuetus* Walker, 1872*b* : 121–122, ♂.
Trichomalus cupreus Delucchi & Graham, 1956 : 560–561, ♀.

Type material. *Pteromalus consuetus* Walker. One male, accepted as TYPE, labelled " Madeira Wollaston " and (in Walker's handwriting) " Pteromalus consuetus ". It might be the male of *cupreus*, though I cannot be certain.

Trichomalus cupreus Delucchi & Graham. Holotype ♀ in BM(NH), labelled " Madeira Wollaston " and, in Walker's handwriting, " Pteromalus flammifer [nom. nud.]". No other material has been seen.

MADEIRA.

Biology. Unknown.

Trichomalus inscitus (Walker)

Pteromalus affinis Walker, 1835 : 492, ♀, **syn. n.**
Pteromalus inscitus Walker, 1835 : 499, ♀.
Pteromalus tristis Walker, 1835 : 500, ♀.
Pteromalus microcerus Walker, 1835 : 500, ♀.
Pteromalus Deiochus Walker, 1839 : 240, ♂, **syn. n.**
Pteromalus reconditus Förster, 1841 : 13, ♀.
Pteromalus Diachymatis Ratzeburg, 1844a : 203, ♂, **syn. n.**
Pteromalus Orchestis Ratzeburg, 1844a : 205, ♀, **syn. n.**
Pteromalus Lampe Walker, 1848 : 125, 192, ♀, **syn. n.**
Isocyrtus (*Trichomalus*) *subnudus* Thomson, 1878 : 140, ♂ ♀, **syn. n.**
Trichomalus reconditus (Förster) Mayr, 1903 : 393.
Habrocytus orchestis (Ratzeburg) Kurdjumov, 1913 : 20.
Trichomalus diachymatis (Ratzeburg) Ruschka, 1924 : 14.
Trichomalus orchestis (Ratzeburg) Ruschka, 1924 : 14.
Trichomalus diachymatis (Ratzeburg) ; Bukovskij, 1938 : 159–160, ♂♀.
Trichomalus inscitus (Walker) Graham, 1956b : 248–249.
Trichomalus inscitus (Walker) ; Delucchi & Graham 1956 : 549, 562–564, ♂ ♀.

Type material. *Pteromalus affinis*. Lectotype designated by Graham (1956*b* : 250). In that paper I synonymized *affinis* with *apertus* (Walker) ; but I now consider that the lectotype of *affinis* to be a female of *inscitus* having the legs paler than usual. Actually none of the syntypes of *affinis* agrees perfectly with the description ; that designated as lectotype agrees best, although it has the femora darkened ; they were, however, partly hidden beneath the thorax and their colour could have been mistaken.

Pteromalus inscitus Walker, *P. tristis* Walker, and *P. microcerus* Walker. Lectotypes designated by Graham (1956*b* : 249).

Pteromalus deiochus Walker. Syntypes, 3 ♂ ; LECTOTYPE, the third specimen, bearing a Waterhouse label.

Pteromalus reconditus Förster. Syntypes, 2 ♀. LECTOTYPE labelled " Collect. G. Mayr " and " Pt. reconditus Förster Type ".

Pteromalus diachymatis Ratzeburg and *P. orchestis* Ratzeburg. Types formerly in Ratzeburg collection, Eberswalde, now presumed destroyed. *P. orchestis* was transferred to *Habrocytus* by Kurdjumov (1913 : 20). Ruschka (1927 : 14) stated that, through Professor Eckstein, then in charge of Ratzeburg's collection, he had compared the types of *diachymatis* and *orchestis* and considered them to be the sexes of one species. He also corrected Kurdjumov, who had placed *orchestis* in *Habrocytus*, pointing out that it had 4 teeth in both mandibles and a thickly pilose propodeal callus, characters which associated it with *Trichomalus*. Ratzeburg's original material of both *diachymatis* and *orchestis* was reared from " *Orchestes viminalis* " [=*Rhynchaenus quercus* (L.)]. This data, together with Ratzeburg's descriptions and the information later supplied by Ruschka, leave no doubt that his two species were the same as *inscitus* (Walker).

Pteromalus lampe Walker. One female, LECTOTYPE, bearing a Waterhouse label.

Isocyrtus (*Trichomalus*) *subnudus* Thomson. Syntypes on 11 pins. LECTOTYPE, a female labelled " Lhn " [Lindholmen].

Widely distributed in EUROPE ; ? U.S.A. The species reared in the Ohio area, U.S.A., from *Rhynchaenus pallicornis* Say, and determined as *Habrocytus orchestis* (Ratzeburg) (see Mundinger, 1951 : 30) might be the same as *Trichomalus inscitus* but the specimens are not available for checking.

Biology. Reared in England from *Orchestes alni* L. on *Ulmus* (*B. S. Doubleday*) (material in Hope Dept., University Museum, Oxford) and from the same host by Förster (see Delucchi & Graham, 1956 : 564) ; from *O. fagi* L. on *Fagus* in the canton of Zurich 15–20.v.1954 (*Delucchi*) (Delucchi and Graham, 1956 : 564) ; from *O. fagi* L., *O. quercus* L. and *O. testaceus* Mull. in U.S.S.R. (*Bukovskij*) (Bukovskij, 1938 : 160, as *Trichomalus diachymatis*) ; also from *O. testaceus* Mull. in Sweden (*Ruschka*) (Ruschka, 1924 : 14). Imagines captured in the field June–Sept., females also throughout the winter and in the spring.

Trichomalus perfectus (Walker)

(Text-fig. 590)

Pteromalus perfectus Walker, 1835 : 488, ♀.
Pteromalus decorus Walker, 1835 : 496, ♀.
Pteromalus decisus Walker, 1836 : 185, ♀.
? *Pteromalus Hippo* Walker, 1839 : 247, ♂.
Pteromalus opulentus Förster, 1841 : 26, ♀.
Isocyrtus (*Trichomalus*) *laevinucha* Thomson, 1878 : 140, ♂ ♀.
Trichomalus perfectus (Walker) Graham, 1956*b* : 250.
Trichomalus perfectus (Walker) ; Delucchi & Graham, 1956 : 550–551, 571–572, ♀.
Trichomalus perfectus (Walker) ; Peck, 1963 : 669.

Type material. For most of the above synonymy, and designation of lectotypes for *Pteromalus perfectus*, *P. decorus*, and *P. decisus*, see Graham (1956b : 250).

Pteromalus hippo Walker. One male, LECTOTYPE (possibly holotype), bearing a Waterhouse label.

Pteromalus opulentus Förster. One female, pinned to a block of pith, LECTOTYPE ; labelled " Collect. G. Mayr " and, in Förster's handwriting, " Pteromalus opulentus nob. det. For. 18 ".

Isocyrtus (*Trichomalus*) *laevinucha* Thomson. Syntypes, 9 specimens. LECTOTYPE, a female labelled " Scan ".

BRITAIN, SWEDEN, GERMANY, HOLLAND, FRANCE, SWITZERLAND, U.S.S.R.; CANADA.

Biology. Reared from *Ceuthorrhynchus assimilis* Payk. in Holland, France and Switzerland (Delucchi & Graham, 1956 : 572 ; Delucchi, in Secrétariat, etc. 1961 : 215) ; also recorded as a parasite of *Ceuthorrhynchus pleurostigma* Marsh. (Secrétariat, etc., 1963 : 344, 355). Peck (1963 : 669) states that specimens from British Columbia, " reared from *Ceutorhynchus assimilis*, agree with Delucchi & Graham's description of *T. perfectus*. The other Pacific Coast records without much doubt

refer to the same species ". Imagines in Europe chiefly July–Aug.; females also in winter and early spring.

Kapucinski (1946 : 92–93, 101, 127, pl. 2, figs. 8, 9) recorded *Trichomalus laevinucha* Thomson as a parasite of the larvae of *Megastigmus kuntzei* Kap. in seeds of *Juniperus*. Possibly the parasite was misidentified ; at all events, the record needs to be checked.

Trichomalus lonchaeae Bouček

Trichomalus lonchaeae Bouček, 1959 : 37–40, ♀.

Type material. Holotype ♀, Germany, S. Bavaria, Allgäuer Alps, Kornau near Oberstdorf, reared in summer 1957 from larvae of *Lonchaea zetterstedti* Becker collected on *Picea* logs (*G. Morge*), in Národní Museum, Prague (Cat. no. 3463).

BRITAIN, GERMANY, CZECHOSLOVAKIA.

Biology. See above.

Trichomalus robustus (Walker)

Pteromalus robustus Walker, 1835 : 488, ♀.
Pteromalus nubilus Walker, 1835 : 488, ♀.
Pteromalus Vibullius Walker, 1839 : 221, ♂, **syn. n.**
Pteromalus xanthopterus Ratzeburg, 1844*a* : 200, ♀, **syn. n.**
Pteromalus Inatos Walker, 1848 : 126, 200, ♀.
Isocyrtus (*Trichomalus*) *spiracularis* Thomson, 1878 : 139, ♂ ♀.
Trichomalus robustus (Walker) Graham, 1956*b* : 250.
Trichomalus robustus (Walker); Delucchi & Graham, 1956 : 548, 558–559, ♀.

Type material. For designation of lectotypes for *Pteromalus robustus*, *P. nubilus* and *P. inatos*, see Graham (1956*b* : 250).

Pteromalus vibullius Walker. One male, LECTOTYPE ; Waterhouse label.

Pteromalus xanthopterus Ratzeburg. Holotype ♀ presumed destroyed. The description applies very well to *Trichomalus robustus* (Walker), the female of which sometimes has a dark cloud on the fore wing.

Isocyrtus (*Trichomalus*) *spiracularis* Thomson. Syntypes, 6 specimens. LECTOTYPE, the first female in the series.

BRITAIN, SWEDEN.

Biology. Unknown. Imagines July–August ; females also in winter (amongst foliage of coniferous trees) and in spring.

Trichomalus apertus (Walker)

Pteromalus apertus Walker, 1835 : 489, ♀.
? *Pteromalus Alopius* Walker, 1848 : 124, 185, ♂.
Trichomalus apertus (Walker) Graham, 1956*b* : 250.
Trichomalus apertus (Walker) ; Delucchi & Graham, 1956 : 551, 572, ♀.
? *Trichomalus palustris* Erdös, 1957 : 65, fig. 7f, g, ♀.

Type material. *Pteromalus apertus* Walker. Lectotype designated by Graham (1956*b* : 250). In the same paper *P. affinis* Walker was synonymized with *apertus* ; this was a mistake, the lectotype being a female of *Trichomalus inscitus* (q.v.).

Pteromalus alopius Walker. One male, LECTOTYPE, bearing a Waterhouse label. It might belong to *apertus*.

Trichomalus palustris Erdös. Holotype ♀, Hungary, Gárdony (Velencei-tó), 24.vii.1952, from *Phragmites communis* Trin. (*Erdös*) in coll. Erdös (not seen by the writer). From the description and figures it would appear to be near *apertus* (Walker).

BRITAIN, apparently rare ; ? HUNGARY.

Biology. Unknown. Imagines captured in the field during August ; females also in winter, I have twice taken them hibernating amongst foliage of *Cupressus* sp.

Trichomalus curtus (Walker) **comb. n.**

Pteromalus curtus Walker, 1835 : 490, ♀.

Type material. One female, which is accepted as TYPE ; it bears a Waterhouse label.

This appears to be a valid species of *Trichomalus*, but as I have no other material which fits the type and therefore cannot check some of the characters, it is not included in my key to species. It has the median area of the propodeum shiny and nearly smooth, and in this and several other characters much resembles the female of *apertus* (Walker) ; but it differs from that in having a shorter pedicellus more like that of *perfectus* (Walker).

BRITAIN.

Biology. Unknown.

Trichomalus helvipes (Walker)

Eutelus helvipes Walker, 1834 : 365, ♀.
Pteromalus cuprinus Walker, 1835 : 489, ♀.
Pteromalus obtusus Walker, 1835 : 490, ♀.
Pteromalus futilis Walker, 1835 : 496, ♀.
Pteromalus famulus Walker, 1835 : 496, ♀.
Pteromalus perpetuus Walker, 1835 : 497, ♀.
Pteromalus detritus Walker, 1835 : 499, ♀.
Pteromalus chrysammos Walker, 1836 : 487, ♀.
? *Pteromalus Saptine* Walker, 1839 : 224, ♂.
Pteromalus Crocale Walker, 1839 : 239, ♂.
Pteromalus Janira Walker, 1839 : 248, ♂.
Pteromalus peregrinus Förster, 1841 : 11, ♀.
Pteromalus lethargicus Förster, 1841 : 13, ♀.
Pteromalus quaesitus Förster, 1841 : 13, ♀.
Pteromalus delectus Förster, 1841 : 26, ♀.
Pteromalus Mese Walker, 1848 : 124, 184, ♂.
Pteromalus Lebadeia Walker, 1848 : 125, 189–190, ♀, **syn. n.**

Pteromalus Carma Walker, 1848 : 126, 202, ♀.
Pteromalus Hyrtacina Walker, 1848 : 127, 213, ♀.
Isocyrtus (*Trichomalus*) *laticeps* Thomson, 1878 : 138, ♂ ♀.
Trichomalus helvipes (Walker) Graham, 1956*b* : 248.
Trichomalus helvipes (Walker) ; Delucchi & Graham, 1956 : 551, 573–4, ♂ ♀.

Type material. For synonymy and designation of lectotypes for most of the above Walker species, see Graham (1956*b* : 248). Species for which lectotypes were not selected are:

Pteromalus saptine Walker. Syntypes, 2 ♂ ; LECTOTYPE, the second specimen, bearing a circular label " 38. 7. 12. 216 ". It may be a slightly aberrant male of *helvipes*.

Pteromalus peregrinus Förster. Syntypes, 2 ♀. LECTOTYPE labelled " Pt. peregrinus Förster Type " and, in Förster's handwriting, " peregrinus m.".

Pteromalus lethargicus Förster. One female, LECTOTYPE ; labelled " Collect. G. Mayr " ; " Pt. lethargicus Förster Type " ; and, in Förster's handwriting, " lethargicus m.".

Pteromalus quaesitus Förster. Syntypes, 2 ♀. LECTOTYPE labelled " Collect. G. Mayr " ; " Pt. quaesitus Förster Type " ; and, in Förster's handwriting, " quaesitus m.".

Pteromalus delectus Förster. One female which agrees only poorly with the description but is accepted as TYPE ; it is labelled, in Förster's handwriting, " Pteromalus delectus nob. det. Först.".

Pteromalus lebadeia Walker. One female, LECTOTYPE, bearing a Waterhouse label.

The following notes on the female of *helvipes* are intended to supplement the redescription given in Delucchi & Graham (1956 : 573–574):

Length 1·4–2·9 mm. Colour of head and thorax usually greenish, but varying from blue through green and bronze-green to coppery bronze ; pale parts of legs tending to be pale or yellowish testaceous, occasionally fulvous ; femora often more or less infuscate, sometimes mainly so ; tibiae sometimes brownish or fuscous medially. POL 1·2–1·4 times OOL. Marginal vein 1·3–1·5 times as long as the stigmal vein ; postmarginal vein about as long as, or a little longer than, the marginal.

BRITAIN, IRELAND, SWEDEN, NORWAY, GERMANY, SWITZERLAND. One of the commonest species of the genus in Britain.

Biology. Recorded as a parasite of *Brachonyx pineti* Payk. in Norway (Secrétariat, etc., 1957 : 321, 324). I have seen a female obtained from an inflorescence of *Trifolium* sp. in southern England, possibly parasitizing one of the " Clover weevils " (*Apion* sp.). Imagines June–October, females then over-wintering in dry situations, particularly amongst the foliage of *Cupressus* and other coniferous trees.

Trichomalus tenellus (Walker)

Amblymerus tenellus Walker, 1834 : 348, ♀.
Pteromalus saturatus Walker, 1835 : 495, ♀.
Pteromalus viridulus Walker, 1835 : 497, ♀.

Pteromalus gentilis Walker, 1836 : 493, ♀.
Pteromalus Axos Walker, 1848 : 126, 201, ♀.
Trichomalus tenellus (Walker) Graham, 1956*b* : 249.
Trichomalus tenellus (Walker) ; Delucchi & Graham, 1956 : 549, 562, ♀.

Type material. For synonymy and designation of lectotypes for the above Walker species, see Graham (1956*b* : 249).

BRITAIN ; not common.

Biology. Unknown. Imagines July–August ; females also in winter, hibernating amongst the foliage of coniferous trees and of *Buxus*, and in similar situations.

Trichomalus fulvipes (Walker)

Pteromalus fulvipes Walker, 1836 : 490, ♀.
? *Pteromalus Amphimedon* Walker, 1839 : 235, ♂.
Pteromalus operosus Förster, 1841 : 13, ♀, **syn. n.**
Trichomalus fulvipes (Walker) Graham, 1956*b* : 250.
Trichomalus operosus (Förster) Delucchi & Graham, 1956 : 550, 565, ♀.

Type material. *Pteromalus fulvipes* Walker. Lectotype female designated by Graham (1956*b* : 250).

Pteromalus amphimedon Walker. Syntypes, 3 ♂ ; LECTOTYPE, the first specimen, bearing a Waterhouse label.

Pteromalus operosus Förster. Syntypes, 3 ♀. LECTOTYPE labelled " Pt. operosus Förster Type " and, in Förster's handwriting, " operosus m.".

Although the males which I believe may belong to *fulvipes* are very different from those of *helvipes* (Walker), it is difficult to assign some females with certainty to one or the other species. The distinctions given in my key to species (females) hold good for most specimens, but a few cause doubt. Females which I can refer definitely to *fulvipes* have the following characters (compare with the corresponding ones in *helvipes*) :

Legs, not counting the coxae, bright testaceous, the femora sometimes reddish. POL 1·45–1·5 OOL. Marginal vein 1·4–1·55 times as long as the stigmal vein. Body more slender than in female *helvipes*, gaster relatively longer (see key to species). These differences are mainly average ones, and are perhaps not very helpful ; but I have no doubt that *fulvipes* represents a distinct species. Perhaps further investigation will reveal some better characters for distinguishing its female from that of *helvipes*.

Delucchi and Graham, when dealing with *operosus* (Förster) (=*fulvipes* Walker) and *helvipes* (Walker), placed them (1956 : 550, 551) in different sections of their key, because the former species was considered to have the pilosity of the fore wing shorter and denser than the latter. After recomparing the females of *fulvipes* and *helvipes*, however, I find this distinction to be very slight and hard to appreciate.

BRITAIN, GERMANY, SWITZERLAND.

Biology. Unknown. Imagines (in Britain) captured in August.

Trichomalus pexatus (Walker)

Pteromalus pexatus Walker, 1835 : 499, ♀.
Pteromalus intermedius Förster, 1841 : 18, ♀.
Trichomalus pexatus (Walker) Graham, 1956*b* : 250.
Trichomalus pexatus (Walker) ; Delucchi & Graham, 1956 : 550, 565–566, ♀.

Type material. *Pteromalus pexatus* Walker. Lectotype designated by Graham (1956*b* : 250).

Pteromalus intermedius Förster. One female, accepted as TYPE ; it is labelled " intermedius m.", in Förster's handwriting ; " Collect. G. Mayr " ; " Pt. intermedius Förster Type ".

BRITAIN, GERMANY.

Biology. Unknown. Imagines Aug.–Sept.

Trichomalus lepidus (Förster)

Pteromalus lepidus Förster, 1841 : 11, ♀.
Isocyrtus (*Trichomalus*) *aeneicoxa* Thomson, 1878 : 142, ♂ ♀, **syn. n.**
Trichomalus lepidus (Förster) Delucchi & Graham, 1956 : 550, 566–568, ♂ ♀.

Type material. *Pteromalus lepidus* Förster. Syntypes, 2 ♂, 2 ♀. LECTOTYPE a male labelled " Pt. lepidus Förster Type " and, in Förster's handwriting, " Lepidus m.".

Isocyrtus (*Trichomalus*) *aeneicoxa* Thomson. Syntypes on 18 pins. LECTOTYPE, a female labelled " Hg " [Hälsingborg] on a mauve label.

BRITAIN, SWEDEN, ? GERMANY.

Biology. Unknown. Females evidently hibernate as I took one from needles of *Ulex* during the winter.

Trichomalus rufinus (Walker)

(Text-fig. 592)

Pteromalus rufinus Walker, 1835 : 495, ♀.
Pteromalus Irus Walker, 1839 : 235, ♂.
Pteromalus nitefactus Förster, 1841 : 26, ♀.
Isocyrtus (*Trichomalus*) *pedicellaris* Thomson, 1878 : 142, ♂ ♀.
Trichomalus rufinis (Walker) Graham, 1956*b* : 250.
Trichomalus rufinis (Walker) ; Delucchi & Graham, 1956 : 549, 561–562, ♂ ♀.

Type material. *Pteromalus rufinus* Walker and *P. irus* Walker. Lectotypes designated by Graham (1956*b* : 250).

Pteromalus nitefactus Förster. Syntypes, 2 ♀. LECTOTYPE labelled " Collect. G. Mayr " ; " Pt. nitefactus Förster Type " ; and, in Förster's handwriting, " Pteromalus nitefactus m. ♀ ".

Isocyrtus (*Trichomalus*) *pedicellaris* Thomson. Syntypes on 8 pins. LECTOTYPE : one of 2 ♀ mounted on a pin together with 3 ♂ and labelled " 295 " and " pedicellaris m.".

BRITAIN, SWEDEN, GERMANY ; not uncommon.

Biology. Reared in England, under the name *irus* Walker, as a parasite of *Apion loti* Kirby, by Richards (1935 : 83–84). Reared specimens emerged in September and October ; I have captured specimens in the field in May and Sept.–Nov.

Trichomalus annulatus (Förster)

Pteromalus annulatus Förster, 1841 : 11, ♂.
Pteromalus annulatus Förster ; Mayr, 1903 : 393, ♂.

Type material. One male, accepted as TYPE (probably holotype) ; it is labelled " Collect. G. Mayr " ; " P. annulatus Förster Type " ; and, in Förster's handwriting, " annulatus m.".

Female unknown.

GERMANY, CZECHOSLOVAKIA.

Biology. Unknown.

Trichomalus inops (Walker)

Pteromalus inops Walker, 1835 : 499, ♀.
Pteromalus confinis Walker, 1836 : 486, ♀.
Isocyrtus (*Trichomalus*) *rufimanus* Thomson, 1878 : 142, ♂ ♀.
Trichomalus inops (Walker) Graham, 1956*b* : 249–250.
Trichomalus inops (Walker) ; Delucchi & Graham, 1956 : 551, 575–576, ♂ ♀.

Type material. For synonymy, and designation of lectotypes for the above Walker species, see Graham (1956*b* : 249–250).

Isocyrtus (*Trichomalus*) *rufimanus* Thomson. Syntypes, 15 specimens. LECTOTYPE, a male labelled " Reft " [Reftera].

BRITAIN, IRELAND, SWEDEN, GERMANY, AUSTRIA, CZECHOSLOVAKIA ; common.

Biology. I have seen three females which were obtained in England from inflorescences of *Trifolium* sp. Females overwinter in similar situations to those of *campestris* (Walker) ; both sexes may be taken in late spring and summer.

Trichomalus campestris (Walker)

Amblymerus campestris Walker, 1834 : 343, ♀.
Amblymerus tenuicornis Walker, 1834 : 347, ♀.
Pteromalus fumipennis Walker, 1835 : 492, ♀.
Pteromalus redactus Walker, 1835 : 492, ♀.
Pteromalus tenuis Walker, 1835 : 498, ♂.
Pteromalus concisus Walker, 1836 : 488, ♀.
? *Pteromalus nubeculosus* Förster, 1841 : 30, ♀.
Isocyrtus (*Trichomalus*) *coxalis* Thomson, 1878 : 141, ♂ ♀.
Trichomalus campestris (Walker) Graham, 1956*b* : 249.
Trichomalus campestris (Walker) ; Delucchi & Graham, 1956 : 551, 574–575, ♂ ♀.

Type material. For synonymy, and designation of lectotypes for above Walker species, see Graham (1956*b* : 249).

Pteromalus nubeculosus Förster. Type apparently lost ; see Delucchi & Graham (1956 : 544–545). The species was synonymized with *fumipennis* by Walker himself (1848*b* : 219) and his remarks there suggest that he saw Förster's material of *nubeculosus* when visiting Aachen.

Isocyrtus (*Trichomalus*) *coxalis* Thomson. Syntypes on 40 pins. LECTOTYPE, a female labelled " Lund " and " coxalis ", also bearing A. Jansson's lectotype label.

BRITAIN, IRELAND, SWEDEN, GERMANY, SWITZERLAND, ITALY, CZECHOSLOVAKIA. Very common in the British Isles.

Biology. Reared in England from clover-seed, probably as a parasite of *Apion* sp. The females overwinter amongst the foliage of coniferous trees and, especially, *Ulex* ; also on *Buxus*, in haystacks and similar dry situations. I have sometimes found great numbers of the females congregated amongst dry, withered needles of *Ulex* during the winter. Both sexes are common during the summer (chiefly Aug.–Sept.).

Note. Pteromalus obsessorius Förster (1841 : 26, ♀) belongs to the species-group of *campestris* (Walker) and is probably the same as the latter. The wings, flagella, and gaster of the type female, however, are missing, so that one cannot be absolutely sure ; the type is labelled " obsessorius m.", in Förster's handwriting ; " Collect. G. Mayr " ; and " Pt. obsessorius Förster Type ".

Trichomalus placidus (Walker) **comb. n.**

Eutelus placidus Walker, 1834 : 359, ♂.
Pteromalus Learchus Walker, 1845 : 262, ♂, **syn. n.**

Type material. *Eutelus placidus* Walker. Syntypes, 2 ♂. LECTOTYPE, the first specimen, bearing a Waterhouse label.

Pteromalus learchus Walker. One male, which is accepted as the TYPE.

The males of *placidus* may well belong to one of those species which is known in the female sex only, and mentioned here under some other name. At present, however, I cannot definitely correlate them with any females.

BRITAIN.

Biology. Unknown.

Trichomalus sp. indet. A

CZECHOSLOVAKIA : Podhoř, near Prague, 1 ♂, 16.vii.1963 (*Graham*) ; Dolni Postevna, 1 ♂, 18.vii.1950 (*A. Hoffer*).

I do not yet know the ♀ of this very distinct ♂.

Trichomalus sp. indet. B

ENGLAND : Berkshire, Wytham, 1 ♀, 12.vii.1960 (*Graham*).

This ♀ appears to be rather distinct, but I do not wish to describe it at present.

Trichomalus sp. indet. C

ENGLAND : Berkshire, Wytham Wood, a few ♂♂, 22.ix.1951 (*Graham*).
Very near the possible ♂ of *fulvipes*, but may be distinct.

ATRICHOMALUS Graham

Atrichomalus Graham, 1956 : 95. Type-species : *A. trianellatus* Graham, by monotypy and original designation.
Atrichomalus Graham ; Peck *et al.*, 1964 : 53.

Atrichomalus trianellatus Graham

(Text-figs. 580–582)

Atrichomalus trianellatus Graham, 1956 : 95–97, ♂ ♀.

Type material. Holotype ♀, England, Berkshire, Wytham Wood, 24.viii.1952 (*Graham*), in the Hope Department, University Museum, Oxford ; paratypes in the writer's collection.

BRITAIN.
Biology. Unknown. Imagines captured in April and August.

PLATYPTEROMALUS Bouček

Platypteromalus Bouček, 1955 : 313. Type-species : *P. pragensis* Bouček, by original designation.
Platypteromalus Bouček ; Peck *et al.*, 1964 : 51.

Platypteromalus pragensis Bouček

Platypteromalus pragensis Bouček, 1955 : 315–316, ♂ ♀.

Type material. Holotype ♀, Bohemia, between Chuchle and Slivenec, near Prague, on limestone steppe, 24.vi.1955 (*Bouček*), in Národní Museum, Prague (Cat. no. 3073).

CZECHOSLOVAKIA.
Biology. Unknown. Imagines June and August.

EUPTEROMALUS Kurdjumov

Pteromalus (*Pteromalus*), section B Thomson, 1878 : 155–156.
Trichomalus Ashmead, 1904 : 318–321 [*nec* Thomson, 1878].
Trichomalus Schmiedeknecht, 1909 : 327, 329, 331 [*nec* Thomson, 1878].
? *Trichomalopsis* Crawford, [May] 1913 : 251. Type-species : *T. shirakii* Crawford, by monotypy and original designation.
Eupteromalus Kurdjumov, [July] 1913 : 12. Type-species : *Pteromalus nidulans* Thomson, by original designation.

Nemicromelus Girault, 1917c : 4. Type-species : *Merisus subapterus* Riley, by original designation.
Eupteromalus Kurdjumov ; Gahan, 1921 : 240–241.
Eupteromalus Kurdjumov ; Gahan, 1933 : 75–89.
Eupteromalus Kurdjumov ; Nikol'skaya, 1952 : 221.
Eupteromalus Kurdjumov ; Graham, 1956*b* : 254–255.
Eupteromalus Kurdjumov ; Peck, 1963 : 683–690.
Eupteromalus Kurdjumov ; Peck *et al.*, 1964, : 51.

Both Ashmead (1904) and Schmiedeknecht (1909) misidentified the genus *Trichomalus* Thomson, which they described as having the occiput margined, whereas in the true *Trichomalus* it is not margined. Kurdjumov (1913 : 12) proposed the name *Eupteromalus* for the genus misidentified by these authors.

Nemicromalus Girault was synonymized with *Eupteromalus* by Gahan (1933 : 80–81).

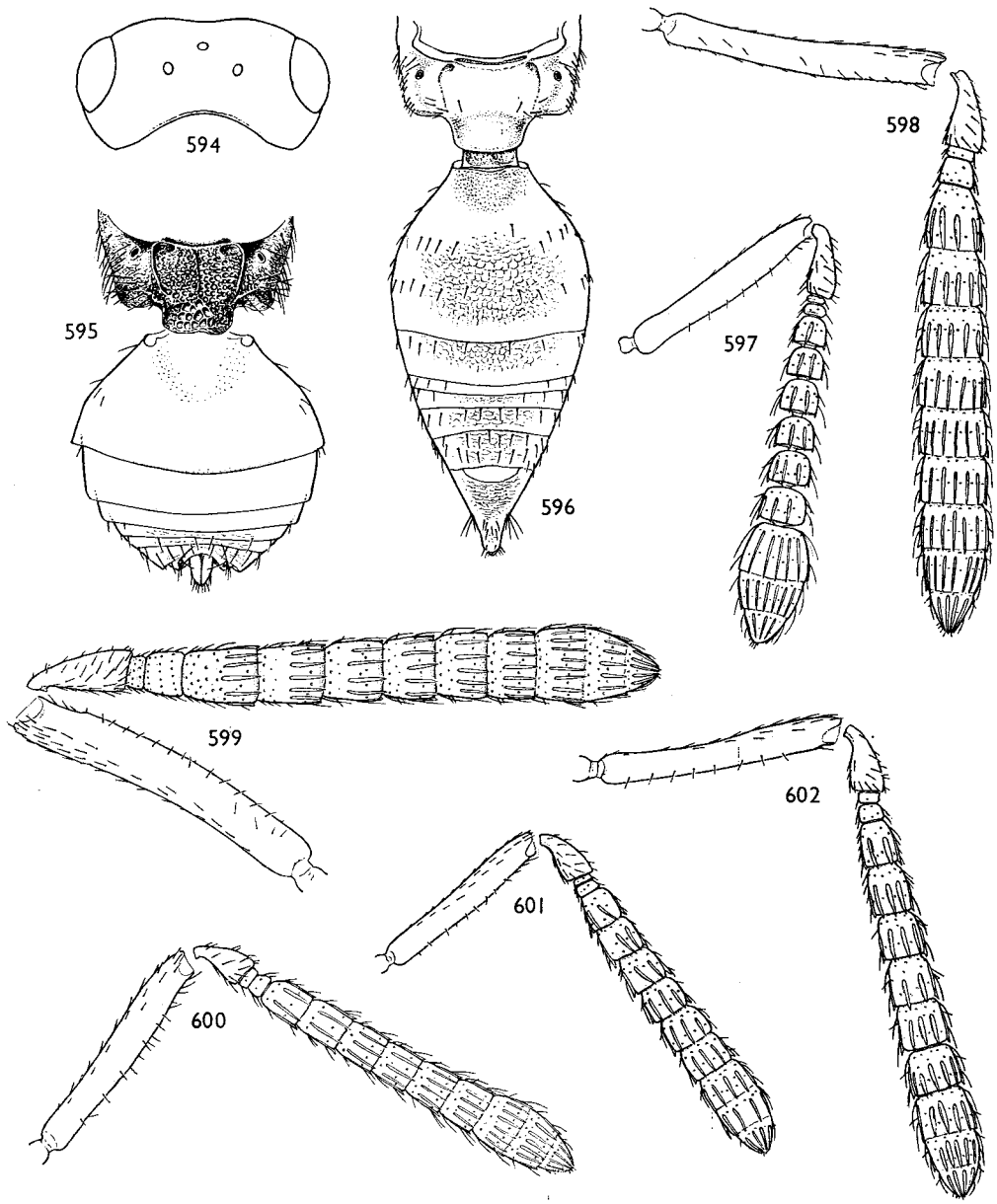
From the original description, *Trichomalopsis* Crawford might be the same as *Eupteromalus* ; but I have not seen the type-species and cannot check this. If *Trichomalopsis* should prove to be identical with *Eupteromalus* it would take priority as it antedates the latter by two months. The name *Eupteromalus*, however, is so well known that its replacement in that event seems undesirable.

The European species of *Eupteromalus* badly need revision. I have attempted to go some way towards this in the present work, but much remains to be done. The North American species are better known, thanks especially to the work of Gahan. Dr. B. D. Burks very kindly sent me types of several of these species for examination. When writing he mentioned the great difficulties encountered when attempting to construct a key to the North American species. As a result of my experience in trying to make one for the European species, I can heartily sympathize. Some of the American species proved to be so close to certain European ones that I decided it would be helpful to include the former in the present study, in order to show such differences as I have found. By so doing I hope that my key may help students in North America. It seems likely that some of our European species which have not hitherto been recorded from the Nearctic region, may eventually be found there.

Key to European and North American Species

(Females)

1		Wings fully developed with normal venation 2
–		Wings more or less abbreviated, not reaching to the tip of the gaster ; venation often abnormal 41
2	(1)	Fore wing with basal cell (upper surface) with 8–13 hairs in its distal part. Gaster (Text-fig. 595) subcircular, shorter than the thorax ; ovipositor sheaths testaceous Antenna, Text-fig. 597 . . . . . ***pompilicola*** sp. n. (p. 752)
–		Fore wing with basal cell (upper surface) bare, or rarely with 1–3 isolated hairs near the basal vein. Gaster ovate to lanceolate-ovate ; ovipositor sheaths dark 3
3	(2)	Gaster (Text-fig. 596) with basal tergite with a transverse band of alutaceous sculpture about in the middle, and with 1–2 rows of hairs ; the three



FIGS. 594–602. *Eupteromalus* spp. 594, *pompilicola* sp. n., ♀, head ; 595, same, ♀, propodeum and gaster ; 596, *subapterus* (Riley), syntype ♀, metanotum, propodeum and gaster ; 597, *pompilicola* sp. n., ♀, antenna ; 598, *tachinae* Gahan, ♀, antenna ; 599, *leguminis* Gahan, ♀, antenna ; 600, *viridescens* (Walsh), ♀, antenna ; 601, *sarcophagae* Gahan, ♀, antenna ; 602, *americanus* Gahan, ♀, antenna.

following tergites with similar sculpture and pilosity. Propodeum nearly or quite as long as the scutellum
Head, Text-fig. 606 (North America). . . ***subapterus*** (Riley) (p. 776)

– Gaster with basal tergite smooth, or rarely with some very weak alutaceous sculpture along its hind margin, bare except at the sides ; the three following tergites also bare except laterally, sometimes smooth though often with some alutaceous sculpture. Propodeum usually relatively shorter than in the above 4

4 (3) Antenna (Text-fig. 598) with flagellum very stout, nearly twice as stout as the pedicellus, subfusiform ; clava broadest across its first segment, thence tapering to apex ; second anellus large, only slightly transverse. Gaster with basal tergite occupying two thirds to three quarters of the whole. Head (Text-fig. 608) fully 1·3 times as broad as the mesoscutum. (North America) . . . . . ***tachinae*** Gahan (p. 777)

– Antennae (Text-figs. 599–602, 629–640) with flagellum not so stout, usually thickening at least slightly from base to tip ; clava tapering less strongly ; second anellus, except in *leguminis*, smaller and transverse. Gaster with basal tergite occupying at most about half the total length, but usually less. Head rarely so broad relative to the mesoscutum 5

5 (4) Antenna (Text-fig. 599) with second anellus subquadrate, very hairy, and half as long as the first funicular segment ; lower edge of toruli hardly above level of ventral edge of eyes ; scape distinctly shorter than eye. Fore wing with marginal vein at most 1·2 times as long as the stigmal vein. Median area of propodeum (Text-fig. 604) rather strongly transverse. (North America).
Head, Text-fig. 610 . . . . . ***leguminis*** Gahan (p. 776)

– Antennae (Text-fig. 600–602, 629–640) with second anellus transverse, never so hairy as in the above 6

6 (5) Fore wing with marginal vein at most 1·6 times as long as the stigmal vein 7

– Fore wing with marginal vein more than 1·6 (up to 2·2) times as long as the stigmal vein 29

7 (6) North American species with gaster nearly or quite twice as long as broad, and about as long as head plus thorax ; antenna (Text-fig. 602) with lower edge of toruli only very slightly above the level of the ventral edge of the eyes, scape nearly as long as an eye, proximal segments of the funicle slightly longer than broad or quadrate. Head in dorsal view (Text-fig. 609) ***americanus*** Gahan (p. 775)

– Either European species ; or gaster at most 1·75 times as long as broad, and the other characters not all present in combination. 8

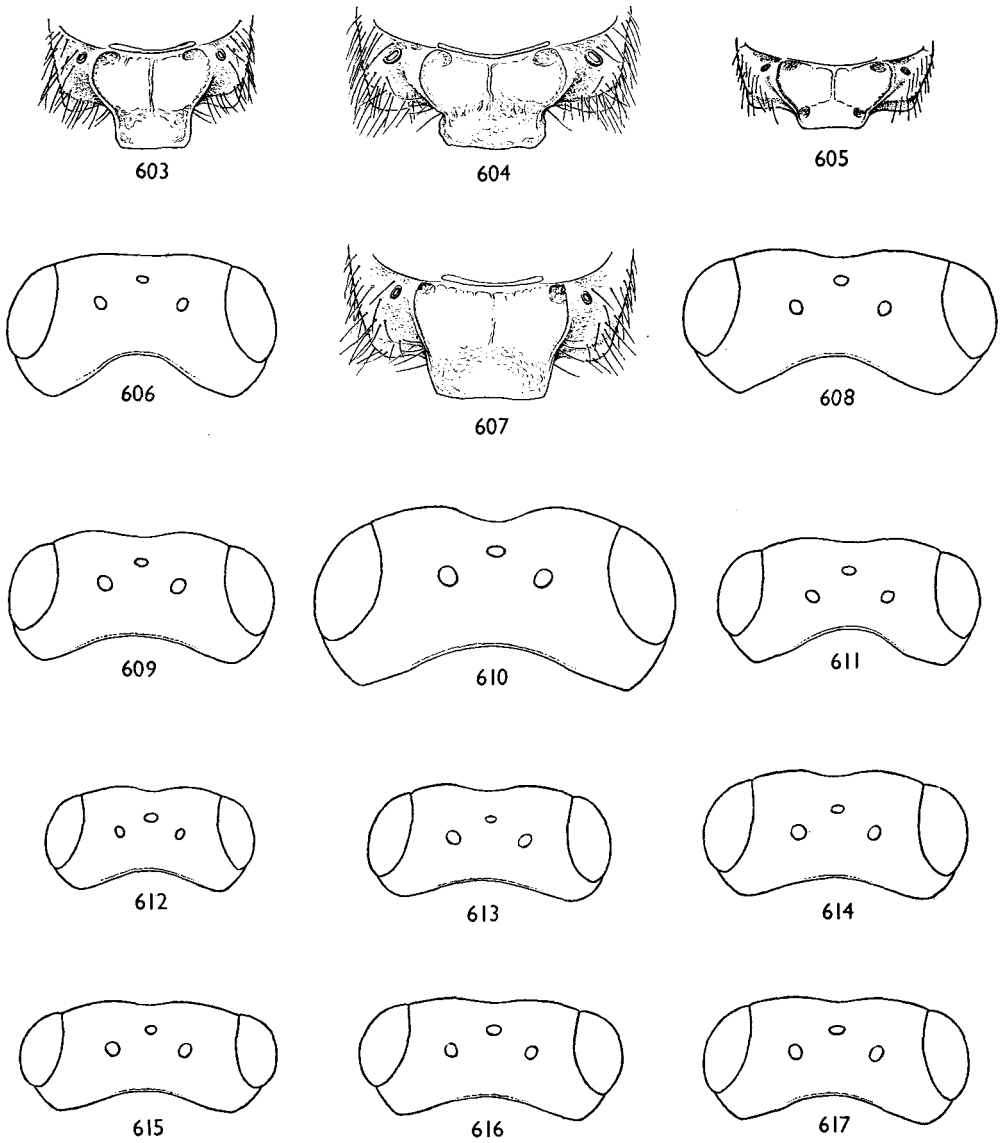
8 (7) Antennae with lower edge of toruli at or hardly above the level of the ventral edge of the eyes, distance between toruli and front margin of clypeus not or hardly greater than the malar space ; scape, except in *maurus* sp. n., as long as an eye and reaching the vertex 9

– Antennae with lower edge of toruli distinctly above the level of the ventral edge of the eyes, distance between toruli and front margin of clypeus usually distinctly greater than the malar space ; if only slightly greater, then scape shorter than an eye and not reaching the vertex . . . 14

9 (8) North American species 10

– European species 11

10 (9) Pronotal collar sharply and evenly margined except just at the sides. Malar space slightly more than half the length of an eye. Antenna (Text-fig. 600); head (Text-fig. 611) . . . . . ***viridescens*** (Walsh) (p. 777)



FIGS. 603–617. *Eupteromalus* spp. 603, *dubius* (Ashmead), ♀, propodeum ; 604, *leguminis* Gahan, syntype ♀, propodeum ; 605, *cognatus* Gahan, syntype ♀, propodeum ; 606, *subapterus* (Riley), ♀, brachypterous form, head ; 607, *sarcophagae* Gahan, syntype ♀, propodeum ; 608, *tachinae* Gahan, ♀, head ; 609, *americanus* Gahan, ♀, head ; 610, *leguminis* Gahan, ♀, head ; 611, *viridescens* (Walsh), ♀, head ; 612, *sarcophagae* Gahan, ♀, head ; 613, *maurus* sp. n., ♀, head ; 614, *caricicola* sp. n., ♀, head ; 615, *laticeps* sp. n., ♀, head ; 616, *micropterus* (Lindeman), ♀, head ; 617, *tigasis* (Walker), ♀, head.

– Pronotal collar weakly and irregularly margined. Malar space slightly less than half the length of an eye. Antenna (Text-fig. 601) ; head (Text-fig. 612) . . . . . ***sarcophagae*** Gahan (p. 776)

11 (9) Head in dorsal view (Text-fig. 613) with temples hardly one-quarter as long as eyes, rounded off. Pronotal collar sharply and evenly margined except just at the sides. Antennae with scape slightly shorter than an eye ; all funicular segments slightly transverse. Propodeal callus not densely pilose, the hairs not hiding the surface. Malar space half the length of an eye . . . . . ***maurus*** sp. n. (p. 770)

– Head in dorsal view (Text-fig. 627) with temples nearly or quite one third as long as eyes, less strongly rounded. Pronotal collar often more weakly and irregularly margined. Antennal scape as long as an eye ; proximal segments of funicle often not transverse. Either the propodeal callus is densely clothed with white hairs which virtually hide the surface ; or the malar space is somewhat more than half the length of an eye . . . 12

12 (11) Propodeal callus densely clothed with white hairs which hide most of the surface. Malar space half, or slightly less than half, the length of an eye. Head and thorax bronze- or bluish black. Antenna, Text-fig. 631 ***albopilosus*** sp. n. (p. 753)

– Propodeal callus less thickly pilose. Malar space from nearly three fifths, to two thirds, the length of an eye 13

13 (12) POL only 1·2–1·27 OOL. Fore wing with postmarginal vein as long as, or slightly longer than, the marginal vein. Malar space 0·4–0·45 the length of an eye. Antenna (Text-fig. 633) with funicular segments relatively longer, the first segment as long as the second, quadrate. Length 1·7–2·6 mm. Species found in salt-marshes, but apparently not associated with seaweed . . . . . ***littoralis*** sp. n. (p. 755)

– POL 1·35–1·55 OOL. Fore wing with postmarginal vein usually at least a little shorter than, rarely as long as, the marginal vein. Malar space from three fifths, to two thirds, the length of an eye. Antenna with funicular segments relatively shorter, the first segment at least slightly shorter than the second, usually slightly transverse. Length 1·3–2·1 mm. Species associated with seaweed (*Fucus*) . . . . ***fucicola*** (Walker) (p. 753)

14 (8) Antennae with combined length of pedicellus and flagellum equal to breadth of head 15

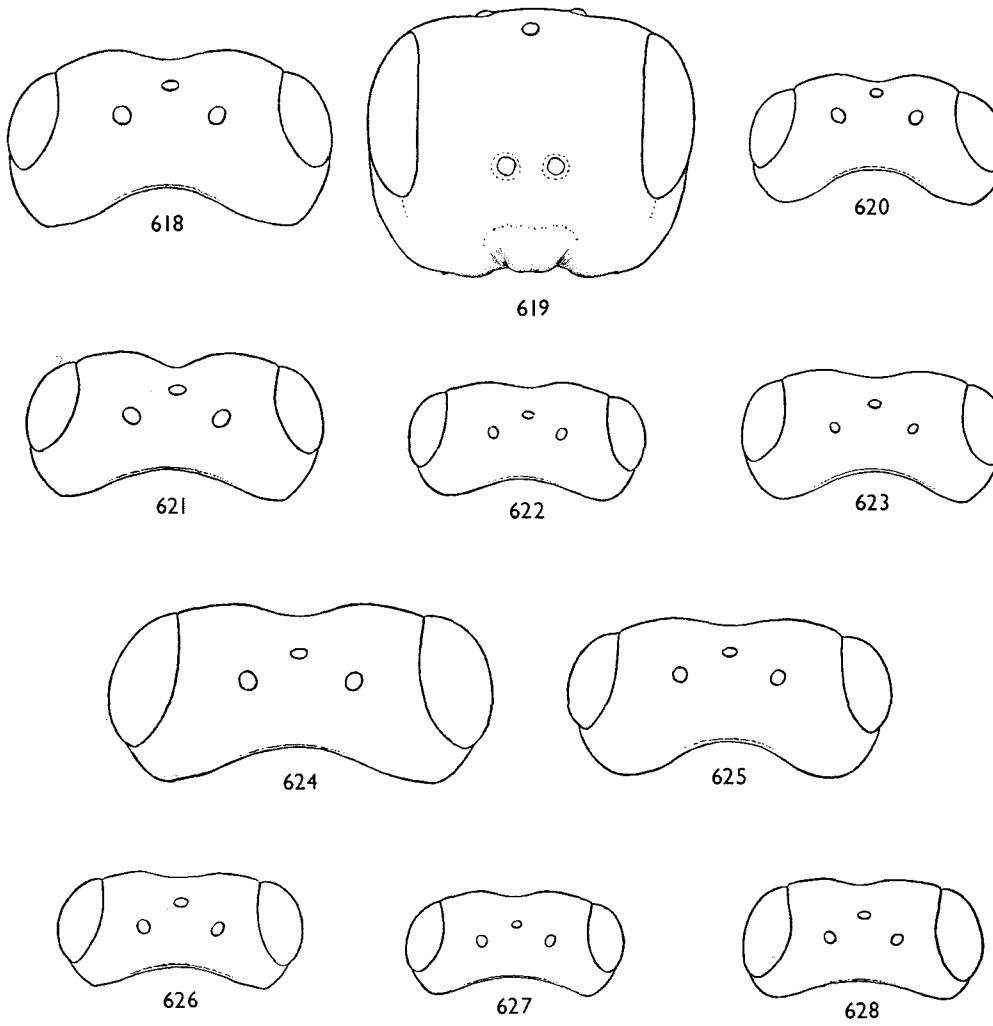
– Antennae with combined length of pedicellus and flagellum at least slightly less than breadth of head 16

15 (14) Antenna (Text-fig. 635) with first funicular segment as long as or slightly longer than the second ; none of the funicular segments, except sometimes the sixth, transverse. Pronotal collar finely though sharply margined except just at the sides. Both mandibles with 4 teeth. Larger species, 1·9–2·2 mm. Head, Text-fig. 614 . . . . . ***caricicola*** sp. n. (p. 768)

– Antenna (Text-fig. 639) with first funicular segment slightly to very distinctly shorter than the second, and at least slightly transverse ; some or all of the following segments usually slightly transverse. Either pronotal collar less distinctly and more irregularly margined, and left mandible with 3 teeth ; or smaller species (length 1·2–1·75 mm.) 38

16 (14) Head in dorsal view (Text-fig. 615) 2·25 times as broad as long, with the eyes prominent and the temples converging strongly. Pronotal collar sharply margined except just at the sides. Antenna (Text-fig. 630) with all funicular segments slightly transverse ; flagellum with rather conspicuous hairs. Head and thorax bluish black . . . . ***laticeps*** sp. n. (p. 760)

– If the head is nearly as strongly transverse and has a similar shape to the above, then the pronotal collar is less distinctly margined, the proximal segments of the antennal funicle are not or hardly transverse and the flagellum has less conspicuous hairs, whilst the head and thorax are tinged with greenish or bronze 17



FIGS. 618–628. *Eupteromalus* spp., ♀, heads. 618, *genalis* sp. n., holotype ♀ ; 619, same, frontal view ; 620, *cognatus* Gahan, ♀ ; 621, *submarginatus* (Thomson), lectotype ♀ ; 622, *potatoriae* sp. n., holotype ♀ ; 623, *dubius* (Ashmead), ♀ ; 624, *acuminatus* sp. n., ♀ ; 625, *lasiocampae* sp. n. ♀ ; 626, *peregrinus* sp. n., ♀ ; 627, *fucoicla* (Walker), ♀ ; 628, *hemipterus* (Walker), ♀.

