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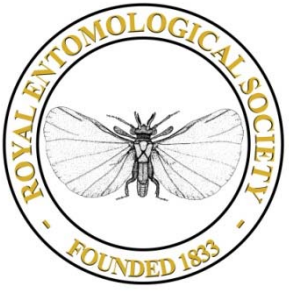

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Handbooks for the Identification of British Insects
Vol. IX, Part 3

MYCETOPHILIDAE

(Bolitophilinae, Ditomyiinae, Diadocidiinae, Keroplatinae, Sciophilinae and Manotinae)

DIPTERA, NEMATOCERA

A. M. Hutson, D. M. Ackland
and L. N. Kidd

ROYAL ENTOMOLOGICAL SOCIETY OF LONDON

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Editor: M. G. Fitton

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DIPTERA, NEMATOCERA

By

A. M. Hutson

Department of Entomology
British Museum (Natural History)
London SW7 5BD

D. M. Ackland

Coniston House
New Street
Deddington
Oxon OX5 4SP

and

L. N. Kidd

8 Central Avenue
Greenfield
Oldham OL3 7DH

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The aim of the *Handbooks* is to provide illustrated identification keys to the insects of Britain, together with concise morphological, biological and distributional information. The series also includes a *Check list of British insects.*

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Contents

Introduction

The Fungus-gnats (Mycetophilidae) are a large family of terrestrial Nematocera, usually with a compact hump-backed appearance (fig. 1), long coxae and well developed tibial spurs. Most species are rather small, but some may reach a length of about 10mm. They are generally some combination of brown, black and yellow, rarely strikingly patterned, but sometimes brightly coloured like Hymenoptera. The family ranges throughout all the major land areas of the world (as well as on many oceanic islands) from northern Greenland in the north to Tierra del Fuego and the Crozet Islands in the south. The Mycetophilids of the tropics have been relatively poorly studied and although the fauna there may not be as representative of the whole family as in the temperate regions, it is certainly rich in species, most of which still await description. About 3400 species have been described.

The basic diagnostic characters of the family are as follows: usually three ocelli, median ocellus sometimes reduced or absent; antennae elongate and placed near the middle of the height of the eye with 11-17 (usually 16) generally distinctly separated segments; thorax distinctly arched, with no suture dividing the mesonotum; coxae long; legs fairly long with tibial spurs usually well developed; other bristles on legs and thorax often strong; venation with Rs usually simple, sometimes forked very close to the base forming a "small cell" over the *r-m* cross-vein, sometimes forked nearer the tip of the wing; median and posterior forks usually present, one or more of branch veins sometimes incomplete or absent; discal cell absent; anterior veins usually more strongly developed than posterior (post-radial) veins.

About 450 species in seven subfamilies are recorded from Britain. About half of these species belong to the single subfamily Mycetophilinae and are not included in this work, which gives keys to species and figures of male genitalia for the other 204 species (included in the subfamilies Bolitophilinae, Ditomyiinae, Diadocidiinae, Keroplatinae, Sciophilinae and Manotinae).

Relationships with other families

The Sciaridae, formerly considered a subfamily of the Mycetophilidae, but currently given separate family status, have a similar appearance and agree in most of the above listed characters. The British Mycetophilidae and Sciaridae are most closely related to the Scatopsidae and Cecidomyiidae. The Scatopsidae (and its related families Synneuridae and Canthyloscelidae) have large eyes that meet or almost meet above the antennae, tibial spurs usually reduced or absent and uniform pubescence on the thorax (no distinct rows of bristles). They are mostly small stout black flies, sometimes with some yellow. Most of the Cecidomyiidae are small fragile species with an eye-bridge and no ocelli, wing venation reduced to two postradial veins reaching the wing margin, very short first tarsal segment, no tibial spurs. Some Cecidomyiidae (in the subfamily Lestremiinae) have ocelli, wing venation similar to Sciaridae and a long first tarsal segment.

The Sciaridae are readily separable from the Mycetophilidae in having the eyes produced over the antennae forming an eye-bridge and in having shorter coxae. The included species are rather uniform in general appearance with characteristic wing venation, generally dark colouration and usually a lack of strong bristles. A few paler species, e.g. *Phytosciara flavipes* Meigen, may be mistaken for Mycetophilidae on superficial examination. The females of some species are wingless and with degeneration of the wings there may be modifications of the thoracic structure and reduction of eyes (including loss of the eye-bridge). Even the halteres may be lost. No apterous Mycetophilidae are known, but the known females of two genera

(*Baeopterogyna* Vockeroth and *Moriniola* Matile) and the female of one *Macrocera* species from the south Indian Ocean, are brachypterous. The apterous and brachypterous forms may be confusing, but associated males and larvae will leave no doubt as to the correct family placement.

British Sciaridae have been little studied, but recent systematic studies by Tuomikoski (1966a) and Steffan (e.g. 1966) might facilitate a better classification of our own fauna. While there may be sufficient grounds for giving the Sciaridae separate family status, many of the groups here treated as subfamilies of the Mycetophilidae are equally well defined and discrete enough for some authors to consider them too as separate families. Whether or not it is fully justified to give the Sciaridae special separate status, it is convenient and practical to do so until we have greater knowledge of their morphology and biology.

Immature stages

Eggs (fig. 2) are usually oval, white and opalescent, the opalescence due to the chorion being raised into longitudinal rows of tubercles. The larva emerges with the aid of a small chitinous egg-burster.

Larvae (fig. 3) are usually slender, white and with a distinct dark head capsule. The head capsule is complete and non-retractile, with the mandibles opposed and in a horizontal plane. It is light coloured in a few species, such as the cave-dwelling *Speolepta leptogaster* Winnertz and the polymycetophagous *Mycetophila fungorum* Degeer. The epicranial plates meet below the head in Keroplatinae, Sciophilinae and Mycetophilinae. Antennae are generally very reduced and obscure, but are well developed in Bolitophilinae. The abdomen is of at least 8 segments, has no tergal plates, no prolegs and no anal lobes (although small anal papillae are present in Keroplatinae and the posterior spiracles of Ditomyiinae are on small spine-like processes). Most larvae that live internally in fungi (especially Mycetophilinae) have some development of locomotory aids in the form of creeping welts, but these are poorly developed in Bolitophilinae and absent in the web-spinning Sciophilinae and Keroplatinae. The Keroplatinae also tend to be relatively large and vermiform, while *Phronia* (Mycetophilinae) are hemiovoid and either covered with slime or with a protective limpet-like shield made up of local debris. *Epicypta* (Mycetophilinae) has a similar protective case. The larvae of Keroplatinae are apneustic, the rest are varieties of hemipneustic and may vary from instar to instar, e.g. in *Bolitophila* and *Brachypeza* the first instar is metapneustic, 2nd and 3rd are propneustic and the 4th (last) instar is peripneustic. While usually white, some larvae may be coloured from dull yellow to bright green.

The evaluation of characters to establish a satisfactory style of description of larvae was presented by Lastovka (1971) and this has been largely followed by Trifourkis (1977).

The pupa (fig. 4) is obtect adecticous and with sufficient of the adult characters apparent for identification with the family. The web-spinners tend to pupate in or by the web, with or without a cocoon. Those developing in soft fungi leave the fungus and pupate in nearby soil or under bark, etc., sometimes with a loose cocoon. Others may pupate in situ in hard fungi or non-fungus media with or without a cocoon, some cocoons being very substantial. The pupal stage is usually very short and hence has been rather neglected, but particularly in those species that build a substantial cocoon the pharate adult may remain in the cocoon for some time awaiting suitable emergence conditions.

General behaviour and habitats

Fungus-gnats are ubiquitous and form an important part of the Dipterous fauna of many habitats. However, little is recorded of the behaviour of adults and much remains to be learned of their larval habitats. Adults are found, often in large numbers, in moist dark places, especially steep damp overhanging banks in woods, cliffs, rivers, the mouths of caves, culverts and tunnels, the root systems of fallen trees, etc. Some prefer more open situations and a few prefer the higher foliage of broad-leaved trees. Most species are probably crepuscular and have their peak of activity around dusk with a lesser peak around dawn. They rest during the daylight period, but are more prone to disturbance during bright, moist conditions. Many species are attracted to light; Malaise traps, pitfall and sticky traps and windows can all produce a variety of species including many that, presumably because of their activity rhythms, are not taken by conventional sweeping, etc. Males of a few species, e.g. in the genera *Mycetophila* and *Phronia,* sometimes form dancing swarms. Some species are attracted to flowers, particularly in the Keroplatinae, and genera such as *Antlemon* and *Asindulum* have elongate mouthparts presumably for feeding on nectar. Species of *Macrocera* and *Mycomya* are frequently to be seen resting in fairly exposed situations on vegetation, but published suggestions that they feed at flowers need confirmation. Seepage from trees, honeydew, some odoriferous rotting vegetation, etc. may attract others. Many of the species that breed in fungi may be found around their hosts.

In Britain, probably the most diverse fauna is found during June. There is then a lull before the autumn flush associated with the peak appearance of fungus fruiting bodies. During this autumn peak Mycetophilidae form an important part of the Dipterous fauna, being extremely numerous when most other flies are on the decline. While far more abundant in these periods, Mycetophilidae (especially Bolitophilinae and Mycetophilinae) can be found throughout the year, except for the severest cold spells of winter. In winter they may collect in heavy concentrations in patches of evergreen vegetation, such as ivy or a conifer. Many species hibernate in caves (see the journal *Hypogean Fauna,* published by the British Cave Research Association), cellars, outhouses, etc., under bark and in hollow plant stems.

About one third of the species of Mycetophilidae recorded in Britain have been reared. Of these c.75% are associated with the fruiting bodies of fungi, including Myxomycetes, c.20% are associated with rotting wood and 5% with other habitats. Because a large amount of work has gone into the rearing of Diptera from fungi, including major efforts in Britain by Edwards (1925), Buxton (1961) and Trifourkis (1977), in Germany by Eisfelder (1954, 1955) and Plassmann (1969, 1971a), in Hungary by Dely-Draskovits (1974) and in Finland by Hackman & Meinander (1979) it seems likely that a smaller proportion of the as yet unreared groups are associated with fungi. Preliminary analysis suggests that probably no more than 60% of the British fauna is closely associated with fungal fruiting bodies. Of the species that have been associated with fungi, about 60% occur inside the body of the fungus, while the rest live on the (under) surface. Again this proportion may not be accurate, because of the notoriously low success rate in attempts to rear larvae that occur inside the fungus. Two species are known to produce gall-like formations on fungi. Some of the species that are found on the outside of fungi are equally common on non-fungus substrates, such as the Keroplatinae and some *Mycomya* spp. Some of the species that feed on fungus material, particularly those found in the later stages of decay of the fungus, also occur in other habitats, e.g. *Docosia gilvipes* Haliday.

Most of the species that are associated with rotting wood live on the surface or under bark—only a few penetrate the wood. Probably most of these are feeding on fungal hyphae. The figure of 5% for the forms known to breed in other habitats may

be the most serious inaccuracy. The figure covers mosses and liverworts, bird and mammal nests, accumulations of rotting plant material, in the tunnels made by earthworms, in grass tussocks, on the walls of caves. The larval pabulum of many groups, including some quite large groups with very common species, is hardly known and it is probable that many of these occur in as yet uninvestigated habitats. For instance, for a short period in the early spring *Boletina gripha* emerges in enormous numbers from areas as diverse as Kent woodland and Westmorland moorland. It is active for most of the summer in smaller numbers, probably passing through a series of overlapping generations—but its larva is unknown. Possibly many such non-sporophore feeders feed on mycelia in the substrate.

Along with this wide diversity of habitat goes a range of diet from vegetarian to carnivorous. All those species feeding inside fungus or wood are assumed to be vegetarians, feeding on fungal tissues. Most of those feeding on the outside of fungi are probably feeding on fungal spores. However, some of the latter and others that live under stones, logs, in grassland, etc. (particularly in the Keroplatinae) are, at least in part, predaceous on small animals that they trap in webs. The webs of many species have droplets of oxalic acid deposited on them by the larvae and these quickly kill any small animal that comes into contact. In New Zealand and Australia, larvae of the genus *Arachnocampa* drop a number of vertical filaments each with regularly spaced sticky mucous drops. These droplets catch small insects. The other extraordinary feature of this larva is that it has a controllable luminescence at the ends of its Malpighian tubules. The larvae often occur in caves and are sometimes so numerous that the filaments are lit up by the luminescence of the larvae and the sight has become a tourist attraction (Richards, 1960). There has been discussion on the possibility of establishing such a colony as a "natural phenomenon" in a tourist cave in England. Some South American cave species may use vertical filaments in the same way, but are not so spectacular. These species and *Arachnocampa* belong to the Keroplatinae and several other species of this group, including some of our own, demonstrate a limited degree of luminosity. Cave dwelling species of *Macrocera* have been described as starting life as scavengers, but quickly become predaceous using a similar technique to *Arachnocampa,* while others spin a large loose web in places where they might expect to find prey, e.g. near bat guano (Peck and Russell, 1976). Such species should be searched for in Britain, where we have so far only recorded *Speolepta leptogaster* Winn. as regularly breeding in caves. *Speolepta* is extremely common and is probably a scavenger, eating any organic matter, such as algae, fungus or animal remains, that occur within its territory. The most outstanding predatory larva is *Planarivora insignis* Hickman, which is an endoparasite of terrestrial planarians in Tasmania (Hickman, 1965).

The species that occur in bird and mammal nests, accumulations of rotting vegetable matter and perhaps also some species that seem to prefer fungi in an advanced state of decay may better be termed saprophagous than fungivorous.

Most species overwinter in the larval stage. Some species appear to be univoltine, but many have a series of overlapping generations.

Associations with fungi

The host specificity of those species of Mycetophilidae that breed in fungi is still poorly understood. Workers who have studied this question in some detail have found different preferences. The poor success rate so far achieved in rearing attempts has been an unfortunate limitation on host data.

Sporophores of the larger fungi are particularly common in summer, building up to a maximum in late autumn. Their infestation with Mycetophilidae remains fairly

constant from June to October (Russell-Smith, 1979). There is then a decrease in infestation rate in November at the time of the decrease in actual numbers of sporophores. The effect of rainfall on infestation is slight, but dry periods may slightly reduce infestation, while very wet fungi become stodgy and less attractive to flies. The highest infestation rates occur in the Amanitaceae, where over 90% of sporophores may be infested. Boletaceae and Russulaceae may reach infestation rates of over 80%, Cortinariaceae and Tricholomataceae over 70% and Polyporaceae in the lower 60%'s. However, within the Polyporaceae infestation rate may be very high in some genera such as *Coriolus* and *Bjerkandera*. Similarly some genera of the other families show consistently low infestation rates. Within genera the infestation rate varies greatly from species to species; thus although the average infestation rate for *Russula* species is high, this may range from 30% to 90% according to species. A major problem in assessing the importance of various groups of fungi is the widely differeing results of different studies. For instance, Edwards (1925) reared *Ditomyia fasciata* Meigen easily and in numbers from what he considered its host fungus, *Polystictus [=Coriolus] versicolor* (L. ex Fr.) Quél. Buxton (1961) reared this species from only 1 of 16 samples of *C. versicolor,* but also from 3 of nine samples of *Fomes ulmarius* (Sow.) Fr., 1 of 1 *Daedalia biennis* (Bull) Quél and *Polyporus picipes* Fr. and 1 of 8 samples of *Bjerkandera adusta* (Wild.) Fr. He did not find it in any of 11 samples of *Polyporus squamosus* (Huds. ex Fr.) Fr. Plassmann (1969) reared it from *Trametes [=Coriolus] versicolor* as well as *Inonotus radiatus* (Sow.) Fr. and *Leptoporus amorphus* Fr. Trifourkis (1977) did not find it at all in 70 samples of Polyporaceae including 15 samples of *Coriolus versicolor,* 8 *B. adusta* and 2 *P. squamosus.* The reason for this variation is uncertain; human factors, such as techniques of rearing and the length of study, are doubtless important, but many natural features may also be involved, such as climate (dry/wet; windy/sheltered), geography (general distribution, altitude) ecology (forest type, composition of tree species, their density, age, etc). The whole problem is further complicated by the difficulties of identifying Mycetophilid larvae, together with the taxonomic and nomenclatural problems of identifying fungi.

Despite such problems, data are accumulating that enable some statements on the host preferences of Mycetophilidae. Although most of the species reared from fungi are restricted to that medium, very few are known to be very host-specific. A few appear to be monophagous (restricted to one species of fungus) such as *Mycetophila cingulum* Meigen on *Polyporus squamosus, Trichonta falcata* Lundström on *Stereum hirsutum* (Willd. ex Fr.) and *Trichonta vernalis* Landrock on *Calocera cornea* (Batsch. ex Fr.) Fr., *Bolitophila hybrida* Meigen is extremely common in *Paxillus involutus* (Batsch. ex Fr.) Fr., but has been recorded from a variety of other fungi. Similarly *B. saundersii* Curtis is usually found in *Hypholoma fasciculare* (Huds. ex Fr.) Quél, but occasionally occurs in other fungi.

Some species appear to be stenophagous (restricted to a few closely related fungi) such as *Bolitophila cinerea* Meigen on a variety of *Hypholoma* and *Pholiota* spp., *Sciophila buxtoni* Freeman from a variety of tough lignicolous Polypores such as species of *Coriolus, Pseudotrametes* and *Daedaleopsis. Cordyla fasciata* Meigen, *Exechia nigroscutellata* Landrock and *Mycetophila alea* (Laffoon) are all restricted to Russulaceae, while *Exechia separata* Lundström and *Mycetophila signatoides* Dziedzicki are restricted to Boletaceae.

Sciophila lutea Macquart, *Docosia gilvipes* Haliday and *Rondaniella dimidiata* Meigen are extreme examples of polyphagous species, in fact *D. gilvipes* also breeds in the nests of birds and animals, but too little is known about the real preferences of many species to decide whether they might more correctly be termed oligophagous (having a preference for a limited variety of fungi that presumably share some features). Certainly many are restricted to soft ground fungi, such as most of the

Mycetophilinae, while others prefer a broad spectrum of lignicolous fungi (such as *Dynatosoma fuscicorne* Meigen and *Mycetophila ornata* Stephens). For these species other factors such as phenology, habitat or density of fungi may be more important in limiting host choice.

The development of a soft fungal sporophore may be separated into three phases: I, fungus fresh with no signs of decay; II, decaying through age and damage (mainly due to the activity of fungivores); III, semi-liquid state through advanced state of decay and histolysis of fungal tissues. Most Mycetophilidae attack at stages I to II, but species such as *Mycetophila fungorum* Degeer will continue to develop in deliquescing sporophores with little regard to the species. Hackman & Meinander (1979) recognise four stages of development. Tough aerial sporophores tend to desiccate and wither or become friable rather than rot; in these late stages they are unsuitable for Mycetophilidae.

Naturally most effort has been put into rearing from the larger Basidiomycetes. Most of these belong to the "Hymenomycetes" (including all agarics, boletes, polypores, coral fungi, hedgehog fungi, dry rots, etc.) and even some of the smaller fungi in this group, such as *Marasmius,* have been shown to support Mycetophilidae. The "Gasteromycetes" (Puff-balls, earthballs, stinkhorns, etc.) and the phragmobasidiomycetes (jelly fungi) have not proved so suitable—the former less so than the latter. The other major group of fungi, the Ascomycetes, have received little attention from workers apart from Buxton (1961), who made a special effort to check them. He had limited success, but found a few previously unreared species. Little has been written on the role of other fungi and Myxomycetes, although some Mycetophilinae (Buxton, 1954) and the rare *Manota* (Chandler, 1978) have been associated with the latter. More work on these obscure fungi may produce interesting results. Probably many species feed on hyphae in the ground.

Trifourkis (1977) gives a thorough review of the available records for the 39 Mycetophilid species that he reared. A similar survey of the records for other species would be an invaluable base-line for future research. A summarised list for British species has been published by Chandler (1979a). A summary list of fungi and other habitats with the species reared from them is presented here for the groups included in this volume. Discussion on the associations of Mycetophilidae (and other Diptera) and fungi and the problems of defining and categorising these associations are given in Eisfelder (1954, 1955), Buxton (1961), Trifourkis (1977) and Hackman & Meinander (1979).

Lists of fungi and other habitats with associated Mycetophilidae

There follows a systematic list of the genera of fungi referred to in the text. This largely follows Pegler (1973) and Henderson, Orton & Watling (1969) and is the system adopted in a guide to British fungi by Kibby (1979). The associated Mycetophilidae (excluding Mycetophilinae) are listed on the right side of the page.

ASCOMYCOTINA
Discomycetes
Pezizales
HUMARIACEAE
Aleuria — Docosia gilvipes

PEZIZACEAE	
Peziza	Docosia gilvipes
Pyrenomycetes	
Sphaeriales	
XYLARIACEAE	
Bulgaria	Sciophila hirta
Hypoxylon	Sciophila lutea, Rondaniella
Ustulina	Sciophila lutea, Docosia gilvipes
Xylodon	Apolephthisa
BASIDIOMYCOTINA	
Holobasidiomycetes	
"Hymenomycetes"	
Agaricales	
BOLETACEAE	
Boletus	Bolitophila cinerea, maculipennis, rossica, hybrida, Sciophila lutea, Coelophthinia thoracica, Rondaniella, Docosia gilvipes
PAXILLACEAE	
Paxillus	Bolitophila saundersii, maculipennis, pseudohybrida, hybrida.
PLEUROTACEAE	
Pleurotus	Mycomya marginata, Sciophila lutea, Rondaniella
TRICHOLOMATACEAE	Bolitophila maculipennis
Armillaria	Bolitophila tenella, cinerea, Sciophila hirta, Rondaniella, Docosia gilvipes
Clitocybe	Bolitophila saundersii, glabrata, pseudohybrida, hydrida, Docosia gilvipes
Collybia	Bolitophila cinerea, Sciophila hirta, lutea, Leia bimaculata
Flammulina	Bolitophila cinerea
Marasmius	Bolitophila cinerea
Tricholoma	Bolitophila saundersii, pseudohybrida, hybrida, Docosia gilvipes
Xeromphalina	Bolitophila fumida
CORTINARIACEAE	
Cortinarius	Bolitophila tenella, ? hybrida
Hebeloma	Bolitophila cinerea, saundersii, Leia bimaculata
Pholiota	Bolitophila tenella, cinerea, hybrida, Sciophila hirta, lutea, Phthinia winnertzi, Rondaniella
Ripartites	Bolitophila pseudohybrida
Rozites	Bolitophila hybrida
STROPHARIACEAE	
Hypholoma	Bolitophila tenella, cinerea, saundersii, Mycomya wankowiczii, Docosia gilvipes
COPRINACEAE	
Coprinus	Bolitophila hybrida, Docosia gilvipes
Lacrymaria	Bolitophila cinerea
AGARICACEAE	Mycomya prominens, Neoempheria
Agaricus	Bolitophila cinerea, pseudohybrida, hybrida

AMANITACEAE	
Amanita	Bolitophila cinerea, saundersii, hybrida, Docosia gilvipes
RUSSULACEAE	
Lactarius	Bolitophila hybrida, Sciophila hirta, lutea, Docosia gilvipes
Russula	Bolitophila pseudohybrida, Sciophila lutea, Rondaniella, Leia bimaculata, Docosia gilvipes
Aphyllophorales	
POLYPORACEAE	Ditomyia, Keroplatus, Cerotelion, Neoempheria, Leptomorphus
Bjerkandera	Rondaniella, Docosia gilvipes
Coriolus	Orfelia (s.s.), Mycomya marginata, Sciophila buxtoni, hirta, lutea, Acnemia nitidicollis, Rondaniella, Ectrepesthoneura hirta, Docosia gilvipes
Daedaleopsis	Sciophila buxtoni
Daedalia	Sciophila hirta, lutea
Fomes	Sciophila rufa, Rondaniella
Grifola	Sciophila lutea, Rondaniella
Heterobasidion	Rondaniella
Heteroporus	Sciophila lutea
Lenzites	Sciophila hirta
Meripilus	Sciophila lutea
Piptoporus	Docosia gilvipes
Polyporus	Bolitophila occlusa, Sciophila rufa, Rondaniella, Docosia gilvipes
Polystictus	Docosia gilvipes
Poria	Mycomya marginata, wankowiczii, ?wrzesniowskyii, ?Monoclona, Apolephthisa, Tetragoneura
Pseudotrametes	Sciophila buxtoni, lutea
Tyromyces	Bolitophila occlusa, Tetragoneura
HYMENOCHAETACEAE	
Inonotus	Ditomyia
Phellinus	Mycomya winnertzi, ?Sciophila ochracea, lutea
GANODERMATACEAE	
Ganoderma	Mycomya winnertzi, Sciophila hirta
THELOPHORACEAE	
Thelophora	Mycomya prominens
SPARASSIDACEAE	
Sparassis	Mycomya marginata, Rondaniella
STEREACEAE	
Stereum	Mycomya cinerascens, marginata, wankowiczii, Sciophila hirta, lutea, Coelosia tenella, Rondaniella, Cerotelion lineatus
Chondostereum	Mycomya marginata
MERULIACEAE	
Merulius	Cerotelion lineatus, Mycomya marginata
Phlebia	Mycomya marginata, Apolephthisa

CONIOPHORACEAE	
Serpula	Cerotelion lineatus
CORTICIACEAE	
Peniophora	Diadocidia
CANTHARELLACEAE	
Cantharellus	Sciophila hirta
GOMPHACEAE	
Gomphus	Sciophila lutea
HYDNACEAE	
Hydnum	Sciophila interrupta, lutea, Coelophthinia
Dacrymycetales	
CALOCERACEAE	
Calocera	Leia bimaculata
"Gasteromycetes"	
Phallales	
PHALLACEAE	
Phallus	Mycomya wankowiczii
Sclerodermatales	
SCLERODERMATACEAE	
Scleroderma	Docosia gilvipes
Phragmobasidiomycetes	
Auriculariales	
AURICULARIACEAE	
Auricularia	Mycomya marginata, duplicata, Sciophila hirta, Docosia gilvipes, Cerotelion lineatus
Tremellales	
TREMELLACEAE	
Sebacina	Mycomya marginata

Below is a list of the other habitats mentioned in the text of the keys with the fungus-gnats that have been associated with them. The rotting wood category covers a variety of situations including living on the surface, under bark, with or without encrusting fungi, on the ground or aerial branches, etc. There is little doubt that the larvae of many species reared from rotting wood feed on fungi in the wood.

Rotting wood	Diadocidia spp, Macrocera spp, Macrorryncha, Keroplatus, Cerotelion, Platyura, Orfelia, Mycomya, Syntemna, Acnemia, Monoclona, Phthinia, Apolephthisa, Boletina flaviventris, Ectrepesthoneura, Manota.
Turf, grass tussocks	Macrocera spp, Orfelia spp
Under boulders	Orfelia
Worm tunnels	Orfelia
Mosses & liverworts	Orfelia, ?Neuratelia, Gnoriste, Boletina spp
Caves, etc	Macrocera spp, Speolepta
Mammal & bird nests	Leia bifasciata, piffardi, Docosia gilvipes, carbonaria, fumosa

Parasites and disease

Records of Hymenopterous parasites are scarce and many are based on rather loose associations of Mycetophilid and Hymenopteran. The few catalogues of relevance to the British fauna are, in the main, old and unreliable and the extraction of records is time consuming. There are, however, some groups which appear to be closely associated with Mycetophilidae. Thus, in the Ichneumonidae the Oxytorinae (=Microleptinae) and Orthocentrinae are usually associated with fungus-gnats. Several Braconidae (Ichneumonoidea), Proctotrupidae and Diapriidae (Proctotrupoidea) have been reared. The families Pteromalidae, Eulophidae and possibly Encyrtidae (all Chalcidoidea) may contain Mycetophilid parasites, as may Eucoilidae and Figitidae (Cynipoidea), Hyperparasites of the family Ceraphronidae (Ceraphronoidea) have been reared from Sciaridae and may occur on Mycetophilidae. Trifourkis (1977) lists many rearing records and Masner (1968) has recently reviewed the Proctotrupidae associated with Mycetophilidae.

A thorough survey of the available records would provide valuable data for those studying either the parasites or the flies. Since many of these records may not be very reliable every attempt should be made to check the identifications and to get further records by careful rearing. Richards' (1977) introduction to the order Hymenoptera gives keys to families and access to relevant literature. Askew (1971) includes general information on the biology of parasitic Hymenoptera.

Almost nothing is known or readily accessible about other parasites and pathogens. Mycetophilidae have been experimentally infected with iridescent virus, but there are no records of such infection in the wild. Madwar (1937) found nematodes in *Diadocidia.*

Parasitic fungi are probably not uncommon, but a superficial survey of recent reviews of the subject produced no records from Mycetophilidae. Large numbers of adult Mycetophilidae (*Rymosia fasciata* Meigen) attacked by the entomophagous fungus *Verticillium ?lucanii* have been found on the walls of a cave in Wales (A. M. Hutson, unpublished).

Steinhaus (1963) may be useful as an introduction to general studies of diseases and pathogens.

The fossil record

Mycetophilidae form a very large proportion of the fossil Diptera, particularly from amber, but the literature is very scattered—there is no catalogue and little review of literature. Rohdendorf (1964 [1974]) has given an overall review of our knowledge of fossil Diptera. However, in a subject which is very prone to alternative interpretation of specimens, age of origin and of unreliability of published descriptions and figures, he has (perhaps justifiably) relied mainly on the material available to him in Russia. According to Rohdendorf the oldest Diptera are described from the Upper Triassic (c.200 million years before present) and over half of these are recognisable as closely related to Mycetophilidae, but in two groups that are now extinct. There is little material from early and late Jurassic, but a good sample from Middle Jurassic (mostly from Karatau—a deposit which is usually considered to be of rather later origin than this). The main group from the Triassic is strongly represented in (early and) middle Jurassic along with several other groups. Few data have been published for the Cretaceous period—material from this period is now available, but has not been studied in detail yet. By the Tertiary, from which a large number of species have been described, all the early groups have been replaced by the currently recognised groups (discussed in this handbook as subfamilies).

Among the material described from this period it is interesting to note the presence of groups that are now very small and rare, such as the Manotinae and Lygistorrhininae. Other authors who have published on fossil Mycetophilidae include Loew, Meunier, Handlirsch, Edwards and Hennig (e.g. Hennig, 1954).

This necessarily short review deals with a subject that is greatly in need of more investigation—a synthesis of the available information and literature on Mycetophilidae would provide valuable background studies for an assessment of contemporary forms.

Collecting and preserving

The section on general behaviour and habitats gives an idea of where to find Mycetophilidae. Sweeping sites mentioned there and any nearby low vegetation will produce many specimens, which can be supplemented by a variety of traps. Further details of techniques and equipment for collecting can be obtained from Stubbs & Chandler (1979) and Cogan & Smith (1974). Careful rearing of larvae to adults provides valuable data on life-cycles and some suggestions for rearing from fungi follow.

Rearing Diptera from fungi

Collected fungi should be kept isolated, either as individual sporophores or as accurately identified conspecific samples, to prevent cross-contamination. A plastic box can be used as a rearing cage; the box should be ventilated but proofed against oviposition by flies from the outside, and containing some fine sterilized peat. The peat will absorb some of the products of decay of the fungus and serve as a pupation site for the larvae. A high humidity should be maintained by frequent spraying with non-chlorinated water. The depth of the peat can be varied from shallow to deep in the box, providing a moisture gradient for the larvae to choose their pupation site. Decomposed fungi should be removed after the larvae have emerged, but the box should be kept intact and regularly inspected for emergences for at least six months. Fungi of various ages should be collected and their condition noted since some Mycetophilidae prefer older, even deliquescent fungi. Other features, such as fungal size, consistency, surface area, substrate, position are also worth noting as these may be factors limiting the choice of host fungus of apparently polyphagous flies. Odour and chemistry may be more difficult to record.

If detailed information on host choice is required, detailed records of emergence should be kept for each sample. If associations of immature stages are required, some of the fungus should be examined at the time of collection and examples of each larval type present separated and preserved. When adult flies emerge the associated pupal exuvium should be collected and this will usually have the larval head capsule attached. Remember that one sporophore may support several species of Mycetophilid.

Supplementary information can be obtained by the use of emergence traps over individual sporophores or groups of sporophores. It is also possible to trap those flies visiting specific sporophores.

Preparation of specimens

All specimens collected should be carefully labelled with locality (including grid reference), date, collector and any available information on ecology.

Adults collected by sweeping or trapping may be stored satisfactorily in 70-80% alcohol; many characters, particularly the genitalia and many of the smaller bristles are easier to see in this medium. However, some workers dislike alcoholic material

and there is a danger of the alcohol evaporating. It is probably easier to review and extract data from a collection that is pinned, although a pinned collection is more prone to damage or attack by pests. If material is stored in spirit the label should be large enough not to move when the tubes are in transit, as movement will damage the specimens. The tube should be filled completely with alcohol, a plug of cotton wool or equivalent placed in the end and the tube then inverted in a larger wide-mouthed jar of alcohol. This allows easy topping-up of alcohol levels and the jars can be used for grouping species, genera, etc.

For pinning Mycetophilidae a micropin should be pushed through the thorax, either laterally (i.e. through the pleurae) or vertically (i.e. down through the mesonotum). Care should be taken not to damage any of the taxonomic characters on both sides of the thorax. The micropin should then be fixed into a small strip of *Polyporus,* Plastozote or equivalent. Alternatively the specimen may be glued on its side to the tip of a card triangle, with the legs protected by the card. A stainless steel pin should then be used to support these mounted specimens and their labels. It is useful to mount all specimens uniformly, e.g. facing the left, to facilitate comparison.

It may be necessary to remove the genitalia and clear them in order to see the structures clearly. Cut off the end of the abdomen, preferably at about the junction of the 5th and 6th segment and drop it into 10% Caustic Potash (KOH). Many specimens will clear in about an hour, but others will need much longer, and they can be left for up to 24 hours without harm. Then wash in distilled water and transfer to Glacial Acetic Acid for 5-30 minutes. They can remain in this medium for a day or so without damage. If possible they should then be stored in glycerine in small corked tubes on the same pin as the rest of the specimen. The cork can be sealed with paraffin-wax or nail varnish, etc. This method enables the specimen to be examined from any angle without distortion, but has the disadvantage that, since the specimens usually have to be removed from the tube for examination, they are not so readily viewed as when mounted on slides. If mounting on slides is preferred the genitalia should be transferred from Glacial Acetic Acid to Clove Oil for half an hour and then mounted in Canada Balsam. They can be mounted separately on standard 8 × 2.5cm (=3 × 1in) glass slides remembering to label as the rest of the specimen and number both parts so that they can be individually associated. A preferable alternative is to mount the genitalia under a small coverslip onto a small piece of clear rigid perspex which can be pinned with the rest of the specimen. So long as they are mounted on clear perspex they can be examined from above and below, with transmitted or direct lighting, but specimens frequently get distorted. If genitalia are mounted it may sometimes be necessary to separate some parts, e.g. dististyle, aedeagus, tergite 9, etc., from the main part of the genitalia, but this should be avoided if at all possible.

Larvae and pupae should be stored in alcohol or mounted on slides.

If specimens have a special association, e.g. male and female taken in copulation or larvae and pupae associated with reared adults, ensure that this is clear from the labels.

Morphology

This section can be used as an introduction to the external morphology of the family but is primarily intended to discuss and illustrate all the structures used in the keys that follow. The naming of parts is still in a state of flux, particularly the structure of the thoracic sclerites, wing veins and genitalia. The differences in nomenclature of these parts is largely due to various views on the homologies of the

structures. The aim of this work is to facilitate identification of specimens and to encourage work on the biology of an ecologically important group of Diptera. To this end the terminology has been kept as simple as possible while adopting a system that is a compromise between earlier works on the family, particularly in Britain (e.g. Edwards, 1925), the introductory *Handbook* to the Diptera (Oldroyd, 1970) and such modern opinion as is now considered undisputed. In the venation the use of "Median fork" and "posterior fork" is an attempt to avoid conflicting opinions. The most recent review of Mycetophilid morphology is by Vockeroth (1980) in a work that has made a serious attempt to discuss and unify the nomenclature of the structures of Diptera.

HEAD (figs. 5-17). Generally convex behind, but closely adpressed to the thorax, occasionally (Manotinae) more flat behind. Top of head lower than the level of the front of the thorax. Antennae (figs. 5-8) arising at the middle height of the head, occasionally (Manotinae) higher. Antennae consisting of distinct scape, pedicel and multisegmented flagellum. The flagellum usually consists of 14 segments, sometimes less (to 9 in some *Cordyla*), occasionally more (one extra in some Keroplatinae). Flagellum sometimes laterally flattened, almost serrate (some Keroplatinae), very elongate in *Macrocera* (Keroplatinae). Flagellar segments usually covered in dense short hairs, sometimes with stouter or longer hairs, the arrangement of hairs usually constant for all flagellar segments, but sometimes varying (e.g. *Macrocera*). Segments usually distinct, but divisions difficult to distinguish towards apex in some *Macrocera*. Length of antennae varying from little longer than head to several times the length of the body. Some sexual dimorphism in length (e.g. *Macrocera*) or bristling (e.g. *Bolitophila saundersii*).

Ocelli usually three, middle one usually reduced, sometimes absent. Lateral ocelli varying from within their own diameter of the mid-line of the head to immediately adjacent to the eye margin. Middle ocellus usually set a little in front of lateral ocelli, sometimes all three in line across head. Postvertex usually with bristles, sometimes of two kinds. Eyes usually reniform being emarginated around the base of antennae, but always well separated from each other. Eyes with inter-ommatidial hairs, sometimes short or sparse. Clypeus usually short, slightly elongate in *Asindulum* and *Macrorrhyncha* (Keroplatinae), very elongate in *Gnoriste* (Sciophilinae). Maxillary palps usually of five segments, but first (basal) two segments often very short and obscured. Number of palpal segments reduced in some genera, e.g. *Keroplatus* in which only one segment is clearly visible (but actually three segments present). Labrum usually small, but elongate in *Antlemon, Macrorrhyncha, Asindulum* and *Gnoriste*. Prementum usually very short and broad, elongate in *Antlemon, Macrorrhyncha* and *Asindulum;* labellae one or two segmented, small in *Antlemon* and most other genera, but large and fleshy in *Asindulum* and *Macrorrhyncha*.

THORAX (figs. 18-23). Usually stout and deep, more delicate in such genera as *Bolitophila, Coelophthinia, Phthinia* and *Speolepta,* but still with hump-backed appearance in lateral view. Pronotum reduced anteriorly, usually remaining as well developed lateral prontal lobes, which are more or less divided into an anterior and posterior pronotum. Below the pronotum and separating it from the front coxae is the propleuron (or prosternum or proepisternum), a small sclerite which may not be well separated from the pronotum. These sclerites carry bristles of various lengths and strengths and their position and number is of importance in some groups. Just behind the pronotum, on a weakly sclerotised area, lies the prothoracic spiracle, which has soft hairs completely surrounding the aperture, but may also have a row of stronger bristles associated with it.

The mesonotum is usually broad with the traces of a prescutal suture evident at sides at the humeri. The surface may be densely covered with fine short bristles sometimes with some longer bristles, or may have a pair of median bare stripes that

start at the front and taper away towards the rear of the mesonotum and a pair of lateral bare stripes that usually start at about the level of the remains of the prescutal suture and run back to the rear of the mesonotum. These bare stripes are occasionally very narrow. The arrangement and naming of the remaining bristles is illustrated in fig. 19. The scutellum may bear a small number of large bristles, or these may be interspersed with small bristles, or the larger bristles may be absent. The postnotum may bear bristles and the arrangement of these bristles varies.

Behind the prothorax and fore-coxa is the mesepisternum, which is usually clearly divided into an upper anepisternum and a lower katepisternum (or sternopleuron). Behind the mesepisternum and below the wing base is the pteropleuron (or mesepimeron). Behind this is the pleurotergite (or laterotergite). The pleurotergite is usually large and bulbous; it lies on either side of the postnotum (or mediotergite or mesophragma) and between the wing base and the metathoracic spiracle and haltere. Between the sclerite that bears the haltere and the hind coxa is the hypopleuron (or metepisternum). Bristles may be present towards the top of the anepisternum, the anterior margin of the katepisternum, the pteropleuron, the pleurotergite and the anterior edge of the hypopleuron. Some of the bristles may be extremely small and fine. Other bristles are present in some groups, but their taxonomic value has not been fully investigated.

LEGS (figs. 24-25): Coxae long and broad, modified only in some *Mycomya* spp. with a dense brush of setae on the inner anterior surface at the distal end of the fore-coxa or with a spur of variable length at the same site on the mid coxa. Front tibia with a preapical brush on the anterior surface and a single apical spur. Mid and hind tibiae usually with a pair of apical spurs, but these may be reduced or absent in some Keroplatinae. Mid-tibia of some Sciophilinae has a sensory pit usually surrounded by dense soft hairs on the dorsal surface. Hind tibia sometimes with an apical comb of bristles on the posterior side. Tibial bristles variable in size and arrangement, fine tibial setae arranged irregularly or in distinct rows for at least part of the length of the tibia. Tarsi usually simple, 2nd and 3rd (and occasionally 1st or 4th segments swollen beneath on the fore-legs of the females of some species. Tarsal claws often simple, more frequently with teeth or with pectinate basal lobe. Empodium present or absent, pulvilla absent.

