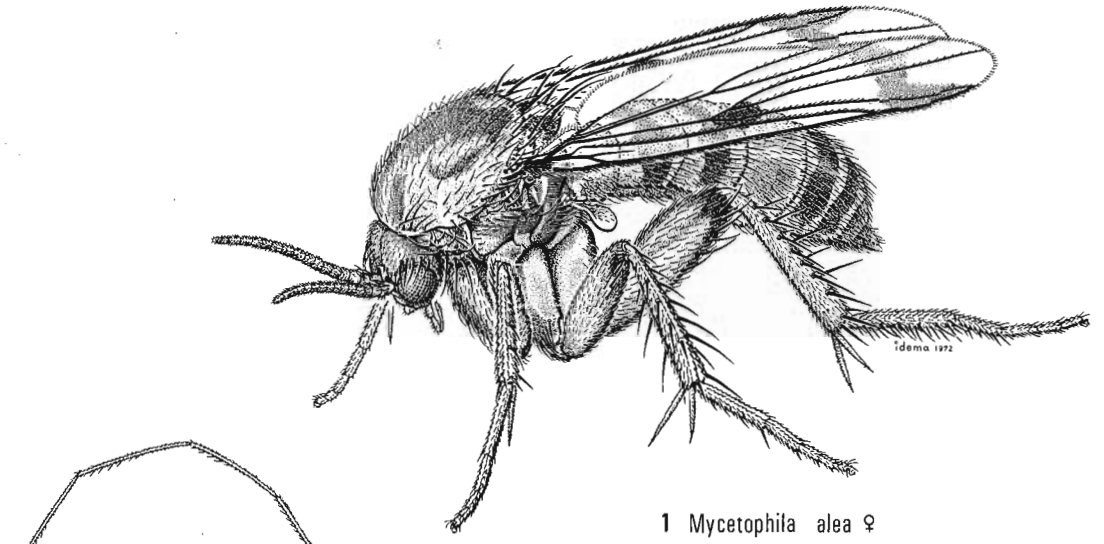
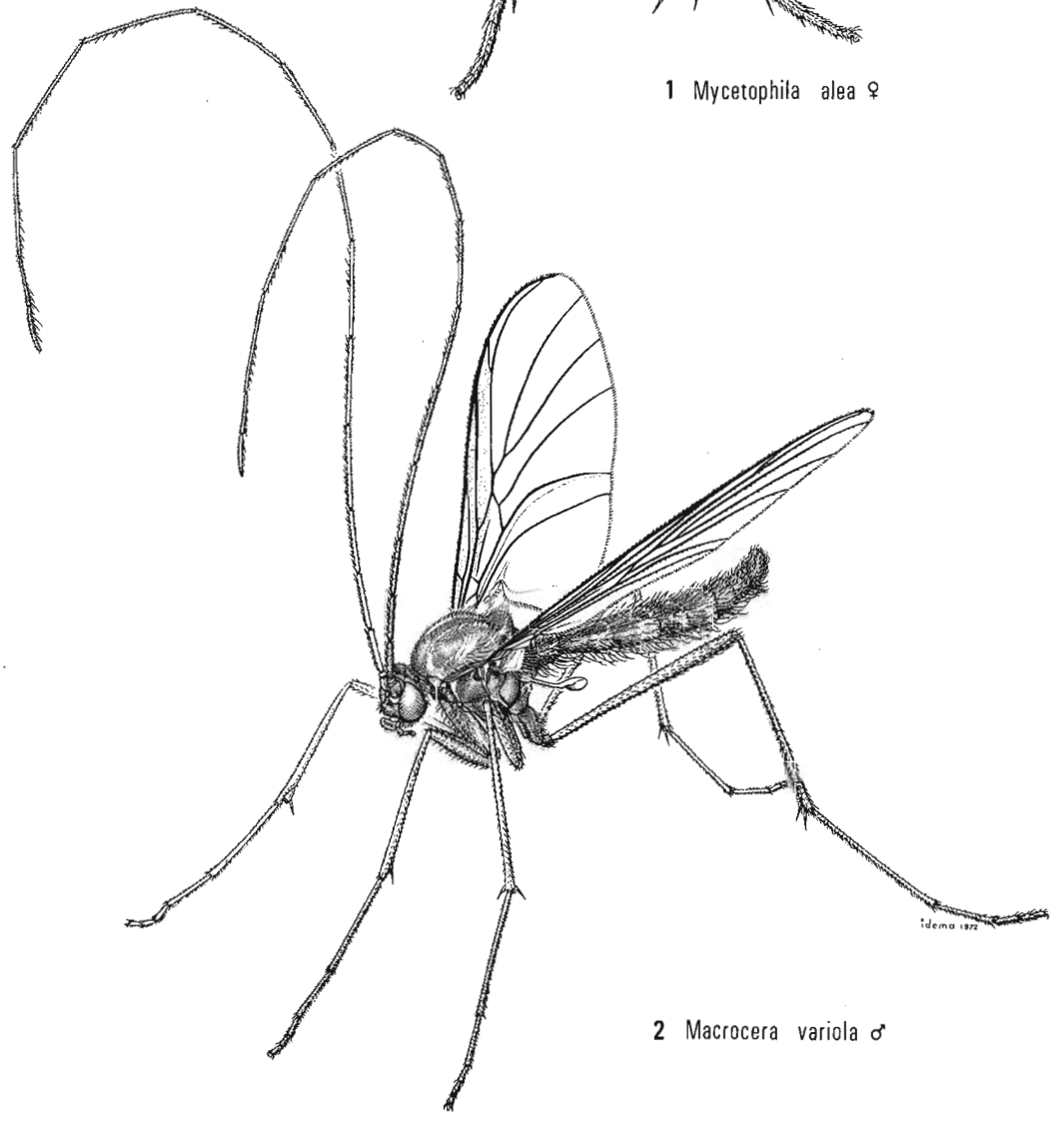
# MYCETOPHILIDAE 14

J. R. VOCKEROTH



1 Mycetophila alea ♀



2 Macrocera variola ♂

Figs. 14.1–2. (1) Female of *Mycetophila alea* Laffoon; (2) male of *Macrocera variola* Garrett.

Slender to moderately robust flies, 2.2–13.3 mm long (Figs. 1, 2). Thoracic and tibial bristles often strong. Coxae long; tibiae usually with long strong apical spurs (Figs. 77–83). Color varied; body usually dull yellow, brown, or black, but sometimes brightly marked; wing often conspicuously marked.

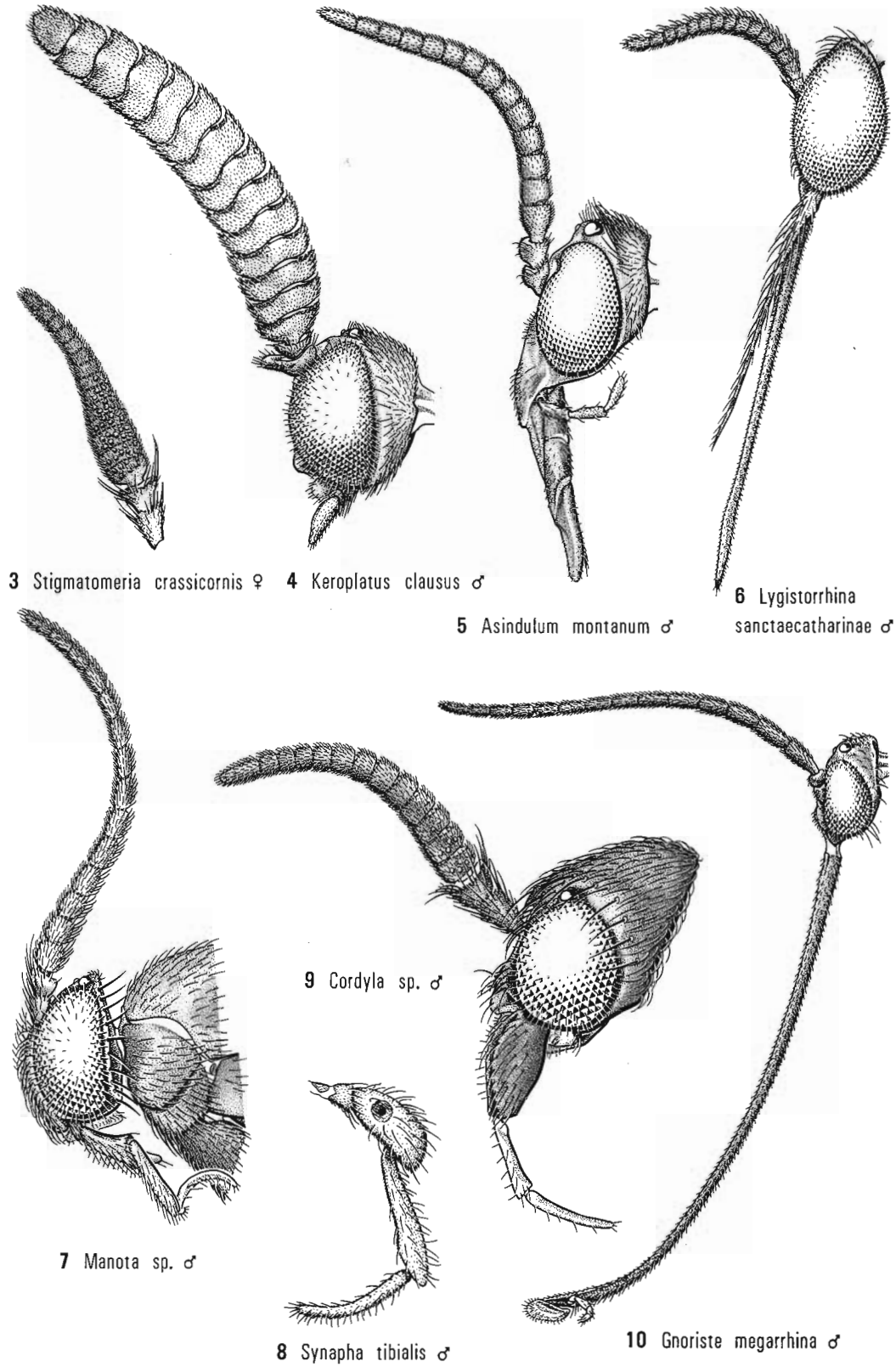
**Adult.** Head: usually flattened from front to back and inserted well below level of upper margin of strongly arched thorax, but semicircular in profile and inserted on anterior end of thorax in Manotinae and some Sciophilinae. Eyes usually densely haired, rarely with a few short hairs, usually situated on lower part of head and widely separated above, with an incomplete eye bridge in some Ditomyiinae and a complete bridge in some Manotinae. Three ocelli usually present, variable in position, with median ocellus sometimes very small or absent; all ocelli absent only in *Hesperodes* Coquillett and in *Syndocosia* Speiser (Afrotropical). Frons between ocelli and antennal bases usually bare but haired in some Keroplatinae and Sciophilinae. Antenna (Figs. 3–7, 9, 10) usually inserted at middle of head, inserted well above middle only in Manotinae and in some Keroplatinae, varying in length from scarcely longer than head to several times as long as body; flagellum usually cylindrical, sometimes thickened basally and tapering toward apex, usually with 14 flagellomeres, but with an additional very small terminal flagellomere in some Keroplatinae and with fewer than 14 flagellomeres in other Keroplatinae and in *Cordyla* Meigen, which has 9–13; flagellomeres strongly compressed or pectinate or both in some Ditomyiinae and Keroplatinae, usually clothed with short dense hairs, but sometimes with short bristles among the hairs, or with long hairs as in some species of *Bolitophila* Meigen. Mouthparts usually much shorter than half height of head, but about as long as height of head in *Asindulum* Latreille (Fig. 5), *Antlemon* Haliday (Palaearctic), *Aphrastomyia* Coher & Lane, and *Paramorganiella* Tonnoir (Australian), and produced into a slender cylindrical proboscis several times as long as height of head in *Rhynchoplatyura* de Meijere (Oriental), *Gnoriste* Meigen (Fig. 10), and *Lygistorrhina* Skuse (Fig. 6). Labella usually large and fleshy, but greatly reduced in all above-named genera except *Lygistorrhina*, in which they are very long and slender. Palpus apparently prehensile in *Paramorganiella*, usually with five segments although first two are usually very short and not apparent in dry specimens, but sometimes with fewer than five segments—four in many Mycetophilinae (but not in *Mycetophila* Meigen or *Epicypta* Winnertz), three in *Keroplatus* Bosc (Fig. 4) and several related genera, two to four in some Neotropical species of *Dziedzickia* Johannsen, one very short segment in *Metanepsia* Edwards (Palaeotropical), and one very long filamentous segment in *Lygistorrhina* (Fig. 6); segments variable in length and form, usually slender, but sometimes one or more broadened (Fig. 8) or swollen (Fig. 9); specialized sensory structures presumably always present on segment 3, taking following forms—a pit containing modified setae, a surface patch of modified setae, scattered slightly clubbed setae (*Bolitophila*), a dorsal and ventral pit (*Asindulum*, Fig. 5), or a longitudinal groove with a highly modified surface and a deep internal invagination (*Cordyla*, Fig. 9).[1]

Thorax: varying in form from compressed and deep to depressed and low. Thoracic sclerites varying considerably in size, shape, and distinctness; thoracic structure used to determine relationships among genera and subfamilies by Shaw (1948) and Shaw and Shaw (1951), but not satisfactorily and therefore requiring more study. Thoracic vestiture variable, consisting of fine setae, moderately strong bristles with apices bifid or otherwise modified (Tuomikoski, personal commun.), scale-like setae, or very fine appressed or erect setae; nature and distribution often used in taxonomic studies, but other times overlooked (e.g. very fine erect setae on various sclerites of *Bolitophila* spp.); hairs or bristles always present on pronotum, scutum, and scutellum, but only occasionally present on most other thoracic sclerites; one or several strong erect setae immediately medial to base of halter in some Keroplatinae and Sciophilinae.