17 (16) Pronotal collar sharply and evenly margined except just at the sides. Head in dorsal view (Text-fig. 613) with temples strongly rounded and from hardly one quarter to slightly more than one quarter as long as eyes. First segment of antennal funicle slightly to distinctly transverse, and usually shorter than the second 38

– Pronotal collar less distinctly and more irregularly margined, or immarginate, when present the transverse carina is sharp at most over about the middle third. Head in dorsal view often with temples relatively longer or less rounded. First segment of antennal funicle sometimes otherwise . . 18

18 (17) Antennal scape as long or virtually as long as an eye, reaching the level of the vertex ; proximal segments of funicle usually quadrate or slightly longer than broad, rarely slightly transverse ; median carina of propodeum weak or absent 19

– Antennal scape distinctly shorter than an eye, often not reaching the vertex ; segments of funicle variable, but sometimes all are transverse ; median carina of propodeum most often distinct and sharp. 21

19 (18) Head in dorsal view with temples more than one third as long as eyes. Both mandibles with 4 teeth . . . . . sp. indet. A (p. 756)

– Head in dorsal view (Text-figs. 616, 617) with temples one quarter or slightly more than one quarter as long as eyes. Left mandible (in the specimens examined) with 3 teeth 20

20 (19) Head in dorsal view (Text-fig. 616) 2·2–2·35 times as broad as long ***micropterus*** (Lindeman) (p. 766)

– Head in dorsal view (Text-fig. 617) 2·05–2·15 times as broad as long ***tigasis*** (Walker) (p. 767)

21 (18) Head in dorsal view (Text-figs. 618, 620–623, 625) with temples one third as long as eyes or more 22

– Head in dorsal view (Text-figs. 613, 624, 626, 628) with temples one quarter as long as eyes or less 34

22 (21) Head of characteristic shape ; in frontal view (Text-fig. 619) with lower margins of oral fossa, on either side of the clypeus, distinctly curved and projecting slightly below the level of the front margin of the clypeus ; in dorsal view (Text-fig. 618) only 1·8–1·85 times as broad as long, with temples fully half as long as eyes . . . . . ***genalis*** sp. n. (p. 757)

– Head in frontal view with lower margins of oral fossa not or hardly curved, and not projecting distinctly below the level of the front margin of the clypeus ; in dorsal view (Text-figs. 620–623, 625) twice or slightly more than twice as broad as long, with temples at most barely half as long as eyes 23

23 (22) Antennae (Text-fig. 634) with all funicular segments at least slightly transverse. Relatively small species, rarely over 2 mm. in length, and not more than 2·3 mm. 24

– Antennae (Text-figs. 632, 636, 640) with at most segments 3–6 of the funicle transverse. Species sometimes relatively larger (length 1·7–3·3 mm.) . 27

24 (23) Scutellum somewhat flattened discally, its reticulation only very slightly raised above the general surface ; both it and the mesoscutum relatively shiny. Left mandible with 3 teeth, right mandible with 4 sp. indet. H (p. 775)

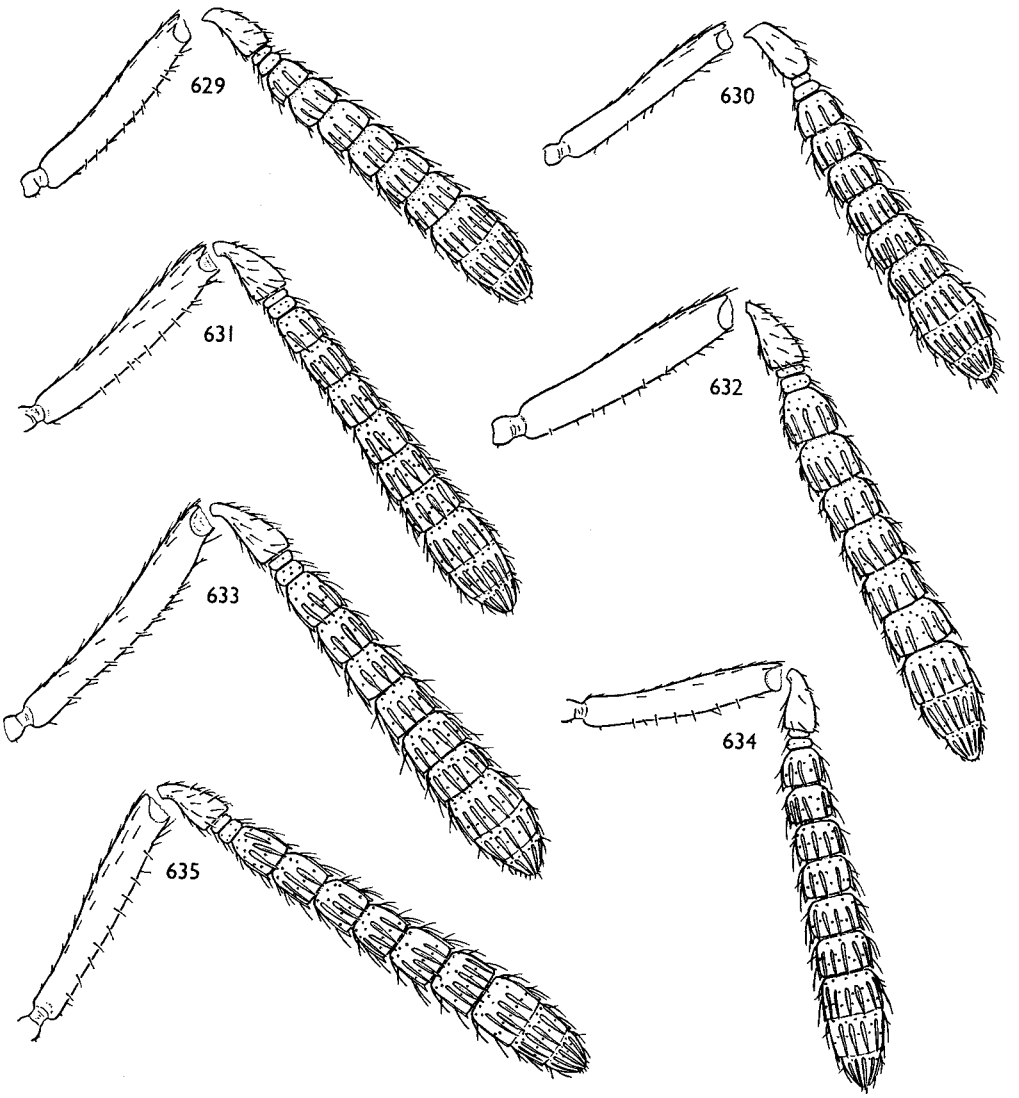
– Scutellum moderately convex, its reticulation distinctly raised above the general surface ; both it and the mesoscutum relatively less shiny. Both mandibles with 4 teeth 25

25 (24) North American species. Median area of propodeum (Text-fig. 605) about 1·7 times as broad as long. Mesoscutum somewhat more than twice as broad as long. Scutellum slightly longer than the mesoscutum. Antennal scape not nearly reaching the median ocellus.

Head, Text-fig. 620 . . . . . ***cognatus*** Gahan (p. 776)

– European species. Median area of propodeum 1·1–1·4 times as broad as long. Mesoscutum 1·8–1·9 times as broad as long. Scutellum at most as long as the mesoscutum. Antennal scape sometimes reaching the median ocellus 26

26 (25) Antenna (Text-fig. 632) with scape not quite, or only just, reaching the lower edge of the median ocellus. Head in dorsal view (Text-fig. 621) with scrobes



FIGS. 629–635. *Eupteromalus* spp., ♀, antennae. 629, *maurus* sp. n. ; 630, *laticeps* sp. n. ; 631, *albopilosus* sp. n. ; 632, *submarginatus* (Thomson) ; 633, *littoralis* sp. n. ; 634, *potatoriae* sp. n. ; 635, *caricicola* sp. n.

rather deeply excavated. Propodeum about two thirds as long as the scutellum, its median area 1·2–1·4 times as broad as long
submarginatus (Thomson) (p. 756)

– Antenna (Text-fig. 634) with scape nearly reaching the level of the vertex. Head in dorsal view (Text-fig. 622) with scrobes less deeply excavated. Propodeum three quarters as long as the scutellum or rather more, its median area 1·1–1·2 times as broad as long . . ***potatoriae*** sp. n. (p. 758)

27 (23) Gaster lanceolate-ovate, 1·8–2 times as long as broad, distinctly longer than the thorax. Larger species, length 2·3–3·3 mm. Left mandible with 3 teeth, right mandible with 4 28

– Gaster ovate, 1·3–1·65 times as long as broad, about as long as the thorax. Smaller species, length 1·7–2·5 mm. 29

28 (27) Head in dorsal view very like that of *submarginatus* (Text-fig. 621) with the temples slightly more than one third as long as eyes. Antenna (Text-fig. 636) with scape not reaching the vertex . . ***germanicus*** sp. n. (p. 761)

– Head in dorsal view (Text-fig. 624) with temples at most one third as long as eyes. Antenna with scape reaching or virtually reaching the vertex
acuminatus sp. n. (p. 762)

29 (27) Head in dorsal view (Text-figs. 621–623, 625) with temples one third or more than one third as long as eyes. Gaster at most 1·6 times as long as broad. Both mandibles with 4 teeth [mandibular formula of *dubius* unknown] . 30

– Head in dorsal view (Text-fig. 626) with temples one quarter as long as eyes or even less. Gaster sometimes relatively longer than in the above. Left mandible often with 3 teeth 34

30 (29) North American species with scutellum flattened. Antenna (Text-fig. 640). Propodeum with a distinct, sharp median carina. Head, Text-fig. 623
dubius (Ashmead) (p. 776)

– European species with scutellum moderately convex 31

31 (30) Antennal scape barely reaching the lower edge of the median ocellus. Head in dorsal view (Text-fig. 621) with scrobes deeply excavated, temples slightly angulate posteriorly. Median carina of propodeum distinct
submarginatus (Thomson) (p. 756)

– Antennal scape reaching nearly or quite to the level of the vertex. Head in dorsal view (Text-figs. 622, 625) with scrobes less deeply excavated; temples sometimes rounded posteriorly 32

32 (31) Antenna (Text-fig. 634) with all funicular segments slightly transverse. Head in dorsal view (Text-fig. 622) with temples somewhat rounded posteriorly . . . . . ***potatoriae*** sp. n. (p. 758)

– Antenna with proximal segments of funicle not transverse. 33

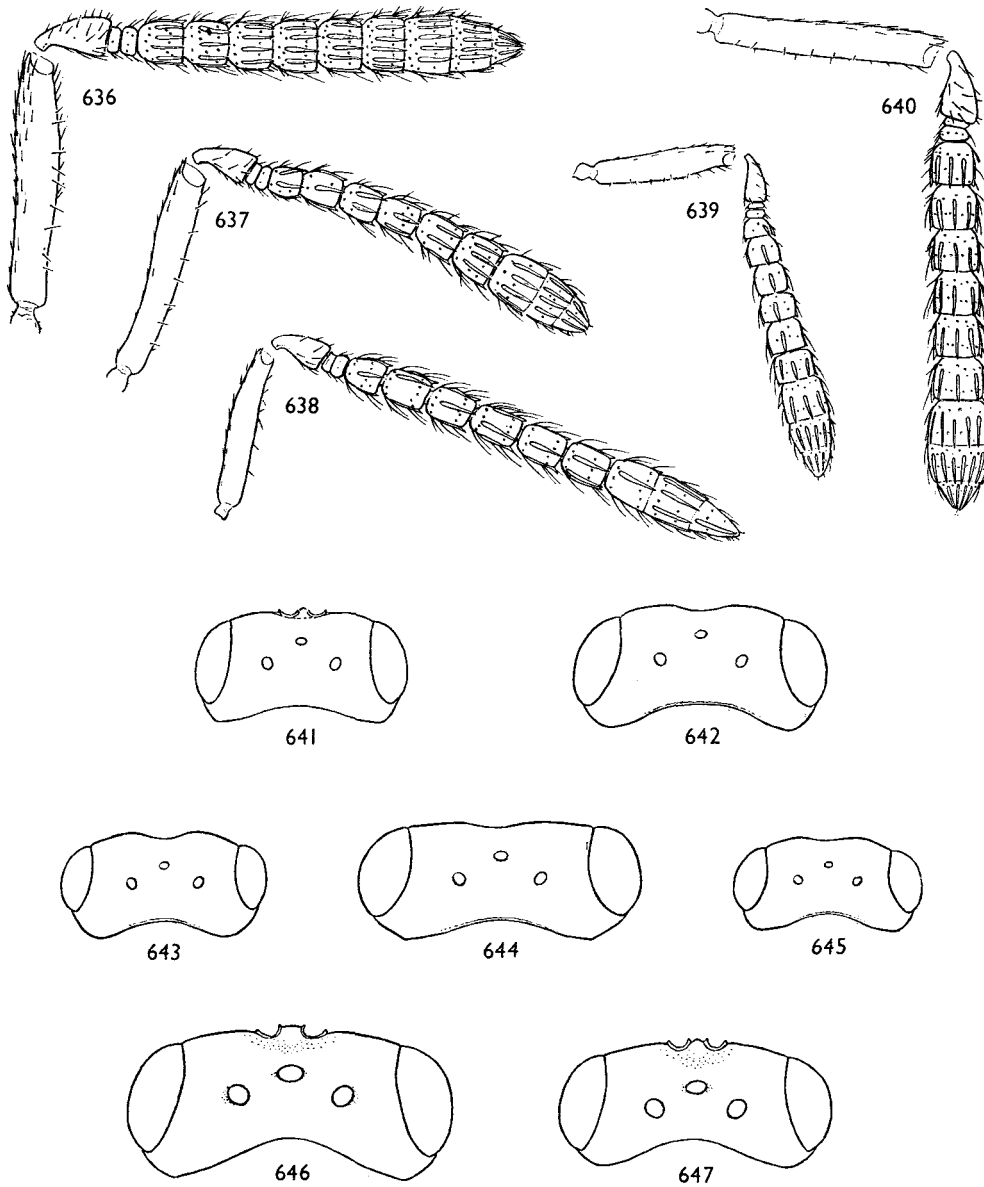
33 (32) Head in dorsal view (Text-fig. 625) with temples rounded posteriorly. Median carina of propodeum distinct . . . ***lasiocampae*** sp. n. (p. 759)

– Head in dorsal view with temples slightly angulate posteriorly, much as in *submarginatus*, Text-fig. 621. Median carina of propodeum vague or absent . . . . . sp. indet. A (p. 756)

34 (29) Head in dorsal view (Text-figs. 624, 626) with temples relatively straight; head 2·03–2·15 times as broad as long. Gaster 1·7–2 times as long as broad, at least somewhat longer than the thorax. Length 1·8–3·3 mm. 35

– Head in dorsal view (Text-figs. 613, 628) with temples rounded; head 1·9–2 times as broad as long. Gaster sometimes relatively shorter. Length 1·3–2·3 mm. 36

35 (34) Head (Text-fig. 624) 1·2–1·3 times as broad as the mesoscutum. Marginal vein 1·55–1·75 times as long as the stigmal vein. Gaster slightly acuminate apically; last tergite as long as, or slightly longer than, its basal breadth;



FIGS. 636–647. 636, *Eupteromalus germanicus* sp. n., ♀, antenna ; 637, *Eupteromalus scaposus* sp. n., ♀, antenna ; 638, same, ♂, antenna ; 639, *Eupteromalus exiguus* (Walker), ♀, antenna ; 640, *Eupteromalus dubius* (Ashmead), ♀, antenna ; 641, *Eupteromalus hemipterus* (Walker), ♂, head ; 642, *Eupteromalus micropterus* (Lindeman), ♂, head ; 643, *Eupteromalus potatoriae* sp. n., ♂, head ; 644, *Eupteromalus littoralis* sp. n., ♂, head ; 645, *Eupteromalus exiguus* (Walker), ♂, head ; 646, *Dirhicnus pirus* (Walker), ♀, head ; 647, *Dirhicnus ferrierei* Hedqvist, syntype ♀, head.

the three tergites following the basal one nearly always with some trace of alutaceous sculpture in their basal part . . . ***acuminatus*** sp. n. (p. 762)

– Head (Text-fig. 626) 1·07–1·15 times as broad as the mesoscutum. Marginal vein 1·18–1·45 times as long as the stigmal vein. Gaster acute but not acuminate apically ; last tergite slightly shorter than its basal breadth ; the three tergites following the basal one are smooth ***peregrinus*** sp. n. (p. 764)

36 (34) Antenna (Text-fig. 637) with scape reaching above the level of the vertex, and virtually as long as an eye. Body elongate ; gaster lanceolate, slightly longer than head plus thorax, fully twice as long as broad. Propodeum almost as long as scutellum, its median area about as long as broad. Fore wing with marginal vein about twice as long as the stigmal vein . . . . . ***scaposus*** sp. n. (p. 774)

– Antenna (Text-fig. 639) with scape not reaching above the level of the vertex, somewhat shorter than an eye. Body more squat ; gaster not longer than head plus thorax, usually ovate, rarely lanceolate. Propodeum about three quarters as long as the scutellum, its median area at least slightly broader than long. Fore wing with marginal vein sometimes shorter relative to the stigmal vein 37

37 (36) Eyes relatively smaller, separated by 1·3–1·4 times their length ; malar space half or virtually half the length of an eye. Antenna (Text-fig. 639) with first funicular segment distinctly shorter than the second, slightly to distinctly transverse. Fore wing with marginal vein 1·4–1·75 times as long as the stigmal vein 38

– Eyes relatively larger, separated by only 1·1–1·25 times their length ; malar space 0·35–0·4 the length of an eye. Antennae with first funicular segment usually as long as the second, rarely very slightly shorter. Fore wing with marginal vein sometimes longer relative to the stigmal vein 39

38 (37) Left mandible with 3 teeth, right mandible with 4. Gaster 1·15–1·4 times as long as the thorax, 1·55–1·9 times as long as broad. Pronotal collar more weakly and irregularly margined . . . . ***exiguus*** (Walker) (p. 770)

– Both mandibles with 4 teeth. Gaster 1·0–1·05 times as long as the thorax, 1·35–1·55 times as long as broad. Pronotal collar tending to be distinctly, sometimes sharply, margined . . . . . ***maurus*** sp. n. (p. 770)

39 (37) Fore wing with marginal vein only 1·3–1·4 times as long as the stigmal vein ; postmarginal vein as long as the marginal.
Left mandible with 3 teeth, right mandible with 4 . sp. indet. E (p. 773)

– Fore wing with marginal vein 1·7–2·25 times as long as the stigmal vein ; postmarginal vein often shorter than the marginal 40

40 (39) Left mandible with 3 teeth, right mandible with 4. Postmarginal vein nearly always at least slightly shorter than, rarely as long as, the marginal ***hemipterus*** (Walker) (p. 771)

– Both mandibles with 4 teeth. Postmarginal vein as long as or virtually as long as the marginal. (Possibly an aberrant form of *hemipterus*) sp. indet. F (p. 773)

41 (1) Gaster (Text-fig. 596) : the first four tergites have a transverse row of hairs, and also at least some trace of alutaceous sculpture. Propodeum (Text-fig. 596) with plicae indistinct or nearly absent in the front half of the sclerite ; callus with only a row of short hairs next to the edge of the metapleuron, and a very few isolated hairs above the supracoxal flange. (North America) . . . . . ***subapterus*** (Riley) (p. 776)

– Gaster : the first four tergites are bare except laterally ; the basal tergite, and sometimes the three following ones, smooth, Propodeum with plicae distinct throughout ; callus with more numerous, and longer, hairs.

(European species, not definitely known to occur in North America). . 42

42 (41) Lower edge of antennal toruli about at level of ventral edge of eyes. Head in dorsal view (Text-fig. 627) with temples about one third as long as the eyes. Malar space from three fifths to two thirds the length of an eye. Head and thorax bronze- or bluish black ; legs very dark, the femora mainly, the tibiae usually more or less, infuscate. Species associated with *Fucus* on the sea-shore . . . . . ***fucicola*** (Walker) (p. 753)

– Lower edge of antennal toruli distinctly above the level of ventral edge of eyes. Head in dorsal view (Text-fig. 628) with temples one fifth to one quarter as long as the eyes. Malar space 0·35–0·4 the length of an eye. Head and thorax green to blue or greenish bronze ; legs apart from coxae often wholly testaceous, the femora sometimes infuscate. Species not associated with *Fucus* . . . . . ***hemipterus*** (Walker) (p. 771)

Key to most European Males

Note. The unknown male of *pompilicola* sp. n. may be expected to differ from those of all the other European species in having an extensively pilose basal cell in the fore wing, combined with quadridentate mandibles.

1 Brachypterous forms 2

– Macropterous forms 4

2 (1) Species associated with seaweed (*Fucus*). Lower edge of antennal toruli hardly above level of ventral edge of eyes. Head and thorax bronze- or bluish black ; legs reddish with the femora often, the tibiae sometimes, infuscate medially. Both mandibles with 4 teeth . ***fucicola*** (Walker) (p. 753)

– Species not associated with *Fucus*. Lower edge of antennal toruli distinctly above level of ventral edge of eye. Head and thorax bronze-green, green, or blue ; legs, not counting coxae, testaceous to yellowish, sometimes with the femora slightly infuscate. Left mandible with 3 teeth, right mandible with 4 3

3 (2) Head in dorsal view (Text-fig. 641) 1·9–2 times as broad as long ***hemipterus*** (Walker) (p. 771)

– Head in dorsal view (Text-fig. 642) 2·05–2·1 times as broad as long ***micropterus*** (Lindeman) (p. 766)

4 (1) Fore wing with marginal vein twice as long as the stigmal vein 5

– Fore wing with marginal vein at most 1·7 times as long as the stigmal vein . 7

5 (4) Thorax twice as long as broad. Antenna (Text-fig. 638) with combined length of pedicellus and flagellum about 1·25 times the breadth of the head ; scape as long as an eye and reaching slightly above the vertex. Head and thorax green ; legs except coxae yellowish . . ***scaposus*** sp. n. (p. 774)

– Thorax somewhat less than twice as long as broad. Combined length of pedicellus and flagellum not or hardly greater than breadth of head. Either the head and thorax are bronze- to bluish black ; or the antennal scape is slightly shorter than an eye 6

6 (5) Head and thorax bright green ; legs except coxae testaceous. Left mandible with 3 teeth, right mandible with 4. Species not associated with seaweed sp. indet. G (p. 774)

– Head and thorax bronze- or bluish black ; legs reddish with the femora often, the tibiae sometimes, partly infuscate. Both mandibles with 4 teeth. Species associated with seaweed (*Fucus*) . . ***fucicola***(Walker) (p. 753)

7 (4) Head in dorsal view (Text-fig. 644) strongly transverse, 2·35–2·4 times as broad as long. Genae so strongly buccate as to appear almost angulate in frontal view. Antenna with pedicellus in dorsal view about 2·5 times as long as broad ; scape slightly longer than an eye and reaching above the vertex ; combined length of pedicellus and flagellum slightly greater than the breadth of the head ; flagellum slightly clavate ***littoralis*** sp. n. (p. 755)

– Head in dorsal view at most 2·2 times as broad as long. Genae less strongly buccate. Antenna with pedicellus in dorsal view rarely more than twice as long as broad, if so then scape shorter than an eye. In most species the combined length of the pedicellus and flagellum is not greater than the breadth of the head, and the flagellum is not clavate 8

8 (7) Eyes very large, separated by only 0·9 their length ; malar space very short, hardly more than one third the length of an eye ; head in dorsal view with temples hardly one sixth as long as the eyes. Pronotal collar sharply margined except just at the sides . . . . . sp. indet. D (p. 769)

– Eyes smaller, separated by at least slightly more than their length ; malar space usually longer ; head in dorsal view with temples at least one fifth as long as the eyes. Pronotal collar often indistinctly margined . . 9

9 (8) Species associated with seaweed (*Fucus*). Lower edge of antennal toruli hardly above the level of the ventral edge of the eyes. Head and thorax bronze- or bluish black ; legs reddish with the femora often, the tibiae sometimes, more or less infuscate. Marginal vein 1·7–2·1 times as long as the stigmal vein . . . . . ***fucicola*** (Walker) (p. 753)

– Species not associated with seaweed. Lower edge of antennal toruli slightly to very distinctly above the level of the ventral edge of the eyes ; if only slightly above, then head and thorax greenish and legs, not counting coxae, testaceous or yellowish. Marginal vein usually less than 1·7 times as long as the stigmal vein 10

10 (9) Propodeal callus densely clothed with white hairs which hide most of the surface. Head and thorax bronze-black ; femora mainly, tibiae slightly, infuscate ; antennae black with the scape partly testaceous. Pronotal collar fairly sharply margined . . . . ***albopilosus*** sp. n. (p. 753)

– Propodeal callus less thickly pilose, the hairs not hiding the whole surface, and usually not conspicuously white. Head and thorax most often some tint of green ; legs, not counting coxae, usually testaceous or yellow, occasionally the femora partly infuscate ; antennal scape often mainly to wholly testaceous, sometimes the whole antenna of this colour. . . 11

11 (10) Pronotal collar evenly and sharply margined throughout, or except just at the sides. Antenna with scape as long or virtually as long as an eye, reaching above the vertex ; combined length of pedicellus and flagellum 1·15–1·2 times the breadth of the head. Propodeum with a distinct median carina. Both mandibles with 4 teeth 12

– Pronotal collar usually weakly and irregularly margined or immarginate ; if at all sharply margined, then only over about the middle third, and combined length of pedicellus and flagellum not or hardly greater than breadth of head 13

12 (11) All funicular segments except sometimes the sixth are slightly longer than broad ; the first segment as long as the second. Larger species, 1·6–1·8 mm. . . . . ***caricicola*** sp. n. (p. 768)

– First funicular segment slightly transverse and slightly shorter than the second. Small species, length about 1 mm. . . . sp. indet. B (p. 757)

13 (11) Antennae with combined length of pedicellus and flagellum 1·25–1·35 times the breadth of the head ; funicular segments, except occasionally the

sixth, distinctly longer than broad ; scape nearly or quite as long as an eye, reaching slightly above the vertex 14

– Antennae with combined length of pedicellus and flagellum at most 1·1 times the breadth of the head, but often less ; funicular segments most often quadrate or slightly transverse, the proximal ones a little longer than broad ; scape sometimes shorter than an eye and sometimes not reaching the vertex 15

14 (13) Left mandible with 3 teeth, right mandible with 4. Propodeum with a strong median carina . . . . . ***acuminatus*** sp. n. (p. 762)

– Both mandibles with 4 teeth. Median carina of propodeum weak or absent (Czechoslovakia) . . . . . sp. indet. C (p. 757)

15 (13) Head in dorsal view with temples slightly more than half as long as eyes, much as in the female of *submarginatus*, cf. Text-fig. 621. 16

Head in dorsal view with temples at least slightly less than half as long as eyes 18

16 (15) Antenna with combined length of pedicellus and flagellum distinctly less than breadth of head. Head in dorsal view only 1·8–1·85 times as broad as long ***genalis*** sp. n. (p. 757)

– Antennae with combined length of pedicellus and flagellum about equal to breadth of head. Head in dorsal view approximately twice as broad as long 17

17 (16) Antenna with first funicular segment as long as the second ; proximal segments of funicle slightly longer than broad, distal segments quadrate. Larger species, length about 2 mm. . . . . sp. indet. A (p. 756)

– Antenna with first funicular segment shorter than the second ; proximal segments of funicle very slightly transverse, distal segments distinctly so. Smaller species, length about 1·5 mm. 22

18 (15) Antenna with all funicular segments except sometimes the sixth distinctly longer than broad ; flagellum very slender, proximally hardly as stout as the pedicellus, only very weakly clavate ; pedicellus in dorsal view rather more than twice as long as broad. Eyes separated by only 1·15–1·2 their length. Propodeum with median carina absent or vague . sp. indet. I (p. 775)

– Antennae with funicular segments not or only slightly longer than broad ; if slightly so, then either the flagellum is distinctly clavate, or the pedicellus in dorsal view is hardly twice as long as broad, and the eyes are rather more widely separated. 19

19 (18) Antennae with scape distinctly shorter than an eye, at least not quite reaching the vertex, sometimes only reaching the lower edge of the median ocelius ; combined length of pedicellus and flagellum slightly less than breadth of head. Head in dorsal view with temples appearing slightly angulate posteriorly. Malar space 0·3–0·47 the length of an eye ; eyes separated by 1·1–1·3 times their length 20

– Antennae with scape as long or virtually as long as an eye, reaching the level of the vertex or above it ; combined length of pedicellus and flagellum [not known in *lasiocampae* sp. n.] about equal to or slightly greater than breadth of head. Head in dorsal view (cf. Text-figs. 625, 643, 645) with the temples tending to be rounded posteriorly. Malar space virtually or fully half the length of an eye ; eyes separated by 1·35–1·6 times their length . . 21

20 (19) Malar space about 0·3 the length of an eye. Mesoscutum weakly convex, about twice as broad as long . . . . ***germanicus*** sp. n. (p. 761)

– Malar space 0·4–0·47 the length of an eye. Mesoscutum moderately convex, not quite twice as broad as long . . . . ***peregrinus*** sp. n. (p. 764)

21 (19) Head in dorsal view (Text-figs. 625, 643) with temples half or nearly half as long as eyes. Both mandibles with 4 teeth 22

– Head in dorsal view (Text-fig. 645) with temples at most one third as long as eyes. Left mandible with 3 teeth, right mandible with 4 23

22 (21) Antenna with first funicular segment subtransverse and distinctly shorter than the second.
Head, Text-fig. 643 . . . . . ***potatoriae*** sp. n. (p. 758)

– Antenna with first funicular segment quadrate and as long as the second ***lasiocampae*** sp. n. (p. 759)

23 (21) Antenna with first segment of funicle quadrate, not or hardly shorter than the second . . . . . ***tigasis*** (Walker) (p. 767)

– Antenna with first segment of funicle slightly to very distinctly transverse, from very slightly to much shorter than the second, in small specimens virtually anelliform.
Head, Text-fig. 645 . . . . . ***exiguus*** (Walker) (p. 770)

Eupteromalus pompilicola sp. n.

(Text-figs. 594, 595, 597)

♀. Body with rather weak bluish and bronze reflections. Mandibles reddish with darker teeth. Antennal scape and pedicellus bright testaceous, the latter often more or less infuscate distally ; flagellum brown. Coxae concolorous with the thorax ; legs otherwise bright testaceous, except the fifth segment of all the tarsi, which is more or less brownish. Tegulae and wing-venation testaceous, wings hyaline. Ovipositor sheaths testaceous. Length 1·55–1·8 mm.

Head in dorsal view (Text-fig. 594) about twice as broad as its maximum length, temples nearly half the length of the eyes ; POL slightly greater than OOL. In front view the head forms a regular oval, the genae being buccate, and is slightly broader than high. Anterior margin of clypeus very distinctly produced medially. Mandibles large, both with 4 teeth. Antennae (Test-fig. 597) inserted nearer to the anterior margin of the clypeus than to the median ocellus, but the lower edge of the toruli slightly above the ventral edge of the eyes ; scape, not counting the radicula, slightly shorter than an eye and not nearly reaching the level of the median ocellus ; combined length of pedicellus and flagellum distinctly less than the breadth of the head ; pedicellus rather more than twice as long as broad, about as long as the anelli plus the first two funicular segments ; flagellum distinctly clavate ; first funicular segment slightly transverse, the following segments more distinctly so.

Thorax about 1·6 times as long as broad. Pronotal collar, except laterally, with a distinct, though irregular and not sharp, margin, reticulate, with a narrow smooth strip along its hind edge. Mesoscutum rather more than twice as broad as long, convex, finely reticulate except in the middle posteriorly. Scutellum slightly longer than the mesoscutum, finely reticulate. Propodeum sloping at a moderate angle relative to the plane of the mesoscutum and scutellum, medially about three quarters as long as the scutellum ; its median area hardly broader than long, moderately finely reticulate, the nucha more coarsely so ; nucha occupying rather more than one third the length of the propodeum ; plicae sharp, especially basally ; median carina distinct but tending to be irregular ; callus rather sparsely haired. Fore wing with basal cell with 8–13 hairs scattered over its distal half, upon the upper surface of the wing ; veins thin, marginal vein about 1·5 times as long as the postmarginal, and about 1·7 times as long as the stigmal vein.

Gaster (Text-fig. 595) almost circular, much shorter than but slightly broader than the thorax ; basal tergite (the third abdominal) occupying about two thirds of the whole gaster, its lateral margins almost bare ; remaining tergites very strongly transverse ; ovipositor sheaths projecting slightly.

♂. Unknown.

Differs from all the other described species of the genus in the extensively pilose

basal cell of the fore wing, the testaceous ovipositor sheaths, and almost circular gaster.

Holotype ♀. IRELAND : Co. Wicklow, Powerscourt, 3.vi.1937, bred from a cocoon of *Anoplius nigerrimus* (Scop.), (Hym., Pompilidae) (*A. W. Stelfox*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 8 ♀ ; SCOTLAND : Mid Perth, Killin, 1 ♀, 7.vii.1952, swept from herbage near the River Tay (*Graham*), in Hope Department and Graham collections.

Eupteromalus fucicola (Walker)

(Text-fig. 627)

Pteromalus fucicola Walker, 1835 : 194–195, ♂ ♀.
Eupteromalus fucicola (Walker) Graham, 1956*b* : 255–256, ♂ ♀.

Type material. Lectotype female designated by Graham (1956*b* : 255).

This species should be recognizable by the dark colour of the body and legs, low insertion of the antennae, quadridentate mandibles, and its habitat. The funicular segments of the antennae vary somewhat in proportions ; especially the first segment, which may be as long as the second, quadrate, and provided with sensilla, or distinctly shorter than the second, sometimes virtually anelliform. The latter condition occurs in small specimens. The wings vary considerably in size. In the female they are usually large, but occasionally somewhat shortened and narrower than usual. In the male they are usually more or less abbreviated and narrow. The length of the marginal vein of the fore wing varies considerably relative to that of the stigmal vein ; sometimes the fore wing is hyaline, sometimes infumate discally.

BRITAIN, IRELAND ; widely distributed on the coast, associated with seaweed (*Fucus* sp.).

Biology. Host unknown, but possibly some Dipteron. Females crawl about in masses of rotting *Fucus* at high-water mark, occasionally wandering over adjacent rocks or sand. Males occur in the same situations ; during spells of bright sunshine I have several times seen them running over rocks by the shore. They jump briskly, but most specimens do not seem able to fly. Imagines from end of June until September (occasionally into October).

Euteromalus albopilosus sp. n.

(Text-fig. 631)

♀. Body with bronze and bluish reflections. Mandibles reddish with darker teeth. Antennae blackish, the scape reddish at the base. Coxae concolorous with the thorax ; legs otherwise rust reddish with the knees rather paler ; the femora and tibiae banded more or less broadly with fuscous, sometimes mainly dark, the fore tarsi and tips of the mid and hind tarsi fuscous. Tegulae fusco-testaceous ; wings subhyaline, venation brownish testaceous. Propodeal callus densely covered with silvery white hairs. Length 1·9–2·5 mm.

Head in dorsal view similar to that of *acuminatus* sp. n. (Text-fig. 624) but with frons slightly

less prominent ; POL 1·3–1·4 times OOL. In front view the head is subtrapeziform, narrowing towards the mouth, the genae converging quite strongly. Malar space half or slightly less than half the length of an eye. Mandibles moderate-sized, both with 4 teeth. Antennae (Text-fig. 631) inserted well below the middle of the face, the lower edge of the toruli being level with the ventral edge of the eyes ; scape as long as an eye and reaching the level of the median ocellus ; combined length of pedicellus and flagellum distinctly less than the breadth of the head ; pedicellus about twice as long as broad, rather longer than the anelli plus the first funicular segment ; flagellum moderately clavate, funicle proximally not or only slightly stouter than the pedicellus ; funicular segments subequal in length, 1–4 subquadrate, 5 quadrate or very slightly transverse, 6 very slightly transverse. Occasionally the first funicular segment is very slightly transverse and a shade shorter than the second.

Thorax about 1·6 times as long as broad. Pronotal collar with a fairly distinct though fine margin, behind this reticulate with a smoother strip along the hind margin. Mesoscutum about twice as broad as long, finely reticulate, a little more coarsely in the middle posteriorly ; notauli fairly sharply impressed. Scutellum as long as the mesoscutum, rather finely reticulate. Propodeum sloping at an angle of about 40° relative to the plane of the mesoscutum and scutellum, medially about two thirds the length of the scutellum ; its median area somewhat broader than long, rather finely reticulate, the nucha somewhat more coarsely ; nucha occupying slightly less than half the total length ; median carina sharp, plicae moderately so ; whole callus very densely clothed with silvery white hairs which in some aspects completely hide the surface. Fore wing with basal cell and basal vein bare ; veins thin, marginal vein slightly shorter than the postmarginal and hardly 1·5 times as long as the stigmal vein ; surface of wing beyond the speculum uniformly and rather densely haired.

Gaster ovate, slightly acuminate apically, hardly broader than but slightly longer than the thorax ; basal tergite (third abdominal) occupying rather more than one third of the whole gaster, its lateral margins with several whitish hairs, as in *Trichomalus* species ; fourth less than half as long as third ; 5–7 extremely short, transversely linear ; 8 slightly shorter than 4 ; 9 triangular, as long as its basal breadth ; tips of ovipositor sheaths just visible in dorsal view.

♂. Differs from the ♀ as follows :

Antennae inserted very slightly above the ventral edge of the eyes. Scape reaching the level of the vertex. Combined length of pedicellus almost equal to the breadth of the head. Flagellum more slender, proximally not stouter than the pedicellus, and less clavate ; funicular segments quadrate.

Gaster nearly circular, much shorter but slightly broader than the thorax ; basal tergite occupying more than half the total length, fourth abdominal tergite about one third the length of the third, remaining tergites retracted and strongly transverse.

This species closely resembles *fucicola* (Walker), especially in the dark colour of the body and relatively dark legs, low insertion of the antennae, quadridentate mandibles, structure and sculpture of the thorax, wing-venation, and shape of the gaster. It differs from *fucicola* especially in its densely pilose propodeal callus, also in some less obvious features as follows:

The head is slightly more transverse (breadth : length in *fucicola* about 2 : 1) with the temples shorter (in *fucicola* half or nearly half the length of the eyes). The funicular segments are longer (in *fucicola* all are transverse, the proximal ones at least very slightly, the distal ones obviously so) ; in *fucicola* the first funicular segment is at least slightly shorter than the second, in dwarfs much shorter and more like an anellus. The sculpture of the head and thorax is slightly denser so that their surface is more opaque, particularly noticeable on the axillae, which are dull, whereas in *fucicola* they are glittering. In *albopilosus* the plicae of the propodeum proceed straight backwards from the base for a short distance and then

converge strongly towards the nucha ; in *fucicola* the plicae curve outwards from the base and then sweep inwards towards the nucha in a regular arc. Finally, in *albopilosus* the hairs clothing the surface of the wing beyond the speculum are rather denser than in *fucicola*. In female *fucicola* the wings are sometimes reduced in size, but all my specimens of *albopilosus* are macropterous.

Holotype ♀. SWEDEN : Skåne, Falsterbo, 8.viii.1959 (*Graham*) in Graham collection.

Paratypes. Same locality as holotype, 1 ♂, 8 ♀, 8.viii.1959 (*Graham*), in Graham collection. All the series from sand-dunes, some swept from herbage, others from foliage of *Salix cinerea* L.

Biology. Unknown.

***Eupteromalus littoralis* sp. n.**

(Text-figs. 633, 644)

♀. Body with greenish and brassy or bronze reflections. Mandibles reddish with darker teeth. Antennae blackish, the proximal part of the scape more or less extensively reddish. Coxae concolorous with the thorax, legs otherwise mainly rust-red ; sometimes the knees, apices of the tibiae, and bases of the tarsi are paler than the rest, on the other hand in darker specimens the femora, less often the tibiae and the tips of the tarsi, may be infuscated. Tegulae testaceous to fuscous ; wings sometimes hyaline, but more often the fore wing is yellowish-tinged and sometimes it is clouded with brownish . Length 1·7–2·6 mm.

Resembles the female of *fucicola* (Walker), from which it differs in the characters mentioned in the key. It also resembles *albopilosus*, but differs as follows :

Malar space slightly longer, about three fifths the length of an eye. Left mandible with 3, right mandible with 4, teeth. Antennal scape slightly longer than an eye and reaching the level of the vertex ; pedicellus slightly longer ; POL 1·2–1·27 OOL.

Hairs on the propodeal callus much less dense, hardly concealing the surface beneath, not covering the spiracular sulci and not extending so close to the nucha ; plicae arcuate right from the base as in *fucicola* ; nucha larger, occupying fully half the length of the propodeum ; basal tergite of gaster with few hairs at the sides.

The marginal vein of the fore wing is 1·3–1·4 times as long as the stigmal vein.

The distal funicular segments (Text-fig. 633) tend to be slightly shorter and broader than in *albopilosus*, the fourth sometimes being very slightly transverse and 5 and 6 distinctly so.

♂. Colour as in female, but femora and tibiae not infuscate. Length 1·6–2 mm. Head of characteristic shape (Text-fig. 644 and couplet 7 of key to ♂♂). Antenna with first anellus somewhat transverse, second quadrate or very slightly transverse ; funicle proximally not stouter than the pedicellus in profile ; first funicular segment half to two thirds as long as the pedicellus, about 1·5 times as long as broad, second similar, rest decreasing gradually in length, fifth quadrate, sixth quadrate or very slightly transverse ; clava about as long as 2½ funicular segments ; hairs of flagellum standing out slightly. Gaster slightly longer than broad, shorter than but a little broader than the thorax ; basal tergite occupying about half the total length.

Holotype ♀. ENGLAND : Dorsetshire, Lodmoor, near Weymouth, 13.ix.1962, swept from marsh vegetation (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same data as holotype, 2 ♂, 15 ♀ ; IRELAND : Co. Dublin, coast at Portrane, 2 ♀, 20.vii.1950 (*A. W. Stelfox*), 1 ♀, 11.viii.1954 (*Graham*) ; Co. Wicklow,

The Murrough, near Newcastle, 1 ♀, 30.v.1954, 1 ♀, 25.v.1955 (*Stelfox*), in BM(NH) and Graham collections.

Biology. Unknown.

Eupteromalus submarginatus (Thomson)

(Text-figs. 621, 632)

Pteromalus submarginatus Thomson, 1878 : 156, ♀ [*?nec* ♂].
Eupteromalus submarginatus (Thomson) Kurdjumov, 1913 : 13.
Eupteromalus submarginatus (Thomson) ; Delucchi, 1958*a* : 56, ♀.

Type material. Syntypes, 16 specimens. LECTOTYPE, the first specimen, a female, labelled " Hbg " [Hälsingborg], " submarginatus Ths " [in Thomson's handwriting], " LECTOTYPE " on a red label, and " Eupteromalus submarginatus Ths. V. Delucchi det.". Delucchi (1958*a* : 56) stated that the lectotype differed only in small characters from *apicalis* [=*hemipterus*] and should be regarded as identical with it. I have re-examined the lectotype and find it to be quite distinct from *hemipterus* ; it differs especially in its much longer temples, and shorter marginal vein.

The female has a head of characteristic shape (Text-fig. 621), the scrobes being deeply excavated and the temples very long ; malar space 0·42–0·46 the length of an eye. Antenna (Text-fig. 632) with scape short, distinctly shorter than an eye, not or only just reaching the lower edge of the median ocellus ; pedicellus in dorsal view barely twice as long as broad ; funicle proximally at least a little stouter than the pedicellus, thickening slightly distad ; first and second segments of funicle sometimes quadrate, sometimes slightly transverse, the following segments at least very slightly transverse. Pronotal collar weakly and irregularly margined, the carina at most sharp over the middle third, or immarginate. Fore wing with marginal vein 1·55–1·75 times as long as the stigmal vein ; postmarginal vein from very slightly, to quite distinctly, shorter than the marginal. Gaster ovate, about as long as the thorax, 1·5–1·65 times as long as broad. Length 1·7–2·3 mm. Head and thorax varying from bright green or blue-green through dark green to bronze-green ; scape mainly or wholly testaceous, pedicellus and flagellum brownish above, testaceous beneath ; legs, apart from coxae, testaceous.

♂. Not definitely associated. One male in Thomson's syntypic series might belong to the above female, but as I am not quite sure no redescription of the male is being given here.

SWEDEN, CZECHOSLOVAKIA.

Biology. Unknown.

The three following species are near *submarginatus* :

Eupteromalus sp. indet. A

CZECHOSLOVAKIA : Bohemia, Břehyně, near Doksy, 1 ♀, 6.vi.1958 (*A. Hoffer*). IRELAND : Co. Kildare, Brockagh, north of Clane, 1 ♂, 29.viii.1948 (*Stelfox*) ; this may be conspecific with the above ♀.

Eupteromalus sp. indet. B

CZECHOSLOVAKIA : Slovakia, Sturova, 1 ♂, 22.vii.1963 (*Graham*).

Eupteromalus sp. indet. C

CZECHOSLOVAKIA : Slovakia, Sturovo-Nana, 1 ♂, 8.vi.1958 (*A. Hoffer*).

Eupteromalus genalis sp. n.

(Text-figs. 618, 619)

♀. Head and thorax bronze-green, in places with a bluish tinge, especially on the pleuron, head, and propodeum ; gaster bronze with slight greenish reflections. Mandibles, scape, pedicellus and anelli testaceous ; rest of antennae brown. Coxae concolorous with the thorax, fore coxae sometimes partly testaceous ; rest of legs testaceous, tips of tarsi brownish. Wings hyaline, veins pale testaceous. Length 1·8–2·3 mm.

Head of characteristic shape (see Text-figs. 618, 619 and explanation in key to females). Antennal scrobes moderately deeply excavated. POL 1·25–1·3 OOL. Eyes elongate, separated by 1·3–1·45 times their length. Malar space 0·44–0·54 the length of an eye. Both mandibles with 4 teeth (only one female examined). Head finely reticulate ; clypeus radiately strigose, the striae extending some distance up the genae and face. Lower edge of antennal toruli distinctly above the ventral edge of the eyes ; scape somewhat shorter than an eye, reaching about to the lower edge of the median ocellus ; combined length of pedicellus and flagellum very distinctly less than breadth of head ; pedicellus about twice as long as broad, much longer than the first funicular segment ; funicle virtually cylindrical, slightly stouter than the pedicellus, all its segments very slightly transverse, or the first segment quadrate ; clava about twice as long as broad, its length slightly less than that of the three preceding funicular segments together. Sensilla fairly numerous, in one row on each segment. The antenna is very similar to that of *submarginatus* (cf. Text-fig. 632).

Thorax somewhat flattened, slightly broader than high, in dorsal view 1·5–1·6 times as long as broad. Pronotal collar sometimes irregularly margined almost throughout, sometimes hardly at all, mainly reticulate, with a smoother strip along the hind margin. Mesoscutum about twice as broad as long, finely reticulate, slightly more coarsely in the middle posteriorly. Scutellum as long as the mesoscutum, slightly broader than long, only slightly convex, finely reticulate. Propodeum about, or slightly more than, three quarters as long as the scutellum ; median area 1·3–1·4 times as broad as long, strongly, moderately finely reticulate ; median carina distinct, extending a little way on to the nucha ; plicae very sharp and strongly bisinuate ; nucha occupying slightly more than one third the total length ; callus moderately thickly pilose. Lower part of mesepisternum, and mesepimeron, moderately finely reticulate ; upper subtriangular part of mesepisternum mainly alutaceous ; metapleuron rather more coarsely reticulate. Fore wing with marginal vein 1·5–1·7 times as long as the stigmal vein ; postmarginal vein variable, from distinctly shorter to slightly longer, than the marginal.