WINGS (figs. 46-49). Usually clear, sometimes patterned. Pattern usually involves wing tip and/or area of *r-m*. Heavily sclerotised areas of wing base variably blackened or pale (e.g. axillary sclerite above distal end of squama in *Syntemna* spp.) Further investigation of this area would be fruitful. Surface of wing membrane more or less covered with microtrichia, macrotrichia or some of each. However, these terms are not used accurately in this family. Macrotrichia are articulated hairs while microtrichia are unarticulated hair-like outgrowths of the cuticle. The term microtrichia as used in Mycetophilidae undoubtedly includes small macrotrichia, particularly in the Sciophilinae. An examination of the distribution of true micro- and macrotrichia may help towards a better classification of this subfamily. For the purpose of this work microtrichia are relatively small structures, not clearly distinguishable at less than 10× magnification, while macrotrichia are larger obvious wing hairs. Where there is any possibility of confusion other characters are available. Both macrotrichia and microtrichia are present in Ditomyiinae, Diadocidiinae, some *Macrocera,* Sciophilinae, etc. Macrotrichia are usually directed away from the wing base (decumbent), but sometimes they are erect or directed back towards the wing base (reflexed). Microtrichia are arranged randomly or tending to form distinct rows, especially towards apex of the Median and posterior forks (Mycetophilinae).

Vein Sc is absent, short or long, ending in Costa (Sc1 present), in Radius (Sc1 absent) or ending free. R1 simple, R2 + 3 absent, R4 + 5 usually simple, if R4

differentiated it is usually short, either near the base of Rs enclosing the "small cell" (some Sciophilinae) or ending near to or beyond the apex of R1 (Bolitophilinae, Keroplatinae, Ditomyiinae); long in Ditomyiinae, short in others. Usually a short cross-vein connecting Rs with the veins of the Median fork (*r-m*), but this cross-vein replaced by a short fusion in Keroplatinae. Veins of Median fork connected to veins of posterior fork by a posterior cross-vein (Ditomyiinae, Keroplatinae, Diadocidiinae, most Bolitophilinae), by a short fusion (some Bolitophilinae) or connected only at wing base in other subfamilies. In those groups in which the Median fork connects to the posterior fork the basal cell enclosed may be partly divided by a trace of the basal extension of the Median vein (e.g. Bolitophilinae, some Ditomyiinae and Keroplatinae). One of the veins of the Median or posterior fork sometimes weak or absent or disconnected at base. The posterior fork set back to base of wing in *Ectrepesthoneura* (similar to Sciaridae). Anal vein variable in length or absent. Macrotrichia always present on Radial veins, present or absent on Sc and postradial veins. One or two weak axillary veins or folds, never with macrotrichia, but with a black spot on the fork in some *Leia* spp. and *Rondaniella.* Anal area of wing usually rounded, but somewhat right-angled in *Macrocera* or virtually absent in some long-winged species (e.g. *Bolitophilia, Phthinia*).

ABDOMEN. Generally narrow at base and broadest near middle, broadest towards apex in some Keroplatinae. Any patterning of abdomen often more strongly developed in male. Usually 8 unmodified pre-genital segments in male, reduced to seven in some Sciophilinae and Ditomyiinae and 6 in some Sciophilinae. Male genitalia partly rotated in *Diadocidia* and some Sciophilinae (this rotation often responsible for the reduction in the number of unmodified pre-genital segments). Female with 7 unmodified pre-genital segments. Some further sexual dimorphism in bristling of abdomen, particularly obvious in dense patches of setae on sides of male abdomen of *Orfelia modesta.*

Male genitalia (figs. 50-53) with tergite 9 usually strongly modified and with a single or paired accessory plate (cerci) at the distal end in some Ditomyiinae and Sciophilinae (notably *Mycomya* and *Boletina).* Below tergite 9 is a pair of soft lobes (tergite 10) above a single lobe—these form the proctiger which surrounds the anus. The pair of basistyles usually form the bulk of the genitalia, but are of limited taxonomic use (although the apodemes from the basistyle are characteristic in some groups, e.g. *Bolitophila*). The dististyles are articulated at the apex of the basistyles and these are frequently very complex and are of wide application in the taxonomy. The aedeagus and parameres are of great value in the identification of many groups, but can normally only be seen in cleared specimens.

The ovipositor (figs. 54-61) is relatively simple, but provides useful features at the species level in most groups. In many groups there is insufficient closely associated material for females to be reliably described. In some groups where association of males and females seems satisfactory and where identification otherwise relies heavily on male genitalia some descriptive notes on the ovipositor have been given as an aid to identification. Tergite 8 is unmodified, 9 usually reduced, 10 weak and membranous or absent. Cerci usually two-segmented, sometimes only one-segmented. The shape and arrangement of the segments of the cerci are often useful features for identification. Sternum 8 is usually lengthened and very variable in shape. It is frequently partly divided medially forming two lateral lobes. Incrassations around the median division may be characteristic. The apical margin may carry spines or occasionally scales. Sternite 9 reduced. Usually two spermathecae, which vary in size, shape and sclerotisation.

Notes on the keys

This is a large and diverse family, some species show a notable range of variation and imperfections are not uncommon. It has not been possible to allow for all anomalies in these keys. It is therefore not expected that people unfamiliar with the family will always be able to identify isolated specimens reliably. Potential users of this work are recommended to have a variety of specimens available to demonstrate the range of variation in important characters. This can be done either by building up a quantity of material before attempting identification or by reference to a recognised named collection.

The keys are largely based on the work of Edwards (1925). Into this framework has been incorporated additional species, additional characters and revised opinions of relationships. However, the information included here has been very restricted and so there is little doubt that the extra background information in Edwards' work will ensure that it remains very useful. After Edwards' death the family received relatively little attention in Europe until in recent years such authors as Burghele-Balacesco, Chandler, Gagné, Hackman, Laštovka, Matile, Plassmann, Stackelberg, Tuomikoski and the present authors have made taxonomic contributions. Work on the Russian fauna has been published by Ostroverkhova (=Plotnikova) and Stackelberg and in Japan by Okada, Saigusa and Sasakawa. Details of the Nearctic fauna are accessible from Vockeroth (1980) and Laffoon (1965). In the keys to small genera it is hoped that sufficient information will be available for students to be able to recognise the fact if they have a species that does not appear in the key. Similarly it is hoped that sufficient information is presented for taxonomists working on a broader front to recognise possible misinterpretations of species in Britain. In the larger genera, it is not always possible to ensure this, but the greater number of characters in a longer key may help. The figures of male genitalia should confirm identification of that sex, although these may not be sufficient for the separation of closely related groups of species. In most groups the females also show fairly reliable characters of the ovipositor but they have not all been discussed in much detail here. This is partly because the association of female with known males is not always reliable. The most obvious gap here is the large genus *Mycomya,* in which of 33 species, the females of 9 species are unknown, the females of several species are uncertainly associated and several groups have so far proved inseparable. Thus no key to ♀ *Mycomya* is provided, the key being divided primarily by the strong secondary sexual characters present in some males.

The keys are not necessarily phylogenetic, but are arranged for the convenience of identification of the British fauna as known.

Localities are given by county. In most cases the county names have not been converted to the current county district names and there may even be overlap where both names are given. Distribution is summarised for some commonly recorded species. Phenology is given by months of occurrence (in the form of Roman numerals), but this may include some records of distinctive larvae (e.g. *Speolepta*) or bred material, which may spread the dates of occurrence beyond the natural range of the adults. Host fungi are given by genus, but this tells little of the habitat preference and host range that a thorough analysis by host species would give. No thorough search of the literature for faunistic records has been attempted—most of the records included here are of material examined by current workers on the family. The other published records should be confirmed where possible.

Original draft keys were produced by L. N. Kidd. These were checked and revised or rewritten by A. M. Hutson. The introduction and notes preceding each key were prepared by A. M. Hutson. The figures were mainly prepared by D. M. Ackland, but A. M. Hutson prepared those for the introduction, for *Neoempheria* and the

Sciophilini, and those for *Diadocidia* were taken from Laštovka and Matile (1972). The cover illustration and fig. 1 are by Stephen Falk.

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Check list

The following check list corrects and updates that in Kloet & Hincks (1976). The subfamily Mycetophilinae is not included in the keys that follow and is therefore omitted from this check list. A total of 204 species in 47 genera are included here.

MYCETOPHILIDAE

BOLITOPHILINAE
BOLITOPHILA Meigen, 1818
  MESSALA Curtis, 1836
S. BOLITOPHILA s.s.
basicornis (Mayer, 1951)
cinerea Meigen, 1818
saundersii (Curtis, 1836)
spinigera Edwards, 1925
tenella Winnertz, 1863

S. CLIOPISA Enderlein, 1936
bimaculata Zetterstedt, 1838
dubia Siebke, 1863
  disjuncta Loew, 1869
fumida Edwards, 1941
glabrata Loew, 1869
hybrida (Meigen, 1804)
  fusca Meigen, 1818
maculipennis Walker, 1836
occlusa Edwards, 1913
pseudohybrida Landrock, 1912
  triangulata Edwards, 1941
rossica Landrock, 1912

DIADOCIDIINAE
DIADOCIDIA Ruthé, 1831
ferruginosa (Meigen, 1830)
spinosula Tollet, 1948
valida Mik, 1874

DITOMYIINAE
DITOMYIA Winnertz, 1846
fasciata (Meigen, 1818)

SYMMERUS Walker, 1848
  PLESIASTINA Winnertz, 1852
annulatus (Meigen 1830)
  zonata Stephens, 1838
  ferrugineus Walker, 1848
  vittata (Walker, 1856)

KEROPLATINAE

MACROCERINI
MACROCERA Meigen, 1803
anglica Edwards, 1925
angulata Meigen, 1818
aterrima Stackelberg, 1945
bipunctata Edwards, 1925
  grandis: Edwards 1913, nec
    Lundstroem, 1912
centralis Meigen, 1818
crassicornis Winnertz, 1863
estonica Landrock, 1924
fasciata Meigen, 1804
fascipennis Staeger, 1840
fastuosa Loew, 1869
longibrachiata Landrock, 1917
lutea Meigen, 1804
maculata Meigen, 1818
parva Lundstroem, 1914

phalerata Meigen. 1818
propleuralis Edwards, 1941
pusilla Meigen, 1830
? multicincta Curtis, 1837
stigma Curtis, 1837
stigmoides Edwards, 1925
tusca Loew, 1869
vittata Meigen. 1830
? dorsalis Curtis, 1837
zetterstedti Lundstroem, 1914

KEROPLATINI
MACRORRHYNCHA Winnertz, 1846
flava Winnertz, 1846
rostrata: (Edwards, 1913), nec (Zetterstedt, 1851)

ASINDULUM Latreille, 1805
nigrum Latreille, 1805

KEROPLATUS Bosc, 1792
testaceus Dalman, 1818

CEROTELION Rondani, 1856
humeralis (Zetterstedt, 1850)
lineatus (Fabricius, 1775)
laticornis (Meigen, 1818)

PLATYURA Meigen, 1803
marginata Meigen, 1804
atrata (Fabricius, 1805)
rufipes Meigen, 1818

ORFELIA Costa, 1857
PLATYURA: auctt., nec Meigen, 1803

S. ISONEUROMYIA Brunetti, 1912
semirufa (Meigen, 1818)
unicolor (Walker, 1856)
vitripennis (Walker, 1856)

S. MONOCENTROTA Edwards, 1925
lundstroemi (Edwards, 1925)

S. NEOPLATYURA Malloch, 1928
biumbrata (Edwards, 1913)
flava (Macquart, 1826)
modesta (Winnertz, 1863)
nigricauda (Strobl, 1893)

S. ORFELIA s.s.
discoloria (Meigen, 1818)
fasciata (Meigen, 1804)
nemoralis (Meigen, 1818)
flavipes (Meigen, 1818)
nigricornis (Fabricius, 1805)
antica (Walker, 1856)
pallida (Staeger, 1840)
aestivalis (Winnertz, 1863)
tristis (Lundstroem, 1911)
unicolor (Staeger, 1840)

S. PYRATULA Edwards, 1929
perpusilla (Edwards, 1913)
zonata (Zetterstedt, 1855)
concisa (Walker, 1856)

S. RUTYLAPA Edwards, 1929
ruficornis (Zetterstedt, 1851)
pectinifera (Edwards, 1913)

S. URYTALPA Edwards, 1929
atriceps (Edwards, 1913)
macrocera (Edwards, 1913)
ochracea (Meigen, 1818)
dorsalis (Staeger, 1840)
mycetophiloides (Walker, 1856)
nigriceps (Walker, 1856)

ANTLEMON Loew, 1871
servulum (Walker, 1837)

SCIOPHILINAE

MYCOMYINI
MYCOMYA Rondani, 1856
britteni Kidd, 1955
cinerascens (Macquart, 1826)
circumdata (Staeger, 1840)
lucorum (Winnertz, 1863)
clavigera (Lundstroem, 1912)
collini Edwards, 1941
digitifera Edwards, 1925
duplicata Edwards, 1925
exigua (Winnertz, 1863)
? nigra: (Walker, 1837), nec (Macquart, 1826)
fimbriata (Meigen, 1818)
cingulata: (Walker, 1837), nec (Meigen, 1804)
affinis: (Dziedzicki, 1885), nec (Staeger, 1840)
flava (Winnertz, 1863)
ruficollis: (Walker, 1856), nec (Zetterstedt, 1852)
flavicollis (Zetterstedt, 1852)
fuscata (Winnertz, 1863)
hyalinata (Meigen, 1830)
incisurata (Zetterstedt, 1838)
? annulata: (Walker, 1948), ? nec (Meigen, 1818)
kingi Edwards, 1941
lambi Edwards, 1941
marginata (Meigen, 1818)
maura (Walker, 1856)
melanoceras Edwards, 1924
nigricornis: (Lundstroem, 1909), nec (Zetterstedt, 1852)

ornata (Meigen, 1818)
parva (Dziedzicki, 1885)
pectinifera Edwards, 1924
nigricornis: (Dziedzicki, 1885), preocc.
prominens (Lundstroem, 1913)
punctata (Meigen, 1804)
rosalba Hutson, 1979
tenuis (Walker, 1856)
trilineata (Zetterstedt, 1838)
ferruginea: (Walker, 1837), ? nec (Meigen, 1818)
trivittata (Zetterstedt, 1838)
marginata (Dziedzicki, 1885), preocc.
tumida (Winnertz, 1863)
vittiventris (Zetterstedt, 1852)
wankowiczii (Driedzicki, 1885)
winnertzi (Dziedzicki, 1885)
fasciata: (Walker, 1856), nec (Zetterstedt, 1838)
? wrzesniowskii (Dziedzicki, 1885)

NEOEMPHERIA Osten-Sacken, 1878
bimaculata (von Roser, 1840)
lineola (Meigen, 1818)
pictipennis (Haliday, 1833)
winnertzi Edwards, 1913
pictipennis: (Winnertz, 1863), nec (Haliday, 1833)

SCIOPHILINI
EUDICRANA Loew, 1869
nigriceps (Lundstroem, 1909)

ALLOCOTOCERA Mik, 1886
pulchella (Curtis, 1837)

LEPTOMORPHUS Curtis, 1831
walkeri Curtis, 1831

POLYLEPTA Winnertz, 1863
guttiventris (Zetterstedt, 1852)
borealis: (Walker, 1856), nec (Zetterestedt, 1852)
undulata Winnertz, 1863
splendida: Verrall, 1901, nec Winnertz, 1863

NEURATELIA Rondani, 1856
ANACLINIA Winnertz, 1863
nemoralis (Meigen, 1818)
elongatus (Walker, 1848)
nigricornis Edwards, 1941

ANACLILEIA Meunier, 1904
PARANEUROTELIA Landrock, 1911
dispar (Winnertz, 1863)

SYNTEMNA Winnertz, 1863
LOEWIELLA Meunier, 1894
hungarica (Lundstroem, 1912)
nitidula Edwards, 1925
stylata Hutson, 1979

PARATINIA Mik, 1874
sciarina Mik, 1874

PHTHINIA Winnertz, 1863
humilis Winnertz, 1863
winnertzi Mik, 1869

AZANA Walker, 1856
anomala (Staeger, 1840)
scatosoides Walker, 1856

MEGALOPELMA Enderlein, 1911
nigroclavatum (Strobl, 1910)
jenkinsoni (Edwards, 1913)

SCIOPHILA Meigen, 1818
LASIOSOMA Winnertz, 1863
adamsi Edwards, 1925
buxtoni Freeman, 1956
cliftoni Edwards, 1925
fenestella var. Edwards, 1913
fenestella Curtis, 1837
fridolini Stackelberg, 1943
geniculata Zetterstedt, 1838
hirta Meigen, 1818
interrupta (Winnertz, 1863)
limbatella Zetterstedt, 1852
sharpi Edwards, 1913
lutea Macquart, 1826
f. *analis* (Winnertz, 1863)
nigronitida Landrock, 1925
nigra (Landrock, 1912), nec Macquart, 1826
nonnisilva Hutson, 1979
ochracea Walker, 1856
plurisetosa Edwards, 1921
quadriterga Hutson, 1979
rufa Meigen, 1830
varia (Winnertz, 1863)

ACNEMIA Winnertz, 1863
amoena Winnertz, 1863
nitidicollis (Meigen, 1818)
defecta (Walker, 1856)
longipes Winnertz, 1863

MONOCLONA Mik, 1886
rufilatera (Walker, 1837)
halterata (Staeger, 1840)
unicornuta (Dziedzicki, 1884)

GNORISTINI
SPEOLEPTA Edwards, 1925
leptogaster (Winnertz, 1863)

COELOPHTHINIA Edwards, 1941
thoracica (Winnertz, 1863)

COELOSIA Winnertz, 1863
flava (Staeger, 1840)
? flava (Walker, 1837)
silvatica Landrock, 1918
tenella (Zetterstedt, 1852)

DZIEDZICKIA Johannsen, 1909
marginata (Dziedzicki, 1885)

PALAEODOCOSIA Meunier, 1904
alpicola (Strobl, 1894)
flava (Edwards, 1913)
janickii (Dziedzicki, 1923)

GNORISTE Meigen, 1818
bilineata Zetterstedt, 1852
longirostris Siebke, 1874

GRZEGORZEKIA Edwards, 1941
collaris (Meigen, 1818)

APOLEPHTHISA Grzegorzek, 1885
subincana (Curtis, 1837)
melanoceras (Walker, 1856)

BOLETINA Staeger, 1840
basalis (Meigen, 1818)
brevicornis Zetterstedt, 1852
digitata Lundstroem, 1914
dispecta Dziedzicki, 1885
dubia (Meigen, 1804)
analis (Meigen, 1818)
inermis Lundstroem, 1912
flaviventris Strobl, 1894
reuteri Lundstroem, 1906
gripha Dziedzicki, 1885
griphoides Edwards, 1925
groenlandica Staeger, 1845
lundstroemi Landrock, 1912
moravica Landrock, 1912
nasuta (Haliday, 1839)
lundbecki: Edwards, 1913, nec Lundstroem, 1912
nigricans Dziedzicki, 1885
nigrofusca Dziedzicki, 1885
nitida Grzegorzek, 1885
pallidula Edwards, 1925
flaviventris: Landrock, 1924, nec Strobl, 1894
pectinunguis Edwards, 1932
plana Walker, 1856
rejecta Edwards, 1941
sciarina Staeger, 1840
silvatica Dziedzicki, 1885
trispinosa Edwards, 1913
trivittata (Meigen, 1818)
villosa Landrock, 1912

SYNAPHA Meigen, 1818
EMPALIA Winnertz, 1863
fasciata Meigen, 1818
paradoxa (Edwards, 1913)
vitripennis (Meigen, 1818)
finalis (Walker, 1856)

LEIINI
RONDANIELLA Johannsen, 1909
dimidiata (Meigen, 1804)
terminalis (Meigen, 1818)
elegans (Winnertz, 1863)
variegata (Winnertz, 1863)

LEIA Meigen, 1818
GLAPHYROPTERA Winnertz, 1863
arsona Hutson, 1978
bifasciata Gimmerthal, 1846
bilineata (Winnertz, 1863)
trimaculata (Strobl, 1910)
strobli Landrock, 1925
bimaculata (Meigen, 1804)
octomaculata Curtis, 1837
f. *fasciola* Meigen, 1818
crucigera Zetterstedt, 1838
cylindrica (Winnertz, 1863)
fascipennis Meigen, 1818
flavicornis Meigen, 1818
piffardi Edwards, 1925
subfasciata (Meigen, 1818)
winthemi Lehmann, 1822

MEGOPHTHALMIDIA Dziedzicki, 1889
crassicornis (Curtis, 1837)
helvola (Walker, 1856)
valida (Walker, 1856)

TETRAGONEURA Winnertz, 1846
sylvatica (Curtis, 1837)
compressa (Walker, 1856)

ECTREPESTHONEURA Enderlein, 1911
MEUNIERIA Johannsen, 1909, preocc.
colyeri Chandler, 1979
hirta (Winnertz, 1846)
aliena (Walker, 1856)
pubescens (Zetterstedt, 1860)

DOCOSIA Winnertz, 1863
carbonaria Edwards, 1941
fumosa Edwards, 1925
fuscipes (Roser, 1840)
gilvipes (Walker, 1856)
moravica Landrock, 1916

pallipes Edwards, 1941
sciarina (Meigen, 1830)
pubescens (Walker, 1837)
basalis (Walker, 1856)
valida Winnertz, 1863
setosa Landrock, 1916
sp. indet.

MANOTINAE
MANOTA Williston, 1896
unifurcata Lundstroem, 1913

Key to subfamilies

The only subfamily that does not occur in Britain is the Lygistorrhininae. This subfamily contains a single tropical genus in which Rs arises at the base of the wing and the proboscis is very long. General works of relevance to the European fauna are Landrock (1926-1927), Edwards (1925), Bei-Bienko (1969). Many species also occur in the Nearctic fauna, which is covered by Vockeroth (1980) and Laffoon (1965).

1 Posterior fork and stem of Median fork connected by a cross-vein or fused for a short distance (figs. 46, 62-74) 2
— Veins of median and posterior forks separate to wing base (figs. 47-49, 75-87) 5
2 R4 present and long, generally at least half as long as R5; Sc short and ending free (figs. 65-66) ..... DITOMYIINAE (p.28)
— R4 less than half as long as R5, sometimes weak or absent; Sc almost always long and ending distinctly in Costa (fig. 46) 3
3 Media and Radius fused for a short distance (figs. 46, 67-74) ... KEROPLATINAE (p.29)
— Cross-vein *r-m* present (figs. 62-64) 4
4 Posterior cross-vein and *r-m* in line across wing; Media without a basal section (fig. 64) ..... DIADOCIDIINAE (p.28)
— Posterior cross-vein well before *r-m;* Media with basal section distinct (figs. 62-63) ..... BOLITOPHILINAE (p.26)
5 Prothorax with distinct long, strong bristles; head convex behind; orbital bristles not forming a conspicuous projecting row; antennae inserted at about middle of height of head (figs. 11-12); stem of median fork present, either the anterior or posterior branch of median fork may be disconnected at the base, but never both together..... 6
— Prothorax without strong bristles; head flat or slightly concave behind, with a row of projecting orbital bristles which are more or less curved backwards; antennae inserted near top of head (fig. 13); stem of median fork absent, the branches present as detached veins in the distal part of the wing..... MANOTINAE (p.69)
6 Microtrichia of wings irregularly arranged; Sc usually long (figs. 47-49) (shorter in *Tetragoneura* and *Megophthalmidia* (Leiini), which have irregular tibial setae and lateral ocelli remote from eye margin); lateral ocelli usually far from eye margin (fig. 17) (except in *Eudicrana* (Sciophilini), *Docosia* and some *Leia* (Leiini) in which tibial setae are irregular and Sc long); fine tibial setae usually irregularly arranged (fig. 32, 34, 40-41) (except in Mycomyiini, in which Sc long, R4 present); R4 present (figs. 47-48) (Mycomyiini and some groups in other tribes) or absent (fig. 49); pleurotergum bare (Mycomyiini and some groups in other tribes) or haired (figs. 20,22) ..... SCIOPHILINAE (p.40)
— Microtrichia of wings in more or less definite lines, particularly near posterior wing margin (not so clear in *Trichonta* and *Phronia*); Sc short (longer in *Trichonta*); lateral ocelli touching eye margin; fine setae of tibia in regular rows; R4 absent; pleurotergum haired..... MYCETOPHILINAE
(N.B. the Mycetophilinae are not included in this volume).

Subfamily Bolitophilinae

As currently understood this subfamily contains the single Holarctic genus *Bolitophila* with about 60 species. *Arachnocampa* from New Zealand and Australia was thought to belong here, but is now generally regarded as a genus of Keroplatinae. Other suggestions of the occurrence of the group in Australia await confirmation.

All the species that have been reared have been found in soft fruiting bodies of fungi.

Genus **Bolitophila** Meigen
(figs. 6, 14, 24, 54-55, 62-63, 88-101)

This is currently separated into two subgenera (or even genera), but this division is probably artificial. The separation is based on one obvious character, is not supported by any other character in the adults, and recent examination of larvae (Trifourkis, 1977) produces no evidence for a natural division in the genus. They are all drab, grey-brown, elongate species with a wing length of about 5.5mm (4-7mm).

The subgenus *Bolitophila* comprises about 20 species, of which 12 are known from Europe. They breed mainly in fungi related to *Hypholoma* (Strophariaceae) or *Pholiota* (Cortinariaceae). The larvae are gregarious. The adults of many species frequently hibernate in caves and cellars. About 40 species are included in the subgenus *Cliopisa* Enderlein. About 20 of these are European breeding mainly in Agaricales, less frequently in Polypores and Boleti.

Stackelberg (1969a) includes most of the European species. See also Hutson & Kidd (1971, 1974), Chandler (1978), Matile (1976), Plassmann (1971b, 1975).

Key to species

1 Vein R4 ending in R1 (*Bolitophila* s.s.) 2
— Vein R4 ending in Costa (*Cliopisa* Enderlein) 6
2 Posterior fork fused for a short distance (sometimes very short) with the vein above, obliterating the posterior cross-vein 3
— Posterior fork separated from the vein above by a short but distinct cross-vein (fig. 62) 4
3 Inner style of ♂ dististyle with curved sclerotised process very long and not forked at tip, bearing only an inconspicuous tooth at about its mid length (fig. 88); terminal segment of ♀ cerci small and round, penultimate segment with straight, rectangular apex ..... **tenella** Winnertz
Cheshire, Herts, Kent, Notts, Surrey. i, iv, vi-xi. Armillaria, Cortinarius, Hypholoma, Pholiota.
— Inner style of ♂ dististyle with curved process shorter, distinctly forked at tip (fig. 89); terminal segment of ♀ cerci large and oval, sunk into concave apex of penultimate segment ..... **basicornis** Mayer
Cheshire, Cumbria, Oxon, Yorks; Scotland: Inverness, Perth. v-vii, x.
4 Stigma faint, grey; pubescence of ♂ antennae barely as long as diameter of segments; segments 2 and 3 of fore tarsus of female swollen, 2 a little longer than 3; ♂ genitalia fig. 90; ♀ ovipositor, fig. 54, with apex of sternum 8 evenly tapered .... **cinerea** Meigen
Very common and widespread. i-xii. Mainly from Hypholoma *and* Pholiota, *but also from* Agaricus, Amanita, Armillaria, Boletus, Collybia, Flammulina, Hebeloma, Lacrymaria, Marasmius.
— Stigma distinct, dark brown; pubescence of ♂ antennae over twice as long as diameter of segments (fig. 6) 5
5 No dark spot over *r-m* (fig. 62); dististyle of ♂ genitalia with prominent apical teeth directed inwards (fig. 91); segments 2 and 3 of ♀ fore tarsus swollen and of equal

length (fig. 24); Sternum 8 of ♀ ovipositor slightly emarginated at tip and without spines on lower margin (fig. 55) ..... **saundersii** Curtis
Very widespread and common. i-xii. Mainly from Hypholoma, *also* Amanita, Clitocybe, Hebeloma, Paxillus, Tricholoma.

— A distinct dark spot over *r-m;* dististyle of ♂ genitalia with weak apical teeth not curved inwards (fig. 92); segments 2 and 3 of ♀ fore tarsus not at all swollen; ovipositor with small spines on lower margin of Sternum 8 ..... **spinigera** Edwards
Cheshire, Devon, Gloucs, Heref, Lancs; Wales: Gwynedd; Scotland: Inverness, Moray, Perth, Ross & Crom; Ireland: Cork. i-vi, x-xi. Particularly in caves.

6 Posterior vein of posterior fork ending in Anal vein just before its tip (fig. 63); ♂ genitalia (fig. 93), tergum 8 with a median pit at base, apex of tergum 6 with a median area of minute pits (visible only in cleared specimens); ♀ with segments 2, 3 and 4 of front tarsus short and swollen; ovipositor with terminal segment of cerci greatly enlarged ..... **occlusa** Edwards
Berks, Cambs, Cornwall, Cumbria, Hants, Hunts, Yorks; Wales: Gwynedd. v-x. Polyporus, Tyromyces.

— Posterior vein of posterior fork and Anal vein separate to wing margin 7

7 Base of anterior vein of posterior fork weak or absent 8

— Anterior vein of posterior fork not distinctly weaker at the base than in the distal half 9

8 Anterior vein of posterior fork widely interrupted at base; mesonotum with three separate stripes; dististyle of ♂ genitalia with a sharp outer spine and single apical point, parameres not divergent (fig. 94); ovipositor with sternum 8 evenly tapered, last segment of cerci short and broad, broadest near its base ..... **dubia** Siebke
Cumbria, Yorks; Scotland: Argyll, Ayr, Dumfr, Inverness, Perth. v-vii, x

— Anterior vein of posterior fork very faint at base, but traceable; mesonotum uniform, unstriped; dististyle of ♂ genitalia rounded apically with the apical point at right angles to the inner surface of dististyle (fig. 95); ovipositor with sternum 8 very truncate, last segment of cerci elongate oval, broadest at its mid point ..... **fumida** Edwards
Scotland: Inverness. vi. Xeromphalina.

9 Wings with dark spot over *r-m* 10

— Wings without a dark spot over *r-m* 11

10 Dististyle of ♂ genitalia broad, with three separate teeth (fig. 96); basal segment of ♀ cerci as wide as long ..... **maculipennis** Walker
Heref. Shrop; Scotland: Banff, Inverness, Moray, Perth. v, ix-x. Boletus, Paxillus, *Tricholomataceae.*

— Dististyle of ♂ genitalia with a single beak-like apical tooth (fig. 97); segments of ♀ cerci distinctly longer than broad ..... **bimaculata** Zetterstedt
Scotland: Inverness. v.

11 Mesonotum usually shining; postnotum orchreous with a black apical spot; posterior branch of posterior fork strongly curved at tip; dististyle of ♂ genitalia with a pair of weak apical points (fig. 98); ♀ front tarsal segments 2, 3 and 4 more or less equally short and swollen; ♀ Sternum 8 rounded apically, terminal segment of cerci round, basal segment nearly quadrate with a shallowly concave apex ..... **glabrata** Loew
Beds, Berks, Herts, Notts, Yorks. viii-x. Clitocybe.

— Mesonotum not shining, if somewhat shining then posterior vein of posterior fork not strongly curved at tip 12

12 Dististyles of ♂ genitalia almost triangular, parameres long and divergent (fig. 99); ♀ front tarsal segments 2, 3 and 4 more or less equally short and swollen; terminal segment of cerci small and oval, sunk into deeply concave apex of basal segment, which is longer than broad ..... **pseudohybrida** Landrock
Beds, Bucks, Cambs, Cheshire, Cornwall, Hants, Heref, Herts, Kent, Middx, Suffolk, Sussex, Westmorland, Wilts. iii, v, ix-xii. From Agaricus, Clitocybe, Paxillus, Ripartites, Russula, Tricholoma.

— Thorax always dull; ♂ genitalia not as above; ♀ front tarsal segment 2 much longer than 3 or 4, all these segments not obviously swollen 13

13 Posterior branch of posterior fork normal; dististyles of ♂ genitalia with a single weak apical point (fig. 100); ♀ sternum 8 tapered evenly; terminal segment of cerci very

small and round, penultimate segment only shallowly concave apically ..... **hybrida** Meigen

Very common and widespread. v-x. Principally Paxillus; *also from* Agaricus, Amanita, Boletus, Clitocybe, Coprinus, ?Cortinarius, Lactarius, Pholiota, Rozites, Tricholoma.

— Posterior branch of posterior fork rather strongly curved at tip; dististyles of ♂ genitalia with a blunt subapical and a trifid apical process (fig. 101); ♀ Sternum 8 emarginated apically; terminal segment of cerci ovate, sunk into deeply concave basal segment ..... **rossica** Landrock

Lancs; Scotland: Aberdeen, Perth. vii, ix. Boletus.

Subfamily Ditomyiinae

A small subfamily of less than 100 species in about eight genera, found in the Palaearctic, Nearctic, Neotropical and Australasian regions. Stackelberg (1969b) and Zaitzev (1978) include keys to the western Palaearctic species, Saigusa (1973) has additional species and genera from Japan.

Key to genera

1 Eyes reniform (fig. 9); R4 hardly longer than R4 + 5 (fig. 66); anepisternum and postnotum with bristles ..... **SYMMERUS** Walker (p.28)

— Eyes rounded; R4 much longer than R4 + 5 (fig. 65); anepisternum and postnotum bare ..... **DITOMYIA** Winnertz (p.28)

Genus **Symmerus** Walker
(Figs. 9, 66, 102)

A Holarctic genus of 13 species, two of which occur in Europe. A single species is recorded from Britain. Munroe (1974) includes a revision of the genus, excluding the species described by Saigusa (1973).

— Postnotal bristles brown; wing length 5-7mm; ♂ genitalia (fig. 102) with Sternum 9 not markedly constricted at mid length, the lateral margins straight; ♂ cerci covered with short pale setae ..... **annulatus** Meigen

Derby, Devon, Gloucs, Hants, Heref, Herts, Hunts, Kent, Lancs, Oxon, Staffs, Yorks; Wales: Glamorgan, Montgomery; Scotland: Argyll. v-viii. In rotting logs.

Genus **Ditomyia** Winnertz
(Figs. 65, 103)

A Holarctic and Neotropical genus of about 5 species, two of which occur in Europe. One species recorded from Britain.

— Wings with distinct brown transverse bands; wing length 4-7mm; ♂ genitalia (fig. 103) ..... **fasciata** Meigen

Beds, Bucks, Cambs, Hants, Herts, Oxon. iii-xi. In hard Polyporous fungi.

Subfamily Diadocidiinae

Apart from the genus *Diadocidia,* a genus of one species from Chile is included in this subfamily. Two other southern hemisphere genera have been included in this

subfamily, but are usually included in the separate family Sciaridae. Lastovka & Matile (1972) revised the Holarctic species of *Diadocidia*. See also Hutson & Kidd (1974), Chandler (1978).

Genus **Diadocidia** Ruthé
(Figs. 10, 26-27, 64, 288-290)

A genus recorded from the Palaearctic, Nearctic, Neotropical and Australasian regions with less than ten described species. All three species recorded from Europe occur in Britain. The larvae may be found in mucous tubes under rotting logs and have been associated with the fungus *Peniophora*. The adults are fairly stout yellowish-brown flies with greyish wings.

Two subgenera have been recognised by Lastovka & Matile (1972) in the Holarctic fauna.

Key to subgenera and species

1 Anepisternum bare; ratio of length to breadth of 1st flagellar segment of antenna at most 3.2; vein R1 ending approximately opposite base of Median fork; wing length 2.5-4.5mm; ♂ tergite 9 with thickened bristles, dististyle narrowly attenuated at apex and shallowly bifurcate; ♀ with segments 2-4 of fore tarsus swollen beneath, last segment of cerci narrowing towards apex. (*Diadocidia* s.s.) 2

— Anepisternum haired; ratio of length to breadth of 1st flagellar segment of antenna at least 4; vein R1 longer, extending to well beyond base of median fork; wing length about 5.5mm; Tergite 9 of ♂ without thickened bristles, dististyle broad at apex and deeply bifurcate; segments 2-4 of ♀ front tarsus not swollen beneath, last segment of cercus broader towards apex. (*Adidocidia* Lastovka & Matile). Sc ending above base of Rs; ♂ genitalia (fig. 290); ♀ genitalia (fig. 290) ..... **valida** Mik
Scotland: Banff. ix.

2 Anterior basitarsus with 2-6 strong prominent ventral bristles (fig. 27); 1st flagellar segment usually with only the base pale; posterior setulae of hind coxae usually dark; ♂ genitalia (fig. 289) with tergite 9 longer than wide basally, with stout black bristles distally; tergite 9 of ♀ rounded ventrally, cercus evenly rounded distally (fig. 289) ..... **spinosula** Tollet
Common and widespread; vi-ix.

— Anterior basitarsus with only the normal fine bristles ventrally (fig. 26); 1st flagellar segment of antenna with basal 1/3 to 1/2 pale; posterior setulae of hind coxae usually pale; ♂ genitalia (fig. 288) with tergite 9 shorter than wide basally, with pale stout bristles distally; ♀ with tergite 9 with a ventral notch at basal margin, cercus abruptly narrowed distally (fig. 288) ..... **ferruginosa** Meigen
Very common and widespread, iv-x.

Subfamily Keroplatinae

A large subfamily of worldwide distribution. Larvae are web-spinners on the underside of hard fungi, under bark, rotting wood, in caves and even in worm-holes in pasture. They are more or less predacious, eating small invertebrates that get caught in the sticky strands of their webs, which are liberally supplied with drops of clear fluid containing oxalic acid. In species in caves and deep forest, the sticky strands may be suspended vertically to catch flying prey. The most spectacular cases of this are the cave "glow-worms" of New Zealand and Australia, *Arachnocampa* spp. One Tasmanian species, *Planarivora insignis* Hickman, has become an internal parasite of terrestrial planarians. The adults of many species feed at flowers.

This is generally regarded as a primitive and diverse subfamily and this has

resulted in the description of a large number of small genera and subgenera, but it is only when the world fauna as a whole is better known that the relative status of these groups can be properly evaluated. In the British fauna this particularly affects *Orfelia* and its relatives and for the purposes of this handbook these groups have been treated in a very conservative fashion, based on the earlier works of Edwards. Some of the subgenera of *Orfelia* have already been raised to generic rank and others may follow suit; for uniformity, they have been kept as subgenera here, but have been included in the following generic key. Matile is currently investigating the generic classification of this group.

Stackelberg (1969c and 1969d) discusses most of the European species. See also Hutson & Kidd (1974), Chandler (1978).

Key to genera and subgenera

1 Posterior fork slightly approximated near its base, then divergent (fig. 67); anal angle of wing angular; tibial bristles absent; anepisternum with some hairs ..... **MACROCERA** Meigen (p.31)

— Posterior fork divergent from base; anal angle of wing rounded; tibial bristles usually present, even if small 2

2 Mouth parts elongate, at least as long as head; pleurotergite bare; R4 ending in Costa... 3

— Mouthparts not elongate 5

3 Labellae small, but prementum and labrum elongate (fig. 16); a few prospiracular hairs present; postnotum bare; anepisternum bare; tibial setae irregular ..... **ANTLEMON** Haliday (p.39)

— Labellae greatly enlarged and fleshy (fig. 15) 4

4 Prospiracular bristles absent; a patch of short hairs on anepisternum; postnotum bare; Anal vein nearly reaching wing margin; claws large with several basal spines; Costa not extending beyond R5; Sc long, ending in Costa ..... **ASINDULUM** Latreille (p.34)

— Prospiracular bristles present; anepisternum bare; postnotum with a few short setae; Anal vein not nearly reaching wing margin; claws small, at most with one basal spine; Costa extending beyond R5; Sc short and ending free (fig. 68) ..... **MACRORRHYNCHA** Winnertz (p.34)

5 Palpi reduced, with only one swollen visible segment (but actually 3 segments present); antennae stout and strongly laterally compressed (fig. 8) 6

— Palpi normal, with 3-4 distinctly visible segments (but actually five segments present); antennae not strongly lateral compressed 7

6 R4 ending in R1 (fig. 46), pleurotergites hairy ..... **KEROPLATUS** Bosc (p.34)

— R4 ending in Costa (fig. 69); pleurotergites bare ..... **CEROTELION** Rondani (p.35)

7 R4 ending in R1; Media with a distinct fold like basal extension (fig. 70); pleurotergites and postnotum bare; empodium present ..... **PLATYURA** Meigen (p.35)

— R4 ending in Costa; basal extension of Media indistinguishable; empodium absent 8

8 Pleurotergites hairy; each tibia with a single (posterior) spur, anterior spurs absent; at most only a few posteroventral bristles on hind tibia; no prospiracular hairs; postnotum bare; mesonotum with bare stripes; anepisternum with very short hairs above; Anal vein almost reaching wing margin (fig. 71); branches of Median and posterior forks bare; tibial setae irregular at base, in more regular rows towards tip ..... **MONOCENTROTA** Edwards (p.36)

— Pleurotergites bare; mid and hind tibia with a pair of spurs, although the anterior spur may be minute (*Rutylapa* spp, fig. 38); usually some anterior and dorsal bristles on hind tibia (*Orfelia* Costa s.l.) 9

9 Branches of median and posterior forks with close-set small macrotrichia; postnotum usually bare (one or two small hairs sometimes present in *Pyratula*); mesonotum with bare stripes (sometimes inconspicuous in *Isoneuromyia* and *Neoplatyura*) (fig. 19); tibial bristles well developed (fig. 39) 10

— Branches of median and posterior forks bare; postnotum bristly; mesonotum uniformly setose; tibial setae in regular rows throughout (fig. 38); Anal vein not reaching wing margin; tibial bristles weak or absent 13

10 Prospiracular bristles present; tibial setae somewhat irregular, but tending to form distinct rows towards the apex (fig. 33); anepisternum usually bare; Anal vein strong and reaching wing margin (fig. 73)..... **ORFELIA (NEOPLATYURA** Malloch) (p.36)
— Prospiracular bristles absent 11
11 Tibial setae in regular rows throughout, all rows alike; Anal vein strong and almost reaching wing margin (fig. 72); anepisternum bare
..... **ORFELIA (ISONEUROMYIA** Brunetti) (p.36)
— Tibial setae irregular (fig. 39); anepisternum frequently with setae..... 12
12 Anal vein strong and reaching wing margin.... **ORFELIA (URYTALPA** Edwards) (p.37)
— Anal vein abbreviated, not reaching wing margin
..... **ORFELIA (PYRATULA** Edwards) (p.37)
13 Prospiracular bristles absent; about 6 rows of tibial setae much more closely set than others, appearing as conspicuous black lines; anepisternum bare; anterior spur on mid and hind tibia well developed; Anal vein weak
..... **ORFELIA (ORFELIA** Costa) (p.38)
— Prospiracular bristles present; all rows of tibial setae alike, anepisternum usually with a few short hairs; anterior spur of hind and mid tibia minute; Anal vein strong
..... **ORFELIA (RUTYLAPA** Edwards) (p.38)

Genus **Macrocera** Meigen
(Figs. 5, 67, 104-125)

A worldwide genus of about 150 species, that is sometimes put with about 4 other small genera into a separate tribe of the Keroplatinae. About 45 species occur in the western Palaearctic. The adults are distinctive in usually having very long fine antennae and they normally rest with the wings slightly spread. They may occur at flowers. Immature stages are poorly known, but they have been reared from clumps of turf, on rotting wood and on cave walls. The larvae are predaceous, although some start as scavengers.