Wing (Figs. 11–76) considerably reduced in size only in female of one species of *Macrocera* Meigen from Crozet Island and of one species of *Baeopterogyna* Vockeroth (Fig. 34) and in some specimens of both sexes of one species of *Boletina* Staeger (Fig. 52). Veins often with setae (Figs. 75, 76); membrane usually densely clothed with microtrichia and often also with few to many macrotrichia; if microtrichia absent, macrotrichia present on at least most of membrane. Venation most nearly complete in *Ditomyia* Winnertz (Fig. 11), *Paleoplatyura* Meunier (Fig. 19), and *Platyura* Meigen (Fig. 18) although these lacking most of Sc, crossvein sc-r, and crossvein r-m (due to partial fusion of Rs and $M_{1+2}$), respectively; venation variously reduced in other genera, extremely reduced in *Lygistorrhina* (Fig. 21), *Manota* Williston (Fig. 22), and *Azana* Walker (Fig. 27).

Legs with coxae elongate and stout (Figs. 84, 85); mid coxa of male of some species of *Mycomya* Rondani and all *Echinopodium* Freeman (Neotropical) with an anterior process; arrangement and strength of bristles and hairs of hind coxa variable. Femora usually slender, sometimes swollen, with vestiture variable; mid femur in male of some species of *Leptomorphus* Curtis with a subbasal spur. Tibiae (Figs. 82, 83) usually slender, with vestiture variable, with short setae arranged irregularly (Fig. 83) or in regular rows (Fig. 82), and usually with bristles varying in strength and arrangement; fore tibia often with an anteroapical depressed area bearing very fine dense setae; in *Synapha* Meigen depressed area extending up to five-sevenths length of tibia; mid tibia of

[1] This account of the palpus is based on examination of species, mostly males, of about 45 genera representing all subfamilies; it may require modification. A sexual difference in the palpus has been reported only in the Afrotropical *Euceroplatus incolumis* Matile, which has the palpus of the female much larger than that of the male.




Figs. 14.3–10. Details of head: (3) antenna of *Stigmatomeria crassicornis* (Stannius); head of (4) *Keroplatus clausus* Coquillett, (5) *Asindulum montanum* Röder, (6) *Lygistorrhina sanctaecatharinae* Thompson, and (7) *Manota* sp.; (8) palpus of *Synapha tibialis* (Coquillett); head of (9) *Cordyla* sp. and (10) *Gnoriste megarrhina* Osten Sacken.

male sometimes with a specialized sensory depression; hind tibia sometimes with a posteroapical comb of stiff setae or with a dorsoapical cleft. One apical spur present on fore tibia; two apical spurs on each of mid and hind tibiae, one of which may be very short; tibial spurs extremely short only in *Dolichodactyla* Freeman (Neotropical). Tarsi (Fig. 81) usually slender, sometimes with modified hairs below, or with some segments swollen below in female. Tarsal claws rarely simple, usually with one or more teeth below, and in male of some genera of Keroplatinae thick, blunt, and serrate below; in male of some *Boletina* spp. and several related genera one or more claws greatly distorted; pulvilli absent; empodia, if present, variable in size.

Abdomen: usually broadest at mid length, but in many Keroplatinae broadest near apex. Tergites and sternites 1–6, 1–7, or 1–8 in male and 1–7 in female well-developed except for sternite 1; sternite 1 often reduced in size, V-shaped, sometimes lacking hairs; sternites 2–6 or 2–7 in many Sciophilinae (but not in *Mycomya* or in *Leia* Meigen and several related genera) and probably in all Mycetophilinae with a pair of submedian or sublateral weakly sclerotized lines and sometimes also with a similar median line (fold lines) so the sternites may be partially folded longitudinally. Spiracles present below margins of tergites 1–7, but sometimes apparently lacking in segment 1 and sometimes also in segment 2.

Male often with sclerites of segments 7 and 8 (tergites especially) short and telescoped into segment 6 (Figs. 92, 93); terminalia usually symmetric, but sometimes markedly asymmetric (one western Nearctic species of *Acnemia* Winnertz, and some *Mycetophila* spp.), usually directed caudally, sometimes rotated clockwise through 90° or more with segments 7 and 8 sharing in the rotation; in *Calliceratomyia* Lane (Neotropical) tergite 7 large, sternite 7 very reduced, segment 8 small, and terminalia reflexed anteroventrally and appressed against the venter of segment 7. Segment 9 and associated structures (Figs. 92–96) extremely varied in form but with an apparently constant basic pattern: tergite 9, sternite 9, a pair of lateral gonocoxites each with an articulated gonostylus, a pair of submedian parameres each articulated laterally with gonocoxite and bearing aedeagus between them (structure of parameres and aedeagus often difficult to determine), and an anus-bearing proctiger lying below the posterior end of tergite 9 and consisting of a pair of lateral unsegmented cerci and a ventral sclerite or hypoproct. Tergite 9 and sternite 9 distinct or partly or entirely fused with gonocoxites, and sometimes bearing spines or processes; midventral line sometimes membranous (possibly a divided sternite 9). Gonostylus particularly varied, sometimes slender and tapering, but more often with lobes or processes bearing a variety of hairs, spines, or striate areas. Aedeagus sometimes with long anterior apodemes; in some species of *Orfelia* Costa a well-sclerotized structure (probably a sperm pump) attached to its anterior end and strong anterior apodemes also present. Hypoproct weak, sometimes divided medially or fused with cerci; cercus usually weak but variable in form, very large in Ditomyiinae, with transverse rows of short stout bristles in most *Boletina* spp. (Figs. 92, 93).

Female (Figs. 88–91) with tergite 8 usually shorter than sternite 8, rarely very short and medially divided, or absent; sternite 8 separate from tergite 8, well-developed, rounded or emarginate posteriorly or medially divided, sometimes with a posterior pair of semiarticulated lobes or with posterior margin invaginated. Tergite 9 well-developed or very short, haired or bare, rarely medially divided or absent; sternite 9 usually fused laterally with tergite 9, lying above tergite 8, usually weakly sclerotized and with membranous areas, sometimes with an anterior apodeme extending above sternites 8 and 7, in many Mycetophilinae with a posterior triangular process that may extend beyond apices of cerci. Tergite 10 short or absent; sternite 10 well-developed, membranous medially, and entire, or absent. Cercus articulated with last sclerotized tergite, usually weakly sclerotized and two-segmented with a larger basal and a smaller apical segment; sometimes one-segmented; rarely strongly sclerotized, one-segmented, elongate, slender, curved, and tapering [*Boletina oviducta* (Garrett); *Drepanocercus* Vockeroth, Fig. 88]. Two spermathecae probably always present, usually spherical or nearly so if sclerotized, with a conical posterior projection in some Keroplatinae. Spermatheca strongly sclerotized in at least one species of each of the genera *Bolitophila, Diadocidia* Ruthe, and *Lygistorrhina*; strongly to very weakly sclerotized in various genera of Keroplatinae; apparently absent in macerated specimens of Ditomyiinae, some Keroplatinae, Manotinae, Sciophilinae, and Mycetophilinae; but detected in unsclerotized form after maceration and dissection in *Orfelia genualis* (Johannsen), *Saigusaia cincta* (Johannsen), and one species of *Dynatosoma* Winnertz (and distal ends of spermathecal ducts detected in species of several other genera). Spermathecal ducts usually slender, sometimes swollen over part of their length, apparently opening separately on a weakly sclerotized or membranous area of sternite 9 or into a slight invagination of sternite 9.

**Larva.** Poorly known, especially non-European forms; usually cylindrical and slender (Figs. 97, 103), but extremely slender and oligochaete-like in some Keroplatinae, and flattened and slug-like in *Phronia* Winnertz; forming a dark conical dorsal case from frass and from larval excrement in at least one species of *Epicypta*; occurring in mucous tubes or webs formed from salivary excretion in Diadocidiinae, Keroplatinae, and Sciophilinae (except *Docosia* Winnertz); possessing light-producing tissues in several species of Keroplatinae; bearing spiracles on prothorax and eight abdominal segments in Ditomyiinae and on prothorax and seven abdominal segments in most other groups; propneustic in *Diadocidia* and *Speolepta* Edwards, and apneustic in Keroplatinae, although nonfunctional spiracles apparently also present in these groups.

Head (Figs. 98–102) important taxonomically, strongly sclerotized, free, well-developed, without tentorial arms, with a few dorsal setae only in Ditomyiinae. Antenna usually very short, nonsclerotized and one-segmented (with apical sensory organs in Ditomyiinae), elongate and three-segmented only in *Bolitophila*. Labrum fleshy, supported by a chitinous frame that articulates with two movable arms, each of which carries a fan-shaped organ. Mandible lamelliform, toothed along inner margin, with prostheca at inner basal angle except in *Bolitophila*. Maxilla consisting of an inner blade-like lobe and an outer oval lobe; blade-like lobe serrated along inner margin, and ending in a sclerotized bar that lies dorsal to a basal plate-like cardo; oval lobe with a circular membranous area that carries several papillae; maxilla reduced and palpus large in Ditomyiinae. Hypopharynx consisting of two curved horizontal processes that join in midventral line and two vertical processes that join horizontal processes. Labium reduced to a small sclerotized plate (or sometimes two plates in Ditomyiinae) at base of hypopharynx.

Body with three thoracic and eight or nine abdominal segments. [Madwar (1937) gives 11 as the number of body segments for Ditomyiinae and *Keroplatus* and 12 for other genera; Hennig (1948) gives 11 as the number of body segments. Further study is needed.] Thoracic segments bare except for two ventral groups of three or four minute setae marking position of imaginal leg discs on each segment; abdominal segments bare except for a few setae mostly near the spiracles in Ditomyiinae and in one *Phronia* sp. Nine to eleven ventral creeping welts between segments of thorax and abdomen in *Bolitophila* and Mycetophilinae; each welt with an armature of spicules and hooks.

One comprehensive account of the larval stage is that of Madwar (1937), from which most of the description here is taken. Hennig (1948) gave a more extended summary, also based mainly on Madwar; he included keys to genera of Ditomyiinae and Sciophilinae. Plachter (1979*a*, 1979*b*, 1979*c*) has recently provided extensive studies of web structure, of larval structure, and of pupal structure, respectively.

**Pupa.** Probably distinguishable from other groups (except Sciaridae) by having leg sheaths side by side rather than overlapping, visible apical tibial spurs, and a sessile undivided anterior thoracic spiracle.

**Biology and behavior.** Mycetophilidae are most abundant in humid areas, especially moist woodland; during the day adults of many species, especially of Mycetophilinae, congregate in moist dark places such as overhanging stream banks and cavities under tree roots. Many species can be swept from undergrowth in woods. Lewis and Taylor (1965) showed that three species in England were most active at dusk and less active at dawn; this behavior may be true of many species and is perhaps the reason why so many specimens, even of apparently rare genera such as *Symmerus* Walker and *Novakia* Strobl, are often taken in Malaise traps. Some species, especially those with elongate mouthparts, visit flowers; species of a number of genera have been observed to feed on honeydew on leaves (J. A. Downes, personal commun.). A few species are brightly colored and probably mimic Hymenoptera. In cool temperate regions some species overwinter as adults under bark or in hollow plant stems.

Many larvae live in fleshy or woody fungi, on or in dead wood, under bark, or in nests of birds or squirrels; most or all of these are probably mycetophagous. Larvae of some Mycetophilini feed on Myxomycetes. Larvae of one (and perhaps all) *Boletina* sp. feed on Hepaticae. Larvae of some Keroplatinae spin webs and capture and feed on small arthropods (Mansbridge 1933). Larvae of some species live mainly or entirely in caves (Matile 1970). The larva of the Tasmanian *Planarivora insignis* Hickman (Keroplatinae) is endoparasitic in land planarians. Edwards (1925), Buxton (1960), and Hackmann and Meinander (1979) give much information on larval habitats and hosts.

Pupation usually takes place in the ground but some Mycetophilinae pupate in the host fungus (adults may remain quiescent in the pupal cocoon for some time and emerge very rapidly if disturbed) and most Sciophilinae have the pupa hanging in a sparse web of salivary threads. The pupa is free in Ditomyiinae and in *Bolitophila*, enclosed in a dense cocoon in Mycetophilinae and in *Docosia*, and apparently enclosed in a weak cocoon, which may be reduced to a few threads, in other groups.