Gaster ovate, nearly or just as long as the thorax, 1·3–1·45 times as long as broad ; basal tergite occupying slightly less than half the total length ; the first four tergites smooth, bare except at the sides.

♂. Differs from ♀ in having the antennae wholly testaceous ; flagellum subclavate ; funicle proximally not stouter than the pedicellus ; proximal segments of funicle subquadrate, the first a little shorter than the second ; distal segments slightly transverse.

Holotype ♀. ITALY : Alto Polesine, reared in 1931 from *Masicera* [=*Paraphorocera*] *senilis* (Mg.) (*A. Goidanich*), in BM(NH).

Paratypes. ITALY: S. Giorgio di Nogaro, 1 ♀ ; Lombardy, unlocalized, 1 ♂, from the same host as the holotype. JUGOSLAVIA : Zagreb, 2 ♀, reared 17.v.1929 from *M.* [*P.*] *senilis* on *Pyrausta nubilalis* Hb. (*B. Hergula*), in BM(NH).

This species falls into the species-group of *submarginatus* (Thomson), which it resembles in many ways. It differs particularly in the characteristic features of the head, especially in having the edges of the oral fossa, on either side of the clypeus, distinctly curved and projecting below the front margin of the clypeus, in *submarginatus* they are hardly curved and do not project ; the temples in dorsal view also appear rather longer, and the scrobes are rather less deeply excavated (compare Text-figs. 618 and 621). The thorax of *submarginatus* is not flattened, the mesoscutum and scutellum being more convex than in *genalis* ; its propodeum is slightly shorter and has the plicae rather less sharp and not so distinctly bisinuate.

Eupteromalus potatoriae **sp. n.**

(Text-figs. 622, 643)

♀. Body olive-green ; disc of gaster bronze. Antennae testaceous ; pedicellus and flagellum more or less brown dorsally. Coxae concolorous with the thorax ; legs otherwise testaceous, with the tips of the tarsi brown. Tegulae testaceous. Wings hyaline ; veins testaceous. Length 1·5–1·7 mm.

Head in dorsal view (Text-fig. 622) about twice as broad as long ; temples slightly more than one third as long as eyes, converging fairly strongly, somewhat rounded posteriorly ; ocelli very small, separated by rather more than three times their major diameter from the eyes ; POL 1·15–1·25 OOL. Head in front view subtrapeziform, about 1·3 times as broad as high. Genae somewhat buccate, malar space nearly half length of eye. Eyes about 1·4 times as long as broad, separated by about 1·4 times their length. Mandibles rather small, both with 4 teeth. Clypeus strigose, its anterior margin hardly produced and very shallowly emarginate medially. Head otherwise finely reticulate. Antennae (Text-fig. 634) inserted distinctly above level of ventral edge of eyes ; combined length of pedicellus and flagellum slightly less than breadth of head; scape a little shorter than an eye, reaching nearly to the level of the vertex ; pedicellus nearly twice as long as broad, distinctly longer than anelli plus first funicular segment ; flagellum fairly stout, subclavate, proximally slightly stouter than the pedicellus ; funicular segments all very slightly transverse, the first sometimes very slightly shorter than the second segment ; clava about as long as the three preceding funicular segments together ; sensilla of funicle fairly numerous.

Thorax about 1·6 times as long as broad. Pronotal collar weakly irregularly margined, reticulate with a smooth strip along its hind edge. Mesoscutum about twice as broad as long, finely reticulate ; notauli moderately deep. Scutellum about as long as mesoscutum, slightly broader than long, convex, finely reticulate (especially posteriorly). Propodeum medially fully three quarters as long as scutellum ; median area 1·1–1·2 times as broad as long, finely reticulate ; nucha more coarsely reticulate, occupying somewhat less than half the length of the propodeum ; median carina fairly strong, reaching to the base or to the middle of the nucha ; plicae complete but sharp only posteriorly ; callus rather thinly pilose with only 1–2 hairs above the supracoxal flange. Fore wing about 2·3 times as long as broad ; basal cell and basal vein bare ; speculum open below ; marginal vein 1·65–1·75 times as long as the stigmal vein ; postmarginal vein distinctly shorter than the marginal.

Gaster ovate, about as long as the thorax and about 1·5 times as long as broad, acute apically ; basal tergite occupying slightly more than one third the total length ; last tergite slightly shorter than its basal breadth ; tips of ovipositor sheaths just visible.

♂. Differs from the female as follows:

Fore and mid coxae partly testaceous. Head (Text-fig. 643) barely twice as broad as long. Eyes rather smaller, separated by rather more than 1·5 times their length ; malar space longer, fully half as long as an eye. Genae, as seen in frontal view, weakly concave just below the eyes, then somewhat convex just above the oral fossa. Antennal scape as long as an eye, reaching almost above the level of the vertex, broader than in female, about 4·5 times as long as broad ; funicle not stout, proximally hardly as stout as the pedicellus, its first segment distinctly shorter than the second segment and subtransverse, segments 2 and 3 quadrate, 4–6 very slightly transverse ; clava nearly three times as long as broad and fully as long as the three preceding funicular segments together. Marginal vein hardly 1·5 times as long as the stigmal vein. Gaster obtuse at apex, only about 1·3 times as long as broad, somewhat broader than the thorax.

Holotype ♀. ENGLAND : Devon, Braunton, bred 17.viii.1929 from the puparium of a Tachinid fly (possibly *Tachina sorbillans* Wied.) which had parasitized *Philudoria* (=*Odonestis*) *potatoria* (L.) (*G. C. Varley*), in Hope Department, University Museum, Oxford.

Paratypes. Same data, 1 ♂, 2 ♀, in Hope Department, University Museum, Oxford.

The female of *potatoriae* most resembles that of *submarginatus* (Thomson), from which it differs in the characters mentioned in my key to species.

The North American species *cognatus* Gahan also resembles *potatoriae*, but the female differs from that of *potatoriae* as follows : antennal scape shorter, about three quarters as long as an eye, and not nearly reaching the median ocellus ; eyes slightly larger, separated by about 1·2 times their length ; median area of propodeum (Text-fig. 605) strongly transverse, about 1·7 times as broad as long ; sculpture of mesoscutum and scutellum rather coarser.

Eupteromalus lasiocampae sp. n.

(Text-fig. 625)

♀. Head and thorax bright blue-green ; gaster sometimes tinged with bronze discally. Mandibles, antennal scape, and pedicellus beneath, testaceous ; rest of antenna brown. Coxae concolorous with thorax ; rest of legs testaceous, with the tips of the tarsi brown. Wings hyaline, venation testaceous. Length 2·1–2·3 mm.

Head in dorsal view (Text-fig. 625) 2·05–2·1 times as broad as long ; temples slightly more than one third as long as eyes, evenly rounded off ; eyes slightly prominent ; POL 1·2–1·3 OOL. Head in frontal view subtrapeziform with genae moderately buccate ; edges of oral fossa, on either side of clypeus, hardly curved. Eyes separated by 1·4–1·55 times their length. Malar space 0·45–0·5 the length of an eye. Both mandibles with 4 teeth. Anterior margin of clypeus very slightly produced, the produced portion very shallowly emarginate, almost truncate. Lower edge of antennal toruli distinctly above ventral edge of eyes ; scape slightly shorter than an eye, but reaching or nearly reaching the vertex ; combined length of pedicellus and flagellum distinctly less than breadth of head ; pedicellus in dorsal view about twice as long as broad, distinctly longer than the first funicular segment ; flagellum stout ; funicle proximally much stouter than the pedicellus, its proximal segments quadrate, the sixth, and sometimes the fifth, very slightly transverse ; clava a little broader than the funicle, about twice as long as broad, not quite as long as the three funicular segments together ; sensilla numerous, in one row on each flagellar segment.

Thorax about 1·5 times as long as broad. Pronotal collar distinctly but rather irregularly

margined except at the sides, behind the carina mainly smooth in the middle third. Mesoscutum about twice as broad as long, moderately finely reticulate, rather more coarsely in the middle. Scutellum about as long as the mesoscutum, slightly broader than long, moderately convex, somewhat coarsely reticulate, the frenum rather more finely than the rest. Propodeum about, or slightly more than, three quarters as long as the scutellum ; median area 1·1–1·2 times as broad as long, strongly and somewhat coarsely reticulate ; median carina distinct, extending slightly on to the nucha, the latter occupying slightly less than half the total length ; callus moderately thickly pilose. Mesopleuron moderately finely reticulate ; upper triangular area of mesepisternum not quite smooth but with traces of alutaceous sculpture. Fore wing with marginal vein 1·45–1·65 times as long as the stigmal vein ; postmarginal vein slightly shorter than the marginal.

Gaster ovate, about as long as the thorax, 1·4–1·5 times as long as broad ; basal tergite occupying slightly less than half the total length ; the first four tergites smooth, bare except at the sides.

♂. Differs from the ♀ as follows :

Eyes smaller, separated by 1·55–1·6 times their length ; malar space 0·52–0·58 the length of an eye ; antennal scape fully as long as an eye, reaching slightly above the vertex ; pedicellus barely twice as long as broad ; funicle proximally not stouter than the pedicellus [distal part of flagellum missing] ; gaster subcircular, shorter than but as broad as the thorax.

Holotype ♀. ENGLAND : Dorsetshire, Studland Bay, 26.vii.1921, reared from a cocoon of *Lasiocampa trifolii* (Esp.) (*T. E. Belcher*), in BM(NH).

Paratypes. Same data, 2 ♂, 4 ♀, in BM(NH).

The female is near that of *submarginatus* (Thomson) but differs in having the antennal scape longer, reaching above the median ocellus ; head in dorsal view slightly more transverse, with scrobes less deeply excavated, temples more rounded posteriorly, hind ocelli more remote from edge of occiput. It differs from that of *potatoriae* sp. n. in having the proximal segments of the antennal funicle quadrate, the occiput rather more deeply excavated, size slightly greater.

The male is very close to that of *potatoriae* but has the first segment of the antennal funicle quadrate and as long as the second.

Eupteromalus laticeps sp. n.

(Text-figs. 615, 630)

♀. Body black with a slight bluish tinge. Antennal scape testaceous, fuscous distally ; pedicellus and flagellum fuscous. Coxae concolorous with thorax, legs otherwise reddish testaceous with the fifth tarsal segment brownish. Tegulae brownish testaceous. Wings faintly tinged with grey ; venation brownish testaceous. Length 1·75 mm.

Head in dorsal view (Text-fig. 615) notably transverse, nearly 1·3 times as broad as the mesoscutum, 2·25 times as broad as long ; temples slightly more than one quarter as long as eyes, converging strongly ; POL 1·25 OOL, ocelli very small, separated by 3 times their major diameter from the eyes. Head in frontal view oval. Eyes separated by 1·4 times their length. Malar space slightly less than half length of eye. Anterior margin of clypeus hardly produced, shallowly emarginate. Head moderately finely, but rather strongly, reticulate. Both mandibles with 4 teeth. Antennae (Text-fig. 630) inserted distinctly above level of ventral edge of eyes ; scape nearly seven eighths length of an eye, reaching the median ocellus ; combined length of pedicellus and flagellum distinctly less than breadth of head ; pedicellus slightly more than twice as long as broad, slightly longer than anelli plus first funicular segment ; flagellum distinctly clavate ; funicle proximally distinctly stouter than the pedicellus ; proxi-

mal segments of funicle slightly, distal segments distinctly, transverse ; clava about twice as long as broad, nearly as long as the three preceding funicular segments together ; sensilla not very numerous ; flagellum rather hairy, the hairs standing out somewhat.

Thorax about 1·5 times as long as broad. Pronotal collar sharply margined almost throughout, behind this mainly shiny with only traces of weak alutaceous sculpture. Mesoscutum about 2·2 times as broad as long, rather dull, moderately finely but quite strongly reticulate. Scutellum fully as long as the mesoscutum, distinctly broader than long, about as strongly reticulate as the mesoscutum. Propodeum about two thirds as long as the scutellum ; median area about 1·5 times as broad as long ; median carina fairly distinct ; plicae fairly sharp throughout ; panels of median area finely reticulate ; nucha coarsely and strongly so, occupying fully half the length of the propodeum ; callus moderately thickly pilose, with a few hairs above the supracoxal flange. Fore wing with basal cell and basal vein virtually bare ; speculum open below ; marginal vein 1·45 times as long as the stigmal vein ; postmarginal vein slightly shorter than the marginal.

Gaster ovate, 1·4 times as long as broad, about as long and as broad as the thorax, acute apically ; basal tergite occupying about half the total length ; last tergite slightly shorter than its basal breadth ; ovipositor sheaths projecting slightly beyond the tip of the last tergite.

♂. Unknown.

Holotype ♀. ENGLAND : Oxfordshire, Bald Hill, near Lewknor, 8.ix.1957 (*Graham*), in Graham collection.

A very distinct species, recognizable by its notably transverse head, shiny and sharply margined pronotal collar, relatively dull and strongly reticulate mesoscutum and scutellum, transverse funicular segments, and the dark colour of the body.

It resembles the American species *viridescens* (Walsh) in the position of the antennal toruli, the shiny and sharply margined pronotal collar, and some other characters ; but *viridescens* has the head (Text-fig. 611) hardly more than twice as broad as long, malar space slightly more than half the length of an eye, antennal scape as long as an eye and reaching the level of the vertex, funicle proximally not stouter than the pedicellus, its segments, except the sixth, not transverse, and differs also in other small details.

Biology. Unknown.

Eupteromalus germanicus sp. n.

(Text-fig. 636)

♀. Head and thorax dull greenish varied with bronze ; gaster bronze-black with some weak greenish reflections. Mandibles reddish with darker teeth. Antennal scape testaceous, darker apically ; pedicellus testaceous, infuscate dorsally ; flagellum fuscous, slightly paler beneath. Coxae concolorous with the thorax ; remainder of legs testaceous ; the femora tend to be brownish medially, whilst the tibiae have a broad brownish band before the middle. Tegulae and wing-venation testaceous ; wings hyaline. Length 2·5–2·8 mm.

Head 1·1–1·15 times as broad as the mesoscutum, in dorsal view similar to that of *submarginatus* (Text-fig. 621) twice as broad as long ; temples somewhat more than one third as long as the eyes, not strongly convergent ; POL about 1·4 OOL. In front view the head is subtrapeziform, broadest above the middle and narrowing ventrad, about 1·25 times as broad as high ; genae very slightly buccate, malar space not quite half the length of an eye. Left mandible with 3 teeth, right mandible with 4. Antennae (Text-fig. 636) with lower edge of toruli slightly above the ventral edge of the eyes ; combined length of pedicellus and flagellum

distinctly less than the breadth of the head ; scape slightly shorter than an eye, but reaching the level of the median ocellus ; pedicellus twice as long as broad, about equal in length to the anelli plus the first funicular segment ; flagellum slightly clavate ; funicle stout, proximally slightly stouter than the pedicellus ; funicular segments 1 and 2 subquadrate, 3–6 slightly transverse ; clava about twice as long as broad, slightly shorter than the combined length of the three preceding funicular segments ; sensilla of flagellum fairly numerous.

Thorax 1·5–1·6 times as long as broad. Pronotal collar rather weakly and irregularly margined except at the sides, reticulate with a narrow smooth strip along its hind margin. Mesoscutum twice as broad as long, finely reticulate. Scutellum practically as long as the mesoscutum, very finely reticulate. Propodeum sloping at only a moderate angle relative to the plane of the mesoscutum and scutellum, medially about three quarters the length of the scutellum ; its median area somewhat broader than long ; nucha occupying somewhat less than half the length of the propodeum ; plicae and median carina sharp, the latter sometimes extending on to the nucha for a short distance ; callus thickly haired. Fore wing about 2·3 times as long as broad ; basal cell, basal vein, and proximal part of cubital vein, bare, basal cell and speculum open below ; marginal vein about 1·4 times as long as the stigmal vein ; postmarginal vein slightly longer than the marginal.

Gaster nearly as long as head plus thorax, long-ovate, about as broad as the thorax, 1·8–2 times as long as broad, acute apically ; basal tergite occupying slightly more than one third of the total length, with several rather conspicuous hairs ; the three following tergites smooth, bare except at the sides ; last tergite slightly shorter than its basal breadth ; tips of ovipositor sheaths just visible in dorsal view.

♂. Differs from the ♀ as follows:

Body with brighter green tints ; antennae testaceous with the funicle and clava slightly darker than the rest ; legs paler, not brownish-marked.

Antenna : funicle slightly less stout, proximally not thicker than the pedicellus, its segments quadrate, except the sixth which is slightly transverse, sometimes the fifth is very slightly so. Fore wing with ratio of lengths of marginal vein to stigmal vein a little less than in the female.

Gaster almost circular, flattened ; much shorter, though broader, than the thorax ; basal tergite occupying half the total length, the remaining tergites very strongly transverse.

Holotype ♀. GERMANY : Berlin, reared 1956 from *Hyponomeuta evonymella* L., in Hope Department, University Museum, Oxford.

Paratypes. Same data, 1 ♂, 1 ♀, in Hope Department, Oxford ; Germany : Kitzeberg, 1 ♀, 5.i.1932, reared from *Apanteles glomeratus* (L.), on *Pieris brassicae* (L.) (*H. Blunck*), in BM(NH).

The female is very near to that of *acuminatus* sp. n., but differs chiefly in the shape of its head, which is less broad relative to the mesoscutum, less transverse, with longer temples. The antennae are inserted a little lower on the head, and have a slightly shorter scape. The gaster is not acuminate apically and its last tergite is slightly shorter than its basal breadth ; the first four tergites are smooth.

Eupteromalus acuminatus sp. n.

(Text-fig. 624)

Pteromalus submarginatus Thomson, 1878: 156, ♀, *ex parte*.

♀. Head and thorax dull bluish or dull olive-green, often with some bronze reflections dorsally. Antennae blackish ; scape with at least its proximal third testaceous, sometimes only its apex infuscate. Coxae concolorous with the thorax ; legs otherwise testaceous or reddish with the tips of the tarsi brownish ; knees, tips of the tibiae, and bases of the tarsi,

usually paler. Wings subhyaline ; venation mainly testaceous, the parastigma and stigma sometimes slightly darker. Length 2–3·3 mm. Head 1·2–1·3 times as broad as the mesoscutum, in dorsal view (Text-fig. 624) 2·03–2·15 times as broad as long ; temples from one quarter to nearly one third as long as the eyes, rather straight ; POL 1·2–1·45 OOL. Eyes separated by 1·2–1·35 times their length. Malar space 0·4–0·45 the length of an eye. Left mandible with 3 teeth, right mandible with 4. Antenna with lower edge of toruli distinctly above level of ventral edge of eyes ; scape as in *peregrinus* sp. n., but sometimes reaching the middle of the median ocellus ; combined length of pedicellus and flagellum distinctly less than breadth of head ; pedicellus about twice as long as broad, nearly or quite as long as anelli plus first funicular segment ; flagellum fairly stout, only slightly clavate ; funicle proximally slightly stouter than the pedicellus ; proximal segments of funicle quadrate in small specimens, up to 1·3 times as long as broad in large ones, sixth, and occasionally fifth and fourth, segments very slightly transverse ; the first segment as long as, or slightly longer than, the second.

Thorax 1·6–1·65 times as long as broad. Pronotal collar weakly margined (the margin irregular, at most sharp over the middle third) its surface reticulate with a narrow smooth strip along the hind margin. Mesoscutum about twice as broad as long, finely reticulate, a little more coarsely in the middle posteriorly. Scutellum nearly or just as long as the mesoscutum, slightly broader than long, finely reticulate. Propodeum from two thirds to three quarters as long as the scutellum ; median area 1·15–1·4 times as broad as long, rather finely reticulate, the nucha rather more coarsely, occupying slightly less than half the total length ; plicae and median carina sharp, the latter extending for a short distance on to the nucha ; callus moderately thickly pilose, the hairs extending along the hind margin, above the supracoxal flange, as far as the sides of the nucha. Fore wing rather narrow, about 2·5 times as long as broad ; basal cell, basal vein, and proximal portion of cubital vein, bare ; marginal vein 1·5–1·75 times as long as the stigmal vein ; postmarginal vein usually slightly shorter than, occasionally as long as, the marginal.

Gaster long-ovate, at least somewhat longer than the thorax and sometimes as long as head plus thorax, slightly broader than the thorax, 1·75–2 times as long as broad, slightly acuminate apically ; basal tergite occupying one third or (usually) rather more than one third of the total length, smooth ; the three following tergites nearly always with at least some trace of alutaceous sculpture at their bases ; last tergite as long as or slightly longer than its basal breadth ; tips of ovipositor sheaths just visible in dorsal view.

Of the species previously described, the female of *acuminatus* sp. n. comes near to that of *americanus* Gahan, which differs as follows : both mandibles with 4 teeth ; antennae inserted only very slightly above the ventral edge of the eyes ; scape nearly as long as an eye, reaching the vertex ; funicle proximally not stouter than the pedicellus ; median carina of propodeum less strong, sometimes very weak or even absent, the nucha a little shorter. The characters by which it differs from other species of the genus may be seen by reference to my key to females.

♂. Differs from the ♀ as follows :

Length 1·7 mm. Head in dorsal view twice as broad as long. Eyes separated by 1·25–1·3 times their length. Genae more strongly buccate ; malar space half the length of an eye. Antennae inserted higher, their toruli midway between the anterior margin of the clypeus and the median ocellus ; scape nearly as long as an eye, reaching above the vertex ; combined length of pedicellus and flagellum about 1·25 times the breadth of the head ; pedicellus hardly twice as long as broad, about as long as the first funicular segment ; flagellum nearly filiform, slightly stouter than the pedicellus ; all funicular segments about 1·5 times as long as broad ; clava about 3·5 times as long as broad, somewhat longer than the two preceding funicular segments together, pointed apically ; flagellum clothed with hairs which stand out at an angle

of 30°–40°, the length of these hairs slightly less than the breadth of the segments that bear them ; sensilla sparse.

Propodeum rather longer, its median area hardly broader than long. Upper surface of basal cell of fore wing with a few scattered hairs.

Gaster subcircular, much shorter than the thorax ; basal tergite occupying more than half the total length.

Holotype ♀. SWEDEN : Dalarne, in coll. Thomson under the name *submarginatus*, in Universitetets Zoologiska Institutionen, Lund. The holotype is pinned and is labelled " Dlc " [Dalecarlia=Dalarne] and " Bhn " [Boheman].

Paratypes. SWEDEN : Skåne, Hälsingborg, 2 ♀ ; Lund, 2 ♀, in coll. Thomson, Universitetets Institutionen, Lund, under the name *submarginatus*. IRELAND : Co. Kildare, marsh near Newbridge, 1 ♂, 1 ♀, 22.vi.1953 (*A. W. Stelfox*), in Graham collection.

Biology. Unknown.

Eupteromalus peregrinus sp. n.

(Text-fig. 626)

Pteromalus nidulans Förster MS., [*ex parte*].
Pteromalus egregius Howard & Fiske, 1911 : 69, 87, 262–263.
Pteromalus nidulans Kurdjumov, 1912 : 228–229, [*ex parte*] [*nec* Thomson, 1878].
Eupteromalus nidulans Gahan, 1914 : 163 [*nec* Thomson].
Eupteromalus nidulans Proper, 1931 : 360–375 [*nec* Thomson].
Eupteromalus hemipterus Burks, *in* Krombein *et al.*, 1958 : 77 [nec *Pteromalus hemipterus* Walker, 1836].
Eupteromalus hemipterus Peck, 1963 : 684–686 [*nec* Walker].

♀. Head and thorax deep blue-green or dark blue, sometimes with weak bronze reflections on dorsum of thorax ; gaster with a blue or green tinge, its disc sometimes bronze. Antennal scape either wholly testaceous, or infuscate distally ; pedicellus usually pale beneath ; rest of antenna fuscous. Coxae concolorous with the thorax ; femora usually more or less infuscate, sometimes only at their base, sometimes mainly ; tibiae sometimes more or less infuscate medially. Wings hyaline, venation testaceous. Length 1·8–2·7 mm.

Structurally most resembles *acuminatus* sp. n. and differs only as follows :

Head (Text-fig. 626) only 1·07–1·15 times as broad as the mesoscutum. POL 1·3–1·55 OOL. Malar space 0·47–0·5 the length of an eye. Antenna with scape 0·85–0·86 the length of an eye, hardly reaching the level of the median ocellus ; proximal segments of funicle subquadrate, the distal segments slightly transverse ; in small specimens the first segment is a little shorter than the second, in larger specimens it is as long as or even very slightly longer than the second. Median area of propodeum 1·13–1·25 times as broad as long ; median carina usually strong but occasionally weak. Fore wing with marginal vein only 1·18–1·45 times as long as the stigmal vein ; postmarginal vein slightly longer than the marginal. Gaster somewhat longer than the thorax but not quite as long as head plus thorax, 1·7–2 times as long as broad, acute but not acuminate apically ; basal tergite and the two or three following tergites entirely smooth ; last tergite slightly shorter than its basal breadth.

The female differs from that of *exiguus* (Walker) mainly in its straighter temples, as seen in dorsal view, relatively larger first funicular segment, and greater average size. From that of *maurus* sp. n. it differs in its straighter temples, shorter marginal vein, relatively longer gaster and greater average size, and in having 3 teeth in the left mandible. From that of *hemipterus* (Walker) it differs in its straighter temples, shorter marginal vein and longer postmarginal,

slightly longer malar space and rather smaller eyes ; the median area of the propodeum is rather less transverse, its median carina usually strong, rarely weak, and the plicae rather sharper throughout ; the legs are on the average darker.

♂. Differs from the ♀ as follows :

Body green, blue-green or bronze-green ; antennae, and legs, not counting coxae, testaceous, the pedicellus and flagellum sometimes brown, the femora occasionally brownish proximally. Length 1·3–1·9 mm. Eyes slightly larger, separated by only 1·1–1·25 times their length ; malar space 0·4–0·47 the length of an eye. Antennal scape slightly shorter than an eye, reaching about to the level of the middle of the median ocellus ; combined length of pedicellus and flagellum slightly less than breadth of head. Gaster subcircular ; shorter, but a little broader, than the thorax.

The male differs from that of *exiguus* in its straighter temples, slightly larger eyes and shorter malar space, relatively larger first funicular segment, and rather greater average size. It differs from that of *hemipterus* in its straighter temples, slightly larger eyes and in being macropterous.

Holotype ♀. ENGLAND : Kent, Romney Marsh, reared iii.1920 " from nest of Brown-tail Moth " [*Euproctis phaeorrhoea* (Don.) (=*chrysorrhoea* auctt. *nec* L.)], (*F. W. Theobald*), in BM(NH).

Paratypes. Same data as holotype ♀, 2 ♂, 3 ♀ ; Cambridgeshire, Cambridge, 2 ♂, 2 ♀, from "hibernating nest of *Euproctis chrysorrhoea*", presented by Agricultural Research Council ; U.S.S.R., Voronezh, 1 ♂, 1 ♀, 29.iv.1927, from " Euproctis chrysorrhoea " (also determined as *nidulans*), the foregoing paratypes in BM(NH).

GERMANY : unlocalized, 1 ♂, 1 ♀, from Förster coll., and determined by him as " nidulans Foerst.", in Hope Department, University Museum, Oxford.

The species mentioned in the North American literature under the names *egregius*, *nidulans*, and *hemipterus*, and which was introduced into the U.S.A. from Europe in 1905 to aid in the control of the brown-tail moth, *Euproctis phaeorrhoea* (Don.) [=*chrysorrhoea* (L.)], appears to be the present one. It was identified as *egregius* Förster on the basis of a specimen named by that author in Sichel's collection in Paris (see Howard and Fiske, 1911 : 69), but this was a misidentification. Later it was misidentified as *nidulans* (Thomson) by Gahan (1914) and as *hemipterus* (Walker) by Burks (*in* Krombein *et al.*, 1958). It has been cited several times under one or other of these three names ; for a comprehensive list of references see Peck (1963). I have not seen any of the material mentioned in these references, but in view of the fact that this was originally reared from the brown-tail moth, and that Proper's figure (1931, fig. 1) of the female agrees very well with my European specimens of *peregrinus* sp. n., I have no doubt that all are the same species.

EUROPE, widely distributed ; CANADA, U.S.A. (introduced).

Biology. Most of the type-specimens of *peregrinus* sp. n. were reared from webs formed by the hibernating larvae of the brown-tail moth, *Euproctis chrysorrhoea* (L.), but more precise data is not available. Much information, however, has been published on the *Eupteromalus* parasite of this moth introduced into North America, which I have concluded above to be the same as *peregrinus*. Proper (1931) gave a summary to that date of the history of its introduction and the known facts regarding

its biology. In 1905–6 and succeeding years large numbers of the parasite were imported into Massachusetts and it soon spread over most of the area infested by the brown-tail moth. In 1920 the satin moth, *Stilpnotia salicis* L., was discovered in Massachusetts where it soon spread over a considerable area, and in 1926 the *Eupteromalus* was found to be also attacking this species. In both cases its life history is similar. The larvae of the *Eupteromalus* feed externally on the small hibernating larvae of the hosts during the autumn, then when fully fed spend the winter within the hibernation web of the hosts. Pupation occurs in the web in the following spring, and adults emerge in May and early June. Females of this overwintering generation may then attack the cocoons of some of the primary parasites of the moths, such as *Apanteles* spp. and *Meteorus versicolor* Wesm. The latter has two generations, both of which may be parasitized by the *Eupteromalus*. There may be as many as two generations of the *Eupteromalus* in the year upon primary parasites of the moth in spring, and up to three generations upon the moth itself in the autumn. On the other hand there may be no reproduction upon the primary parasites, and only one or two generations upon the moth in the autumn. Under laboratory conditions some females lived for as long as four months ; if the same holds good under natural conditions, then some females of the overwintering generation would be able to parasitize the young larvae of the moths in autumn. Usually only one *Eupteromalus* emerges from each moth larva, but sometimes two or three. In one case seven *Eupteromalus* were observed to develop to maturity on a single larva of *Apanteles melanoscelus* (Ratz.). Other details of the biology of this Chalcid, including descriptions of the early stages, were given by Proper (1931).

I am using the name *chrysorrhoea* (L.) for the brown-tail moth, a host of *Eupteromalus peregrinus* sp. n., following Continental lepidopterists and the opinion of Collenette (1947 : 259) who examined the syntypes of *chrysorrhoea* in the Linnean collection.

Kurdjumov (1912 : 228–229) noted considerable variation in the number of teeth in the mandibles in the species which he identified as *nidulans*, some reared from *Euproctis chrysorrhoea* ; most specimens had three teeth in the left mandible, four in the right one, some four teeth in both mandibles, whilst one female had five in both mandibles. I have not examined enough material of *peregrinus* sp. n. to know whether the mandibles are variable. On the whole, however, the dental formula in other species of this genus appears to be reasonably constant.

Eupteromalus micropterus (Lindeman)

(Text-figs. 616, 642)

Merisus intermedius var. *microptera* Lindeman, 1887 : 182, ♂ ♀.
Baeotomus coxalis Ashmead, 1897 : 83, ♂ ♀.
Eupteromalus arvensis Kurdjumov, 1914 : 3–4, ♂ ♀.
Eupteromalus micropterus (Lindeman) Gahan, 1933 : 86–89, ♂ ♀.
Eupteromalus micropterus (Lindeman) ; Nikol'skaya, 1937 : 10–11, ♂ ♀.

Type material (not seen).

Merisus intermedius var. *microptera* Lindeman. Location of original material not known. Gahan (1933 : 87–88) mentioned that the U.S.N.M. possessed 5 ♂ and 1 ♀ labelled " *Merisus intermedius* var. *micropterus* Lindeman " ; Howard had assured him that these specimens had been received from Lindeman himself, and that the label was in Lindeman's handwriting. Howard believed that they were part of the original material. I follow Gahan as first reviser of the species. If no further material is discovered, a lectotype might be selected from that in the U.S.N.M.

Baeotomus coxalis Ashmead. Syntypes, France, 1 ♀ and 4 ♂, in U.S.N.M.; they were compared with the above specimens of *Merisus intermedius* var. *microptera* by Gahan, who declared them to be identical (1933 : 88).

Eupteromalus arvensis Kurdjumov. Location of syntypes (U.S.S.R.: Poltava, Moscow, Kiev) not known, possibly in Leningrad. Gahan (1933 : 88) considered that his available material of *micropterus* (Lindeman) agreed completely with the description of *arvensis*, which he therefore put in synonymy. I agree with Gahan's opinion.

♀. Extremely close to that of *peregrinus* sp. n., but differs as follows : head in dorsal view (Text-fig. 616) rather more transverse, 2·2–2·35 times as broad as long and 1·2–1·25 times as broad as the mesoscutum ; antennal scape a little longer, 0·9–0·95 the length of an eye, reaching or virtually reaching the level of the vertex ; proximal segments of funicle sometimes a little longer than broad ; median carina of propodeum weak or absent ; antennal scape fuscous with its base, or at most its basal half, testaceous ; femora and tibiae usually testaceous, the femora sometimes slightly infuscate.

♂. Kurdjumov, when describing *arvensis* (now regarded as a synonym of *micropterus*) stated that males with fully-developed wings exist. I have seen only the brachypterous form ; apart from the shortened wings, this is extremely close to the male of *peregrinus* sp. n., but has the combined length of pedicellus and flagellum about equal to the breadth of the head ; it is also very close to the male of *hemipterus* (Walker) but seems to have a slightly more transverse head, with the temples rather less rounded ; the funicular segments tend to be a little longer. Additional material of *micropterus* is desirable in order to study its range of variation.

? BRITAIN ; FRANCE, U.S.S.R. In U.S.N.M. are some specimens labelled as having come from Ohio, U.S.A.; but Gahan (1933 : 88) suspected that an error might have been made in labelling, and that these specimens may have come from Europe. Miss Ormerod (1887 : 317) recorded specimens of *Merisus intermedius* var. *micropterus* from Scotland, which had been reared from puparia of the Hessian fly and identified by Lindeman himself. I cannot locate these specimens and so am unable to check the record ; I have seen no other British specimens.

Biology. Parasite of Diptera Cecidomyiidae, e.g., *Mayetiola destructor* (Say) (Lindeman, Ashmead, Kurdjumov) and *M. avenae* (Marchal) (Marchal, 1897). I have examined specimens reared from the former host in the U.S.S.R. Nikol'skaya (1935 : 11) mentioned that it had been obtained in 1924, at Poltava, U.S.S.R., from seeds of lucerne. Details of its biology are apparently unknown.

Eupteromalus tigasis (Walker)

(Text-fig. 617)

Pteromalus Tigasis Walker, 1839 : 233, ♂.
Eupteromalus tigasis (Walker) Graham, 1956*b* : 255, ♂.

Type material. Lectotype male designated by Graham (1956*b*).

The males in a series of *Eupteromalus* from Holland in BM(NH) agree very well with the lectotype of *tigasis* ; I believe all these specimens to be conspecific and the following redescription is drawn from them.

♀. Extremely close to that of *micropterus* (Lindeman) but has the head in dorsal view (Text-fig. 617) slightly less transverse, 2·08–2·15 times as broad as long ; the femora in three of the specimens seen are mainly brownish or fuscous, and the tibiae are sometimes infuscate medially. The host of *micropterus* is a Dipteron, that of *tigasis* a Lepidopteron. *E. tigasis* differs from *peregrinus* sp. n. in having the antennal scape slightly longer, 0·9–0·96 the length of an eye, reaching the vertex or even slightly above it ; median area of propodeum slightly more transverse, 1·35–1·45 times as broad as long ; postmarginal vein not longer than the marginal, the latter 1·5–1·6 times as long as the stigmal vein.

♂. Differs from that of *micropterus* in being macropterous, and in its host. It differs from that of *peregrinus* sp. n. in having the antennal scape slightly longer, the combined length of pedicellus and flagellum fully equal to the breadth of the head ; postmarginal vein not longer than the marginal.

ENGLAND : Isle of Wight (Lectotype ♂, coll. Walker). HOLLAND : Wieringermeer, 3 ♂, 1 ♀, 25.viii.1937, 1 ♂, 3 ♀, 10.ix.1937, all reared from *Bucculatrix maritima* Stainton (*D. C. Geisjkes*) ; specimens in BM(NH). Walker's original material was captured in September, in the Isle of Wight, where the host cited above is known to occur.

Eupteromalus caricicola sp. n.

(Text-figs. 614, 635)

♀. Head and thorax olive-green, here and there verging towards brassy and bluish ; gaster with reflections of similar tints, particularly at the base and apex. Mandibles reddish with darker teeth. Antennae fuscous ; the proximal half or rather more of the scape reddish ; pedicellus slightly reddish beneath and at its apex ; clava slightly reddish beneath. Coxae concolorous with the thorax, except their tips and the internal aspect of the fore coxa, which are bright testaceous ; remainder of the legs bright or reddish testaceous, the knees, tips of the mid and hind tibiae, and the bases of the mid and hind tarsi, paler. Tegulae mainly testaceous ; wings hyaline or faintly yellowish, venation pale testaceous. Length 1·9–2·2 mm.

Head in dorsal view (Text-fig. 614) slightly more than twice as broad as long ; temples about one quarter as long as the eyes ; POL 1·3–1·4 OOL. In front view the head forms a regular oval, the genae being moderately buccate, and is broader than high, ratio about 1·25 : 1. Eyes rather large, separated by about 1·3 times their own length ; malar space slightly less than half the length of an eye. Mandibles moderate-sized, both with 4 teeth. Antennae (Text-fig. 635) inserted slightly nearer to the anterior margin of the clypeus than to the median ocellus, but distinctly above the ventral edge of the eyes ; scape slightly shorter than an eye, but reaching to or distinctly above the level of the vertex ; combined length of pedicellus and flagellum equal to the breadth of the head ; pedicellus twice as long as broad, as long as anelli plus first funicular segment ; flagellum only moderately clavate ; funicle proximally not stouter than the pedicellus, its segments very slightly longer than broad, except the fifth and sixth which are quadrate, or the sixth very slightly transverse ; clava about 2·5 times as long as broad, slightly shorter than the combined length of the three preceding funicular segments ; sensilla of funicle not very numerous.

Thorax about 1·6 times as long as broad. Pronotal collar margined throughout, the margin

sharp, especially medially ; behind this margin the surface is relatively smooth and shiny, except at the sides. Mesoscutum about twice as broad as long, convex, finely reticulate, more coarsely in the middle posteriorly. Scutellum fully as long as the mesoscutum. Propodeum medially about three quarters as long as the scutellum ; its median area slightly broader than long, moderately finely reticulate, the nucha rather more coarsely ; nucha occupying slightly less than half the length of the propodeum ; median carina distinct ; plicae sharp ; callus moderately thickly haired. Fore wing about 2·4 times as long as broad, far surpassing the tip of the gaster ; basal cell, basal vein, and proximal portion of cubital vein, bare, basal cell and speculum open below ; marginal vein about 1·5–1·6 times as long as the stigmal vein ; post-marginal vein subequal in length to the marginal

Gaster ovate, about as long and as broad as the thorax, about 1·6 times as long as broad ; acute but not acuminate apically ; basal tergite occupying rather less than half the total length, its sides with a few hairs only ; last tergite distinctly shorter than its basal breadth ; ovipositor sheaths projecting very slightly.

♂. Differs from the ♀ as follows :

Antennal scape reddish, darker at the apex ; pedicellus sometimes more extensively pale ; mid coxa more or less reddish. Eyes larger, separated by about 1·2 times their length. Malar space half or virtually half the length of an eye. Antenna with combined length of pedicellus and flagellum slightly greater than the breadth of the head ; scape almost as long as an eye ; flagellum more slender, only very slightly clavate ; funicular segments slightly longer than broad, except the sixth which is quadrate ; flagellum clothed with hairs which stand out at an angle of about 30°, the length of these hairs slightly less than the breadth of the segments that bear them. Marginal vein 1·5–1·65 times as long as the stigmal vein. Gaster almost circular, flattened, distinctly shorter than the thorax, but slightly broader ; basal tergite occupying half the total length, the following tergite (second) about half as long as the basal tergite, remaining tergites retracted and very strongly transverse.

The female is very near that of *maurus* sp. n., but has the funicular segments of the antenna relatively longer, the first segment not shorter than the second ; malar space a little shorter ; size greater ; flagellum rather more slender. In female *maurus* the combined length of pedicellus and flagellum is usually slightly less than, occasionally equal to, the breadth of the head.

The female of *caricicola* differs from that of *exiguus* (Walker) in having 4 teeth in both mandibles ; pronotal collar sharply margined ; malar space a little shorter ; antennae differing in the same feature as those mentioned as distinguishing it from *maurus*. Most females of *exiguus* are smaller than those of *caricicola*.

Holotype ♀. ENGLAND : Oxfordshire, Otmoor, 9.ix.1955 (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. Same locality as holotype, 1 ♀, 28.viii.1955, 1 ♂, 17.ix.1955, 1 ♀, 24.ix.1955, 1 ♀, 6.viii.1956 (*Graham*), in Graham collection. SWEDEN : Skåne, Hälsingborg, 1 ♀ in the syntypic series of *submarginatus* (Thomson), in Thomson collection, Lund.

Biology. Unknown ; the British specimens were captured in a Caricetum.

Eupteromalus sp. indet. D

ENGLAND : Oxfordshire, Otmoor, 1 ♂, 12.vi.1956 (*Graham*). Appears to be near *caricicola*.

Eupteromalus exiguus (Walker)

(Text-figs. 639, 645)

Meraporus exiguus Walker, 1834 : 301, ♂.
Eupteromalus exiguus (Walker), Graham, 1957*d* : 218, ♂.

Type material. Lectotype designated by Graham (1957*d*) ; as it is the only extant specimen, it may actually be a holotype.

♀. Head and thorax coloured as in *hemipterus* (Walker), but sometimes darker, varying to olive- or bluish black. Legs on the average darker, the femora usually more or less infuscate, sometimes mainly so, the tibiae sometimes infuscate medially. Length 1·3–2 mm.

Malar space half, or virtually half the length of an eye ; eyes rather smaller than in *hemipterus*, separated by 1·3–1·4 times their length. Antenna (Text-fig. 639) with first funicular segment at least very slightly shorter than the second, sometimes almost anelliform, slightly to quite distinctly transverse ; the middle segments of the funicle are sometimes quadrate, but usually all the segments are slightly transverse.

Pronotal collar usually weakly and irregularly margined, occasionally the transverse carina is sharp over about the middle third. Median area of propodeum 1·2–1·32 times as broad as long. Macropterous : fore wing with marginal vein 1·4–1·6 times as long as the stigmal vein ; postmarginal vein usually as long as, or even very slightly longer than, the marginal, occasionally slightly shorter.

Gaster ovate, 1·15–1·4 times as long as the thorax, 1·55–1·9 times as long as broad.

The female differs from that of *hemipterus* (Walker) in its relatively shorter first funicular segment, rather smaller eyes and longer malar space, and relatively shorter marginal vein.

♂. Colour as in ♀, but femora usually testaceous, occasionally slightly infuscate proximally ; flagellum testaceous or brownish. Malar space half, or slightly more than half, the length of an eye ; eyes separated by 1·37–1·5 times their length. Antennal scape nearly or quite as long as an eye, reaching to or slightly above the level of the vertex ; first funicular segment from half to three quarters as long as the second, slightly to very distinctly transverse, in the smallest specimens virtually anelliform. Fore wings fully developed. Gaster subcircular, hardly as long as the thorax. Length 1–1·4 mm. Head, Text-fig. 645.

The male differs from that of *hemipterus* in being macropterous, and in having rather smaller eyes and longer malar space.

ENGLAND : " near London " (Walker, 1834 : 301) ; Middlesex, Southgate, 2 ♀, 20.viii.1964, 2 ♂, 1 ♀, 27.viii.1964 (*Graham*).

Biology. Unknown ; the Southgate specimens were swept from grassy habitats.

Eupteromalus maurus sp. n.

(Text-figs. 613, 629)

♀. Closely resembles that of *exiguus* (Walker) but differs as follows :

Both mandibles with 4 teeth ; marginal vein 1·55–1·75 times as long as the stigmal vein, postmarginal vein at least very slightly shorter than the marginal ; gaster relatively shorter, 1·0–1·05 times as long as the thorax and 1·35–1·55 times as long as broad. Head and thorax on the average darker, bluish black or with at most a weak olive tinge on parts of their dorsal surface. Pronotal collar tending to be fairly regularly and distinctly margined (the transverse

carina sometimes sharp except just at the sides) its surface usually extensively shiny. Length 1·2–1·75 mm.

♂. Unknown.

Holotype ♀. SWEDEN : Skåne, Falsterbo, 27.vii.1959, swept from sand-dune vegetation (*Graham*), in Graham collection.

Paratypes. Same data as holotype, 5 ♀; ENGLAND : Berkshire, Wytham, 1 ♀, 12.vii.1956, swept in a meadow between Wytham Wood and the River Thames (*Graham*), all in Graham collection.

Eupteromalus hemipterus (Walker)

(Text-figs. 628, 641)

Pteromalus apicalis Walker, 1836 : 196, ♀ [*nec* Nees, 1834].
Pteromalus hemipterus Walker, 1836 : 196–197, ♂ ♀.
Pteromalus pedestris Förster, 1861 : 36, ♂ ♀.
Pteromalus nidulans (Förster MS.) Thomson, 1878 : 155–156, ♂ ♀ [*ex parte*].
Eupteromalus hemipterus (Walker) Kurdjumov, 1913 : 13.
Eupteromalus nidulans (Thomson) Kurdjumov, 1913 : 13.
Eupteromalus pedestris (Förster) Kurdjumov, 1913 : 13.
Eupteromalus hemipterus (Walker) ; Hårdh, 1950 : 92–93.
Eupteromalus apicalis (Walker) Graham, 1956*b* : 255.
Eupteromalus apicalis (Walker) ; Delucchi, 1958*a* : 56.

Type material. *Pteromalus apicalis* Walker and *P. hemipterus* Walker. Lectotypes designated by Graham (1956*b* : 255).

Pteromalus pedestris Förster. Syntypes, 6 specimens in Förster collection, Naturhistorisches Museum, Vienna ; lectotype designated by Delucchi (1958*a* : 56), who synonymized the species with *apicalis* (Walker).

Pteromalus nidulans Thomson. Syntypes, 22 specimens representing at least 3 different species (including 5 ♂ of *Meraporus* !). None of the specimens agrees absolutely perfectly with the description. Most of the females, and some of the males, however, are the same as *hemipterus* (Walker), which Thomson (1878 : 155) cited as a probable synonym of *nidulans*. Thomson (ibid.) included the brachypterous form in his concept of the range of variation of *nidulans*, so it is clear that the species here called *hemipterus* was uppermost in his mind when he described *nidulans*. Most of the female syntypes have damaged antennae, but one (on the last pin in the series) is a perfect specimen of the brachypterous form ; I designate this specimen, which is labelled " ♀ " and " Lund ", as LECTOTYPE. It is particularly important to have a perfect specimen as lectotype because *nidulans* is the type-species of the genus.

The species identified as *nidulans* Thomson by Masi (1908 : 122–123, figs. 25, 26) cannot have been the same as the true *nidulans*. Masi's figure 25 of the female shows the marginal vein as only slightly longer than the stigmal vein, and the eyes relatively small. I have not seen his specimens and so cannot be sure whether his *nidulans* is identical with any of the other species mentioned in the present work. The species identified by several American authors as *nidulans* was introduced into

the U.S.A. in 1905, from Europe, and might be the same as Masi's *nidulans* ; it is not the true *nidulans* [=*hemipterus* (Walker)].

As some confusion has arisen over the identity of *hemipterus*, I give a redescription of the species :

♀ (macropterous form).—Green to blue- or bronze-green. Antennal scape fuscous, more or less testaceous proximally ; pedicellus black or fuscous ; flagellum brown to fuscous, often rather paler distally and beneath. Coxae concolorous with the thorax ; legs otherwise testaceous with the tips of the tarsi brown ; femora sometimes more or less infuscate. Tegulae testaceous to brown. Wings hyaline or faintly yellowish ; veins yellowish testaceous. Length 1·6–2·3 mm.