Key to species

1 Wings with only microtrichia..... 2
— Wings with numerous macrotrichia at least towards the tip..... 19
2 Wings quite unspotted, or at most with a faint cloud in the base of the posterior fork.... 3
— Wings with at least one small spot around base of Rs and/or at wing tip..... 14
3 Sc ending far before tip of basal cell; small species..... 4
— Sc ending above tip of basal cell 5
4 Thorax with mesonotum striped; a markedly smaller species, about 3mm long; ♂ antennae about 1.5× length of body, ♀ antennae slightly longer than body; wing length 3.5mm; ♂ genitalia (fig. 104)..... **pusilla** Meigen
Herts, Hunts, Yorks. viii-ix.
— Thorax uniformly ochreous except for a pair of small dark spots on front margin of mesonotum and an ill-defined dark pleural stripe; a relatively larger species, about 4mm long; ♂ antennae about 3× body length, ♀ antennae about 1.5× body length; wing length 4-4.5mm; ♂ genitalia (fig. 105) ..... **anglica** Edwards
Beds, Hants, Heref, Herts, Kent, Oxon, Staffs, Surrey, Sussex, Wilts, Yorks. vi-ix.
5 Abdomen with black apical bands; mesonotum with three shining red-brown stripes; large elongate species, about 8mm; wing length 6.5mm; ♂ genitalia (fig. 106)
..... **longibrachiata** Landrock
Devon. viii.
— Abdomen almost unicolorous or with pale apical bands 6
6 Abdominal tergites with conspicuous pale apical bands..... 7
— Abdomen almost unicolorous yellow or black..... 10

7 Lateral stripes of mesonotum largely obsolete, but their front ends turned down and connected with a dark brown patch on and above the notopleuron; median stripe much widened at front margin; propleurae blackish; vein R1 thickened at tip (but to a lesser extent than *vittata*); wing length about 5.0mm; ♂ unknown ..... **propleuralis** Edwards
Devon. vi.

— Lateral stripes well developed and well separated from dark pleural markings; vein R1 not thickened at tip 8

8 Antennae with conspicuous pale rings; median thoracic stripe much widened at front margin; propleurae black; wing length 5-5.5mm; ♂ genitalia (fig. 107) ..... **crassicornis** Winnertz
Cumbria, Gloucs, Herts. vi-x.

— Antennae at most faintly ringed; median thoracic stripe with no more than normal widening at front margin; propleurae yellow 9

9 Posterior fork usually clear, occasionally with a slight trace of a spot in the basal constriction; thoracic bristles strong, scutellar bristles about twice as long as depth of scutellum; Costa usually extended to about 1/3 of distance from R5 to Median fork; ♂ tergites 1-6 pale apically; ♂ genitalia (fig. 108) with two strong spines at apex of dististyle ..... **fasciata** Meigen
Berks, Bucks, Chesh, Cornwall, Devon, Hants, Heref, Herts, Hunts, Kent, Lancs, Lincs, London, Middx, Notts, Staffs, Suffolk, Surrey, Sussex, Westmorland, Yorks; Wales: Brecon, Caerns, Flint, Merioneth; Scotland: Aberdeen, Argyll, Inverness, Rhum; Ireland: Down, Kerry, Wicklow. v-x.
[N.B. Tergite 9 may be truncate or distinctly bilobed. This may be a complex of species.]

— A more or less distinct spot in the basal constriction of the posterior fork; thoracic bristles weaker, scutellar bristles barely as long as depth of scutellum; Costa extended beyond end of R5 to at most about 1/4 of the distance to Median vein. At least ♂ tergites 6 and 7 completely dark; ♂ genitalia (fig. 109) without apical spines to dististyle ..... **tusca** Loew
Berks, Cumbria, Kent, Lancs, Oxon, Sussex; Wales: Gwynnedd. vii-x.

10 ♂ antennae more than twice as long as body; wing length 5-7mm 11

— ♂ antennae not much longer than body length; wing length 4-5.5mm 12

11 Mesonotum with three more or less distinct stripes; thoracic bristles blackish; basal extension of Media rather faint (fig. 67); vein R1 thickened at tip; wing length 5-7mm; ♂ genitalia (fig. 110) ..... **vittatta** Meigen
Berks, Bucks, Chesh, Derby, Devon, Dorset, Hants, Heref, Hunts, Kent, Lancs, Lincs, Norfolk, London, Staffs, Suffolk, Surrey, Sussex, Warwick, Westmorland, Yorks; Wales: Brecknock, Glamorgan, Merioneth; Scotland: Argyll, Arran, Banff, Inverness, Sutherland; Ireland: Clare, Laois, Wicklow. v-ix.

— Mesonotum uniformly yellowish; thoracic bristles yellowish and weak; basal extension of Media strong and distinct, dividing the basal cell into two; vein R1 not thickened at tip; wing length 5-6mm; ♂ genitalia (fig. 111) ..... **lutea** Meigen
Bucks, Herts, Lancs, Surrey, Sussex; Wales: Merioneth; Scotland: Argyll, Inverness, Sutherland; Ireland: Wicklow. vi-ix.

12 R1 thickened at tip; R4 usually short and almost vertical; wing length about 5mm; ♂ genitalia (fig. 112) ..... **aterrima** Stackelberg
Scotland: Inverness, Ross & Crom; Ireland: Kerry. vii, x.

— R1 not thickened at tip; R4 longer, curving into Costa 13

13 ♂ antennal flagellum with first seven segments well differentiated, the other segments uniformly narrow, covered with bristles and difficult to differentiate (fig. 5); ♂ dististyle with stout bristles confined to basal third (fig. 113); wing length 4-5.5mm ..... **parva** Lundstroem
Derby, Hants, Herts, Lincs, Norfolk, Westmorland, Yorks; Wales: Flint, Gwynedd; Scotland: Aberdeen, Inverness, Perth, Ross & Crom, Sutherland; Ireland: Laois. v-viii.

— ♂ antennal flagellum with only the first six segments well differentiated; ♂ dististyle with strong bristles on basal three-quarters; ♂ genitalia (fig. 114) ..... var. of **parva** Lundström
Scotland: Aberdeen, Inverness, Perth. vii.

14 Wings with tip clear 15
— Wings with tip dark (faintly so in *maculata*) 16
15 Abdominal tergites with pale apicalbands; a large dark cloud at base of R5 extending into posterior fork and towards Costa, a small cloud at base of Rs and on Costa at tip of R1; wing length 4.5-6mm; ♂ genitalia (fig. 115) ..... **centralis** Meigen
Berks, Cambs, Chesh, Cumbria, Devon, Derby, Gloucs, Hants, Heref, Herts, Kent, Lancs, Lincs, Middx, Norfolk, Oxon, Suffolk, Surrey, Sussex; Wales: Brecknock, Flint, Glamorgan, Gwent, Gwynedd; Scotland: Aberdeen, Moray, Sutherland; Ireland: Kildare, Wexford, Wicklow. v-ix.
— Abdominal segments with pale basal bands; a small dark cloud at base of R5 and over base of Rs, no dark Costal spot; wing length about 6mm; ♂ genitalia (fig. 116) ..... **bipunctata** Edwards
Cumbria, Lancs. vii.
16 Abdomen largely yellow, the tergites with black apical bands; wings with central fascia completely crossing wing 17
— Abdomen unicolourous dark or with the apices of the segments paler 18
17 Larger species; thorax dark; R4 long; wing markings darker without spot in base of posterior fork; wing length 7mm; ♂ genitalia (fig. 117) ..... **fastuosa** Loew
Devon. viii.
— Smaller species; thorax light; wing markings paler, but with a spot near base of posterior fork; wing length 4.5-6mm; ♂ genitalia (fig. 118) ..... **angulata** Meigen
Bucks, Chesh, Cumberland, Derby, Devon, Dorset, Essex, Hants, Heref, Herts, Kent, Lincs, Middx, Norfolk, Notts, Oxon, Suffolk, Sussex, Westmorland, Yorks; Wales: Brecknock, Gwynedd; Ireland: Kerry. v-ix.
18 Wings with central fascia completely crossing wing; a separate dark spot on wing margin between veins of posterior fork; mesonotum unmarked; wing length about 5.5mm; ♂ genitalia (fig. 119) ..... **fascipennis** Staeger
Chesh, Hants, Worcs; Scotland: Argyll. vii.
— Wings with the central fascia incomplete; dark spots usually present at ends of veins of posterior fork, but not between them; wing markings often very faint; mesonotum with three blackish stripes; wing length 4-5.5mm; ♂ genitalia (fig. 120) ..... **maculata** Meigen
Cambs, Herts, Somerset, Suffolk, Surrey. v-x.
19 R4 absent; wings clear; wing length 4-4.5mm, a small montane species; ♂ genitalia (fig. 121) ..... **zetterstedti** Lundström
Scotland: Inverness, Perth. v-vi.
— Vein R4 present and distinct 20
20 Tip of wing broadly dark, other dark areas at apex of R1, in centre of wing and towards base; wing length 4-5.5mm; ♂ genitalia (fig. 122) ..... **phalerata** Meigen
Beds, Berks, Cambs, Chesh, Cumberland, Devon, Dorset, Essex, Hants, Heref, Herts, Hunts, Kent, Lancs, London, Middx, Norfolk, Shrop, Suffolk, Surrey, Sussex; Wales: Caerns, Gwynedd; Scotland: Aberdeen; Ireland: Down. v-ix. From clumps of earth.
— Wings without distinct markings, at most with a vaguely darkened apex 21
21 Thorax shining black, scutellum yellow; abdomen shining black with narrow yellow hind margins to tergites; vein R1 only slightly thickened at tip; wing length about 4.5mm; ♂ genitalia (fig. 123) ..... **estonica** Landrock
Chesh, Norfolk. viii.
— Thorax yellowish, with or without dark stripes; vein R1 distinctly thickened at tip 22
22 Vein R1 with blackish mark just before tip, which is pale; wings distinctly more hairy, macrotrichia extending well into base of cell below *r-m*; wing tip clear; wing length 5.5-6.5mm; ♂ genitalia (fig. 124) ..... **stigma** Curtis
Berks, Bucks, Chesh, Derby, Dorset, Essex, Gloucs, Hants, Heref, Herts, Kent, Lancs, Norfolk, Somerset, Warwick, Westmorland, Yorks; Wales: Glamorgan; Scotland: Aberdeen, Arran, Inverness, Perth, Ross & Crom, Sutherland; Ireland: Cork, Kerry, Killarney, Laois. v-vii. under rotting wood.
— Vein R1 uniformly brownish; wings distinctly less hairy towards base, with few or no macrotrichia below *r-m*; wing tip usually slightly clouded; wing length 4.5-6mm; ♂ genitalia (fig. 125) ..... **stigmoides** Edwards

Cambs, Chesh, Devon, Hants, Heref, Kent, Lancs, Lincs, Middx, Norfolk, Notts, Suffolk, Surrey, Sussex, Westmorland, Yorks; Wales: Brecknock, Merioneth; Scotland: Aberdeen, Arran, Banff, Inverness, Moray, Ross & Crom; Ireland: Clare, Dublin, Kerry, Laois, Wicklow. v-ix.

Genus **Asindulum** Latreille
(Figs. 15, 131)

A Holarctic genus of one European and Russian species, one Israeli and one Nearctic species. The biology is unknown and the adults are rare. Matile (1975) revised the Palaearctic species.

— A rather large shining black species with dark tips to the wings; coxae and halteres black; anepisternum haired; posterior fork bare; abdomen all black; wing length about 6mm; ♂genitalia (fig. 131) ..... **nigrum** Latreille
Norfolk, Suffolk. vii.

Genus **Macrorrhyncha** Winnertz
(Figs. 68, 132)

A holarctic genus of two Nearctic species and eight Palaearctic species, of which only one is known from Britain. Other species may well occur, but were not found in about 100 specimens examined in this study. Adults can be found at umbellifer flowers and have been bred from rotting wood. Matile (1975) revised the Palaearctic species.

— A small ochreous species with unmarked wings; postnotum haired; coxae and postnotum yellow, mesonotum yellow and unstriped, abdomen yellow basally becoming dark towards apex; wing length 3-4mm; ♂ genitalia (Fig. 132) ..... **flava** Winnertz
Berks, Cambs, Devon, Dorset, Essex, Hants, Heref, Herts, Kent, Lancs, Somerset, Suffolk, Surrey, Sussex; Wales: Caerns, Glamorgan; Scotland: Arran, Inverness; Ireland: Down, Kerry, Killarney. vi-ix.

Genus **Keroplatus** Bosc
(Figs. 46, 128)

At present this genus contains four European, four Nearctic and two African species. Other species may belong in this genus, but their status needs review. *Keroplatus* included groups that are now regarded as separate genera, such as *Cerotelion* Rondani. Too many areas remain unexamined in the light of more recent taxonomic opinion for any meaningful indication of the distribution and number of species on a world scale. However, this and its closely related genera form a fairly small and distinct group. Apart from the four recognised European species a number of other species have been described in this genus, but these species have remained unrecognised so far through inadequate description.

The adults may be found around rotting logs. The larvae live under a large irregular, flat, mucilaginous net on the underside of logs, usually with polyporaceous fungi. They feed partly on the fungus and partly on other animals. They are flattened and somewhat luminous. The pupa develops in a distinct dry cocoon.

— A large pale brown species with brown markings towards the leading edge and tip of the wings; abdomen uniform pale brown, sometimes with darker brown basal bands or

lateral patches; wing length 6-8.5mm; ♂ genitalia (fig. 128) ..... **testaceus** Dalm
Berks, Hants, Oxon, Sussex, Warwick. vi-x. Under rotting logs, usually with Polyporaceous fungi. Has also been recorded from Stereum, Serpula *and* Auricularia.

Genus **Cerotelion** Rondani
(Figs. 8, 69, 126-127)

A small genus of four Palaearctic, one Nearctic and an uncertain number of species from elsewhere in the world (see *Keroplatus*). Adults may be found around rotting logs and have been found flying around and hanging onto spiders' webs. The cylindrical larva lives in a net under logs, particularly in association with Polyporaceous fungi. From an irregular, 3-dimensional net with a small mucous area for the larva's protection, it forages partly on fungal spores and partly as a predator. The pupa develops under a dense net, but without a distinct cocoon. Matile (1969) discusses the European species.

Key to species

1 Scutellum with a more or less single row of bristles, some distinctly stronger than others; shaded area of wing-tip distinctly demarcated, without a clear spot, at most narrowly connected to the cloud proximal to the apex of the posterior fork; central wing spot distinct (above base of median fork); hind coxae at most with the tip blackish; ♂ tarsal claws small and inconspicuous, ♀ slightly larger, both with a single basal tooth; wing length 4.5-8mm; ♂ genitalia (fig. 126) ..... **lineatus** Fabricius
Beds, Berks, Derby, Hants, Heref, Herts, Kent, Lancs, London, Surrey, v-x. Under rotting logs, especially encrusted with Polyporaceous or other encrusting fungi. Sometimes in houses possibly associated with . ry-rot fungus Merulius lacrymans.
— Scutellum with a broad band of dense uniformly short bristles; shaded area of wing tip diffuse and with a clear spot at the tip of R5 and connected along wing margin to large shaded area proximad of the apex of posterior fork; central wing cloud faint or absent; hind coxae blackish at base on outer surface; ♂ tarsal claws very large, pectinate for their whole length, ♀ claws smaller with three or four basal teeth; wing length 4.5-6.5mm; ♂ genitalia (fig. 127) ..... **humeralis** Zetterstedt
Somerset. [This record is based on a single specimen in the collection of A. E. J. Carter which could not be found during the present study].

Genus **Platyura** Meigen
(Figs. 70, 129)

One western and one eastern Palaearctic species and 7 Nearctic species. This genus was formerly known under the generic name *Apemon* Johannsen. Adults occur in a wide variety of habitats but are never common. The larvae live under logs in a large web and are voracious predators. The pupa develops in a thick mass of web but without a distinct cocoon.

— A large dark species; Sc extending beyond base of Rs; head, thorax and abdomen black, abdomen often with reddish basal bands to tergites 3-5; wings with apical and posterior areas slightly smokey, anterior part yellowish, usually with a slightly darker patch at base of Median fork; wing length 6.5-9mm; ♂ genitalia (fig. 129) ..... **marginata** Meigen
Bucks, Hants, Heref, Gloucs, Kent, Lancs, Middx, Staffs, Surrey, Sussex; Wales: Gwynedd, Montgomery. v-viii. Under rotting logs.

Genus **Monocentrota** Edwards
(Figs. 71,130)

One Palaearctic species, three African and possibly one Indian and one Neotropical species. This genus has been considered a subgenus of *Orfelia* Costa and possibly does not merit exclusion from that genus any more or less than many of the subgenera still included in it. Its biology is unknown.

— A small, slim species with uniform dark brown body and pale legs; wings often slightly brownish, particularly towards tip; wing length 3-4mm; ♂ genitalia (Fig. 130) ..... **lundstroemi** Edwards
Berks, Bucks, Hants, Herts, Hunts, Lancs, Lincs, Northumberland, Oxon, Staffs, Yorks; Scotland: Perth, vi-ix. Often at light, active around dawn.

Genus **Orfelia** Costa

This is the genus that was known as *Platyura* for a very long time. It is a large worldwide genus, split into about 20 subgenera. Some groups that have been included as subgenera, such as *Monocentrota* Edwards, are now regarded as separate genera and others of the groups here regarded as subgenera may be (or sometimes have been) similarly elevated. The Nearctic, many of the Neotropical and indeed some of the European species have not yet been assigned to subgenera. Thus comments on the distribution and status of the subgenera must be regarded as provisional. Six subgenera are included here and these cover all the subgenera recorded from Europe. The key to subgenera is included in the generic key on p. 30.

The adults of some species have been found on flowers, particularly Umbelliferae, and some occur in rather more open, dry habitats than most Mycetophilidae. The larvae live in webs under bark of logs or under fallen wood itself, under boulders, in or under moss, among grass roots below the soil surface and in worm-burrows in pasture. The net is irregular, usually flat but may invade cavities. The threads of the net are well supplied with drops of fluid containing oxalic acid, which attacks any animals that contact it. There is a central main tube of thread that the larva moves along and from which it forages to animals trapped by the net.

Subgenus **Isoneuromyia** Brunetti
(Figs. 72,133)

The subgenus was based on an Oriental species. Most of the 12 or so species currently included are from the Oriental region with others from New Zealand, Neotropical region, Australia, West Indies and Europe. Nothing is known of their breeding biology.

— A large black species, abdomen sometimes red; wings usually slightly brown, darkest subapically; wing length 5-6mm; ♂ genitalia (fig. 133)..... **semirufa** Meigen
Cambs, Chesh, Dorset, Essex, Heref, Hants, Herts, Kent, Lancs, Notts, Oxon, Surrey, Sussex, Yorks; Wales: Glamorgan, Gwynedd; Ireland: Kerry, Wicklow. vi-ix.

Subgenus **Neoplatyura** Malloch
(Figs. 33, 73, 134-137)

This subgenus was based on a Nearctic species and includes a number of species from most parts of the world. Four species are recorded from Europe and all occur in Britain.

Key to species

1 Wings with an obvious dark tip and a dark cloud on posterior vein of posterior fork; Sc ending above base of Rs; tibial setae not in distinct rows even at apex; Anal vein weak towards wing margin; a rather dark species; wing length about 4mm; ♂ genitalia (fig. 134) ..... **blumbrata** Edwards
Cornwall, Dorset, Hants. viii.

— Wings clear or with a faint apical spot; tip of Sc well before base of Rs; tibial setae in distinct rows at apex; Anal vein strong to wing margin; yellowish species 2

2 A small faint cloud below tip of R5 (fig. 73a), anepisternum haired; R4 longer, ending not more than twice its own length from the tip of R1; wing length 4-4.5mm; ♂ genitalia (fig. 135); ♀ ovipositor with lateral lobes of sternum 8 without flat lateral processes from the base and with rounded tip ..... **flava** Macquart
Beds, Berks, Bucks, Chesh, Devon, Dorset, Durham, Hants, Norfolk, Northumberland, Surrey, Sussex, Yorks; Wales: Gwynedd; Scotland: Inverness, Moray, Sutherland, vii-ix.

— Wings clear; anepisternum bare (or occasionally one or two small hairs present in *nigricauda*) 3

3 R4 longer, ending less than twice its own length from the tip of R1; ♂ abdomen yellow with the tip black (from tergite 6), bristles uniform in distribution; wing length 4-4.5mm; ♂ genitalia (fig. 136); ♀ ovipositor with flat pale lateral processes from base of lateral lobes of sternum 8 ..... **nigricauda** Strobl
Berks, Cornwall, Devon, Hants, Heref, Herts, Hunts, Kent, Oxon, Surrey, Sussex; Wales: Glamorgan. vi-ix.

— R4 shorter, ending about twice its own length from tip of R1; ♂ abdomen yellow to reddish, sometimes slightly banded, but not markedly black at tip, lateral patches of dense setae on tergites 3-6; wing length 4-4.5mm; ♂ genitalia (fig. 137); ♀ ovipositor without flat pale lateral processes to lateral lobes of sternum 8, but these lobes emarginated at tip ..... **modesta** Winnertz
Chesh, Hants, Hunts, Kent, Lancs, Surrey, Suffolk, Sussex; Wales: Brecknock. vii-ix.

Subgenus **Pyratula** Edwards
(figs. 39, 138-139)

A small group of two European species. Their life history is unknown. They are small dark species.

Key to species

1 Anal vein strong and bearing macrotrichia; Sc generally reaching at least to Rs; abdomen uniformly dark or with pale apical bands; wings brownish, length 3.5-4.5mm; ♂ genitalia (fig. 138) ..... **zonata** Zetterstedt
Cambs, Cumberland, Derby, Devon, Hants, Herts, ?Lancs, Sussex; Scotland: Aberdeen, Inverness, Perth; Ireland: Wicklow. v-vi.

— Anal vein very weak and without macrotrichia; Sc short, not reaching Rs; abdomen uniformly dark or with pale basal bands; wings clear, length 2.5mm; ♂ genitalia (fig. 139) ..... **perpusilla** Edwards
Cambs, Herts, Suffolk, Wilts. vii-ix.

Subgenus **Urytalpa** Edwards
(Figs. 18-19, 140-142)

Apart from the three European species included here, only one Oriental species has been included in this subgenus. Largish species, variable in colour.

Key to species

1 Basitarsus of fore-leg as long as tibia; ♂ antennae nearly twice as long as head and thorax together; Costa extending about 1/3 distance from tip of R5 to anterior branch of Median fork; thorax dark, mid and hind coxae darkened; wing length 5-5.5mm; ♂ genitalia (fig. 140) ..... **macrocera** Edwards
Scotland: Inverness. vii-viii.

— Basitarsus of fore-leg distinctly shorter than tibia; ♂ antennae not longer than head and thorax; coxae pale 2

2 Costa reaching 1/3-1/2 distance from tip of R5 to that of anterior branch of Median fork; wings quite clear, length 5-6mm; thorax pale with or without stripes; ♂ genitalia (fig. 141) ..... **atriceps** Edwards
Devon, Dorset, Hants, Oxon, Yorks. vi.

— Costa reaching only 1/4 or less of distance from tip of R5 to tip of anterior branch of Median fork; wings often with a small faint grey spot at tip; thorax dark (♂) to pale with or without stripes (♀); wing length 5-6.5mm; ♂ genitalia (fig. 142) ..... **ochracea** Meigen
Berks, Bucks, Chesh, Cumbria, Hants, Herts, Hunts, Kent, Lancs, Middx, Norfolk, Notts, Yorks; Scotland: Inverness, Rhum; Ireland: Antrim, Down. iii, v-vii.

Subgenus **Rutylapa** Edwards
(Figs. 38, 143)

Four Ethiopian, five Oriental and one European species have been included in this subgenus. Nothing is known of their life history.

— A medium sized species with orange thorax; abdominal tergites dark (♂) or yellow with dark apical and lateral borders, the apical band tending to develop slightly along the mid-dorsal line (♀); wing length about 4mm; ♂ genitalia (fig. 143) ..... **ruficornis** Zetterstedt
Hants, Oxon. vii.

Subgenus **Orfelia** Costa
(Figs. 56-57, 74, 144-150)

About 20 species are recorded in this subgenus from the Palaearctic, Nearctic, Neotropical and Oriental regions. One European species has recently been found in New Zealand, but is probably the result of an introduction. Most of the European species can only be identified satisfactorily by reference to the male genitalia. Most of the other characters given in the following key should be treated with caution and the females of the yellow species have not been properly identified for lack of suitably associated males. Also isolated females of *nigricornis* may be quite orange and run to *fasciata;* no way has yet been found for confidently separating the females of these two species.

Key to species

1 Head, thorax (including pleurae) and abdomen largely black 2

— Head, thorax (including pleurae) largely orange; abdomen may be rather dark, but usually banded or pale 4

2 Whole wing tip more or less evenly darkened (fig. 74); palpal segments short and rounded; wing length 3-3.5mm; ♂ genitalia (fig. 144) with dististyle nearly as broad as long, not clearly divided into two styles; ♀ cerci short and broad (fig. 56) ..... **nemoralis** Meigen
Berks, Cambs, Chesh, Devon, Essex, Hants, Herts, Kent, Lancs, London, Middx,

Norfolk, Oxon, Surrey, Sussex, Wilts; Wales: Brecknock; Scotland: Dumfries, Inverness, Kincardine, Perth; Ireland: Armagh, Cork, Kerry, Kildare, Wicklow. v-vii.

— Wings with preapical dark band; palpal segments more elongate, especially terminal segment; ♂ dististyles much longer than broad, divided into two styles; ♀ cerci long and narrow (fig. 57) 3

3 Subapical wing cloud clearly demarcated, dark; mesonotum usually with some yellow around border of three more or less confluent black stripes; ♀ mesonotum may be more orange with or without vague stripes; halteres usually orange; wing length 5-6mm; ♂ genitalia (fig. 145) ..... **nigricornis** Fabricius
Cambs, Chesh, Hants, Herts, Kent, Lancs, London, Sussex; Wales: Gwent; Scotland: Aberdeen, Inverness. v-vii.

— Subapical wing cloud not clearly demarcated from rest of wing, which is slightly smokey; body almost entirely black; halteres usually dark; wing length 4-5mm; ♂ genitalia (fig. 146) ..... **tristis** Lundström
Berks, Essex, Hants, Herts, Kent, London, Oxon, Surrey, Suffolk, Yorks. vi-viii.

4 Anterior spur of mid-tarsus reduced, 1/4 to 1/3 length of posterior spur; wings with a very faint cloud at tip; ♂ abdomen uniformly dark or tergites with narrow pale apical bands, ♀ abdomen dark or light; wing length 3.5-4.5mm; ♂ genitalia (fig. 147); ♀ cerci slightly longer than broad at base ..... **pallida** Staeger
Devon, Dorset, Hants, Lancs, Surrey; Ireland: Waterford. vi-vii.

— Anterior spur of mid-tarsus about half length of posterior spur or longer 5

5 ♂ genitalia (fig. 148) with upper style sinuous and haired only at base, lower style narrow and bare, a tooth-like process on inner side of basistyle; ♂ abdominal tergites yellow with black basal bands; ♀ cerci more than three times as long as broad at base; wings with distinct subapical dark band; wing length 4.5-5.5mm ..... **fasciata** Meigen
Beds, Berks, Dorset, Essex, Hants, Heref, Herts, London, Middx, Surrey (?♀: Kent, Sussex); Ireland: Wicklow. vi-viii, x. Moulds under wet bark.

— ♂ genitalia with upper style less sinuous and with bristles at or near tip, lower style broad with long strong bristles along inner surface, no process on basistyle; ♀ cerci less than twice as long as broad at base (this last character may not be reliable as insufficient positively associated ♀♀ have been examined) 6

6 Wings usually with distinct preapical dark band; ♂ abdomen usually unbanded, yellow; ♂ genitalia (fig. 149) with hairs on upper style stronger, blacker and placed at tip; wing length 4-5mm ..... **unicolor** Staeger
Berks, Cambs, Chesh, Cumbria, Essex, Hants, Herts, Kent, Lancs, Sussex; Ireland: Armagh, Wicklow; (?♀: Surrey, Caerns, Kildare). vi-viii. Under Coriolus.

— Wings with preapical band pale to absent; ♂ abdomen with broad black bands at base of tergites, sometimes all dark; ♂ genitalia (fig. 150) with hairs on upper style not so conspicuous and well removed from tip; wing length 3.5-4mm ..... **discoloria** Meigen
Hants, Suffolk; Ireland: Wexford; (?♀: Bucks, Chesh, Herts, Surrey; Waterford). vi-vii.

Genus **Antlemon** Haliday
(figs. 16, 151)

A Palaearctic genus of three species. The adults may be found at flowers, particularly Umbelliferae. Immature stages are unknown. Apart from the elongate mouthparts this genus could easily be mistaken for an *Orfelia* and might run to subgenus *Pyratula* in these keys. *A. halidayi* has a much longer proboscis (about twice the length of the front coxa) and *brevimanum* differs in details of the genitalia. Matile (1977) has revised the genus and includes the British species and *brevimanum* in the subgenus *Antlemonopsis* Tollet.

— Small black or dark brown species; palps well developed; proboscis about same length as front coxa; wing length 2.5-3.5mm; ♂ genitalia (fig. 151) only with very small

lobe on inner surface of dististyle..... **servulum** Walker
Berks, Cambs, Devon, Gloucs, Hants, Kent, Oxon, Somerset, Sussex; Ireland: Kildare. vi-vii.

Subfamily Sciophilinae

The subfamily Sciophilinae contains about one third of the British fauna. The subfamily is divided into 5 tribes, of which four are represented in the British fauna. The other tribe, the Metanepsiini, is only known so far from one genus in tropical Africa and Malaysia.

The two tribes Mycomyiini and Sciophilini are fairly easy to define, with certain exceptions noted in the key, but the other two tribes are not so clearly differentiated since they are diverse and contain a number of genera that show characters that do not clearly agree with the normal pattern of these groups. A review of this group may be required to provide a better classification for these genera.

The life histories of relatively few species of the Sciophilinae are known. Species have been reared from in or on the surface of fungi, under bark, in rotten wood, on liverworts, mosses and in the nests of birds and mammals. The species that live on fungi and under bark, etc, inhabit a small mucilaginous tube supported by retaining threads. Some species cover this with a dry irregular web and such webs may be large and communal. Some of the nest inhabitants entirely free-living. Those living on fungi feed mainly on fungal spores, while those under bark and in rotting wood are probably feeding on fungi associated with the substrate. The species on liverworts and mosses appear to be feeding on these green plants, a habit not known elsewhere in the family. The nest inhabitants are probably saprophagous.

Records of adult activity are limited to the few observations of species occurring at flowers. These records are scattered through the subfamily.

At the time of writing, a revision of the Palaearctic species of *Docosia* is in preparation by Lastovka and Matile. This will add many species to the known fauna of this genus. Other revisions of the genera *Ectrepesthoneura* (by Chandler, 1979) and *Syntemna* (by Hutson, 1979) are published, but there are no other revisions recently published that add substantially to the European fauna. In the same paper, Hutson also discusses the synonymy of various taxa of this subfamily.

Key to tribes

1 Fine tibial setae placed in distinct regular longitudinal rows (figs. 25, 31); ocelli two, placed close together (fig. 17); empodium absent; wings without macrotrichia on membrane; R1 long; postnotum haired or bare ..... MYCOMYINI (p.41)

— Fine tibial setae irregularly arranged, at most slightly linearly arranged at apex (fig. 32); ocelli three (fig. 12) (except in *Eudicrana* in which the two ocelli are contiguous with the eye margin; in *Dziedzickia* and *Palaeodocosia* the middle ocellus may be reduced or even absent, but the tibial setae are irregular); empodium usually present.. 2

2 Wings with macrotrichia on membrane (only at tip in *Paratinia*), with or without microtrichia; postnotum usually with bristles..... SCIOPHILINI (p.46)
[N.B. in those genera lacking postnotal bristles, macrotrichia are unmistakeably present; *Coelophthinia* (Gnoristini) has haired postnotum, but no macrotrichia and has an elongate sense organ on the dorsal surface of the mid-tibia in both sexes.]

— Wings without macrotrichia; postnotum bare (except *Coelophthinia* which has no macrotrichia and an elongate sense organ on the dorsal surface of mid-tibia in both sexes) 3

3 R1 long, several times as long as *r-m* which is usually more or less oblique or vertical; median fork always much longer than its stem; Sc usually long (figs. 79-84) ..... GNORISTINI (p.54)

— R1 short, usually little if any longer than *r-m* which is long and nearly horizontal; Median fork usually longer than its stem; Sc long or short (figs. 49, 85-87) ..... LEIINI (p.62)
[N.B. R1 is rather long in *Rondaniella,* when the Median fork is hardly longer than its stem, and in *Docosia,* in which Sc is short, *r-m* is nearly horizontal.]

Tribe Mycomyini

A large worldwide tribe of about ten genera, the two largest and most widespread occurring in Britain. The tribe contains some of the more striking sexual dimorphisms in the family, shown in a simple fashion by the mid-coxal spur of the males of some of our *Mycomya* species. In other genera, such as *Echinopodium,* of South America, these outgrowths are very elaborate, while in the African *Syndocosia,* the wing tip of the male is curiously modified. Larvae of this group have usually been found in rotting wood, under bark or in Basidiomycete fungi, but the larva of one African genus, *Viridivora,* feeds on liverworts and mosses. Adult behaviour is virtually unrecorded.

The two genera included here are the only ones recorded from the Holarctic region.

Key to genera

1 Wings without conspicuous markings; Costa ending abruptly at tip of R5, which usually reaches extreme tip of wing; no fold between R5 and anterior branch of Median fork; eyes slightly emarginated above antennae..... **MYCOMYA** Rondani (p.41)
— Wings usually with conspicuous markings; Costa usually continued at least a short distance beyond tip of R5, which does not quite reach wing tip; usually a more or less distinct, often vein-like, fold between R5 and anterior branch of Median fork; eyes not or scarcely emarginated ..... **NEOEMPHERIA** Osten-Sacken (p.45)

Genus **Mycomya** Rondani
(Figs. 17, 25, 31, 75, 152-183)

A genus of about 80 Palaearctic, 60 Nearctic and 80 Neotropical species, with smaller numbers in the other regions of the southern hemisphere. In the males of many species a long spur is developed on the inner apex of the mid-coxa and this curves up towards the body (fig. 31). The males of one group of species have obvious patches of dense setae on the fore-coxae. These features are never seen in the females. The spurs are not the result of a natural grouping, but are such an ideal key character that a key specifically for males is provided. Without these characters the females are not easy to separate, the females of many species are unknown or uncertainly associated and it has not been possible to find sufficient reliable distinction between some of the known species. For these reasons no guide to females is included here.

The purpose of the male adornments is unknown and adult activity is poorly recorded—they are usually found resting on leaves in woodland with their wings slightly divaricate. A few species have been bred from larvae in or on fungi or associated with fungi on dead wood. Those species that are known spin webs and the webs may be communal.

Again, exceptions to some of the characters in the key are to be expected in this genus and identification of many species can only be confirmed by reference to the male genitalia. It is likely that the female ovipositor will provide reliable characters, but little has been published and preliminary examination suggests some difficulties.

Key to species (males)

1 Mid-coxa with a spur (fig. 31) 2
— Mid-coxa without a spur 17
2 Base of posterior fork below or before base of stem of Median fork; postnotum with or without bristles 3
— Base of posterior fork well beyond base of stem of Median fork; postnotum with one to three bristles at tip 16
3 Coxal spur about half the length of coxa; wing length 3.5-5mm; genitalia (fig. 152) ..... **incisurata** Zetterstedt
Berks, Bucks, Chesh, Cornwall, Cumbria, Dorset, Essex, Hants, Heref, Herts, Kent, Lancs, Notts, Staffs, Suffolk, Surrey, Sussex, Westmorland, Worcs, Yorks; Wales: Brecknock, Merioneth, Montgomery; Scotland: Aberdeen, Arran, Inverness, Moray, Perth; Ireland: Antrim, Clare, Galway, Kerry, Kildare, Killarney, Wicklow. v-x.
— Coxal spur more than half and usually more than total length of coxa 4
4 Basitarsus of fore-leg shorter than tibia 5
— Basitarsus of fore-leg at least as long as tibia (occasionally shorter in *winnertzi*) 7
5 Thorax all yellow; Sc curved into R1 (Sc1 absent); wing length 3.5-4.5mm; genitalia (fig. 153) ..... **flavicollis** Zetterstedt
Devon, Dorset, Hants, Herts, Oxon, Surrey; Ireland: Kildare. vi-x.
— Thorax dark, dorsum heavily dusted; Sc1 present and ending in Costa 6
6 Small species, wing length 3.5-4mm; basitarsus of fore-leg distinctly shorter than tibia; tarsal claws with one small tooth; genitalia (fig. 154) ..... **exigua** Winnertz
Hants, Herts, Lancs, Oxon, Suffolk, Sussex, Yorks; Scotland: Aberdeen, Arran, Perth, Sutherland; Ireland: Kerry. v-vi.
— Larger species, wing length 5.5-6mm; basitarsus of fore-leg almost as long as tibia; tarsal claws with two distinct teeth; genitalia (fig. 155) ..... **clavigera** Lunström
Scotland: Inverness, Perth. vi.
7 Scutellum with two bristles (*winnertzi* and *wankowiczii*, couplet 14, normally have four scutellar bristles, but may have less) 8
— Scutellum normally with four bristles (*cinerascens*, couplet 9, normally has two bristles, but may have four) 11
8 Sc1 distinct and ending in Costa; macrotrichia on distal part of Sc 9
— Sc1 usually absent, sometimes present or represented by a stump-vein from Sc2 10
9 Pleurae darkened, particularly lower half of katepisternum; mesonotal stripes more or less fused; abdominal segments with yellow hind margins; wing length 4-5mm, genitalia (fig. 156) ..... **cinerascens** Macquart
Beds, Berks, Cambs, Chesh, Cornwall, Cumbria, Devon, Dorset, Hants, Heref, Herts, Hunts, Kent, Lancs, Notts, Oxon, Surrey, Sussex, Worcs, Yorks; Wales: Dyfed, Flint, Merioneth, Monmouth, Montgomery; Scotland: Arran, Inverness, Moray, Nairn; Ireland: Kerry, Wicklow. iii-xi. From Stereum.
— Pleurae yellow, the lower half of the katepisternum very obscurely darkened; mesonotal stripes distinct and separate; abdomen yellow with black dorsal stripe on segments 1-5, sixth segment black with yellow triangular mark at base; genitalia (fig. 157) ..... **britteni** Kidd
Cumbria. viii.
10 Sc without macrotrichia; Sc1 present, absent or represented by a stump-vein; thorax almost wholly dark grey; abdomen uniformly dark; basal segment of antennal flagellum dark; wing length 4.5-5mm; genitalia (fig. 158) ..... **kingi** Edwards
Scotland: Inverness, Moray. vii-viii.
— Sc with macrotrichia; Sc1 absent or represented by a light stump-vein; thorax generally paler, with yellowish propleurae and often scutellum; basal flagellar segment extensively yellow; abdomen frequently banded; wing length 4.5-5mm; genitalia (fig. 159) ..... **trivittata** Zetterstedt
Chesh, Hants; Scotland: Inverness, Moray, Ross & Cromarty. v-ix.
11 Small cell of wing darkened (fig. 75); abdominal tergites with distinct apical yellow bands; wing length 4-7mm; genitalia (fig. 160) with each lobe of tergum 8 bearing 20 or more hairs on its posterior margin ..... **marginata** Meigen
Berks, Bucks, Cambs, Chesh, Cornwall, Cumbria, Derby, Devon, Dorset, Essex,

Hants, Herts, Kent, Lancs, Middx, Shrop, Surrey, Sussex, Worcs, Yorks; Wales: Brecknock, Caerns; Scotland: Aberdeen, Arran, Inverness; Ireland: Down, Kerry, Leitrim, Tipperary, Wicklow. ii-xii. From Auricularia, Chondostereum, Coriolus, Merulius, Phlebia, Pleurotus, Poria, Sebacina, Sparassis, Stereum. *Also from fungoid wood.*

— No cloud over small cell of wing 12

12 Abdominal tergites 1-5 yellow with a black basal dorsal line, segments 6 and 7 black; wing length 5.5-6mm; genitalia (fig. 161) with lobes of tergum 8 bearing 20 or more hairs on posterior margin..... **punctata** Meigen
Scotland: ?Glasgow, Inverness (Eigg Is). v-viii.