**Classification and distribution.** Mycetophilidae occur on all continental areas except Antarctica (from northern Greenland to Tierra del Fuego) and on most oceanic islands. About 3000 species have been described but the number is undoubtedly much greater. The Mycetophilidae plus Sciaridae of the present work, which Hennig (1948, 1973) treats under the Mycetophiloidea, are generally considered a holophyletic group. There is, however, great divergence in the ranking of the subgroups by different authors. Edwards (1925), who laid the basis for subsequent classifications, recognized one family with 10 subfamilies, one of which was the Sciarinae; subsequently Edwards (1941) included the Macrocerinae in the Keroplatinae. Hennig (1973) considered six of the nine subfamilies recognized by Edwards in his later papers as separate families: the Lygistorrhininae he included in the Keroplatidae, following Tuomikoski (1966*c*); the Manotinae, following Tuomikoski (1966*b*), and the Sciophilinae he placed in the Mycetophilidae, although Hennig (1948) had treated the Sciophilidae as a separate family. Madwar (1937), following Keilin (1919), treated the Ditomyiidae as a separate family because of similarities between their larvae and those of the Bibionidae; the rest of the superfamily, including the Sciaridae, he treated as the family Mycetophilidae. Most recent authors treat the Sciaridae as a family, possibly so they can ignore it when treating the Mycetophilidae, and consider the rest of the superfamily as the

Mycetophilidae with eight subfamilies. This arrangement is adopted here because of its general acceptance, although the Mycetophilidae in this sense is probably a paraphyletic group. A thorough phylogenetic analysis is necessary to clarify the problem.

Two of the subfamilies, Sciophilinae and Mycetophilinae, are normally divided into tribes. The sciophiline tribes Mycomyini and Sciophilini are readily defined. The Mycomyini includes, in the Nearctic region, only *Mycomya* and *Neoempheria* Osten Sacken. The Sciophilini includes all those Sciophilinae with abundant macrotrichia on the wing membrane (couplets 30–46); it may be a monophyletic group, but *Paratinia* Mik shows several similarities with *Acomoptera* Vockeroth, a genus that lacks wing macrotrichia. The validity and limits of the two other generally recognized Nearctic tribes, the Gnoristini and Tetragoneurini (=Leiini), are doubtful; I am unable to distinguish them satisfactorily. They include genera in couplets 48–73 (except *Megalopelma* Enderlein) plus *Aphrastomyia*. The two tribes of the Mycetophilinae, Exechiini and Mycetophilini, have been redefined by Tuomikoski (1966*a*). The Exechiini includes all the genera in the key below from *Anatella* Winnertz to *Cordyla*; the Mycetophilini includes the eight genera following *Cordyla*.

Certain genera or generic complexes require further study. *Orfelia* on a world basis is at present divided into about 24 subgenera, some of which have been, and more of which probably should be, treated as distinct genera. *Coelosia* Winnertz shows great diversity, especially in the male terminalia, and may be a complex of genera. *Dziedzickia* is undoubtedly a complex of several genera. One or more of the Nearctic species referred here probably belong to *Palaeodocosia* Meunier, but other distinct genera are probably included as well. An attempt to divide the genus seems premature until the world fauna, and particularly the many Neotropical species, can be reviewed. *Leia* requires further study; even with the recognition of *Greenomyia* Brunetti and of *Garrettella* Vockeroth as separate genera, the remaining species show diversity in ocellar position, wing venation, and structure of male and female terminalia. Study of the world fauna may show that several other distinct genera are grouped under this name. The genera of the Exechiini were revised by Tuomikoski (1966*a*); most of the genera recognized by him are recognizable in the Nearctic region, but further study of the group, and especially of his subgeneric segregates, would be desirable. The nominal genera related to *Mycetophila* (*Epicypta*, *Platurocypta* Enderlein, and their synonyms) are separable from *Mycetophila*, although only with difficulty, in the Holarctic region; however, in tropical regions these groups are well developed and the generic limits are still very confused.

Probably fewer than half the Nearctic species have been recorded from the region; many Holarctic species await recognition and many species are still undescribed. For example, a recent revision of *Phronia* (Gagné 1975) increased the number of species from 14 to 49, of which 33 are known to be Holarctic. Several species are incorrectly assigned to genera and, especially in the Exechiini, the correct assignment of many species of genera recently divided is uncertain. Therefore the information about distribution and number of species given for each genus is subject to correction.

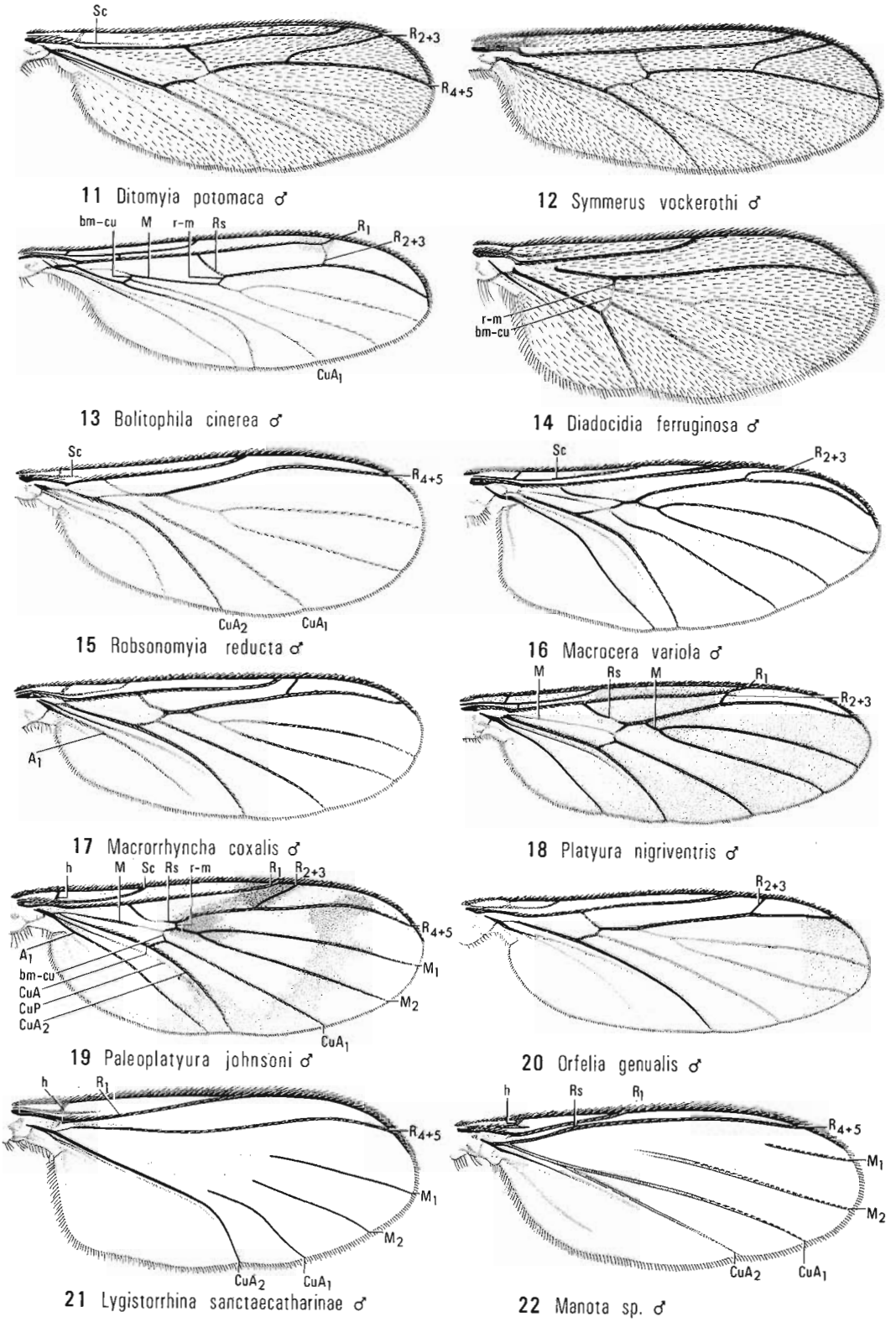
Johannsen (1910*a*, 1910*b*, 1912*a*, 1912*b*) revised the Nearctic fauna; because of the many species not included and the many subsequent changes in generic limits and nomenclature, his work is of limited value. Shaw and Fisher (1952) gave keys to the species of the northeastern United States, but some are unsatisfactory. These two papers are not cited below under individual genera; only references to the few other generic revisions or keys published since Johannsen's revisions are listed.

Rohdendorf (1974) has referred fossils of various periods from Upper Triassic onward to several extinct genera and families of Fungivoroidea (=Sciaroidea), but the oldest fossil definitely referable to the Mycetophilidae is an undescribed species of Sciophilinae from Canadian Upper Cretaceous amber. The early Tertiary Baltic amber is very rich in Mycetophilidae; all subfamilies recognized here, except Ditomyiinae, and a number of recent genera have been reported. About 250 species have been described from Baltic amber. A few species are known from Tertiary sediments.

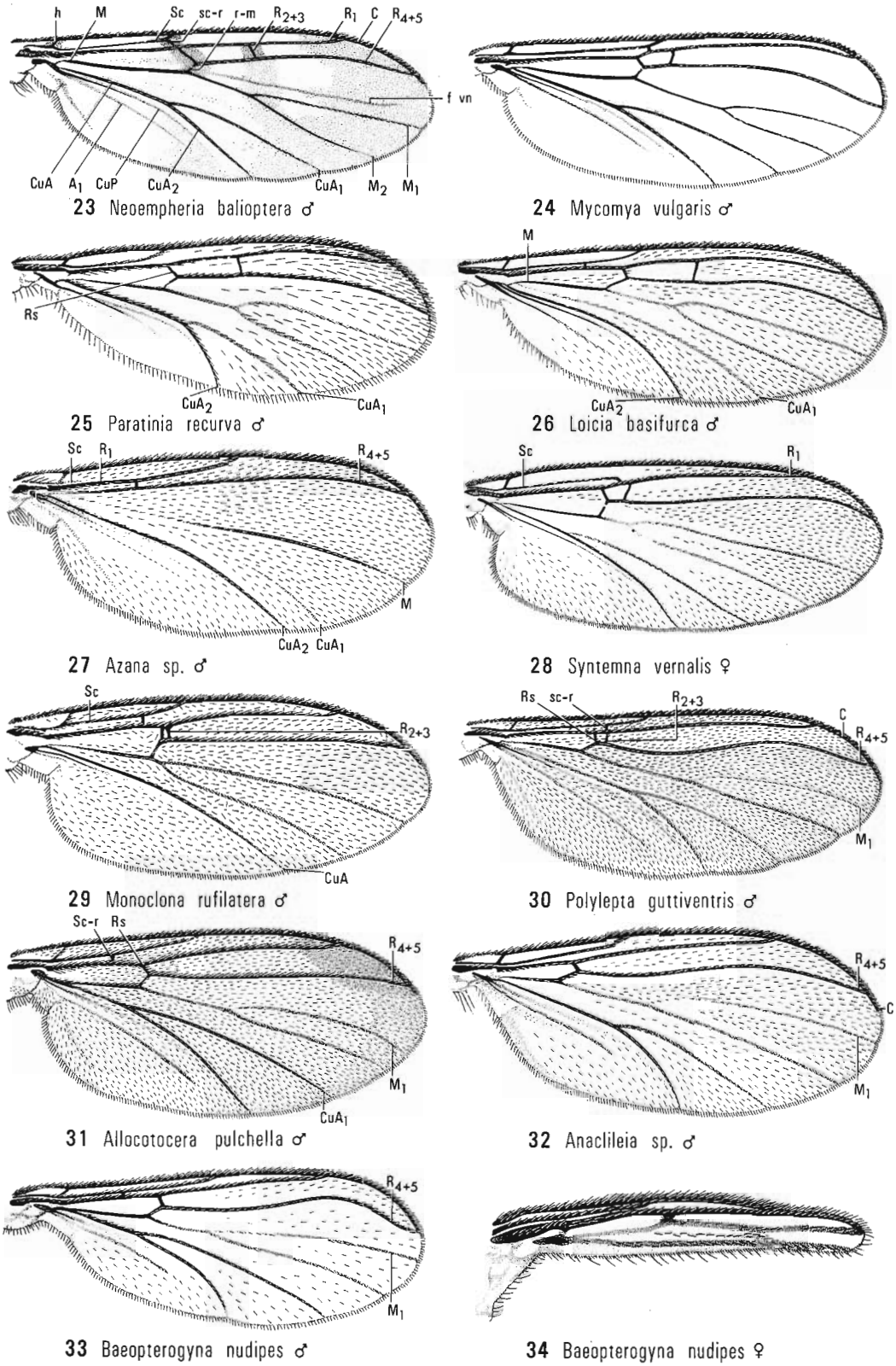
## Key to genera

1. Wing short, about half as long as abdomen ..... SCIOPHILINAE, in part ....2
   Wing of normal size, about as long as abdomen ..... 3
2. Wing very narrow; venation reduced and obscure (Fig. 34). Female only ..... ***Baeopterogyna*** Vockeroth, in part
   1 sp., *nudipes* Vockeroth; northwestern
   Wing moderately broad; venation complete or nearly so and distinct (Fig. 52). Male and female ..... ***Boletina*** Staeger, in part
   1 undescr. sp., dimorphic in wing length; eastern; see couplet 59
3. M and $CuA_1$ connected well beyond level of crossvein h by a distinct crossvein bm-cu or by a brief contact or fusion of M and $CuA_1$ (Figs. 11–20) ..... 4
   M and CuA connected at most basally at or very near level of crossvein h (Figs. 21–74) ..... 22