Head in dorsal view (Text-fig. 628) 2–2·1 times as broad as long ; temples from one fifth to nearly one quarter as long as eyes, converging strongly ; ocelli very small, POL 1·3–1·5 OOL. Head in frontal view transversely oval with the vertex rather strongly arched, genae converging strongly though very slightly buccate. Eyes 1·3–1·35 times as long as broad, separated by only 1·1–1·25 times their length, their inner orbits tending to converge slightly ventrad. Malar space 0·35–0·4 the length of an eye. Mandibles small, the left one with 3 teeth, right with 4. Antennae inserted distinctly above the level of the ventral edge of the eyes, though their toruli are slightly nearer to the anterior margin of the clypeus than to the median ocellus ; combined length of pedicellus and flagellum slightly less than breadth of head ; scape fully three quarters as long as an eye, reaching nearly to level of vertex ; pedicellus nearly twice as long as broad, slightly longer than anelli plus first funicle segment ; flagellum proximally about as stout as the pedicellus, thickening somewhat distad ; first funicular segment usually as long as the second but sometimes very slightly shorter, subquadrate ; segments 2–4 often quadrate but sometimes very slightly transverse, 5 and 6 slightly transverse ; clava 2·1–2·5 times as long as broad, nearly as long as the three preceding funicular segments together ; sensilla rather sparse, especially on the proximal segments of the funicle.

Thorax about 1·5 times as long as broad. Pronotal collar weakly and irregularly margined or immarginate, usually with only a narrow shiny strip (sometimes absent) along its hind edge. Mesoscutum about twice as broad as long, finely reticulate ; notauli rather shallow. Scutellum about as long as mesoscutum, slightly broader than long, moderately convex, very finely reticulate, especially the frenum. Propodeum about three quarters as long as scutellum ; median area 1·25–1·5 times as broad as long ; median carina usually indicated, sometimes strong ; plicae distinct throughout, but sharp only posteriorly ; panels of median area finely though strongly reticulate, nucha more coarsely so, the latter occupying nearly half the length of the propodeum ; spiracles small, short oval, separated by slightly less than their length from the metanotum ; callus sparsely pilose, especially posteriorly where there are usually no (at most 2) hairs above the supracoxal flange. Legs rather short, not slender, the femora relatively stout. Fore wing 2·3–2·5 times as long as broad, reaching at least slightly beyond the tip of the gaster ; basal cell and basal vein bare or virtually so ; speculum open below ; marginal vein 1·8–2·25 times as long as the stigmal vein ; postmarginal vein distinctly shorter than the marginal.

Gaster ovate, acute apically, somewhat longer than thorax, as broad as or slightly broader than the latter, 1·6–2·1 times as long as broad ; basal tergite occupying slightly more than one third the total length ; last tergite slightly shorter than its basal breadth ; tips of ovipositor sheaths just visible in dorsal view ; tergites 3 (basal tergite), 4 and 5 smooth or with some very weak alutaceous sculpture along their bases, bare except laterally, 7 more or less alutaceous, 8 and 9 wholly so.

♀ (brachypterous form). Wings more or less shortened and narrowed, with their apical portion, beyond the stigmal vein, relatively shorter than in macropters ; marginal, stigmal, and postmarginal veins thickened, the stigma larger than in macropters. In specimens having the shortest wings, the forewings reach only to the middle of the gaster and may be fully 3 times as long as broad.

♂. Differs from the ♀ as follows :

Antennal scape often entirely testaceous ; pedicellus often pale beneath, or entirely so ; flagellum brownish-testaceous to fuscous. Length 1–1·75 mm.

Apparently always brachypterous. Fore wings reaching at most to about middle of gaster, sometimes hardly beyond the apex of the propodeum ; very narrow, with the marginal, stigmal and postmarginal veins thickened, stigma relatively large; sometimes the triangular area between the postmarginal and stigmal veins is sclerotized like the veins; apical portion of wing, beyond the stigmal vein, reduced, the apical margin usually rounded but sometimes subtruncate in specimens with exceptionally short wings.

Head in dorsal view (Text-fig. 641) 1·9–2 times as broad as long. Eyes separated by 1·3–1·35 times their length. Antennal scape reaching level of vertex or very slightly above it ; combined length of pedicellus and flagellum about equal to, or slightly greater than, the breadth of the head ; funicle cylindrical, hardly stouter than the pedicellus ; first funicular segment as long as or distinctly shorter than the second segment, quadrate to somewhat transverse ; following segments usually about quadrate, occasionally very slightly longer than broad, or slightly transverse ; clava 3·2–3·5 times as long as broad, hardly broader than the funicle, rather more pointed apically than in the female.

Gaster oval or, if the apical segments are retracted, subcircular or somewhat transverse, broader than the thorax.

EUROPE, possibly the whole, but only specimens from BRITAIN, IRELAND, SWEDEN, GERMANY, AUSTRIA, and CZECHOSLOVAKIA critically examined ; it appears to be one of the commonest species of the genus. The species recorded from North America under the name *nidulans* Thomson by several authors, and later as *hemipterus* (Walker) by Peck (1963 : 684–686) is misidentified ; there is no undoubted record of the true *hemipterus* from North America.

Biology. The following reared specimens are in the BM(NH). Sweden, Västergötland, Tiarp, 18.vii.1958, one female, from *Mayetiola destructor* (Say) (*A. Borg*). Switzerland, Zurich, 31.vii.1935, one male and one female, from pupa of *Chlorops taeniopus* Mg. [=*pumilionis* (Bjerk.)] (*K. Roos*). The record of Hårdh (1950) from *M. destructor* is probably correct. The hosts cited for *hemipterus* by Peck (1963 : 686) refer to another species (*peregrinus* sp. n.). On 15.vii.1959 I swept several specimens of *hemipterus* from lucerne (*Medicago sativa* L.) at Wytham, Berkshire ; these might have been attacking some host on this plant. Note that the allied species *micropterus* has been recorded from seeds of lucerne.

Eupteromalus sp. indet. E

ENGLAND : Berkshire, Wytham, 1 ♀, 31.vii.1958 (*Graham*). Might be a form of *hemipterus*, but the marginal vein seems too short for it to be within the range of variation of that species.

Eupteromalus sp. indet. F

IRELAND : Co. Wicklow, Manor Kilbride, 1 ♀, 18.vi.1953 ; coast near Bray, 1 ♀, 16.viii.1954 (*Graham*). Also very near *hemipterus* ; perhaps a form of it.

Eupteromalus sp. indet. G

ENGLAND : Lincolnshire, Tetford Hill, 1 ♂, 27.vii.1951 (*Graham*). Not associated with any ♀.

Eupteromalus scaposus sp. n.

(Text-fig. 637)

♀. Body green. Mandibles reddish with darker teeth. Antennal scape testaceous, fuscous distally ; pedicellus and flagellum dull testaceous, infuscate dorsally. Coxae concolorous with the thorax, except the inner aspect of the fore coxa, which is reddish ; remainder of legs bright testaceous with the lest segment of all the tarsi brown. Tegulae and wing-venation testaceous ; wings hyaline. Length 2·1 mm.

Head in dorsal view about twice as broad as its maximum length ; temples about one quarter the length of the eyes ; POL about 1·25 OOL. In front view the head forms an almost regular oval and is about 1·25 times as broad as high. Eyes separated by 1·35 times their length. Genae very slightly buccate, slightly less than half the length of an eye. Mandibles moderate-sized, the left one with 3, right with 4, teeth. Antennae (Text-fig. 637) inserted well above the ventral edge of the eyes though somewhat nearer to the anterior margin of the clypeus than to the median ocellus. Scape as long as an eye and reaching distinctly above the level of the vertex ; combined length of pedicellus and flagellum equal to the breadth of the head ; pedicellus about twice as long as broad, slightly longer than the anelli plus the first funicular segment ; flagellum distinctly clavate ; first funicular segment quadrate, slightly shorter and narrower than the second, the second to fifth segments slightly longer than broad, sixth subquadrate ; clava hardly more than twice as long as broad, about as long as two and a half of the preceding funicular segments ; sensilla of funicle relatively sparse.

Thorax elongate, about 1·8 times as long as broad. Pronotal collar weakly and irregularly margined in the middle only. Mesoscutum convex, fully twice as broad as long. Scutellum slightly shorter than the mesoscutum. Propodeum sloping only slightly relative to the plane of the mesoscutum and scutellum, medially only slightly shorter than the scutellum ; its median area about as long as broad ; median carina subobsolete ; nucha occupying rather less than half the length of the propodeum ; plicae sharp posteriorly, weak but just traceable anteriorly ; callus sparsely haired. Fore wing rather narrow, reaching the tip of the gaster ; basal cell, basal vein, and proximal part of the cubital vein bare, both the basal cell and the speculum being open below ; marginal vein nearly twice as long as the stigmal vein ; postmarginal vein nearly three quarters the length of the marginal.

Gaster slightly longer than head plus thorax, 2·2 times as long as broad ; basal tergite occupying about one third of the total length ; apically the gaster is slightly acuminate, the last tergite fully as long as its basal breadth ; tips of ovipositor sheaths just visible in dorsal view.

♂. Differs from the female as follows :

Antennae somewhat paler, more extensively testaceous. Length 1·5 mm. POL about 1·4 OOL. Eyes separated by 1·25 times their length. Antennal toruli about equidistant from the anterior margin of the clypeus and the median ocellus ; combined length of pedicellus and flagellum about 1·2 times the breadth of the head ; flagellum (Text-fig. 638) only slightly clavate ; funicular segments 2–5 rather more elongate, about 1·4 times as long as broad, 6 very slightly longer than broad ; clava 2·7–2·8 times as long as broad, nearly as long as the three preceding funicular segments together. Mesoscutum only about 1·75 times as broad as long. Fore wing about 2·75 times as long as broad, narrower than in the female ; basal vein with a few hairs ; marginal vein 2·4 times as long as the stigmal vein. Gaster oval, distinctly shorter than, but as broad as, the thorax ; basal tergite occupying about half the total length ; gaster slightly convex both dorsally and ventrally, without a ventral plica.

Holotype ♀. ENGLAND : Lincolnshire, Woodhall Spa, 25.vii.1951 (*Graham*), in Graham collection.

Paratype ♂. Same data as holotype, in Graham collection.

This species belongs to the group of *hemipterus* (Walker) and may be distinguished from the other species of that group by the characters given in the key.

Biology. Unknown. The types were captured in a marshy field.

Eupteromalus sp. indet. H

ENGLAND : Oxfordshire, Otmoor, 1 ♀, 27.viii.1955 (*Graham*). Appears to be a rather distinct species.

Eupteromalus sp. indet. I

ENGLAND : Berkshire, Wytham, 1 ♂, 2.vii.1960 (*Graham*). Not associated with any ♀.

Eupteromalus caesareus (Dalla Torre) **comb. n.**

Pteromalus gentilis Förster, 1841 : 19, ♀ [*nec* Walker, 1836.].
Pteromalus caesareus Dalla Torre, 1898 : 115 [nom. n.].
Eupteromalus gentilis (Förster) Kurdjumov, 1913 : 13.
Eupteromalus gentilis (Förster) ; Delucchi, 1958*a* : 56, ♀.

Type ♀ (Germany) recognized by Delucchi (1958*a*) who stated that it is a valid species. I have not seen the type and cannot recognize the species.

Eupteromalus pospelovi (Kurdjumov)

Pteromalus pospelovi Kurdjumov, 1912 : 229–230, ♀.
Eupteromalus pospelovi (Kurdjumov) Kurdjumov, 1913 : 13.

Type material. 6 ♀, U.S.S.R., reared from *Agrilus hastulifer* (*V. Pospelov*) stated to have been in the Entomological Station, Kiev (not seen).

I have nothing which seems to fit the description of this species and cannot recognize it.

U.S.S.R.

The chief references to the following North American species which are included in my key to females, are given below ; many other references will be found in Peck (1963 : 683–690).

Eupteromalus americanus Gahan

(Text-figs. 602, 609)

Eupteromalus americanus Gahan, 1933 : 82–86, ♂ ♀.

U.S.A.

Biology. Host *Phytophaga destructor* Say (Dipt., Cecidomyiidae).

Eupteromalus cognatus Gahan

(Text-figs. 605, 620)

Eupteromalus cognatus Gahan, 1924 : 16–18, ♂ ♀.

U.S.A.

Biology. Hosts, the spiders *Epeira foliata* (Fourcr.), *E. undata* (Oliv.) (Epeiridae), *Philodromus aureolus* (Oliv.) (Thomisidae).

Eupteromalus dubius (Ashmead)

(Text-figs. 603, 623, 640)

Meraporus dubius Ashmead, 1896 : 219–220, ♂ ♀.
Eupteromalus dubius (Ashmead) Gahan, 1921 : 240.

U.S.A.

Biology. Hosts, various Lepidoptera and their Ichneumonid and Braconid parasites, Diptera (for a list see Peck, 1963 : 684).

Eupteromalus leguminis Gahan

(Text-figs. 599, 604, 610)

Eupteromalus leguminis Gahan, 1937 : 63–65, ♂ ♀.

U.S.A.

Biology. Hosts, *Bruchus pisorum* (L.) (Col., Bruchidae), *Hypera postica* Gyll. (Curculionidae) ; *Bathyplectes curculionis* (Thoms.) (Hym., Ichneumonidae).

Eupteromalus sarcophagae Gahan

(Text-figs. 601, 607, 612)

Eupteromalus sarcophagae Gahan, 1914 : 162–163, ♂ ♀.

U.S.A.

Biology. Hosts, mine of *Nepticula* [=*Stigmella*] sp. in *Scirpus occidentalis* ; *Sarcophaga kellyi* Ald.

Eupteromalus subapterus (Riley)

(Text-figs. 596, 606)

Pteromalus ? *fulvipes* Forbes, 1885 : 47–49 [nec *Pteromalus fulvipes* Walker, 1836].
Merisus (*Homoporus*) *subapterus* Riley, 1885 : 416–417, ♂ ♀.
Eupteromalus fulvipes (Forbes) Gahan, 1933 : 75–82, ♂ ♀.
Eupteromalus subapterus (Riley) Peck *in* Muesebeck *et al.*, 1951 : 555.

CANADA, U.S.A.

Biology. Hosts, the Diptera *Phytophaga destructor* (Say) (Cecidomyiidae), *Meromyza americana* Fitch (Chloropidae) ; Hymenoptera, *Platygaster vernalis* (Myers) (Platygasteridae).

Eupteromalus tachinae Gahan

(Text-figs. 598, 608)

Eupteromalus tachinae Gahan, 1917 : 211–212, ♀.

CANADA, U.S.A.

Biology. Hosts, the Lepidoptera *Cirphis unipuncta* (Haw.) (Noctuidae), *Ostrinia nubilalis* (Hübn.) (Pyralidae) ; Diptera, *Archytas analis* (F.) (Tachinidae).

Eupteromalus viridescens (Walsh)

(Text-fig. 611)

Glyphe viridascens [*sic*] Walsh, 1861 : 264, 370, ♀.
Eupteromalus viridescens (Walsh) Gahan, 1921 : 240–241.

U.S.A.

Biology. The species has many recorded hosts, mostly Lepidoptera and their Ichneumonid and Braconid parasites.

GYRINOPHAGUS Ruschka

Isocyrtus Thomson, 1878 : 131–133, *ex parte* [*nec* Walker, 1833].
Gyrinophagus Ruschka, 1914 : (208)–(209). Type-species : *G. luteipes* Ruschka, by monotypy.
Gyrinophagus Ruschka ; Delucchi, 1955*b* : 150–153.
Gyrinophagus Ruschka ; Graham, 1956*b* : 246.
Gyrinophagus Ruschka ; Peck *et al.*, 1964 : 48, 50.

This genus is extremely close to *Eupteromalus* Kurdjumov, as will be seen from the small differences between them that are mentioned in my key to genera. The males differ from those of *Eupteromalus* in having conspicuously enlarged eyes ; this, however, is a sexual character, and moreover the males of one species of *Eupteromalus* show a tendency to be rather large in some specimens. Further research may indicate the desirability of uniting these genera.

Two species are known from Europe ; another, *dineutis* (Ashmead) occurs in North America.

Gyrinophagus aper (Walker)

Pteromalus Aper Walker, 1839 : 234, ♂.
? *Urolepis Cychreus* Walker, 1850 : 131, ♂.
Isocyrtus marginatus Thomson, 1878 : 132, ♂ ♀.
Gyrinophagus marginatus (Thomson) Delucchi, 1955*b* : 151–153, ♂ ♀.
Gyrinophagus aper (Walker) Graham, 1956*b* : 246.

Type material. *Pteromalus aper* Walker. Lectotype designated by Graham (1956*b* : 247).

Urolepis cychreus Walker. There are no specimens so named in the BM(NH). In Haliday's collection I found an unnamed male which, although it bears the

wrong data, agrees remarkably well with the original description of *cychreus* and in my opinion indicates that *cychreus* must have been the male of *Gyrinophagus aper* (Walker). It is a Haliday specimen, labelled in his handwriting " Waterside Glassnevin [*sic*] 49.8.2 " and [a modern printed label] " Ireland. Haliday ". The locality mentioned (Glasnevin) contains the Botanical Gardens and is a suburb of Dublin, not so far from the original locality, Phoenix Park (Walker, 1850 : 132 " Found on the edge of a pond in the Zoological Gardens, Phoenix Park in September ").

Isocyrtus marginatus Thomson. Syntypes, 8 specimens. LECTOTYPE, a male labelled " Wll [?] 7/69 " and " marginatus Ths ".

BRITAIN, IRELAND, SWEDEN.

Biology. Reared from cocoons of *Sisyra fuscata* (F.) at Oxford, 24.v.1932 (*F. J. Killington*). Imagines May–Sept.

Gyrinophagus luteipes Ruschka

Gyrinophagus luteipes Ruschka, 1914 : (209), ♂ ♀.
Gyrinophagus luteipes Ruschka ; Delucchi, 1955*b* : 153, fig. 7, E, F., ♂ ♀.

Type material. Syntypes, Germany, Westphalia, Munster, 3 ♀ and 1 ♂, reared from pupal cocoons of *Gyrinus natator* L., in coll. Ruschka, Naturhistorisches Museum, Vienna ; re-examined by Delucchi.

According to Delucchi (1955*b*) the types of *luteipes* are very close to *marginatus* (=*aper*) but differ in being smaller (♀ 1·7 mm., ♂ 1·4 mm.) ; the female has all the funicular segments of the antenna slightly transverse, the first segment shorter than the sixth, and the sensilla sparser ; the male has smaller eyes and uniformly yellow antennae ; the basal cell and costal cell of the fore wing are relatively less thickly haired. Excepting the colour of the antennae, the above differences are such as one might expect if the types of *luteipes* were just unusually small examples of *aper*. The range of variation in size of the available specimens which I regard as belonging definitely to *aper* is 2·0–2·8 mm. for females, 1·7–2·7 mm. for males. The sizes given by Delucchi for the two sexes of *luteipes* fall outside this range, so that there is some room for doubt. Further study is necessary to settle the problem.

Note. Gyrinophagus splendens Erdös (1957 : 64, fig. 7b–e, ♂ ♀) is probably not a *Gyrinophagus* but a *Eupteromalus* ; Erdös states " coxis posticis nudis ", a character which suggests the latter genus.

Note. Sisyridivora Gahan (1951 : 100) must be near *Gyrinophagus*. It is said, however, to have a large triangular hollow on the gena, extending to the lower edge of the eye ; the female of *Gyrinophagus* lacks such a hollow, whilst the male has a small one which does not extend to the eye.

NASONIA Ashmead

Mormoniella Ashmead, 1904 : 316, 317. Type-species : *M. brevicornis* Ashmead, by monotypy.
Nasonia Ashmead, 1904 : 317, 318, xi. Type-species : *N. brevicornis* Ashmead, by monotypy.
Mormoniella Ashmead ; Schmiedeknecht, 1909 : 316, 317, 322.
Nasonia Ashmead ; Schmiedeknecht, 1909 : 323, 325–326.
Nasonia Ashmead ; Girault & Sanders, 1909 : 119–132.
Nasonia Ashmead ; Brues, 1910 : 259–260.
Mormoniella Ashmead ; Kurdjumov, 1913 : 5.
Mormoniella Ashmead, Gahan, 1927 : 5–7.
Nasonia Ashmead ; Muesebeck *et al.*, 1951 : 559.
Mormoniella Ashmead ; Nikol'skaya, 1952 : 221.
Nasonia Ashmead ; Peck, 1963 : 709.
Nasonia Ashmead ; Peck *et al.*, 1964 : 30, 48.

Brues (1910 : 260) was informed by Kurdjumov that Ashmead had based his genera *Mormoniella* and *Nasonia* on the same type specimen, and that therefore these names were synonyms. Brues adopted *Nasonia* because the genus had been redescribed more fully under that name by Girault and Sanders (1909). Kurdjumov (1913 : 5) preferred to use the name *Mormoniella*, which has page-priority, and since then this name has been more often used than *Nasonia*. Muesebeck *et al.* (1951 : 559) adopted *Nasonia* because this name had been selected by Brues, the first reviser of the genus. Peck (1963 : 709) followed the latter usage and it is adopted here.

Nasonia vitripennis (Walker)

Pteromalus vitripennis Walker, 1836 : 492, ♀.
Pteromalus muscarum Hartig, 1838 : 256, **syn. n.**
Pteromalus abnormis Boheman, 1858 : 58, 59, pl. 2, fig. 3, ♂ ♀.
Dicyclus pallinervosus Walker, 1872*b* : 117, ♀. **syn. n.**
Stictonotus insuetus Walker, 1872*b* : 117, ♀, **syn. n.**
Pteromalus abnormis Boheman ; Thomson, 1878 : 174, ♂ ♀.
Mormoniella brevicornis Ashmead, 1904 : 316, 382, ♀.
Nasonia brevicornis Ashmead, 1904 : 317, ♀.
Mormoniella vitripennis (Walker) Gahan, 1927 : 5–7.
Nasonia vitripennis (Walker) Peck, *in* Muesebeck *et al.*, 1951 : 559.
Mormoniella vitripennis (Walker) ; Edwards, 1954 : 88–112.
Nasonia vitripennis (Walker) ; de Santis, 1957 : 81–85.
Mormoniella vitripennis (Walker) ; Whiting, 1958 : 857–866.
Mormoniella vitripennis (Walker) ; Barrass, 1960 : 185–209, 210–218.
Mormoniella vitripennis (Walker) ; Barrass, 1961 : 288–312.
Nasonia vitripennis (Walker) ; Peck, 1963 : 709–711.

The above references do not include many on the biology of the species, for which see Peck (1963). Further papers, not cited by Peck, are those by Edwards (1954) on host-finding and oviposition behaviour ; Whiting (1958, and others) on the genetics ; and Barrass (1960, 1961) on the courtship behaviour of *vitripennis*.

Type material. *Pteromalus vitripennis* Walker. Syntypes, 2 ♀. LECTOTYPE female bears a Waterhouse label and a green-bordered type label.

Pteromalus muscarum Hartig. No specimens so labelled in Hartig collection ; but three groups of 8 ♀, 10 ♀, and 2 ♂ respectively, mounted with Muscid puparia, and ticketed 988, 987, and 986, are regarded as syntypes. The specimens of each group are mounted on card-points arranged in a whorl, with a puparium below. LECTOTYPE, a female in the first group (988) whose card-point I have marked with a red spot.

Pteromalus abnormis Boheman. I recall having seen the syntypes of *abnormis* and concluding that it was in fact the same as *vitripennis* (Walker), but cannot now find my notes on the specimens. No lectotype has yet been designated.

Dicyclus pallinervosus Walker. One female (Type Hym. 5. 856) accepted as HOLOTYPE, labelled " Madeira Wollaston ", " Dicyclus pallinervosus ", in Walker's handwriting, and " Walker ".

Stictonotus insuetus Walker. One female, LECTOTYPE (Type Hym. 5. 664), labelled " Madeira Wollaston " and " Stictonotus insuetus ".

Mormoniella brevicornis and *Nasonia brevicornis* Ashmead. Type material in U.S.N.M. (not seen). Placed in synonymy with *vitripennis* (Walker) by Gahan (1927) from information supplied by Waterston.

Cosmopolitan.

Biology. Chiefly a parasite of Diptera (Calliphoridae and Muscidae), but has been reared from Diptera of other families ; for a list of hosts, see Peck (1963 : 711). In Britain, imagines have been captured in the field June–August.

UROLEPIS Walker

Urolepis Walker, 1846 : 26. Type-species : *Ormocerus maritimus* Walker, by monotypy.
Urolepis Walker ; Förster, 1856 : 59, 60–61.
Halizoa Förster, 1856 : 145 [n. n. for *Urolepis* Walker, supposedly pre-occupied].
Pteromalus sgen. *Halizous* Thomson, 1878 : 146, 147.
Urolepis Walker ; Schmiedeknecht, 1909 : 327, 329, 332.
Urolepis Walker ; Nikol'skaya, 1952 : 220.
Urolepis Walker ; Peck *et al.*, 1964 : 49.

Urolepis maritima (Walker)

Ormocerus maritimus Walker, 1834 : 169, ♀.
? *Miscogaster Stygne* Walker, 1839 : 201, ♂.
Ormocerus maritimus [Walker] ; Haliday, 1841–1842 ; pl. E, fig. 4, ♀.
Pteromalus salinus v. Heyden, 1844 : 205.
Pteromalus Alope Walker, 1848 : 127, 212, ♀, **syn. n.**
Halizous maritimus (Walker) Thomson, 1878 : 147, ♂ ♀.
Urolepis maritima (Walker) Dalla Torre, 1898 : 106.

Type material. *Ormocerus maritimus* Walker. One female, LECTOTYPE, Waterhouse label.

Miscogaster stygne Walker. " Found by Mr. Haliday, at Holywood, near Belfast, Ireland " (Walker, 1839 : 201). I have not found the type material, either in Walker's or Haliday's collections. The species was placed in synonymy with

Urolepis maritimus by Walker himself (1846 : 26) and it seems best to accept this as correct.

Pteromalus salinus v. Heyden. This is possibly a *nomen nudum* ; von Heyden gave no description but merely stated that the species often emerged from pupae of *Coenia halophila* v. Heyd. [=*Ephydra riparia* Fln.]. It was cited as a possible synonym of *maritimus* by Walker (1848 : 107). Förster (1856 : 60) stated that he had compared a syntype of *maritimus* with von Heyden's specimens of *salinus*, so that the synonymy may be accepted.

Pteromalus alope Walker. One female, LECTOTYPE ; Waterhouse label.

BRITAIN, IRELAND, DENMARK, SWEDEN, GERMANY, RUMANIA, MOLDAVIAN S.S.R.

Biology. In the Blood coll. (Oxford) there is a female stated to have been reared from a pupa of *Themira putris* (L.) (Dipt., Sepsidae) in Denmark ; both sexes were reared from Dipterous puparia (? Ephydridae) found amongst *Lemna* and *Azolla* at Appleton Pond, Berkshire, England (Dr. *B. M. Hobby*). Henriksen (1919 : 161) stated that it had often been reared from puparia of *Ephydra riparia* Fln. in Denmark. Von Heyden's record (under the name *Pteromalus salinus*) of rearings from the same host has already been quoted. Imagines in May and Aug.–Sept.

RAKOSINA Bouček

Rakosina Bouček, 1955 : 316. Type-species : *R. deplanata* Bouček, by original designation.
Rakosina Bouček ; Peck *et al.*, 1964 : 48.

Rakosina deplanata Bouček

Rakosina deplanata Bouček, 1955 : 319–319, ♂ ♀.

Type material. Holotype ♀, Southern Slovakia, Gbelce (formerly Köbölkút), 29.viii.1955, from *Phragmites* (*Bouček*) in Národní Museum, Prague (Cat. no. 3075).

CZECHOSLOVAKIA, HUNGARY, MOLDAVIAN S.S.R.

Biology. Unknown ; the species is associated with *Phragmites*. Imagines captured in August and October.

HALOMALUS Erdös

Halomalus Erdös, 1953 : 233. Type-species : *H. crucifer* Erdös, by monotypy and original designation.
Halomalus Erdös ; Peck *et al.*, 1964 : 50.

Halomalus crucifer Erdös

Halomalus crucifer Erdös, 1953 : 233–234, fig. 7, ♂ ♀.

Type material (not seen). Syntypes, Hungary, Soltvadkert, 14.viii.1945, from Gramineae in the salt-marshes known as Hosszúvíz and Városi-tó, in coll. Erdös.

CZECHOSLOVAKIA, HUNGARY, MOLDAVIAN S.S.R. ; in salt-marshes.

Biology. Unknown.

PEZILEPSIS Delucchi

Pezilepsis Delucchi, 1955*b* : 153. Type-species : *Isocyrtus dentifer* Thomson, 1878, by original designation.
Pezilepsis Delucchi ; Peck *et al.*, 1964 : 49–50.

Pezilepsis dentifer (Thomson)

Isocyrtus dentifer Thomson, 1878 : 133, ♂ ♀.
Pezilepsis dentifer (Thomson) Delucchi, 1955*b* : 154, ♂ ♀.

Type material (*Isocyrtus dentifer* (Th.)). Syntypes, 5 specimens in coll. Thomson (Lund), 1 in coll. Möller (Göteborg). Thomson (1878 : 134) stated that the species was taken in Skåne, at Wallerup by Möller, and at Ringsjö by himself. A male from Yddingen in Thomson's collection has been labelled " Type " by Delucchi ; as this specimen does not appear to come from the right locality, I prefer not to validate his selection at present.

SWEDEN, CZECHOSLOVAKIA.
Biology. Unknown. In marshy places ; apparently rare.

DIGLOCHIS Förster

Diglochis Förster, 1856 : 65. Type-species : *Pteromalus complanatus* Ratzeburg, 1844*a*, by subsequent reference.
Pteromalus sgen. *Trichoglenus* Thomson, 1878 : 146, 149. Type-species : *Pteromalus complanatus* Ratzeburg, by monotypy.
Diglochis Förster ; Mayr, 1904 : 598.
Trichoglenes Thomson ; Ashmead, 1904 : 318, 321 [emendation].
Trichoglenus Thomson ; Schmiedeknecht, 1909 : 327, 329, 333.
Dirhicnus Thomson ; Kurdjumov, 1913 : 16, [*ex parte*].
Diglochis Förster ; Nikol'skaya, 1952 : 220.
Diglochis Förster ; Peck, 1963 : 670.
Diglochis Förster ; Peck *et al.*, 1964 : 49.

Diglochis Förster was described without included species. Mayr (1904) included *Pteromalus complanatus* Ratzeburg, which automatically became the type-species of the genus. Thomson's (1878) interpretation of *complanatus* is provisionally accepted here, following Mayr (1904), in spite of the fact that Kurdjumov (1913 : 16) considered *complanatus* Ratzeburg to be different from that of Thomson. Actually the question of the identity of *complanatus* is somewhat complicated. Probably neither Thomson nor Mayr ever saw the types of *complanatus* although Kurdjumov evidently did ; and they are presumed to have been destroyed in 1945. Ratzeburg stated (1844*a* : 197) that his original material had come from two different sources : " Vier ♀, welche ich besitze, stammen theils von Hrn. Nördlinger her, der sie aus Fichtenzapfen erzog, theils von Hrn. Saxesen, der sie aus Bedeguars der Feldrosen zu haben vermeint, doch aber seiner Sache nicht ganz gewiss ist ". It appears very likely that the females from spruce-cones and from (?) bedeguar galls belonged

to two different species. Those from spruce-cones might have been *Anogmus vala* according to Bouček (1966*a*, see under *A. vala*), a view which I consider quite possible. The identity of the other females, from Saxesen, is problematic ; presumably Thomson had them in mind when he identified *complanatus* as belonging to his genus *Trichoglenus* (1878 : 149), which has conspicuously pilose eyes and a margined occiput. However, Kurdjumov (1913 : 16) remarked of *complanatus* Ratzeburg " this is not the same as *Diglochis* (*Trichoglenus*) *complanatus* Th., differing in the naked eyes and immargined occiput ". Although Kurdjumov saw Ratzeburg's types (including presumably those of *complanatus*) he did not say whether he had in mind the material which Ratzeburg had received from Nördlinger (reared from spruce-cones) or the Saxesen material. To decide which of these conflicting views should finally be accepted, it may be necessary to apply to the International Commission on Zoological Nomenclature. If it should be decided that *complanatus* Ratzeburg (based on his material from Saxesen) is the same as *sylvicola* Walker (=*complanatus* sensu Thomson) then the name *Diglochis* Förster could be retained for the present genus. On the other hand, if the interpretation of *complanatus* Ratzeburg based on his material from spruce-cones should be accepted, the *Diglochis* would become a synonym of *Anogmus* Förster, and the valid name for the present genus would be *Trichoglenus* Thomson. On the whole the first alternative (that provisionally followed here) seems preferable in the interest of uniformity.

Diglochis sylvicola (Walker)

Pteromalus sylvicola Walker, 1835 : 481, ♀.
? *Pteromalus crinifrons* Förster, 1841 : 23, ♂.
Pteromalus complanatus Ratzeburg, 1844*a* : 197, ♀, [*ex parte*].
Trichoglenus complanatus (Ratzeburg) Thomson, 1878 : 149–150, ♂ ♀.
Diglochis sylvicola (Walker) Graham, 1956*b* : 260.

Type material. *Pteromalus sylvicola* Walker. Lectotype designated by Graham (1956*b* : 260).

Pteromalus crinifrons Förster. I have not seen the type, which according to Delucchi (1958*a* : 51) is a badly-damaged male ; he says that it is very probably identical with *complanatus* (Ratzeburg).

Pteromalus complanatus Ratzeburg. Types presumed lost. The interpretation of Thomson (1878 : 149), which was accepted by Mayr (1904 : 598) is provisionally followed here.

BRITAIN, IRELAND, SWEDEN, GERMANY. Local, often in woodland habitat ; I have sometimes swept it from foliage of willows (*Salix* spp.).

Biology. Thomson (1878 : 150) stated that in Sweden this species had been reared from a pupa of " *Lipara salicis* ". There appears to be no such species. Perhaps Thomson's record was a mistake for the Lymantriid moth *Stilpnotia salicis* (L.), which in nineteenth-century literature was often called *Liparis salicis*.

TOMICOBIA Ashmead

Tomicobia Ashmead, 1899 : 203. Type-species : *T. tibialis* Ashmead, by subsequent reference.
Tomicobia Ashmead ; Schmiedeknecht, 1909 : 155, 161–162.
Ipocoelius Ruschka, 1924 : 6–12. Type-species : *I. seitneri* Ruschka, by original designation.
Tomicobia Ashmead ; Gahan, 1938 : 221–222.
Tomicobia Ashmead ; Nikol'skaya, 1952 : 216.
Tomicobia Ashmead ; Erdös, 1963 : 223.
Tomicobia Ashmead ; Hedqvist, 1959 : 177–184.
Tomicobia Ashmead ; Peck *et al.*, 1964 : 44.

Ipocoelius Ruschka was placed in synonymy with *Tomicobia* Ashmead by Gahan (1938 : 221), who compared two syntypes of *Ipocoelius seitneri* Ruschka (type-species of *Ipocoelius*) with the type of *Tomicobia tibialis* Ashmead and found them to be congeneric.

The European species were revised by Hedqvist (1963). My views differ slightly from those expressed in his paper, and his species *ferrierei* I have transferred to *Dirhicnus*.

Key to European Species

(Females)

1 Gaster subcircular, as broad as or broader than the thorax ; in dorsal view its apex does not appear conspicuously bristly. Head, mesoscutum, and scutellum shiny, their sculpture for the most part engraved ; frons, vertex, and mesoscutum with some small but distinct piliferous punctures. Pronotal collar medially one twelfth to one eighth as long as the mesoscutum. Antennal flagellum subclavate ; distal segments of funicle slightly transverse 2

– Gaster oval, narrower than the thorax ; in dorsal view its apex appears very bristly. Head, mesoscutum, and scutellum less shiny, their sculpture at least slightly raised above the general surface ; piliferous punctures of head and mesoscutum not easily visible because of the relatively stronger reticulation. Pronotal collar medially one sixth to one fifth as long as the mesoscutum. Median area of propodeum nearly uniformly reticulate. Tarsi relatively short and stout ; first segment of mid and hind tarsi only 2·5–3 times as long as thick ; hind tarsi from hardly more than half, to about two thirds, as long as their tibiae. Fore wing usually immaculate 3

2 (1) Antennal scape reaching almost or quite to the level of the vertex, its length slightly greater than the transverse diameter of an eye. Tibiae and tarsi relatively less stout ; the first segment of the mid and hind tarsi nearly 4 times as long as thick ; hind tarsi slightly more than two thirds as long as their tibiae. Median area of propodeum usually with some irregular wrinkles as well as reticulation. Fore wing often with a distinct brownish cloud below the marginal vein. Larger species, 2–2·8 mm. . . . ***promulus*** (Walker) (p. 785)

– Antennal scape not nearly reaching the median ocellus, its length hardly greater than the transverse diameter of an eye. Tibiae and tarsi stout ; the first segment of the mid and hind tarsi only 2·2–2·7 times as long as thick ; hind tarsi hardly two thirds as long as their tibiae. Median area of propodeum uniformly or nearly uniformly reticulate. Fore wing with a hardly visible infumation below the marginal vein ; stigmal vein forming a rather more acute angle with the postmarginal than in *promulus*. Smaller species, less than 2 mm. in length . . . . . ***subincrassata*** (Thomson) (p. 786)

3 (1) Head in dorsal view about 2·2 times as broad as its maximum length ; temples about one third as long as eyes. Scutellum slightly longer than broad, moderately convex. Antennae with all funicular segments slightly transverse, or at most the first and second quadrate ; sensilla in one, sometimes irregular, row on each funicular segment. Smaller species, length 2–2·8 mm. ***acuminati*** Heqvist (p. 786)

– Head in dorsal view 2·35–2·4 times as broad as its maximum length ; temples about one quarter as long as eyes. Scutellum hardly longer than broad, less convex. Antennae with proximal funicular segments usually at least slightly longer than broad, occasionally quadrate, distal segments subquadrate ; sensilla in two rows on at least some of the funicular segments. Larger species, 2·5–4 mm. 4

4 (3) Malar space about two thirds the transverse diameter of an eye. (Europe) ***seitneri*** (Ruschka) (p. 786)

– Malar space about seven eighths the transverse diameter of an eye. (North America) . . . . . ***tibialis*** Ashmead (p. 787)

(MALES)

1 Head, mesoscutum, and scutellum shiny, their sculpture for the most part engraved ; frons, vertex, and mesoscutum usually with some discernible piliferous punctures. Pronotal collar medially very short, one twelfth to one eighth as long as the mesoscutum. Median area of propodeum usually with some irregular wrinkles as well as reticulation. Hairs of antennal flagellum longer, their length about half the breadth of the segments, and standing out at 30–45°. Head and thorax bright green to blue ***promulus*** (Walker) (p. 785)

– Head, mesoscutum, and scutellum less shiny, their sculpture at least slightly raised above the general surface ; piliferous punctures of head and mesoscutum not or hardly visible amongst the dense reticulation. Pronotal collar longer, medially one sixth to one fifth as long as the mesoscutum. Median area of propodeum uniformly or nearly uniformly reticulate. Hairs of flagellum shorter and tending to stand out less strongly. Head and thorax usually duller green or bronze 2

2 (1) Head in dorsal view 2–2·1 times as broad as its maximum length. Antenna with scape distinctly shorter than an eye, not reaching the vertex ; funicular segments subquadrate, the first distinctly shorter than the pedicellus. Head and thorax green to bronze-green . . . ***acuminati*** Hedqvist (p. 786)

– Head in dorsal view 2·25–2·35 times as broad as its maximum length. Antenna with scape virtually as long as an eye, reaching level of vertex ; funicular segments, except sometimes the sixth, at least slightly longer than broad, the first only slightly shorter than the pedicellus. Head and thorax bronze with at most slight greenish reflections . . . . ***seitneri*** (Ruschka) (p. 786) and ***tibialis*** Ashmead (p. 787)

Tomicobia promulus (Walker)

Pteromalus Promulus Walker, 1840 : 232, ♀.
Pteromalus Acrotatus Walker, 1845 : 261, ♀, **syn. n.**
Metopon (Dirhicnus) sublaevis Thomson, 1878 : 172, ♂ ♀, **syn. n.**
? *Ipocoelius rotundiventris* Ruschka, 1924 : 11–12, ♀.
Tomicobia promulus (Walker) Bouček, 1965*e* : 8.

Type material. *Pteromalus promulus* Walker. One female in Greville collection

(Edinburgh), designated LECTOTYPE, labelled " Pteromal. Promulus W Fide Wk. Edinb." and " Greville 1936–50. 291 ".

Pteromalus acrotatus Walker. One female, designated LECTOTYPE, bearing a Waterhouse label.

Metopon (*Dirhicnus*) *sublaevis* Thomson. Syntypes, 8 specimens ; LECTOTYPE, a female labelled " Hlm " [Holm.=Stockholm] and " Bhn " [Boheman].

Ipocoelius rotundiventris Ruschka. Holotype ♀ said to be in Ruschka collection ; but I have not located it. From the description it might well be the same as *promulus* (Walker).

BRITAIN, SWEDEN, AUSTRIA, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Not certain (*Ipocoelius rotundiventris* was reared in Austria from *Otiorrhynchus ligustici* L.). Imagines June–Sept.

Tomicobia subincrassata (Thomson) **comb. n.**

Metopon (*Dirhicnus*) *subincrassatus* Thomson, 1878 : 172, ♂ ♀.

Type material. Syntypes on 3 pinns. LECTOTYPE, a ♀ labelled " Ö " [Öland] and (in Thomson's handwriting) " subincras=satus Ths.".

I have not properly assessed the characters of the ♂, which is therefore omitted from my key.

SWEDEN.

Biology. Unknown.

Tomicobia acuminati Hedqvist

Tomicobia acuminati Heqvist [Hedqvist], 1959 : 179–180, ♂ ♀.
Tomicobia acuminati Hedqvist, 1963 : 111–112.

Type material. Holotype ♀, Swedish Lapland, Stensele, 28–30.vii.?, and paratypes in coll. Hedqvist ; I have examined the holotype and some paratypes.

SWEDEN (Lapland).

Biology. Parasite of *Ips acuminatus* Gyll. (Col., Scolytidae) ; see Hedqvist, 1959.

Tomicobia seitneri (Ruschka)

Ipocoelius seitneri Ruschka, 1924 : 7–11, ♂ ♀.
Tomicobia seitneri (Rushcka) Erdös, 1953 : 223–225, ♂ ♀.
Tomicobia seitneri (Ruschka) ; Hedqvist, 1959 : 178, 181–182, ♂ ♀.

Type material. Syntypes in Hochschule für Bodenkultur and Naturhistorisches Museum, Vienna ; in Swedish Forestry Academy, and in coll. Ruschka. Lectotype female selected by Graham in 1956 from syntypes in Naturhistorisches Museum, Vienna. These are 19 specimens pinned to a block of pith and labelled " typograph. Weyer 27.7.1921 " and " Ipocoelius seitneri Ruschka Type " ; I now designate the fourth specimen, a female, as LECTOTYPE and have marked it with a small dark red ticket ; my lectotype label has also been added.

SWEDEN, GERMANY, AUSTRIA, POLAND, HUNGARY.

Biology. Endoparasite of imago of *Ips typographus* L. ; also recorded from *Ips acuminatus* Gyll., *I. duplicatus* Sahlb., and *I. amitinus* Eichh. (Col., Scolytidae). For a detailed account of the biology see Sachtleben (1952 : 175–179).

[*Tomicobia tibialis* Ashmead

Tomicobia tibialis Ashmead, 1904 : 283, ♀.
Tomicobia tibialis Ashmead ; Gahan, 1938 : 221–222.
Tomicobia tibialis Ashmead ; Hedqvist, 1959 : 178, 180–181.

This species was not described by Ashmead, but is validated by the generic diagnosis in Ashmead's key (1904 : 283). Later it was described by Gahan (1938). I have not seen the types which are in U.S.N.M., but have examined authenticated material from North America. The species is included in my key to show the differences between it and *seitneri* (Ruschka).]

DIRHICNUS Thomson

Metopon sgen. *Dirhicnus* Thomson, 1878 : 165, 170. Type-species : *D. subcoeruleus* Thomson, by designation of Ashmead, 1904 : 314.
Dirhicnus Thomson ; Ashmead, 1904 : 314, 315.
Dirhicnus Thomson ; Schmiedeknecht, 1909 : 309, 310, 313, [ex *parte*].
? *Dirhicnus* Thomson ; Kurdjumov, 1913 : 16, [*ex parte*].
Dirhicnus Thomson ; Nikol'skaya, 1952 : 228, *ex parte*.
Dirhicnus Thomson ; Bouček, 1961*a* : 448, [*ex parte*].
Dirhicnus Thomson ; Peck *et al.*, 1964 : 56.

This genus has been little noticed since its description. Most or all of the species referred to it by Kurdjumov (1913) do not belong here. Bouček (1961) described a new species *conopidarum* which he placed provisionally in *Dirhicnus* ; I think, however, that it belongs rather to *Habrocytus*, or is at least very near it. Consequently only two species remain in the genus.

The mandibles of *pirus* (Walker) are unusually variable. Of the specimens examined, most have the mandibular formula 3.4 with the inner tooth of the left mandible truncate, the inner tooth of the right mandible obtuse ; one has the formula 4.4 with the inner tooth of both mandibles obtuse ; one has the formula 3.3 with the inner tooth of both truncate.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Head in dorsal view (Text-fig. 646) with temples one quarter to one third as long as the eyes, less convergent. Antennae brown to fuscous with at most the scape and pedicellus more or less testaceous ; tegulae usually brown to black, occasionally partly testaceous ; femora infuscate at least proximally . . . ***pirus*** (Walker) (p. 788)

– Head in dorsal view (Text-fig. 647) with temples one fifth as long as eyes or even rather less, more convergent. Antennae, tegulae, and legs, not counting coxae, yellowish or testaceous . . . . . . ***ferrierei*** (Hedqvist) (p. 788)

Males of *ferrierei* seem to differ from those of *pirus* only in having the body more brightly metallic and the antennae and legs paler.

Dirhicnus pirus (Walker) **comb. n.**

(Text-fig. 646)

Pteromalus Pirus Walker, 1839 : 219, ♂.
Pteromalus Toxicrate Walker, 1839 : 226, ♂, **syn. n.**
Pteromalus Sisenna Walker, 1839 : 227, "♂" [recte ♀], **syn. n.**
Pteromalus Gonatas Walker, 1839 : 231, "♂" [recte ♀], **syn. n.**
Pteromalus separatus Förster, 1841 : 14, ♂, **syn. n.**
Pteromalus insidiator Förster, 1841 : 25, ♂, **syn. n.**
Pteromalus Bubaris Walker, 1845 : 261, ♀, **syn. n.**
Pteromalus Nestocles Walker, 1845 : 261, ♂ ♀, **syn. n.**
Pteromalus Cercides Walker, 1845 : 262, ♂ ♀, **syn. n.**
Pteromalus Gallonius Walker, 1848 : 125, 193, ♂, **syn .n.**
Metopon (*Dirhicnus*) *subcoeruleus* Thomson, 1878 : 170, ♂ ♀, **syn. n.**

Type material (all the Walker lectotypes bear Waterhouse labels).

Pteromalus pirus Walker. Syntypes, 4 ♂; LECTOTYPE, the second specimen.

Pteromalus toxicrate Walker. Syntypes, 3 ♂ ; LECTOTYPE, the second specimen.

Pteromalus sisenna Walker. Syntypes, 2 ♀, which are not congeneric. LECTOTYPE, the second specimen.

Pteromalus gonatas Walker. One female, now designated LECTOTYPE ; Walker described it as male, but his description shows that he had a female before him.

Pteromalus separatus Förster. Syntypes, 2 ♂ in Förster coll. ; lectotype designated by Delucchi (1958*a* : 55) who placed *separatus* and *subcoeruleus* Thomson in synonymy.

Pteromalus insidiator Förster. Type ♂ recognized by Delucchi (1958*a* : 55) who stated the species to be the same as *separatus* Förster.

Pteromalus bubaris Walker. One female, now designated LECTOTYPE.

Pteromalus nestocles Walker. Syntypes, 4 ♂ ; LECTOTYPE, the third specimen.

Pteromalus cercides Walker. Syntypes, 2 ♀ ; LECTOTYPE, the second specimen.

Pteromalus gallonius Walker. One male, now designated LECTOTYPE.

Metopon (*Dirhicnus*) *subcoeruleus* Thomson. Syntypes, a long series mounted on 31 pins. LECTOTYPE, a female labelled " Lund " and, in Thomson's handwriting, " subcoerule=us Ths " ; the specimen also bears A. Jansson's lectotype label.

BRITAIN, IRELAND, SWEDEN, GERMANY, CZECHOSLOVAKIA ; probably more widely distributed in Europe.

Biology. Unknown (but see host record for the following species, *ferrierei*, which may prove to be identical with *pirus*). Imagines June–Sept.

Dirhicnus ferrierei (Hedqvist) **comb. n.**

(Text-fig. 647)

Tomicobia ferrierei Heqvist, 1959 : 178–179, ♂ ♀.

Type material. Holotype ♀, France, Antibes, 7.viii.1934, reared from adult of *Otiorrhynchus rugosostriatus* (Goeze) (*R. Pussard*) in BM(NH) ; paratypes in the same collection.