— Abdominal pattern different, either uniform dark or with pale transverse bands; each lobe of tergum 8 with at most about 10 hairs on its posterior margin 13

13 Tergites uniformly dark or with narrow apical pale bands; no lateral sternal processes to genitalia 14

— Tergites with broad pale apical bands; lateral sternal processes to genitalia present..... 15

14 Scl often not reaching Costa (sometimes completely absent); median dorsal process of genitalia (fig. 162) swollen and bulbous; wing length 4.5-6mm
..... **hyalinata** Meigen
Berks, Chesh, Cumbria, Hants, Lancs, Norfolk, Notts, Shrop, Somerset, Sussex, Yorks; Wales: Gwynedd; Scotland: Arran, Inverness, Kincardine; Ireland: Armagh. iv-x.

— Scl complete (1 specimen); median dorsal process of genitalia (fig. 163) evenly tapered from base; wing length about 5mm..... **rosalba** Hutson
N. Yorks. vi.

15 Genitalia (fig. 164) with lateral dorsal processes outwardly concave, without inner basal protuberance; wing length 4.5-7mm..... **winnertzi** Dziedzicki
Chesh, Cornwall, Cumbria, Derby, Devon, Dorset, Hants, Herts, Kent, Lancs, Oxon, Worcs, Yorks; Wales: Gwynedd, Powys; Scotland: Aberdeen, Inverness, Nairn, Perth; Ireland: Antrim, Clare, Kerry, Killarney, Leitrim, Roscommon, Westneath. iii-xii. On Ganoderma, Phellinus.

— Genitalia (fig. 165) with lateral dorsal processes outwardly convex, a small protuberance on inner side near base; wing length 5-5.5mm ..... **wankowiczii** Dziedzicki
Beds, Chesh, Cumbria, Hants, Herts, Notts, Suffolk; Scotland: Arran; Ireland: Wicklow. v-x. On Poria *and* Stereum *on fallen birch branches. Also on* Hypholoma *and* Phallus.

16 Genitalia (fig. 166) with two or three very long lateral bristles; wing length 3-4mm
..... **tenuis** Walker
Berks, Cambs, Chesh, Cornwall, Durham, Hants, Herts, Lancs, Middx, Notts, Suffolk, Sussex, Yorks; Wales: Brecknock, Merioneth; Scotland: Aberdeen, Argyll, Arran, Inverness, Moray. iii-x.

— Genitalia (fig. 167) without such bristles; wing length 4.5-5mm..... **duplicata** Edwards
Chesh, Essex, Hants, Lancs, Notts, Oxon, Surrey, Sussex; Scotland: Inverness, Kincardine. v-x. From Auricularia.

17 Front coxa with a dense brush-like patch of fine setae at the tip towards the inner side (fig. 25); postnotum with a few bristles..... 18

— Front coxae without obvious patch of fine setae; postnotum bare 22

18 Sc completely bare; claws with three teeth; thorax entirely dark and heavily grey-dusted, at most with the scutellum sometimes obscurely yellowish; abdomen darker than in other species of this group; wing length 5-5.5mm; genitalia (fig. 168)
..... **fuscata** Winnertz
Scotland: Inverness, Moray, Ross & Cromarty. viii.

— Sc with macrotrichia; claws with only one or two small teeth 19

19 Mesonotal stripes more or less separate; scutellum yellow, postnotum and pleurotergites yellow on upper half..... 20

— Mesonotum uniformly dark, with at most the shoulders yellow 21

20 Mesonotum somewhat shining; wing length 5-6mm; genitalia (fig. 169)
..... **ornata** Meigen
Lancs, Sussex; Scotland: ?Glasgow, Inverness, Moray. v, viii-ix.

— Mesonotum dusted; wing length 5-6mm; genitalia (fig. 170)..... **prominens** Lundström
Cumberland, Chesh, Derby, Dorset, Herts, Kent, Lancs, Lincs, Sussex, Warwick,

Yorks; Wales: Caerns; Scotland: Inverness, Moray, Perth; Ireland: Antrim. iii-ix. From Agaricaceae and Thelophora. *Also rotten wood.*

21 Scutellum dark; postnotum and pleurotergites entirely dark; abdominal tergites broadly yellow posterolaterally; shoulders usually yellow; genitalia (fig. 171) with parameres moderately long, flattened and densely pubescent along their inner edge; wing length 4.5-6mm ..... **tumida** Winnertz
Avon, Devon, Hants, Herts, Sussex, Yorks; Scotland: Argyll, Ayr, Inverness, Perth. iv-vi, ix.

— Scutellum more or less yellow; rest of thorax entirely dark grey dusted; abdominal tergites with posterior margins only indistinctly pale; genitalia (fig. 172) with parameres very short and sickle-shaped, bare; wing length 5-5.5mm..... **lambi** Edwards
Scotland: Argyll, Inverness, Rannoch. vi-ix.

22 Base of posterior fork approximately below or before base of stem of Median fork; Sc1 generally present and reaching Costa..... 23

— Base of posterior fork well beyond base of stem of Median fork; Sc1 absent 30

23 Scutellum with four bristles 24

— Scutellum with two bristles..... 29

24 Abdomen all dark 25

— Abdomen banded; Sc with macrotrichia 26

25 Sc bare; wing length 4.5-5mm; genitalia (fig. 173)..... **melanoceros** Edwards
Scotland: Inverness, Moray, Perth. ix.

— Sc with macrotrichia; wing length about 4.5mm; genitalia (fig. 174).. **pectinifera** Edwards
Cornwall. ix.

26 Abdominal tergites with broad basal yellow markings 27

— Abdominal tergites with apical yellow markings..... 28

27 Base of posterior fork below or just beyond base of stem of Median fork; stem of Median fork almost as long as its upper branch; yellow tergal bands divided by a mid dorsal black stripe; wing length 4.5-5mm; genitalia (fig. 175)..... **circumdata** Staeger
Berks, Dorset, Herts, Hants, Notts, Worcs; Scotland: Arran; Ireland: Kildare. v-vi, ix.

— Base of posterior fork distinctly before base of stem of Median fork; stem of Median fork barely half as long as its upper branch; wing length 5-6mm
..... ?**wrzesniowskii** Dziedzicki
Hants; Wales: Gwynedd; Scotland: Arran. v-vii. on Poria *under fallen birch branch.*

[N.B. All these records are based on females. Since Dziedzicki's original specimen appears to have been destroyed and no other male has been traced in any collection, the identity of the British specimens must be questioned and no figure of the genitalia is given here. Any possible male should be compared with Dziedzicki's figures (1885: Tab VII, figs. 1-2).]

28 Scutellum and pleurae dark; thorax practically all uniform dark; Sc1 sometimes very short and not reaching Costa; wing length 4.5mm; genitalia (fig. 176)
..... **digitifera** Edwards
Oxon; Scotland: Inverness, Moray, Nairn. v-vi.

— Scutellum yellow, pleurae largely yellow; mesonotum with shoulders extensively yellow; Sc1 reaching Costa; wing length 4-4.5mm; genitalia (fig. 177).... **parva** Dziedzicki
Hants, Kent, Oxon, Suffolk; Ireland: Kildare. vi-viii, x.

29 Sc with macrotrichia: Sc2 about opposite base of small cell; postnotum and pleurotergites uniformly dark; wing length about 4mm; genitalia (fig. 178)
..... **collini** Edwards
Bucks. v.

— Sc bare; Sc2 well beyond the base of small cell; postnotum and pleurotergites yellow basally, black apically; wing length about 5mm; genitalia (fig. 179)
..... **vittiventris** Zetterstedt
Yorks; Scotland: Inverness, Stirling. vii-viii.

30 All branches of Median and posterior forks bare; wing length 3.5-4.5mm; genitalia (fig. 180)..... **flava** Winnertz
Chesh, Lancs, Norfolk, Notts, Surrey, Yorks; Wales: Merioneth; Scotland: Dunbarton, Moray, Perth, Stirling. vii. ix-x.

— Branches of Median and posterior forks with macrotrichia, although sometimes scarce

on posterior fork 31

31 Scutellum dark, rest of thorax usually black; abdominal tergites usually with pale apical bands; wing length 4-4.5mm; genitalia (fig. 181) ..... **maura** Walker
Beds, Hants, Herts, Kent, Oxon, Staffs, Suffolk, Sussex; Wales: Merioneth; Scotland: Perth; Ireland: Antrim, Clare, Down, Galway. iv-vii, ix.

— At least scutellum yellow 32

32 Adbominal tergites pale basally or all dark; wing length 3-4mm; genitalia (fig. 182) ..... **fimbriata** Meigen
Chesh, Gloucs, Hants, Lancs, Norfolk, Oxon, Staffs, Sussex, Yorks; Wales: Brecknock, Merioneth; Scotland: Inverness, Perth, St. Kilda; Ireland: Wicklow. v-ix.

— Abdominal tergites yellow, more or less darkened basally; wing length 3.5-4mm; genitalia (fig. 183) ..... **trilineata** Zetterstedt
Berks, Chesh, Devon, Dorset, Hants, Heref, Kent, Lancs, Oxon, Sussex, Yorks; Wales: Merioneth; Scotland: Inverness; Ireland: Mayo. v-x.

Genus **Neoempheria** Osten-Sacken
(Figs. 184-187)

A genus of over 100 species most of which are tropical, particularly Neotropical. About 8 species are known in Europe and four are recorded from Britain. The adults of most species (including all the species recorded from Britain) have patterned wings and are found in damp woodland. Larvae may be found in webs on fungi or on rotting wood.

Key to species

1 Costa produced well beyond the tip of R5; subradial fold distinct; small cell barely twice as long as broad; dark band through middle of wing as well as dark mark at or near wing tip; abdomen banded with black and yellow (at least in male); small species with wing length 3-4mm 2

— Costa hardly produced beyond tip of R5; subradial fold very faint; small cell elongate; wings with dark marks around Sc2, Rs and *r-m*, R4, below posterior fork and entire wing tip; abdomen uniform yellow; Sc2 ending beyond base of Rs; large species, wing length about 6.5mm; ♂ genitalia (fig. 184) ..... **lineola** Meigen
Hants. vi.

2 Wing with dark subapical band 3

— Wing tip entirely dark; Sc2 above base of Rs; band through middle of wing not distinctly interrupted between veins of Median and posterior forks; ♂ abdomen with segments 1, 2 and 4 yellow (2 somewhat darkened apically), 3 dull blackish-brown, 5 and 6 black; genitalia (fig. 185) ..... **bimaculata** Roser
Hants, Oxon, Wilts. viii-ix.

3 Sc2 ending above or before base of Rs; band through middle of wing not interrupted; outer wing band generally narrow and outwardly concave; ♂ abdomen with segments 1, 2 and 4 yellow (2 and 4 sometimes slightly darkened), 3 uniform dull black, 5 and 6 black; ♂ genitalia (fig. 186) ..... **pictipennis** Haliday
Bucks, Cornwall, Dorset, Hants, Heref, Kent, Lancs, Notts, Surrey, Sussex; Wales: Gwynedd, Powys; Scotland: Banffshire, Moray; Ireland: Tipperary. vi-ix.

— Sc2 ending beyond base of Rs, opposite middle of small cell; band through middle of wing interrupted between veins of median and posterior fork; outer band broad and straight; ♂ abdomen with segments 1-4 with black dorso-apical triangles, that on 3 occupying most of the segment, smallest on 1 and 4, segments 5 and 6 black; ♂ genitalia (fig. 187) ..... **winnertzi** Edwards
Gloucs. viii.

Tribe Sciophilini

The Sciophilini include species with a wide range of general appearance, arranged in about twenty genera. Most of these genera contain few species: in Britain *Sciophila* has 17 species, but none of the others has more than three. The genus *Baeopterogyna* Vockeroth is the only genus known from the Holarctic that has not been recorded from Britain; it is similar to *Neuratelia* Rondani, but lacks distinct tibial setae, the tibial spurs are reduced to about equal to the width of the tibia, anepisternum, pleurotergite and katepisternum with short hairs, wing macrotrichia short and sparse, female brachypterous.

The adults of a few species may be found at flowers. The larvae have been reared from fungi or rotting wood, where they may construct webs, and from moss.

Key to genera

1 Ocelli two, contiguous with eye margins; postnotum almost covered with small fine hairs as well as the usual large bristles apically; R5 straight; Median and posterior forks both complete; Costa slightly extended beyond end of R5; Sc2 well beyond middle of Sc ..... **EUDICRANA** Loew (p.47)

— Ocelli three, lateral ocelli not contiguous with eye margins, although sometimes (e.g. *Paratinia, Phthinia*) quite close 2

2 Base of posterior fork distinctly proximal to that of Media; hind tibia without a distinct apical comb (fig. 43) 3

— Base of posterior fork distinctly distal to that of Media, or this fork absent; hind tibia often with distinct apical comb (fig. 42); Postnotum hairy 9

3 Postnotum hairy, at least towards the sides at tip; pleurotergites hairy 4

— Postnotum completely bare 8

4 R5 sinuous; base of anterior branch of Median fork weak or absent; wings usually unmarked; Usually grey-brown species 5

— R5 straight; wing with dark markings; anterior branch of Median fork complete or very narrowly interrupted at base; yellowish species 7

5 Costa distinctly produced beyond end of R5; base of anterior branch of Median fork faint but traceable 6

— Costa only produced slightly beyond end of R5; base of anterior branch of Median fork absent; Sc2 well before middle of Sc; R4 absent (fig. 77) ..... **NEURATELIA** Rondani (p.48)

6 Anterior branch of Median fork arising only slightly beyond posterior fork; Sc2 before middle of Sc, faint or absent; R4 absent ..... **ANACLILEIA** Meunier (p.48)

— Anterior branch of Median fork arising well beyond posterior fork; Sc2 well beyond middle of Sc, distinct; R4 frequently present (fig. 78)... **POLYLEPTA** Winnertz (p.48)

7 Sc2 before middle of Sc; wing marking restricted to near apex of R1 and R5; anterior branch of median fork very narrowly interrupted at base; Costa slightly produced beyond R5 ..... **ALLOCOTOCERA** Mik (p.47)

— Sc2 beyond middle of Sc; bold wing markings covering most of wing tip and with smaller marking over base of R5 and *r-m*; Median fork complete; Costa ending at tip of R5 (fig. 76) ..... **LEPTOMORPHUS** Curtis (p.47)

8 Pleurotergites hairy; Sc ending in R1 (fig. 47); body stout.. **SYNTEMNA** Winnertz (p.49)

— Pleurotergites bare; Sc ending in Costa; body long and slender ..... **PARATINIA** Mik (p.54)

9 Slender species; fore basitarsus very much longer than tibia, often more than twice as long; posterior branch of posterior fork sinuous; median and posterior forks complete ..... **PHTHINIA** Winnertz (p.53)

— Not slender species; front basitarsus not much longer than tibia; posterior branch of posterior fork more or less straight when present 10

10 Median fork complete 11

— Only two major veins posterior to the radius, with a short remnant vein on the wing margin between them (? anterior branch of Median fork absent, posterior branch

present but weak at base; anterior branch or posterior fork widely detached at base, posterior branch present and complete); Sc very short, ending free; macrotrichia decumbent; anepisternum haired; *r-m* long and horizontal ..... **AZANA** Walker (p.49)

11 Sc2 well beyond base of Rs; macrotrichia erect or reflexed towards wing base; anepisternum bare..... **MEGALOPELMA** Enderlein (p.50)

— Sc2 before, above or immediately beyond base of Rs 12

12 Posterior fork complete; anepisternum with small hairs (fig. 20); macrotrichia decumbent ..... **SCIOPHILA** Meigen (p.51)

— No posterior fork, only a simple vein present; anepisternum bare; Sc2 before Rs..... 13

13 Macrotrichia decumbent; R4 absent..... **ACNEMIA** Winnertz (p.50)

— Macrotrichia reflexed (fig. 48); R4 usually present ..... **MONOCLONA** Mik (p.51)

Genus **Eudicrana** Loew
(Fig. 188)

A genus of about 10 species most of which are Neotropical. The single Nearctic species may be the same as the European species, but the only other Holarctic species, described from Japan, differs in having distinct markings in the middle of the wing as well as at the tip. The life-history is unknown.

— An elongate species with wing tip dark; thorax pale with three distinct stripes; abdomen banded; wing length about 7mm; ♂ genitalia (fig. 188) ..... **nigriceps** Lundström
Scotland: Inverness. vi.

Genus **Allocotocera** Mik
(Fig. 189)

A genus of about 12 species most of which occur in the Neotropical, Australasian and New Zealand regions. One species occurs throughout the Palaearctic and in the Nearctic. Adults may be found on Umbelliferous flowers or in damp woods. Immature stages are unknown.

— A small yellow species; wings with a dark cloud around apex of cell R1; abdomen of ♂ with segments 1-5 black apically, segments 6 and 7 entirely black, genitalia (fig. 189) yellow; ♀ abdomen with only segment 6 completely black; wing length 3-3.5mm ..... **pulchella** Curtis
Berks, Cambs, Chesh, Devon, Hants, Herts, Kent, Lancs, Suffolk, Surrey, Sussex, Wales: Gwynedd, Powys; Scotland: Inverness; Ireland: Kerry, (?i) vi-viii.

Genus **Leptomorphus** Curtis
(Figs. 76, 190)

This genus includes about 15 species from most parts of the world, but about half from the Nearctic. In the Palaearctic one species occurs in Europe (including Britain), one from Europe to Japan and two only in Japan.

The larvae are quite common in webs on bark growing fungi (e.g. *Poria* spp.) on fallen branches. The larval skin remains attached to the tail of the pupa, which hangs free, head downwards.

— Large yellowish species; wings with broad cloud at tip, cloud over base of Rs and *r-m*, and below posterior fork; R4 absent (fig. 76); thorax yellow with three dark dorsal stripes, sometimes confluent; abdomen yellow with more or less distinct black apical bands, segment 7 entirely black in male; wing length 5.5-8mm; ♂ genitalia (fig. 190) ..... **walkeri** Curtis
Cambs. Gloucs, Hants, Heref, Herts, Kent, Lancs, Middx, Oxon, Staffs, Suffolk, Surrey. vi-x. On Poria, *etc.*

Genus **Anaclileia** Meunier
(Fig. 191)

A small genus known from two species in Europe and three undescribed species in the Nearctic region. Life history unknown. Dark species, similar to *Neuratelia,* but smaller.

— All coxae yellow; wing length 2-3mm; ♂ genitalia (fig. 191)..... **dispar** Winnertz
Lancs, Staff; Scotland: Arran, Inverness; Ireland: Wicklow. v-vi.

Genus **Neuratelia** Rondani
(Figs. 43, 77, 192-193)

N. nemoralis Meigen occurs commonly throughout the Holarctic. Five other species are known from the Palaearctic (including one from Japan) and 13 from the Nearctic. Single species are also known from the Oriental and Neotropical regions. A key including most of the Palaearctic species has been published by Matile (1974).

The adults are mainly rather elongate species, usually dark brown or black, with yellow legs. Laffoon (1965) states that the larvae occur in moss, but I have not been able to find a source for this and Matile (1974) says that the larva is unknown.

Key to species

1 Antennae with first flagellar segment largely yellow; wing length 4-5mm; ♂ genitalia (fig. 192) without spines on basistyle and with pointed dististyle
..... **nemoralis** Meigen
Avon, Berks, Cambs, Chesh, Cumbria, Derby, Dorset, Hants, Heref, Herts, Kent, Lancs, Middx, Staffs, Surrey, Sussex, Yorks; Wales: Gwynedd, Powys; Scotland: Aberdeen, Arran, Inverness, Perth, Rannoch, Stirling; Ireland: Antrim, Clare, Kerry, Killarney, Laois, Leitrim, Tipperary, Wicklow. v-vi.

— Antennae wholly black; wing length 3.5-4mm; ♂ genitalia (fig. 193) with spines on basistyle and rounded dististyle..... **nigricornis** Edwards
Devon, Kent, Sussex, Tyne & Wear; Wales: Gwynedd; Ireland: Down, Kerry, Wicklow. vi-viii.

Genus **Polylepta** Winnertz
(Figs. 32, 35, 78, 194)

Four Palaearctic species, three Nearctic and one Oriental species. Of the European species, *splendida* Winnertz is distinct in having a dark wing tip and quite different genitalia; *zonata* Zetterstedt is probably a synonym of *guttiventris* since the venational characters used to separate these two species are not reliable; *borealis* Lundström is very similar to *guttiventris,* but differs in details of the genitalia, particularly in the curved inner dististyle, and in the uniform dark abdomen. The males of both *guttiventris* and *borealis* have the base of the mid-tibia swollen and the outer surface covered in fine pale setae, as in figs. 32 and 35 (information lacking for other species). They are both fairly elongate species. Nothing is known of the life history of this genus.

— Wings clear; abdomen with pale basal bands on segments 2-5 (♂) or 2-7 (♀); ♂ with mid-tibial swelling bearing patch of fine short setae; ♂ genitalia (fig. 194) with curved inner dististyle simple and evenly tapered; last segment of ♀ cerci rounded; wing length 3.5-5mm ..... **guttiventris** Zetterstedt
Chesh, Cumbria, Derby, Dorset, Gloucs, Hants, Kent, Lancs, Sussex; Wales:

Gwynedd, Powys; Scotland: Inverness, Moray, Perth, Sutherland; Ireland: Wicklow. v-x.

[N.B. 4 damaged ♀♀ from Kent are very pale and may be a second species or a pale form of this species—described as *flava* Grzegorzek.]

Genus **Syntemna** Winnertz
(Figs. 47, 195-197)

An Holarctic genus of about 14 species, 8 of which occur in the Palaearctic and 10 in the Nearctic regions. Most species occur in the north of their region and there is a strong Holarctic element. Specimens are uncommon in collections and are usually taken singly. Very few females have been collected. The male genitalia are the only reliable characters so far found for separating species, and so, while the female ovipositor presents good (if smaller) differences, there have been problems in associating them with males. The Palaearctic species have been revised by Hutson (1979). The three species recorded in Britain differ from most other species in having the combination of R4 present, wing macrotrichia extending towards wing base well beyond Median fork, ♂ front tarsus without ventral brush of fine hairs, hairs of dorsum of thorax and scutellum very pale. The females of five species are known and four of these have swollen front tarsi. They are all small dark species with a wing length of about 3.5mm.

Behaviour of adults is unrecorded, but two species have been reared from rotting wood. Larvae and pupae are undescribed.

Key to species

1 Palps yellow; humeri slightly pale; stem of posterior fork usually with only a few macrotrichia near the fork; usually five or less (but sometimes up to 20) macrotrichia in upper surface of basal cell; pedicel and basal two or more flagellar segments yellow; Anal vein with macrotrichia; spot above distal end of squama pale; mesonotal bristles very pale, long and coarse; apico-lateral corners of ♂ tergite 2 (and sometimes 3) usually pale; ♂ genitalia (fig. 195); ♀ with lateral lobes of Sternum 8 evenly rounded, broader than long ..... **hungarica** Lundström
Berks, Chesh, Gloucs, Heref, Hunts, Oxon, Yorks; Wales: Brecknock, Brecon; Scotland: Inverness, Moray, Perth. v-x. Rotting Beech (Fagus sylvaticus) *wood.*

— Palps dark; mesonotum uniform dark; stem of posterior fork with many macrotrichia extending back towards origin of vein; 15-30 macrotrichia on upper surface of basal cell 2

2 Spot above distal end of squama pale; Anal vein with 8-12 macrotrichia; pedical and at least 3 basal flagellar segments of antennae usually yellow; mesonotal bristles usually shorter, finer, more yellow; ♂ Tergite 2 distinctly pale; ♂ genitalia (fig. 196); ? ♀ with lateral lobes of Sternum 8 somewhat pointed, longer than broad ..... **nitidula** Edwards
Heref, Kent, Lancs. v-viii.

— Distinct black spot above distal end of squama (fig. 47); Anal vein with only one or two apical macrotrichia; antennae uniform dark, 1st flagellar segment slightly paler; mesonotal bristles long, coarse and pale; apico lateral corners of ♂ tergites 2 and 3 slightly pale; ♂ genitalia (fig. 197); ♀ unknown ..... **stylata** Hutson
Scotland: Moray. ix.

Genus **Azana** Walker
(Fig. 198)

A small genus of two species in Europe and single species in each of Canary

Islands, North America, Africa and Ceylon. No details of life history are known.

— **Small** black species; halteres black; mesonotum evenly covered with long dense pale hairs; coxae dark, tibiae pale, rest of legs more or less dark; wing length 2-2.5mm; ♂ genitalia (fig. 198) with dorsal spur of dististyle pale and sharply pointed, parameres with a brush of spines towards apex..... **anomala** Staeger
Cambs, Herts, Suffolk; Scotland: Inverness. iv-vi.

Genus **Megalopelma** Enderlein
(Fig. 199)

A small genus with a single species widespread in the western Palaearctic, two species in the Nearctic and about four in the Neotropical region. No details of life history are known.

— Small species with uniform dark thorax and abdomen; legs pale; stem of haltere pale, knob black; stem of Median fork very short; stem of posterior fork very long; R4 present or absent; wing length 3.5-4mm; ♂ genitalia (fig. 199)
..... **nigroclavata** Strobl
Devon, Shrop, Sussex, Worcs, Wilts; Wales: Denbigh; Scotland: Moray; Ireland: Dublin, Kerry. v-ix.

Genus **Acnemia** Winnertz
(Figs. 42, 200-202)

Another widespread genus with few species. Apart from the three species included here, two others have been described from Europe, but are poorly documented. There are also three Nearctic species, five Neotropical, one Ethiopian and one Oriental species.

One species has been reared from a pupa found under rotting wood. Adults have been found at flowers. The adults rest with the wings slightly divaricate (as in *Sciophila*). They are small species.

Key to species

1 Yellow species, including the knob of haltere; microtrichia as well as decumbent macrotrichia present all over wing membrane; wing length 3-4mm; ♂ genitalia (fig. 200); ♀ Sternum 8 evenly rounded at apex ..... **amoena** Winnertz
Bucks, Hants. v, viii-ix.
— Dark species; wings with only macrotrichia present, microtrichia absent.....2
2 Ocelli in a very shallow triangle, the middle one placed a little forwards; palps yellowish; antennae uniform dark; a small species, wing length 2.5-3.5mm; ♂genitalia (fig. 201); Sternum 8 rather pointed at apex..... **nitidicollis** Meigen
Berks, Cambs, Chesh, Devon, Hants, Heref, Herts, Kent, Lancs, Norfolk, Notts, Shrop, Staffs, Surrey, Sussex, Warwick, Westmorland, Yorks; Wales: Brecknock, Merioneth; Scotland: Aberdeen, Inverness, Moray, Perth; Ireland: Armagh, Kerry, Wicklow. iii-xi.
— Ocelli arranged in a straight line; palps dark; scape and pedicel of antennae paler than flagellum; larger species, wing length about 4mm; ♂ genitalia (fig. 202); ♀ not seen
..... **longipes** Winnertz
Sussex; Wales: Gwynedd; Ireland: Wicklow. x.

Genus **Monoclona** Mik
(Figs. 48, 203)

A principally New World genus with five species in the Nearctic and about eight in the Neotropic. Four species are described from Europe, but it is likely that they all belong to the single species included here, which also occurs in North America.

It has been reared from rotten wood attacked by fungus (?*Poria* sp.). The larva lives in a mucilaginous tube and pupation takes place in a dry silken cocoon in a crevice of the wood.

— Small species, wing length 3-4mm (fig. 48); thorax and abdomen almost entirely yellow (particularly ♀♀) to dark with only the shoulders pale; ♂ genitalia (fig. 203) ..... **rufilatera** Walker
Berks, Cambs, Chesh, Cornwall, Devon, Dorset, Hants, Herts, Hunts, Oxon, Suffolk, Surrey, Sussex, Yorks; Scotland: Perth; Ireland: Down. v-x. ?Poria.

Genus **Sciophila** Meigen
(Figs. 20-21, 204-220)

This is by far the largest genus of this tribe, with 17 of the 30 or more Palaearctic species occurring in Britain. About 25 species occur in North America, although a number of them are shared with the Palaearctic. Very few species have been described from the southern hemisphere, but a few species are known from South America and single species from the Ethiopian, Oriental and Australasian regions.

Very few useful structural characters apart from the male genitalia have been found to separate the species of this genus and so colour is used rather widely. Some common species, such as *S. lutea* Macquart and *hirta* Meigen, are so variable that they cannot readily be fitted definitively into such a key; other species are so little known that it is difficult to know how reliable the characters for their separation are. The male genitalia seem to be reliable and are illustrated, the female genitalia show some differences, but have not been thoroughly investigated and deserve further examination. Females of many species were not available in the present study. This key in particular should be used with caution.

Adults rest with their wings only partially overlapping. The larvae of most species are to be found on fungi, particularly hard bark fungi. They live on the undersurface of the fungus in a mucilaginous tube and with a dry silk web. They probably feed mainly on fungal spores. They pupate in a slight cocoon in a crevice in the fungus or in the bark of the host tree. Some species may be associated with rotting wood.

Key to species

1 Microtrichia of wings absent, except at extreme base, macrotrichia obvious 2
— Microtrichia covering wing membrane between macrotrichia 5
2 Antennal flagellum, head and abdomen black 3
— Base of antennal flagellum, head and abdomen ochreous or red 4
3 Thorax black; Sc2 before base of Rs; hind coxae slightly darkened; wing length about 5mm; ♂ genitalia (fig. 204) ..... **limbatella** Zetterstedt
Scotland: Inverness. vii.
— Thorax reddish; Sc2 beyond base of Rs; all coxae pale; wing length 4-4.5mm; ♂ genitalia (fig. 205) ..... **buxtoni** Freeman
Bucks, Essex, Kent. i, iii, viii-xii. From Coriolus, Daedaleopsis *and* Pseudotrametes.
4 Large reddish species; front tibia with antero-dorsal row of bristles; Sc2 before base of Rs; wing length 5-6.5mm; ♂ genitalia (fig. 206) ..... **rufa** Meigen
Scotland: Aberdeen, Argyll, Inverness, Perth. v-vi. From Fomes, Polyporus.

— Smaller ochreous species; front tibia without antero-dorsal row of bristles; Sc2 above base of Rs; wing length 3.5-4.5mm; ♂ genitalia (fig. 207) ..... **ochracea** Walker
Cambs, Hunts. v-vi. From "?Fomes" *on old Plum tree, cocoons on Cherry tree; probably* Phellinus *sp.*

5 Anterior branch of posterior fork widely interrupted at base; hind femora black at tip and on ventral surface near base; Sc2 ending just before base of Rs; thorax uniform dark; antennal flagellum dark; wing length about 2.5mm; ♂ genitalia (fig. 208) ..... **interrupta** Winnertz
Cambs, Hants, Suffolk. ix. Hydnum.

— Posterior fork complete 6

6 Hind femur entirely yellow 7

— Hind femur with dark apex, body all black 16

7 At most first flagellar segment yellowish 8

— At least first two flagellar segments pale; thorax at least partly pale 11

8 Sc2 before base of Rs; thorax black to orange; wing length 3-4mm; ♂ genitalia (fig. 209) ..... **hirta** Meigen
Bucks, Cambs, Chesh, Essex, Greater Manchester, Hants, Heref, Herts, Hunts, Kent, Lancs, London, Surrey, Worcs; Wales: Gwynedd; Scotland: Inverness; Ireland: Down, Dublin. iv-xi. From Armillaria, Auricularia, Bulgaria, Cantharellus, Collybia, Coriolus, Lactarius, Lenzites, Pholiota, Stereum; *especially Polyporaceae.*

— Sc on or after base of Rs 9

9 Larger species, wing length 3.5-4.5mm; thorax light (typical var.) to dark (var. *analis* Winnertz); ♂ genitalia (fig. 210) ..... **lutea** Macquart
Beds, Berks, Bucks, Cambs, Chesh, Essex, Hants, Herts, Hunts, Kent, Lancs, London, Norfolk, Surrey, Sussex, W. Yorks; Scotland: Angus; Ireland: Antrim. iii-x. From Boletus, Collybia, Coriolus, Daedalia, Gomphus, Grifola, Heteroporus, Hydnum, Hypoxylon, Lactarius, Meripilus, Phellinus, Pholiota, Pleurotes, Pseudotrametes, Russula, Stereum, Ustulina.

— Smaller species, wing length 2.5-3.5mm; thorax dark 10

10 Hypopleuron with fine hairs; wing length about 2.5mm; ♂ genitalia (fig. 211) with dististyle very short, emarginate apically; tergite 9 shallowly emarginated apically, with two long bristles on prominent tubercles near the lateral margins ..... **fridolini** Stackelberg
Sussex, Yorks. vi, ix.

— Hypopleuron bare; wing length about 3mm; ♂ genitalia (fig. 212) with dististyle short with a dorso-apical posteriorly directed process and two strong latero-apical spines; tergite 9 with an obtusely pointed apex ..... **cliftoni** Edwards
1♂; Clifton coll.—no further data.

11 Dorsum of thorax completely orange 12

— Dorsum of thorax with some dark stripes, sometimes merged 13

12 Larger species, wing length 3.5-4.5mm; ♂ genitalia (fig. 210) with tergite 9 shallowly emarginate apically with two long bristles on tubercles near lateral margins; latero-ventral process of dististyle longer than broad, with lateral as well as two terminal bristles; parameres prominent and broadly bifurcate at tip ..... **lutea** Macquart
See couplet 9 for details of distribution, etc.

— Smaller species, wing length c.3mm; ♂ genitalia (fig. 213) with tergite 9 evenly rounded apically with c.12 long bristles; latero-ventral process of dististyle short and broad with only two terminal bristles; parameres inconspicuous ..... **plurisetosa** Edwards
?Chesh; Scotland: Arran. viii-ix.

13 Smaller species, wing length less than 3.5mm 14

— Larger species, wing length over 3.5mm 15

14 Length of antennal flagellar segments 2 and 3 about three times width; ♂ genitalia (fig. 214) with tergite 9 broadly truncate; dististyle reduced, latero-ventral process with only two long bristles; parameres very narrow, finely pointed and simple ..... **quadriterga** Hutson
Heref. v.

— Length of antennal flagellar segments 2 and 3 about twice width; ♂ genitalia (fig. 215) with tergite 9 with a distinctly triangular apex; latero-ventral process of dististyle with long bristles all along one edge; parameres short with rounded apex and small

inner spur ..... **fenestella** Curtis
Berks, Hants, Hunts, Oxon, Wilts; Wales: Gwynedd. vi-vii.

15 ♂ genitalia (fig. 210) with tergite 9 very shallowly emarginate apically with two long bristles on small tubercles near lateral margins; parameres prominent and broadly bifurcate at tip..... **lutea** Macquart
See couplet 9 for details of distribution, etc.

— ♂ genitalia (fig. 216) with tergite 9 deeply and rectangularly emarginate, a row of strong bristles along the margin of the emargination and a brush of strong hairs on the apico-lateral lobes; parameres inconspicuous, ? not bifurcate..... **varia** Winnertz
?Bristol; Scotland: Moray. ix-x.
[N.B. only one ♂ seen. In this specimen the genitalia are badly preserved and it is possible that the strongly bristled "apico-lateral lobes" are not part of tergite 9. In this case T9 is simply truncate apically.]

16 Hind femur narrowly dark at tip, sometimes slightly darkened at base beneath; small group of fine hairs near anterior edge of hypopleuron and anterior angle of katepisternum 17

— Hind femur broadly black at tip and on ventral surface near base; hypopleuron bare... 18

17 Sc2 before base of Rs; wing length 3-4mm; ♂ genitalia (fig. 209) with dististyle rounded without posteriorly directed process; tergite 9 evenly rounded..... **hirta** Meigen
See couplet 8 for details of distribution, etc.

— Sc2 on or after base of Rs; wing length about 3mm; ♂ genitalia (fig. 217) with dististyle approximately square with a ventro-apical posteriorly directed process; tergite 9 triangular with a sharply pointed apex ..... **nonnisilva** Hutson
Cambs, Hunts, Surrey, Wilts, iv-x.

18 Hind tibia distinctly black at tip; a group of fine pale hairs at anterior angle of katepisternum; Sc2 above base of Rs; hind coxa somewhat darkened; wing length 3.5mm; ♂ genitalia (fig. 218)..... **adamsi** Edwards
Hants. viii.

— Hind tibia not black apically, no group of hairs at anterior angle of katepisternum..... 19

19 Hind coxa darkened outwardly; Sc2 beyond base of Rs; wing length about 3.5mm; ♂ genitalia (fig. 219) ..... **nigronitida** Landrock
Devon, Heref, Herts; Scotland: Perth, Sutherland; Ireland: ?Co. v-viii.

— Hind coxa dark at tip and base only; Sc2 not beyond base of Rs; wing length about 4mm; ♂ genitalia (fig. 220)..... **geniculata** Zetterstedt
Scotland: Arran. ix.

Genus **Phthinia** Winnertz
(Figs. 36, 221-223)

Apart from the two species included here, the Palaearctic has a third European species that is inadequately described and a fourth species in Japan. The genus is also widely recorded from the rest of the world with three species in North America, three in South America, one in New Zealand and one in Australia. The adults are elongate medium sized species which occur around rotting wood from which they have been reared. The postnotum is only sparsely haired laterally.

Key to species

1 Fore-leg with basitarsus 2.5× as long as tibia; body elongate; Median fork broad at base; Anal vein straight; anal lobe of wing inconspicuous; abdomen with ill-defined pale bands; wing length 4.5-6mm; ♂ genitalia (fig. 221) small and pale; ♀ ovipositor with last segment of cerci pale and rounded..... **winnertzi** Mik
Berks, Bucks, Chesh, Cornwall, Derby, Hants, Herts, Norfolk, Notts, Sussex; Wales: Dyfed, Gwynedd, Powys, W. Glamorgan; Scotland: Dumfries, Moray, Perth; Ireland: Cork. vi-xi. ?associated with Pholiota *on rotting wood.*

— Fore-leg with basitarsus nearly twice as long as tibia; body not so elongate; Median fork narrowing to a point at base as usual; Anal vein curving down at tip; anal lobe

of wing usually apparent; abdomen uniformly dark; wing length 3.5-5mm; ♂ genitalia (fig. 222) larger and darker; ♀ ovipositor with last segment of cerci dark and pointed ..... **humilis** Winnertz

Berks, Cornwall, Derby, Devon, Dorset, Hants, Kent, Sussex; Wales: Gwynedd; Ireland: Wicklow. v-x.

[N.B. 1 ♂ specimen of *P. humilis* from Crowborough, Sussex (coll. F. Jenkinson) has rather different genitalia from all other specimens (fig. 223). However, no other differences were found and the genitalia are very similar to *humilis* compared with other *Phthinia* spp. and so it is considered inadvisable to describe it as a separate species until further material is available.]

Genus **Paratinia** Mik
(Fig. 224)

A very small genus of two dark Palaearctic species and a pale species that may be a synonym of the single Nearctic species. Life history unknown, but the adult of at least the British species would appear to be nocturnal.

— A medium sized, elongate, uniformly dark species, somewhat Sciarid-like in general appearance; wing length 4-6mm; ♂ genitalia (fig. 224)..... **sciarina** Mik

Beds, Herts, Lincs, Shrop, Sussex; Scotland: Inverness, Moray, Perth. v-xii.

Tribe Gnoristini

Like the Sciophilini, this tribe includes genera showing a wide range of general appearance. About 15 genera are currently recognised, but some of these are being studied with a view to dividing them into a number of smaller genera (e.g. Vockeroth, 1980). Most of the genera are small—in the Holarctic region only *Boletina* includes more than ten species, but other larger genera occur in the southern hemisphere. Only one Holarctic genus does not occur in Britain: this is *Hadroneura,* known from two European and three Nearctic species. In the following key to genera *Hadroneura* would run to *Dziedzickia. Dziedzickia* may be a complex of genera and only when this has been examined can the status of *Hadroneura* be qualified; meanwhile the European species of *Hadroneura* differ from *Dziedzickia* in the genitalia and in having a rather more elongate lower part of head.

Again there are biological data for only very few species. The activity of adults is virtually unknown. The larvae have been found in or on fungi, decaying wood, liverworts and mosses. The biology of *Speolepta leptogaster* Winnertz, an inhabitant of underground cavities, is better studied than most (Matile, 1970).

The distinctions between this tribe and the next may prove difficult without some experience. Some of the more likely sources of error are accounted for in the key to genera.