4. $R_{2+3}$ present and at least half as long as $R_{4+5}$; Sc distinctly sclerotized for only a short distance, continuing as a weak fold that ends free (Figs. 11, 12); wing membrane with macrotrichia. Postpronotum with one or more long fine setae.....DITOMYIINAE....5

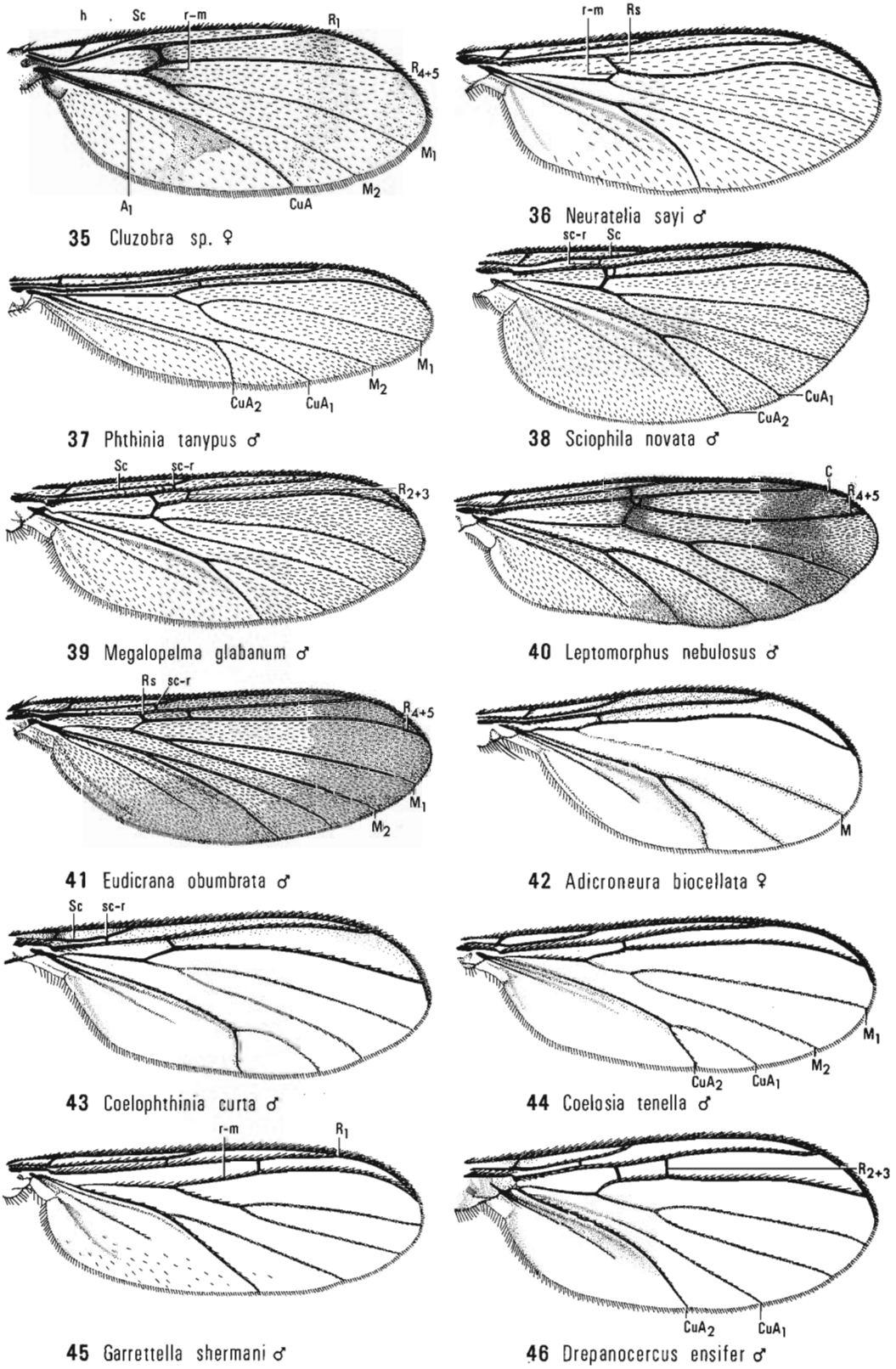



Figs. 14.11–22. Wings: (11) *Ditomyia potomaca* Fisher; (12) *Symmerus vockerothi* Munroe; (13) *Bolitophila cinerea* Meigen; (14) *Diadocidia ferruginosa* (Meigen); (15) *Robsonomyia reducta* Matile & Vockeroth; (16) *Macrocera variola* Garrett; (17) *Macrorrhyncha coxalis* (Loew); (18) *Platyura nigriventris* (Johannsen); (19) *Paleoplatyura johnsoni* Johannsen; (20) *Orfelia genualis* (Johannsen); (21) *Lygistorrhina sanctaecatharinae* Thompson; (22) *Manota* sp. (*continued*).




Figs. 14.23–34. Wings (*continued*): (23) *Neoempheria balioptera* (Loew); (24) *Mycomya vulgaris* Garrett; (25) *Paratinia recurva* Johannsen; (26) *Loicia basifurca* Vockeroth; (27) *Azana* sp.; (28) *Syntemna vernalis* (Sherman); (29) *Monoclona rufilatera* (Walker); (30) *Polylepta guttiventris* (Zetterstedt); (31) *Allocotocera pulchella* (Curtis); (32) *Anaclileia* sp.; (33, 34) *Baeopterogyna nudipes* Vockeroth (*continued*).

Abbreviation: f vn, false vein.