This species is so close to *pirus* (Walker) that I feel doubtful whether it is really distinct. The most obvious difference lies in the pale antennae and legs of *ferrierei*, as compared with those of north-west European examples of *pirus*. One might expect, however, that *pirus* from more southern localities in Europe, such as the south of France, where *ferrierei* was taken, would have relatively paler appendages than the northern specimens, since that is the case with several species belonging to other genera. As regards females, those of *ferrierei* have the temples a little shorter and more convergent than in *pirus* ; this might prove to be a valid distinction. For the present I treat *ferrierei* as being possibly distinct from *pirus* ; but it will be necessary to evaluate the variation of *pirus* by examining material from as many different regions in Europe as possible, before the status of *ferrierei* can be confirmed.

ARTHROLYTUS Thomson

Pteromalus sgen. *Arthrolytus* Thomson, 1878 : 147, 158. Type-species : *A. punctatus* Thomson by designation of Ashmead, 1904 : 320.
Arthrolytus Thomson ; Ashmead, 1904 : 320, 322.
Arthrolytus Thomson ; Schmiedeknecht, 1909 : 329, 331, 358–359, [*ex parte*].
Arthrolytus Thomson ; Kurdjumov, 1913 : 7–8, *ex parte*.
Arthrolytus Thomson ; Nikol'skaya, 1952 : 228–229.
Arthrolytus Thomson ; Graham, 1956*b* : 254.
Arthrolytus Thomson ; Peck *et al.*, 1964 : 57.

Key to European Species

(Females)

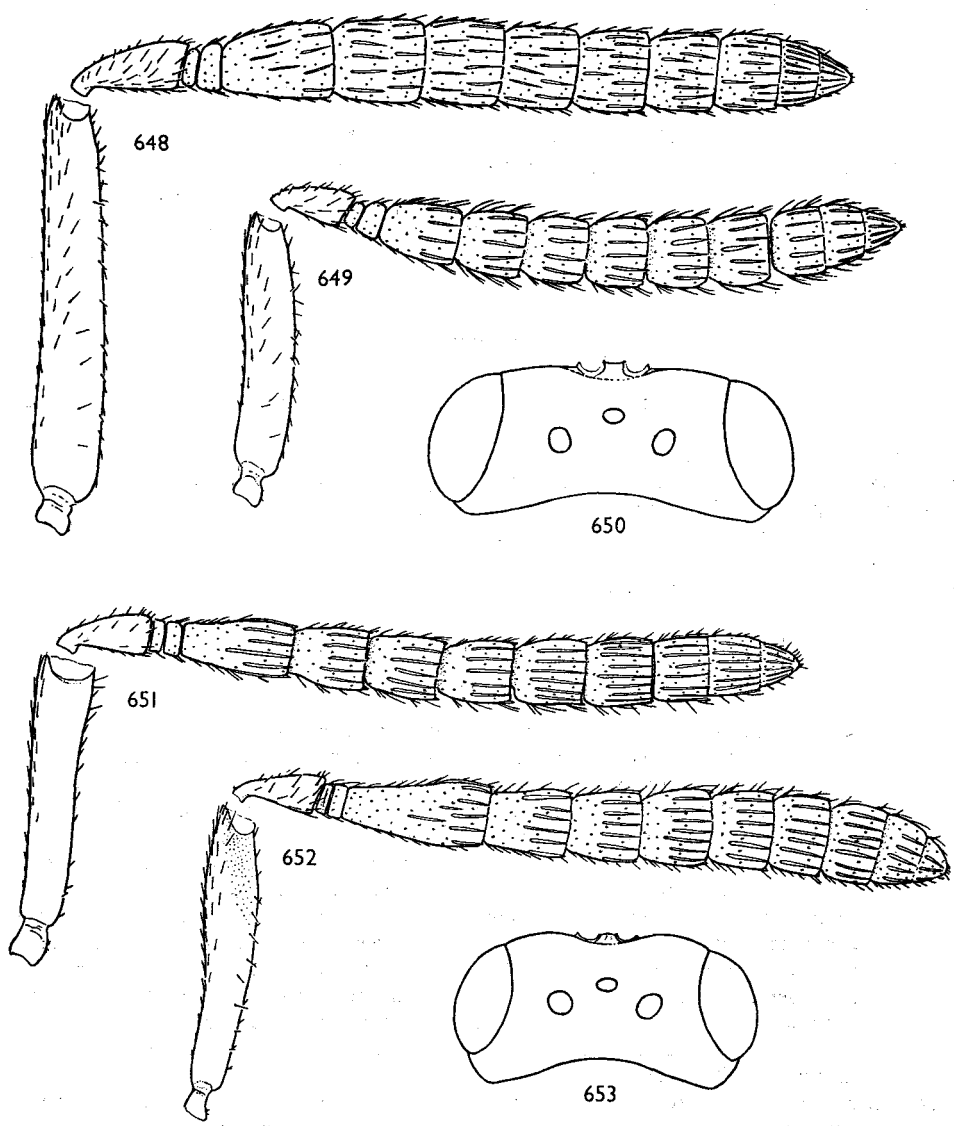
1 Antenna (Text-fig. 648) with first funicular segment not constricted basally ; flagellum stout, cylindrical or subfusiform ; second anellus fully twice as long as the first. Antennae inserted low on head, much nearer to the anterior margin of the clypeus than to the median ocellus, the lower edge of the toruli hardly above the level of the ventral edge of the eyes ; head strongly protuberant at level of toruli. Malar space hardly one third the length of an eye. Propodeal plicae weak, curved. (*ANARTHROLYTUS* **sgen. n.**) . . 2

– Antennae with first funicular segment (Text-figs. 651, 652) usually distinctly constricted basally ; if hardly so then the lower edge of the antennal toruli is well above the level of the ventral edge of the eyes, and the head is hardly protuberant at the level of the toruli. Antennal flagellum clavate ; anelli subequal in length. Malar space slightly more than one third the length of of an eye. Propodeal plicae strong, slightly curved or nearly straight. (*Arthrolytus* Thomson, s. str.) 3

2 (1) Fore wing with stigmal vein (Text-fig. 309) forming an acute angle with the postmarginal vein. Femora usually entirely pale, sometimes with a dark stripe beneath. Fore wing with a broad and very intense fuscous cloud which is usually extended to the hind margin of the wing. Head in dorsal view thicker antero-posteriorly, twice as broad as long or hardly more

ocellus (Walker) (p. 793)

– Fore wing with stigmal vein forming a less acute angle with the postmarginal vein. Femora mainly dark. Fuscous cloud of fore wing relatively narrower and less intense, often not reaching the hind margin of the wing. Head in dorsal view relatively thinner antero-posteriorly . ***glandium*** Bouček (p. 793)



FIGS. 648–653 *Arthrolytus* spp. 648, *ocellus* (Walker), ♀, antenna ; 649, same, ♂, antenna ; 650, *slovacus* sp. n., ♀, head ; 651, same, ♀, antenna ; 652, *maculipennis* (Walker), ♀, antenna ; 653, *discoideus* (Nees), ♀, head.

3 (1) Antennae (Text-fig. 651) inserted well above level of ventral edge of eyes, their toruli about equidistant from the anterior margin of the clypeus and the median ocellus ; head hardly protuberant at level of toruli. Head in dorsal view (Text-fig. 650) strongly transverse, about 2·25 times as broad as its maximum length, with temples hardly one sixth as long as eyes. Propodeum (medially) hardly half as long as scutellum ; its median area about 1·8 times as broad as long, the panels finely reticulate. Thorax squat, about 1·4 times as long as broad. Gaster with a yellowish band across the basal tergite ; venter extensively pale. (Czechoslovakia) . . . ***slovacus*** sp. n. (p. 793)

– Antennae (Text-fig. 652) inserted less high, their toruli slightly nearer to the anterior margin of the clypeus than to the median ocellus ; head somewhat protuberant at level of toruli. Head in dorsal view 2–2·15 times as broad as long, with temples one fifth to more than one quarter as long as eyes. Propodeum (medially) slightly more than half as long as the scutellum ; its median area 1·5–1·7 times as broad as long, the panels often rather coarsely reticulate. Thorax often more elongate, 1·4–1·7 times as long as broad. Gaster sometimes immaculate 4

4 (3) Antennae with combined length of pedicellus and flagellum usually slightly less than, rarely almost equal to, the breadth of the head. Costal cell of fore wing 9–9·5 times as long as broad. Gaster without pale markings ; 1·5–1·7 times as long as broad, slightly shorter than head plus thorax 5

– Combined length of pedicellus and flagellum slightly greater than the breadth of the head. Costal cell of fore wing 10·5–11 times as long as broad. Gaster often with a pale transverse band on the basal tergite, sometimes the whole base yellowish ; sometimes relatively longer than in the above . . . 6

5 (4) Head in dorsal view (Text-fig. 653) 2–2·1 times as broad as long. Panels of median area of propodeum rather more coarsely reticulate (Europe) ***discoideus*** (Nees) (p. 795)

– Head in dorsal view 2·15 times as broad as long. Panels of median area of propodeum rather more finely reticulate (Amurland) ***megaspilus*** (Walker) (p. 795)

6 (4) Larger species, up to 3·4 mm. in length. Gaster 1·8–2·15 times as long as broad, at least very slightly longer than head plus thorax. Antenna, Text-fig. 652 . . . . ***maculipennis*** (Walker) (p. 794)

– Smaller species, up to 2·3 mm. in length. Gaster 1·55–1·65 times as long as broad, at least slightly shorter than head plus thorax. . . . sp. indet.

(MALES)

1 Antennal formula 11263 (Text-fig. 649) with combined length of pedicellus and flagellum only equal to breadth of head ; pedicellus about twice as long as broad, as long as or slightly longer than the first funicular segment ; second anellus distinctly longer than the first ; funicle stout, with very short and subdecumbent hairs, funicular segments relatively short, the first at most twice as long as broad, the sixth subquadrate to slightly transverse. Eyes large, separated by only about 1·15 times their length ; malar space hardly one third the length of an eye. Antennae inserted only slightly above level of ventral edge of eyes. Propodeum with plicae weak or incomplete ; costula absent. Fore wing in one species shortened and narrow, with a fuscous cloud below the stigmal vein, often also with the apical margin of the wing infuscate. (*ANARTHROLYTUS* **sgen. n.**) 2

– Antennal formula most often otherwise ; combined length of pedicellus and flagellum at least 1·3 times the breadth of the head ; pedicellus at most 1·5

times as long as broad, much shorter than the first funicular segment ; anelli strongly transverse, the second only slightly longer than the first ; funicle varying from moderately stout to very slender, clothed with longer hairs which stand out at about 45°, the length of these hairs is at least half the breadth of the segments that bear them ; funicular segments relatively longer, the first from more than 1·5 times to 5·5 times, as long as broad ; the sixth usually longer than broad. Eyes smaller, somewhat more widely separated ; malar space more than one third the length of an eye. Antennae inserted well above the level of the ventral edge of the eyes. Propodeum with plicae distinct and usually sharp ; costula sometimes indicated. Fore wing long and broad, immaculate or at most slightly infumate (*Arthrolytus* Thomson, s. str.). . 3

2 (1) Gaster with a pale spot or transverse band on the basal tergite. Femora pale. Fore wing with a fuscous spot or spots . . . ***ocellus*** (Walker) (p. 793)

– Gaster immaculate. Femora mainly infuscate. Fore wing immaculate ***glandium*** Bouček (p. 793)

3 (1) Antennae with 6 funicular segments and a 3-segmented clava ; combined length of pedicellus and flagellum 1·3–1·4 times the breadth of the head ; segments of funicle short, the first at most twice as long as broad, the sixth at most slightly longer than broad. (Czechoslovakia) . . ***slovacus*** sp. n. (p. 793)

– Antennae either with 7 funicular segments and a 2-segmented clava ; or else with all 9 flagellar segments separated by peduncles ; combined length of pedicellus and flagellum 2·1–2·75 times the breadth of the head ; segments of funicle elongate, the first 3·5–5·5 times, the seventh 1·8–3 times as long as broad 4

4 (3) Antennae with 7 funicular segments and a 2-segmented clava. Fore wing with costal cell 9–9·5 times as long as broad ; speculum bare or nearly so.
Antennae with combined length of pedicellus and flagellum 2·2–2·3 times the breadth of the head ; seventh funicular segment 2·5–2·6 times as long as broad ; scape hardly expanded in its upper half, the subapical shiny boss tending to be indistinct . . . . . ***discoideus*** (Nees) (p. 795)

– All 9 flagellar segments separated by peduncles, therefore no clava is differentiated. Fore wing with costal cell 10–13 times as long as broad ; speculum sometimes effaced by scattered hairs 5

5 (4) Antennae with combined length of pedicellus and flagellum 2·1–2·35 times the breadth of the head ; scape distinctly expanded in its upper half, where there is a distinct shiny boss on its outer aspect. Fore wing with speculum, on lower surface of wing, more or less effaced by scattered hairs ; basal cell partly, sometimes entirely, pilose. Larger species, up to 3·1 mm. ***maculipennis*** (Walker) (p. 794)

– Antennae with combined length of pedicellus and flagellum 2·5–2·75 times the breadth of the head ; scape hardly expanded distally, its shiny boss often indistinct. Fore wing with speculum and basal cell bare or with only a few hairs. Smaller species, up to 1·8 mm. . . . . sp. indet.

ARTHROLYTUS (ANARTHROLYTUS) sgen. n.

Derivation : Greek α, not, compounded with *Arthrolytus*. (Gender : Masculine).
Type-species : *Eutelus ocellus* Walker.
For characters, see key (p. 791).

Arthrolytus (Anarthrolytus) ocellus Walker

(Text-figs. 648, 649)

Eutelus ocellus Walker, 1834 : 359, ♂.
Arthrolytus albiscapus Thomson, 1878 : 159, ♀.
Arthrolytus ocellus (Walker) Graham, 1956*b* : 254.

Type material. *Eutelus ocellus* Walker. Lectotype designated by Graham (1956*b* : 254).

Arthrolytus albiscapus Thomson. Syntypes, 6 specimens. LECTOTYPE female labelled " Rsiö " [Ringsjö] and " albiscapus Ths ".

BRITAIN, SWEDEN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Unknown. Imagines captured in May, June, September.

Bouček (1967 : 639) when comparing the female of his species *glandium* with that of *ocellus*, remarks that in ♀ *ocellus* the marginal vein is on the average 1·62 times as long as the stigmal vein, and is not less than 1·49 times as long. The ♀ of *glandium* is said to have the marginal vein 1·3–1·43 times as long as the stigmal vein. Some females of *ocellus* have the fore wings rather shorter and narrower than usual, and in these the marginal vein is sometimes only 1·4 times as long as the stigmal. One of the best criteria for distinguishing the two species appears to be the angle which the stigmal vein makes with the postmarginal.

Arthrolytus (Anarthrolytus) glandium Bouček

Arthrolytus glandium Bouček, 1967 : 637–639, figs. 4, 5, ♂ ♀.

Type material. Holotype ♀, allotype ♂, and paratypes ♂ ♀, Czechoslovakia : Slovakia, in Národní Museum, Prague.

CZECHOSLOVAKIA.

Biology. Parasite of *Curculio* (=*Balaninus*) sp. (Col., Curculionidae) living in acorns (Bouček, 1967).

Sgen. ***ARTHROLYTUS***, s. str.

Arthrolytus (Arthrolytus) slovacus sp. n.

(Text-figs. 650, 651)

The diagnostic characters of this species are given in my keys to species of *Arthrolytus* (♂, ♀) and need not be repeated here. Some additional characters are the following:

♀.—Head and thorax bluish black ; gaster, excepting the pale areas, bronze with purplish reflections. Antennal scape and pedicellus testaceous, the latter darker apically ; flagellum black. Legs testaceous ; fore coxa blackish externally, mid and hind coxae blackish at base ; fore and mid femora slightly infuscate medially ; pretarsus and claws of all tarsi fuscous. Tegulae testaceous, brown posteriorly ; wings slightly yellowish, with a faint infumate discal cloud. Length 2·5 mm.

Antenna (Text-fig. 651) with scape distinctly shorter than an eye, reaching level of vertex or a little above it ; combined length of pedicellus and flagellum about equal to breadth of head ; flagellum subcylindrical, rather more slender than in *maculipennis* ; first funicular segment longer than the pedicellus, segments 2–5 a little longer than broad, sixth subquadrate ; clava longer and narrower than that of *maculipennis*, nearly 2·5 times as long as broad.

Legs stout, especially femora ; fifth tarsal segment of all tarsi rather swollen, pulvilli and claws large.

Fore wing with costal cell with upper surface bare, lower surface with a complete row of hairs ; proximal part of wing bare, except for 2–3 hairs on the basal vein ; marginal vein about 1·8 times as long as the stigmal vein, and slightly longer than the postmarginal vein.

Gaster about 1·6 times as long as broad, slightly longer than head plus thorax, slightly acuminate apically.

♂.—Colour as ♀ but pedicellus brown ; all coxae mainly black ; gaster blackish with a yellowish spot on the basal tergite. Antenna : pedicellus only about 1·5 times as long as broad, somewhat shorter than the first funicular segment ; flagellum distinctly stouter than the pedicellus, latter as seen in dorsal view ; clava about 3·5 times as long as broad, about as long as 2½ of the preceding funicular segments ; hairs of flagellum slightly shorter than the breadth of the segments that bear them, standing out at about 45°. Thorax nearly 1·6 times as long as broad. Median area of propodeum fully half as long as the scutellum, only about 1·5 times as broad as long. Postmarginal vein hardly shorter than the marginal. Gaster oval, as long as but narrower than the thorax.

Holotype ♀. CZECHOSLOVAKIA: Southern Slovakia, Kovačov, 7.vi.1958 (*A. Hoffer*), in Graham collection.

Paratype ♂. CZECHOSLOVAKIA : Moravia, Pavlovské Kopce, 6.v.1961 (*A. Hoffer*), in Graham collection.

These specimens were amongst some material kindly given to me by Dr. Hoffer.

Arthrolytus (Arthrolytus) maculipennis (Walker)

(Text-fig. 652)

Pteromalus maculipennis Walker, 1836 : 191, ♀.
Arthrolytus punctatus Thomson, 1878 : 158, *ex parte* [excluding lectotype].
Holcaeus cecidomyiae Ashmead, 1897 : 137, *ex parte* (♂).
Holcaeus cecidomyiae Ashmead ; Marchal, 1897 : 83.
Homoporus laniger Marchal, 1897 : 83, 95.
Arthrolytus maculipennis (Walker) ; Gahan, 1933 : 71–75, fig. 17, ♂ ♀.
Arthrolytus maculipennis (Walker) ; Graham, 1956*b* : 254.

Type material. *Pteromalus maculipennis* Walker. Lectotype ♀ designated by Graham (1956*b* : 254). In that paper I mentioned the possibility that *Arthrolytus punctatus* Thomson might be a synonym of *maculipennis*. Since then I have re-examined Thomson's syntypic series of *punctatus*, which proves to be a mixed one, containing some specimens of *maculipennis*, others (including the lectotype) which are the same as *discoideus* (Nees).

Holcaeus cecidomyiae Ashmead. Lectotype (actually cited as " holotype ") male selected by Gahan (1933 : 73–74). It is in U.S.N.M. and according to Gahan, bears the name label in Ashmead's handwriting, also a small hand-written label " Type ". Gahan considered it to be the same as *maculipennis*. The species was described from material reared in France from the Hessian fly, by P. Marchal.

Arthrolytus maculipennis was redescribed in detail by Gahan (1933). His description and figure (17C) of the male antenna, particularly the form of the scape and his statement (p. 73) that the antennal club is not differentiated, as well as some points in his description of the female, show that he had before him the true *maculipennis*. It is true that he synonymized *A. punctatus* Thomson with *maculipennis*, but he did not see the syntypes of *punctatus*, some of which (but not the lectotype) are in fact the same as *maculipennis*.

BRITAIN, FRANCE, SWEDEN, GERMANY ; probably widely distributed in Europe, but I have not checked any specimens from countries other than those mentioned. In Britain I find it most often in damp meadows and marshy places.

Biology. Reared in France, under the names *Holcaeus cecidomyiae* Ashmead and *Homoporus laniger*, from the Cecidomyiid species *Mayetiola* (=*Phytophaga*) *destructor* (Say) and *M.* (=*P.*) *avenae* (Marchal) ; see Marchal, 1897. Gahan (1933 : 75) remarked that, in view of the apparent abundance and wide distribution of *maculipennis* and the fact that it had been recorded only once as a parasite of these common pests, it seemed hardly likely that either of them was the normal host. No doubt this will prove to be the case. Imagines May–Sept.

Arthrolytus (Arthrolytus) discoideus (Nees) **comb. n.**

(Text-fig. 653)

Pteromalus discoideus Nees, 1834 : 119, ♀.
Pteromalus Artembares Walker, 1839 : 257, ♂, **syn. n.**
Arthrolytus punctatus Thomson, 1878 : 158, ♀, **syn. n.**

Type material. *Pteromalus discoideus* Nees. LECTOTYPE, a female in coll. Westwood (Oxford), e coll. Nees, bearing a small pink square label numbered " 7 ", also labelled in Westwood's handwriting " Pteromalus discoideus Esenb. 2. 119. E Mus. Esenb.".

Pteromalus artembares Walker. Syntypes, 2 ♂. One bearing a Waterhouse label, is selected as LECTOTYPE.

Arthrolytus punctatus Thomson. Syntypes, several specimens. LECTOTYPE, a female labelled " Lp in " [Lapponia inferioris] ; " Bhn " [Boheman] ; " 14/G " ; " punctatus Ths " ; and " TYPE " (on a red label).

BRITAIN, SWEDEN, GERMANY ; probably widely distributed in Europe.

Biology. Unknown. Imagines Aug.–Sept.

Arthrolytus (Arthrolytus) megaspilus (Walker) **comb. n.**

Pteromalus megaspilus Walker, 1874 : 318, ♀.

Type material. Syntypes, 2 ♀. LECTOTYPE, Hym. 5. 728, bearing a red-bordered type label and also labelled " 142 ", " Amurland. Coll. F. Walker 1913–71 ", and, in Walker's handwriting, " Pteromalus megaspilus ".

ASIA (Amurland).

Biology. Unknown.

ERDOESINA Graham

Erdoesina Graham, 1957*b* : 180. Type-species : *Pteromalus alboannulatus* Ratzeburg, 1852.
Erdoesina Graham ; Peck *et al.*, 1964 : 57.

Two species are known, one only from Siberia.

Erdoesina alboannulata (Ratzeburg)

(Text-figs. 296, 656, 657)

Pteromalus alboannulatus Ratzeburg, 1852 : 231.
Pteromalus alboannulatus Ratzeburg; Otten, 1940 : 185–186.
Erdoesina alboannulata (Ratzeburg) Graham, 1957*b* : 180–181, ♂ ♀.

Type material. Types presumed lost. The species was redescribed by Graham (1957*b*).

GERMANY.

Biology. Parasite of the pupae of *Panolis griseovariegata* (Goeze) ; reared from this host by Ratzeburg [under the name of *Noctua piniperda* (Pz.)] and by Sachtleben (see Graham, 1957*b* : 181) ; Otten (1940 : 185–186) recorded it in Germany from *Bupalus piniarius* (L.), *Polia* [=*Ceramica*] *pisi* (L.), and from cocoons of *Banchus* sp. (Hym., Ichneumonidae).

[*Erdoesina boarmiae* Bouček

Erdoesina boarmiae Bouček, 1967 : 640–641, ♀.

Type material. Holotype ♀, Siberia, Tomsk region, 18.i.1962, in Národní Museum, Prague (Cat. no. 26.101).

ASIA: Siberia.

Biology. Parasite of pupae of *Boarmia crepuscularia* (Schiff.) (Bouček, 1967).

For the differences between *boarmiae* and *alboannulata* (Ratzeburg) see Bouček (1967 : 641)].

CYCLOGASTRELLA Bukovskij

Cyclogastrella Bukovskij, 1938 : 153–156. Type-species : *C. quercina* Bukovskij, by monotypy.
Pseudomicromelus Gahan & Fagan ; Gahan, 1938 : 226, [*ex parte*].
Pseudomicromelus Gahan & Fagan ; Nikol'skaya, 1952 : 224.
Cyclogastrella Bukovskij ; Graham, 1956b : 258.
Cyclogastrella Bukovskij ; Peck *et al.*, 1964 : 51.
Cyclogastrella Bukovskij ; Bouček, 1965e : 26–27.

The genus *Pseudomicromelus* Gahan and Fagan, 1923, which is very close to *Cyclogastrella*, has been recorded from Europe, but I think in error. Thus Bouček (*in* Peck *et al.*, 1964 : 51) records " Only *P. silanus* (Walker) in western Europe, not found in C.S.R., reared from *Anarsia lineatella*." The type-species of *Pseudomi-*

cromelus (*Micromelus silanus* Walker, 1843) is Australian. It seems likely that the European record of *P. silanus* is a mistake for *Cyclogastrella deplanata* (Nees).

Key to European Species

(Females)

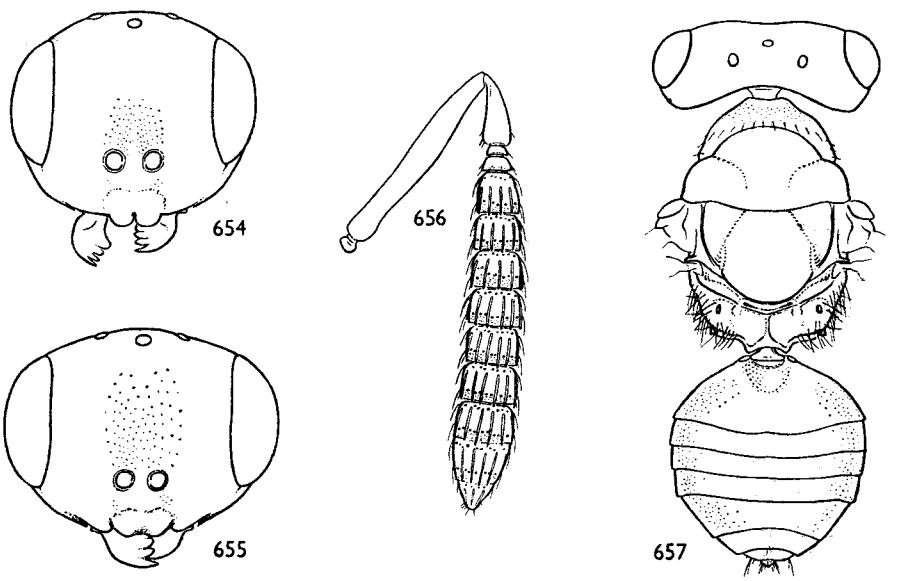
1 Antenna with flagellum slender, only slightly stouter than the pedicellus ; distal segments of funicle quadrate ; 3 anelli present. Fore wing with postmarginal vein 1·2–1·4 times as long as the stigmal vein ; basal vein pilose throughout, basal cell usually with a few scattered hairs in its distal part. Mesoscutum and scutellum relatively shiny, with very fine and delicate reticulation.

Anterior margin of clypeus shallowly emarginate medially. Antennal pedicellus (and scape) mainly to wholly testaceous ; tibiae testaceous, femora less strongly infuscate than in the following species

flavius (Walker) (p. 800)

– Antenna with flagellum distinctly stouter than the pedicellus ; distal segments of funicle slightly to quite obviously transverse ; 2 or 3 anelli present. Fore wing with postmarginal vein usually approximately as long as the stigmal vein, rarely very slightly longer ; basal vein usually bare, occasionally sparsely pilose, basal cell bare. Mesoscutum and scutellum relatively duller, with stronger reticulation.

Antennal pedicellus often infuscate ; tibiae sometimes more or less so ; femora usually mainly dark 2



FIGS. 654–657. 654, *Cyclogastrella clypealis* Bouček, ♀, head ; 655, *Cyclogastrella deplanata* (Nees), ♀, head ; 656, *Erdoesina alboannulata* (Ratzeburg), ♀, antenna ; 657, same, ♀, body.

2 (1) Anterior margin of clypeus (Text-fig. 654) projecting as two semicircular flat lobes which are separated by a deep incision ; head in frontal view appearing more subcircular. Antenna with pedicellus nearly or quite as long as the four succeeding flagellar segments together . . ***clypealis*** Bouček (p. 800)

– Anterior margin of clypeus (Text-fig. 655) projecting less strongly, with two short lobes between which there is only a shallow emargination ; head in frontal view appearing more transversely oval. Antenna with pedicellus not or barely as long as the four succeeding flagellar segments together ***deplanata*** (Nees) (p. 798)

(MALES)

1 Antenna with anelli moderately transverse, each anellus rather more than twice as broad as long ; scape nearly as long as an eye, reaching the median ocellus, mainly to wholly testaceous. Fore wing with basal vein pilose throughout ; basal cell usually with some scattered hairs in its distal part. Mesoscutum and scutellum more shiny, with delicate reticulation.

Anterior margin of clypeus shallowly emarginate medially ***flavius*** (Walker) (p. 800)

– Antenna with anelli strongly transverse, each anellus more than three times as broad as long ; scape either distinctly shorter than an eye and not reaching the median ocellus, or else mainly fuscous. Fore wing with basal cell most often bare ; basal vein bare or pilose. Mesoscutum and scutellum less shiny, with stronger reticulation 2

2 (1) Anterior margin of clypeus projecting as two semicircular lobes which are separated by a deep incision (cf. Text-fig. 654). Antennal scape distinctly shorter than an eye, not reaching the median ocellus. Head in dorsal view 2·1–2·15 times as broad as long . . . . ***clypealis*** Bouček (p. 800)

– Anterior margin of clypeus projecting less strongly, with two short lobes between which there is only a shallow emargination (cf. Text-fig. 655). Antennal scape virtually as long as an eye, reaching the lower edge of the median ocellus. Head in dorsal view 2·25–2·4 times as broad as long ***deplanata*** (Nees) (p. 798)

Cyclogastrella deplanata (Nees) auctt. plur.

(Text-fig. 655)

Ormocerus simplex Walker, 1834 : 169, ♂, **syn. n.**
Pteromalus deplanatus Nees, 1834 : 110, ♂ ♀, [*ex parte*].
Pteromalus domesticus Walker, 1835 : 481, ♀.
Pteromalus Artemon Walker, 1839 : 218, ♂, **syn. n.**
Pteromalus Merope Walker, 1839 : 219, ♂, **syn. n.**
Pteromalus Phasis Walker, 1848 : 119, 175, ♂, **syn. n.**
Pteromalus Acco Walker, 1848 : 120, 177, ♀, **syn. n.**
Pteromalus Androbius Walker, 1848 : 126, 200, ♀, **syn. n.**
Cyclogastrella quercina Bukovskij, 1938 : 154–156, ♂ ♀.
Cyclogastrella deplanata (Nees) Graham, 1956*b* : 259.
Cyclogastrella deplanata (Nees) ; Bouček, 1965*e* : 27.

Type material. The name *deplanata* (Nees) is well known and has been used for the present species by many authors following its adoption by Walker (1846 : 40) as a senior synonym of his own species *domesticus*. The name, however, has never been objectively defined by selection of a lectotype because the collection of Nees

was thought to have been destroyed. Actually there are remains of the collection in Oxford and it contains two specimens identified as *deplanatus* ; one is a female of *Psychophagus omnivorus* (Walker), the other a female of *Diglochis sylvicola* (Walker) ! It seems advisable to preserve the current usage of the name *deplanatus* and disregard the above specimens. From the description of *deplanatus* by Nees (1834 : 110) it appears very probable that he had at least three species mixed under that name. On page 111 he states " Mares et feminas primo vere et autumno ad fenestras cubiculi *Sickershusae* observavi. Majo mense in Pruno Pado, Julio aliis in floribus deprehendi". The first sentence suggests the species currently known as *Cyclogastrella deplanata*, which sometimes swarms in old houses ; the second sentence might refer to the specimens still extant, particularly to the female of *Psychophagus omnivorus*, which according to its label was captured in July. In order to define objectively the name *deplanatus*, the best course would be to apply to the International Commission with a proposal that the lectotype of *domesticus* (Walker), the next junior synonym, should be made neotype of *deplanatus*.

Ormocerus simplex Walker. One male, LECTOTYPE, bearing a Waterhouse label.

Pteromalus domesticus Walker. Lectotype designated by Graham (1956*b* : 259). Walker synonymized his species with *deplanatus* Nees in 1845*b* : 1142, footnote.

Pteromalus artemon Walker. Syntypes, 5 specimens. LECTOTYPE, the third specimen, an unlabelled male.

Pteromalus merope Walker. Syntypes, 3 specimens. LECTOTYPE, a male bearing a Waterhouse label, also one reading " 38. 7. 12. 205 ".

Pteromalus phasis Walker. One male, LECTOTYPE, bearing a Waterhouse label.

Pteromalus acco Walker. One female, LECTOTYPE ; it bears a Waterhouse label, also one in C. Ferrière's handwriting " Pseudomicromelus deplanatus Nees ".

Pteromalus androbius Walker. One female, LECTOTYPE, bearing a Waterhouse label.

Cyclogastrella quercina Bukovskij. Location of type material (from *Tortrix viridana* L. in the Crimea) not known to me.

Widely distributed in EUROPE ; NORTH AFRICA (Morocco).

Biology. Parasite of various Tortricoidea, e.g., *Tortrix viridana* L., *Cacoecia sorbiana* Hübn., *Semasia diniana* Gmel.

Long ago Walker (1845*a* : 850) recorded the species (under the name of *Pteromalus domesticus*) as a parasite of *Lozotaenia* (=*Cacoecia*) *xylosteana* (L.) and (1845*b* : 1142) of *Tortrix viridana* (L.). These records went unnoticed for some years and there was some speculation regarding the hosts of *deplanata* until Scott (1922 : 56) bred several from pupae of *Tortrix viridana* (L.). *C. deplanata* often appears in large swarms in buildings. Walker (1835 : 481) recorded it " on the windows and walls of houses in infinite numbers during July, and more sparingly throughout the rest of the year " ; later (1845*a* : 850) he remarked that it " lives throughout the year, being torpid during the cold weather, though the occurrence of a mild day often draws it from its retreats ". Scott (1919 : 13–16 ; and 1922 : 59–60)

recorded numerous other cases of swarms of *deplanata* in buildings. Such swarms occur most often in July and August, though sometimes as late as December in Britain. Extreme abundance of *deplanata* and consequent swarming, appears to coincide with severe infestations by *Tortrix viridana*.

Cyclogastrella flavius (Walker)

Pteromalus Flavius Walker, 1839 : 230, ♂.
Pteromalus Cepio Walker, 1848 : 127, 213, ♀, **syn. n.**
Metopon (Dirhicnus) heterotomus Thomson, 1878 : 171, ♀, **syn. n.**
Cyclogastrella flavius (Walker) Bouček, 1965*e* : 27.

Type material (Walker types bear a Waterhouse label).
Pteromalus flavius Walker. One male, LECTOTYPE (possibly holotype).
Pteromalus cepio Walker. One female, LECTOTYPE.
Metopon (Dirhicnus) heterotomus Thomson. Syntypes, 2 ♂, 1 ♀. LECTOTYPE, the female, labelled " Lund ", " ♀ " and (in Thomson's handwriting) " Heterotomus ".

BRITAIN, SWEDEN.
Biology. Unknown. Imagines Aug.–Sept.

Cyclogastrella clypealis Bouček
(Text-fig. 654)

Cyclogastrella clypealis Bouček, 1965e : 26, ♂ ♀.

Type material. Holotype ♀, Czechoslovakia, Praha-Hanspaulka, 3.x.1947, on a window (*Bouček*), in Národní Museum, Prague (Cat. no. 26.010).

CZECHOSLOVAKIA, MOLDAVIAN S.S.R.
Biology. Unknown. Imagines June–Oct.

PLATNEPTIS Bouček

Platneptis Bouček, 1961 : 84. Type-species : *P. maceki* Bouček by monotypy and original designation.

Platneptis laeta (Walker)

Pteromalus Laeta Walker, 1848 : 125, 199, ♀.
Platneptis maceki Bouček, 1961 : 84, ♀.
Platnepis laeta (Walker) Bouček, 1965*b* : 549.

Type material. *Pteromalus laeta* Walker. One female, probably holotype, bearing a Waterhouse label.
Platneptis maceki Bouček. Holotype ♀, Czechoslovakia, Bohemia, Kytín in

Brdy mountains, vii.1959 (*J. Maček*), in Národní Museum, Prague (Cat. no. 2972). Placed in synonymy with *laeta* (Walker) by Bouček (1965*b* : 549).

The male of *laeta* is unknown.

BRITAIN, CZECHOSLOVAKIA.

Biology. Unknown. Imagines in July.

TRITNEPTIS Girault

Tritneptis Girault, 1908 : 92. Type-species : *T. hemerocampae* Girault, by monotypy and original designation.
Tritneptis Girault ; Gahan, 1938 : 213–219.
Tritneptis Girault ; Nikol'skaya, 1952 : 229.
Tritneptis Girault ; Peck *et al.*, 1964 : 51.

This genus is very close to *Dibrachys* Förster, from which it differs chiefly in the immarginate occiput. It was in fact synonymized with *Dibrachys* by Girault himself (1926 : 63). In 1938 Gahan treated *Tritneptis* as a valid genus, gave a key to the North American species, and corrected the synonymy. No revision of the European species has appeared, though certain collectors have been aware for some years that several species occur in this region. I give below a tentative key to those which I have been able to examine critically. Before a complete revision can be achieved, however, it may be necessary to examine the types of some American species and much more material from Europe than is available to me.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Head thick antero-posteriorly, only about 1·75 times as broad as its maximum length ; temples, in dorsal view of head, more than half as long as eyes ; antennal scrobes deeply excavated. Gaster shortly ovate to subcircular, 1·1–1·4 times as long as broad, broader than but only slightly longer than the thorax, nearly always more or less reddish basally. Marginal vein 2·5–3 times as long as the stigmal vein . . . ***lophyrorum*** (Ruschka) (p. 802)

– Head more transverse, 1·9–2 times as broad as its maximum length in dorsal view ; temples at least slightly less than half as long as eyes ; antennal scrobes less deep. Gaster usually relatively longer, not reddish basally. Marginal vein at most about 2·3 times as long as the stigmal vein . . 2

2 (1) Fore wing with marginal vein about 2·3 times as long as the stigmal vein. Head in dorsal view with temples rather more than one third as long as eyes. Anterior margin of clypeus broadly but shallowly emarginate . sp. indet. (p. 803)

– Fore wing with marginal vein 1·75–2 times as long as the stigmal vein. Head in dorsal view with temples one quarter to one third as long as eyes. Anterior margin of clypeus less broadly but more deeply emarginate . . . 3

3 (2) Apical margin of fore wing completely bare all round. Gaster hardly as long as head plus thorax, slightly broader than the thorax, 1·35–1·6 times as long as broad. Head shaped much as in *Dibrachys lignicola* (Text-fig. 668), with temples about one third as long as eyes and converging only moderately. Legs, apart from the coxae, usually testaceous, occasionally the femora infuscate . . . . . ***diprionis*** Gahan (p. 803)

– Apical margin of fore wing ciliate over at least its posterior half. Gaster as long as or somewhat longer than head plus thorax, 2·25–2·7 times as long as broad, not broader than the thorax. Head shaped much as in *Dibrachys cavus* (Text-fig. 670), with temples only about one quarter as long as eyes and converging strongly. Femora, and hind tibiae, usually more or less infuscate
klugii (Ratzeburg) (p. 803)

I am unable to provide a key to the males of *Tritneptis* at present.

Tritneptis lophyrorum (Ruschka)

Diglochis lophyrorum Ruschka, *in* Ruschka & Fulmek, 1915 : 400–401, fig. 1, ♂ ♀.

Type material. Syntypes, Bohemia, Humprecht, 1911, bred from cocoon of *Lophyrus pini* L., presumably in Naturhistorisches Museum, Vienna.

I have not seen the types of *lophyrorum*, but Ruschka's description accords very well with the specimens I have so named. Gahan (1938 : 215) placed *lophyrorum* in synonymy with *Tritneptis klugii* (Ratzeburg) but he had not seen the types of either species. There seems to be no doubt that Gahan was right in his interpretation of *klugii*, but I cannot follow his opinion regarding the identity of *lophyrorum* ; the respective original descriptions suggest to me that two different species are involved.

Ruschka's description of the female of *lophyrorum* (1915 : 400–401) states " Hinterleib sehr Kurz, oval, Bohrer etwas vorstehend . . . Kopf und Thorax dunkel erzfarben . . . Hinterleib an der Basis braun durchscheinend, hinten pechbraun ".

On the other hand, Ratzeburg's description of the female of *klugii* (1844*a* : 198) includes the following statements: " Hinterleib länger, als Rumpf, eiformig, stachelspitzig-kurzzugespitzt . . . Rumpf und Kopf stahlblau (letzterer öfters grunlich), Hinterleib metallisch bräunlich." Gahan (1938 : 216) supplements Ratzeburg's description by saying that the abdomen of female *klugii* is " as long as the head and thorax or longer, elongate ovate in outline, and fully twice as long as broad. The venation, shape of the abdomen, and most of the other characters agree very closely with those of the genus *Dibrachys* Foerster, but the absence of any semblance of an occipital carina at once excludes the species from that genus ".

Tritneptis klugii (Ratzeburg), as interpreted here following Gahan, has indeed much the same facies as *Dibrachys cavus* (Walker), having a dark bluish head and thorax and an elongate, immaculate gaster. Incidently Ratzeburg (1844*a* : 198) compared *klugii* with his *Pteromalus tenuis*, which is now considered to be the male of *cavus*.

On the other hand, *Tritneptis lophyrorum* (Ruschka) has more of the general facies of a *Diglochis* as regards the head and the short, oval to subcircular gaster, the latter also paler at its base.

It may also be pointed out that Ratzeburg later (1852) placed *klugii* in his section II of *Pteromalus*, which section is characterized (p. 236) as having the postmarginal vein 1·5–2 times as long as the stigmal vein (" Der Costalnerv ist $1\frac{1}{2}$–2 Mal so lang, als der Radialnerv "). Females which I presume to be *klugii*

have the postmarginal vein slightly longer than the stigmal vein. On the other hand, in *lophyrorum* (Ruschka) the postmarginal vein is approximately equal in length to, or even very slightly shorter than, the stigmal vein.

In view of these differences I maintain *lophyrorum* as a valid species.

SWEDEN, GERMANY, CZECHOSLOVAKIA, U.S.S.R. ; CANADA, U.S.A.

Biology. Ruschka's original material was bred from cocoons of *Diprion* (=*Lophyrus pini* (L.) (Hym., Diprionidae)). Imagines July–August.

Tritneptis diprionis Gahan

Tritneptis diprionis Gahan, 1938 : 214, 217, ♂ ♀.
Tritneptis diprionis Gahan ; Peck, 1963 : 670.

Type material (not seen) from four localities in U.S.A., the type under no. 52891 in U.S.N.M.

I refer to this species some males and females bred from cocoons of *Neodiprion* sp. taken at Arnhem, Holland, by Prof. G. C. Varley, the parasites emerging 14.iii. 1952 ; also many males and females reared from cocoons of *Neodiprion sertifer* (Geoffr.) at Ameibischl, Carinthia, Austria, ix.1961–v.1962, by K. Schedl (material in BM(NH)).

HOLLAND, AUSTRIA ; CANADA, U.S.A.

Biology. The host records for *diprionis* in North America (see Peck, 1963 : 670) include three species of *Diprion*, four species of *Neodiprion*, and two of the genus *Pikonema*.

Tritneptis sp. indet.

FINLAND : Ta., Vanaja, females reared in 1952 (Mr. *Erkki Valkeila*).

This species does not agree with any of those given in Gahan's key to the North American species (1938 : 213–214) and is presumably undescribed. I think it advisable, however, to defer describing it until the whole genus can be critically revised.

Tritneptis klugii (Ratzeburg)

Pteromalus klugii Ratzeburg, 1844*a* : 198, ♀.
Tritneptis klugii (Ratzeburg) Gahan, 1938 : 213, 214–216, ♂ ♀.
Tritneptis klugii (Ratzeburg) ; Peck, 1963 : 671–673.

Type material. Syntypes, Germany, Grand Duchy of Posen, 1841, from cocoons of *Nematus erichsonii*, in Ratzeburg collection, Eberswalde, now presumed destroyed. I accept the interpretation of *klugii* proposed by Gahan (1938) whose supplementary notes have been used in my determinations.

BRITAIN (new record): Scotland, Perthshire, Rannoch, 1 ♀, 3.vii.1953 (*Graham*); SWEDEN : Skåne, Sjöholmen, 1 ♀, 31.vii.1959 (*Graham*); GERMANY, CANADA, U.S.A.

Biology. The list of hosts in North America given by Peck (1963) includes species of *Diprion* and *Neodiprion* (Hym., Diprionidae) ; *Pristiphora erichsonii* (Htg.) (Tenthredinidae) ; and *Mesoleius tenthredinis* Morley (Ichneumonidae). Imagines June–July.

DIBRACHYS Förster

Dibrachys Förster, 1856 : 65. Type-species : *Pteromalus boucheanus* Ratzburg, by designation of Thomson, 1878 : 47.
Pteromalus sgen. *Dibrachys* Förster ; Thomson, 1878 : 147, 160–162.
Dibrachys Förster ; Ashmead, 1904 : 320, 322.
Dibrachys Förster ; Schmiedeknecht, 1909 : 329, 330, 358, [*ex parte*].
Dibrachys Förster ; Kurdjumov, 1913 : 11–12.
Coelopisthoidea Gahan, 1913 : 179. Type-species : *C. cladiae* Gahan, by original designation.
Dibrachys Förster ; Gahan, 1938 : 211–213.
Dibrachys Förster ; Nikol'skaya, 1952 : 218–219.
Dibrachys Förster ; Peck, 1963 : 674–683.
Dibrachys Förster ; Bouček, 1965*e* : 28–30.

The genus was erected by Förster (1856 : 65) without included species. The type-species is *Pteromalus boucheanus* Ratzeburg (1844*a* : 196), according to Gahan & Fagan (1923 : 43) who stated that it was designated as such by Thomson (1878 : 47). Thomson's statement occurs in a Swedish footnote referring to the genus *Colotrechnus*, and may be translated as follows : " Note. *Dibrachys* Foerster would agree best with this genus [i.e., with *Colotrechnus*] but Reinhard has sent me *Pteromalus Boucheanus* as type for that genus " [*Dibrachys*]. Farther on in the same volume (loc. cit. : 161–2) Thomson included two species in *Dibrachys*, viz. *boucheanus* (Ratzeburg) and *acutus* Thomson. It seems clear that Thomson accepted Reinhard's selection of *boucheanus* as the type-species.

Reinhard's interpretation of *Dibrachys* has been accepted by all authors subsequent to Thomson, and there would be no point in attempting to alter it. It is interesting to note, however, that Thomson, with his remarkable insight, was evidently right in his surmise that Förster's concept of *Dibrachys* really referred to the genus now known as *Colotrechnus* Thomson, because Dr. Novitzky wrote to me some years ago " Förster created *Dibrachys* for an undescribed species, remains of which in the Vienna Museum are clearly a species of *Colotrechnus* ".

The type-species of *Dibrachys* (*boucheanus* Ratzeburg) has hitherto been only subjectively defined ; the type material appears to have been destroyed in 1945 together with most of Ratzeburg's collection, hence no lectotype can be selected. However, Thomson (1878 : 161) cited *Pteromalus cavus* Walker (1835 : 477) as a probable synonym of *boucheanus*, and his view has gained general acceptance (for an extensive list of references to *cavus* and *boucheanus* see Peck, 1963). As *cavus* Walker is the earlier name, and the species is represented by several original specimens in Walker's collection, it can be objectively defined by selecting a lectotype, and one is designated in the present paper. Failing the discovery of original material of *boucheanus*, the lectotype of *cavus* might conveniently be made neotype

of *boucheanus*, since Ratzeburg's description suggests that the two are in fact identical.

The taxonomy of the European species of *Dibrachys* is not yet completely cleared up. At least five species occur in Britain, and I have seen about as many additional species from the Continent. The morphological characters separating some of the presumed species are rather small, whilst on the other hand the biology of some is not known so that evidence is not forthcoming from this aspect. Some species have been recorded from only one or two hosts, while on the other hand *cavus* (Walker) in the sense of recent authors (e.g., Peck, 1963) has an enormous list of hosts. Perhaps *cavus* is in fact very polyphagous, but I would not rule out the possibility that it (in the current sense) may include two or more sibling species. Only an extensive assessment of morphological characters combined with careful biological observations can settle this question. Until recently no key to the European species of *Dibrachys* existed ; that of Bouček (1965*e*) has, however, clarified their relationships. My own key was produced independently, but to some extent employs characters also used by Bouček.

Key to most European Species

(Males and Females)

1 Vertex curving very strongly in the longitudinal axis, the occipital carina very close to the foramen magnum. Left mandible with 3 teeth, right mandible with 4.