Key to genera

1 Base of posterior fork well beyond that of Median fork.....2
— Base of posterior fork before, below or scarcely beyond that of Media 3
2 Sc2 present; *r-m* subequal to base of Rs; empodium absent; postnotum with a transverse row of bristles; mid-tibia of both sexes with an elongate sense organ on the dorsal surface; tibial bristles weak or absent..... **COELOPHTHINIA** Edwards (p.55)
— Sc2 absent (fig. 79); *r-m* many times longer than base of Rs; empodium well developed postnotum bare; tibia without sense organs; tibial bristles well developed ..... **COELOSIA** Winnertz (p.55)

3 Sc not reaching Costa, either ending in R, or Sc1 ending free 4
— Sc ending in Costa 6
4 Sc ending free, seventh segment of abdomen quite large (♂ and ♀); tibial bristles weak; pleurotergites bare ..... **SPEOLEPTA** Edwards (p.56)
— Sc ending in R; seventh abdominal segment small and usually retracted, at least in the male; tibial bristles well developed; pleurotergites hairy 5
5 Stem of Median fork at least twice as long as *r-m;* R4 usually present ..... **DZIEDZICKIA** Johannsen (p.57)
— Stem of Median fork very short, varying from slightly shorter than *r-m* to about 1.25× as long; R4 absent (fig. 80) ..... **PALAEODOCOSIA** Meunier (p.57)
6 Proboscis (clypeus) very elongate, much longer than rest of head (fig. 11) ..... **GNORISTE** Meigen (p.58)
— Proboscis (clypeus) shorter than head 7
7 Sc2 present and well beyond middle of Sc 8
— Sc2 near middle of Sc or absent 9
8 Base of posterior fork well beyond base of stem of Median fork (fig. 81); lateral ocelli less than their own width from eye margin; empodium well developed; Sc at most with one or two setae; tibial bristles tending to form rows towards apex; seventh abdominal segment small and retracted ..... **SYNAPHA** Meigen (p.58)
— Base of posterior fork more or less opposite base of stem of Median fork; lateral ocelli at least their own width from eye margin; empodium rudimentary or absent; Sc setulose; tibial bristles irregular throughout; seventh abdominal segment larger ..... **GRZEGORZEKIA** Edwards (p.58)
9 R4 present; Sc2 absent (fig. 83); Sc setulose; tergite 9 of ♂ with terminal row of strong spines ..... **APOLEPHTHISA** Grzegorzek (p.59)
. [N.B. *Rondaniella* (Leiini) may run to here. In contrast to the genera considered here, it has a distinct dark wing tip. See page 64.]
— R4 absent; Sc2 usually present (fig. 84); Sc bare (except *plana* and sometimes *dubia*); tergite 9 of ♂ without a terminal row of spines (sometimes with short combs on apex) ..... **BOLETINA** Staeger (p.59)

Genus **Coelophthinia** Edwards
(Fig. 225)

A small genus of one Palaearctic and one Nearctic species, both of which may be synonymous. One species has been reared from fungi.

— Small species, wing length 3-4mm; head and antennal flagellum dark, scape and pedicel yellow; mesonotum yellow with three dark stripes; halteres with yellow stem and black knob; abdomen dark; ♂ genitalia (fig. 225) yellow; ♀ genitalia darker, but the terminal segment of cerci yellow and broadly rounded apically ..... **thoracica** Winnertz
Cornwall, Hants, Herts, Yorks; Wales: Caerns, Merioneth; Scotland: Midlothian. iv, ix-x. From Boletus, Hydnum.

Genus **Coelosia** Winnertz
(Figs. 79, 227-229)

A genus of about ten species in the Holarctic region and a few species in the Neotropical and Oriental regions. One species has been associated with fungus.

Key to species

1 Thorax entirely yellow; Costa extending to less than half distance from R5 to anterior vein of Median fork; postradial veins bare; palps, base of antennae, halteres and legs yellow; wing length 3.5-5mm; ♂ abdomen yellow except for dark tergite 6,

genitalia (fig. 227); ♀ abdomen dull yellow, terminal segment of cerci large and broadly rounded ..... **flava** Staeger

Devon, Hants, Oxon, N. Yorks, Surrey; Ireland: Antrim, Louth, Meath. vi-vii.

— Thorax and abdomen dark, at most the shoulders, sides or mesonotum and genitalia pale 2

2 Costa extending almost three-quarters of distance from R5 to anterior vein of Median fork; dingy species, palps, base of antennae, knob of halteres and legs all darkened; wings slightly greyish, all veins dark; postradial veins bare, but slightly seamed with dark brown, particularly at base of posterior fork; wing length 3.5-5mm; ♂ genitalia (fig. 228); ♀ terminal segment of cerci small and oval ..... **silvatica** Landrock

Herts, Kent, Oxon; Scotland: Moray. ii-iii, ix.

— Costa extending less than half the distance from R5 to anterior vein of Median fork; brighter species, palps, base of antennae, knob of halteres and legs generally clear yellow; wings clearer, postradial veins pale; postradial veins with macrotrichia; wing length 3.5-4mm; ♂ genitalia yellow (fig. 229); ♀ terminal segment of cerci small and oval ..... **tenella** Zetterstedt

Chesh, Hants, Sussex; Wales: Merioneth; Scotland: Aberdeen, Inverness, Moray, Ross & Crom; Ireland: Sligo, Wicklow. i, iv-x. From Stereum.

Genus **Speolepta** Edwards
(Figs. 37, 226)

A small genus of a single Palaearctic species and one unnamed Nearctic species. A second Palaearctic species, recently described from a single specimen, is undoubtedly a synonym. *S. leptogaster* Winnertz is very common in underground cavities and has occasionally been found outside this habitat—even at light traps. It is the only British fly that approaches a troglodytic way of life, but is perhaps more correctly termed a troglophile.

The larvae are common on the walls and roof of damp caves, mines, tunnels, cellars, etc. They are probably equally common in small rock fissures, etc. They are white with a pale head capsule and live in a slime-tube suspended with the aid of supporting threads. The tube is probably an overlapping roll of mucilaginous silk and not a sealed tube and the larvae can partly extrude from any part of the length of the tube to forage on the substrate. It probably feeds largely on algae and other available organic matter. The pupa hangs head downwards without a cocoon. The adults are not as common as might be expected from the numbers of larvae and it might be that the larvae have a protracted development while the adults are short-lived. It is not known to what extent the species is seasonal within the cave environment, but more adults have been collected in May and June than at other times of year.

— An elongate grey-brown species, wing length 4-4.5mm; R4 present or absent; tibial spurs short, especially on fore and mid-legs; ♂ mid-tibia slightly swollen near base with an inconspicuous sense organ on dorsal surface; ♂ genitalia (fig. 226); ♀ sternum 8 with a broadly truncate apex, terminal segment of cerci small and oval ..... **leptogaster** Winnertz

Cornwall, Cumbria, Derby, Devon, Durham, Gloucs, Kent, Lancs, Oxon, Somerset, Surrey, Yorks; Wales: Clwyd, Dyfed, Gwent, Merioneth, Mid-Glamorgan, Powys; Scotland: Inverness (Eigg Is.), Renfrew; Ireland: Clare, Fermanagh, Sligo, Tipperary. i, iv-xi. In caves, etc.

Genus **Dziedzickia** Johannsen
(Fig. 230)

This may cover a complex of genera, but as currently understood most species occur in the New World with one Palaearctic species (the type-species of the genus) and one African species. Species of *Hadroneura* would run to here, but differ in structure of the genitalia. Other species currently included in *Dziedzickia* do not demonstrate all the features used in this generic key. Life history unknown.

— Head and thorax dark, at most slightly yellow at shoulders; abdomen, including genitalia dark, sometimes with yellow apical bands on tergites; halteres and legs yellow; small cell 2-3 times as long as R4; Sc long, extending to beyond base of Rs; Costa extended beyond R5 to about one third distance to anterior vein of Median fork; post-radial veins with macrotrichia; wing length 3-4mm; ♂ genitalia (fig. 230); ♀ front tarsus slightly swollen; ♀ terminal segment of cerci minute, oval; ♀ sternum 8 broadly rounded in lateral view ..... **marginata** Dziedzicki
Sussex, Worcs; Scotland: Inverness, Kincardine, Moray, Perth, Stirling. viii-x.

Genus **Palaeodocosia** Meunier
(Figs. 80, 231-233)

Apart from the Baltic Amber species upon which this genus was based, the three species included here are the only species that have so far been included in the genus. Some Nearctic species currently included in *Dziedzickia* belong with species of this genus, but a study of a wider range of species is necessary to establish a better understanding of the genera in this complex. The British species all have a largely yellow mesonotum with a pair of black lateral patches. While the last two species in the key seem quite discrete in British material, a Nearctic species (*vittata* Coquillett) shows intermediate characters and it may be that further material will suggest that these species should be synonymised. Life history unknown.

Key to species

1 Abdomen mainly yellow, the posterior margins of the first five and practically the whole of the sixth and seventh tergites black; Sc reaching base of Rs; veins of Median and posterior forks bare; wing length 4.5-5.5mm; ♂ genitalia (fig. 233) ..... **flava** Edwards
Cambs, Heref. v-vi.

— Abdomen mainly blackish-brown, with moderately broad yellow posterior margins; Sc ending well before base of Rs (fig. 80); veins of Median and posterior forks with macrotrichia 2

2 Scutellum pale; mesonotum with dark lateral stripes not extending inwards beyond intra-alar bristles; fine bristles of mesonotum dark; wing length 4mm; ♂ genitalia (fig. 232) with tergite 9 uniformly hairy, hairs on distal margin not unusually stout, sternum 8 not noticeably produced and with fewer long bristles; ♀ not examined ..... **alpicola** Strobl
Hants, Lancs; Wales: Caerns; Scotland: Inverness. vi-viii.

— Scutellum mainly dark; mesonotum with dark lateral stripes extending inwards to dorsocentral bristles; fine bristles of mesonotum usually pale; wing length 4-5.5mm; ♂ genitalia (fig. 233) with regular row of spine-like bristles across apex of tergite 9, which is bare before these spines, sternum 8 strongly produced with a dense marginal row of long strong bristles; ♀ apex of abdomen noticeably tapered, terminal segment of cerci small and oval, penultimate segment very long and parallel sided, sternum 8 elongate ..... **janickii** Dziedzicki
Bucks, Cambs, Chesh, Herts, Hants, Kent; Wales: Gwynedd; Scotland: Perth; Ireland: Killarney. v, vii, ix-x.

Genus **Gnoriste** Meigen
(Figs. 11, 234-235)

An Holarctic genus of 8 species and possibly another species in South America. Four species are known from Europe and a fifth species has been described from Japan. All species are quite large and have a characteristic very long proboscis. Chandler (1976) provides a key to species. The activity of adults is unrecorded. One species has been reared from larvae found in mosses.

Key to species

1 Ground colour of mesonotum yellow, with distinct black stripes, sometimes fused; proboscis (fig. 11) half body length or less (less than three times length of front coxae); ♂ with posterior claw of all legs stunted; wing length 7-8mm; ♂ genitalia (fig. 235); ♂ wings usually dark tipped, ♀ clear..... **bilineata** Zetterstedt
Scotland: Inverness, Perth, Stirling. vi.

— Thorax grey-brown; proboscis more than half body length (more than three times length of front coxae); ♂ tarsal claws unmodified; wing length about 6mm, wing tip clear in ♂, ♀ not seen; ♂ genitalia (fig. 234)..... **longirostris** Siebke
Scotland: Perth. vii.

Genus **Synapha** Meigen
(Figs. 81-82, 236-237)

A rather more widespread genus than most of the genera of this tribe, including the two Palaearctic species included here, three in the Nearctic region, about 10 in each of New Zealand and South America and a single species in Australia. However some of these may not properly belong to this genus. Adults have been found at flowers, but the breeding biology is unknown.

Key to species

1 Branches of Median and posterior forks with macrotrichia throughout; Sc ending just before base of Rs, Sc2 at about two-thirds the length of Sc1; R4 always absent (fig. 82); first few abdominal tergites with yellow markings basally; middle tibia of male with a small oval sense organ on the dorsal surface; wing length 2.5-3mm; ♂ genitalia (fig. 236); ♀ terminal segment of cerci oval..... **fasciata** Meigen
Bucks, Devon, Hants, Heref, Herts, Kent, Surrey; Wales: Anglesey, Merioneth; Scotland: Inverness, Sutherland; Ireland: Kerry, Wicklow. vi-vii.

— Branches of Median and posterior forks with macrotrichia only towards tip; Sc reaching at least to base of Rs, Sc2 at more than three-quarters of the length of Sc1; R4 usually present (fig. 81); first few abdominal segments with yellow markings apically; middle tibia of male without sense organ; wing length 3-3.5mm; ♂ genitalia (fig. 237); ♀ terminal segment of cerci round..... **vitripennis** Meigen
Berks, Bucks, Chesh, Dorset, Hants, Heref, Herts, Kent, Lancs, Middx, Suffolk, Surrey, Sussex, Yorks; Wales: Caerns, Merioneth, Powys; Scotland: Inverness, Midlothian, Ross & Crom. v-x.

Genus **Grzegorzekia** Edwards
(Fig. 238)

Apart from the single species included here, known from the Western Palaearctic, a second species has been described from Austria, but may be a synonym. Adult activity is unrecorded. The larvae have been found on damp rotton wood either on

the surface or suspended in a web-like structure into which they rapidly retreat when disturbed. The webs may be close to each other. Pupation takes place on the surface of the wood; there is no cocoon.

— Medium large species, wing length about 5.5mm; prothorax light yellow, rest of thorax shining black; wings with the tip slightly darkened and a slight dark cloud over the small cell; vein R5 sinuous; abdominal tergites dark with pale basal bands in ♂, bands reduced or absent in ♀; ♂ genitalia (fig. 238), ♀ terminal segment of cerci large and yellow, sternum 8 truncate with about 4 strong bristles at apex
..... **collaris** Meigen
Cambs, Gloucs, Hants, Suffolk, Warwick. iv-vii, ix.

Genus **Apolephthisa** Grzegorzek
(Figs. 83, 239)

This genus comprises one Palaearctic and one unidentified Nearctic species. Adult activity unknown. The larvae live under bark or on bark-growing fungi, in a mucilaginous tube anchored with lateral threads. There is no cocoon.

— Medium sized species, wing length 3-4mm; head, thorax and abdomen black; halteres yellow; legs yellow with the hind femur more or less dark tipped; pleurotergites haired; postradial veins with macrotrichia; base of anterior branch of posterior fork weak or absent (fig. 83); ♂ genitalia (fig. 239) with a row of large spines on the apex of tergite 9; apex of ♀ abdomen distinctly tapered, last segment of cerci elongate oval, penultimate segment about 1.5 times as long as broad ..... **subincana** Curtis
Beds, Berks, Chesh, Cornwall, Essex, Hants, Heref, Herts, Lancs, Shrop, Staffs, Suffolk, Sussex, Yorks; Wales: Gwynedd; Scotland: Arran, Inverness, Midlothian, Moray, Perth; Ireland: Down, Kerry, Wicklow. iii-x. From Phlebia, Xylodon *and under bark of oak* (Quercus).

Genus **Boletina** Staeger
(Figs. 7, 28-30, 58-59, 84, 240-262)

The largest genus of this tribe, with about 100 species, all from the northern hemisphere but including about 10 species from the Oriental region. Although principally species of wooded streams, members of this genus are found in a wider variety of habitats and distribution than most genera of the family. Their ability to thrive in open moorland, etc. has enabled some species to colonise the more barren areas of Britain and its islands. Wetlands, which are generally poor habitats for Mycetophilidae, will frequently produce at least a species of *Boletina*. This is perhaps a result of the use of diverse breeding sites, since while some species develop in the more normal habitats such as rotting wood, others develop in mosses and liverworts. The breeding biology of most species is unknown and other species may occur in unexpected situations.

The following key includes 23 species. One other species, *silvatica* Dziedzicki, was included in the British fauna by Edwards (1941) based on a single ♂ from Gloucestershire which should be in the British Museum (Natural History). We have not been able to find this specimen and no other British specimens are known to us, so it has been omitted from this work. It would run to the end of the key (to the *sciarina*-group) and differs from other species by the structure of the genitalia. The genitalia are figured in Landrock (1929) and Ostroverkhova & Stackelberg (1969).

There have been various attempts to separate species or groups of species as separate genera or subgenera, but none has so far found general acceptance. The use

of more obvious characters, such as the presence or absence of pleurotergal bristles, does not provide a natural division. A species such as *flaviventris* Strobl may exhibit a combination of characters and a general appearance that make it quite distinct from the rest of the British fauna, but a thorough investigation of the whole genus is necessary before any groupings can be satisfactorily delimited.

Key to species

1 Pleurotergites with bristles, at least near the ridge 2
— Pleurotergites completely bare 11
2 Sc sparcely setose 3
— Sc bare 4
3 Sc2 usually present; wing length about 4mm; ♂ with posterior claw of front tarsus club-shaped, other claws unmodified; ♂ genitalia (fig. 240); ♀ sternum 8 not deeply divided medially (fig. 59) ..... **plana** Walker
Berks, Bucks, Cambs, Derby, Devon, Gloucs, Hants, Heref, N. Lancs, Monmouth, Oxon, Suffolk, Surrey, Sussex, Westmorland, Yorks; Wales: Brecon, Caerns, Flint, Merioneth; Scotland: Argyll, Inverness, Midlothian, Moray; Ireland: Wicklow. v-x.
— Sc2 normally absent; wing length 4-5.5mm; ♂ with posterior claw of anterior tarsus club-shaped, anterior claws of all legs greatly enlarged and with a comb of fine teeth on the underside (fig. 30), other claws similar but shorter; ♂ genitalia (fig. 241); ♀ sternum 8 deeply divided medially (fig. 58); (see also couplet 6) ..... **dubia** Meigen
Chesh, Cornwall, Derby, Devon, Heref, Kent, Lancs, Norfolk, Oxon, Shrop, Somerset, Sussex, Westmorland, Yorks; Wales: Brecknock, Caerns, Denbigh, Glamorgan, Merioneth; Scotland: Aberdeen, Argyll, Dumbarton, Inverness, Midlothian, Moray, Perth, Sutherland; Ireland: Antrim, Leix, Mayo, Monaghan, Westmeath. iv-ix.
4 Sc2 normally absent 5
— Sc2 present 7
5 Abdomen with yellowish terminal bands on tergites 2-4; scape, pedicel and first two flagellar segments ochreous, rest dark; Median fork weakly developed and with few macrotrichia; wing length 3-3.5mm; ♂ with posterior claw of front tarsus short and club-shaped, all other claws unmodified; ♂ genitalia (fig. 242); ♀ sternum 8 with four very strong bristles ..... **pallidula** Edwards
Hants, Herts, Kent, Oxon; Wales: Caerns. v-vi, viii-x.
— Abdomen entirely or mostly blackish; at most base of first flagellar segment yellow; Median fork well developed, densely beset with macrotrichia except at base 6
6 R5 rather sinuous; shoulders and pleurae heavily dusted, more or less dull; wing length 4-4.5mm; ♂ tarsal claws modified (fig. 30), ♂ genitalia (fig. 241); ♀ sternum 8 without strong bristles (fig. 58); (see also couplet 3) ..... **dubia** Meigen
For details of distribution, etc. see couplet 3.
— R5 nearly straight; shoulders and pleurae not heavily dusted, more or less shining; wing length 3.5-4.5mm; ♂ tarsal claws unmodified; ♂ genitalia (fig. 243) ..... **villosa** Landrock
Scotland: Inverness, Moray, Perth. ix.
7 Thorax uniformly shining black without dusting 8
— Thorax greyish dusting at least on shoulders 10
8 Abdominal sternites 2-4 all yellow, tergites 2-4 extensively yellow; wing length about 4mm; ♂ posterior claw of front tarsus short and club-shaped; all other claws unmodified; ♂ genitalia (fig. 244) with proximal comb of cerci rudimentary ..... **nitida** Grzegorzek
Hants, Somerset; Ireland: Clare, Wicklow. v-vii, ix-x.
— Abdominal segments 2-4 not yellow 9
9 Wing length about 3.5mm; ♂ tarsal claws unmodified; ♂ genitalia (fig. 245) with cerci narrower than next species, the distal comb with fewer and stronger teeth ..... **rejecta** Edwards
Hants; Ireland: Kerry. v-vi.
— Wing length 3.5-4mm; all ♂ tarsal claws short and rounded; ♂ genitalia (fig. 246) with

cerci broader, the distal comb with more numerous and slender teeth
..... **dispecta** Dziedzicki
Hants, Heref, Kent, Somerset; Wales: Montgomery; Scotland: Argyll. vi, vii, ix-xi.

10 First two segments of antennal flagellum yellow; wing length about 4.5mm; ♂ with conspicuous projecting horn on face below antennae; ♂ with posterior tarsal claws of front legs club-shaped, all others unmodified; ♂ genitalia (fig. 247); ♀ sternum 8 short with a broad straight apical margin..... **nasuta** Haliday
Chesh; Wales: Glamorgan; Scotland: Moray; Ireland: Antrim, Down. v, ix-x.

— Only first segment of antennal flagellum yellow; wing length about 4.5mm; ♂ without facial horn; all tarsal claws large and broad with very fine pectinations; ♂ genitalia (fig. 248)..... **pectinunguis** Edwards
Scotland: Inverness. vi.
[N.B. *B. dubia* may run to here, but differs by characters given in couplets 3 and 6.]

11 Costa scarcely reaching beyond R5 (fig. 84); *r-m* long and almost in line with R5; wing length 4.5-5.5mm; ♂ tarsal claws large and unmodified (fig. 28); ♂ genitalia (fig. 249); ♀ sternum 8 with a row of spinous bristles at apex..... **trivittata** Meigen
Berks, Cambs, Chesh, Cumberland, Derby, Dorset, Gloucs, Hants, Heref, Kent, Lancs, Lincs, Norfolk, Notts, Shrop, Staffs, Suffolk, Westmorland, Yorks; Wales: Caerns, Denbigh, Flint, Glam, Merioneth; Scotland: Aberdeen, Arran, Inverness, Moray, Nairn, Perth, Ross & Crom, Sutherland, Tayside: Ireland: Antrim, Clare, Down, Kerry, Kildare, Laois, Leitrim, Sligo, Wicklow. v-vii, ix-x.

— Costa reaching distinctly beyond R5; *r-m* shorter, oblique and not approaching alignment with R5..... 12

12 Sc2 normally absent; Sc bare, ending well before base of Rs; Anal vein with macrotrichia; shoulders and large lateral triangles on tergites 2-4 of abdomen yellow; setae at apex of tibia almost in rows; ♂ tarsal claws unmodified; wing length 4-4.5mm; ♂ genitalia (fig. 250) with cerci small and without combs of spines; ♀ ovipositor very attenuate
..... **flaviventris** Strobl
Berks, Cambs, Chesh, Hants, Herts, Lancs, Westmorland, Yorks; Wales: Caerns, Merioneth; Scotland: Dumfries, Inverness, Moray, Perth, Sutherland; Ireland: Wicklow. v-vi, ix. Decaying wood.

— Sc2 present; Sc reaching to approximately base of Rs, usually bare; Anal vein usually bare; ♂ genitalia usually with well developed cerci bearing combs of spines; ♀ ovipositor short and contracted..... 13

13 First two segments of antennal flagellum usually all yellow..... 14

— Antennae all black, or at most with first flagellar segment partly yellow..... 15

14 Usually some yellow on shoulders and posterior margins of abdominal tergites, particularly in ♀; macrotrichia on entire posterior fork and its stem; wing length 4.5-5mm; all ♂ tarsal claws large, blunt and very finely pectinate; ♂ genitalia (fig. 251); ♀ sternum 8 well developed and rather pointed with about 8 strong bristles apically
..... **basalis** Meigen
Berks, Chesh, Derby, Devon, Gloucs, Hants, Heref, Herts, Kent, Lancs, Oxon, Shrop, Somerset, Surrey; Wales: Merioneth; Scotland: Arran, Inverness, Midlothian, Moray, Perth; Ireland: Antrim, Down, Killarney. v-vi, viii-ix.

— Thorax and abdomen all black; macrotrichia on posterior fork restricted to outer half of the fork veins; wing length 4-5mm; all ♂ tarsal claws unmodified; ♂ genitalia (fig. 252); ♀ sternum 8 reduced and blunt with six very strong bristles apically
..... **digitata** Lundström
Scotland: Inverness, Perth. vi.

15 Hind coxa distinctly black, usually yellow at extreme tip; macrotrichia well developed on all postradial veins, including Anal vein; Anal vein very long; setae occasionally present on Sc; wing length 4.5-5mm; ♂ tarsal claws all large, blunt and very finely pectinate, anterior claws slightly smaller than posterior; ♂ genitalia (fig. 253); ♀ sternum 8 well developed and rounded with about 6 strong bristles apically
..... **groenlandica** Staeger
Scotland: Inverness, Perth. vi.

— Hind coxa not distinctly black, but may be somewhat darkened; Anal veing bare and short as usual; wing length less than 4mm; ♂ tarsal claws small, not pectinate..... 16

[It is only possible to satisfactorily identify these last nine species (the *sciarina*-group) by

reference to the male genitalia, noting particularly the number and size of cercal combs, shape of dististyles, ventral process of basistyle and parameres. The characters given for *nigrofusca* and *moravica* should be used with caution, details of the claws are difficult to detect. Note that *trispinosa* and usually *gripha* have darkened hind coxae. The first flagellar segment of *brevicornis* is usually yellowish.]

16 Macrotrichia of posterior fork continuous from wing margin to just before fork (occasionally also in *nigricans* and *moravica*); wing length 3-3.5mm; all ♂ tarsal claws broad and rounded with an indistinct apical spur; ♂ genitalia (fig. 254) ..... **nigrofusca** Dziedzicki
Scotland: Moray, Ross & Crom. vii, ix.

— Macrotrichia of posterior fork usually sparse or absent near fork; at least some ♂ tarsal claws with distinct apical spur 17

17 ♂ tarsal claws of mid- and hind-leg and anterior claw of fore leg without distinct basal tooth, posterior claw of front leg broad and rounded; wing length 3-3.5mm; ♂ genitalia (fig. 255)..... **moravica** Lundström
Wales: Merioneth; Scotland: Inverness, Moray. v, ix.

— ♂ with posterior tarsal claw of fore (and sometimes mid-) leg broad and rounded with indistinct terminal spur (fig. 29), all other claws with large basal lobe and distinct fine apical spur. Rest of "*sciarina*-group"..... 18

18 ♂ genitalia (fig. 256); wing length 2.5-3mm..... **brevicornis** Zetterstedt
Hants, Kent, Lancs, Oxon, Sussex, Worcs; Wales: Merioneth; Scotland: Argyll, Inverness, Moray, Perth. iv-x.

— ♂ genitalia (fig. 257); wing length 3-4mm..... **gripha** Dziedzicki
Beds, Berks, Chesh, Cambs, Devon, Durham, Essex, Gloucs, Hants, Heref, Herts, Kent, Lancs, Norfolk, Northumb, Notts, Oxon, Suffolk, Surrey, Sussex, Warwick, Westmorland, Wilts, Worcs, Yorks; Wales: Merioneth, Powys; Scotland: Aberdeen, Argyll, Arran, Inverness, Perth, Roxburgh, Tayside; Ireland: Down, Galway, Kildare, Wicklow. i-vi, viii-xii.

— ♂ genitalia (fig. 258); wing length 2.5-3mm..... **griphoides** Edwards
Berks, Bucks, Cumbria, Heref, Herts, Kent, Somerset, Surrey, Worcs; Scotland: Moray, Ross & Crom; Ireland: Kerry. iv-x.

— ♂ genitalia (fig. 259); wing length 3-3.5mm..... **lundstromi** Landrock
Devon, Herts, Kent; Scotland: Inverness, Moray, Perth, Sutherland; Ireland: Galway, Kerry. i, iii, v-vi, x-xi.

— ♂ genitalia (fig. 260); wing length 3.5-4mm..... **nigricans** Dziedzicki
Kent, Norfolk, Notts, Westmorland; Scotland: Aberdeen, Inverness, Moray; Ireland: Louth. v-x.

— ♂ genitalia (fig. 261); wing length 3.5-4mm ..... **sciarina** Staeger
Beds, Hants, Heref, Herts, Kent, Norfolk, Suffolk; Scotland: Inverness, Stirling. i, v-vii, ix-x.

— ♂ genitalia (fig. 262); wing length about 3.5mm..... **trispinosa** Edwards
Berks, Bucks, Cornwall, Hants; Wales: Brecon, Caerns; Scotland: Inverness, Moray; Ireland: Down, Kildare, Tyrone, Wicklow. iv-x.

Tribe Leiini

A tribe of less than 20 genera, most of which contain few species. Three genera that occur in the Holarctic have not been found in Britain. These are *Novakia, Greenomyia* and *Neoclastobasis. Novakia* Strobl is very similar to *Tetragoneura* Winnertz, but differs in having vein *r-m* extended back almost to the wing base and is therefore several times longer than R1, in having a short fusion of R1 and R4 + 5 just beyond *r-m* (*Tetragoneura* may show this fusion, but usually has a short R4 present enclosing a very narrow small cell), in having the dorsum of the thorax uniformly covered in short hairs, while *Tetragoneura* has two narrow median anterior bare stripes and narrow lateral bare stripes, and in having the antennae short and stout, about as long as the head, while they are more than twice as long in

Tetragoneura. Novakia is known from one Palaearctic, one Nearctic and one Neotropical species. *Novakia* has recently been associated with genera that are here included in the Sciophilini (Papavero, 1978). *Greenomyia* Brunetti is similar to *Leia,* but the ocelli are remote from the eye margin, the Median and posterior forks are complete (anterior vein of posterior fork slightly interrupted in one species) and the whole of the wing tip is usually dark. In some ways it is like *Rondaniella,* but Sc2 is present, the Costa does not extend beyond R5, *r-m* is double the length of R1. *Greenomyia* is known from 4 Palaearctic, 2 Oriental and one undescribed Nearctic species. *Neoclastobasis* and *Clastobasis* were considered as a separate tribe, Clastobasini, but this group is now regarded as belonging to the Leiini. *Neoclastobasis* is known from two Palaearctic species and has the whole of the wing tip dark, the anterior vein of the posterior fork neither connected at the base nor reaching the wing margin, the posterior vein of the Median fork not reaching the wing margin, lateral ocelli remote from the eye margin, palps very long—about as long as the antennae. Matile (1978) provides a key to genera.

One other genus, *Allactoneura* Enderlein, which has been reared from stored products in the Old World tropics and has probably been spread around the tropics by human agency, may appear in Britain. With its lack of strong prothoracic bristles, flattened back to the head, distinct orbital bristles and antennae inserted above the middle of the head, it may run to the subfamily Manotinae. However, it is generally regarded as belonging to the Leiini. Apart from the above characters the dorsum of the thorax, both surfaces of the abdomen and the upper surface of the anterior wing veins are covered with scales. *r-m* is remarkable in having a long horizontal section that fades away towards the wing base, while the connection with the Median veins is through a short vertical section. The veins of the posterior fork are separate to the wing base. The larvae are probably saprophagous rather than fungivorous.

Little is recorded of the adult activity of the members of this tribe, but some genera, such as *Leia,* may be found in drier habitats and higher above the ground than is usual in the family. Species have been reared from a variety of habitats, including fungi, fungus infected wood, other vegetable matter and the nests of birds and mammals. Some tropical species have been associated with stored products.

Key to genera

1 Sc distinctly ending in Costa (fig. 49) (faint apically in some *Leia* spp); pleurotergites hairy; R4 absent; no hind tibial comb 2

— Sc ending free or in R 3

2 R1 over twice as long as *r-m,* which is rather oblique; Sc2 absent; anterior branch of Median fork often detached at base; lateral ocelli far from eye margin; Costa produced beyond apex of R5; stem of Median fork much longer than *r-m;* apex of wing dark; anterior branch of posterior fork disconnected at base, apparently arising from wing base as a fold in the wing membrane ..... **RONDANIELLA** Johannsen (p.64)

— R1 shorter than *r-m,* which is horizontal (fig. 49); Sc2 present; anterior branch of Median fork complete at base or almost so; lateral ocelli rather variable in position, but usually close to eye margin; Costa ending at apex of R5; stem of Median fork not longer than *r-m;* wings usually with a subapical fascia; anterior branch of posterior fork usually narrowly disconnected at base, but originating well beyond wing base ..... **LEIA** Meigen (p.64)

3 Hind tibial comb present (fig. 44); bristles of pronotal lobes short and dark, even the longest not nearly reaching mid-line of head; (figs. 22-23); postradial veins almost as strongly developed as radial veins, dark; no bristles at base of posterior coxae; dorsum of thorax uniformly covered with short dark bristles; pleurotergites hairy; R4 absent; Sc very short, ending in Radius; lateral ocelli remote from eye margin; R1 little if any longer than *r-m*; stem of Median fork about half as long as fork veins ..... **MEGOPHTHALMIDIA** Dziedzicki (p.66)

— Hind tibial comb absent (figs. 40,45); bristles of pronotal lobes including long pale bristles, some of which reach to beyond the mid-line of the head; postradial veins usually pale and weak; bristles present at base of posterior coxae; dorsum of thorax usually with narrow bare median and lateral stripes 4

4 Lateral ocelli touching eye margin; R1 usually about twice as long as *r-m*, sometimes shorter, sometimes longer; R4 absent; stem of Median fork short, about 0.25 length of fork; posterior fork with long stem; pleurotergites hairy or bare; Sc long ending free or in R (fig. 87)..... **DOCOSIA** Winnertz (p.68)

— Lateral ocelli remote from eye margin (fig. 12); pleurotergites bare; R1 little if any longer than *r-m;* stem of Median fork longer, about half as long as the fork veins; R4 present, absent or obliterated by a fusion of R1 and R4 + 5..... 5

5 Sc very short and ending free; posterior fork with long stem, the fork beyond base of *r-m* (fig. 86) ..... **TETRAGONEURA** Winnertz (p.66)

— Sc long and ending in R; stem of posterior fork very short or absent, the veins forking at wing base (fig. 85)..... **ECTREPESTHONEURA** Enderlein (p.67)

Genus **Rondaniella** Johannsen
(Figs. 34, 263)

A very small genus. Within Europe, apart from the single species included here, a second species has been recognised at various times, but this is generally regarded as a synonym. Outside Europe there is one Nearctic species that occurs as far south as Mexico and one Oriental species. While the Oriental species would seem to be a valid species, we can see no reliable differences between North American and European specimens and the status of these two species needs investigations.

Adult activity is unrecorded, but the species has been bred frequently from a variety of fungi.

— Wing length 3-4mm; dorsum of thorax yellow with three dark stripes which may be broad and fused; coxae femora and tibiae mainly yellow, hind coxae black tipped, tarsi darkened; abdomen with a variable amount of yellow at the base of tergites 1-4; genitalia mainly yellow; ♂ genitalia (fig. 263)..... **dimidiata** Meigen

Beds, Berks, Bucks, Chesh, Essex, Hants, Heref, Herts, Kent, Staffs, Surrey, Sussex; Wales: Brecon. ii-xii. From Armillaria, Bjerkandera, Boletus, Coriolus, Fomes, Grifola, Heterobasidion, Hypoxylon, Pholiota, Pleurotus, Polyporus, Russula, Sparassis, Stereum.

Genus **Leia** Meigen
(Figs. 41, 49, 60-61, 264-272)

This is by far the largest genus of the tribe, with over 130 species distributed throughout the world. The greater number of species are described from South America, but the genus is well represented in the northern hemisphere with about 20 species in Europe.

The adults may be found in the foliage of trees as well as lower vegetation and are one of the groups that frequently occurs on windows. Species have been bred from fungi, from decaying wood and from the nests of birds and mammals. One immigrant species is included in the key, although still only known from one record.

Key to species

1 Halteres black; wings with clouds over base of cell R5, below posterior fork and before apex of wing; thorax orange with black marks at base of wings and centre of posterior margin of thorax; wing length 3.5-4mm; ♂ genitalia (fig. 264)..... **arsona** Hutson

London. vi. In rotting root ginger (Zingiber).

— Halteres white 2

2 A distinct dark spot present at base of cell R5 3

— No dark spot at base of cell R5 (but see *piffardi* Edwards, couplet 8) 4

3 Without an isolated dark spot at the tip of R5; a fairly broad, diffuse preapical fascia crossing wing; dorsum of thorax with at most reduced lateral stripes; scutellum all yellow; wing length 3.5-4.5mm; ♂ genitalia (fig. 265); terminal segment of female cercus large and setose. ..... **bifasciata** Gimmerthal

Chesh, Hants, Somerset, Yorks. iv-v, vii-viii. From nest of Red Squirrel (Sciurus vulgaris); *also under bark of oak* (Quercus).

— A sharply defined spot present at the tip of vein R5 in addition to strongly marked fairly narrow, irregular preapical band crossing wing; dorsum of thorax with distinct stripes including median stripes; scutellum with dark central stripe continuing onto postnotum; wing length 4-6mm; ♂ genitalia (fig. 266); terminal segment of female cerci very small. ..... **winthemi** Lehmann

Beds, Cambs, Chesh, Devon, Dorset, Glos, Hants, Herts, Lancs, Oxon, Staffs, Sussex, Yorks; Wales: Gwent, Merioneth, Powys; Scotland: Inverness, Moray; Ireland: Antrim, Down, Mayo. iii, v-xi.

4 Abdomen mainly or all uniformly orange-yellow; femora all yellow, or black only at extreme tip 5

— Abdomen with black bands on tergites; hind femora with distinct black apical bands. . . . 6

5 First abdominal tergite all orange; no distinct black mark at base of fork of axillary veins; frequently with small weak cloud below posterior fork; wing length 4-5mm; ♂ genitalia (fig. 267); terminal segment of ♀ cercus elongate, deeply sunk into penultimate segment and with a dark patch at its base (fig. 60). . . . . **fascipennis** Meigen

Bucks, Cambs, Chesh, Cumberland, Devon, Dorset, Essex, Gloucs, Hants, Heref, Herts, Hunts, Kent, Lancs, Middx, Oxon, Somerset, Surrey, Sussex, Yorks; Wales: Merioneth, Monmouth, Powys; Scotland: Argyll, Arran, Inverness, Perth; Ireland: Down, Dublin, Galway, Leitrim, Louth, Waterford. v-x.

— First abdominal tergite narrowly black at tip; a distinct black mark at base of fork of axilliary veins; no cloud below posterior fork; wing length 4-5mm; ♂ genitalia (fig. 268); terminal segment of ♀ cercus small rounded and yellow (fig. 61) ..... **crucigera** Zetterstedt

Berks, Derby, Essex, Gloucs, Heref, Hunts, Kent, Oxon, Suffolk, Surrey; Scotland: Perth, Ross & Crom; Ireland: Wicklow. iv-ix.

[N.B. This species may be a synonym of *L. subfasciata* Meigen.]

6 Black abdominal tergal bands not reaching sides of segments, but tending to form a continuous longitudinal stripe; black mark at base of fork of axillary veins; distinct black mark on postnotum and lower part of pleurotergites; black tips to hind femora sometimes very narrow; wing length 4.5-6mm; ♂ genitalia (fig. 269); ♀ ovipositor not seen ..... **subfasciata** Meigen

Cambs, Durham, Heref, Westmorland; Wales: Monmouth; Scotland: Aberdeen, Inverness, Perth. v-vii, x.

— Black abdominal tergal bands reaching sides of segments, not tending to form a longitudinal stripe; ♂ dististyle not trifid 7

7 No black mark at base of fork of axillary veins; cross-vein *r-m* usually more than twice as long as R1; wing length 4.5-5.5mm; ♂ genitalia (fig. 270); terminal segment of ♀ cercus large and setose. ..... **cylindrica** Winnertz

Beds, Bucks, Hants, Kent, Lancs, Middx, Norfolk, Notts, Staffs, Suffolk, Surrey, Sussex, Yorks; Wales: Merioneth; Scotland: Aberdeen, Inverness, Moray. vii-x.

— Black mark at base of fork of axillary veins (fig. 49); cross-vein *r-m* less than twice as long as R1. 8

8 Colour very variable, from largely black thorax and abdomen to largely pale, even in the palest specimens (var. *fasciola* Meigen) bands on abdominal tergites usually broader in middle than at sides (especially tergite 2); tergite 1 distinctly angled at apex; no clouds on wing apart from the subapical fascia; wing length 4-6mm; ♂ genitalia (fig. 271); ♀ sternum 8 evenly convex dorsolaterally. ..... **bimaculata** Meigen

Beds, Berks, Cambs, Chesh, Dorset, Essex, Hants, Heref, Herts, Kent, London, Middx, Norfolk, Surrey, Sussex, Warwick, Yorks; Wales: Merioneth; Ireland: Down. v-x. Calocera, Collybia, Hebeloma, Russula *(decaying).*

[N.B. There are very few intermediates between typical *bimaculata* and the variety *fasciola*. In the British Museum (Natural History) 18 specimens have an all black mesonotum without a trace of differentiable stripes, 28 have an all pale mesonotum without a trace of stripes and six are intermediate in showing a variable amount of striping on the mesonotum. These six include specimens bred from a sample that includes all dark specimens.]

— Thorax always pale; black bands of abdominal tergites usually somewhat broader at sides (especially tergite 2); tergite 1 smoothly rounded apically; usually a more or less distinct cloud below posterior fork and occasionally a slight cloud at proximal end of *r-m;* wing length 3.5-5mm; ♂ genitalia (fig. 272); ♀ sternum 8 emarginate dorso-laterally..... **piffardi** Edwards

Berks, Dorset, Hants, Herts, Kent. ii-iii, vi, viii. From nests of Aves: Magpie (Pica pica) *and Blackbird* (Turdus merula) *and Mammalia: Grey Squirrel* (Sciurus carolinensis) *and Red Squirrel* (S. vulgaris).

Genus **Megophthalmidia** Dziedzicki
(Figs. 22-23, 44, 273)

About four species are known in this genus in the western Palaearctic and one in Japan. One is known from North America and about seven from South America. Most Holarctic species are darker and smaller than the species recorded here. Nothing is known of their life history.

— Stout orange species, with short dense black bristles; wing length 3-4mm; antennae stout; mouthparts not noticeably elongate; wings yellowish with darkened apex; posterior fork before base of stem of Median fork; ♂ genitalia (fig. 273)
..... **crassicornis** Curtis

Cambs, Cornwall, Devon, Hants, Heref, Middx, Somerset, Staffs, Surrey, Sussex; Ireland: Down. vi-ix.