35 Cluzobra sp. ♀

36 Neuratelia sayi ♂

37 Phthinia tanypus ♂

38 Sciophila novata ♂

39 Megalopelma glabanum ♂

40 Leptomorphus nebulosus ♂

41 Eudicrana obumbrata ♂

42 Adicroneura biocellata ♀

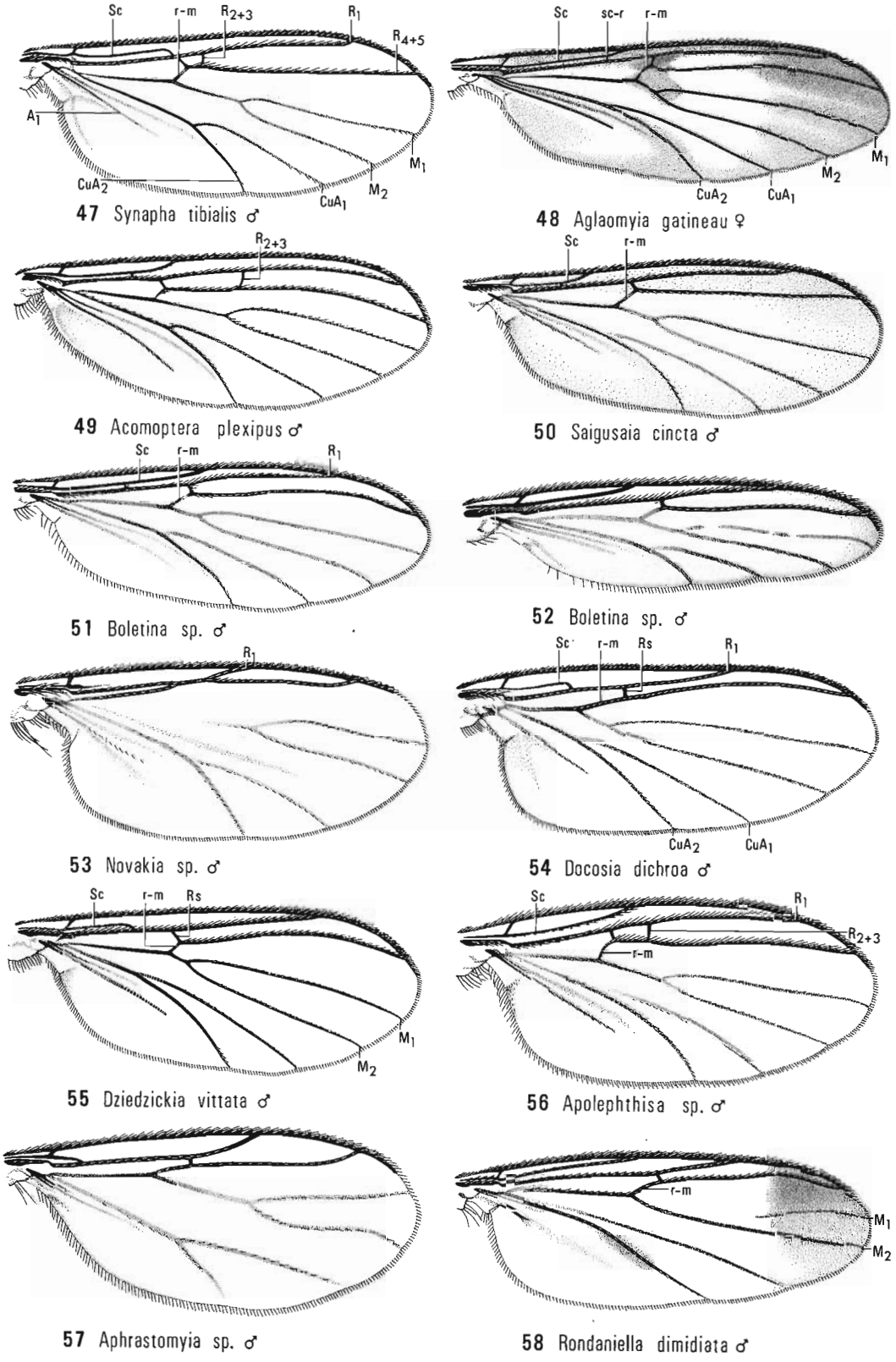
43 Coelophthinia curta ♂

44 Coelosia tenella ♂

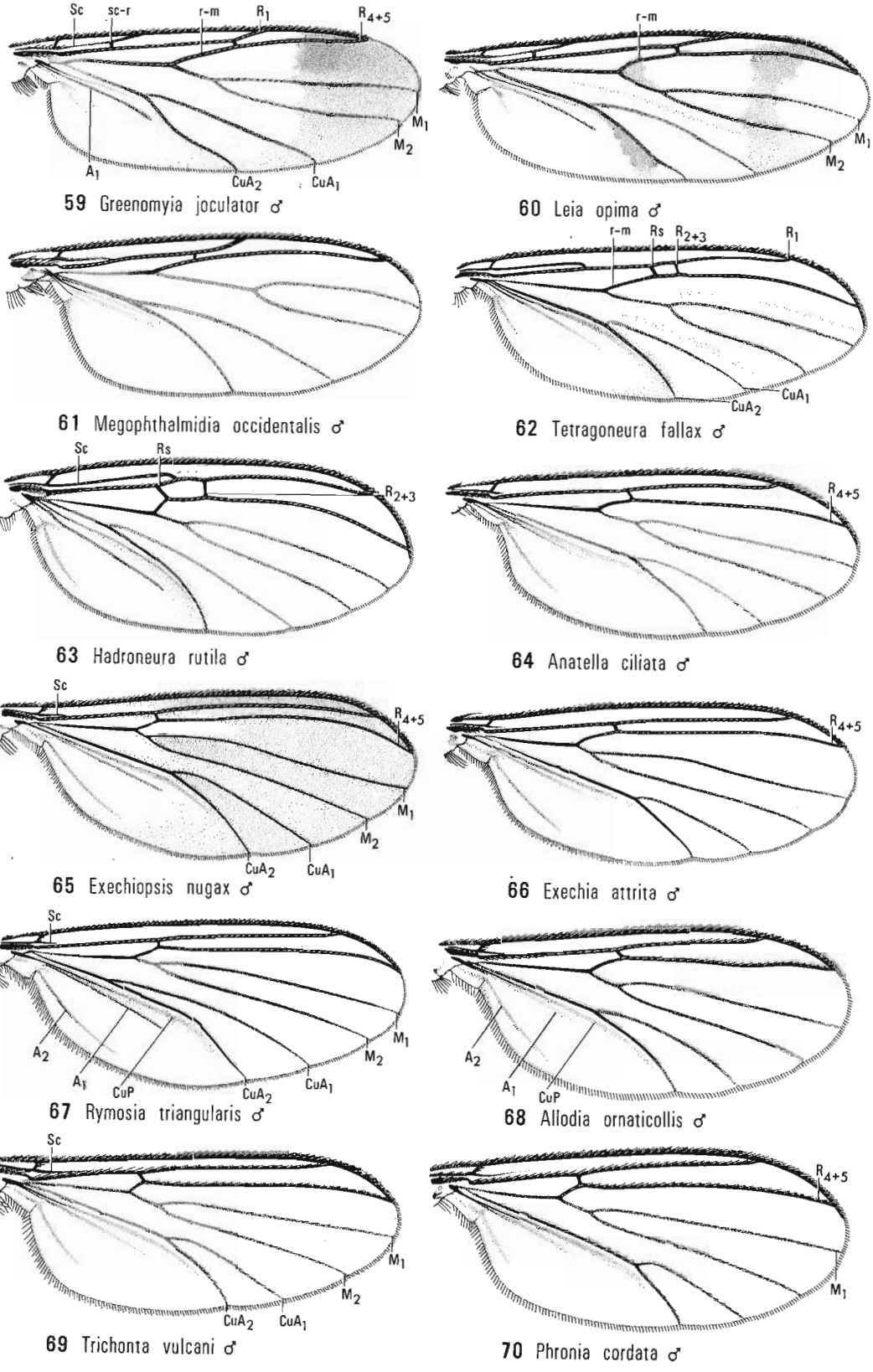
45 Garrettella shermani ♂

46 Drepanocercus ensifer ♂

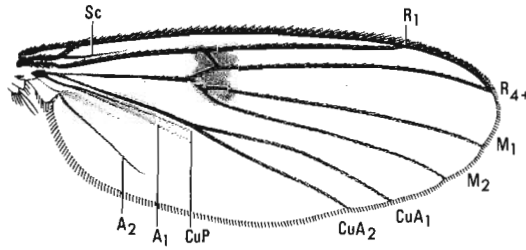
Figs. 14.35–46. Wings (*continued*): (35) *Cluzobra* sp.; (36) *Neuratelia sayi* (Aldrich); (37) ***Phthinia tanypus*** Loew; (38) *Sciophila novata* Johannsen; (39) *Megalopelma glabanum* (Johannsen); (40) ***Leptomorphus nebulosus*** (Walker); (41) *Eudicrana obumbrata* Loew; (42) *Adicroneura biocellata* Vockeroth; (43) ***Coelophthinia curta*** (Johannsen); (44) *Coelosia tenella* (Zetterstedt); (45) *Garrettella shermani* (Garrett); (46) ***Drepanocercus ensifer*** Vockeroth (*continued*).



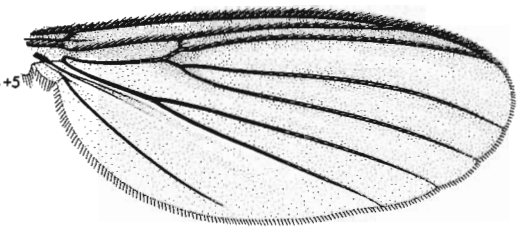

Figs. 14.47–58. Wings (*continued*): (47) *Synapha tibialis* (Coquillett); (48) *Aglaomyia gatineau* Vockeroth; (49) *Acomoptera plexipus* (Garrett); (50) *Saigusaia cincta* (Johannsen); (51, 52) *Boletina* sp.; (53) *Novakia* sp.; (54) *Docosia dichroa* Loew; (55) *Dziedzickia vittata* (Coquillett); (56) *Apolephthisa* sp.; (57) *Aphrastomyia* sp.; (58) *Rondaniella dimidiata* (Meigen) (*continued*).



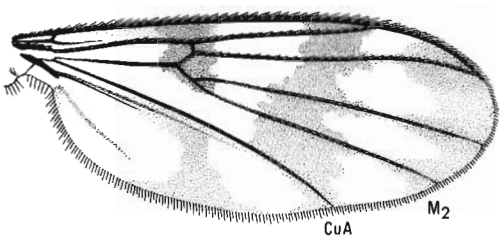

Figs. 14.59–70. Wings (*continued*): (59) *Greenomyia joculator* (Laffoon); (60) *Leia opima* (Loew); (61) *Megophthalmidia occidentalis* Johannsen; (62) *Tetragoneura fallax* Sherman; (63) *Hadroneura rutila* (Sherman); (64) *Anatella ciliata* Winnertz; (65) *Exechiopsis nugax* (Johannsen); (66) *Exechia attrita* Johannsen; (67) *Rymosia triangularis* Shaw; (68) *Allodia ornaticollis* (Meigen); (69) *Trichonta vulcani* (Dziedzicki); (70) *Phronia cordata* Lundström (*continued*).



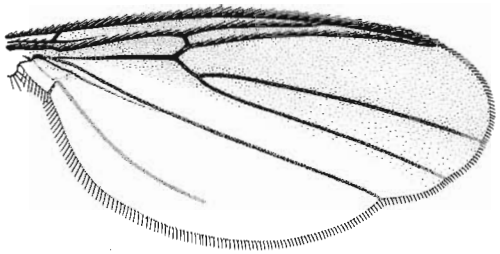

71 Mycetophila unipunctata ♂



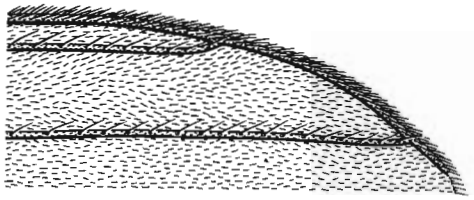
72 Epicypta scatophora ♂



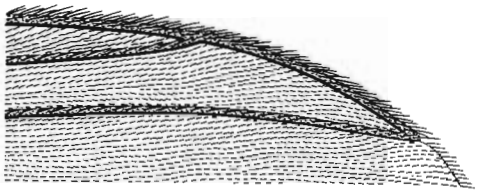

73 Zygomyia ornata ♂



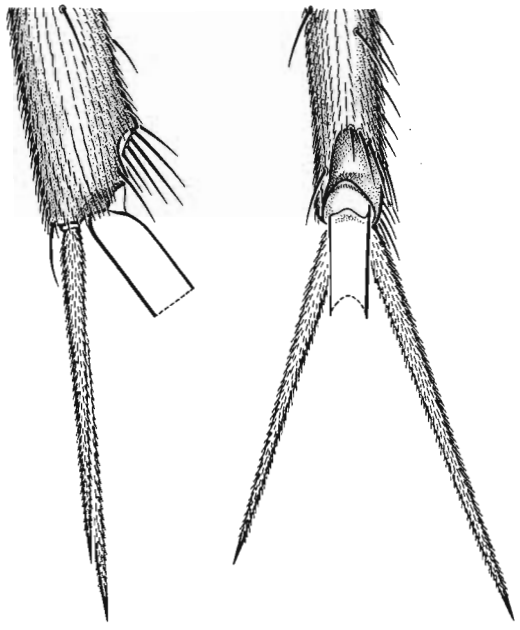
74 Sceptonia johannseni ♂



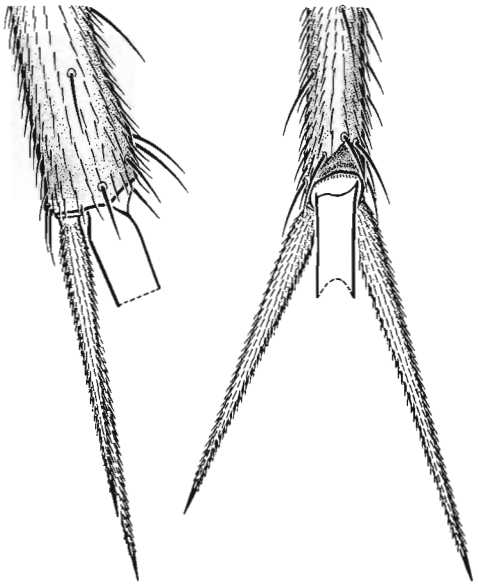
75 Synapha tibialis ♂



76 Exechia attrita ♂



77 Exechiopsis nugax ♂ 78



79 Exechia attrita ♂ 80

Figs. 14.71–80. Wings (*concluded*) and hind tibiae: wing of (71) *Mycetophila unipunctata* Meigen, (72) *Epicypta scatophora* (Perris), (73) *Zygomyia ornata* Loew, and (74) *Sceptonia johannseni* Garrett; anteroapical portion of wing of (75) *Synapha tibialis* (Coquillett) and (76) *Exechia attrita* Johannsen; apex of left hind tibia of (77) *Exechiopsis nugax* (Johannsen) in anterior view, (78) *E. nugax* in dorsal view, (79) *Exechia attrita* in anterior view, and (80) *E. attrita* in dorsal view.

$R_{2+3}$ present and less than half as long as $R_{4+5}$ (Figs. 13, 16–20), or absent (Figs. 14, 15); Sc ending in C or in R or ending free; wing membrane with or without macrotrichia. Postpronotal setae very short or absent ..... 7

5. Eyes almost touching above antennae, separated by scarcely more than width of median ocellus. Point of furcation of Rs well beyond level of point of furcation of M (Fig. 12). Anepisternum haired above ..... ***Symmerus*** Walker....6

Eyes separated above antennae by more than width of ocellar triangle. Point of furcation of Rs very near level of point of furcation of M (Fig. 11). Anepisternum bare ..***Ditomyia*** Winnertz
2 spp.; eastern; Fisher 1941

6. Mediotergite with setae on posterior half ..... ***Symmerus*** (***Symmerus*** Walker)
1 sp., *lautus* (Loew); eastern

Mediotergite bare..... ***Symmerus*** (***Psilosymmerus*** Munroe)
3 spp.; eastern or western; Munroe 1974

7. Crossvein bm-cu, or point of contact of M and $CuA_1$, far before level of base of Rs; crossvein r-m distinct (Fig. 13) ..... BOLITOPHILINAE....***Bolitophila*** Meigen....8

Crossvein bm-cu beyond level of base of Rs, or Rs and M fused for a short distance; crossvein r-m distinct or obliterated by fusion of R and M (Figs. 14–20) ..... 9

8. $R_{2+3}$ ending in C ..... ***Bolitophila*** (***Cliopisa*** Enderlein)
12 spp.; widespread; Shaw 1962

$R_{2+3}$ ending in $R_1$ (Fig. 13)..... ***Bolitophila*** (***Bolitophila*** Meigen)
8 spp.; widespread; Shaw 1962

9. Crossveins r-m and bm-cu both distinct, forming a straight line; $R_{2+3}$ absent (Fig. 14) .....
..... DIADOCIDIINAE....***Diadocidia*** Ruthe....10

Crossvein r-m usually absent because of contact or partial fusion of R and M; if crossvein r-m present, situated beyond level of crossvein bm-cu (Fig. 19); $R_{2+3}$ present or absent .....
..... KEROPLATINAE....11

10. Third flagellomere at least four times as long as broad. Anepisternum haired above. Segments of fore tarsus slender in female ..... ***Diadocidia*** (***Adidocidia*** Laštovka & Matile)
2 spp.; widespread; Laštovka and Matile 1972

Third flagellomere at most 3.2 times as long as broad. Anepisternum bare above. Segments 2–4 of fore tarsus swollen below in female (Fig. 81) ..... ***Diadocidia*** (***Diadocidia*** Ruthe)
2 spp.; widespread

11. Antenna strongly compressed. Palpus very short, often porrect, with three segments (Fig. 4). Prosternum with at least a few hairs ..... 12

Antenna cylindrical or only moderately compressed. Palpus drooping, with five segments. Prosternum haired or bare..... 15

12. $R_{2+3}$ ending in $R_1$ (as in Fig. 18). Laterotergite haired ..... ***Keroplatus*** Bosc
4 spp.; widespread; Fisher 1941

$R_{2+3}$ ending in C (as in Fig. 20). Laterotergite bare ..... 13

13. Tibial setae irregularly arranged (as in Fig. 83) ..... 14

Tibial setae in regular longitudinal rows (as in Fig. 82)..... ***Euceroplatus*** Edwards
3 spp.; widespread; Fisher 1941

14. Mediotergite with triangular membranous area at base ..... ***Heteropterna*** Skuse
1 sp., *cressoni* (Fisher); eastern

Mediotergite uniformly sclerotized ..... ***Cerotelion*** Rondani
1 sp., *johannseni* (Fisher); eastern

15. Branches of CuA slightly convergent beyond their base, then divergent (Figs. 15, 16); wing membrane with or without macrotrichia. Anepisternum with at least a few long erect hairs on upper half..... 16

Branches of CuA regularly divergent from their base (Figs. 17–20); wing membrane without macrotrichia. Anepisternum bare or with short hairs above ..... 18

16. Ocelli absent. Upper part of anepisternum with many fine pale hairs. C ending at apex of $R_{4+5}$. Empodia absent..... ***Hesperodes*** Coquillett
1 sp., *johnsoni* Coquillett; eastern

Ocelli present. Upper part of anepisternum with few to many coarse dark hairs. C extending at least slightly beyond apex of $R_{4+5}$ (Figs. 15, 16). Empodia present, short to long ..... 17