Body squat. Gaster of *female* only 1·1–1·4 times as long as broad, not or only slightly longer than the thorax, only bluntly pointed apically. (Sgen. *Allodibrachys* Bouček) 2

– Vertex curving less strongly in the longitudinal axis, the occipital carina at most slightly nearer to the foramen magnum than to the posterior ocelli. Both mandibles with 4 teeth.

Body sometimes more slender. Gaster of *female* 1·6–2·6 times as long as broad, usually longer than the thorax, often acute apically. (*Dibrachys* Förster, s. str.) 3

2 (1) Genae, in frontal view of head, almost straight, forming a distinct angle with the oral edge of the head. POL about 1·8 OOL. Marginal vein of fore wing 2–2·1 times as long as the stigmal vein. Larger species, length 2–2·5 mm.

hians Bouček (p. 808)

– Genae in frontal view evenly curved, not forming a distinct angle where they meet the oral edge of the head. POL approximately twice OOL. Marginal vein 1·75–1·9 times as long as the stigmal vein. Smaller species, length 1·6–2 mm.

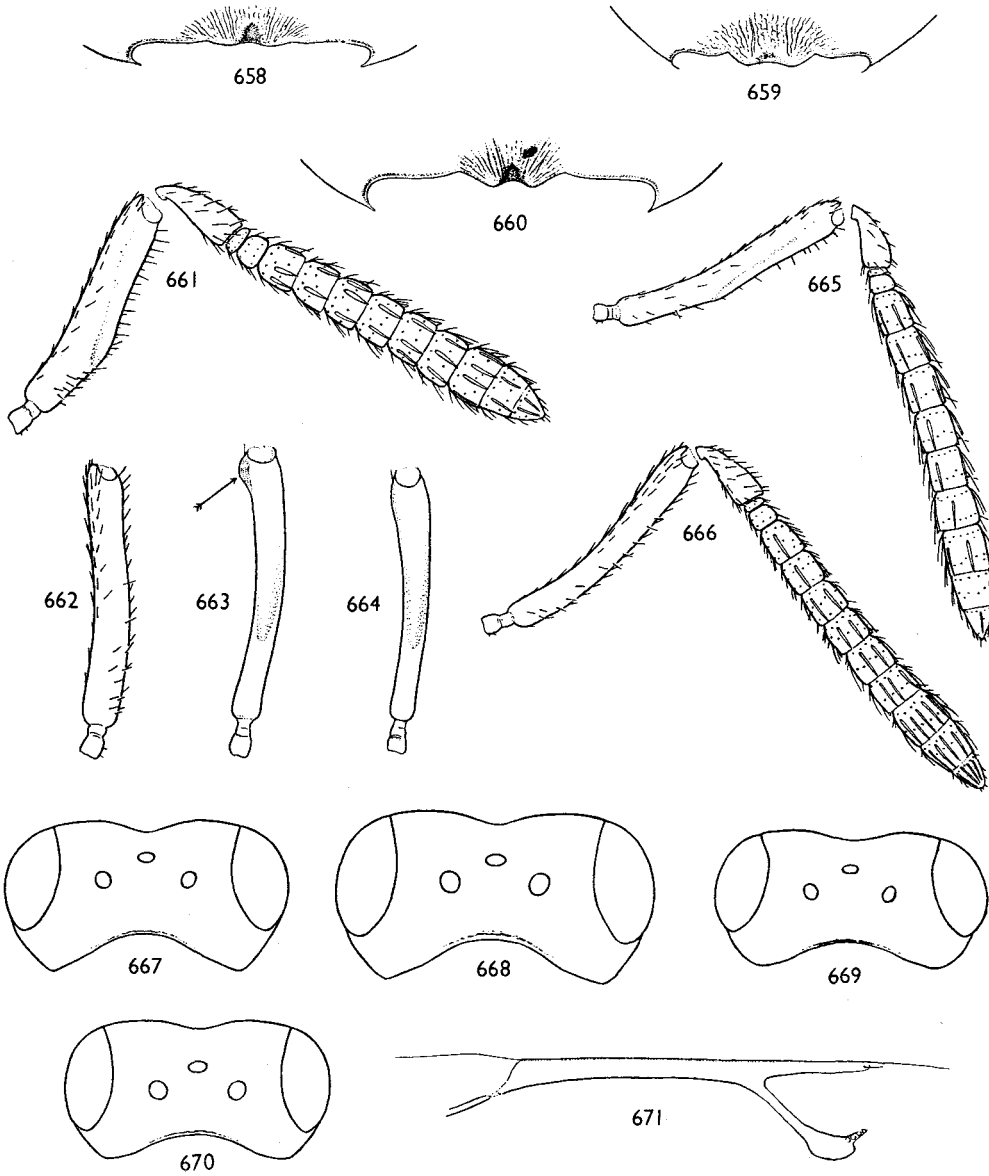
Clypeus, Text-fig. 658 . . . . . ***affinis*** Masi (p. 808)

3 (1) Face below antennal toruli flat, finely wrinkled transversely. Fore wing strongly and extensively infumate discally. Large species, 2·9–3·8 mm.

maculipennis Szelényi (p. 814)

– Face below antennal toruli convex, reticulate. Fore wing usually hyaline or with a small infumate discal cloud, rarely with a large one. Species sometimes relatively smaller 4

4 (3) Anterior margin of clypeus (Text-fig. 660) more deeply emarginate, with a long and deep median impression above the emargination. Breadth of oral fossa 2·8–3 times the malar space. Antennal flagellum of *female* stout ; second



FIGS. 658–671. *Dibrachys* spp. 658, *affinis* Masi, ♀, clypeus ; 659, *cavus* (Walker), ♀, clypeus ; 660, *fuscicornis* (Walker), ♀, clypeus ; 661, same, ♂, antenna ; 662, same, ♀, scape, profile ; 663, *lignicola* sp. n., ♂, scape, front view ; 664, *cavus* (Walker), ♂, scape, front view ; 665, same, ♂, antenna ; 666, same, ♀, antenna ; 667, *fuscicornis* (Walker), ♀, head ; 668, *lignicola* sp. n., ♀, head ; 669, *boarmiae* (Walker), ♀, head ; 670, *cavus* (Walker), ♀, head ; 671, *boarmiae* (Walker), ♀, fore wing venation.

anellus about 1·5 times as broad as long ; all funicular segments, except the first, at least slightly transverse. Fore coxae partly to wholly testaceous. Head, Text-fig. 667. *Male* with antennal scape (Text-fig. 661) relatively stout ; funicle with relatively shorter and straighter hairs

fuscicornis (Walker) (p. 808)

– Anterior margin of clypeus (Text-fig. 659) shallowly emarginate, with a short and shallow median impression. Breadth of oral fossa 2·1–2·7 times the malar space. Antennal flagellum of *female* more slender ; second anellus sometimes quadrate or only slightly transverse ; at most the distal segments of the funicle slightly transverse. Fore coxae dark. *Male* with antennal scape (Text-fig. 665) more slender ; funicle with relatively longer and more curved hairs 5

5 (4) *Female*. Eyes only 1·35–1·4 times as long as broad, their posterior orbits, as seen in profile hardly emarginate ; breadth of oral fossa 2·55–2·7 times the malar space ; gaster short, 1·6–1·8 times as long as broad, at most as long as head plus thorax ; marginal vein of forewing 1·8–2 times as long as the stigmal vein ; temples in dorsal view of head (Text-fig. 668) about one third as long as eyes. *Male*. Antennal scape in front view (Text-fig. 663) with a small projecting lobe at its apex ; gaster with a testaceous subbasal spot

lignicola sp. n. (p. 810)

– *Female*. Eyes 1·5–1·85 times as long as broad, their posterior orbits sometimes shallowly emarginate ; breadth of oral fossa 2·1–2·5 times the malar space ; gaster usually relatively longer ; marginal vein 1·75–2·9 times as long as the stigmal vein ; temples in dorsal view of head (Text-figs. 669, 670) tending to be less than one third as long as eyes. *Male*. Antennal scape in front view (Text-fig. 664) without a distinct lobe at its apex ; gaster with or without a pale spot 9

6 (5) *Female*. Fore wing with a large strongly infumate discal cloud ; marginal vein only about 1·75 times as long as the stigmal vein ; head about 1·3 times as broad as the mesoscutum ; head and thorax bright blue or blue green. *Male*. Not known to me . . . ***braconidis*** (Ferrière & Faure) (p. 814)

– Males and females. *Female*. Fore wing immaculate, or with at most a weak infumate discal cloud, in the latter case (*boarmiae*) the marginal vein is 1·8–2·1 times as long as the stigmal vein, the head is rather less broad relative to the mesoscutum, and the head and thorax are bronze or dark bluish . . 7

7 (6) *Female*. Head (Text-fig.- 669) exactly or almost exactly twice as broad as its maximum length ; eyes 1·5–1·6 times as long as broad ; when the head is seen in profile the posterior orbit of the eye is not or hardly emarginate ; disc of fore wing often slightly suffused with yellowish or brownish, the stigma (Text-fig. 671) tending to be slightly larger and more oblong than in *cavus*, the postmarginal vein often slightly shorter than the stigmal vein. *Male*. Gaster with a distinct testaceous subbasal spot . . ***boarmiae*** (Walker) (p. 812)

– *Female*. Head (Text-fig. 670) 1·85–1·9 times as broad as its maximum length ; eyes 1·65–1·85 times as long as broad ; when the head is seen in profile the posterior orbit of the eye appears shallowly emarginate in the middle ; fore wing hyaline or whitish hyaline, the stigma (Text-fig. 294) usually small and not distinctly oblong, the postmarginal vein usually as long as the stigmal vein. *Male*. Gaster immaculate, or with at most a minute and indistinct pale subbasal spot . . . . . ***cavus*** (Walker) (p. 810)

DIBRACHYS (ALLODIBRACHYS) Bouček

Dibrachys sgen. *Allodibrachys* Bouček, 1965*e* : 30. Type-species : *Dibrachys hians* Bouček, by original designation.

Bouček created this subgenus for *Dibrachys affinis* Masi and his new species *D. hians*, designating (1965*e* : 30) the latter as type-species. The species differ from those of *Dibrachys* s. str. in having the left mandible 3-dentate and the right mandible 4-dentate ; the occipital carina is situated low down near the foramen magnum. In addition they have the body more squat, and the appendages less slender, than in *Dibrachys* s. str.

Dibrachys (Allodibrachys) hians Bouček

Dibrachys (*Allodibrachys*) *hians* Bouček, 1965*e* : 28–29, 30, ♀.

Type material. Holotype ♀, Czechoslovakia, Bohemia, Kunratice near Prague, 29.viii.1964, on window of Entomology Dept. of the National Museum of Natural History (*P. Mikula*), in Národní Museum, Prague (Cat. no. 26.003).

The male is unknown.

CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Unknown, but two of the paratypes were captured in the Moldavian S.S.R., on a plum tree and on a hollow walnut tree respectively (Bouček, 1965*e* : 29). Imagines June–Oct. (one record of a female in March).

Dibrachys (Allodibrachys) affinis Masi

(Text-fig. 658)

Dibrachys affinis Masi, 1907 : 250–252, ♂ ♀.
Dibrachys affinis Masi; Thompson, 1958, sect. 2, pt. 5 : 591.
Dibrachys (*Allodibrachys*) *affinis* Masi ; Bouček, 1965*e* : 30.

Type material (not seen). Syntypes, Italy, Portici, reared from *Eudemis botrana* (Schiff.), in Museo Civico di Storia Naturale, Genoa.

BRITAIN, FRANCE, AUSTRIA, SPAIN, ITALY, ALGERIA. New to Britain ; Berkshire, Bagley Wood, 2 ♀, 24.vi.1954 (*Graham*).

Biology. Thompson (1958) gives a list of the recorded hosts of *affinis*, which includes *Anilastus ebeninus* (Gr.) (Ichneumonidae), *Apanteles glomeratus* (L.) (Braconidae) ; Diptera Calliphoridae (*Calliphora* spp.) ; and Lepidoptera of the families Tortricidae, Gelechiidae, Hyponomeutidae, and Oleuthridae. It has also been recorded (Secrétariat, etc., 1956 : 119, 126) as a parasite of *Stilpnotia salicis* (L.) (Lep., Lymantriidae) in Italy. Masi's original material was reared from *Eudemis botrana* (Schiff.) (Lep., Tortricidae). Adults appear during the summer in western Europe, specimens captured in the field in June, July and September.

DIBRACHYS (DIBRACHYS) Förster

Dibrachys (Dibrachys) fuscicornis (Walker) **comb. n.**

(Text-figs. 660, 667)

Pteromalus fusci-cornis Walker, 1836 : 484–485, ♀.

Type material. Syntypes, 3 ♀ ; LECTOTYPE, the first specimen, bearing a Waterhouse label.

Besides the characters given in my key (see above) *fuscicornis* has the following:

♀. Antennal scape either entirely testaceous, or else more or less infuscate distally ; pedicellus sometimes partly testaceous ; legs varying in colour, sometimes entirely testaceous with only the hind coxae darkened proximally, sometimes having the hind- (less often the mid-) coxae blackish with a metallic tinge, occasionally with the hind femora infuscate ; tegulae testaceous to brown ; gaster often more or less reddish at the base ventrally. Head in dorsal view (Text-fig. 667) only about 1·85 times as broad as long, with the temples more than one third as long as the eyes and forming distinct angles posteriorly. Mandibles large, their lower margin sinuate and, in its basal half, strongly reflexed. Scutellum rather more convex than in *lignicola*, *cavus*, *boarmiae*, and *braconidis*. Plicae of propodeum distinctly curved. Gaster hardly or only just as long as head plus thorax, 1·75–2 times as long as broad.

♂. Colour as in the female, but the gaster with a distinct, often large, subbasal testaceous spot, which is sometimes extended to form a transverse band ; hind coxae, often also the fore coxae more or less, black with a bluish metallic tinge. Antennal scape (Text-fig. 661) somewhat expanded, only 4·5–5 times as long as broad ; funicle stout, rather shorter than that of the female, all its segments except the first very slightly transverse ; clava about twice as long as broad ; flagellum clothed with short straight hairs.

BRITAIN : " near London. Isle of Wight " (Walker, 1836 : 485) ; Oxfordshire, Otmoor, ♂♂, ♀♀, 13.ix.1954, 12.viii.1955, 14.viii.1955, 18.ix.1956 (*Graham*) ; most of these were captured on foliage of *Salix fragilis* L.

Biology. Unknown ; there is a strong suggestion that the species is associated with some host or hosts on Salix. Imagines Aug–Sept.

Note. Dibrachys saltans (Ratzeburg) (=*Pteromalus saltans* Ratzeburg, 1852 : 232, ♂ ♀) must be close to *fuscicornis* (Walker) through probably not identical with it. The types of *saltans* (? Germany ; from cocoons of " *Cladius uncinatus* "), formerly in the Ratzeburg collection in Eberswalde, are now presumably destroyed. Gahan (1938 : 212) stated that in 1927 he had examined " the type " of *Pteromalus saltans*, and in the same paper he gave some notes on its characters. His notes apply well to the female of *fuscicornis*, with the exception of his statement that the second ring joint (anellus) of *saltans* is subquadrate ; that of *fuscicornis* is very distinctly transverse. He did not mention some of the other characters given here in my redescription of *fuscicornis*, so these cannot be checked. Bouček (1965*e* : 30) in his key to most European species of *Dibrachys*, distinguishes *saltans* (Ratzeburg) from *cavus* (Walker) by several characters. One of these " clypeal lobes shorter and turned more backwards, therefore not well visible in facial view " does not agree with those structures in *fuscicornis* (Walker), which suggests that the species regarded as *saltans* by Bouček is different from *fuscicornis*. The identity of *saltans* will have to remain an open question for the present.

Dibrachys (Dibrachys) vesparum (Ratzeburg)

Pteromalus vesparum Ratzeburg, 1852 : 233, ♀.

Type material. Syntypes (Germany : locality not specified, 30 ♀, reared (*Reissig*) from a wasp nest attached to a wall) presumably destroyed. According to informa-

tion kindly supplied by Dr. Novitzky, who saw the types, *vesparum* is a valid species of *Dibrachys*. Dr. Bouček recently sent me both sexes of a *Dibrachys* which might be the true *vesparum*, reared in Germany (Eschbach, 2.ii.1966, *R. Gauss*) from a nest of *Dolichovespula saxonica* (F.) (Hym., Vespoidea). It differs from all the species included in my key above. At this late stage I cannot modify my key, and prefer in any case to leave to Dr. Bouček the decision whether the species is *vesparum* or not.

Dibrachys (Dibrachys) lignicola sp. n.

In addition to the characters given in my key (which are considered diagnostic), *lignicola* has also the following:

♀. Antennal scape testaceous, or more or less infuscate distally ; head and thorax olive or bronzy olive greenish dorsally, dark blue ventrally ; legs, apart from the coxae, testaceous with the hind femora usually, the fore and mid femora sometimes, more or less infuscate ; rarely some or all of the tibiae (e.g., in Irish ♀♀) are brownish medially. Tegulae brown. Head in dorsal view (Text-fig. 668) about 1·9 times as broad as long, with temples slightly angulate posteriorly ; ocelli in a very low triangle (about 122°–125°) ; mandibles moderate-sized, their lower margin hardly sinuate or margined. Scutellum not strongly convex, less so than in *cavus*. Plicae of propodeum distinctly curved, converging posteriorly.

♂. Colour as ♀, but gaster with a subbasal testaceous spot ; flagellum brown or brownish testaceous. Antennal scape (Text-fig. 663) with a small projection at its upper internal angle, the antenna otherwise much as in ♂ *cavus* (Text-fig. 665).

Holotype ♀. IRELAND : Co. Dublin, Harold's Cross, 22.viii.1954, on a wooden post in garden at 14, Clareville Road (*Graham*), in Hope Department, University Museum, Oxford.

Paratypes. ENGLAND : Berkshire, Wytham, ♀♀, 10.viii.1952, 17.viii.1952 (*Graham*). IRELAND : Co. Dublin, Harold's Cross, 1 ♀, 14.vi.1937, 1 ♀, 15.vi.1937, 1 ♀, 27.ix.1937, 1 ♀, 17.vi.1941 (*Stelfox*) ; 1 ♀, 21.viii.1954, several ♀♀, 1 ♂, same data as holotype. Paratypes in Stelfox and Graham collections.

Biology. Unknown.

Dibrachys (Dibrachys) cavus (Walker)

(Text-figs. 659, 664, 670)

? *Diplolepis microgastri* Bouché, 1834 : 168, ♂ ♀.
Pteromalus cavus Walker, 1835 : 477, ♀, [?] ♂.
Pteromalus decedens Walker, 1835 : 478, ♂ ♀, **syn. n.**
? *Pteromalus perversus* Walker, 1835 : 479, " ♀ " [recte ♂].
Pteromalus tenuis Ratzeburg, 1844*a* : 195, ♂.
Pteromalus Bouchéanus Ratzeburg, 1844*a* : 196, ♀.
Dibrachys Boucheanus (Ratzeburg) Thomson, 1878 : 161, ♂ ♀.
Dibrachys cavus (Walker) Kurdjumov, 1913 : 11.
Dibrachys cavus (Walker) ; Muesebeck *et al.*, 1951 : 553–554.
Dibrachys cavus (Walker) ; Peck, 1963 : 674–682.
Dibrachys cavus (Walker) s. lat. ; Bouček, 1965*e* : 30.

The literature on *cavus* (Walker) is very extensive ; for very useful summaries

see Muesebeck *et al.*, 1951, and Peck, 1963. Several synonyms of *cavus*, other than those cited above, are given by these authors. Some of them refer to American species which I have not been able to examine ; consequently I have not included them here as definite synonyms of *cavus* although in all probability they are so. My chief concern here is to designate a lectotype for *cavus* ; also to give a short redescription of the species, which is desirable in order to indicate the differences between the nominotypical form and certain others (such as *boarmiae*) which may be specifically distinct.

Type material. *Diplolepis microgastri* Bouché. Types presumed lost ; there is no mention of them in Sachtleben's report (1944 : 65–76) on the remains of Bouché's collection in the Deutsche Entomologische Institut.

Pteromalus cavus Walker. The syntypic series comprises 1 ♂ and 6 ♀, all labelled " Pteromalus cavus Walker. Stood under this name in the old B.M. collection. C. Waterhouse ". Two of the females may belong to a different species from the rest. LECTOTYPE, the last specimen in the series, a female. It agrees well with specimens bred from *Apanteles* on *Pieris brassicae* L. [see new records below] ; the original description of *cavus* mentions (Walker, 1835 : 478) "*Pontia* [=*Pieris*] *brassicae* " as a host.

Pteromalus decedens Walker. Syntypes, 4 ♂, 7 ♀, all bearing Waterhouse labels. LECTOTYPE, the ninth in the series, a female ; it is very close to the lectotype of *cavus* and I consider it to be within the range of variation of that species.

Pteromalus perversus Walker. One male stands under this name and is certainly the TYPE (probably holotype) ; it bears a Waterhouse label. The gaster is broadly oval and slightly pointed apically ; this explains Walker's supposition that it was a female. It is a very small (length 1·35 mm.) very dark specimen which comes extremely close to some males of *cavus* in the Oxford collections which were bred from *Digonochaeta setipennis* Fln. (Dipt., Tachinidae), although the head appears rather more transverse. I regard it as probably within the range of variation of male *cavus*.

Pteromalus tenuis Ratzeburg and *P. boucheanus* Ratzeburg. Types, formerly in Ratzeburg collection, Eberswalde, now presumed destroyed. *P. tenuis* was later stated to be conspecific with *boucheanus* by Ratzeburg himself (1848 : 189) and there seems to be no reason to doubt the correctness of his conclusion. Thomson (1878 : 161) recognized *boucheanus* as a *Dibrachys*, citing *cavus* as a probable synonym ; his specimens seem to bear out this conclusion.

In addition to characters mentioned in my key to species (see below) *cavus* has the following, as seen in specimens from southern England.

♀. Head and thorax bronze, dark bluish, or dark greenish blue. Antennal scape (Text-fig. 666) often entirely fuscous, but sometimes testaceous proximally, rarely mainly so ; pedicellus and flagellum usually fuscous to black, occasionally the pedicellus paler beneath. Wing veins varying from brownish testaceous to almost white. Legs variable in colour, from almost entirely black to extensively testaceous ; in those having the palest legs only the coxae are black, the remainder being testaceous with the femora and tibiae slightly brownish. The tarsi are sometimes mainly testaceous but are more often mainly brown or fuscous. Marginal vein 2·0–2·9 times as long as the stigmal vein ; postmarginal usually as long as or even very slightly

longer than the stigmal vein, rarely very slightly shorter ; the stigma (Text-fig. 294) tends to be smaller than in *boarmiae* and as a rule not subrectangular.

♂. Head and thorax greenish to bluish, the axillae and scutellum concolorous, or the scutellum at most slightly tinged with bronze ; gaster nearly always without, or with a very small and indistinct pale spot, rarely with the spot distinct. Antennae variable in colour, often entirely testaceous but sometimes having the pedicellus and scape infuscate, occasionally with the flagellum brownish. Legs sometimes as pale as in *boarmiae*, but in dark forms having both the femora and tibiae heavily infuscate. Antenna (Text-figs. 664, 665) with scape slender, 6·5–7·5 times as long as broad, without a projecting lobe at its distal end ; pedicellus shorter than in the female, hardly more than twice as long as broad ; funicle slender, its segments quadrate, or the proximally ones slightly longer than broad ; clava 2·3–3 times as long as broad ; flagellum clothed with hairs most of which are curved, subdecumbent, and longer than those of *fuscicornis*.

EUROPE (probably whole) ; CANADA, U.S.A. It has also been reported from China, Korea, North Africa, and Uruguay, but these records need confirmation.

Biology. If all the host-records in the huge list of Peck (1963 : 682) are correct, then *cavus* is a very polyphagous species. They include many records of *cavus* as a secondary parasite in the cocoons of Ichneumonidae and Braconidae which attack lepidopterous, and sometimes coleopterous, hosts ; but sometimes *cavus* acts as a primary parasite of the larvae. Sometimes it has been reared from the puparia of Tachinidae which are parasites on insects of other orders. It has even been recorded as parasitizing other Chalcidoidea, or even other individuals of its own species. Balduf (1937 : 181) remarked " Perhaps no other species of parasitic Hymenoptera is reported more frequently in the literature than this small chalcid ". In Britain imagines have been captured in the field May–Sept. (one record for November).

Dibrachys (Dibrachys) boarmiae (Walker) comb. n.

(Text-figs. 669, 671)

Pteromalus Mesoleptorum (Kollar MS.), Walker, 1847 : 230 [nom. nud.].
Pteromalus Boarmiae Walker *in* Newman, 1863 : 8609, [8610], ♀.

Type material. *Pteromalus boarmiae* Walker. Syntypes, 3 ♀ mounted on the same card and bearing a label " boarmiae " in Walker's handwriting ; the third (right-hand) specimen is designated LECTOTYPE. Walker's description of *boarmiae* is rather confused. On page 8609 of his 1863 paper he gave a Latin diagnosis of *Pteromalus boarmiae*, followed by an English description. On page 8610 he gave a latin diagnosis of *Tetrastichus decisus*, likewise followed by an English description. The respective English descriptions have clearly been accidentally transposed ; that on page 8610 really applies to *Pteromalus boarmiae* and not to *Tetrastichus decisus*, that on page 8609 applies to *T. decisus*, as a comparison with the respective Latin diagnoses shows.

The differences between *boarmiae* and *cavus* are very small but I think that the

two may be distinct species. Besides the characters mentioned in my key to species (see below), *boarmiae* tends to have the reticulation of the head rather denser than in *cavus*, the plicae of the propodeum slightly more curved, and the venation of the fore wing rather thicker. The following notes on the characters of *boarmiae* will supplement the foregoing :

♀. Head and thorax black with a weak bluish or bronze tinge. Antennal scape usually entirely testaceous, sometimes infuscate distally ; pedicellus often testaceous beneath and apically, occasionally brown ; flagellum brown to fuscous. Wing-veins on the average rather darker than in *cavus*. Legs varying in colour much as in *cavus* but tending to be on the average rather paler ; the tibiae often testaceous ; tarsi at least proximally, often mainly, clear testaceous. Marginal vein 1·8–2·1 times as long as the stigmal vein ; postmarginal vein often slightly shorter than, sometimes as long as, the stigmal ; stigma (Text-fig. 671) tending to be slightly larger and more subrectangular than that of *cavus* ; fore wing sometimes with a weak yellowish or brownish discal cloud.

♂. Head and thorax greenish to bluish with the axillae and scutellum bronze. Gaster with a distinct subbasal testaceous spot, which sometimes spreads out to form a transverse band. Antennae testaceous with the pedicellus a little darkened dorsally. Legs, apart from the coxae, testaceous, or with some or all of the femora brown. Other details as in male *cavus* (q.v.).

I have examined the following material of *boarmiae* :

ENGLAND : Buckinghamshire, Slough, a large number of ♂♂ and ♀♀, bred vii.1961, from pupae of *Hoffmannophila pseudospretella* (Stt.) at the Pest Infestation Research Laboratory, Slough. Dr. G. E. Woodroffe kindly informed me that the original specimens came from a field experiment where they were breeding *Hoffmannophila*. They were kept going on *Galleria mellonella* (L.) and were tested against spun-up larvae of a number of host species. They bred successfully on the following :

Lepidoptera : *Galleria mellonella* (L.), *Achroia grisella* (F.), *Aphomia gularis* (Zell.), *Corcyra cephalonica* (Stt.) and *Sitotroga cerealella* (Oliv.) (Pyralidae) ; *Hoffmannophila pseudospretella* (Stt.) (Oecophoridae). Coleoptera : *Stegobium paniceum* (L.), *Lasioderma serricorne* (F.) (Anobiidae) ; *Ptinus tectus* Boield. (Ptinidae) ; *Caryedon gonagra* F. (Bruchidae). Hymenoptera : *Bracon hebetor* (Say) (Braconidae). Two pupae of *Pieris brassicae* (L.) were successfully attacked when the pharate adult had separated inside the pupal skin.

Oxfordshire, Oxford, ♂♂, ♀♀ reared at some time between 1892 and 1900 from cocoons of *Apanteles* sp. on larvae of *Pieris rapae* (L.) (*G. D. H. Carpenter*). Warwickshire, Birmingham, ♂♂, ♀♀ reared 19.ix.1952 from cocoons of *Orgyia antiqua* (L.) (Lep., Lymantriidae) (*G. C. Varley*). Britain, unlocalized : 1 ♀ found in a breeding-case with *Melitaea aurinia* (L.), possibly hyperparasitic through *Apanteles bignelli* Marsh. Imagines July–Sept.

Walker's type specimens were reared from larvae of *Cleora* [" *Boarmia* "] *rhomboidaria* (Schiff.) ab. *perfumaria* Newman (see Newman, 1863 : 8609) ; no doubt as hyperparasites through *Microgaster alvearia* (F.)

In the old Hope-Westwood collection in Oxford there are 3 ♀ of *boarmiae* from Austria, unlocalized (*Kollar*), labelled " Pteromalus mesoleptorum Kll." [nom. nud.].

Dibrachys (Dibrachys) braconidis (Ferrière & Faure)

Homoporus luniger Nees var. *braconidis* Ferrière & Faure, 1925 : 226, fig. 1, ♀.
Dibrachys (*Dibrachys*) *braconidis* (Ferr. & Faure) Bouček, 1965*e* : 30.

Type material. Type female, France, region of Lyon, in BM(NH) as Type Hym. 5. 683. This specimen is very near to the female of *boarmiae* (Walker) but has the head and thorax more brightly metallic (blue), whilst the head is slightly broader, 2·1 times as broad as long in dorsal view, and 1·3 times as broad as the mesoscutum ; the head and thorax have rather stronger and denser sculpture, and the fore wing has a large yellowish brown cloud below the stigma. Unless these differences are due to geographical variation, it seems likely that *braconidis* represents a distinct species. It was recognized as a *Dibrachys* by Novitzky some years ago, and was later recombined into that genus by Bouček (1965*e*).

FRANCE : region of Lyon, 1923, reared as an external (and often gregarious) parasite of the larvae of *Apanteles glomeratus* (L.)

Biology. Original material reared from *Apanteles glomeratus* (L.), see above ; also recorded as a parasite of *Luffia lapidella* (Goeze) and *L. ferchaultella* (Steph.) (Lep., Tinaeidae), Secrétariat, etc., 1960 : 342, 350.

Dibrachys (Dibrachys) maculipennis Szelényi

Dibrachys maculipennis Szelényi, 1957 : 307–308, fig. 1, ♂ ♀.
Dibrachys maculipennis Szelényi ; Bouček, 1965*e* : 30.

Type material. Syntypes, 15 ♀ and 7 ♂ reared (Dr. *Jermy*) from pupae of *Hyphantria cunea* Drury collected at Adony, Hungary, 11–16.viii.1948, presumably in Hungarian Research Institute for Plant Protection, Budapest.

HUNGARY.

Biology. See above.

Note. Pteromalus transversus Förster (1841) was referred to *Dibrachys* by Delucchi (1955*a* : 174) ; later the same author (1958*a* : 54) corrected his earlier statement and stated that the type female of *transversus* was in fact the same as [*Dibrachoides*] *dynastes* (Förster).

DIBRACHOIDES Kurdjumov

Dibrachoides Kurdjumov, 1913 : 2–3, 12. Type-species : *Pteromalus dynastes* Förster, 1841, by monotypy and original designation.
Dibrachoides Kurdjumov ; Nikol'skaya, 1952 : 218.
Dibrachoides Kurdjumov ; Peck *et al.*, 1964 : 50.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Head in dorsal view (Text-fig. 676) with temples not acutely pointed posteriorly, and about half as long as eyes. Antenna with pedicellus slightly more than twice as

long as broad ; second anellus large, subquadrate, about two thirds as long as the first funicular segment . . . . . ***dynastes*** (Förster) (p. 815)

– Head in dorsal view (Text-fig. 675) with temples acutely pointed posteriorly, hardly half as long as eyes. Antenna (Text-fig. 673) with pedicellus about twice as long as broad ; second anellus about twice as broad as long, less than half as long as the first funicular segment . . . . . ***cionobius*** sp. n. (p. 816)

(MALES)

1 Head in dorsal view with temples only slightly acute posteriorly, virtually half as long as eyes. Antenna (Text-fig. 672) with second anellus only slightly transverse, about two thirds as long as the first funicular segment ***dynastes*** (Förster) (p. 815)

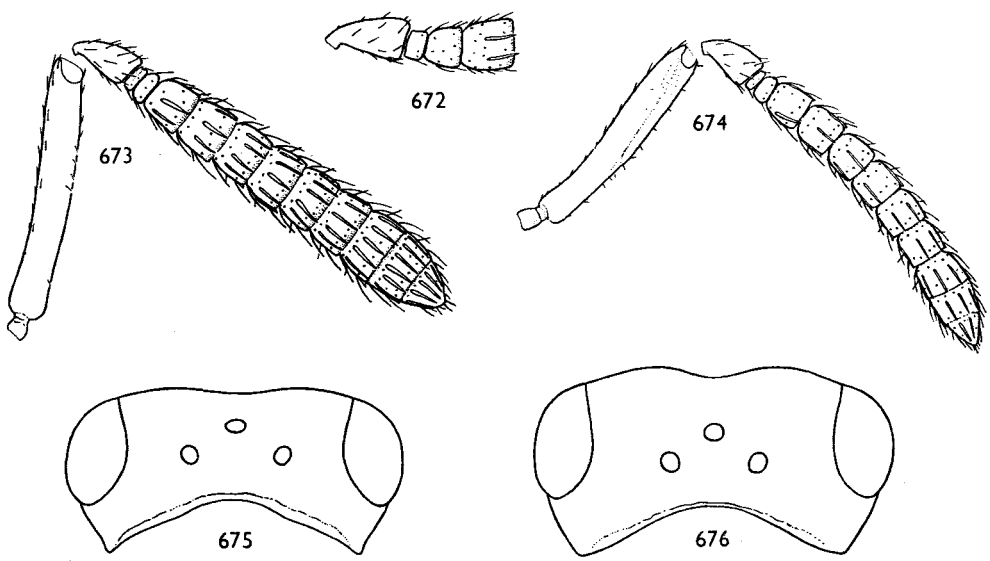
– Head in dorsal view with temples distinctly acute (nearly as in the female, cf. Text-fig. 675), somewhat less than half as long as eyes. Antenna (Text-fig. 674) with second anellus fully twice as broad as long, slightly less than half as long as the first funicular segment . . . . . ***cionobius*** sp. n. (p. 816)

Dibrachoides dynastes (Förster)

(Text-figs. 672, 676)

Pteromalus transversus Förster, 1841 : 18, ♀.
Pteromalus dynastes Förster, 1841 : 24, ♀.
Pteromalus (*Dibrachys*) *acutus* Thomson, 1878 : 162, ♂ ♀, **syn. n.**
Dibrachoides dynastes (Förster) Kurdjumov, 1913 : 12.
Dibrachoides druso Graham, 1956*b* : 260, ♂ [nec *Pteromalus druso* Walker, 1839].
Dibrachoides dynastes (Förster) ; Peck, 1963 : 667.

Type material. *Pteromalus transversus* Förster. Delucchi (1958*a* : 54) saw the



FIGS. 672–676. *Dibrachoides* spp. 672, *dynastes* (Förster), ♂, pedicellus and proximal part of flagellum ; 673, *cionobius* sp. n., ♀, antenna ; 674, same, ♂, antenna ; 675, same, ♀, head ; 676, *dynastes* (Förster), ♀, head.

damaged type female of *transversus* and stated it to be the same as *dynastes* Förster ; in doing so he corrected his earlier view (1955*a* : 154) that it belonged to *Dibrachys*.

Pteromalus dynastes Förster. Type material not seen (in Förster coll., Naturhistorisches Museum, Vienna) ; it was re-examined by Kurdjumov (1913).

Pteromalus (*Dibrachys*) *acutus* Thomson. Syntypes, 2 ♀, 1 ♂. LECTOTYPE female labelled " L-d " [Lund] and " acutus Ths ".

Note. Both *P. dynastes* Förster and *P. acutus* Thomson were erroneously placed in synonymy with *druso* Walker by me (Graham, 1956*b* : 260). The type ♂ of *druso* was thought to belong to *Dibrachoides*, but in fact as I later realized it is a male of *Kranophorus extentus* (Walker). Bouček (1965*e* : 35) has pointed out my error.

BRITAIN, SWEDEN, GERMANY, CZECHOSLOVAKIA, MOLDAVIAN S.S.R. ; NORTH AFRICA (Morocco).

Biology. *D. dynastes* was reared as a parasite of the larvae of the alfalfa-weevil, *Phytonomus posticus* (Gyll.) (Col., Curculionidae) in Portici, Italy, then imported into the U.S.A. during 1911–1912. These specimens were compared with Förster's type by Kurdjumov (1913 : 12). The species has also been reared from *Phytonomus* (=*Hypera*) *nigrirostris* (F.) and *Ph. rumicis* (L.), and has been mentioned in several papers on economic entomology published in North America ; for a list of these see Peck (1963). Imagines appear in the field in July and August (Europe).

***Dibrachoides cionobius* sp. n.**

(Text-figs. 673–675)

♀. Head and thorax olive-green, with a coppery bronze tinge in part, particularly on the mesoscutum and scutellum ; gaster mainly bronze, its first tergite mainly bright green. Mandibles testaceous. Antennal scape and pedicellus testaceous, the latter darker above ; flagellum brown, paler beneath. Coxae concolorous with the thorax ; rest of legs brownish testaceous with the trochanters partly, the knees very narrowly, the tips of the tibiae broadly, and the tarsi proximally, pale testaceous. Tegulae brownish testaceous. Wings hyaline, venation testaceous. Length 2·4–2·5 mm.

Head in dorsal view (Text-fig. 675) about twice as broad as long ; temples hardly half as long as the eyes, converging moderately, their outline almost straight, posteriorly produced to an acute point ; POL slightly greater than OOL. In front view the head is transversely oval. Eyes ovate, about 1·5 times as long as broad, their inner orbits diverging slightly ventrad. Malar space about two fifths the length of an eye. Antenna (Text-fig. 673) with scape not reaching the median ocellus ; combined length of pedicellus and flagellum about two thirds the breadth of the head ; pedicellus fully as long as anelli plus first funicular segment, in dorsal view about twice as long as broad ; first anellus short and strongly transverse, second somewhat longer, though fully twice as broad as long, and hardly more than one-third the length of the first funicular segment ; funicle stouter than the pedicellus, nearly cylindrical, all its segments, except perhaps the first, very slightly transverse ; clava hardly broader than the funicle, about 1·75 times as long as broad, nearly as long as the three preceding funicular segments together ; sensilla fairly numerous except on the proximal funicular segments.

Thorax like that of *dynastes* (Förster) female, but rather more squat, length : breadth viewed dorsally about 1·35 : 1, with the mesoscutum a little more strongly transverse, slightly more than twice as broad as long ; median area of propodeum more shiny, its sculpture less

strong, especially posteriorly. Fore wings similar to those of female *dynastes*, but with the apical margin ciliate over at least its hinder half.

Gaster ovate, slightly shorter than head plus thorax, 1·5–1·6 times as long as broad ; its apex pointed but not acutely so, the sides of the last tergite meeting at an angle of about 90°.

♂. Differs from the female as follows:

Head, thorax, and coxae bright green ; gaster greenish bronze, with a yellowish transverse band before the middle ; antennal scape, tegulae, and remaining parts of legs, bright yellow ; rest of antenna orange-yellow with the clava slightly darker ; mandibles yellowish ; wing-veins yellowish. Length 1·8 mm.

Antenna (Text-fig. 674) with pedicellus slightly shorter, hardly twice as long as broad ; funicle more slender, hardly stouter than the pedicellus.

Thorax less squat, 1·5–1·6 times as long as broad, with the mesoscutum rather less than twice as broad as long ; propodeum slightly longer, its median area less transverse.

Gaster oval, about as long and as broad as the thorax.

Holotype ♀. ENGLAND : West Kent, Belgebury [? Bedgebury] Park, reared from cocoon of *Cionus* sp. (Col., Curculionidae) on *Scrophularia* sp., collected on 4.viii.1935, the parasites emerging 11.viii.1935 (*O. W. Richards*), in BM(NH).

Paratypes. Same data as holotype, 1 ♂ in BM(NH), 1 ♀ in United States National Museum.

D. cionobius is easily distinguished, in both sexes, from *dynastes* (Förster) by the shape of the head as seen from above, and by the larger second anellus of the antenna.

In female *dynastes* the head in dorsal view (Text-fig. 676) is slightly less transverse than in *cionobius* ; the temples are relatively longer, about half as long as the eyes, and are not acutely pointed posteriorly ; POL is about equal to OOL. The eyes are rather longer (length : breadth nearly 1·7 : 1) and their inner orbits are virtually parallel. The pedicellus is slightly longer, in dorsal view a little more than twice as long as broad ; the second anellus is large, subquadrate, twice as long as the first anellus and about two thirds as long as the first funicular segment. The gaster is relatively longer (as long as, or very slightly longer than, head plus thorax) and is more sharply pointed apically, the sides of the last tergite meeting at a slightly acute angle. Slight differences in the thoracic structure of of the two species have already been mentioned. The head and thorax of female *dynastes* tend to be a brighter green than in female *cionobius*.

In male *dynastes* the head is shaped much as in the female (cf. Text-fig. 676) though with the temples very slightly acute, but not so distinctly so as in *cionobius*. The eyes are relatively longer than in male *cionobius*, and have their inner orbits virtually parallel. The second anellus is only slightly transverse, and is a half to two thirds as long as the first funicular segment.

SCHIZONOTUS Ratzeburg

Pteromalus sgen. *Schizonotus* Ratzeburg, 1852 : 230. Type-species : *Pteromalus* (*Schizonotus*) *sieboldi* Ratzeburg, by designation of Ashmead, 1904.
Schizonotus Ratzeburg ; Ashmead, 1904 : 283, 284, 388.
Schizonotus Ratzeburg ; Schmiedeknecht, 1909 : 155, 157, 162–163.
Schizonotus Ratzeburg ; Kurdjumov, 1913 : 7.
Schizonotus Ratzeburg ; Ferrière & Faure, 1925 : 233, *ex parte*.

Schizonotus Ratzeburg ; Nikol'skaya, 1952 : 227.
Schizonotus Ratzeburg ; Graham, 1956*b* : 260.
Schizonotus Ratzeburg ; Bouček, 1956*a* : 395–398.
Schizonotus Ratzeburg ; Peck *et al.*, 1964 : 48.

For a revision of the European species, see Bouček (1958*a*).

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Head in frontal view with clypeus projecting somewhat below the level of the ventral ends of the genae. Antennal funicle yellowish beneath, darker above, clava fuscous to blackish ; combined length of the two anelli greater than the breadth of the second anellus ; second funicular segment subquadrate
sieboldi Ratzeburg (p. 819)

– Head in frontal view with clypeus not projecting below the level of the ventral ends of the genae. Antennal flagellum uniformly fuscous to black ; combined length of the two anelli approximately equal to the breadth of the second anellus ; second funicular segment 1·2–1·5 times as broad as long . ***latus*** (Walker) (p. 818)

(MALES)

1 Flagellum yellowish with the clava blackish ; clava often not longer than the combined length of funicular segments 5 and 6 ; first funicular segment subquadrate, distal segments broader than long . . . ***sieboldi*** Ratzeburg (p. 819)

– Flagellum uniformly testaceous to brown, the clava not distinctly darker than the funicle ; clava longer than the combined length of funicular segments 5 and 6 ; all funicular segments slightly broader than long, the first segment usually smaller than the second and sometimes almost anelliform . . ***latus*** (Walker) (p. 818)

Schizonotus latus (Walker)

(Text-fig. 293)

Pteromalus latus Walker, 1833 : 481, ♀.
? *Pteromalus latus* Walker ; Haliday, 1841-1842 : v, pl. G, fig. 2, ? ♀.
Arthrolytus incongruens Masi, 1907 : 252–254, ♂ ♀.
Schizonotus latus (Walker) Graham, 1956*b* : 260.
Schizonotus latus (Walker) ; Bouček, 1958*a* : 395–397, fig. 2, ♂ ♀.

Type material. *Pteromalus latus* Walker. Lectotype female designated by Graham (1956*b* : 260).

Arthrolytus incongruens Masi. Syntypes (not seen), Italy, Napes, Cancello, reared from pupae of *Plagiodera versicolor*, in Museo Civico di Storia Naturale, Genoa. The species was placed in synonymy with *latus* (Walker) by Graham (1956*b*: 260).

Schizonotus sieboldi Ratzeburg of authors was synonymized with *latus* (Walker) by Graham (1956*b* : 260) but Bouček has since shown that the true *sieboldi* of Ratzeburg is a valid species (see below).

Widely distributed in EUROPE ; probably also N. AFRICA, but the records for the latter need confirming.

Biology. Chiefly a parasite of *Plagiodera versicolor* Laich.). (Col., Chrysomelidae.) Imagines chiefly Aug.–Sept. (some females taken in April).

Schizonotus sieboldi Ratzeburg

Pteromalus (*Schizonotus*) *Sieboldi* Ratzeburg, 1852 : 230, ♀, [♂].
Schizonotus sieboldi Ratzeburg ; Bouček, 1958*a* : 395–397, fig. 1, ♂ ♀.
Pteromalus (*Schizonotus*) *sieboldi* Ratzeburg ; Bouček, 1964*b* : 672.

Type material. Types presumed lost. Bouček (1958*a* : 395–397) discussed the identity of *sieboldi* and concluded that it was a valid species, basing his conclusions on the host mentioned by Ratzeburg and the latter's mention of the colour of the antennae in one of his specimens, which could only have been a male of the present species. Later (1964*b* : 672) he found, in a remnant of Ratzeburg's collection in Eberswalde, a female which could be one of the original specimens ; it agreed with his earlier definition.

GERMANY, CZECHOSLOVAKIA, U.S.S.R.

Biology. Chief host *Melasoma populi* (L.) (Col., Chrysomelidae) ; see Bouček, 1958*a*.

KRANOPHORUS Graham

Pteromalus sgen. *Coelopisthus* Thomson, 1878 : 162 [emendation of *Coelopisthia* Förster, 1856].
Coelopisthia Nikol'skaya, 1952 : 220, *ex parte* [*nec* Förster, 1856].
Kranophorus Graham, 1956b : 257. Type-species : *Pteromalus extentus* Walker, 1835, by original designation.
Coelopisthia Peck, 1963 : 665–667 [*nec* Förster, 1856].
Kranophorus Graham ; Peck *et al.*, 1964 : 50.

It seems quite certain that *Coelopisthus* Thomson was intended as an emendation of *Coelopisthia* Förster, from Thomson's reference in his Swedish footnote (1878 : 162) ; it was also regarded as such by Gahan & Fagan (1923 : 38). Now Ashmead (1904 : 320, 371) designated *Pteromalus cephalotes* Walker [1836] as type-species of *Coelopisthia* Förster, which had originally been described without included species. Unfortunately the lectotype of *Pteromalus cephalotes* Walker is a female identical with *Pteromalus puparum* (L.) ; hence *Coelopisthia* falls as a synonym of *Pteromalus* Swederus (q.v.). The species included in *Coelopisthus* by Thomson as " Pteromalus cephalotes Walker " was in fact erroneously identified on the basis of false information supplied by Reinhard ; it has nothing to do with Walker's *cephalotes* but is the same as *extentus* Walker. For this reason I redescribed (1956*b*) the genus *Coelopisthia* of authors (*nec* Förster) as *Kranophorus*. Peck would prefer to preserve the customary usage of the name *Coelopisthia* and suggested (1963 : 665) that the International Commission should be asked to reject Ashmead's designation of *Pteromalus cephalotes* Walker as type-species and to replace it by that of *Coelopisthia cephalotes* Thomson [= *C. extentus* (Walker)].

KEY TO EUROPEAN SPECIES

(FEMALES)

The fore wing in both species may be immaculate or have a brownish discal cloud.

1 Antennal flagellum relatively slender, its maximum breadth hardly 1·5 times that of

the pedicellus when the latter is seen in dorsal view ; both anelli subquadrate or at most very slightly transverse ; proximal segments of funicle quadrate, distal segments only very slightly broader than long. Head strongly protuberant at level of antennal toruli ; the face receding strongly and forming an angle of about 100° with the frons. Marginal vein 1·6–1·9 times as long as the stigmal vein
extentus (Walker) (p. 820)

– Antennal flagellum stout, its maximum breadth nearly twice that of the pedicellus when the latter is seen in dorsal view ; first anellus distinctly broader than long, the second anellus at least very slightly so ; funicular segments, except sometimes the first, distinctly broader than long. Head less strongly protuberant at level of toruli ; the face receding less strongly and forming an angle of 130°–135° with the frons. Marginal vein 1·9–2 times as long as the stigmal vein
pachycerus (Masi) (p. 821)

(MALES)

Only the male of *extentus* is known to me. It has the head strongly protuberant at the level of the toruli and the face receding strongly, as in the female ; antennae with anelli about as in the female, but the distal segments of the funicle usually a little more distinctly transverse ; temples (Text-fig. 332) strongly produced backwards and appearing acute in dorsal view.