Genus **Tetragoneura** Winnertz
(Figs. 12, 45, 86, 274)

A widespread genus of about 60 species, but only four species described from the Palaearctic region. Over half the described species are from the Neotropical region, 14 from New Zealand, about 10 in the Nearctic region and a few from Australia. Of the Palaearctic species, two occur in Europe and two in Japan. The single species occuring in Britain is one of the most common woodland species. The only reliable characters so far published for separating the Palaearctic species are in the male genitalia.

The larvae live in a mucilaginous tube among bark encrusting fungi on small fallen branches. A slight dry cocoon is spun for pupation.

— Small black species, wing length 2.5-3mm; head, and thorax and abdomen black with white bristles; pedicel of antennae orange, rest black; haltere yellow; base of hind and mid-coxae and ventral surface of femora dark, rest of legs yellow (these colour characters slightly variable); 2nd palpal segment slightly swollen; R4 present or base of Rs fused with R1; ♂ mid-tibia without sensory area; ♂ genitalia (fig. 274)
..... **sylvatica** Curtis

Berks, Chesh, Cumberland, Devon, Dorset, Essex, Gloucs, Hants, Heref, Herts, Kent, Lancs, Middx, Norfolk, Notts, Oxon, Shrop, Suffolk, Surrey, Sussex, Warwick, Westmorland, Wilts, Worcs, Yorks; Wales: Brecknock, Caerns, Denbigh, Flint, Merioneth; Scotland: Banff, Inverness, Moray; Ireland: Down, Galway, Kerry, Killarney, Wicklow. v-x. From Poria.

Genus **Ectrepesthoneura** Enderlein
(Figs. 40, 85, 275-277)

This is an Holarctic genus of six European and an uncertain number of Nearctic species. Two species have been described from Japan, but the published details strongly suggest that they belong to the family *Sciaridae*. Some authors (e.g. Vockeroth, 1980) have suggested that this genus is not differentiable from *Tetragoneura*, but in the Palaearctic the two groups are distinct and so they are separated here in the absence of any firm synonymy. The inclusion of four recently described European species in this genus might enable a more valid re-appraisal of the status of this genus. Chandler (1979b) discusses the genus, including some of the Nearctic species and provides a key to the European species published so far. Most of the species are only satisfactorily separated by reference to the male genitalia, which are very distinct, but *E. gracilis* Edwards is distinct in being a more elongate species with slight clouds at the wing tips, across the middle of the wing and behind the posterior fork. *E. gracilis* also has the post-radial veins strongly developed, anal vein bare, R5 somewhat sinuous, R1 about twice length of *r-m*, etc. *E. referta* Plassmann is very similar to the species discussed below. One other species was not seen during the present study, while its description was awaiting publication by Plassmann. This is another genus in which so few specimens have been seen of most of the species that it has not been possible to test the reliability of many of the characters included here. They are all small, dark species with a wing length of 2.5-3.5mm and a sensory area near the base of the mid-tibia in the male.

Two species have been reared from dead wood.

Key to species

1 Femora without black markings at base on ventral surface; hind femora only weakly darkened at apex; Costa not reaching beyond half distance from R5 to apex of anterior branch of Median fork; bare stripes of mesonotum broader than the areas of bristles that separate them; 1st and 2nd visible palpal segments swollen, but not greatly, 1st shorter than 2nd (penultimate) segment; preapical comb of front tibia pale; tibial spurs pale; thorax and abdomen uniformly black; pedicel and base of 1st flagellar segment pale, rest dark; anterior bristles of hind tibia divided into basal and apical groups, basal group of larger bristles with a distinctly large dark last bristle, apical group of uniformly weaker bristles; ♂ genitalia (fig. 275) ..... **pubescens** Zetterstedt
Scotland: Inverness. v.

— Femora of mid and hind legs with dark markings at base on ventral surface; hind femur distinctly black at apex; Costa reaching more than half distance from R5 to apex of anterior branch of Median fork; bare stripes of mesonotum narrower, not broader than the area of bristles that separates them, basal two of three visible palpal segments very swollen, equal in length 2

2 Preapical comb of front tibia usually dark; tibial spurs usually dull brown; thorax and abdomen uniform dull reddish black, sometimes slightly pale at humeri; female abdomen often with pale apical bands; pedicel and 1st flagellar segment yellow, rest dark; anterior bristles of hind tibia narrowly divided into basal and apical groups, the last bristle of the basal group being distinctly larger and usually paler than others; ♂ genitalia (fig. 276)..... **hirta** Winnertz
Berks, Cambs, Devon, Hants, Heref, Herts, Kent, Lancs, Middlx, Norfolk, Oxon, Surrey, Sussex; Scotland: Perth; Ireland: Down. v-x. From dead wood, sometimes associated with encrusting fungi, e.g. Coriolus.

— Preapical comb of front tibia pale; tibial spurs pale; ♂ tergites 1-4 with pale apico-lateral areas, humeri slightly pale, rest of thorax and abdomen dark reddish-brown; pedical, 1st and basal part of 2nd flagellar segments of antennae yellow, rest dark; anterior bristles of hind tibia widely separated into two groups without any distinctly larger bristles; ♂ genitalia (fig. 277)..... **colyeri** Chandler
Hants, Sussex; Scotland: Dunbarton. vi-vii.

Genus **Docosia** Winnertz
(Figs. 87, 278-286)

A genus of about 25 Palaearctic, 15 Nearctic and 2 Neotropical species. The Palaearctic species are being revised by Lastovka & Matile (in prep.). All species are dark with pale hairs and with a similar general appearance to species of *Ectrepesthoneura* and *Tetragoneura.* Adult activity is unrecorded and most species are generally uncommon on the wing.

One species has been reared from a wide variety of fungi. On one occasion a single specimen of this species emerged from the nest of a Short-tailed Vole *(Microtus agrestis),* but it is possible that the larva did not develop there, but only pupated there. This species differs markedly from the other British species, especially in the female ovipositor. Another species has been reared from the disused nests of a variety of birds. In some cases these nests had been taken over for the winter by small rodents. A third species has been bred from fungi and from rotting wood. The larvae of the fungus feeders are unusual in the Sciophilinae in living actually inside the fungus and usually in fungi that are in an advanced state of decay. The larvae in birds' nests are unusual in being free-living, without a mucilaginous tube and are believed to be saprophagous. Pupation takes place in a dense tough cocoon covered with dirt particles.

Key to species

1 Sc setose and ending free; pleurotergites hairy; wings clear or evenly brown tinged, especially in ♀; R1 almost 3-5 times as long as *r-m;* wing length 2-4.5mm; ♂ genitalia (fig. 278); last segment of ♀ cercus large laterally flattened and heavily sclerotised ..... **gilvipes** Haliday
Beds, Berks, Bucks, Cambs, Chesh, Essex, Hants, Heref, Herts, Kent, Lancs, Lincs, London, Notts, Oxon, Suffolk, Surrey, Sussex, Yorks; Wales: Merioneth; Scotland: Banff; Ireland: Down, Roscommon. i-v, vii, x. From Aleuria, Amanita, Armillaria, Auricularia, Bjerkandera, Boletus, Clitocybe, Coprinus, Coriolus, Hypholoma, Lactarius, Lepista, Pepiza, Piptoporus, Polyporous, Polystictus, Russula, Scleroderma, Tricholoma, Ustulina. *Also from nest of* Microtus *(Mammalia Cricetidae).*

— Sc bare or almost so, and ending in R; R1 usually less than three times as long as *r-m;* last segment of ♀ cercus not laterally flattened and heavily sclerotised 2

2 Pleurotergites bare 3

— Pleurotergites haired 5

3 Fore coxae dark only at base, other coxae with apical half pale; macrotrichia of posterior fork hardly continuing back before fork; dorsal margin of hind femur pale 4

— All coxae dark, at most pale at the extreme base; macrotrichia of posterior fork continuing back for almost half the length of its stem; hind femur with dorsal and ventral margins dark, so that only a small paler area is left laterally, which may be inconspicuous or even absent; 4-6 dorsal and 9-13 anterior bristles on hind tibia; apical half of wing more or less indistinctly clouded; hairs on thorax long and white; wing length 3-4.5mm; ♂ genitalia (fig. 279) ..... **fuscipes** Roser
Devon, Hants, Heref; Wales: Merioneth, Caerns. iii-vi.

4 Hind femur dark at base and tip only; apical half of wing slightly darkened; hairs on dorsum of thorax long and white; about 9 dorsal and 15-16 anterior bristles on hind tibia; wing length about 3.5mm; ♂ genitalia (fig. 281) ..... **setosa** Landrock
Yorks; Wales: Powys; Scotland: Perth. v.

— Hind femur with base, apex and entire ventral edge dark; wings quite clear; hairs on dorsum of thorax short and slightly yellow; 7 dorsal and 13-14 anterior bristles on hind tibia; wing length about 3.5mm; ♂ genitalia (fig. 280) ..... **sp. indet.**

Yorks; Wales: Powys. vi.

[This species is to be described in a forthcoming revision of the genus by Lastovka et al.]

5 Hind femur completely black 6

— Hind femur at least partly yellow 7

6 Entire wing slightly brown tinged, especially Costal region; coxae ochreous; bristles of dorsum of thorax short and darker, supra-alar bristles especially dark; wing length 2.5-3.5mm; ♂ genitalia (fig. 282) ..... **fumosa** Edwards

Chesh, Cornwall, Gloucs, Herts, Oxon, Surrey, Sussex. iv-ix. From nest of Aves: Corvus *(Corvidae), "finch" (Fringillidae),* Prunella *(Prunellidae),* Turdus *(Turdidae).*

— Wings clear; coxae black; bristles of dorsum of thorax very pale and long, with white supra-alar bristles; wing length 2.5-3.5mm; ♂ genitalia (fig. 283) ..... **carbonaria** Edwards

Oxon, Norfolk, Suffolk. iv-v.

7 Coxae largely dark; pleurotergal hairs very short; hind femur with tip and whole of ventral surface dark, the dark area sometimes extended so that pale area inconspicuous; wing length 3.5-4.5mm; ♂ genitalia (fig. 284) ..... **sciarina** Meigen

Berks, Cambs, Devon, Gloucs, Hants, Heref, Herts, Kent, Suffolk, Surrey, Wilts; Wales: Caerns, Powys; Scotland: Perth. iv-vi.

— Coxae yellow; pleurotergal hairs long as usual 8

8 Hind femur at most with slightly blackened tip; Sc usually with at least one macrotrichia; wing length 3-4mm; ♂ genitalia (fig. 285) ..... **pallipes** Edwards

Beds, Hunts, Norfolk, Suffolk; Wales: Glamorgan, Scotland: Inverness, Moray. vii-ix.

— Hind femur darkened at base beneath and at tip; Sc bare; wing length 3.5-4mm; ♂ genitalia (fig. 286) ..... **moravica** Landrock

Berks, Devon, Heref, Herts, Lancs, Oxon, Norfolk, Suffolk; Wales: Flint, Powys. v-vii.

Subfamily Manotinae

A small subfamily of four genera, only one of which occurs in the Palaearctic. Tuomikoski (1966b) has discussed the relationships of this subfamily and the genera included in it. *Allactoneura* was included when the subfamily was first described, but is now considered to belong to the Leiini (Sciophilinae). Should this genus occur in Britain, possibly in tropical plant products, it will probably run to this subfamily in the key, but it is discussed under Leiini (p.62).

— Sc ending free; no macrotrichia on wing membrane; posterior fork with short stem; prothorax forming a broad, shield-like plate covered with dense, short setae; *r-m* in line with R5, very short and near base of wing ..... **MANOTA** Williston (p.69)

Genus **Manota** Williston
(Figs. 13, 287)

A genus of about 15 species including one Palearctic species and an unnamed Nearctic species. Most of the described species are from Africa, but many species remain to be described from here and elsewhere in the tropics. In temperate areas it is rarely found and there are few records of the European species. It has been collected at light and by sweeping the lower branches of a larch tree *(Larix europea).* A single specimen is recorded (Chandler, 1978) as emerging from rotten beech wood bearing a Myxomycete, but any association requires confirmation.

— Face yellow; mesonotum black with humeri and prothorax yellow; hind femur yellow, darkened at base; basal antennal segments dark with yellow basal rings, rest of antennae uniformly dark; 4 scutellar bristles; wing length 2.5-3mm; ♂ genitalia (fig. 287) ..... **unifurcata** Lundström

Berks, Cambs, vii.

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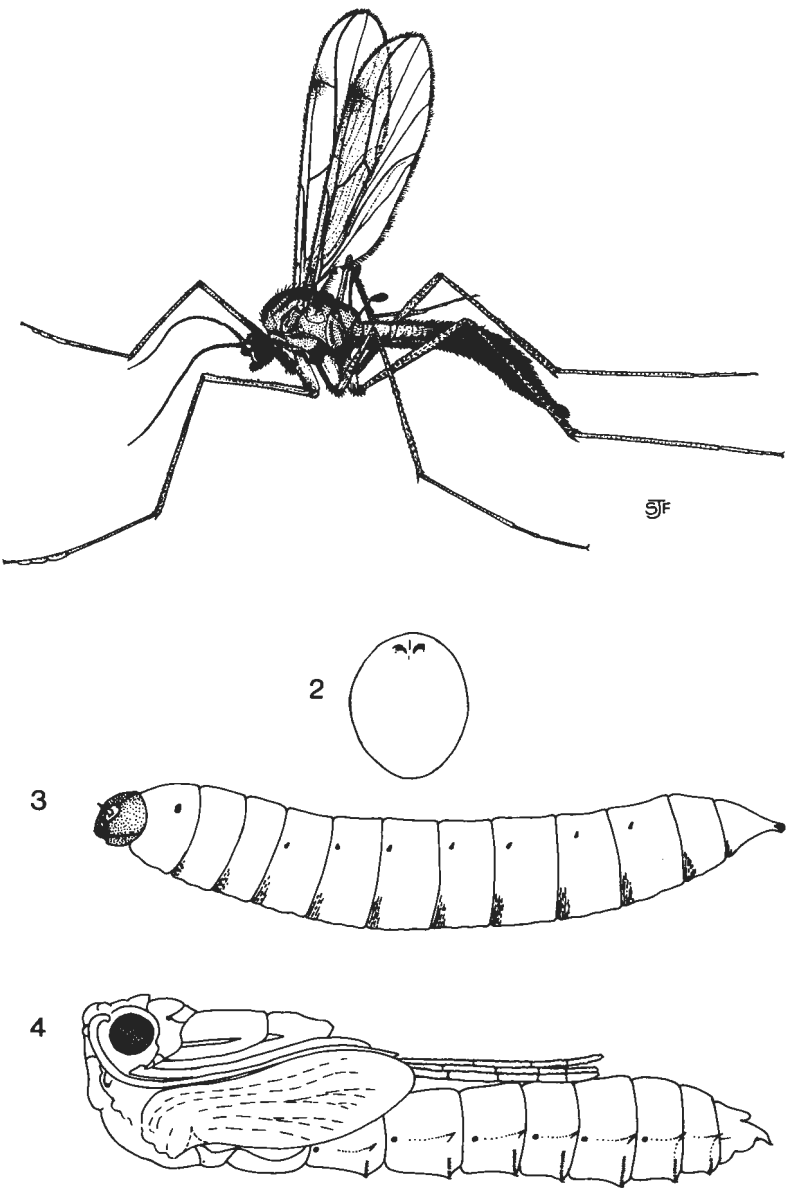
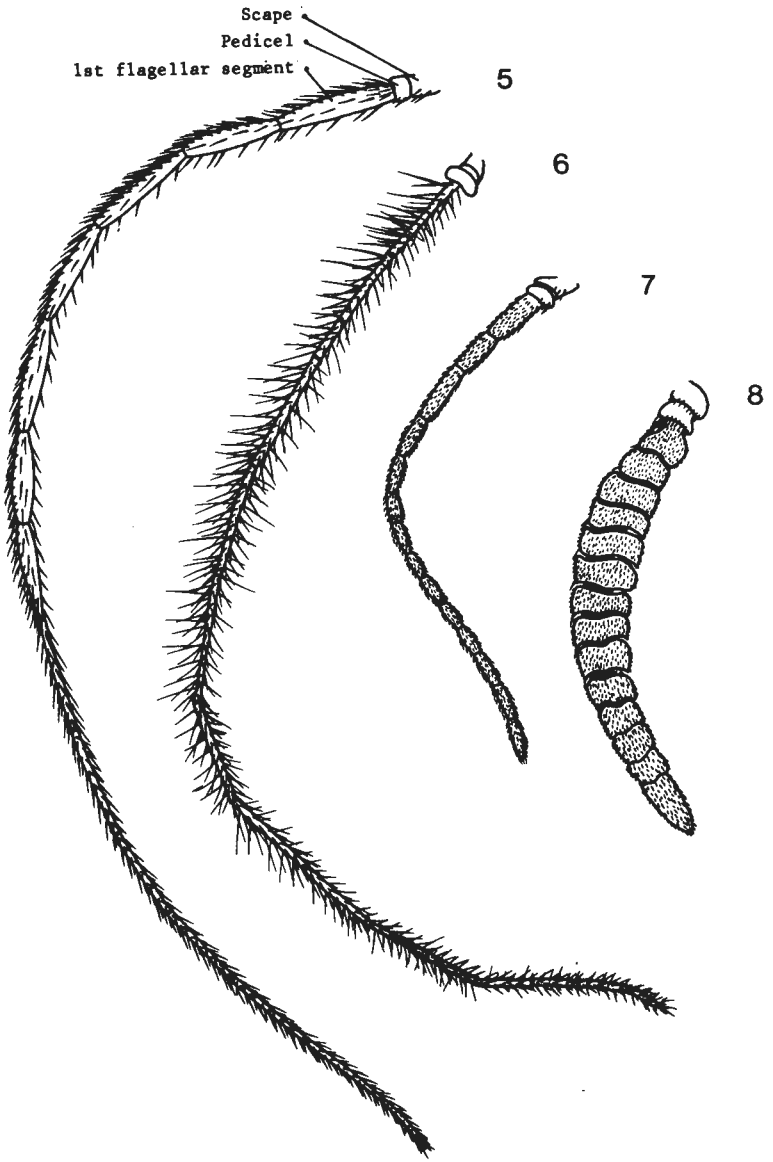
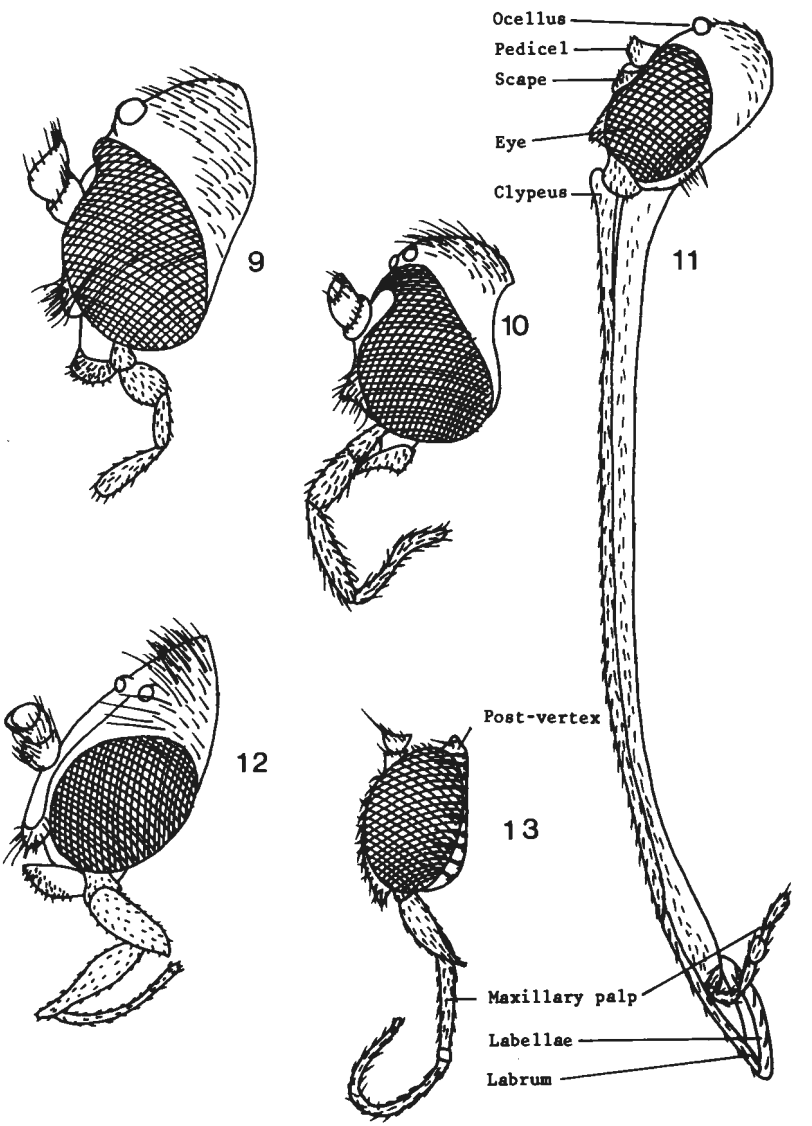


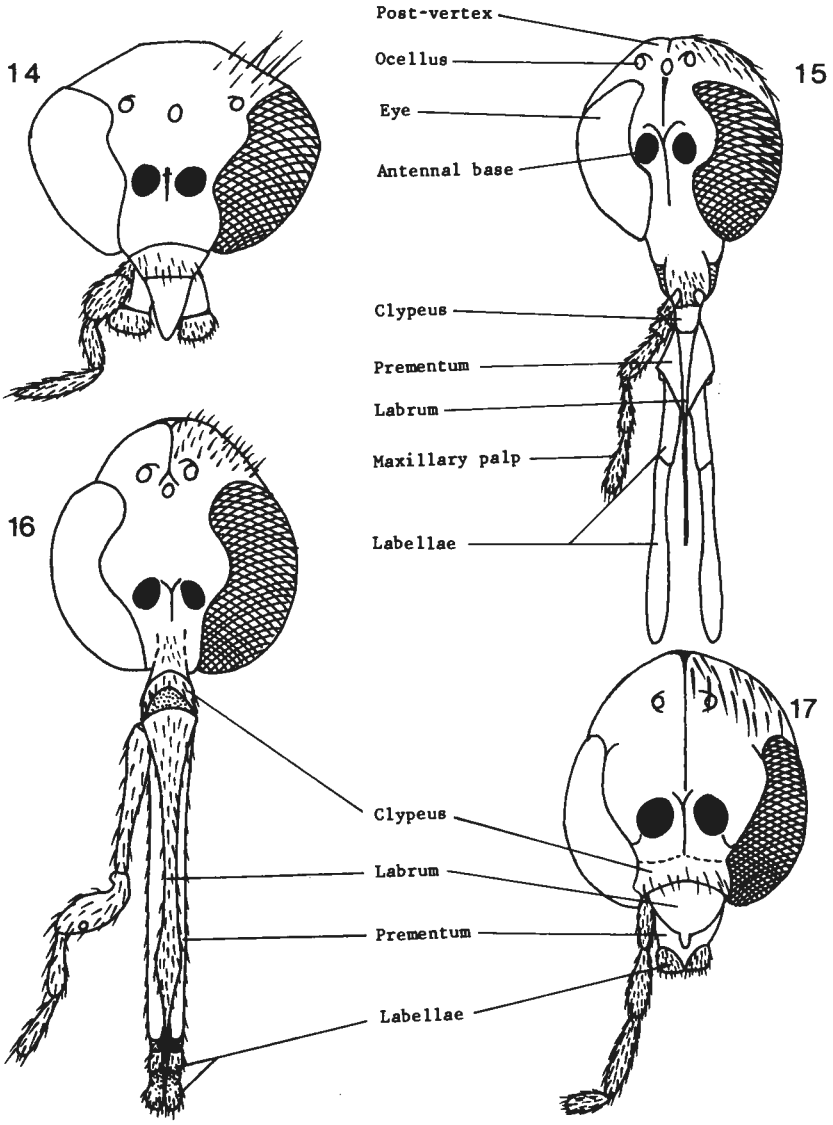
Figs 1-4. 1, adult ♀ *Bolitophila cinerea* (drawn by S. Falk). 2, egg of unidentified Mycetophilid. 3, 4th instar larva of *Bolitophila cinerea*. 4, pupa of *B. occlusa*.



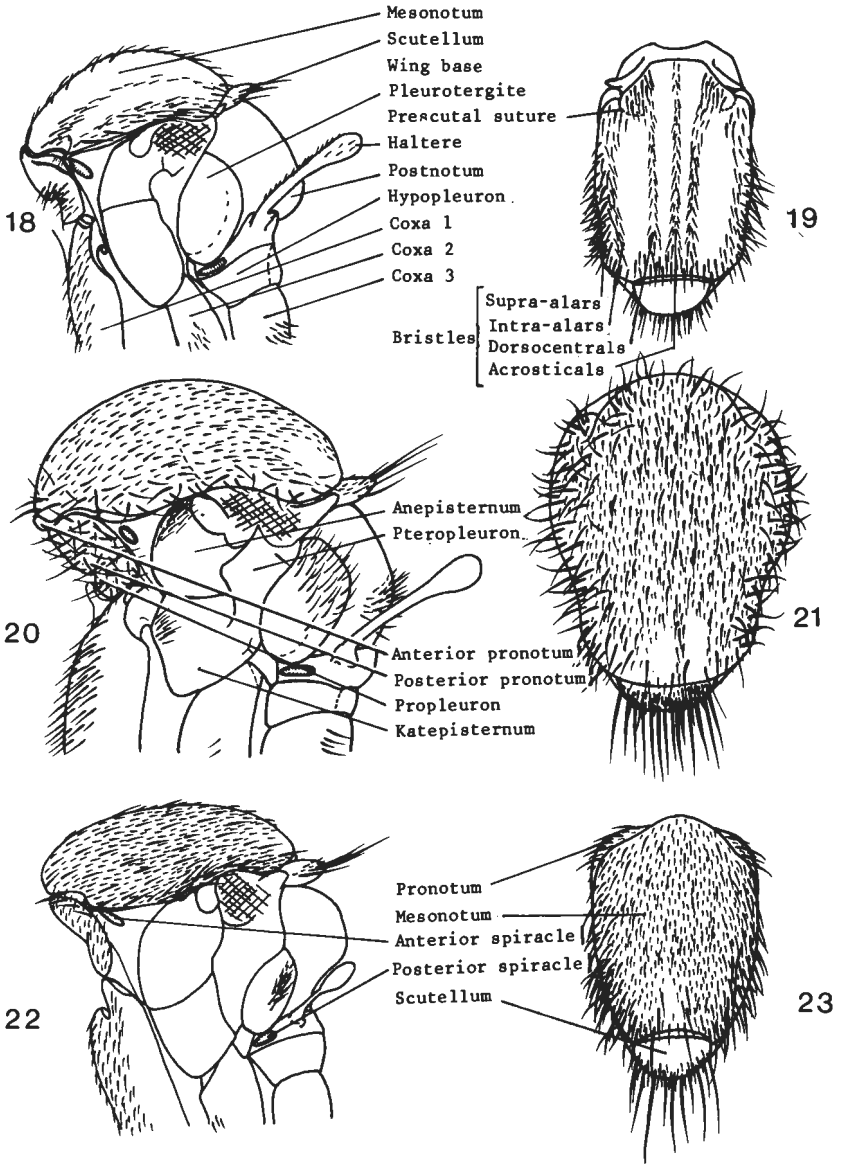
Figs. 5-8. Antennae. 5, *Macrocera parva* ♂. 6, *Bolitophila saundersii* ♂. 7, *Boletina basalis* ♂ 8, *Cerotelion lineatus* ♂.



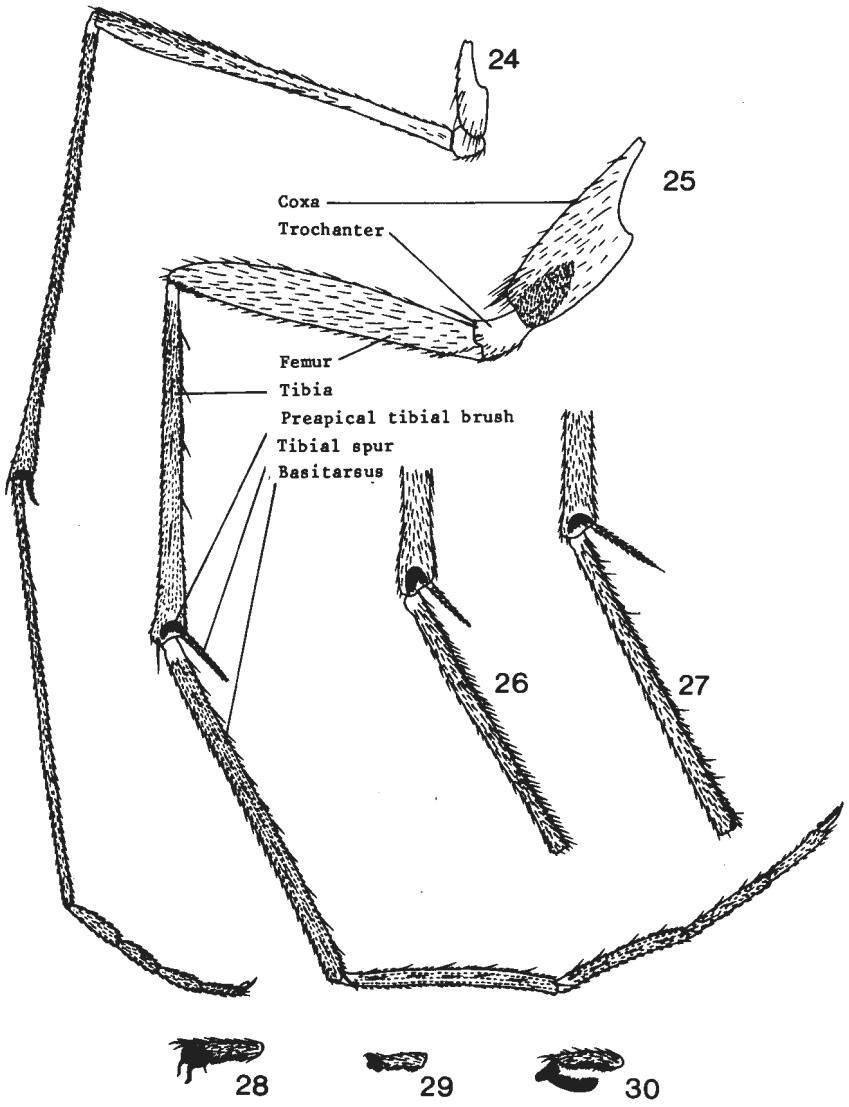
Figs. 9-13. Heads, lateral view. 9, *Symmerus annulatus* ♂. 10, *Diadocidia ferruginosa* ♂. 11, *Gnoriste bilineata* ♂. 12, *Tetragoneura sylvatica* ♂. 13, *Manota defecta* ♂ (Caribbean species).



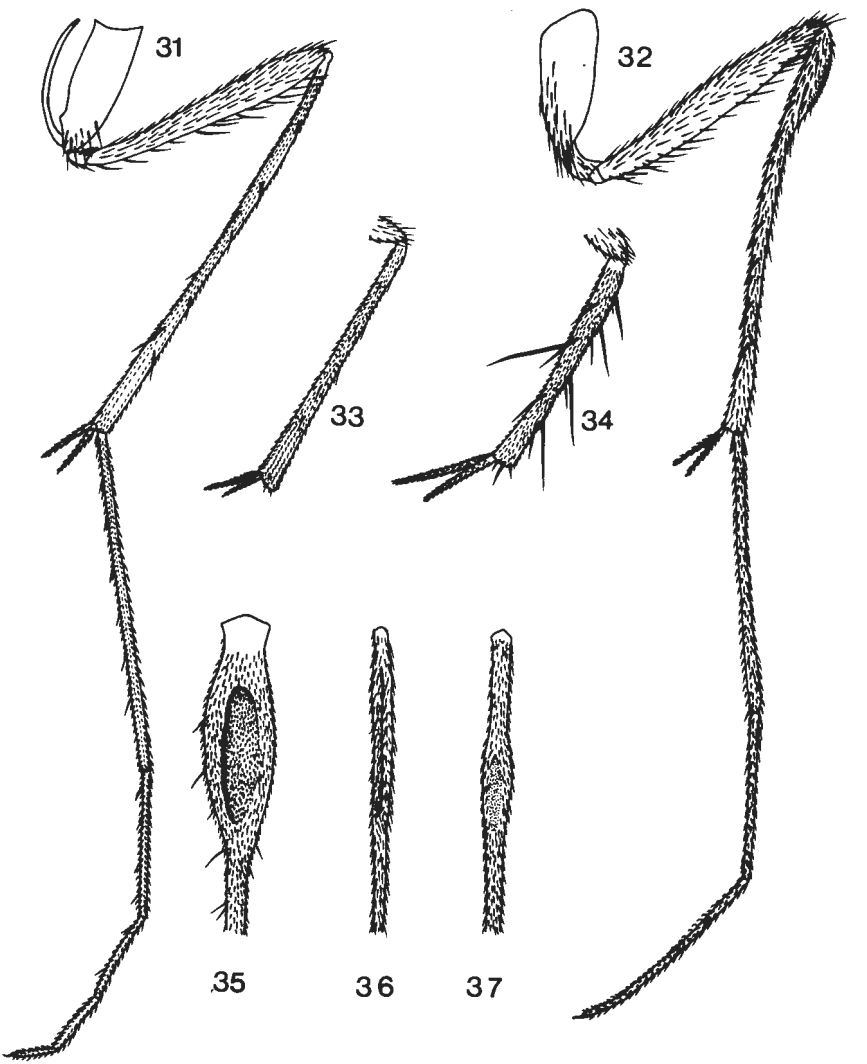
Figs. 14-17. Heads, anterior view. 14, *Bolitophila hybrida* ♀. 15, *Asindulum nigrum* ♂. 16, *Antlemon servulum* ♂. 17, *Mycomya incisurata* ♀.



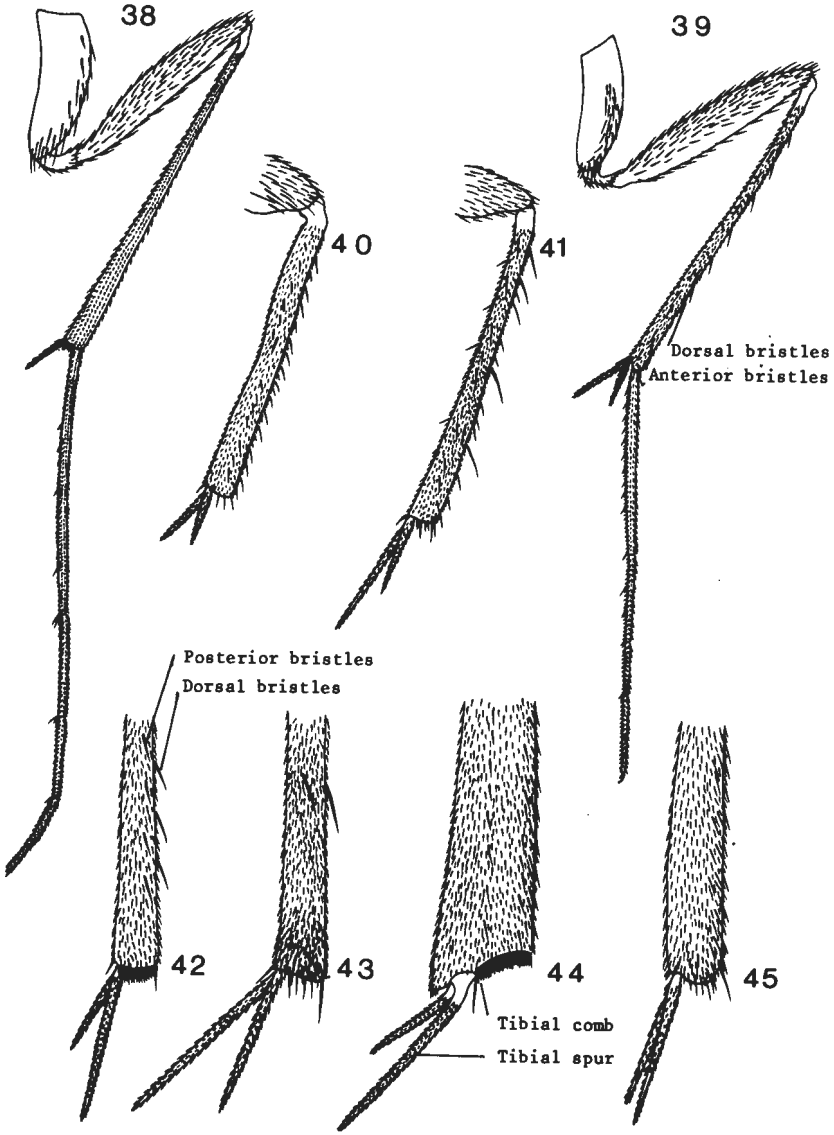
Figs. 18-23. Thorax (left: lateral view; right: dorsal view). 18-19, *Orfelia (Urytalpa) atriceps* ♂. 20-21, *Sciophila rufa* ♂. 22-23, *Megophthalmidia crassicornis* ♂.



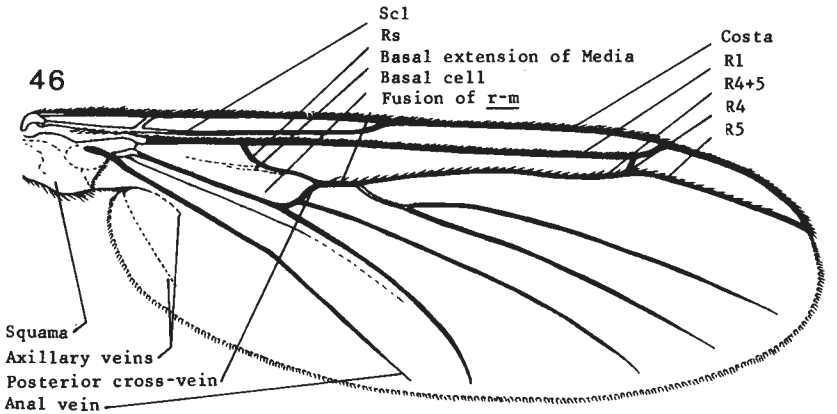
Figs. 24-30. Fore legs. 24, *Bolitophila saundersii* ♀. 25, *Mycomya fuscata* ♂. 26, *Diadocidia ferruginosa* ♂. 27, *D. spinosula* ♂. 28, *Boletina trivittata* ♂. 29, *B. gripha* ♂. 30, *B. dûbia* ♂. (Figs. 24-27 anterior view; figs. 28-30 posterior view of 5th tarsal segment).

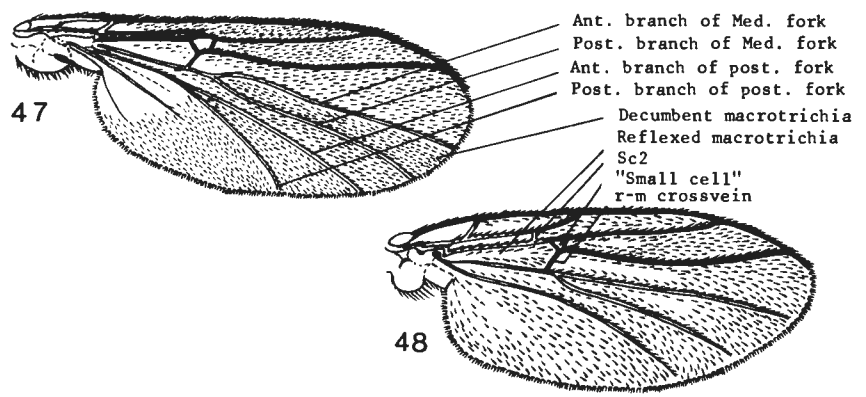


Figs. 31-37. Mid-legs. 31, *Mycomya cinerascens* ♂. 32, *Polylepta guttiventris* ♂. 33, *Orfelia (Neoplatyura) flava* ♂. 34, *Rondaniella dimidiata* ♀. 35, *Polylepta guttiventris* ♂. 36, *Phthinia humilis* ♂. 37, *Speolepta leptogaster* ♂. (Figs. 31-34 anterior view; figs. 35-37 dorsal view of base of tibia).