17. Sc short, ending in R well before level of base of Rs; $R_{2+3}$ absent; wing unmarked, without macrotrichia (Fig. 15). Antenna much shorter than body ..***Robsonomyia*** Matile & Vockeroth
1 sp., *reducta* Matile & Vockeroth; western

Sc long, ending in C at or beyond level of base of Rs; $R_{2+3}$ present or absent; wing sometimes with dark markings and sometimes with macrotrichia (Fig. 16). Antenna usually longer than body (Fig. 2) ..... ***Macrocera*** Meigen
24 spp.; widespread

18. Mouthparts at least as long as head (Fig. 5) ..... 19

Mouthparts much shorter than head ..... 20

19. $A_1$ incomplete, becoming faint well before wing margin (Fig. 17). Anterior thoracic spiracle with short erect black setae on posterior margin ..... ***Macrorrhyncha*** Winnertz
2 spp.; widespread

$A_1$ extending distinctly to, or almost to, wing margin. Anterior thoracic spiracle without setae on posterior margin ..... ***Asindulum*** Latreille
1 sp., *montanum* Röder; widespread

20. Crossvein r-m short but distinct (Fig. 19) ..... ***Paleoplatyura*** Meunier
3 spp.; eastern or western; Fisher 1941

Crossvein r-m absent because of contact or partial fusion of Rs and M (Figs. 18, 20) ..... 21

21. $R_{2+3}$ ending in $R_1$; base of M weak but distinct (Fig. 18). Empodia present, large ..... ***Platyura*** Meigen
7 spp.; widespread; Fisher 1941

$R_{2+3}$ ending in C; base of M absent (Fig. 20). Empodia absent ..... ***Orfelia*** Costa
34 spp.; widespread

22. Rs and $R_1$ separated from level of crossvein h; stem of M absent; $CuA_1$ and branches of M present as detached veins on distal part of wing (Fig. 21). Mouthparts long and slender, several times as long as height of head (Fig. 6) ..... LYGISTORRHININAE.... ***Lygistorrhina*** Skuse
1 sp., *sanctaecatharinae* Thompson; southeastern

Rs arising from R well beyond crossvein h; stem of M present or absent (Figs. 22–74). Mouthparts usually much shorter than head; if mouthparts long and slender, both M and CuA entire and normally forked ..... 23

23. Stem of M absent; branches of M present as detached veins on distal part of wing (Fig. 22). Head inserted at anterior end of thorax, projecting as far dorsally as highest part of scutum, and with a row of strong posteriorly directed bristles behind eye (Fig. 7). Pronotum with many short hairs but without distinct bristles..... MANOTINAE.... ***Manota*** Williston
1 sp., unnamed; western

Stem of M present, although sometimes weak (Figs. 23–74). Head inserted below anterior end of thorax, not extending as far dorsally as highest part of scutum, and without strong posteriorly directed bristles behind eye. Pronotum with distinct bristles ..... 24

24. Wing membrane either with microtrichia irregularly arranged (Fig. 75) and with macrotrichia present or absent, or with microtrichia absent and macrotrichia abundant; Sc variable, ending in C or in R or ending free; $R_{2+3}$ present or absent (Figs. 23–63). Laterotergite haired or bare. Ocelli variable in position, often far from eye margins ..... SCIOPHILINAE.... 25

Microtrichia always present and, especially near wing margin, arranged in more or less regular longitudinal lines (Fig. 76); macrotrichia usually absent, at most a few present in anal area; Sc ending free or in R; $R_{2+3}$ absent (Figs. 64–74). Laterotergite haired. Lateral ocelli touching eye margins ..... MYCETOPHILINAE.... 74

25. Fine tibial setae arranged in regular longitudinal rows (Fig. 82). Ocelli very close together near middle of frons. Wing membrane without macrotrichia..... 26

Fine tibial setae irregularly arranged (Fig. 83). Ocelli variable in position; lateral ocelli sometimes near eye margins. Wing membrane with or without macrotrichia ..... 28

26. $R_{2+3}$ absent; $R_1$ ending at or before level of point of furcation of M, subequal in length to crossvein r-m; crossvein r-m nearly horizontal; Sc very short, ending in R (Fig. 57). Three ocelli present; median one small. Laterotergite with a few hairs ..... ***Aphrastomyia*** Coher & Lane
1 sp., unnamed; eastern

$R_{2+3}$ present; $R_1$ ending far beyond level of point of furcation of M, at least six times as long as crossvein r-m; crossvein r-m nearly transverse; Sc long, ending in C or in R (Figs. 23, 24). Two ocelli present. Laterotergite bare ..... 27

27. C extending slightly beyond apex of $R_{4+5}$; $R_{4+5}$ reaching wing margin slightly before wing apex; wing membrane with a false vein between $R_{4+5}$ and $M_1$; wing with conspicuous dark markings (Fig. 23) ..... ***Neoempheria*** Osten Sacken
7 spp.; widespread

C ending at apex of $R_{4+5}$; $R_{4+5}$ reaching wing margin at wing apex; wing membrane without false vein between $R_{4+5}$ and $M_1$; wing unmarked or with obscure clouding (Fig. 24) ..... ***Mycomya*** Rondani
61 spp.; widespread; Fisher 1937

28. Wing membrane with many distinct macrotrichia and usually also with microtrichia (Figs. 25–33, 35–41) (*Megalopelma* may have macrotrichia very reduced; it keys either way) ..... 29

Wing membrane without macrotrichia or with at most a few near posterior margin (Fig. 45), always with dense microtrichia ..... 47

29. Laterotergite bare; mediotergite bare ..... 30

Laterotergite with strong erect hairs; mediotergite usually haired at least posteriorly ..... 31

30. Point of furcation of CuA slightly beyond level of base of Rs (Fig. 25). Tibiae without distinct bristles ..... ***Paratinia*** Mik
1 sp., *recurva* Johannsen; eastern

Point of furcation of CuA very near wing base; $CuA_1$ arising from base of M (Fig. 26). Tibiae with short but distinct bristles ..... ***Loicia*** Vockeroth
1 sp., *basifurca* Vockeroth; British Columbia

31. M and CuA not clearly branched but a detached branch of one of them (probably of CuA) present near wing margin; Sc short, ending free (Fig. 27) ..... ***Azana*** Walker
1 sp., unnamed; widespread

M or CuA, or both, clearly branched; Sc long, ending in C or in $R_1$ (Figs. 28–33, 35–41) ..... 32

32. Sc ending in C (Figs. 29–41). Mediotergite haired; hairs usually long and erect but sometimes very short ..... 33

Sc ending in $R_1$ (Fig. 28). Mediotergite bare ..... ***Syntemna*** Winnertz
3 spp.; widespread

33. CuA unbranched (Figs. 29, 35) ..... 34

CuA branched, with anterior branch sometimes obsolete basally (Figs. 30–33, 36–41) ..... 36

34. Macrotrichia of wing membrane reflexed, directed toward wing base; $R_{2+3}$ present or absent (Fig. 29). Posteroventral part of metepisternum with fine hairs ..... ***Monoclona*** Mik
5 spp.; widespread; Fisher 1946

Macrotrichia decumbent, directed toward wing apex; $R_{2+3}$ absent. Metepisternum bare ..... 35

35. Two ocelli present. Sc ending before or opposite base of Rs (Fig. 35). Anepisternum haired above ..... ***Cluzobra*** Edwards
1 sp., unnamed; Louisiana

Three ocelli present. Sc ending well beyond level of base of Rs. Anepisternum bare ..... ***Acnemia*** Winnertz
3 spp.; widespread

36. Base of $M_1$ obsolete or very weak (Figs. 30–33, 36) ..... 37

Base of $M_1$ entire (Figs. 37–41) ..... 41

37. Crossvein sc-r beyond base of Rs; $R_{2+3}$ present (Fig. 30) ..... ***Polylepta*** Winnertz, in part
3 spp.; widespread

Crossvein sc-r, if present, before base of Rs; $R_{2+3}$ absent (Figs. 31–33, 36) ..... 38

38. $R_{4+5}$ moderately to strongly sinuate; $M_1$ basally obsolete or weak for a moderate distance (Figs. 32, 33, 36) ..... 39

$R_{4+5}$ nearly straight; $M_1$ weak at base for only a very short distance (Fig. 31) ..... ***Allocotocera*** Mik, in part
1 sp., *pulchella* (Curtis); eastern

39. C produced at least one-third of the distance between apex of $R_{4+5}$ and apex of $M_1$; $R_{4+5}$ moderately sinuate (Fig. 32) ..... ***Anaclileia*** Winnertz
3 spp., unnamed; widespread

C produced at most one-fifth of the distance between $R_{4+5}$ and $M_1$; $R_{4+5}$ strongly sinuate (Figs. 33, 36) ..... 40

40. Upper part of anepisternum, and metepisternum, with fine hairs. Male only ..... ***Baeopterogyna*** Vockeroth, in part
see couplet 2

Anepisternum and metepisternum bare ..... ***Neuratelia*** Rondani
14 spp.; widespread

41. Point of furcation of CuA beyond point of furcation of M; $CuA_1$ sometimes obsolete basally (Figs. 37–39) ..... 42

Point of furcation of CuA before point of furcation of M; $CuA_1$ entire (Figs. 30, 31, 40, 41) ..... 44

42. Legs extremely long and slender; first tarsomere of foreleg more than twice as long as fore tibia. $CuA_2$ widely divergent from $CuA_1$ (Fig. 37) ..... ***Phthinia*** Winnertz
3 spp.; widespread

Legs normal; first tarsomere of foreleg not longer than fore tibia. $CuA_2$ only slightly divergent from $CuA_1$ (Figs. 38, 39) ..... 43

43. Crossvein sc-r at least four times its own length from apex of Sc (Fig. 38); halter unicolorous or nearly so, yellow to pale brown. Anepisternum haired above ..... ***Sciophila*** Meigen
23 spp.; widespread

Crossvein sc-r at most twice its own length from apex of Sc (Fig. 39); halter yellow with end of knob blackened. Anepisternum bare ..... ***Megalopelma*** Enderlein, in part
2 spp.; widespread

44. C not produced beyond apex of $R_{4+5}$ (Fig. 40) ..... ***Leptomorphus*** Curtis
7 spp.; widespread

C produced well beyond apex of $R_{4+5}$ (Figs. 30, 31, 41) ..... 45

45. Crossvein sc-r well before base of Rs (Fig. 31). Anepisternum with many long hairs ..... ***Allocotocera*** Mik, in part
see couplet 38

Crossvein sc-r beyond base of Rs (Figs. 30, 41). Anepisternum bare or with a few short hairs near upper margin ..... 46

46. $R_{4+5}$ sinuate; stem of median fork almost as long as $M_1$ (Fig. 30). Three ocelli present; lateral ocelli far from eye margins ..... ***Polylepta*** Winnertz, in part
see couplet 37

$R_{4+5}$ nearly straight; stem of median fork about one-sixth as long as $M_1$ (Fig. 41). Two ocelli present, touching eye margins ..... ***Eudicrana*** Loew
1 sp., *obumbrata* Loew; eastern and central

47. Mediotergite with long erect hairs near posterior end ..... 48

Mediotergite bare ..... 50

48. M branched (Figs. 39, 43). Three ocelli present ..... 49

M unbranched (Fig. 42). Two ocelli present, near middle of frons ..... ***Adicroneura*** Vockeroth
1 sp., *biocellata* Vockeroth; Oregon

49. Laterotergite bare. Crossvein sc-r near middle of Sc; $R_{2+3}$ absent (Fig. 43); wing membrane without macrotrichia ..... ***Coelophthinia*** Edwards
1 sp., *curta* (Johannsen); widespread

Laterotergite haired. Crossvein sc-r very near end of Sc; $R_{2+3}$ present (Fig. 39); wing membrane with very short erect or slightly reflexed macrotrichia ..... ***Megalopelma*** Enderlein, in part
see couplet 43

50. Laterotergite bare ..... 51
Laterotergite haired; hairs usually long and abundant but sometimes short and few in number and confined to posterior declivity of laterotergite ..... 65

51. Sc ending in C (Figs. 44–46, 48–52) ..... 52
Sc ending free or in R (Figs. 47, 53–55) ..... 60

52. Point of furcation of CuA distinctly beyond level of point of furcation of M; crossvein sc-r absent (Fig. 44) ..... ***Coelosia*** Winnertz
6 spp.; widespread
Point of furcation of CuA before, below, or very slightly beyond point of furcation of M; crossvein sc-r present or absent (Figs. 45–52) ..... 53

53. $R_1$ not longer than crossvein r-m (Fig. 45) ..... ***Garrettella*** Vockeroth
1 sp., *shermani* (Garrett); western
$R_1$ at least three times as long as crossvein r-m (Figs. 46–52) ..... 54

54. Mouthparts forming a long slender proboscis that is several times as long as height of head (Fig. 10) ..... ***Gnoriste*** Meigen
4 spp.; widespread
Mouthparts shorter than height of head ..... 55

55. Point of furcation of CuA very near wing base; $R_{2+3}$ present (Fig. 46). Female cercus long, strongly sclerotized, scimitar-like (Fig. 88) ..... ***Drepanocercus*** Vockeroth
1 sp., *ensifer* Vockeroth; eastern
Point of furcation of CuA well beyond wing base; $R_{2+3}$ present or absent (Figs. 47–52). Female cercus usually short, weakly sclerotized ..... 56