Kranophorus extentus (Walker)

(Text-fig. 332)

Pteromalus extentus Walker, 1835 : 480, ♀.
Pteromalus Catillus Walker, 1835 : 480, ♀.
Pteromalus rotundiventris Zetterstedt, 1838 : 426, ♀, **syn. n.**
Pteromalus Druso Walker, 1839 : 132, ♂.
Pteromalus breviramulus Förster, 1841 : 99, ♂.
? *Pteromalus eurynotus* Förster, 1841 : 116, ♂.
Coelopisthus cephalotes Thomson, 1878 : 163, ♂ ♀ [nec *Pteromalus cephalotes* Walker, 1836].
Kranophorus extentus (Walker) Graham, 1956*b* : 258.

Type material. *Pteromalus extentus* Walker and *P. catillus* Walker. Lectotypes designated by Graham (1956*b* : 258).

Pteromalus rotundiventris Zetterstedt. Five specimens stand under this name in Zetterstedt's collection, but one does not fit the description. LECTOTYPE, the second specimen (a female) in the series, unlabelled. Three of the other specimens are conspecific with the lectotype.

Pteromalus druso Walker. Lectotype designated by Graham (1956*b* : 261, when it was incorrectly stated to be the same as *Dibrachoides dynastes* Förster). My error has since been pointed out by Bouček (1965*e* : 35).

Pteromalus breviramulus Förster. Delucchi (1955*a* : 174) stated that the badly damaged type is probably the same as *catillus* Walker [=*extentus* Walker].

Pteromalus eurynotus Förster. Delucchi (1955*a* : 174) saw the type and stated that it was probably the same as *catillus* (Walker).

Widely distributed in EUROPE.

Biology. Recorded as a parasite of *Cacoecia murinana* (Hbn.) (Lep., Tortricidae) in Czechoslovakia (Secrétariat, etc., 1957 : 320, 326). Imagines May–August, females overwintering and becoming active in the following spring.

Kranophorus pachycerus (Masi) comb. n.

Coelopisthia pachycera Masi, 1924*a* : 220, ♀.

Type material. Syntypes, Italy, Isle of Giglio, 9 ♀, captured in January, February, June, July and November, 1901–1904 ; Camoligure, 1 ♀, April, 1915 (*A. Andreini*), in Museo Civico di Storia Naturale, Genoa ; lectotype not yet selected.

BRITAIN, ITALY, HUNGARY. New to Britain ; England : Berkshire, Wytham Wood, 1 ♀, 31.x.1953 (*Graham*) ; Dorset, Portland, West Weares Cliff, 1 ♀, 24.vii. 1935 (*C. D. Day*).

Biology. Unknown. Imagines June, Aug.–Oct.

CONOMORIUM Masi

Conomorium (Mayr MS.) Masi, 1924*a* : 215–217. Type-species : *Pteromalus eremita* Förster, 1841, by monotypy.
Conomorium Masi ; Peck *et al.*, 1964 : 41, 50.

Conomorium patulum (Walker)

Pteromalus patulus Walker, 1835 : 479, ♀.
Pteromalus amplus Walker, 1835 : 480, ♀.
Pteromalus Eremita Förster, 1841 : 29, ♀.
Coelopisthus vitripennis Thomson, 1878 : 163, ♂ ♀.
Conomorium eremita (Förster), Masi, 1924*a* : 217–220, ♀.
Conomorium patulum (Walker) Graham, 1956*b* : 257.
Conomorium patulum (Walker) ; Bouček, 1961*c* : 14.

Type material. *Pteromalus patulus* Walker and *P. amplus* Walker. Lectotypes designated by Graham (1956*b* : 257).

Pteromalus eremita Förster. Type (not seen) in Naturhistorisches Museum, Vienna ; the species was redescribed by Masi (1924*a*) from material compared with the type.

Coelopisthus vitripennis Thomson. Syntypes, 3 ♀, 4 ♂. LECTOTYPE, a female labelled " Rsiö " [Ringsjö] and " vitripennis Ths ".

BRITAIN, SWEDEN, GERMANY, CZECHOSLOVAKIA, HUNGARY, MOLDAVIAN S.S.R., ITALY.

Biology. The species has been recorded as a parasite of various Lepidoptera, e.g. *Hyphantria cunea* Drury (Arctiidae) and *Erannis bajaria* (Schiff.) (Selidosemidae), according to Bouček (1961*c*) ; also [under the name *eremita*] of *Malacosoma neustrium* (L.) (Lasiocampidae) in Sardinia (Secrétariat, etc., 1957 : 320–328) ; of *Lithocolletis platani* Stgr. (Gracillariidae) and *Paraleucoptera sinuella* Reutti (Lyonetiidae) in Italy (Secrétariat, etc., 1966 : 119, 128). Imagines appear in the field June–Oct.; females possibly overwinter.

STICHOCREPIS Förster

Stichocrepis Förster, 1860 : 130–132. Type-species : *S. armata* Förster, by monotypy.
Stichocrepis Förster, 1878 : 63–64.
Stichocrepis Förster; Erdös, 1955 : 295.
Stichocrepis Förster ; Peck *et al.*, 1964 : 51.

After its description this genus remained unnoticed until its recognition by Erdös (1955).

Stichocrepis armata Förster

(Text-figs. 292, 331)

Stichocrepis armata Förster, 1860 : 131–132, ♂.
Stichocrepis armata Förster, 1878 : 64, ♂.
Stichocrepis armata Förster ; Erdös, 1955 : 295, figs. d–g, ♂ ♀.

Type material. Type ♂ (Tyrol) presumably in Förster coll., Naturhistorisches Museum, Vienna (not seen). After Förster described the male, the species remained unnoticed until Erdös (1955) described the female and figured the antenna of the male. In the only female that I possess (from Czechoslovakia) the hind wings are much reduced in size, but I do not know whether such is the usual condition in this sex.

SWITZERLAND, AUSTRIA, CZECHOSLOVAKIA, HUNGARY, MOLDAVIAN S.S.R.

Biology. Unknown. Occurs in xerothermic habitats ; the male is not uncommon but the female is rarely captured. Imagines June–August.

MUSCIDIFURAX Girault & Sanders

Muscidifurax Girault & Sanders, 1910 : 146–149. Type-species : *M. raptor* G. & S., by original designation.
Muscidivorax [*sic*] Girault ; Kurdjumov, 1913 : 5.
Muscidifurax Girault & Sanders ; Nikol'skaya, 1952 : 221.
Muscidifurax Girault & Sanders ; Peck, 1963 : 708–709.
Muscidifurax Girault & Sanders ; Peck *et al.*, 1964 : 45.

Both the genus and its type species were very fully described in the above paper by Girault and Sanders.

Muscidifurax raptor Girault & Sanders

(Text-fig. 291)

Muscidifurax raptor Girault & Sanders, 1910 : 149–153, figs. 1–4, ♂ ♀.
Muscidifurax raptor Girault & Sanders ; Peck, 1963 : 708–709.

Type material (not seen). Syntypes, 32 ♂ and 81 ♀ in Illinois State Laboratory of Natural History, Urbana, Illinois, Cat. no. 40,250 ; 2 ♂ and 2 ♀ in U.S.N.M., Cat. no. 12,240.

The species is virtually cosmopolitan.

Biology. Reared as a parasite of *Musca domestica* L. (Dipt., Muscidae) ; in America also from *Phormia regina* (Mg.) and *Chrysomyia macellaria* (F.) (Dipt., Calliphoridae) ; see Peck (1963). Imagines (in Britain) Aug.–Sept.

DIMACHUS Thomson

Dimachus sgen. *Dimachus* Thomson, 1878 : 50, 52. Type-species : *Pteromalus discolor* Walker, 1836, by monotypy.
Dimachus Thomson ; Ashmead, 1904 : 276.
Dimachus Thomson ; Schmiedeknecht, 1909 : 284, 285, 287.
Dimachus Thomson ; Peck *et al.*, 1964 : 47.

Dimachus discolor (Walker)

? *Pteromalus Cingolum* Nees, 1834 : 95, ♂.
Pteromalus discolor Walker, 1836 : 473, ♀.
Pteromalus Emathion Walker, 1839 : 243, ♂, **syn. n.**
Pteromalus Drepanon Walker, 1848 : 124, 188, ♂, **syn. n.**
Dimachus discolor (Walker) Thomson, 1878 : 52–53, ♂ ♀.

Type material. *Pteromalus cingulum* Nees. Type destroyed. The description suggests the ♂ of *Dimachus discolor*.

Pteromalus discolor Walker. One female, LECTOTYPE ; Waterhouse label.

Pteromalus Emathion Walker. Syntypes, 3 ♂. LECTOTYPE labelled "38.7.12. 208."

Pteromalus drepanon Walker. One ♂, LECTOTYPE.

BRITAIN, IRELAND, SWEDEN, CZECHOSLOVAKIA ; but probably more widely distributed in Europe.

Biology. A female was captured on 23.vi.1952, at Henley, Oxfordshire (Mr. *G. R. Gradwell*), who believed that the specimen may have emerged from *Stegobium paniceum* L. (Col., Anobiidae). Imagines June–August.

LARIOPHAGUS Crawford

Lariophagus Crawford, 1909*a* : 52. Type-species : *L. texanus* Crawford, by monotypy.
Lariophagus Crawford ; Kurdjumov, 1913 : 8, 15–16, [*ex parte*].
Lariophagus Crawford ; Waterston, 1921 : 13–19.
Lariophagus Crawford ; Nikol'skaya, 1952 : 229.
Lariophagus Crawford ; Peck, 1963 : 690.
Lariophagus Crawford ; Peck *et al.*, 1964 : 56.
Lariophagus Crawford ; Bouček, 1965*e* : 20–22.

Kurdjumov (1913 : 15–16) recognized that *Lariophagus* occurred in Europe ; but he placed in it not only *distinguendus* Förster and *puncticollis* Möller, but also some other species that do not belong to it. Waterston (1921) gave some useful notes on the genus. Bouček (1965*e*) described a new European species.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Hind tibia with two distinct spurs. Fore wing with basal cell with scattered hairs over most of its surface ; costal cell broad, length to breadth about 8 : 1. Antennae with combined length of pedicellus and flagellum distinctly less than breadth of head ; funicle stouter than the pedicellus, its segments subquadrate or slightly transverse. Gaster dorsally convex. Mesoscutum with rather indistinct piliferous punctures. Malar space slightly more than half length of an eye . . . . . sp. indet. (p. 826)

– Hind tibia with only one spur. Fore wing with basal cell bare, or with at most a very few isolated hairs ; costal cell narrower, length to breadth about 10 : 1 2

2 (1) Apical margin of fore wing ciliate except sometimes for a short space just beyond the postmarginal vein. Antennae with combined length of pedicellus and flagellum slightly less than breadth of head ; flagellum rather stout, segments of funicle subquadrate. Malar space only about half length of an eye. Gaster dorsally flat or slightly concave . . ***fimbriatus*** Bouček (p. 826)

– Apical margin of fore wing without cilia. Antennae with combined length of pedicellus and flagellum approximately equal to breadth of head ; flagellum slender, proximally not stouter than the pedicellus. Malar space about two thirds the length of an eye. Gaster dorsally convex. Propodeum, Text-fig. 313 . . . . . ***distinguendus*** (Förster) (p. 824)

(MALES)

1 Fore wing with apical margin mainly to entirely bare. Antennae with pedicellus fully twice as long as broad ; flagellum rather slender ; at least some of the proximal funicular segments slightly longer than broad, in large specimens segments 1–4 may be very distinctly longer than broad, and only the sixth segment quadrate . . . . . ***distinguendus*** (Förster) (p. 824)

– Fore wing with apical margin ciliate. Antennae with pedicellus about 1·5 times as long as broad ; flagellum relatively stouter ; all funicular segments subquadrate . . . . . ***fimbriatus*** Bouček (p. 826)

Lariophagus distinguendus (Förster)

(Text-fig. 313)

Pteromalus distinguendus Förster, 1841 : 17, ♂.
Pteromalus Calamis Walker, 1849 : 207, ♂ ♀, **syn. n.**
Pteromalus oryzinus Rondani, 1874 : 131.
Pteromalus oryzinus Rondani, 1877 : 195.
Meraporus utibilis Tucker, 1910 : 341–343, ♀.
Lariophagus distinguendus (Förster) Kurdjumov, 1913 : 15.
Lariophagus distinguendus (Förster) ; Gahan, 1921 : 239.
Lariophagus distinguendus (Förster) ; Waterston, 1921 : 9, 13–15, ♀.
Lariophagus utibilis (Tucker) Waterston, 1921 : 8–9, 18–19, ♂ ♀.
Lariophagus distinguendus (Förster) ; Peck, *in* Muesebeck *et al.*, 1951 : 555.
Lariophagus distinguendus (Förster) ; Peck, 1963 : 691.

Several other references to this species, which is well-known in the economic literature, are given by Peck (1963).

Type material.

Pteromalus distinguendus Förster. Syntypes presumably in Förster coll., Naturhistorisches Museum, Vienna (not seen) ; I have examined some Förster specimens, determined by him as *distinguendus*, in the Westwood collection in Oxford.

Pteromalus calamis Walker. Syntypes, 11 specimens ; LECTOTYPE, the first one, a male (Type Hym. 5.708) labelled " Madeira, Wollaston " and " Pteromalus calamis ".

Pteromalus oryzinus Rondani. Type in Museum " La Specola ", Florence, according to Delucchi (1955*a* : 174) who stated it to be the same as *distinguendus*.

Meraporus utibilis Tucker. Type ♀ (U.S.A., Texas, Plano) in U.S.N.M. (not seen). The species was synonymized with *L. distinguendus* by Gahan (1921), who considered the type of *utibilis* to be a rather small and poorly developed specimen of *distinguendus*.

Cosmopolitan.

Biology. Parasite of beetles associated with stored products, e.g. *Calandra* (=*Sitophilus*) *oryzae* (L.), *Lasioderma serricorne* (F.) (Anobiidae), *Bruchus brachialis* Fåhr. (Brüchidae). A detailed list of references to its hosts is given by Peck (1963). Occasionally the species is captured in open country.

Lariophagus puncticollis (Möller)

Arthrolytus puncticollis Möller, 1882 : 180, ♂ ♀.
Lariophagus puncticollis (Möller) Kurdjumov, 1913 : 16.
Lariophagus puncticollis (Möller) ; Ruschka & Fulmek, 1915 : 401.
Lariophagus puncticollis (Möller) ; Waterston, 1921 : 9, 16–18, ♀.
Lariophagus puncticollis (Möller) ; Ruschka, 1921 : 463, 464–465.

Type material. Kurdjumov (1913) stated that he had seen " the type " in Naturhistorisches Museum, Vienna ; Ruschka (1921 : 464–465) also mentioned having examined the types in that museum. According to *Ent. Tidskr.* (1883 : 223), Möller presented specimens of *puncticollis* to the Entomological Society of Stockholm; I am not aware of the present location of these. It will be necessary to re-examine all the extant syntypes and to select a lectotype. Meanwhile the status of *puncticollis* is rather doubtful. Kurdjumov (1913) transferred it to *Lariophagus* and gave some brief notes on the specimen which he considered to be the type. Waterston (1921) referred to Kurdjumov's notes, and also redescribed and figured *puncticollis* from three other females which he considered to belong to that species ; one of them is now in the BM(NH) and has been examined by me. According to Waterston (1921 : 9) *puncticollis* differs from *distinguendus* in its larger size [actual dimensions not mentioned], more distinct and numerous setigerous punctures of the mesoscutum, more numerous bristles on stigmal vein [wrongly termed " marginal vein " on p. 9], and structure of the propodeum, the front part of the latter being divided into four rectangular cells. The distinctions enumerated by Waterston do not appear at all obvious to me. One of the females which he

identified as *puncticollis* is certainly large (length about 2·5 mm.) ; but some other specimens which seem to be otherwise typical *distinguendus* are just as large. Ruschka (1921 : 463) synonymized *puncticollis* with *distinguendus*, stating (*ibid.* : 464–465) that he had seen the types of both in Vienna. It seems likely that *puncticollis* represents a large and robust form of *distinguendus*.

Lariophagus fimbriatus Bouček

Lariophagus fimbriatus Bouček, 1965*e* : 20, ♂ ♀.

Type material. Holotype ♀, Czechoslovakia, southern Slovakia, Pukanec (between Levice and Banská Štiavnica), 31.vii.1955 (*Dlabola*), in Národní Museum, Prague (Cat. no. 26.005).

CZECHOSLOVAKIA, MOLDAVIAN S.S.R.
Biology. Unknown.

Lariophagus sp. indet.

BRITAIN : unlocalized, one female in Dale collection, Hope Dept., University Museum, Oxford. This species appears to be a true *Lariophagus*, but is remarkable in having two distinct spurs on the hind tibia.

HEMITRICHUS Thomson

Dimachus subgen. *Hemitrichus* Thomson, 1878 : 50, 54. Type-species : *H. rufipes* Thomson, by monotypy.
Uriella Ashmead, 1896 : 221. Type-species *U. rufipes* Ashmead, by monotypy.
Hemitrichus Thomson ; Schmiedeknecht, 1909 : 284, 285, 287.
Hemitrichus Thomson ; Peck *et al.*, 1964 : 46.

Uriella was placed in synonymy with *Hemitrichus* by Gahan & Wallace (1950 : 97).

KEY TO EUROPEAN SPECIES
(FEMALES)

1 Gaster 2–2·5 times as long as broad, at most slightly longer than head plus thorax ; last tergite not or hardly longer than its basal breadth. Marginal vein of fore wing 1·7–1·75 times as long as the stigmal vein. Propodeum less constricted posteriorly, the nucha therefore relatively less distinct . . . ***seniculus*** (Nees) (p. 827)
– Gaster 2·8–3·3 times as long as broad, nearly or quite 1·5 times as long as head plus thorax ; last tergite nearly or quite twice as long as its basal breadth. Marginal vein of fore wing about 1·8 times as long as the stigmal vein. Propodeum more constricted posteriorly so that the nucha is relatively more distinct ***oxygaster*** Bouček (p. 827)

Other smaller difference between the females of these two species are given by Bouček (1965*e* : 19).

The male of *oxygaster* is unknown.

Hemitrichus seniculus (Nees)

Pteromalus seniculus Nees, 1834 : 101, 423, ♀.
Pteromalus Phylacis Walker, 1848 : 120, 185, ♂, **syn. n.**
Dimachus (*Hemitrichus*) *rufipes* Thomson, 1878 : 54, ♀.
Uriella rufipes Ashmead, 1896 : 222–3, ♂ ♀.
Hemitrichus assimilis Masi, 1922 : 158–159, ♀.
Hemitrichus seniculus (Nees) Delucchi, 1955*a* : 173.

Type material. *Pteromalus seniculus* Nees. Delucchi (1955*a* : 173) stated that he had found, in Naturhistorisches Museum, Vienna, a specimen of *seniculus* marked " Or. Ex." [Original Exemplar] ; this specimen agreed with Nees' description and Delucchi evidently regards it as lectotype.

Pteromalus phylacis Walker. One male, LECTOTYPE (possibly holotype), bearing a Waterhouse label. It is a very small specimen (length 1·7 mm.) with unusually short funicular segments, the first being hardly 1·5 times as long as broad, the sixth even shorter. I have, however, seen other rather similar males in a reared series with normal males of *seniculus*, and I think *phylacis* is probably within its range of variation.

Hemitrichus rufipes Thomson. One female, clearly the holotype, labelled " Lhn 24/7 ".

Uriella rufipes Ashmead. Lectotype female, U.S.A., Ohio, in U.S.N.M. (not seen) ; it was re-examined by Gahan and Wallace, who placed Ashmead's species in synonymy with *H. rufipes* Thomson (1950 : 97).

Hemitrichus assimilis Masi. Syntypes, two ♀, Italy, Isle of Giglio, iv.1901 and i(?)1904, in Museo Civico di Storia naturale, Genova. The species was synonymized with *seniculus* (Nees) by Delucchi (1955*a* : 173) after comparing the respective types.

BRITAIN, FRANCE, SWEDEN, GERMANY, CENTRAL EUROPE, ITALY ; NORTH AMERICA.

Biology. Most often found in association with stored products. The published records include as hosts Lepidoptera, Coleoptera, and Diptera. Gahan & Wallace (1950 : 98) suggested that this indicates that some of the records may be wrong. There is a female in the Hope Dept., University Museum, Oxford, reared at Summertown, Oxford " from *Ptinus tectus* Boield. [Col., Ptinidae] in dog-biscuits ". Occasionally specimens have been captured in open country. Bouček (1954 : 61) recorded *Eurygaster maura* (L) [Hem., Pentatomidae] as a host. Imagines May–June, September.

Hemitrichus oxygaster Bouček

Hemitrichus oxygaster Bouček, 1965e : 19, ♀.

Type material. Holotype ♀, Moldavian S.S.R., Sadovo, 24.viii.1963 (*Bouček*), in Národní Museum, Prague (Cat. no. 26.000).

CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Unknown. Imagines in August.

DORCATOMOPHAGA Kryger

Dorcatomophaga Kryger, 1951 : 103–104. Type-species : *D. westi* Kryger, by monotypy.
Dorcatomophaga Kryger ; Peck *et al.*, 1964 : 35.

Dorcatomophaga westi Kryger

Dorcatomophaga westi Kryger, 1951 : 105–106, ♂ ♀.

Type material. Syntypes (not seen) presumably in Universitetets Zoologiske Museum, Copenhagen.

The antennae seem to be unusually variable in this species. Kryger (1951, fig. 8) showed the antenna of a normal female as having the formula 11263, but he also figured an abnormal female in which the first and second segments of the funicle are coalesced. In his generic diagnosis (1951 : 104) he described the antennae of both sexes as having 2 anelli and 6 funicular segments ; but he remarked that the antennae are variable and stated that he had males and one female in which the antennae had only 5 funicular segments. I have myself seen a female in which the antennae have 3 anelli and 5 funicular segments.

DENMARK, SWEDEN.

Biology. " Parasitic in larvae of *Dorcatoma* in old oak-trees " (Kryger, 1951 : 106). Kryger (ibid. : 103) stated that he had reared the parasite from wood taken from an old oak infested with larvae of *Dorcatoma* and that no other insects except the beetle and the Chalcidoid were reared, hence the latter must be parasitic on the *Dorcatoma*.

VRESTOVIA Bouček

Vrestovia Bouček, 1961 : 79. Type-species : *V. clypealis* Bouček, by monotypy and original designation.

This genus is close to *Metastenus* Walker but differs in having the marginal vein not thickened, the left mandible with 3 teeth and the right mandible with 4 (both mandibles with 4 teeth in *Metastenus*) ; and, at least in the female, in having 2 instead of 3 anelli in the antennae. So far only one species is known.

Vrestovia fidenas (Walker)

Gastrancistrus Fidenas Walker, 1848 : 105, 157, ♂.
Vrestovia clypealis Bouček, 1961 : 79, ♂ ♀.
Vrestovia fidenas (Walker) Bouček, 1965*b* : 548.

Type material. *Gastrancistrus fidenas* Walker. One male, LECTOTYPE (but probably holotype), bearing a Waterhouse label.

Vrestovia clypealis Bouček. Holotype ♀, eastern Bohemia, Velký Vřeštov, 8.vii.1957 (*Bouček*), in Národní Museum, Prague (Cat. no. 2971). The species was synonymized with *fidenas* (Walker) by Bouček (1965*b* : 548).

BRITAIN, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Unknown. Imagines July–August.

METASTENUS Walker

Metastenus Walker, 1834 : 301. Type-species : *M. concinnus* Walker, by monotypy.
Scymnophagus Ashmead, 1904 : 319. Type-species : *S. townsendi* Ashmead by monotypy and original desingation.
Scymnophagus Ashmead ; Schmiedeknecht, 1909 : 328, 330, 335.
Metastenus Walker ; Graham, 1956*b* : 256.
Metastenus Walker ; Peck *et al.*, 1964 : 39.

Scymnophagus Ashmead was placed in synonymy with *Metastenus* Walker by Graham (1956*b* : 256). The latter genus had been misinterpreted by Thomson (1876*a* : 205).

Metastenus concinnus Walker

Metastenus concinnus Walker, 1834 : 302 " ♂ " [*recte* ♀].

Type material. Lectotype ♀ designated by Graham (1956*b* : 256).

BRITAIN, rare : only the lectotype of *concinnus* (taken in " August ; on grass in fields ; near London " by Walker) is known to me. It is clear that Walker originally had more than one specimen, however, since he described a var. β.

The lectotype female has the head and thorax bronze, with a faint olive tinge in places ; the gaster is twice as long as broad, distinctly longer and also narrower than the thorax, its apex relatively strongly acute, forming an angle of about 45°.

Biology. Unknown.

Metastenus mesnili (Delucchi) **comb. n.**

Scymnophagus mesnili (Ferrière MS.) Delucchi, 1954 : 264–266, ♀.

Type material. Holotype ♀ in BM(NH), Type Hym. 5. 696 ; paratypes in coll. Mesnil.

I am not sure whether *mesnili* is a form of *concinnus* (Walker) or a valid species. The two are very similar, but the female of *concinnus* has the gaster relatively longer, 1·8–2 times as long as broad, and somewhat longer than the thorax, and more acute apically ; whilst the type ♀ of *mesnili* has the gaster 1·6–1·7 times as long as broad, hardly longer than the thorax, and relatively less acute apically. The head, mesoscutum, and scutellum of female *mesnili* appear rather more shiny than those of *concinnus*, their reticulation being rather weaker. The respective types differ somewhat in colour, but this feature seems to be variable. Study of further material may show that *mesnili* is just a form of *concinnus*.

GERMANY, SWITZERLAND.

Biology. Parasite of the pupae of *Pullus impexus* (Mulsant). Delucchi (1954 : 265–266) stated that in some cases the parasites emerged in June and July, though a number of them remained in larval diapause until the following spring. It is not

known what happens to those imagines which emerge in June and July ; possibly they have another host on which further generations develop.

Note. *Scymnophagus latithorax* Risbec (1951 : 275–277, fig. 142), described from Senegal, does not belong to that genus ; it is probably near *Dinarmus* Thomson.

PACHYNEURON Walker

Pachyneuron Walker, 1833 : 371, 380. Type-species : *P. formosum* Walker, by monotypy.
Pachyneuron Walker ; Förster, 1856 : 52, 54.
Pachyneuron Walker ; Thomson, 1878 : 18, 27.
Pachyneuron Walker ; Ashmead, 1904 : 329.
Pachyneuron Walker ; Schmiedeknecht, 1909 : 371, 372, 373.
Serimus Brèthes, 1913 : 90. Type-species : *S. argentinus* by monotypy.
Pachyneuron Walker ; Szelényi, 1942 : 93–105.
Pachyneuron Walker ; Nikol'skaya, 1952 : 247.
Pachyneuron Walker ; Delucchi, 1955*b* : 122–139.
Atrichoptilus Delucchi, 1955*b* : 141. Type-species : *Pachyneuron aeneum* Masi, 1929, by original designation.
Pachyneuron Walker ; Peck, 1963 : 612–619.
Pachyneuron Walker ; Peck *et al.*, 1964 : 39–40.
Pachyneuron Walker ; Bouček, 1965*e* : 16–18.

Serimus Brèthes was synonymized with *Pachyneuron* by de Santis (1957 : 118) after having examined the original material of its type-species.

Bouček (1965*e*) placed *Atrichoptilus* Delucchi in synonymy with *Pachyneuron*, pointing out that the characters used by Delucchi (1955) for separating the two are too variable to be considered of generic value. This conclusion is accepted here.

The Palaearctic species of *Pachyneuron* were revised by Szelényi (1942) ; but he did not see the types of most of the species and for this reason his revision is unsatisfactory. The European species were revised by Delucchi (1955*b*) who placed their taxonomy on a much sounder basis. Since then, however, some changes in the synonymy and nomenclature have been made. The earlier-described species are now reasonably well understood, but some of those described more recently need further study. In particular the North American species, of which Peck (1963) lists 14, need to be compared with those from Europe ; possibly some of the former will prove to be identical with European species.

The identity of *Ichneumon coccorum* Linneaus (1758 : 567) is very doubtful and has been the subject of some controversy ; the available evidence suggests that it was not a *Pachyneuron*. It was transferred to that genus by Reinhard (1857 : 77). The type or types of *coccorum* are not in the Linnean collection in London, and I could not find any specimens that agreed with the description in the DeGeer collection in Stockholm. The original description, of course, is very brief and conveys little ; but Linnaeus cited a reference to the work by DeGeer, " *De Geer ins.* 1. t. 35. f. 17 ". Plate 35, fig. 17 of this work represents an adult Hymenopteron which can hardly be anything except a Chalcidoid ; the antennae are shown as having a scape, pedicellus, four funicular segments, and a clava. Although one must not place too much emphasis on a figure drawn at that period, it would seem to rule out any

Pachyneuron. The insect shown in the figure was described by DeGeer in his 17th Memoir, section 8, p. 604, and he obtained it from some parasitized " Gallinsectes " which he had found on elm ; his figure 14 on pl. 35, representing this " Gallinsecte " shows what appears to be a Lecaniine Coccid.

Key to European Species

(Males and Females)

1 Fore wing with apical margin without cilia ; postmarginal vein only slightly longer than the stigmal vein ; marginal vein strongly thickened, only about 1·25 times as long as its maximum breadth. Pronotal collar sometimes immarginate. Antennal scape not reaching the median ocellus. Gastral petiole slightly transverse, subconical. . ***aeneum*** (Masi) (p. 834)

– Fore wing with apical margin ciliate ; postmarginal vein 1·5–2 times as long as the stigmal vein ; marginal vein less strongly thickened, 2·7–4 times as long as its maximum breadth. Pronotal collar nearly always distinctly margined, very weakly so in some dwarfs. Antennal scape often reaching the median ocellus. Gastral petiole sometimes otherwise . . . 2

2 (1) Thorax weakly arched dorsally ; scutellum in profile nearly flat, its disc with weaker sculpture, hence more shiny, than the rest. Marginal vein of fore wing 1·3–1·4 times as long as the stigmal vein. Genae only slightly compressed, hardly sharp-edged above the bases of the mandibles, and with only a small hollow. Head in frontal view about 1·5 times as broad as high ***planiscuta*** Thomson (p. 834)

– Thorax usually moderately to strongly arched dorsally with the scutellum convex ; if not, then the scutellum is distinctly reticulate all over. Marginal vein of fore wing at most 1·2 times as long as the stigmal vein. Genae usually very distinctly compressed and sharp above the bases of the mandibles, usually with a larger hollow. Head in frontal view usually less transverse 3

3 (2) Median produced portion of clypeus (Text-fig. 678) having its anterior margin slightly emarginate or truncate, and its surface virtually flat . . . 4

– Median produced portion of clypeus (Text-fig. 678) having its anterior margin obtuse or rounded, and its surface convex in the transverse axis . . 9

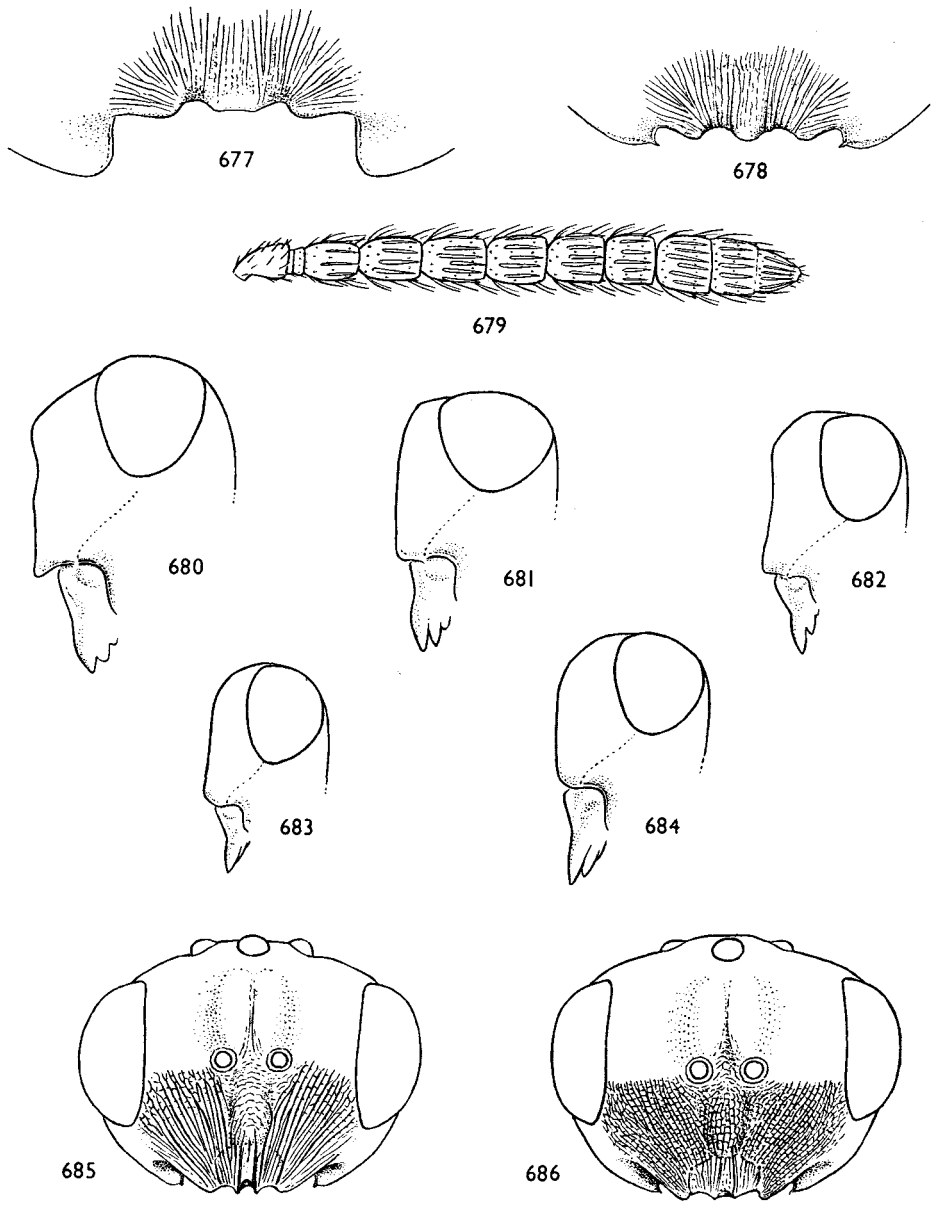
4 (3) Gastral petiole slightly broader than long, smooth or virtually so. Thorax very strongly arched dorsally ; dorsellum and propodeum sloping at an angle of about 80° relative to the tangential plane of the mesoscutum and scutellum. Gena with only a very weak lamina above the base of the mandible . . . . . ***gibbiscuta*** Thomson (p. 838)

– Gastral petiole at least slightly longer than broad, mainly reticulate or transversely aciculate. Thorax less strongly arched dorsally ; dorsellum and propodeum sloping at a relatively less steep angle. Gena often with a stronger lamina above the base of the mandible 5

5 (4) Fore wing with speculum closed below ; upper surface of costal cell with a row of hairs extending over its distal quarter to one third.
♀ clypeus, Text-fig. 677 ; antenna excluding scape, Text-fig. 679
solitarium (Hartig) (p. 838)

– Fore wing with speculum open below ; upper surface of costal cell often bare 6

6 (5) Thorax relatively weakly arched dorsally, scutellum in profile appearing only weakly convex ; propodeum sloping at an angle of only 30°–35° relative to the tangential plane of the mesoscutum and scutellum. Propodeum only slightly more than half as long as the scutellum ; nucha mainly



FIGS. 677–686. 677, *Pachyneuron solitarium* (Hartig), syntype ♀, clypeus ; 678, *Pacyhneuron concolor* (Förster), ♀, clypeus ; 679, *Pachyneuron solitarium* (Hartig), syntype ♀, antenna, excluding scape ; 680, *Pachyneuron grande* Thomson, ♀, head, profile ; 681, *Pachyneuron formosum* Walker, ♀, head, profile ; 682, same, ♂ ; 683, *Pachyneuron umbratum* Delucchi, ♂, head, profile ; 684, same, ♀ ; 685, *Euneura augarus* Walker, ♀, head ; 686, *Euneura laeviuscula* sp. n., ♀, head.

smooth or virtually so, and marked off by a very distinct constriction. Gaster of *female* generally 2–2·5 times, occasionally a little less than twice, as long as broad . . . . . ***cremifaniae*** Delucchi (p. 838)

– Thorax moderately strongly arched dorsally, scutellum in profile appearing more convex ; propodeum sloping at a relatively steeper angle, often rather longer than in *cremifaniae* ; nucha mainly to entirely reticulate or transversely aciculate. Gaster of *female* at least slightly less than twice as long as broad, average about 1·5 times 7

7 (6) Lamina of gena ending, next to base of mandible, in an acute point (Text-fig. 680). Costal cell of fore wing (upper surface) with a row of hairs extending over its distal third to half . . . . . ***grande*** Thomson (p. 837)

– Lamina of gena (Text-figs. 681–684) ending in a blunt or rounded lobe which is sometimes not very prominent. Costal cell of fore wing (upper surface) bare 8

8 (7) Fore wing with marginal vein a little shorter than the stigmal vein ; basal vein usually bare, rarely with 1–2 isolated hairs. Lamina of gena (Text-figs. 681, 682) more prominent . . . . . ***formosum*** Walker (p. 836)

– Fore wing with marginal vein approximately as long as, or slightly longer than, the stigmal vein ; basal vein with 2–12 hairs. Lamina of gena (Text-figs. 683, 684) less prominent . . ***umbratum*** Delucchi (p. 834)

9 (3) Fore wing with marginal vein thick, only 2·7–3 times as long as its maximum breadth ; speculum open below. Antennae of *female* with 3 strongly transverse anelli and 5 funicular segments ; gaster short and broad. Thorax very strongly arched dorsally ; propodeum sloping at an angle of about 60° relative to the tangential plane of the mesoscutum and scutellum. Gastral petiole not longer than broad, virtually smooth ***aphidis*** (Bouché) (p. 842)

– Fore wing with marginal vein less thick, 4–5 times as long as its maximum breadth ; speculum closed or nearly closed below. Antennae of *female* with 2 anelli and 6 funicular segments, in small specimens the first funicular segment may be somewhat shorter than the second and slightly transverse, but it is never markedly anelliform. *Female* gaster relatively longer. Thorax at least rather less strongly arched dorsally 10

10 (9) *Female* with gastral petiole slightly less than half as long as the propodeum, slightly broader than long, nearly or quite smooth ; gaster 2–2·4 times as long as broad. Propodeal nucha weakly aciculate transversely, or nearly smooth, its front edge distinctly defined. Thorax not very strongly arched dorsally . . . . . ***vitodurense*** Delucchi (p. 841)

– *Female* with gastral petiole at least two thirds as long as the propodeum, 1·5–1·8 times as long as broad, its dorsal surface, not counting the basal stalk, transversely aciculate or aciculate-reticulate ; gaster at least slightly less than twice as long as broad. Propodeal nucha finely reticulate, its front edge not distinctly defined. Thorax moderately strongly arched dorsally 11

11 (10) Fore wing with upper surface of basal cell with 10–17 hairs. *Female* with first funicular segment of antenna (Text-fig. 679) from virtually as long as, to slightly longer than, the pedicellus, quadrate or slightly longer than broad.

Some specimens might run here if the clypeus is viewed from a rather more dorsal direction . . . . . cf. ***solitarium*** (Hartig) (p. 838)

– Fore wing with upper surface of basal cell bare or with at most 5 hairs. *Female* with first funicular segment at most three quarters as long as the

pedicellus, varying from slightly transverse to very slightly longer than broad.

♀ clypeus, Text-fig. 678 . . . . . ***concolor*** (Förster) (p. 840)

Pachyneuron aeneum Masi

Pachnyeuron aeneum Masi, 1929 : 229, ♀.
Atrichoptilus aeneus (Masi) Delucchi, 1955*b* : 141–142.
Pachyneuron aeneum Masi ; Bouček, 1965*e* : 16–18, ♂ ♀.

Type material. Holotype ♀, North Africa, Libya, Oasis of Giarabub, iii.1927, in Museo Civico di Storia Naturale, Genoa (not seen).

Delucchi (1955*b* : 141–142) mentioned some characters by which he considered *aeneum* to differ from the other species of *Pachyneuron*, and erected the genus *Atrichoptilus* on the basis of these characters. Bouček re-examined the type of *aeneum* as well as additional material, and consequently was able to form a more satisfactory concept of the variation of the species ; he concluded (1965*e* : 18) that the main character used by Delucchi for separating *Atrichoptilus* from *Pachyneuron* was too variable to be of value. Consequently he referred *aeneum* once more to *Pachyneuron* ; at the same time he redescribed the species (1965e : 16–18).

EUROPE (Moldavian S.S.R.) ; TURKEY ; LIBYA.

Biology. Bouček (1965*e* : 18) stated that *aeneum* had been reared in Moldavia from Syrphid puparia found amongst aphids (" *Yezabura reaumuri* ", presumably *Patchiella reaumuri* (Kalt.)). Imagines chiefly July–August (some records for March and April).

Pachyneuron planiscuta Thomson

Pachyneuron planiscuta Thomson, 1878 : 29, ♂ ♀.
Pachyneuron planiscuta Thomson ; Szelényi, 1942 : 100, 101, ♂ ♀.
Pachyneuron planiscuta Thomson ; Delucchi, 1955*b* : 126, 129–130, ♂ ♀.

Type material. Syntypes, 3 ♂, 2 ♀. LECTOTYPE : the lowermost of two males which are mounted on the same pin and labelled " Hma " [Holmeja].

IRELAND, SWEDEN, HUNGARY, MOLDAVIAN S.S.R. The species appears to be associated with *Phragmites* ; in Sweden I captured many specimens in a reed-bed at Yddingen, very near to Holmeja (the type-locality). Imagines June–August.

Biology. Unknown.

Pachyneuron umbratum Delucchi

(Text-figs. 683, 684)

? *Pachyneuron coeruleum* Delucchi, 1955*b* : 127, 131–132, ♂ ♀.
Pachyneuron umbratum Delucchi, 1955*b* : 127–128, 132–133, ♂ ♀.
Pachyneuron umbratum Delucchi ; Bouček, 1965*e* : 8, 18.

Type material. *Pachyneuron coeruleum* Delucchi. Type ♀, and paratypes,

Holland, Deventer, 1952 and 1953, 19 ♀ and 2 ♂ (*Betrem*) in Muséum d'Histoire naturelle, Geneva.

P. umbratum Delucchi. Type ♀, and paratypes, Switzerland, Lausanne, Mt. Calme, 24–29.vii.1942, 18 ♀ and 12 ♂ ; Holland, Baarn, vi.1947, 8 ♀ (*Doesburg*), in Muséum d'Histoire naturelle, Geneva.

I have examined these types which are further discussed below.

Bouček (1965*e* : 18) suggested that *umbratum* Del. may be the same as *formosum* Walker. He pointed out that British specimens of *formosum* differed from most Continental specimens mainly in their relatively shorter marginal vein, but that this character appeared to be variable and therefore unreliable [for distinguishing *formosum* and *umbratum*].

After having examined the types of *formosum* and *umbratum*, as well as other material from the Continent, I feel confident that these two represent distinct, though very closely allied, species. I agree with Bouček that the length of the marginal vein relative to that of the stigmal vein is slightly variable, but an average difference exists. There is also a distinct difference between *formosum* and *umbratum* in the form of the genal flange, as explained in my key to species. Other small differences between the respective females, not completely diagnostic, exist in the degree of pilosity of the basal vein of the fore wing, and the colour of the head and thorax. In addition to the syntypes of *umbratum*, I have a number of specimens captured in southern Sweden which are clearly *umbratum* and which differ from *formosum* in the characters mentioned.

The question whether *coeruleum* Delucchi is distinct from *umbratum* is more difficult to answer at present. My impression is that *coeruleum* probably represents a form of *umbratum*, after examining the syntypes of both. Delucchi (1955*b* : 127–128) distinguished the two as follows:

" 9 (10) Propodeum dreimal länger als das Metanotum, relativ kurz, mit stark entwickelten Lateralfalten (Längswölbungen) innenseits des Sulcus spiracularis, die bei der Abschnürungsstelle des Hinterrandsstreifens zu scharfen Lateralkielen umgewandelt werden. Propodeumsoberfläche stark punktiert, Hinterrandstreifen quer strichliert. Beine vom Trochanter an bei beiden Geschlechtern gelb. Diskalregion des Metanotums beim Männchen flach ; erstes Funiculusglied beim Männchen länger als das sechste und fast zweimal länger als breit. . . . . ***P. coeruleum*** n. sp.

10 (9) Propodeum relativ länger, mit schwächeren Längsfalten innenseits des Sulcus spiracularis, die vor der Abschnürungsstelle des Hinterrandsstreifens abgebrochen sind. Propodeumsoberfläche schwach punktiert, Hinterrandsstreifen im allgemeinen ziemlich glatt und stärker abgeschnürt. Abschnürungsstelle glatt und glänzend. Beine beim Weibchen mit gebraünten Femora und im allgemeinen mit gebraünter Basis der Hintertibien. Diskalregion des Metanotums beim Männchen gewölbt ; erstes Funiculusglied beim Männchen Kürzer als das sechste und 1, 5 mal länger als breit . . . . . ***P. umbratum*** n. sp. "

I do not find any tangible difference between the syntypes of *coeruleum* and *umbratum*, as regards the characters mentioned by Delucchi. In both the median length of the propodeum is two thirds or slightly more than two thirds that of the scutellum. Delucchi compares the length of the propodeum with that of the

metanotum, but the latter is a small and variable structure, probably not a reliable feature. The propodeal plicae (Längsfalten) form well-marked, convex ridges in the syntypes of *coeruleum* ; in most of the types of *umbratum* they are weak, though in one female just as distinct as in *coeruleum*. The other propodeal characters, the colour of the legs, and the characters of the male metanotum and antennae, do not hold good for all the syntypes of the respective species. In the female syntypes of *coeruleum* the head and thorax are a bright blue-green ; in some of the syntypes of *umbratum* these parts are dull blue-green, though in one female just as bright as in *coeruleum*.

In 1959 I captured a number of *Pachyneuron*, which I refer to *umbratum*, in southern Sweden (Yddingen and Falsterbo). I feel certain that these all represent only one species, yet they show considerable variation as regards size, colour of body and legs, structure of the propodeum, and proportions of antennal segments in the males. The smaller specimens exactly fit the types of *umbratum*, and some of them are very close to the types of *coeruleum*, but differ in having the head and thorax a duller blue-green, and in having the propodeal plicae weaker. Thus there is just a slight doubt as to whether *coeruleum* is really the same as *umbratum*, although the differences causing this dubiety are extremely small.

The range of variation of *umbratum* (as observed in the syntypes and my Swedish specimens) is as follows:

♀. Length 1·5–2·6 mm. Head and thorax varying from dull olive-green or bluish olive to a fairly bright green or blue-green. Femora often more or less infuscate, sometimes wholly pale ; tibiae pale, or with a fuscous subbasal ring, or (occasionally) mainly fuscous. Reticulation of scutellar frenum finer in large specimens, coarse in small ones. Propodeal plicae varying from very weak to quite distinct. Basal vein of fore wing usually with 2–9 hairs, occasionally bare.

♂. Antenna with first funicular segment from 1·5 times to nearly twice as long as the pedicellus, 1·6–2·3 times as long as broad, and approximately equal in length to, or very slightly longer than, the sixth segment ; the latter 1·6–2 times as long as broad. Upper surface of costal cell usually with a few hairs in its distal part. Head and thorax bright green to blue ; legs (except coxae) yellow.

SWEDEN, HOLLAND, SWITZERLAND, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. *P. umbratum* has been recorded as a parasite of *Oscinella frit* (L.) (Dipt., Chloropidae) in Czechoslovakia (Secrétariat, etc., 1966 : 120, 131), the material being determined by Dr. Delucchi himself. Delucchi originally (1955*b* : 133) stated that it has been reared in Lausanne from Syrphid pupae on willows. In late July and early August, 1959, I captured a number of *umbratum* in Skåne, Sweden, on foliage of *Salix cinerea* L. at Falsterbo, and amongst reeds (*Phragmites communis* Trin.) at Yddingen ; in the latter case I also reared some specimens from the puparia of an undetermined Syrphid found on the leaves of these reeds. Imagines June–August.

Pachyneuron formosum Walker

(Text-figs. 681, 682)

Pachyneuron formosum Walker, 1833 : 380, ♂ ♀.
Pachynevron speciosum [*sic*] Walker ; Blanchard, 1840 : 266 [*lapsus*].