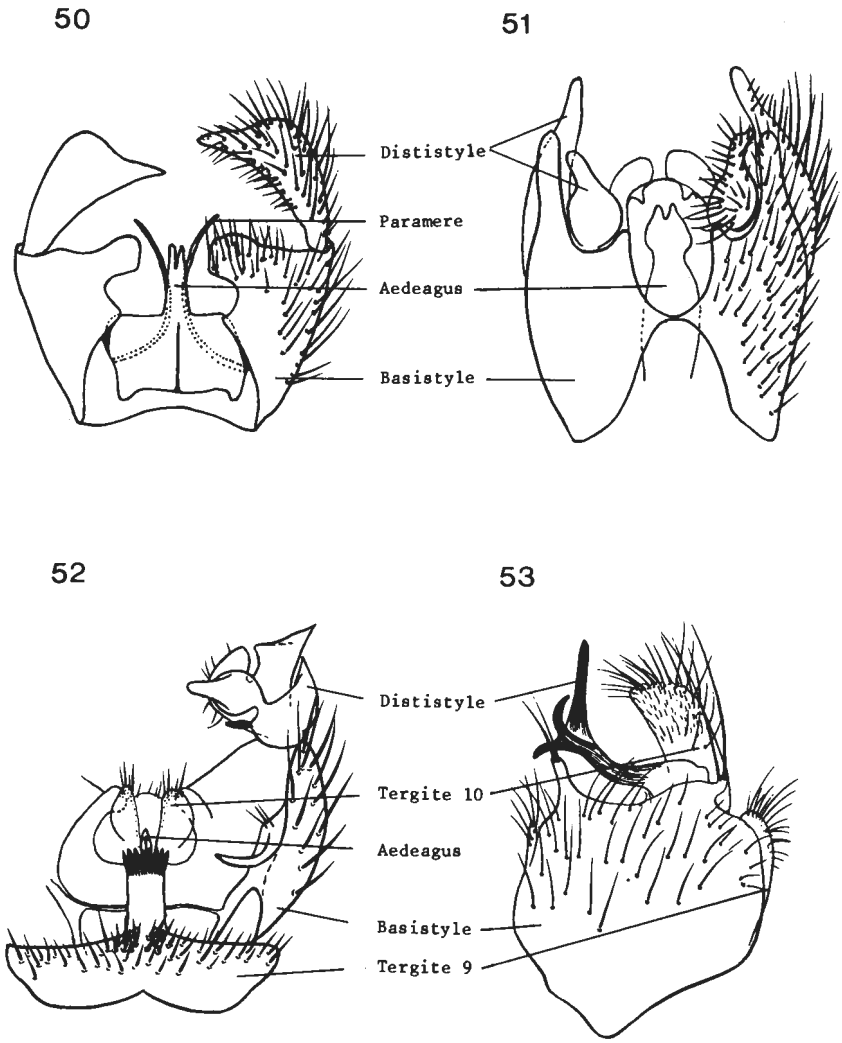


Figs. 38-45. Hind legs. 38, *Orfelia (Rutylapa) ruficornis* ♀. 39, *Orfelia (Pyratula) zonata* ♂. 40, *Ectrepesthoneura hirta* ♂. 41, *Leia piffardi* ♂. 42, *Acnemia nitidicollis* ♂. 43, *Neuratelia nemoralis* ♂. 44, *Megophthalmidia crassicornis* ♂. 45, *Tetragoneura sylvatica* ♂. (Figs. 38-41 anterior view; figs. 42-45 posterior view).

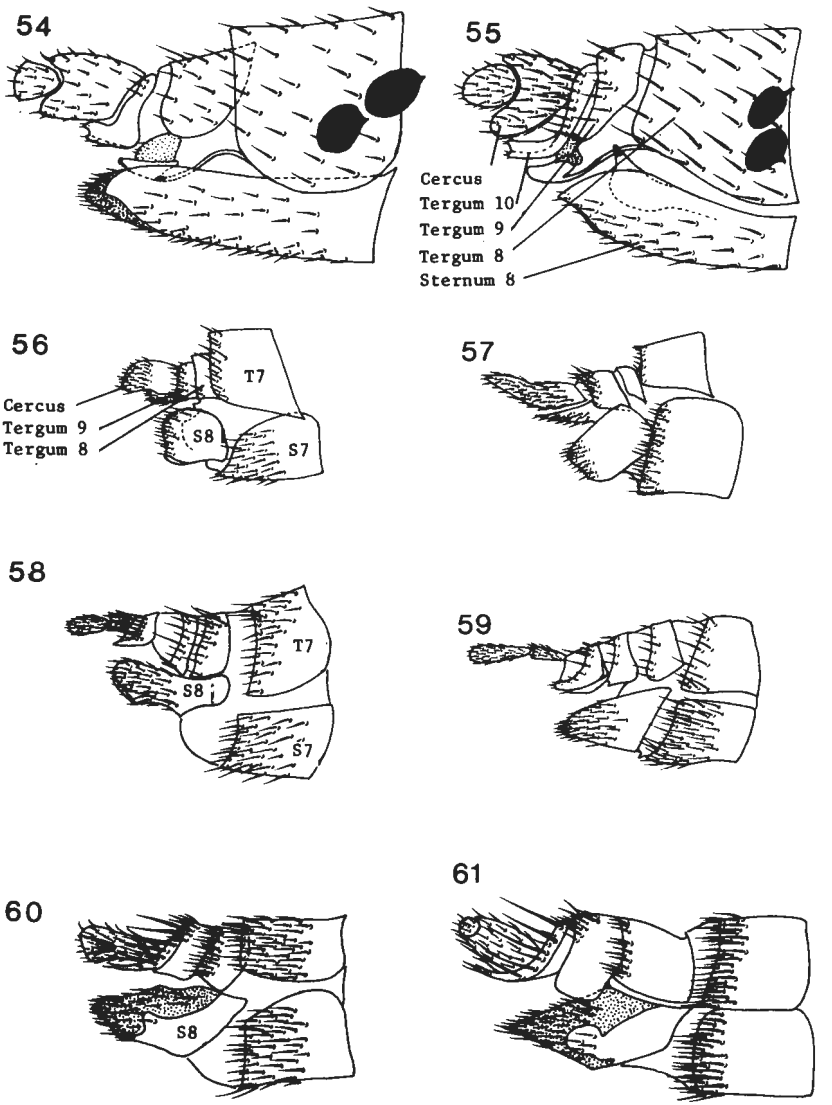




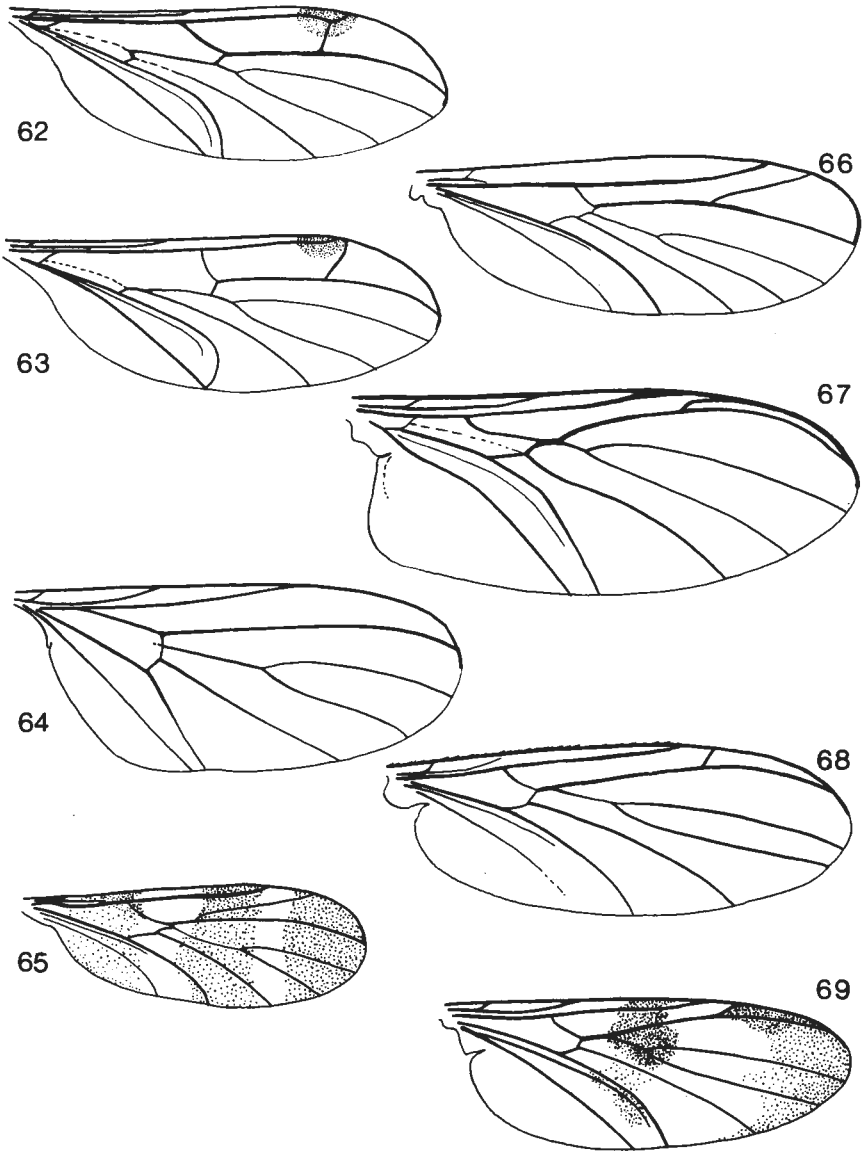
Figs. 46-49. Wings. 46, *Keroplatus testaceus* ♀. 47, *Syntemna stylata* ♂. 48, *Monoclona rufilatera* ♂. 49, *Leia bimaculata* ♀. (See also figs. 62-87).



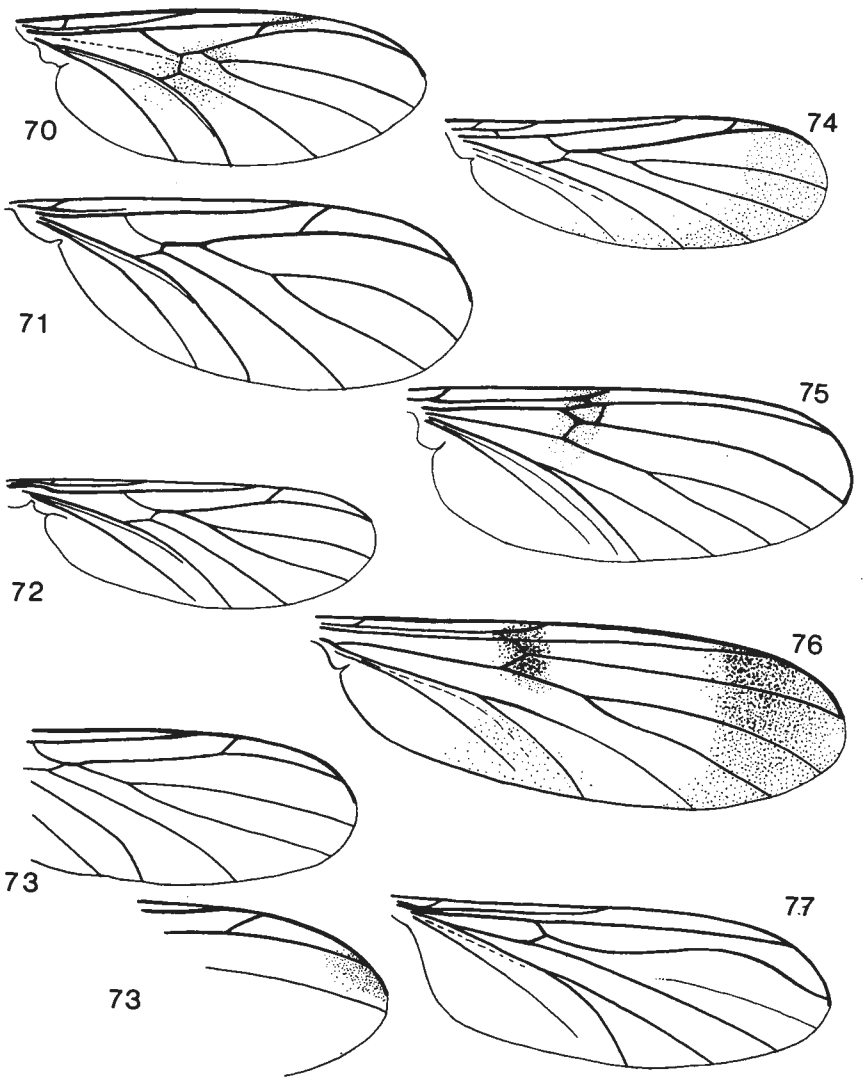
Figs. 50-53. ♂ genitalia. 50, *Bolitophila pseudohybrida* (dorsal, tergite 9 removed). 51, *Orfelia (Urytalpa) atriceps* (ventral). 52, *Syntemna nitidula* (dorsal). 53, *Leia subfasciata* (lateral).



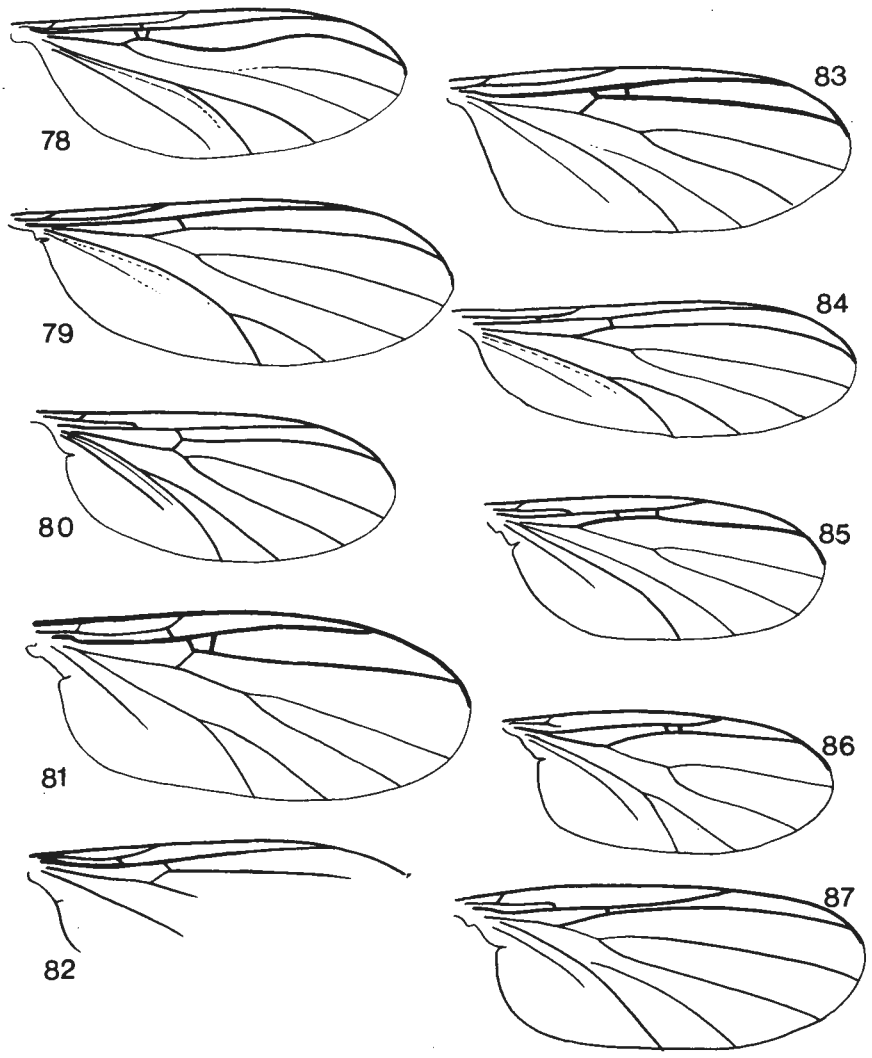
Figs. 54-61. ♀ ovipositor (lateral). 54, *Bolitophila cinerea*. 55, *B. saundersii*. 56, *Orfelia (O.) nemoralis*. 57, *O. (O.) tristis*. 58, *Boletina dubia*. 59, *B. plana*. 60, *Leia fascipennis*. 61, *L. crucigera*.



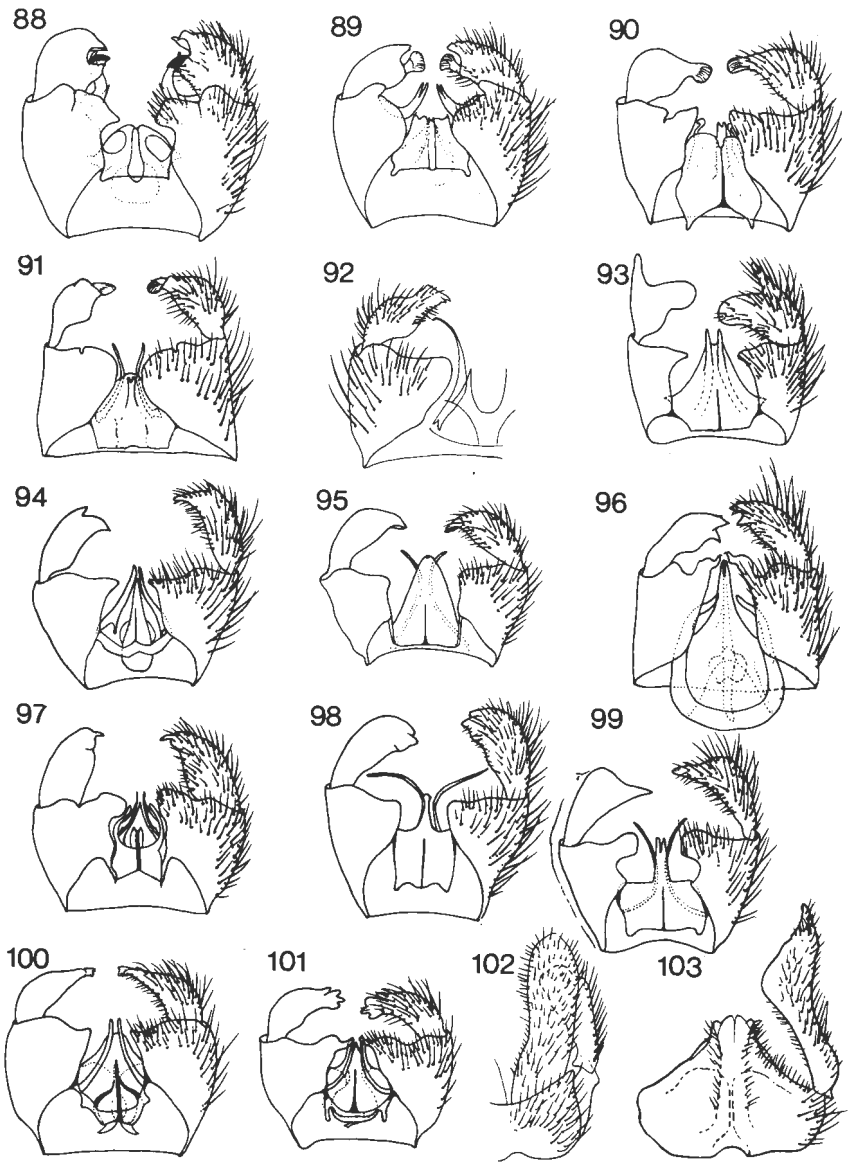
Figs. 62-69. Wings. 62, *Bolitophila saundersii.* 63, *B. occlusa.* 64, *Diadocidia ferruginosa.* 65, *Ditomyia fasciata.* 66, *Symmerus annulatus.* 67, *Macrocera vittata.* 68, *Macrorrhyncha flava.* 69, *Cerotelion lineatus.*



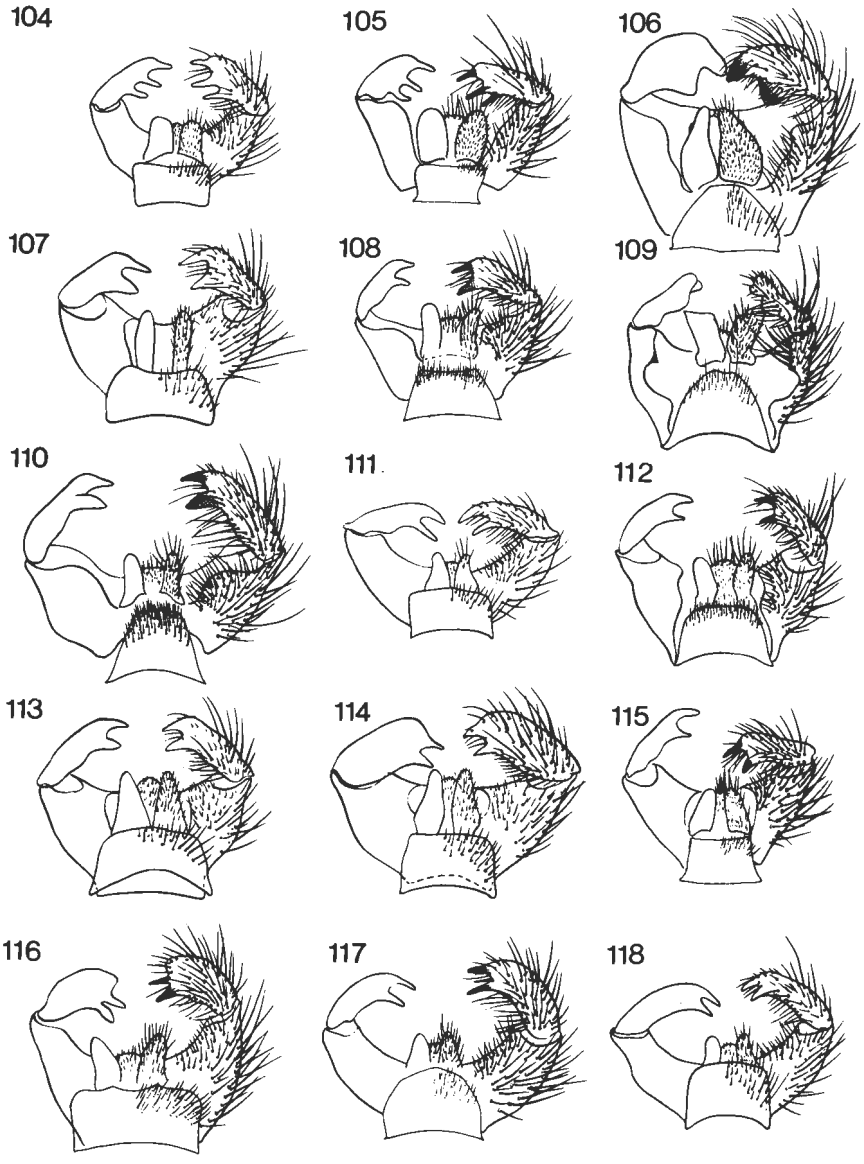
Figs. 70-77. Wings. 70, *Platyura marginata.* 71, *Monocentrota lundstroemi.* 72, *Orfelia (Isoneuromyia) semirufa.* 73, *O. (Neoplatyura) modesta.* 73a, tip of wing of *O. (N.) flava.* 74, *O. (s.s.) nemoralis.* 75, *Mycomya marginata.* 76, *Leptomorphus walkeri.* 77, *Neuratelia nemoralis.*



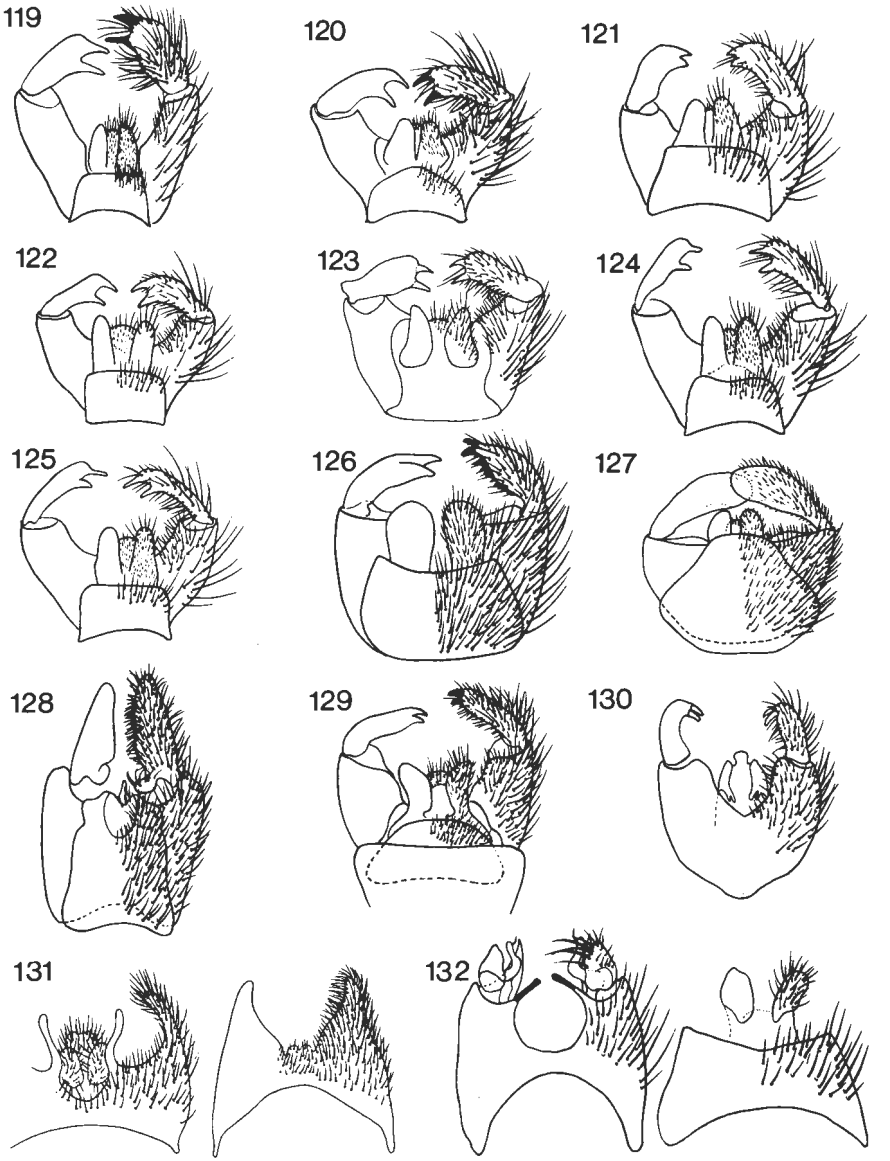
Figs. 78–87. Wings. 78, *Polylepta guttiventris.* 79, *Coelosia tenella.* 80, *Palaeodocosia janickii.* 81, *Synapha vitripennis.* 82, *S. fasciata* (anterior part of wing only). 83, *Apolephthisa subincana.* 84, *Boletina trivittata.* 85, *Ectropesthoneura hirta.* 86, *Tetragoneura sylvatica.* 87, *Docosia sciarina.*



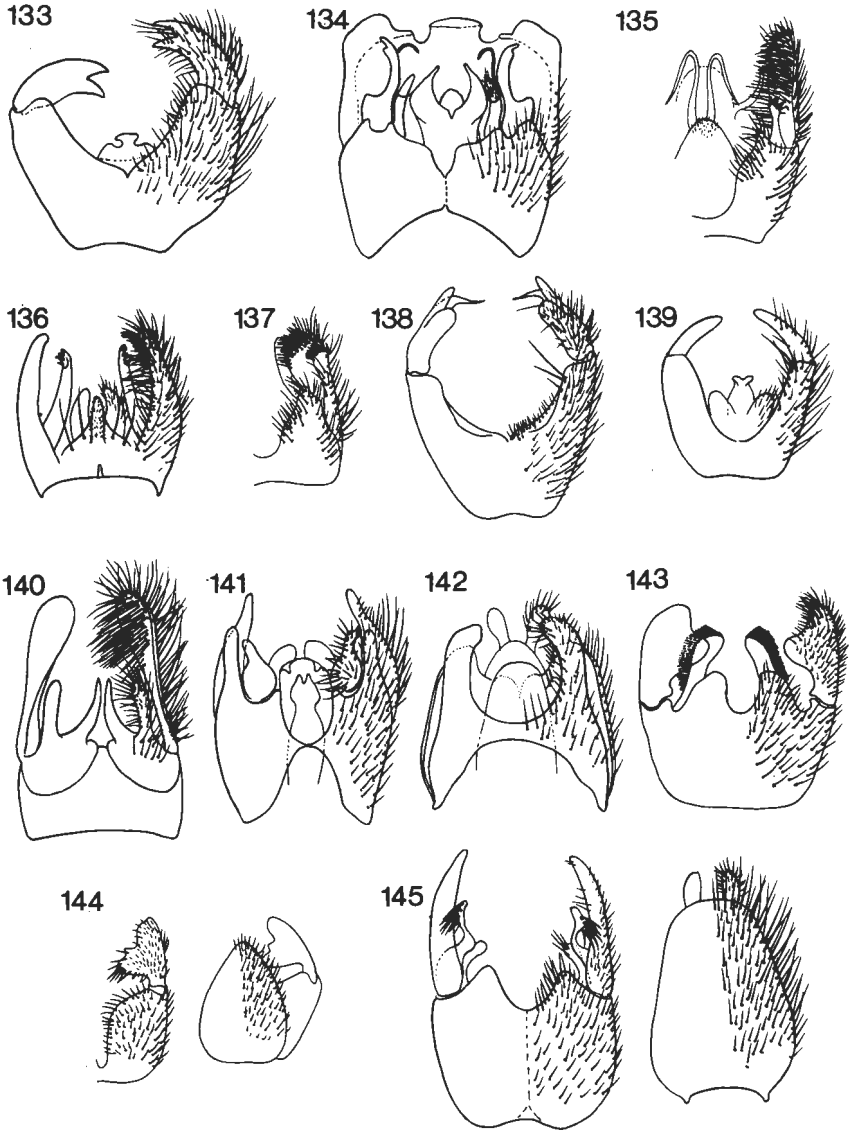
Figs. 88-103. ♂ genitalia. 88-103, *Bolitophila* spp, (dorsal, tergite 9 removed). 88, *B. tenella.* 89, *B. basicornis.* 90, *B. cinerea.* 91, *B. saundersii.* 92, *B. spinigera.* 93, *B. occlusa.* 94, B. *dubia.* 95, *B. fumida.* 96, *B. maculipennis.* 97, *B. bimaculata.* 98, *B. glabrata.* 99, *B. pseudohybrida.* 100, *B. hybrida.* 101, *B. rossica.* 102, *Symmerus annulatus* (dorsal). 103, *Ditomyia fasciata* (dorsal).



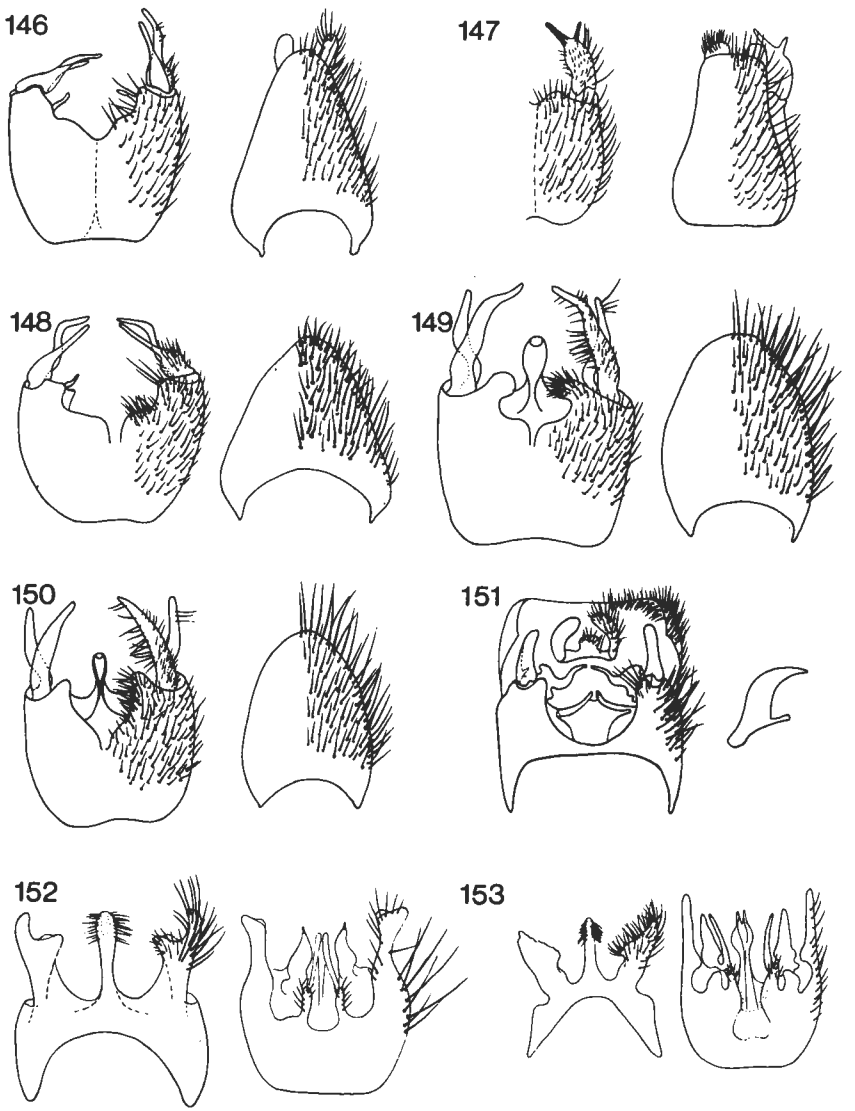
Figs. 104-118. ♂ genitalia, *Macrocera* spp. (dorsal). 104, *M. pusilla*, 105, *M. anglica*. 106, *M. longibrachiata*. 107, *M. crassicornis*. 108, *M. fasciata*. 109, *M. tusca*. 110, *M. vittata*. 111, *M. lutea*. 112, *M. aterrima*. 113, *M. parva*. 114, var. of *M. parva*. 115, *M. centralis*. 116, *M. bipunctata*. 117, *M. fastuosa*. 118, *M. angulata*.



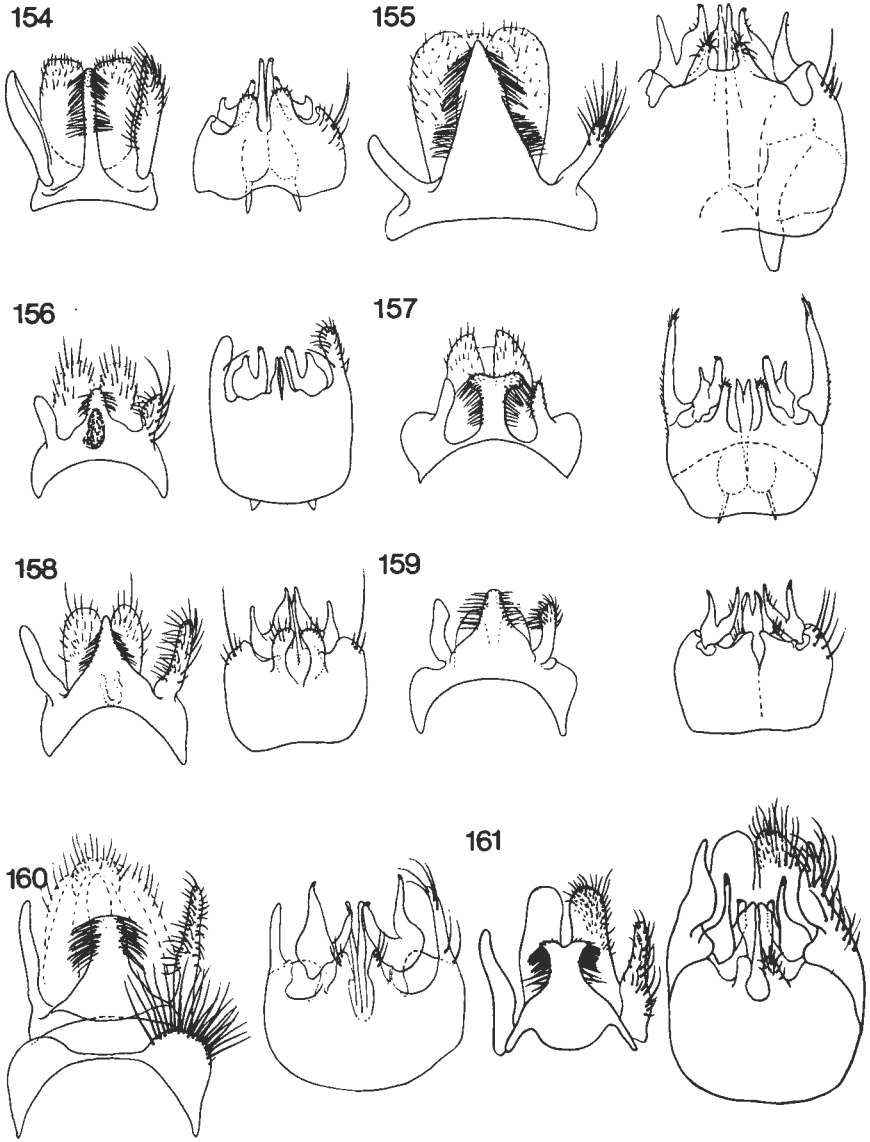
Figs. 119-132. ♂ genitalia. 119-125, *Macrocera* spp. (dorsal). 119, *M. fascipennis*. 120, *M. maculata*. 121, *M. zetterstedti*. 122, *M. phalerata*. 123, *M. estonica*. 124, *M. stigma*. 125, *M. stigmoides*. 126, *Cerotelion lineatus* (dorsal). 127, *C. humeralis* (dorsal). 128, *Keroplatus testaceus* (dorsal). 129, *Platyura marginata* (dorsal). 130, *Monocentrota lundstroemi* (ventral). 131, *Asindulum nigrum* (left: dorsal; right: ventral). 132, *Macrorryyncha flava* (left: dorsal; right: ventral).