56. Crossvein sc-r present, well beyond middle of Sc (Fig. 48) ..... 57
Crossvein sc-r near middle of Sc, or absent (Figs. 49–51) ..... 58

57. Point of furcation of CuA beyond base of crossvein r-m; stem of median fork three times as long as crossvein r-m; wing unmarked (as in Fig. 47) ..... ***Synapha*** Meigen, in part
3 spp.; widespread
Point of furcation of CuA before base of crossvein r-m; stem of median fork less than twice as long as crossvein r-m; wing with dark cloud on crossvein r-m and at apex (Fig. 48) ..... ***Aglaomyia*** Vockeroth
1 sp., *gatineau* Vockeroth; Quebec

58. $R_{2+3}$ present (Fig. 49) ..... ***Acomoptera*** Vockeroth
1 sp., *plexipus* (Garrett); western
$R_{2+3}$ absent (Figs. 50, 51) ..... 59

59. Sc ending before level of base of crossvein r-m (Fig. 50). Metepisternum with very short hairs that are dark in female but pale and inconspicuous in male ..... ***Saigusaia*** Vockeroth
1 sp., *cincta* (Johannsen); eastern
Sc ending beyond level of base of crossvein r-m (Fig. 51). Metepisternum bare ..... ***Boletina*** Staeger, in part
36 spp.; widespread

60. Crossvein r-m nearly horizontal; $R_1$ less than three times as long as crossvein r-m (Figs. 53, 54, 62) ..... 61
Crossvein r-m oblique; $R_1$ more than 3.5 times as long as crossvein r-m (Figs. 47, 55) ..... 63

61. Basal section of Rs indistinguishable because of crowding of radial veins toward C (Fig. 53) ..... ***Novakia*** Strobl
1 sp., unnamed; widespread
Basal section of Rs distinct (Figs. 54, 62) ..... 62

62. Hind coxa with many posterolateral hairs near base, then bare almost to apex (Fig. 84). $R_{2+3}$ absent; point of furcation of CuA well beyond wing base; both branches of CuA entire (Fig. 54). Lateral ocelli very near eye margins ..... ***Docosia*** Winnertz, in part
15 spp.; widespread
Hind coxa with a row of rather long setose posterolateral hairs on at least apical three-quarters (Fig. 85). $R_{2+3}$ present (Fig. 62) or absent; point of furcation of CuA very near or well

beyond wing base; anterior branch of CuA sometimes very weak basally or detached. Lateral ocelli variable in position (including *Ectrepesthoneura* Enderlein) ..... ***Tetragoneura*** Winnertz
11 spp.; widespread

63. Stem of median fork at least three times as long as crossvein r-m; $R_{2+3}$ present (Fig. 47) ..... 64
Stem of median fork less than twice as long as crossvein r-m; $R_{2+3}$ present or absent (Fig. 55) .... ***Dziedzickia*** Johannsen, in part
8 spp.; widespread

64. Spurs of mid tibia subequal in length to apical tibial diameter; mid and hind tibiae with bristles few in number and much shorter than tibial diameter. Antepenultimate palpal segment slender ..... ***Speolepta*** Edwards
1 sp., unnamed; eastern

Spurs of mid tibia about twice as long as apical tibial diameter; mid and hind tibiae with many bristles, some of which are longer than tibial diameter. Antepenultimate palpal segment broad and flat, projecting well beyond base of fourth segment (Fig. 8) ..... ***Synapha*** Meigen, in part
see couplet 57

65. Sc ending in C (Figs. 51, 56, 58–60) ..... 66
Sc ending free or in R (Figs. 54, 55, 61, 63) ..... 70

66. $R_1$ at least four times as long as crossvein r-m (Figs. 51, 56) ..... 67
$R_1$ at most three times as long as crossvein r-m (Figs. 58–60) ..... 68

67. $R_{2+3}$ present; crossvein sc-r absent; Sc densely setose above (Fig. 56) ... ***Apolephthisa*** Grzegorzek
1 sp., unnamed; widespread

$R_{2+3}$ absent; crossvein sc-r usually present; Sc usually bare above, rarely with a few setae (Fig. 51) ..... ***Boletina*** Staeger, in part
see couplet 59

68. $M_1$ detached at base, not longer than stem of median fork; crossvein r-m oblique (Fig. 58) ..... ***Rondaniella*** Johannsen
1 sp., *dimidiata* (Meigen); widespread

$M_1$ not detached at base, much longer than stem of median fork; crossvein r-m nearly horizontal (Figs. 59, 60) ..... 69

69. $R_{4+5}$ ending well before level of apex of $M_2$ (Fig. 59). Prosternum with strong lateral bristles. Lateral ocelli separated from eye margins by about three times their own diameter ..... ***Greenomyia*** Brunetti
2 spp.; western

$R_{4+5}$ ending opposite or beyond level of apex of $M_2$ (Fig. 60). Prosternum bare. Lateral ocelli variable in position, usually separated from eye margins by less than their own diameter ..... ***Leia*** Meigen
19 spp.; widespread

70. $R_1$ at most twice as long as crossvein r-m; crossvein r-m nearly horizontal (Figs. 54, 61) ..... 71
$R_1$ at least four times as long as crossvein r-m; crossvein r-m oblique (Figs. 55, 63) ..... 72

71. Point of furcation of M well before level of apex of $R_1$ (Fig. 54). Hind coxa with many posterolateral hairs near base (Fig. 84). Lateral ocelli very near eye margins ..... ***Docosia*** Winnertz, in part
see couplet 62

Point of furcation of M below or beyond level of apex of $R_1$ (Fig. 61). Hind coxa bare on basal two-thirds. Lateral ocelli separated from eye margins by more than their own diameter ..... ***Megophthalmidia*** Dziedzicki
1 sp., *occidentalis* Johannsen; western

72. Sc ending in R; point of furcation of CuA well before base of crossvein r-m; $R_{2+3}$ present (Fig. 63) or absent (Fig. 55). Hairs of laterotergite long and strong ..... 73

Sc ending free; point of furcation of CuA below or slightly beyond base of crossvein r-m; $R_{2+3}$ absent. Hairs of laterotergite short and weak ..... ***Acadia*** Vockeroth
1 sp., *polypori* Vockeroth; New Brunswick

73. $R_{2+3}$ absent or, if present, less than its own length from outer end of crossvein r-m; Sc ending before or beyond base of Rs (Fig. 55) ..... ***Dziedzickia*** Johannsen, in part
see couplet 63

$R_{2+3}$ present, at least twice its own length from outer end of crossvein r-m; Sc ending beyond base of Rs (Fig. 63) ..... ***Hadroneura*** Lundström
4 spp.; widespread

74. Anepisternum bare or with short fine hairs (Fig. 86) ..... 75
Anepisternum with strong bristles at least near upper margin (Fig. 87) ..... 85

75. C ending well beyond apex of $R_{4+5}$ (Fig. 64) ..... ***Anatella*** Winnertz
5 spp.; widespread; Fisher 1938
C ending at apex of $R_{4+5}$ (Figs. 65–68) ..... 76

76. Point of furcation of CuA beyond level of point of furcation of M (Figs. 65, 66) ..... 77
Point of furcation of CuA before or opposite level of point of furcation of M (Figs. 67, 68) ..... 78

77. $R_{4+5}$ curved caudally at apex; Sc ending in R (Fig. 65). Dorsal surface of hind tibia oblique apically; dorsal surface of apex with a large triangular shining depression (Figs. 77, 78) ..... ***Exechiopsis*** Tuomikoski
several spp.; widespread

$R_{4+5}$ nearly straight; Sc ending free or in R (Fig. 66). Dorsal surface of hind tibia nearly transverse apically; dorsal surface of apex with a small triangular depression (Figs. 79, 80) ..... ***Exechia*** Winnertz
many spp.; widespread

78. Branches of M, and usually also of CuA, setulose above especially near apex ..... 79
Branches of M and of CuA without setulae above ..... 82

79. Sc ending free (as in Fig. 66) ..... 80
Sc ending in R (as in Fig. 65) ..... 81

80. Mid and hind coxae each with a vertical blackish mark near apex; hind tibia with posterior bristles on no more than apical third. Flagellum of female antenna strongly swollen basally (Fig. 3) ..... ***Stigmatomeria*** Tuomikoski
1 sp., *crassicornis* (Stannius); widespread

Mid and hind coxae without dark mark near apex; hind tibia with posterior bristles on most of its length. Flagellum slender in both sexes ..... ***Pseudobrachypeza*** Tuomikoski
1 sp., *bulbosa* (Johannsen); widespread

81. Most flagellomeres shorter than wide and anepisternum haired on upper half ..... ***Brachypeza*** Winnertz
3 spp.; widespread

Either flagellomeres longer than wide or anepisternum bare ..... ***Allodiopsis*** Tuomikoski
several spp.; widespread

82. Sc ending free; $A_1$ strong, extending beyond point of furcation of CuA (Fig. 67). Mediotergite usually with short appressed or suberect hairs at upper end of posterior declivity ..... ***Rymosia*** Winnertz
several spp.; widespread

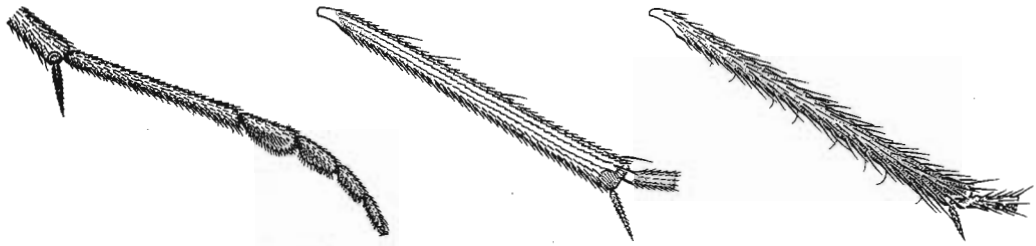
Sc ending in $R_1$; $A_1$ variable in length and strength. Mediotergite bare ..... 83

83. Anepisternum with short hairs (Fig. 86). Basal portion of M and crossvein r-m setulose above; $A_1$ strong, extending beyond point of furcation of CuA (as in Fig. 67) ..... ***Tarnania*** Tuomikoski
1 sp., *tarnanii* (Dziedzicki); widespread

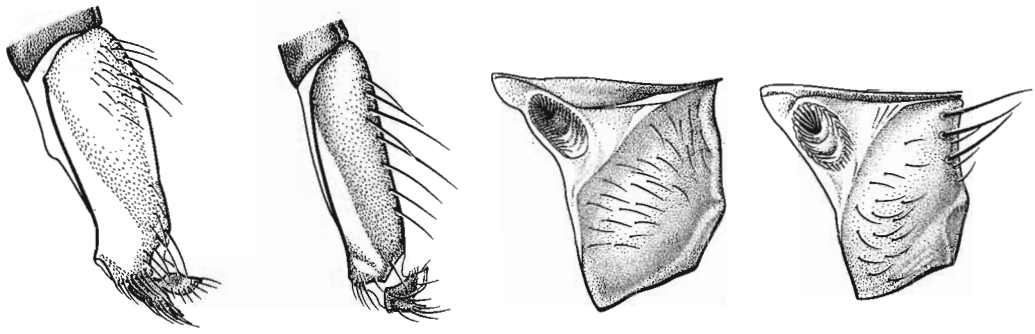
Anepisternum bare. Basal portion of M and crossvein r-m without setulae; $A_1$ weak, not extending to point of furcation of CuA (Fig. 68) ..... 84

84. Hind tibia with one or more short fine posterior bristles on apical third. Scutum with subappressed bristles on most of disc ..... ***Brevicornu*** Marshall
several spp.; widespread

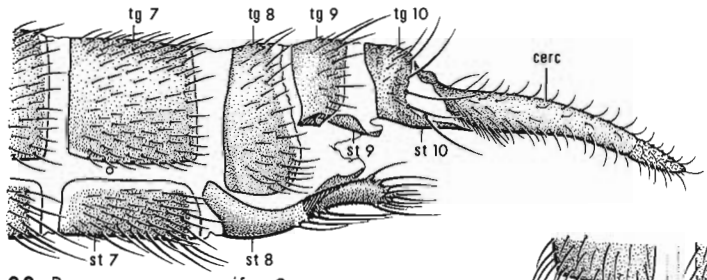
Hind tibia without posterior bristles. Scutum either with discal bristles arranged in two sublateral stripes and sometimes also a median stripe, or without discal bristles ..... ***Allodia*** Winnertz
several spp.; widespread