Pteromalus incubator Förster, 1841 : 28, ♂.
Pteromalus amoenus Förster, 1841 : 28, " ♂ " [*recte* ♀].
Pachyneuron formosum Walker ; Thomson, 1878 : 28–29, ♂ ♀.
Pachyneuron formosum Walker ; Delucchi, 1955*b* : 128, 133, ♂ ♀.

Type material. *Pachyneuron formosum* Walker. Syntypes, 7 specimens. LECTOTYPE, the seventh in the series, a female, bearing a Waterhouse label.

Pteromalus incubator Förster and *P. amoenus* Förster. Type material in Naturhistorisches Museum, Vienna (coll. Förster). I have not seen the types of these species, which were placed in synonymy with *Pachyneuron formosum* by Delucchi (1955*b* : 133) ; this author stated (ibid. : 124) that Förster's type of *amoenus* (described as a male) is really a female.

Bouček (1965*e* : 18) has suggested that *Pachyneuron umbratum* Delucchi may be the same as *formosum* Walker. I find some small though apparently constant differences between the two, and regard *umbratum* as a valid species (for additional details, see *umbratum*).

BRITAIN, FRANCE, GERMANY, ITALY.

Biology. *P. formosum* has been recorded as a parasite of *Syrphus ribesii* L. in Germany and of *Xanthandrus comtus* (Harr.) in Italy (Secrétariat, etc., 1963 : 343, 368) ; also of *Epistrophe* [=*Syrphus*] *balteata* (DeG.) in France (Ibid., 1966 : 120, 130). These records, based on specimens determined by Dr. Delucchi, are accepted as correct. I have seen the specimens to which Delucchi (1955*b* : 133) refers, reared from a " Syrphus " on cabbage at Levallois-Perret, near Paris ; they are typical *formosum*. Delucchi's earlier record (1954 : 246) of *formosum* as a parasite of *Syrphus arcuatus* Fln. was later stated (Delucchi, 1955*b* : 133) to refer to *grande* Thomson and not to *formosum*. Imagines appear (in Britain) Aug.–Nov.

Pachyneuron grande Thomson

(Text-fig. 680)

Pachyneuron grande Thomson, 1878 : 29, ♀.
Pachyneuron grande Thomson ; Delucchi, 1955*b* : 128, 133–134, ♂ ♀.

Type material. Syntypes, 2 ♀. LECTOTYPE, a female labelled " Dlc Bhn " [Dalecarlia, Boheman] and " grande Ths ".

Delucchi (1955*b*) has given a good redescription of *grande*. Most of the characters he describes hold good for all the specimens I have seen. The range of variation in size, however, is rather greater than he states ; females vary in length from 1·8 to 3 mm. He says (1955*b* : 128) " Funiculusglieder beim Weibchen immer länglich " ; but although the majority of females have the proximal segments of the funicle slightly longer than broad, the distal segments are usually quadrate, whilst in one exceptionally small specimen all the segments are quadrate.

SWEDEN, FRANCE, SWITZERLAND, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Reared in Switzerland from puparia of *Syrphus arcuatus* Fln. (Delucchi, 1955*b* : 134) ; recorded as a parasite of *Epistrophe* [= *Episyrphus*] *balteata* (DeG.) in France (Secrétariat, etc. 1966 : 120, 130). Imagines July–Sept.

Szelényi (1942 : 103–104) gave a description of a species which he considered to be *grande*, from material reared in Hungary from *Eriopeltis festucae*. He stated that specimens of *Leucopis silesiaca* Egg. (Dipt., Chaemaemyiidae) had emerged together with the *Pachyneuron*, which he thought had very probably parasitized larvae of the *Leucopis*. He had not seen the type of *P. grande* and some features in his description suggest that he had misidentified the species.

Pachyneuron cremifaniae Delucchi

Pachyneuron cremifaniae Delucchi, 1953 : 8, ♀.
Pachyneuron cremifaniae Delucchi, 1955*b* : 127, 131, ♀.

Type material (not seen). Syntypes reared at Laimbach, near Munich, Germany, Spöck (Bavaria), and Seegraeben (Switzerland, Canton of Zürich) in May and August 1950 ; type ♀ in coll. C.I.B.C.

Females of *cremifaniae* appear to vary somewhat in the relative length of the gaster and the degree of flattening of the thorax.

BRITAIN, GERMANY, SWITZERLAND, CZECHOSLOVAKIA, MOLDAVIAN S.S.R.

Biology. Delucchi (1953, 1954) and Delucchi and Pschorn (1954) originally reared the species as a parasite of *Cremifania nigrocellulata* Cz. (Dipt., Chamaemyiidae) ; Delucchi (1955*b*) also recorded two females reared from a species of *Leucopis* (Dipt., Chamaemyiidae).

Pachyneuron gibbiscuta Thomson

Pachyneuron gibbiscuta Thomson, 1878 : 29, ♂ ♀.
Pachyneuron gibbiscuta Thomson ; Szelényi, 1942 : 100, 101, ♂ ♀.
Pachyneuron gibbiscuta Thomson ; Delucchi, 1955*b* : 128, 134–135, ♂ ♀.

Type material. Syntypes, 5 specimens. LECTOTYPE, a female labelled " Ö " [Öland] and also bearing a modern red type label.

SWEDEN, AUSTRIA, CZECHOSLOVAKIA ; apparently rather rare.

Biology. Unknown.

Pachyneuron solitarium (Hartig)

(Text-figs. 677, 679)

Pachyneuron coccorum auctt., *ex parte* [nec *Ichneumon coccorum* Linnaeus, 1758].
Chrysolampus solitarius Hartig, 1838 : 250.
? *Chrysolampus solitarius* Hartig ; Ratzeburg, 1844 : 29, pl. 8, fig. 7.
? *Chrysolampus solitarius* Hartig ; Ratzeburg, 1844*a* : 180, p. 8, fig. 7, ♀.
Pachyneuron solitarius (Hartig) Reinhard, 1857 : 77.
Pachyneuron solitarius (Hartig *sensu* Ratz.) ; Kurdjumov, 1913 : 24.
Chrysolampus solitarius Hartig ; Bouček, 1964*b* : 672.
Pachyneuron solitarium (Hartig) ; Bouček, 1965*e* : 18, [*ex parte*].

Type material. Syntypes, 8 ♀ in Hartig collection, Munich. Seven of these are mounted on card-points which are grouped in a tree-like whorl on one pin, and labelled " 786 ". The eighth specimen (which actually stood first in the series) is mounted, together with an egg of *Dendrolimus pini* which has an emergence-hole, upon a red-bordered card, and labelled " solitarius " ; this specimen is designated LECTOTYPE. All the syntypes stood next to a Hartig label " Chrysolampus ".

Hartig originally described the species from material reared from eggs of *Gastropacha* [=*Dendrolimus*] *pini* (L.) (Lep., Lasiocampidae). The name *solitarius* has sometimes been attributed to Ratzeburg who, however (1844*a* : 180) expressly quoted Hartig (and incidentally, referred to the host-species as " Kiefernspinner "). Some confusion was caused later by Szelényi who remarked (1942 : 96) " *Pachyneuron concolor* Först. (*solitarius* Ratz.) lebt nach Ratzeburg einzeln in Eiern von *Bupalus piniarius* L.". Clearly Szelényi has here mistaken the " Kiefernspanner " (*B. piniarius* L., family Selidosemidae) for the " Kiefernspinner " of Ratzeburg (*Dendrolimus pini* (L.)).

Pteromalus [=*Pachyneuron*] *concolor* Förster has sometimes been considered to be the same as *solitarius*. Ratzeburg (1848 : 184) mentioned that he had received specimens of *concolor* from Förster himself, and found them to be the same as *solitarius*. There is some reason for doubting the correctness of his conclusion, however. Although it is not clear whether he had seen Hartig's types, he presumably had specimens of the true *solitarius*, since he mentioned (loc. cit.) material reared from the original host by Reissig. Even so, the differences between *solitarius* and *concolor* are so small that he was hardly likely to have noticed them. Bouček (1965*e* : 18) also stated that he considered *concolor* to be the same as *solitarius*, which he thought to have a very wide range of hosts. However, Dr. Bouček's own specimens of *solitarium*, reared from eggs of *Dendrolimus pini*, differ from *concolor* Förster (as redescribed by Delucchi) in the shape of the clypeus, a character which appears to be of relatively high taxonomic value in *Pachyneuron*. Also, the known facts regarding the biology of *solitarium* and *concolor* seem to suggest that they are not identical.

The female of *P. solitarium*, as interpreted here, is remarkably like that of *concolor* (Förster). It differs in having the anterior margin of the clypeus (Text-fig. 677) slightly produced, the produced part weakly emarginate or subtruncate, and the surface of the clypeus only weakly convex. In *concolor* (Text-fig. 678) the anterior margin of the clypeus, which is more strongly convex, has a blunt, rounded median projection. There appear to be other small differences between the two species, in the proportions of the flagellar segments and the gastral petiole, but I have not been able to study a sufficient number of specimens to confirm this.

GERMANY, CZECHOSLOVAKIA, ? MOLDAVIAN S.S.R.

Biology. At present only those specimens reared from eggs of *Dendrolimus pini* (L.) can be definitely identified as *solitarium*. In view of the confusion of *concolor* with *solitarium*, other records relating to the latter will have to be re-examined.

Pachyneuron concolor (Förster)

Pachyneuron coccorum auctt. [*ex parte*] [nec *Ichneumon coccorum* Linnaeus, 1758].
Pteromalus concolor Förster, 1841 : 28, ♀.
Pteromalus concolor Förster ; Ratzeburg, 1848 : 184.
~~? *Pachyneuron Pruni* (Förster MS.) Walker, 1850 : 128, [*ex parte*].~~
? *Pachyneuron psyllaephaga* Mani, 1939 : 84, ♂ ♀.
Pachyneuron siculum Delucchi, 1955*b* : 135, ♂ ♀, **syn. n.**

Type material. *Pteromalus concolor* Förster. Syntypes in Naturhistorisches Museum, Vienna ; lectotype female designated by Delucchi (1955*b* : 136, 137). I have not seen the lectotype, but have examined another female from Förster's collection which agrees with Delucchi's redescription. This species was regarded as being identical with *solitarium* (Hartig) by Ratzeburg (1848) and Bouček (1961*c* : 12).

Pachyneuron pruni Walker. Walker's collection contains a male and a female. He described only the female but his description does not apply well to the female in his collection. His male, which appears to be a small *concolor*, is labelled in Förster's handwriting " Pachyneuron Pruni Foerst. Aachen ".

Pachyneuron psyllaephaga Mani. Holotype ♀ and allotype ♂ in Pusa collection, Imperial Agricultural Research Institute, New Delhi (not seen). From the description and host it seems to me likely that it may be the same as *concolor* (Förster). Mani's types were bred from nymphs of *Psylla peregrina* Förster, the type-locality being Edinburgh ; I have seen Scottish specimens of *concolor* bred from the same host.

Pachyneuron siculum Delucchi. Holotype ♀, Sicily, 3.ix.1950 (*Priesner*), in Muséum d'Histoire naturelle, Geneva. In my opinion it is an extremely small, dark-coloured female of *concolor* (Förster) ; I have examined a range of forms intermediate between the type of *siculum* and typical *concolor*. Bouček (1965*e* : 18) expressed the opinion that *siculum* was a small form of *solitarium* (Htg.) ; but he considered *solitarium* to be identical with *concolor* (Förster), whereas in my opinion these two are distinct.

Widely distributed in EUROPE, from BRITAIN to U.S.S.R. ; ISRAEL.

Biology. A number of hosts have been recorded for *concolor* and *siculum*, but the data given are not always very precise and there is room for further research. The species has been recorded as a parasite of *Oscinella frit* (L.) in Czechoslovakia (Secrétariat, etc., 1966 : 120–131) ; also (under the name *siculum* Delucchi) as a parasite of *Coccus hesperidum* L. (ibid., 1963 : 343, 370), of *Chilochorus bipustulatus* L., *Ceroplastes floridensis* Comst., *Pseudococcus citriculum* Green, and *Saissetia oleae* Bern. (ibid., 1966 : 120, 125) in Israel. In the case of the records from Israel I have been informed that the *Pachyneuron* were hyperparasitic on the above species ; and it seems likely that the species is normally a hyperparasite. Recently Professor G. C. Varley has reared a number of *Pachyneuron concolor* from samples of *Eriopeltis* ? *strelkovi* Borchs. collected on *Brachypodium pinnatum* (L.) Beauv. at Wytham Wood, Berkshire, and at Blenheim, Oxfordshire. From these samples *Eunotus cretaceus* Walker, and five species of Encyrtidae (including *Trichomasthus*

frontalis Alam and *T. marsus* Walker), and a Dipteron, *Leucopis silesiaca* Egger (Chamaemyiidae), were also reared. A number of the *Eriopeltis* ovisacs were isolated and their contents investigated. From a study of this material Professor Varley (1966) concludes that the *Pachyneuron* is a hyperparasite of the *Eriopeltis* through the species of *Trichomasthus*. None of the *Leucopis* had been attacked by the *Pachyneuron* ; this is interesting because certain other species of this genus (*cremifaniae* Delucchi and *vitodurense* Del., q.v.) have been recorded as parasites of Chamaemyiidae. Evidently more research is needed on the precise relationships between various species of *Pachyneuron* and their hosts. Imagines of *concolor* are most frequent in the field from July until September in Britain, though some may be found earlier.

Considerable variation exists in the reared series of *concolor*, and it may be useful to record this here. The females vary in length from 1·3 to 2 mm.; the head and thorax are most often bluish black or dark blue, but the colour ranges from dark blue-green to violet-black, the propodeum tending more towards greenish ; usually only the femora, especially the hind ones, are more or less infuscate, but sometimes the tibiae are also more or less infuscate, mainly so in some specimens from northern Britain ; the first segment of the antennal funicle varies from slightly transverse to very slightly longer than broad (in large specimens), and this segment is usually slightly shorter than the second segment, hardly two thirds as long as the second in very small specimens, occasionally as long as the second in large ones ; segments 2–5 are usually a little longer than broad (up to 1·5 times) though sometimes quadrate ; segment 6 is usually quadrate, occasionally very slightly transverse in small specimens, very slightly longer than broad in large ones ; the sensilla are relatively sparse, very sparse in small specimens ; the propodeum, above the supracoxal flange and mesad of the spiracular sulcus, has 1–3 hairs on each side ; the basal vein of the fore wing is pilose throughout, whilst the speculum is normally closed below, occasionally partly open. Males vary from 0·9 to 1·7 mm. in length ; the head and thorax vary from a fairly bright green, to dark blue, in the latter case the front of the head tends to remain green ; the femora are sometimes pale, sometimes (especially the hind ones) more or less infuscate ; the tibiae occasionally have a fuscous antemedial band ; the first funicular segment varies from quadrate (small males) to 1·8 times as long as broad, this segment being sometimes as long as the second though usually slightly shorter ; the middle segments of the funicle vary from 1·5 to 2 times as long as broad ; the sixth is usually a little shorter than segments 2–5.

Pachyneuron vitodurense Delucchi

Pachyneuron ferrierei Delucchi, 1953 : 2–8, ♂ ♀ [*nec* Mani, 1939].
Pachyneuron ferrierei Delucchi, 1954 : 246.
Pachyneuron vitodurense Delucchi, 1955*b* : 137, ♀ [n. n. for *ferrierei* Delucchi *nec* Mani].

Type material (not seen). Delucchi (1953) stated that the type [data not specified] of *ferrierei* had been placed in the European Laboratory of the Commonwealth Institute of Biological Control, with 4 paratypes in the Institut Royal des

Sciences naturelles de Belgique, Brussels ; when he renamed the species as *vitodurense*, however, he stated (1955*b* : 137) " Typus (♀) in meiner Sammlung ". His original material (of *ferrierei*) came from Germany (Laimbach, near Munich, 4–9.vii.1950 and Bavaria, Spöck, 25.vi.–18.viii.1950) and from Switzerland (Zürich Canton, Seegraeben, v.1950).

BRITAIN, GERMANY, SWITZERLAND.

Biology. According to Delucchi (1954), this species is a parasite of *Leucopomyia obscura* Hal., *Cremifania nigrocellulata* Czerny and *Leucopis griseola* Fln., attacking the puparia ; these three species are predators of the Balsam Woolly aphid, *Adelges* (*Dreyfusia*) *piceae* (Ratzeburg). Delucchi (1954 : 244–246) has given a very interesting account of the predator-parasite complex associated with this aphid. Imagines of *vitodurense* have been taken in the field June–September.

Pachyneuron aphidis (Bouché)

Diplolepis Aphidis Bouché, 1834 : 170, ♂ ♀.
Pteromalus minutissimus Förster, 1841 : 28, ♂.
Pachyneuron pruni (Förster MS.) Walker, 1850 : 128, ♀, **syn. n.**
Pachyneuron aphidis (Bouché) Reinhard, 1859 : 195, ♂ ♀.
Pachyneuron aphidis (Bouché) ; Thomson, 1878 : 30, ♂ ♀.
Pachyneuron aphidis (Bouché) ; Szelényi, 1942 : 99, 100, 101, ♂ ♀.
Pachyneuron minutissimum (Förster) Delucchi, 1955*b* : 129, 137–139, ♂ ♀.
Pachyneuron aphidis (Bouché) ; Bouček, 1961*c* : 12.
Pachyneuron aphidis (Bouché) ; Bouček, 1965*e* : 18.

Type material. *Diplolepis aphidis* Bouché. Types probably no longer extant ; although I have made enquiries I have failed to locate them. Delucchi (1955*b* : 125) regarded *aphidis* as a " phantom species " ; but I am prepared to follow the interpretation of Reinhard (1859) which is accepted by Dr. Bouček.

Pteromalus minutissimus Förster. Lectotype ♂ (not seen) in Naturhistorisches Museum, Vienna, according to Delucchi (1955*b* : 138). I have examined some other specimens so named by Förster. *P. minutissimus* was synonymized with *aphidis* Bouché by Reinhard (1859 : 195).

Pachyneuron pruni Walker. Walker described only the female. His collection contains a male and a female, neither of which agrees well with the description. However, in order to settle the name, I designate the female as LECTOTYPE ; it is labelled " Named by F. Walker 1907–345 " and, in Walker's handwriting, " Pruni Foerst.".

Widely distributed in EUROPE.

Biology. Szelényi (1942 : 99) gave a list of the recorded hosts of *aphidis*, all of them either aphid species or their parasites, chiefly Braconidae Aphidiinae, the Chalcidoid *Aphelinus mali* Hald. recorded a few times. It has also been recorded (Secrétariat, etc., 1961 : 215, 230) under the name *minutissimum* (Förster) as a parasite of *Myzus persicae* Sulz. and of *Brevicoryne brassicae* L. in Holland ; and (Secrétariat, etc., 1963 : 343, 372) as a parasite of *Toxoptera aurantii* Fonsc. in

Israel. I have been informed that in the latter case it was a hyperparasite. One suspects that it may normally act as a hyperparasite. Ferrière and Voukassovich (1928 : 28) found that in the vicinity of Belgrade it was hyperparasitic on eight species of Braconidae Aphidiinae which were attacking various aphids on different plants ; they also suggested that *aphidis* might sometimes be a hyper-hyperparasite. There are other host-records for *aphidis* in the literature, but those mentioned above are the best authenticated. In western Europe imagines are most frequent in the field in July and August.

EUNEURA Walker

Euneura Walker, 1844*a* : 331. Type-species : *E. augarus* Walker, by monotypy.
Eunevra Agassiz, 1846 : 427 [invalid emendation].
Hypsicamara Förster, 1856 : 52, 54. Type-species : *H. ratzeburgi* Reinhard, 1859, by subsequent reference.
Hypsicamera Dalla Torre, 1898 : 168 [invalid emendation].
Euneura Walker ; Ashmead, 1904 : 329.
Euneura Walker ; Schmeideknecht, 1909 : 372, 374.
Hypsicamera [*sic*] Förster ; Schmiedeknecht, 1909 : 372, 373–274.
Hypsicamera [*sic*] Förster ; Nikol'skaya, 1952 : 247.
Eunera Walker ; Nikol'skaya, 1952 : 247.
Euneura Walker ; Muesebeck *et al.*, 1951 : 541.
Euneura Walker ; Delucchi, 1955*b* : 142–144.
Euneura Walker ; Peck, 1963 : 621–622.
Euneura Walker ; Peck *et al.*, 1964 : 39.

Hypsicamara Förster was synonymized with *Euneura* by Peck (*in* Muesebeck *et al.*, 1951 : 541).

As will be seen from my keys to the genera of Pteromalinae above, the differences between *Euneura* and *Pachyneuron* are slight. Perhaps *Euneura* may eventually be regarded as a subgenus of *Pachyneuron* though for the present I consider it best to keep them separate.

Key to European Species

(Females)

1 Clypeus, face, and frons (Text-fig. 685) with coarser and conspicuously strigose sculpture, the longitudinal striae being strong, the transverse walls of the areoles weak. Fore wing with distal half or more of basal cell pilose ; speculum nearly always closed below, occasionally partly open ; marginal vein hardly thicker at apex than at base . . . . . ***augarus*** Walker (p. 844)

– Clypeus, face, and frons (Text-fig. 686) with finer sculpture, the longitudinal striae relatively less strong, the transverse walls of the areoles more distinct, than in *augarus*. Fore wing with basal cell bare, or with at most 4 isolated hairs distally ; speculum open below ; marginal vein about 1·5 times as thick at apex as at base ***laeviuscula*** sp. n. (p. 844)

The ♂ of *augarus* has the same characters as those noted above for its ♀ ; that of *laeviuscula* sp. n. is not yet described.

Euneura augarus Walker

(Text-fig. 685)

Miscogaster Sopolis Walker, 1839*b* : 32, ♂, **syn. n.**
Euneura Augarus Walker, 1844*a* : 331, ♀.
Hypsicamara Ratzeburgi Reinhard, 1859 : 195, ♂ ♀.
Euneura augurus [*sic*] Walker ; Delucchi, 1955*b* : 144, ♀.

Although the name *sopolis* Walker has priority, I retain *augarus* as it is well known and is the type-species of the genus.

Type material. *Miscogaster sopolis* Walker. LECTOTYPE (probably holotype) in Greville coll., labelled " Miscog. sopolis, Wk. n.sp. Fide Wk. Edinb." and " Greville 1936–50. 289 ".

Euneura augarus Walker. LECTOTYPE (possibly holotype) ♀, Type Hym. 5. 862, labelled " Type Gahan 1927 " and, in Walker's handwriting, " Euneura Augarus ".

Hypsicamara ratzeburgi Reinhard. Location of type material not known (possibly Zoologisches Museum, Berlin). From the description this species would appear to be the same as *Euneura augarus*.

BRITAIN, NORWAY (Alten), GERMANY, CENTRAL EUROPE.

Biology. Reared in Germany from *Cinaropsis* (*Cinara*) *pruinosa* Htg. and *Cupressobium juniperinum* Mordv. (Hem., Aphididae) the material determined by Dr. Delucchi (Secrétariat, etc., 1963 : 343, 370). Imagines July–Sept.

Euneura laeviuscula sp. n.

(Text-fig. 686)

♀.—Body blue-green or greenish blue, sometimes with some bronze reflections on dorsum of thorax. Antennal scape usually testaceous, occasionally partly infuscate ; pedicellus brown, flagellum fuscous. Coxae concolorous with thorax ; femora mainly fuscous, hind ones nearly wholly black with a metallic tinge ; rest of legs testaceous, the mid and hind tibiae usually slightly infuscate medially, occasionally mainly so. Wings subhyaline, venation brown. Length 1·6–2·3 mm.

Similar to *augarus* Walker (redescribed by Delucchi, 1955*b* : 144), but differs in the characters given in my key to species. Anterior margin of clypeus (Text-fig. 686) shallowly emarginate, in most specimens of *augarus* deeply emarginate as in Text-fig. 685. Basal cell, not counting the basal vein, bare or with at most 4 hairs, open below or closed only in its distal third, in *augarus* entirely or mainly closed below.

♂.—A specimen from Italy (Gran Paradiso, Tignet, 27.xi.1958) probably belongs here, but as it lacks the head I cannot describe it.

Holotype ♀. ITALY : Gran Paradiso, Valsavaranche, 17.vi.1958 (*A. Goidanich*), in Národní Museum, Prague.

Paratypes. ITALY : Livionaz, 1 ♀, 30.x.1958 (*A. Goidanich*) ; Firenze, Viala dei colli, 1 ♀, 19.ix.1957 (*A. Goidanich*), in Národní Museum, Prague. CZECHOSLOVAKIA : Bohemia, Dolni Postevna, 1 ♀, 14–16.viii.1959 (*A. Hoffer*), in Graham collection.

Biology. Unknown.

GYGAXIA Delucchi

Gygaxia Delucchi, 1955*b* : 145. Type-species : *G. saetosa* Delucchi, by monotypy and original designation.

This genus is very close to *Euneura* Walker but differs in having unusually strong thick bristles on the vertex, pronotal collar, mesoscutum, scutellum, and apex of the gaster ; apical margin of fore wing lacking cilia, postmarginal vein only about 1·2 times as long as the stigmal vein, and the latter 1·35–1·4 times as long as the marginal vein.

Gygaxia saetosa Delucchi

Gygaxia saetosa Delucchi, 1955*b* : 145–146, ♀.

Type material. Holotype ♀, Germany, Haimhausen near Munich, 27.vi.1948 (*Wichmann*), in Muséum d'Histoire naturelle, Geneva.

The male of *saetosa* is unknown.

GERMANY.

Biology. Reared as a hyperparasite of an aphid of the subfamily Chaitophorinae, which had been parasitized by *Coelonotus pini* (Hal.) (Braconidae), on *Acer pseudoplatanus* L. (Delucchi, 1955*b* : 147).

CORUNA Walker

Coruna Walker, 1833 : 371, 379. Type-species : *C. clavata* Walker, by monotypy.
Coryna Walker, 1846 : 29 [invalid emendation ; pre-occupied].
Pachycrepis Förster, 1856 : 51, 54, 59 [n. n. for *Coruna* Walker, supposedly pre-occupied].
Pachycrepis Förster ; Thomson, 1878 : 18, 26.
Pachycrepis Förster ; Schmiedeknecht, 1909 : 371, 372.
Pachycrepis Förster ; Nikol'skaya, 1952 : 242.
Coruna Walker ; Peck *et al.*, 1964 : 36.

Coruna clavata Walker

Coruna clavata Walker, 1833 : 380, ♂ ♀.
Chrysolampus lagenarius Nees, 1834 : 132, ♂., **syn. n.**
Coruna clavata Walker ; Haliday, 1841-1842 : v, pl. C, fig. 2, ♂ ♀.
Gastrancistrus Hierocles Walker, 1848 : 105, 158, ♂, **syn. n.**
Coryna dubia Buckton, 1879 : 86, pl. 64, **syn. n.**
Coruna clavata Walker ; Peck, 1963 : 620.

Type material. *Coruna clavata* Walker. In BM(NH) there are 3 specimens in the British section, none original material. In the foreign section there are 2 ♂ and 2 ♀ which are clearly the syntypes (misplaced). From the latter a female is selected as LECTOTYPE ; it is card-pointed (remounted) and bears a Waterhouse label.

Chrysolampus lagenarius Nees. Type ♂ destroyed ; I believe, from the description, that it was the same as *Coruna clavata* Walker.

Gastrancistrus hierocles Walker. One male, LECTOTYPE ; it bears a printed label " GASTRANCISTRUS Hierocles ".

Coryna dubia Buckton. No material found in BM(NH) ; a note by Claude Morley, pinned in the space reserved for this species, states " Does not appear to be in coll. Buckton (in Brit. Mus.) C.M. iii.09 ". From the brief description, and the figure, I think it can hardly have been anything but *clavata* Walker.

Widely distributed in EUROPE, as far as U.S.S.R. ; NORTH AMERICA.

Biology. This species is a hyperparasite of aphids through various species of Braconidae Aphidiinae. Ferrière and Voukassovitch (1928 : 28) recorded it from Serbia as a hyperparasite of " *Macrosiphonella absinthi* Roch " [? =*Macrosiphoniella absinthii* (L.)] through *Ephedrus lacertosus* Hal.; they did not obtain it from any of the other Aphidiine species which they observed during their investigations. Dunn (1949 : 103) recorded it from Aphidiinae attacking *Myzus persicae* (Sulz.), *Macrosiphum solanifolii* (Ashm.) [=*euphorbiae* (Thomas)], and *Aulacorthrum solani* (Kalt.); he stated that the *Coruna* larvae attack the Aphidiinae whilst these are still immature within their aphid host and feed either externally upon their victims, from inside the cocoons of the latter, or internally as endoparasites. They pupate within the cocoons and the adults emerge through jagged holes cut through the dorsal cuticle of the dead aphids. Maud Haviland (1922 : 321–338) described the post-embryonic development of *Pachycrepis* [=*Coruna*] *clavata*, which she obtained in considerable numbers from cocoons of *Aphidius ervi* Hal., a parasite of *Macrosiphum urticae* Kalt. [? *Microlophium evansi* (Theob.)] on *Urtica dioica* L. She concluded that the *Coruna* had at least two generations per annum, the exact number not ascertained, and probably dependent on the number of hosts available. In Britain I have taken adults in the field at various dates between May and October. *C. clavata* has also been recorded in North America as a hyperparasite on *Macrosiphum solanifolii* (Ashm.) and *Chaitophorus* spp. (see Peck, 1963).

PACHYCREPOIDEUS Ashmead

Pachycrepoideus Ashmead, 1904 : 329. Type-species : *P. dubius* Ashmead, by monotypy.
Pachycrepoideus Ashmead ; Schmiedeknecht, 1909 : 371, 372–373.
Pachycrepoideus Ashmead ; Nikol'skaya, 1952 : 242–243.
Anisopteromalia Bouček, 1954 : 57. Type-species : *A. crassinervis* Bouček, by original designation.
Pachycrepoideus Ashmead ; Delucchi, 1955*b* : 139–141.
Pachycrepoideus Ashmead ; Peck, 1963 : 620.
Pachycrepoideus Ashmead ; Peck *et al.*, 1964 : 39.

Anisopteromalia was placed in synonymy with *Pachycrepoideus* by Bouček himself (1957 : 165).

Pachycrepoideus vindemiae (Rondani)

Encyrtus vindemiae Rondani, 1875 : 145–148, [not seen].
Pteromalus vindemmiae Rondani, 1875 : 3, figs. 4–6 [off-print.]
Encyrtus vindemmiae Rondani, 1876 : 84–85 [emendation].
Pachycrepoideus dubius Ashmead, 1904 : 329, 383.

Anisopteromalia crassinervis Bouček, 1954 : 57–60, ♀.
Pachycrepoideus elongata Delucchi, 1955*b* : 141, ♀, **syn. n.**
Pachycrepoideus vindemiae (Rondani) ; Peck, 1963 : 620–621.

Type material. *Encyrtus vindemiae* Rondani. Lectotype ♀ in Museum " La Specola ", Florence, according to Delucchi (1955b : 441) ; I have not seen it.

Pachycrepoideus dubius Ashmead. Type ♀, U.S.A., Michigan, East Lancing, in U.S.N.M. (not seen). The species was synonymized with *vindemiae* by Delucchi (1955b : 139) ; it was not described by Ashmead but the name is validated by the generic diagnosis in his key (1904 : 329).

Anisopteromalia crassinervis Bouček. Holotype ♀, Czechoslovakia, Hradec Králové-Věkoše, 7.ix.1952, in Národní Museum, Prague (Cat. no. 3007). Bouček himself later synonymized *crassinervis* with *vindemiae* (1957 : 165).

Pachycrepoideus elongata Delucchi. Holotype ♀, Morocco, Rabat, 30.x.1928 (*J. Mimeur*), in Muséum d'Histoire naturelle, Geneva. Delucchi distinguished it from *vindemiae* on the basis of its relative longer funicular segments and the more strongly developed tubercle at the base of the propodeum. In a series of *vindemiae* in BM(NH) reared from puparia of *Musca* sp. at Giza, Egypt, some females have the antennae and propodeum as in typical *vindemiae*, others are intermediate in the structure of these parts between *vindemiae* and *elongata* ; whilst one large specimen has the funicular segments virtually as long as in the type of *elongata*, and has a large tubercle on the propodeum. On the other hand there are females in Geneva and BM(NH), reared from the same host as *elongata* (*Ceratitis capitata* Wied.), which are typical *vindemiae* in the structure of the antennae and propodeum. I consider, therefore, that the type of *elongata* is just an unusually large specimen of *vindemiae*.

The size, form of the antennal flagellum, and the development of the propodeal tubercle, vary considerably even in European females. The body-length varies from 1·0 to 2·3 mm. In very large females the propodeal tubercle is strongly developed, as in the type of *elongata*, in very small ones it may be virtually absent. Larger females have the antennal flagellum cylindrical, usually with the proximal segments of the funicle longer than broad, whilst occasionally even the last funicular segment may be very slightly elongate. Very small females tend to have the flagellum subclavate, a little attenuated basad, with the first funicular segment sometimes very slightly transverse and the distal segments distinctly so. All intermediate forms occur.

Cosmopolitan.

Biology. Recorded as a pupal parasite of numerous Diptera, including species of *Musca*, *Fannia* and *Hylemyia* (Muscidae), *Calliphora*, *Lucilia* and *Phormia* (Calliphoridae), *Drosophila* (Drosophilidae), *Piophila* (Piophilidae), *Rhagoletis* and *Ceratitis* (Tephritidae=Trypetidae) (see Nøstvik, 1954 : 195–204 ; Peck, 1963 : 621). Nøstvik (1954) gave an account of the biology of *vindemiae* [under the name *dubius* Ashmead]. He noted (ibid. : 197–198) that parthenogenesis occurs ; progeny resulting from unfertilized females were all males. Imagines appear in Britain May–June and Aug.–September.

PLATECRIZOTES Ferrière

Platecrizotes Ferrière, 1934 : 90–92. Type-species : *P. sudanensis* Ferrière, by monotypy.
Platecrizotes Ferrière ; Bouček, 1963 : 503–505.
Platecrizotes Ferrière ; Bouček, 1964*a* : 261.

This genus was originally described in Pireninae, but Bouček (1963 : 503) considered that it might be rather closely allied to *Pachycrepoideus* Ashmead. The type-species is from Africa (Anglo-Egyptian Sudan), but recently Bouček discovered a new species in Europe.

Platecrizotes europaeus Bouček

Platecrizotes europaeus Bouček, 1964*a* : 262–263, ♀.

Type material. Holotype ♀, Moldavian S.S.R., Vadu-lui-Vody, 29.viii.1963 (*Bouček*) in Národní Museum, Prague (Cat. no. 25768).

POLAND, MOLDAVIAN S.S.R.

Biology. Reared in Poland from puparia of a Dipterous genus near *Drosophila* Fln., hidden in leaves of rosette-galls of the Cecidomyiid *Rhabdophaga rosaria* (Lw.) on *Salix purpurea* L. (see Bouček, 1964*a* : 263).

CRATOMINAE

This subfamily, as defined in the present work, includes only one genus, *Cratomus* Dalman, which is easily recognized by its characteristic head (Text-fig. 47) having crests on the face and frons, in combination with the structure of the antennae. The latter have the formula 11083 ; between the pedicellus and the clava there are 8 segments none of which is truly anelliform.

Förster (1956 : 51) included *Cratomus* (=*Caratomus*) in his family Miscogastroidae. Thomson (1876*a* : 217) formed for it a subtribe Caratomides of his tribe Pteromalina. Ashmead (1904 : 327–332) regarded *Cratomus* and *Paracaratomus* as forming a tribe within the subfamily Sphegigasterinae of Pteromalidae. Peck (*in* Muesebeck *et al.*, 1951 : 541 ; and 1963 : 622) follows Ashmead, but (rightly) excludes *Paracaratomus* from Cratomini.

The structure of the head, together with that of the antennae, seems to make the group distinct enough to be regarded as a subfamily. Amongst European Pteromalinae, the nearest approach to *Cratomus* seems to be *Kaleva corynocera* Grah., which resembles it in many features of its thorax and gaster ; it differs considerably, however, in the form of its head, antennae, and wings. Possibly the resemblances do not indicate a real affinity between these two genera.

Paracaratomus Ashmead (1894*b* : 335), according to the characters of its type-species *P. cephalotes* Ashmead, is not a Cratomine. It belongs to Miscogasterinae, probably to the tribe Sphegigasterini as defined in the present work. It differs from *Cratomus* in lacking crests on the head, and in having 2 anelli in the antennae, whilst the gastral petiole is much more elongate than in *Cratomus*, the fore wing

has the marginal vein about 3 times as long as the stigmal vein, and the postmarginal vein is long. Peck (1963 : 611) placed *Paracaratomus* in Miscogasterini.

CRATOMUS Dalman

Perilampus sgen. *Cratomus* Dalman, 1820 : 173, 177, pl. 7, figs. 32–33. Type-species : *Cynips megacephala* Fabricius, 1793 by monotypy.
Caratomus Dalman, 1823 : 403 [invalid emendation].
Cratomus Dalman ; Walker, 1833 : 367.
Caratomus Dalman ; Thomson, 1878 : 44.
Caratomus Dalman ; Schmiedeknecht, 1909 : 384.
Caratomus Dalman ; Mercet, 1924 : 426–429.
Caratomus Dalman ; Nikol'skaya, 1952 : 242.
Cratomus Dalman ; Peck *et al.*, 1964 : 39.

Three species occur in North America, including *megacephalus* (F.) ; but only the latter species is known from Europe.

Cratomus megacephalus (Fabricius)

(Text-fig. 47)

Cynips megacephala Fabricius, 1793 : 103, no. 17.
Perilampus (*Cratomus*) *megacephalus* (Fabricius) Dalman, 1820 : 177, pl. 7, figs. 32, 33.
Cratomus megacephalus (Fabricius) ; Walker, 1833 : 368, ♂.
Cratomus nigripes Walker, 1833 : 368, **syn. n.**
Caratomus megacephalus (Fabricius) ; Thomson, 1878 : 44–46, ♂ ♀.
Caratomus megalocephalus Schulz, 1906 : 144 [invalid emendation].
Caratomus megacephalus (Fabricius) ; Mercet ; 1924 : 426–429, figs. 2, 3.
Cratomus megacephalus (Fabricius) ; Peck, 1963 : 622.

Type material. *Cynips megacephala* Fabricius. Syntypes, two specimens, one in Universitetets Zoologiske Museum, Copenhagen [LECTOTYPE], the other in the private collection of Fabricius in Kiel University. The specimen in Copenhagen was selected a lectotype in 1962 by Hedqvist and I now validate his selection ; it is labelled " *Caratomus megacephalus* det. Hedqvist 1962 ".

Cratomus nigripes Walker. Walker published Stephens' manuscript description of *nigripes*, based upon specimens which Stephens had captured in his garden at the Hermitage, South Lambeth, London. Stephens' material of *Cratomus* is in BM(NH) and comprises 5 specimens. Three are labelled as having stood under the name *megacephalus* in his collection. The other two (males) are labelled " Cratomus ater. stood under this name in Stephens' collection ". One of these males, which is card-pointed and staged on a strip of pith, also bears a manuscript label " ater " ; I designate this specimen LECTOTYPE of *Cratomus nigripes* Walker, as it agrees well enough with the description. It has subhyaline wings, whilst the legs are dark enough to be described as " black ", they are black with the tarsi fuscous, only the base of the first segment of the mid and hind tarsi being pale. The name might well have been altered from *ater* to *nigripes* before publication.

BRITAIN, FRANCE, SPAIN, SWEDEN, GERMANY, U.S.A.

Biology. Virtually nothing appears to be known of the biology of *megacephalus*. When first describing it, Fabricius (1793 : 103) mentioned that it had been found in old wood (" Habitat in Daniae ligno antiquo Dom. Lund "). Walker (1833 : 368) stated that it had been taken " on palings ; near London ", and Stephens (1846 : 8) says " Found occasionally on new palings near London ". On 29.vi.1958 I captured two females of *megacephalus* indoors, in a window of my house in Oxford ; and on 6.vi.1960 I watched a female walking slowly about the wooden gate of our garden, and investigating cracks in its surface. Imagines appear in June and July.,

Mercet (1924) gave good figures of the head, and the female, of *megacephalus*.

COLOTRECHNINAE

Colotrechninae contains a single genus *Colotrechnus*, whose precise affinities are rather difficult to decide. It was originally placed by Thomson (1878 : 46) in a subtribe Colotrechnides of his tribe Pteromalina [most of his subtribes are roughly equivalent to the subfamilies recognized in the present work]. Ashmead (1904 : 281, 285) put it in Cleonymidae and established for it a subfamily Colotrechninae, although the genus was in fact known to him only from Thomson's description. Schmiedeknecht (1909 : 270, 289) made it a tribe Colotrechnini of the Miscogasterinae. In his key to the Czechoslovak Pteromalidae, Bouček (*in* Peck *et al.*, 1964 : 41) placed *Colotrechnus* in a subfamily Colotrechninae. I agree with the latter view. When compared with the other subfamilies of Pteromalidae, Colotrechninae appear to me to be nearest Pteromalinae, from which they differ chiefly in the characters given in my key to subfamilies. The forward position of the axillae and the shape of the scutellum in *Colotrechnus* do not occur in other Pteromalids, but rather resemble these structures in some Eulophidae.

COLOTRECHNUS Thomson

Colotrechnus Thomson, 1878 : 46. Type-species : *C. subcoeruleus* Thomson by monotypy.
Colotrechnus Thomson ; Schmiedeknecht, 1909 : 289.
Zanonia Masi, 1921 : 184–186. Type-species : *Z. viridis* Masi by monotypy.
Colotrechnus Thomson ; Nikol'skaya, 1952 : 209.
Colotrechnus Thomson ; Delucchi, 1956*a* : 233–237.
Colotrechnus Thomson ; Peck *et al.*, 1964 : 41–42.

Zanonia Masi was placed in synonymy with *Colotrechnus* Thomson by Delucchi (1956*a* : 233), who revised the European species. Burks (1958 : 13–14) is not sure whether this action is justified but tentatively regards *Zanonia* as being of subgeneric rank. Personally I do not think that the differences between the respective type-species are of generic value.

KEY TO EUROPEAN SPECIES

(FEMALES)

1 Antenna with segments of funicle longer than broad, or at most the distal segments quadrate. Disc of fore wing usually with a yellowish or brownish cloud. Body

varying from dark blue, sometimes with weak greenish reflections in places, to violet ***subcoeruleus*** Thomson (p. 851)

– Antenna with segments of funicle transverse. Fore wing immaculate. Body dark green . . . . . ***viridis*** (Masi) (p. 851)

(MALES)

1 Antenna with combined length of pedicellus and flagellum much greater than breadth of head ; segments of funicle longer than broad, the first usually more than twice, the fifth usually about 1·5 times, as long as broad ***subcoeruleus*** Thomson (p. 851)

– Antenna with combined length of pedicellus and flagellum not greater than breadth of head ; segments of funicle, except sometimes the first, at least slightly broader than long . . . . . ***viridis*** (Masi) (p. 851)

Colotrechnus subcoeruleus Thomson

(Text-figs. 45, 46, 58)

Colotrechnus subcoeruleus Thomson, 1878 : 46, ♂ ♀.
Colotrechnus subcoeruleus Thomson ; Delucchi, 1956*a* : 234–236, ♂ ♀.

Type material. Syntypes from Öland, Gottland and Skåne. Lectotype designated by Delucchi (1956*a* : 236) ; a ♂ from Öland.

BRITAIN (Bouček, unpublished), SWEDEN, AUSTRIA, ITALY, CZECHOSLOVAKIA.
Biology. Unknown.

Colotrechnus viridis (Masi)

Zanonia viridis Masi, 1921 : 187–189, ♀.
Colotrechnus viridis (Masi) Delucchi, 1956*a* : 234, 236–237, ♂ ♀.

Type material. Type ♀, Libya, Bengasi, v.1906 (*V. Zanon*), in Museo Civico di Storia Naturale, Genoa.

CZECHOSLOVAKIA, MOLDAVIAN S.S.R. ; LIBYA.
Biology. Unknown.

Species wrongly placed in Pteromalidae

Gastrancistrus Iriarte Walker, 1848 : 105, 159, ♂. Type material. 1 ♂, LECTOTYPE ; Waterhouse label. It is a ♂ of the Entedontine species *Chrysocharis idyia* (Walker) **syn. n.**

G. Vonones Walker, 1839, *Mon. Chalciditum*, **2** : 67, ♂ (Brazil) (Type Hym. 5. 663). This belongs to the Eulophid genus *Chrysocharis*! **comb. n.**

Pteromalus cruciatus Ratzeburg, 1848 : 205, ♂. Holotype presumably destroyed ; Ratzeburg mentioned that it lacked the head. From his description, and figure of the propodeum (1848 : 3, fig. 8) there is little doubt that *cruciatus* was a male of the Eulophid genus *Pnigalio*, possibly of *agraules* (Walker) ; since the holotype

lacked head and antennae, Ratzeburg's mistake in placing it in Pteromalidae is not surprising.

Pteromalus Orthia Walker, 1839 : 223, ♂. Type material : 1 ♂, LECTOTYPE, Waterhouse label. It is a ♂ of *Eupelmus urozonus* Dalman, **syn.n.**

Nomina nuda

1. *Megorismus Aon* Walker, 1848 : 109. (See note under *Leptomeraporus nicaee.*)
2. *Pteromalus Cytoeum* Walker, 1848 : 125. This is represented in Walker's collection by a ♂ *Habrocytus*, but was never described.
3. *Pteromalus festucae* (Walker) Moncreaff, 1871 ; see Moncreaff, 1871 and Walker, 1871 : 2436. Walker merely stated " Mr. Moncreaff . . . reared *Decatoma mellea, Pteromalus fulviventris* and *P. festucae* (n.sp.) from galls on *Festuca* ". He also appended a note in Moncreaff's paper, stating that one specimen of *P. festucae* had been reared from stems of *Festuca ovina.* The name is cited without comment in all the catalogues but I doubt if it is valid, since there is no description and the data given in the papers cited can hardly be construed as indicating the " work " of the species. I have found no specimen labelled *festucae* in Walker's collection. One of three cards marked " Moncreaff " standing under *Pteromalus imbutus* Walker bears a ♀ of *Habrocytus microps* sp.n. which might have been the original specimen of *festucae*, but there is no proof of this.

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Valid names are in roman letters, synonyms in *italics*.

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ERRATA and ADDENDA

To be inserted opposite page 908.

Page 16, line 28. *After* 'evenly curved' *add* 'except in some male Torymidae'.
Page 32, line 19. *For* 'Brachyelatus' *read* '*Brachyelatus*'.
Page 176, line 6. *For* 'στυλοξ' *read* 'στυλος'.
Page 266, line 2. *For* 'μελασ' *read* 'μελας'.
Page 271, line 14 from bottom. *For* 'Euope' *read* 'Europe'.
Page 352, line 13. *For* 'general' *read* genera'.
Page 377, line 12 from bottom. *For* 'basal vein bare, or virtually bare' *read* 'basal vein, bare or virtually bare'.
Page 528, line 3. *For* '*incusus*' *read* '*inclusus*'.
Page 636, line 16. *For* 'ὀξύσ' *read* 'ὀξύς'.
Page 743, line 2 from bottom. *For* '*fucoicla*' *read* '*fucicola*'.
Page 788, line 12 from bottom. *For* '2♀' *read* '2♂'.
Page 823, line 12. *For* '*Cingolum*' *read* '*Cingulum*'.
Page 862. *Add to* REFERENCES 'GRAHAM, M. W. R. DE V. & CLARIDGE, M. F. 1965. Studies on the *Stenomalina*-group of Pteromalidae (Hymenoptera: Chalcidoidea). *Trans. R. ent. Soc. Lond.*, **117** (9): 263–311'.
Page 875, column 2, line 31. *For* '439' *read* '539'.
Page 882, column 1, line 4 from bottom. *For* 'aeneiscapus, Metopon' *read* '*aeneiscapus, Metopon*'.
Page 887, column 2, *between lines* 1 *and* 2, *insert*: 'Colotrechninae, 850 ; 33'.
Page 887, column 2, line 24. *For* 'conjugens' *read* 'conjungens'.
Page 888, column 1, line 10 from bottom. *For* 'crinifrons, Pteromalus' *read* '*crinifrons, Pteromalus*'.
Page 890, column 2, line 17 from bottom. *For* 'Euamblymerus' *read* '*Euamblymerus*'.
Page 891, column 2, line 13. *To* 'fimbriatus, Lariophagus' *add* '824'.
Page 892, column 1, line 9 from bottom. *To* 'gelanor, Seladerma' *add* '188, 192'.
Page 895, column 2, line 25. *For* 'lesches, Stichtomischus' *read* 'lesches, Stictomischus'.
Page 897, column 2, line 17 from bottom. *For* '269' *read* '268'.
Page 899, column 1, line 19 from bottom. *For* '544' *read* '554'.
Page 904, column 2, line 15. *For* 'splendidus, Merismus' *read* 'splendidus, Merisus'.
Page 905, column 1, line 24. *For* '576' *read* '756'.

20 *January*, 1970