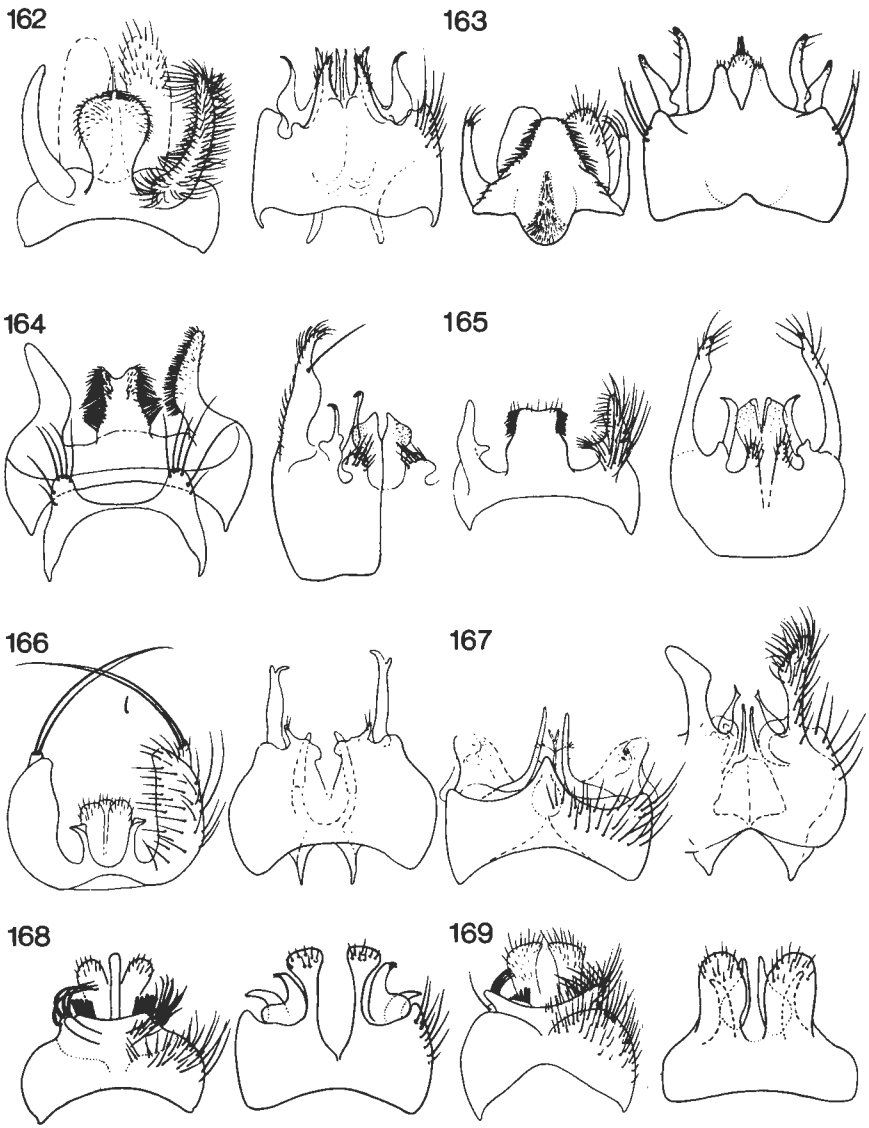
Figs. 133-145. ♂ genitalia, *Orfelia* spp. (ventral; figs. 144-145 with tergite 9). 133, *O. (Isoneuromyia) semirufa.* 134, *O. (Neoplatyura) biumbrata.* 135, *O. (N.) flava.* 136, *O. (N.) nigricauda.* 137, *O. (N.) modesta.* 138, *O. (Pyratula) zonata.* 139, *O. (P.) perpusilla.* 140, *O. (Urytalpa) macrocera.* 141, *O. (U.) atriceps.* 142, *O. (U.) ochracea.* 143, *O. (Rutylapa) ruficornis.* 144, *O. (Orfelia) nemoralis.* 145, *O. (O.) nigricornis.*



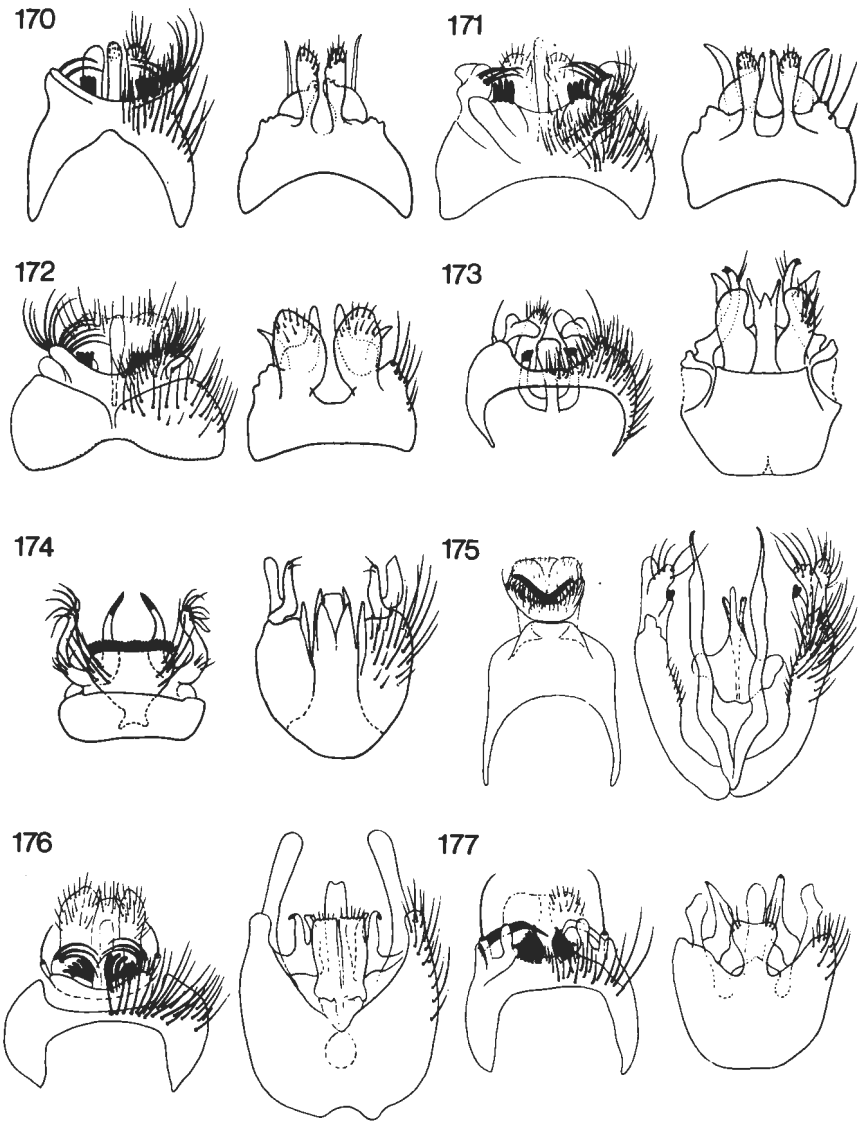
Figs. 146-153. ♂genitalia. 146-150, *Orfelia (Orfelia)* spp. (left: ventral; right: tergite 9). 146, *O. (O.) tristis.* 147, *O. (O.) pallida.* 148, *O. (O.) fasciata.* 149, *O. (O.) unicolor.* 150, *O. (O.) discoloria.* 151, *Antlemon servulum* (left: ventral; right: lateral view of dististyle). 152, *Mycomya incisurata* (left: dorsal; right: ventral). 153, *M. flavicollis.*



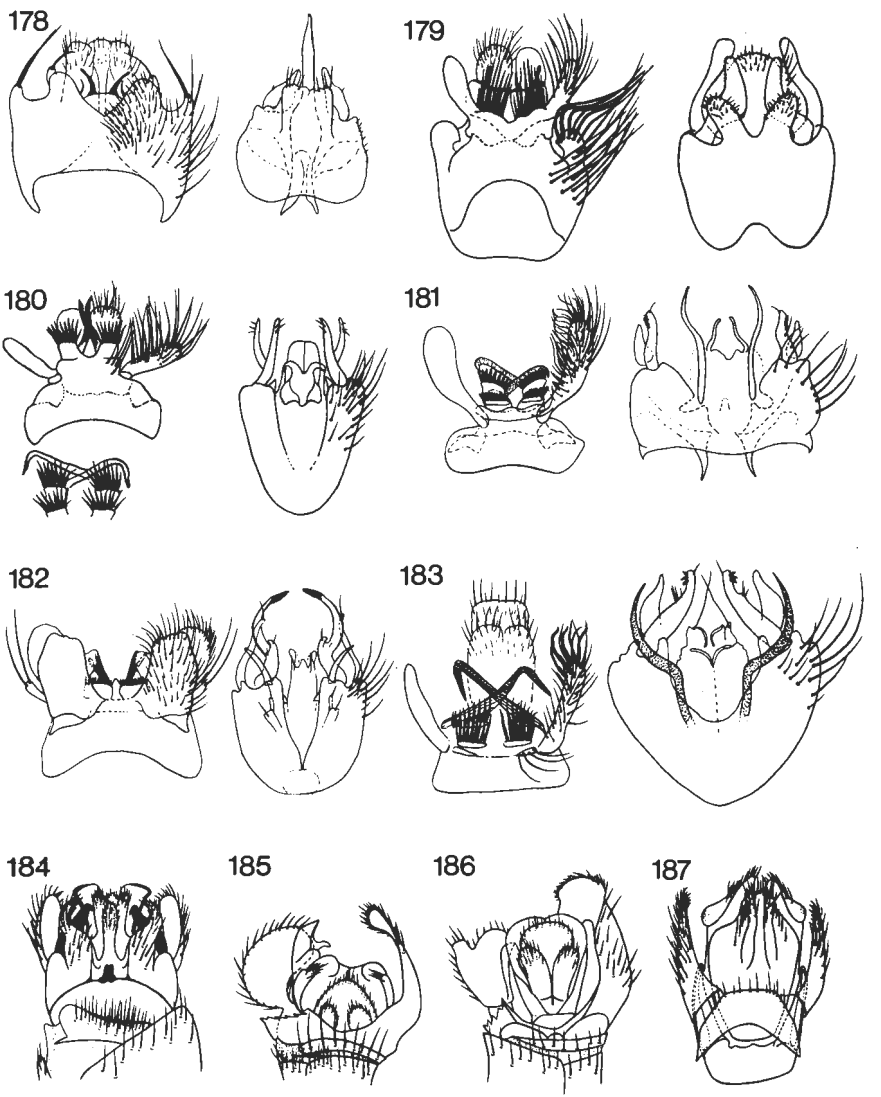
Figs. 154-161. ♂ genitalia, *Mycomya* spp. (left: dorsal; right: ventral). 154, *M. exigua*. 155, *M. clavigera*. 156, *M. cinerascens*. 157, *M. britteni*, 158, *M. kingi*. 159, *M. trivittata*. 160, *M. marginata*. 161, *M. punctata*.



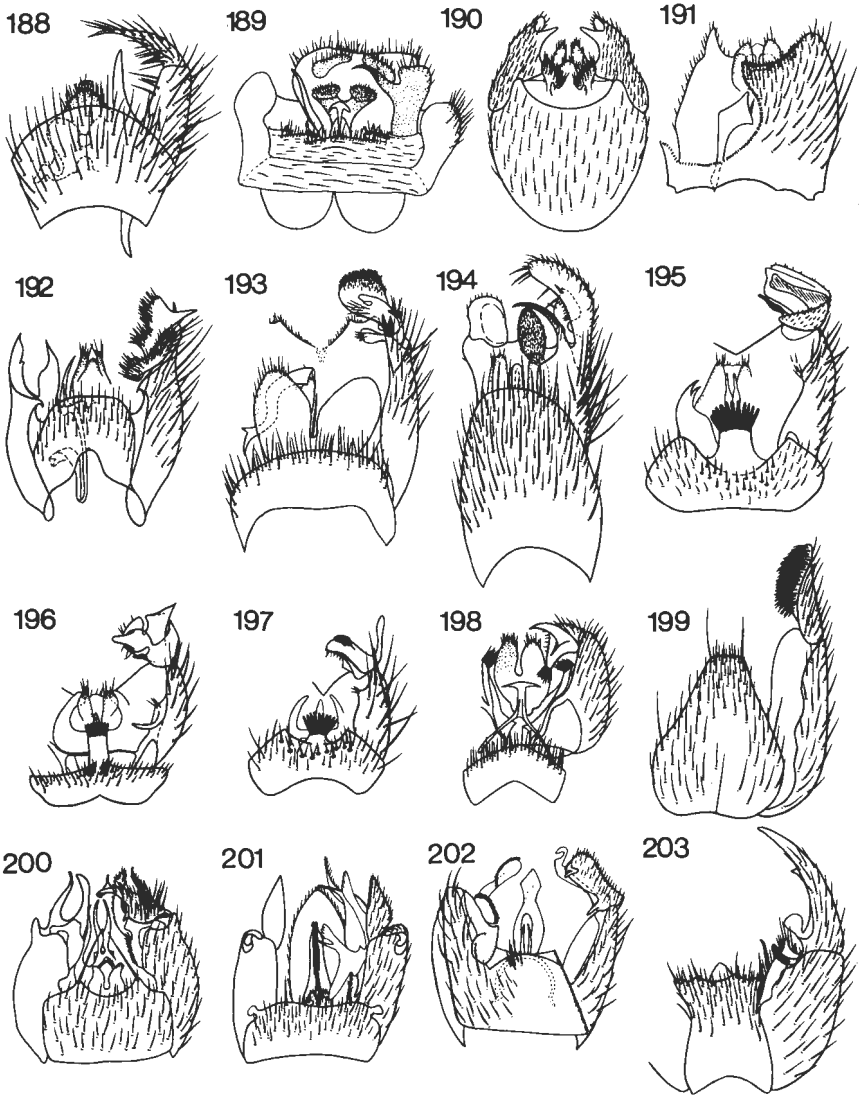
Figs. 162-169. genitalia, *Mycomya* spp. (left: dorsal; right: ventral). 162, *M. hyalinata*. 163, *M. rosalba*. 164, *M. winnertzi*. 165, *M. wankowiczii*. 166, *M. tenuis*. 167, *M. duplicata*. 168, *M. fuscata*. 169, *M. ornata*.



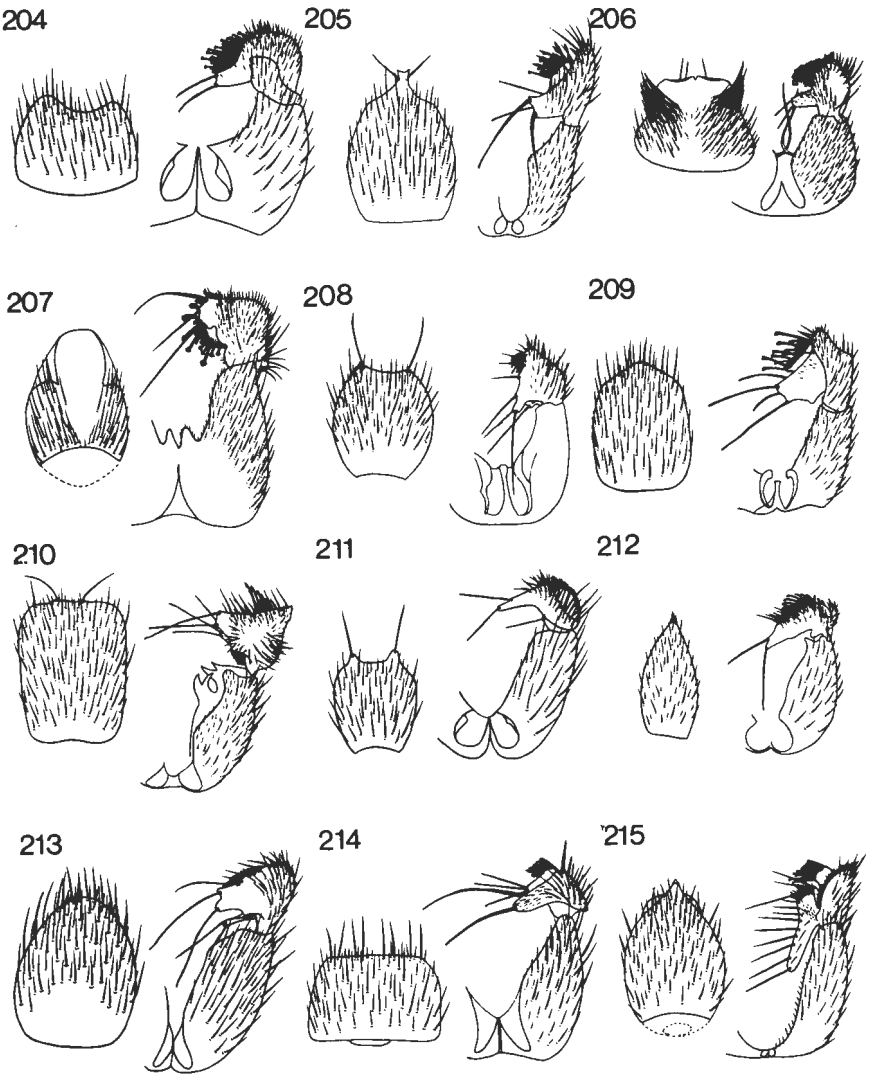
Figs. 170-177. ♂ genitalia, **Mycomya** spp. (left: dorsal; right: ventral). 170, *M. prominens.* 171, *M. tumida.* 172, *M. lambi.* 173, *M. melanoceras.* 174, *M. pectinifera.* 175, *M. circumdata.* 176, *M. digitifera.* 177, *M. parva.*



Figs. 178-187. ♂ genitalia. 178-183, *Mycomya* spp. (left: dorsal; right: ventral). 178, *M. collini.* 179, *M. vittiventris.* 180, *M. flava.* 181, *M. maura.* 182, *M. fimbriata.* 183, *M. trilineata.* 184-187, *Neoempheria* spp. (dorsal). 184, *N. lineola.* 185, *N. bimaculata.* 186, *N. pictipennis.* 187, *N. winnertzi.*



Figs. 188-203. ♂ genitalia. 188, *Eudicrana nigriceps* (dorsal). 189, *Allocotocera pulchella* (ventral). 190, *Leptomorphus walkeri* (ventral). 191, *Anaclileia dispar* (dorsal, part of tergite 9 removed). 192, *Neuratelia nemoralis* (dorsal). 193, *N. nigricornis* (dorsal). 194, *Polylepta guttiventris* (dorsal). 195, *Syntemna hungarica* (dorsal). 196, *S. nitidula* (dorsal). 197, *S. stylata* (dorsal). 198, *Azana anomala* (dorsal). 199, *Megalopelma nigroclavatum* (dorsal). 200, *Acnemia amoena* (dorsal). 201, *A. nitidicollis* (dorsal). 202, *A. longipes* (dorsal). 203, *Monoclona rufilatera* (dorsal).



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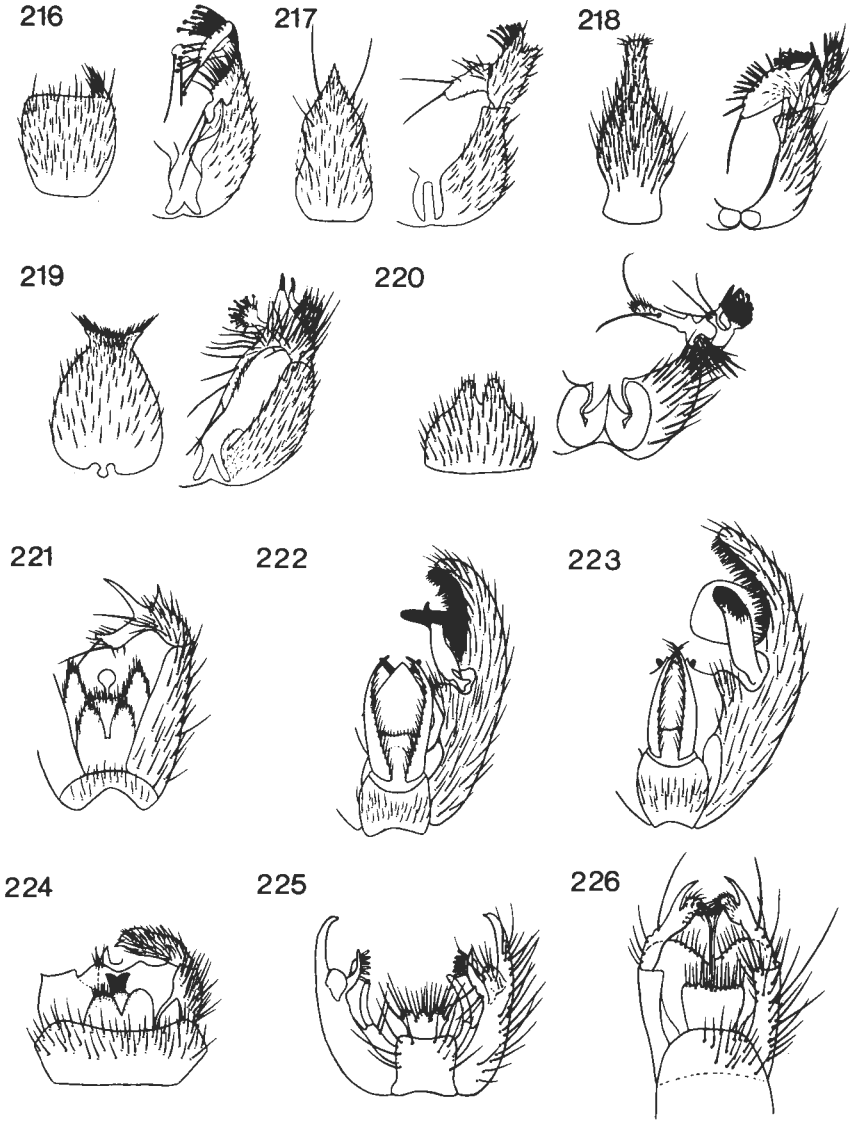

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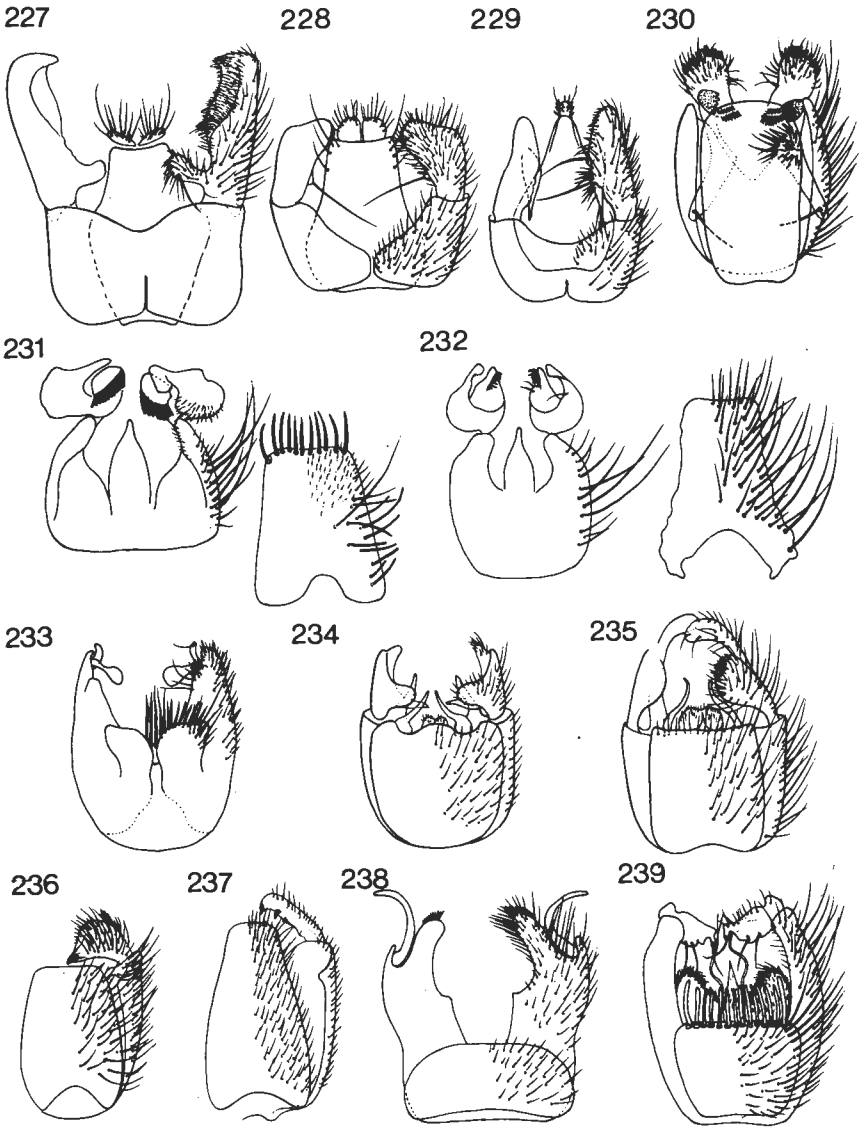

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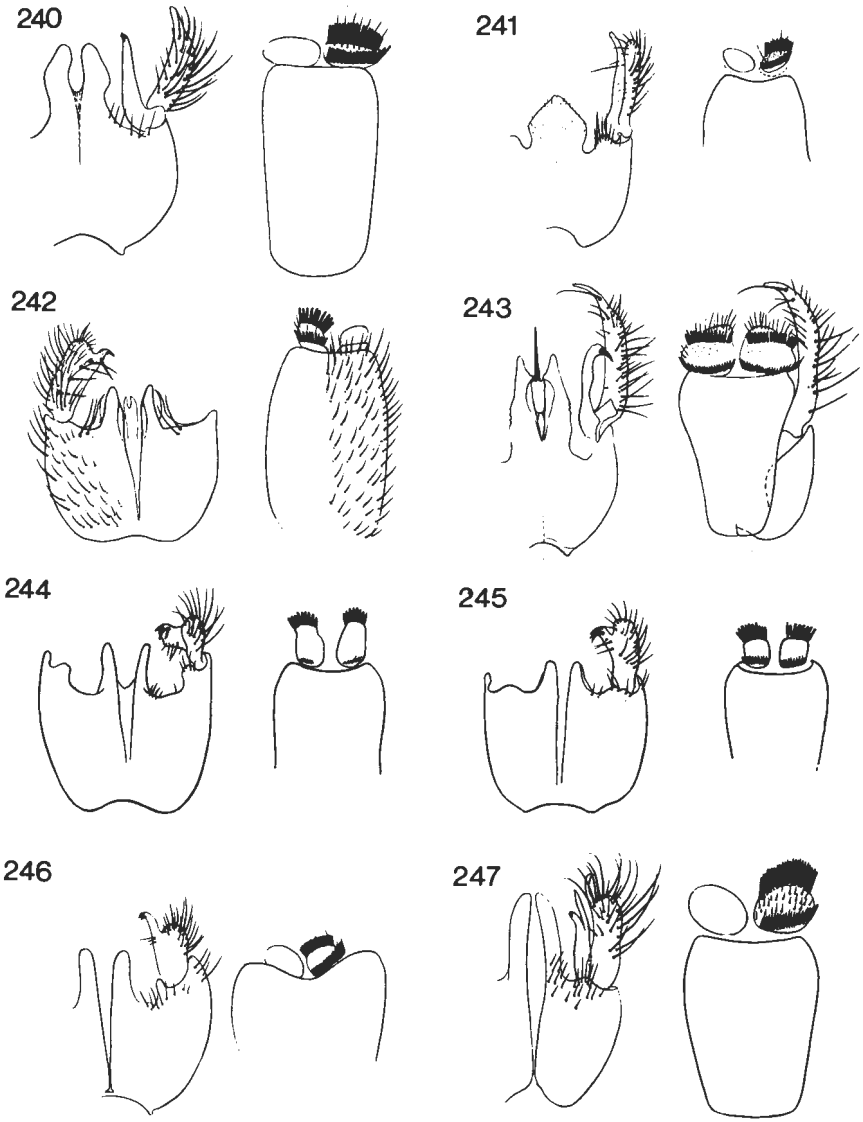

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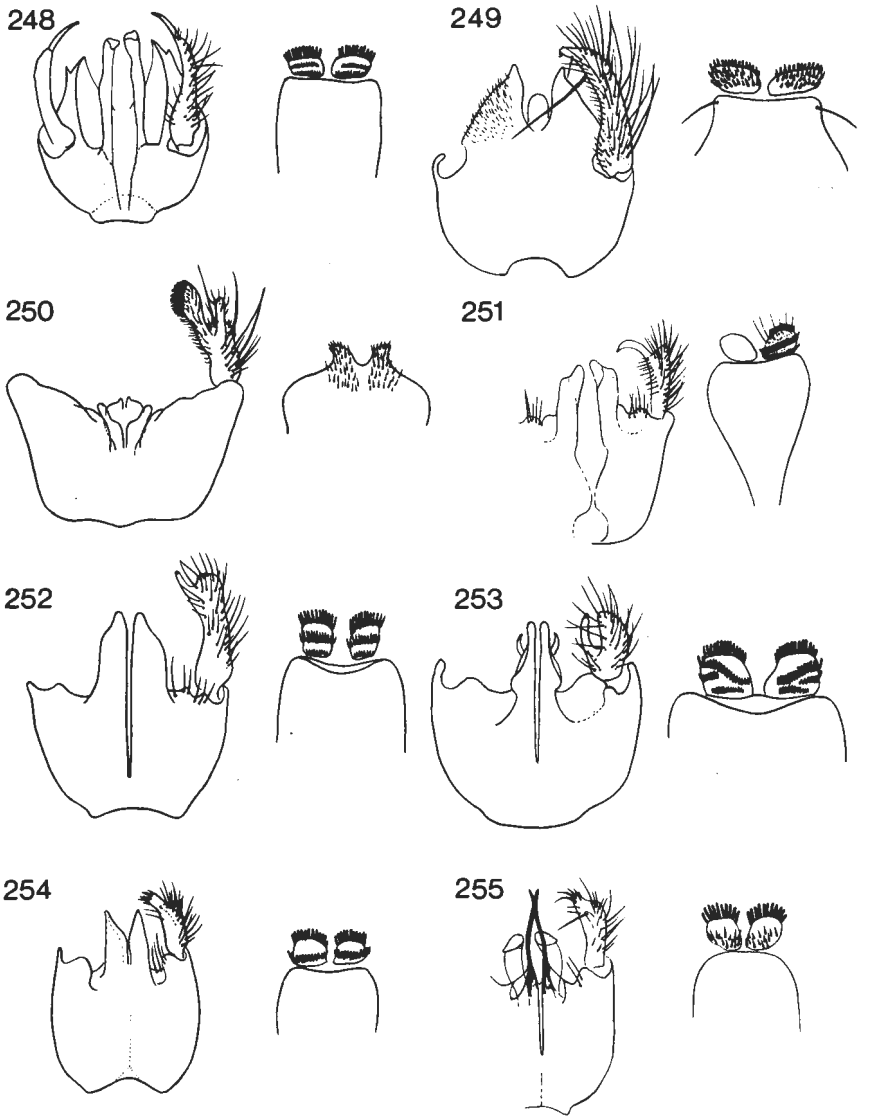

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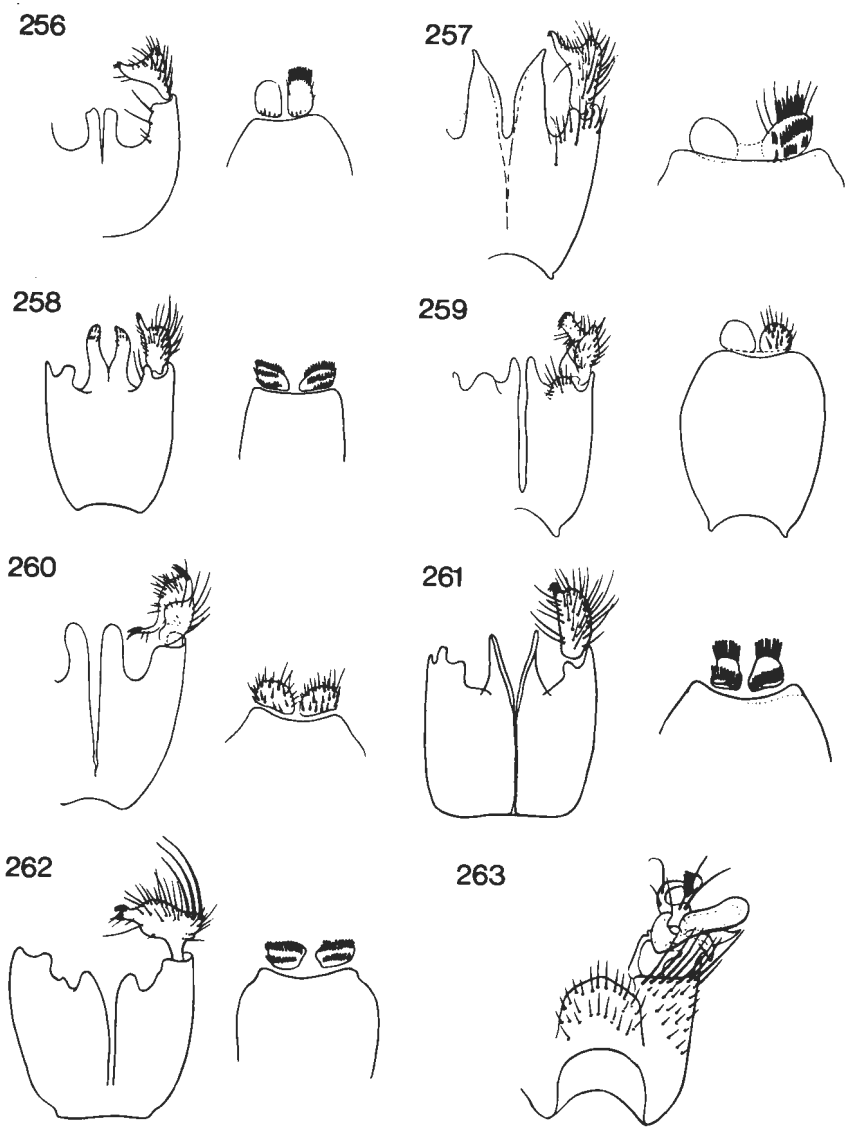

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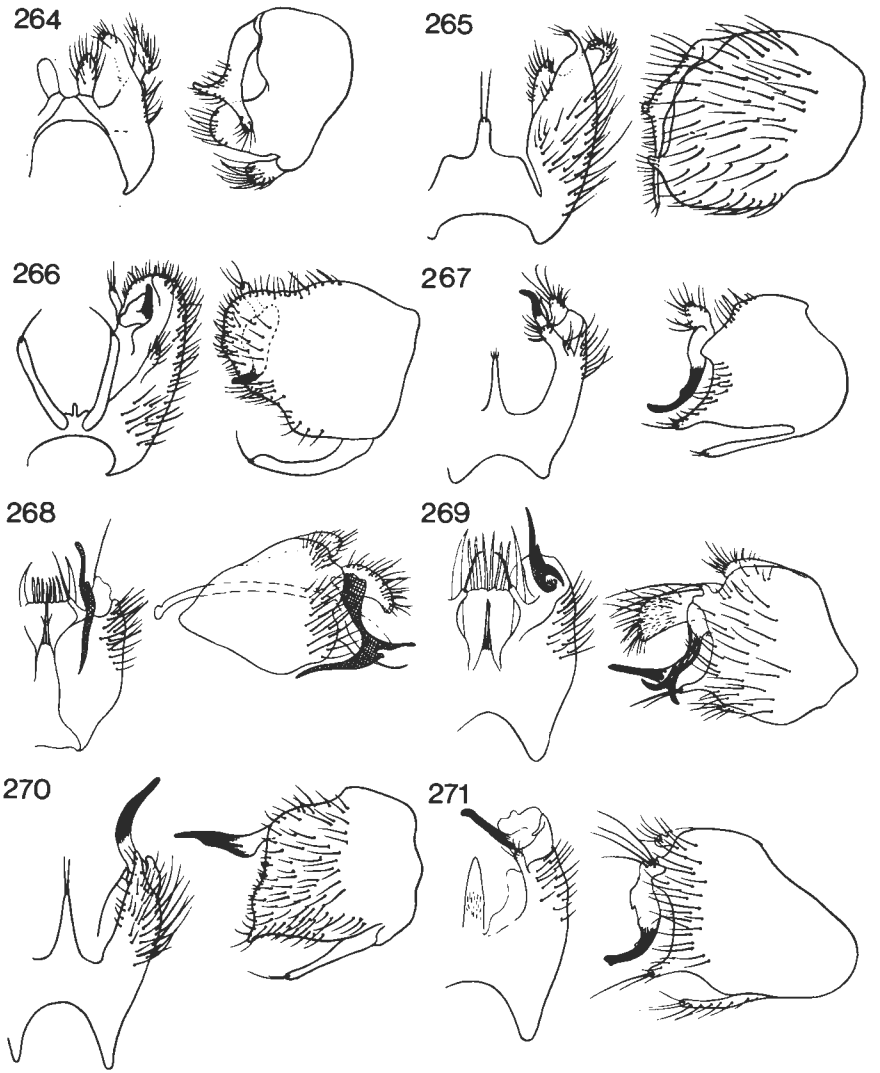

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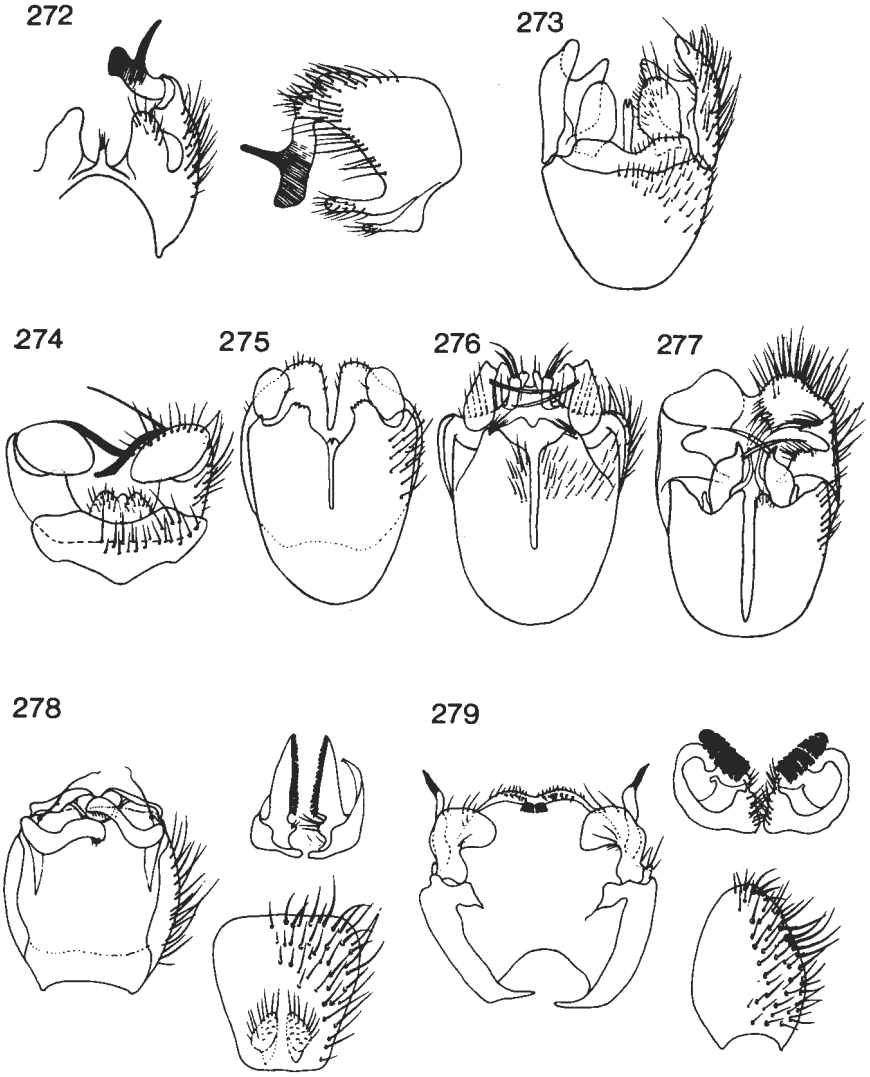

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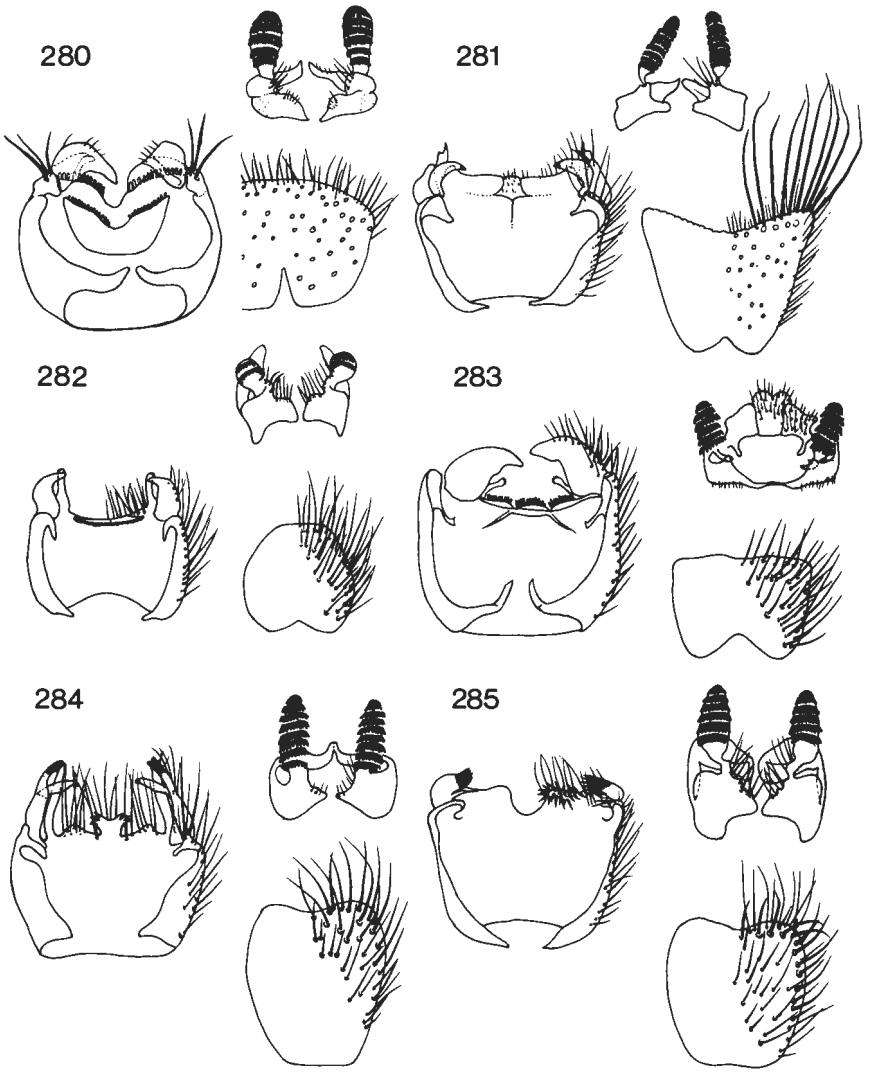

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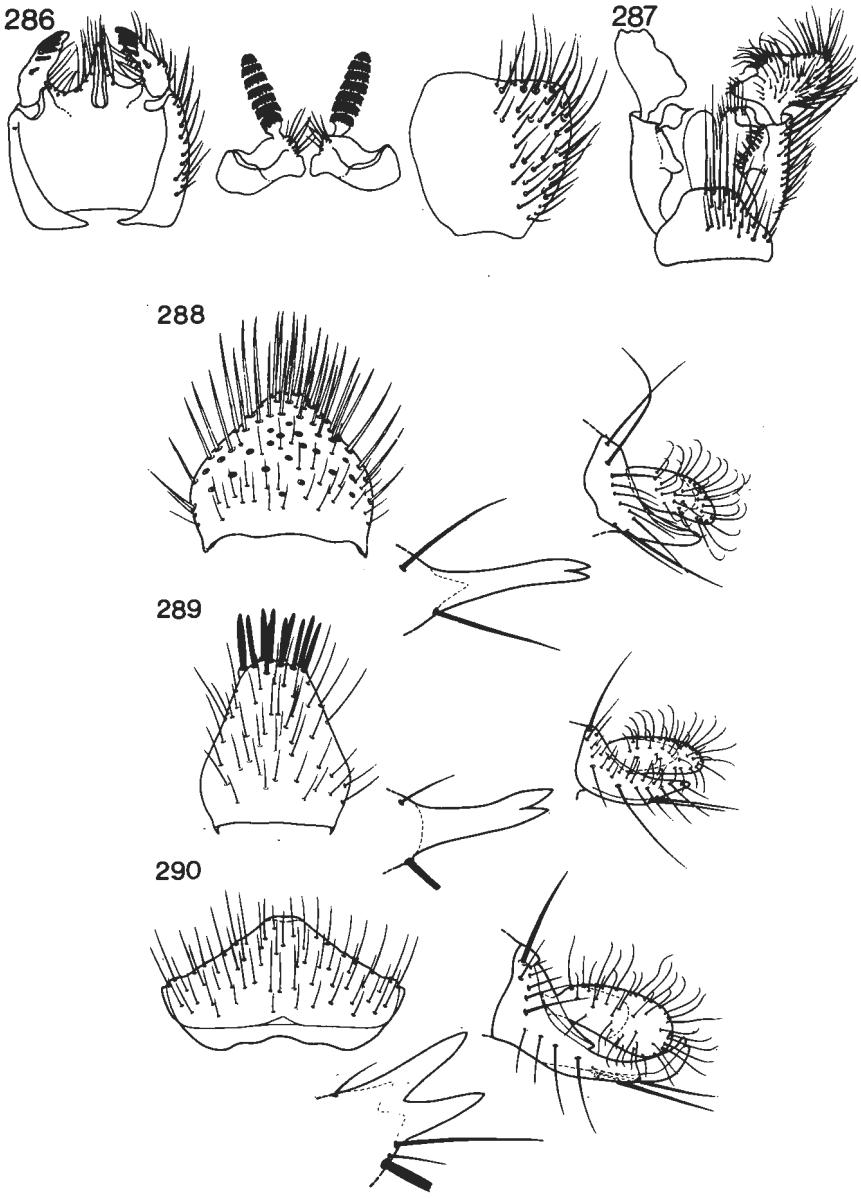

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