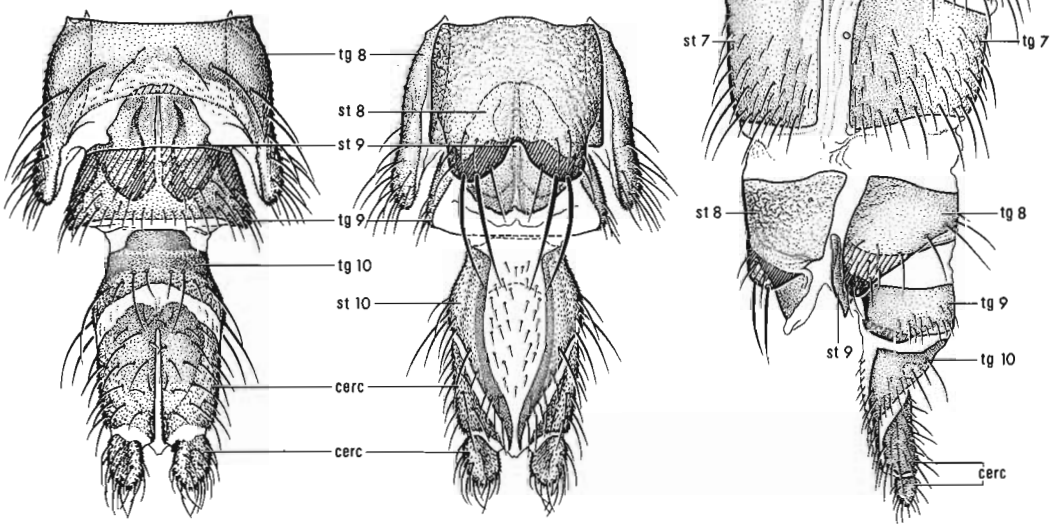
**81** Diadocidia ferruginosa ♀ **82** Mycomya vulgaris ♂ **83** Paratinia recurva ♂



**84** Docosia dichroa ♂ **85** Tetragoneura arcuata ♂ **86** Tarnania tarnanii ♂ **87** Phronia braueri ♂



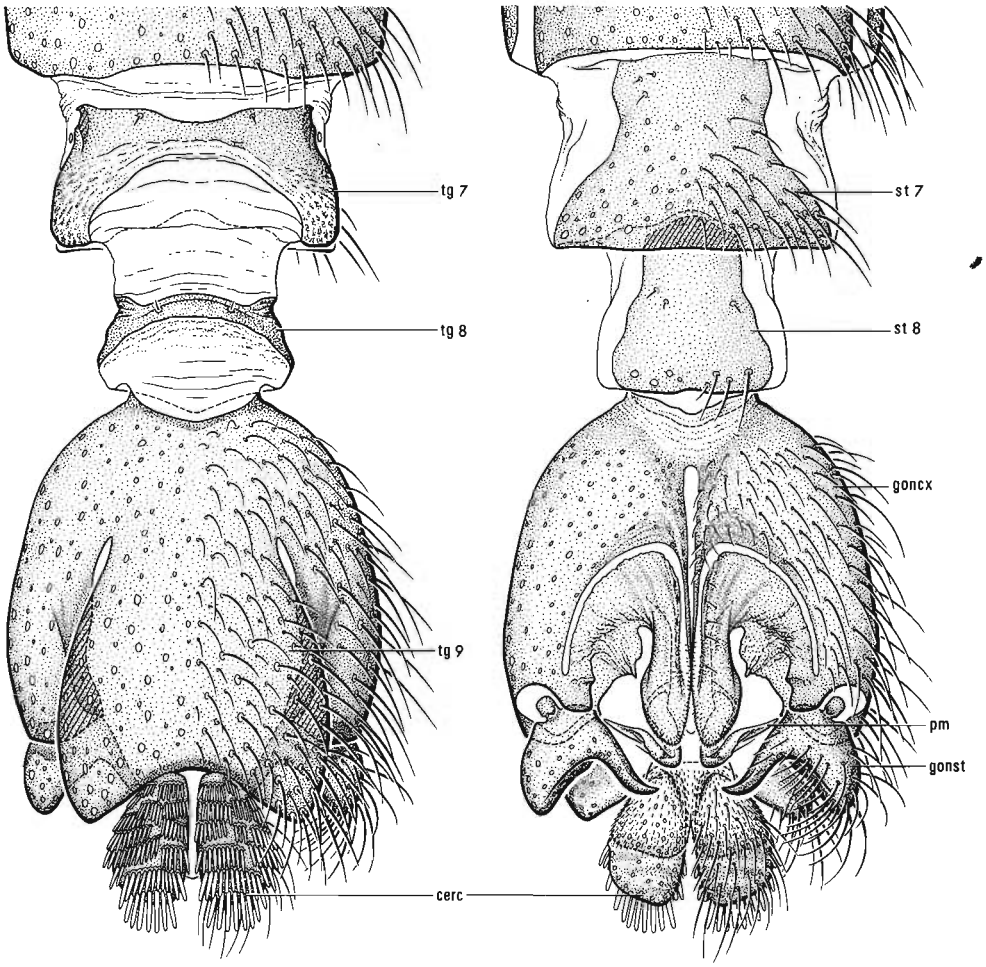

**88** Drepanocercus ensifer ♀



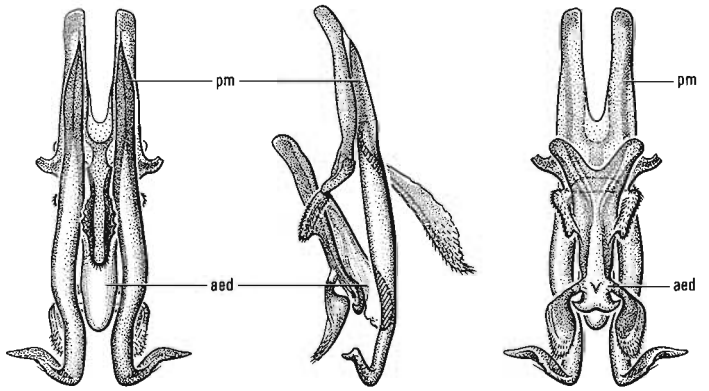

**89** Boletina sp. ♀ **90** Boletina sp. ♀ **91** Boletina sp. ♀

Figs. 14.81–91. Legs, anepisterna, and female terminalia: anterior view of (81) tarsus of foreleg of *Diadocidia ferruginosa* (Meigen); anterior view of tibia of foreleg of (82) *Mycomya vulgaris* Garrett and (83) *Paratinia recurva* Johannsen; lateral view of left hind coxa of (84) *Docosia dichroa* Loew and (85) *Tetragoneura arcuata* Sherman; left anepisternum of (86) *Tarnania tarnanii* (Dziedzicki) and (87) *Phronia braueri* Dziedzicki; terminalia of female of (88) *Drepanocercus ensifer* Vockeroth in lateral view, (89) *Boletina* sp. in dorsal view, (90) *Boletina* sp. in ventral view, and (91) *Boletina* sp. in lateral view.

Abbreviations: cerc, cercus; st, sternite; tg, tergite.




**92** Boletina sp. **93** Boletina sp.




**94** Boletina sp. ♂ **95** Boletina sp. ♂ **96** Boletina sp. ♂

Figs. 14.92–96. Male terminalia of *Boletina* sp.: (92) terminalia in dorsal view and (93) in ventral view; (94) aedeagus and parameres in dorsal view, (95) in left lateral view, and (96) in ventral view.

Abbreviations: aed, aedeagus; cerc, cercus; goncx, gonocoxite; gonst, gonostylus; pm, paramere; st, sternite; tg, tergite.

85. Antepenultimate palpal segment swollen, much thicker than penultimate segment (Fig. 9). Antenna short and stout; flagellum with 9–13 segments (Fig. 9). Katepimeron with a sharply delimited black mark near anterior margin ..... ***Cordyla*** Meigen
10 spp.; widespread

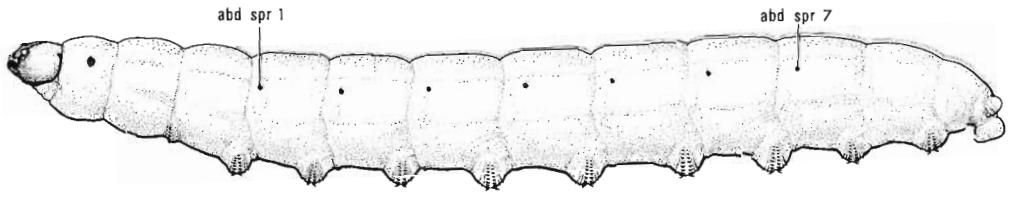
Antepenultimate palpal segment slender, not thicker than penultimate segment. Antenna slender; flagellum with 14 segments. Katepimeron without black mark anteriorly ..... 86

86. Anepimeron bare. Tibial bristles short or long ..... 87

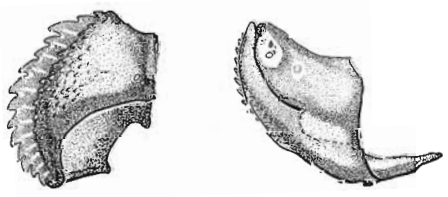
Anepimeron with hairs and bristles. Tibial bristles long, up to three times as long as tibial diameter ..... 90

87. Longest tibial bristles about three times as long as tibial diameter. Sc ending in R ..... ***Dynatosoma*** Winnertz
8 spp.; widespread

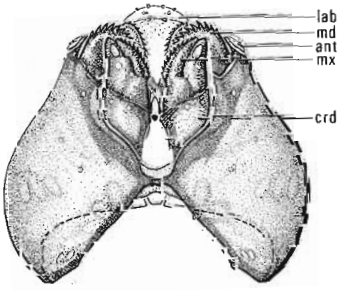
Tibial bristles subequal in length to tibial diameter. Sc ending free or in R ..... 88



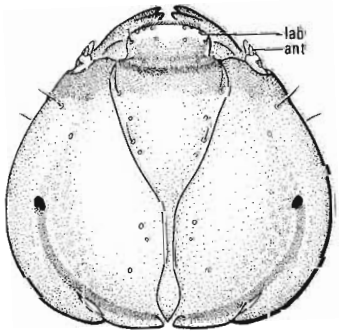

**97** Mycetophila sp.



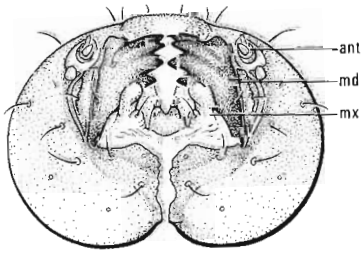
**98** Mycetophila fisherae **99**



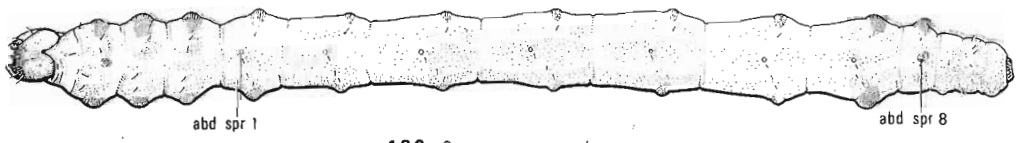

**100** Mycetophila fisherae




**101** Symmerus coqulus




**102** Symmerus coqulus




**103** Symmerus coqulus

Figs. 14.97–103. Larvae: (97) *Mycetophila* sp.; (98) *Mycetophila fisherae* (Laffoon), mandible; (99) *M. fisherae*, maxilla; (100) *M. fisherae*, head capsule, ventral view; (101) *Symmerus coqulus* Garrett, head capsule, dorsal view; (102) *S. coqulus*, head capsule, anterior view; (103) *S. coqulus*, general view.
Abbreviations: abd spr, abdominal spiracle; ant, antenna; crd, cardo; lab, labium; md, mandible; mx, maxilla.

88. Point of furcation of CuA before, opposite, or very slightly beyond point of furcation of M; Sc usually ending in R (Fig. 69) ..... ***Trichonta*** Winnertz
46 spp.; widespread; Gagné, in press

Point of furcation of CuA well beyond point of furcation of M; Sc ending free (Fig. 70) ..... 89

89. C extending more than halfway between apex of $R_{4+5}$ and apex of $M_1$ ..... ***Macrobrachius*** Dziedzicki
1 sp., *productus* (Johannsen); eastern

C extending at most very slightly beyond apex of $R_{4+5}$ (Fig. 70) ..... ***Phronia*** Winnertz
49 spp.; widespread; Gagné 1975

90. CuA forked (Figs. 71, 72) ..... 91

CuA simple (Figs. 73, 74) ..... 92

91. $CuA_1$ slightly divergent from $M_2$ but parallel with or convergent toward $CuA_2$ (Fig. 71) ..... ***Mycetophila*** Meigen
97 spp.; widespread; Laffoon 1957 (as *Fungivora* Meigen)

$CuA_1$ parallel with $M_2$ but slightly divergent from $CuA_2$ (Fig. 72) (including *Platurocypta* Enderlein) ..... ***Epicypta*** Winnertz
2 spp.; widespread

92. CuA slightly divergent from $M_2$ (Fig. 73). Mid tibia with one or more short to long ventral bristles ..... ***Zygomyia*** Winnertz
9 spp.; widespread

CuA parallel with $M_2$ (Fig. 74). Mid tibia without ventral bristles ..... ***Sceptonia*** Winnertz
2 spp.; widespread

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