

- [Probably subaquatic and saprophagous.] SCUDDER, 1890; COCKERELL, 1907f, 1916c; TOWNSEND, 1942; BRADLEY, 1931. *Eoc.*, USA (Colorado, Utah).
- Lichotachina* TOWNSEND, 1921, p. 133 [**Echinomyia antiqua* HEER, 1849, p. 247; OD]. Little-known genus (adult). TOWNSEND, 1942. *Mio.*, Europe (Germany).
- Muscidites* HEYDEN & HEYDEN, 1866, p. 157 [**M. deperditus*; OD]. Little-known genus (larva). TOWNSEND, 1942. *Oligo.*, Europe (Germany).
- Pachyuronympha* ROHDENDORF, 1964, p. 212 [**P. karatauensis*; OD]. Little-known genus, based on fragment of pupa. *Jur.*, USSR (Kazakh).
- Protocyrtus* ROHDENDORF, 1938, p. 39 [**P. jurassicus*; OD]. Little-known genus, based on wing fragment. ROHDENDORF, 1962a. *Jur.*, USSR (Kazakh).
- Remalia* GIEBEL, 1856, p. 199 [**R. sphinx*; OD]. Little-known genus, probably a muscoid. HULL, 1945. *Jur.*, England.
- Syrphopsis* ZEUNER, 1931, p. 316 [**S. globosiceps*; OD]. Little-known genus. HULL, 1945. *Mio.*, Europe (Germany).
- Vinculomusca* TOWNSEND, 1938, p. 166 [**Musca vinculata* SCUDDER, 1877a, p. 758; OD]. Little-known genus (larva). TOWNSEND, 1942. *Eoc.*, USA (Colorado).

Order HYMENOPTERA Linné, 1758

(Hymenoptera LINNÉ, 1758, p. 553)

Minute to medium-sized insects. Head free and usually very motile; compound eyes large, often holoptic in males; antennae diversely formed, especially so within the suborder Symphyta; sexual dimorphism of the antennae common in the suborder Apocrita; mouthparts of most species mandibulate and adapted for chewing, but labrum, in some Apocrita, modified to form a proboscis. Prothorax small; metathorax small and fused with the large mesothorax; abdomen broadly attached to thorax in the Symphyta, but in the Apocrita first abdominal segment fused with metathorax, with distinct constriction present between modified first abdominal segment (propodeum) and remaining segments (collectively termed the gaster, see Fig. 240), and with first gastral segment typically reduced to a narrow neck (petiole); female abdomen usually with an ovipositor. Wings membranous, hind pair much smaller than

fore pair; in some species females (and more rarely males) apterous. Wing venation highly specialized, even the most generalized members of the order (Xyelidae) showing some reduction and coalescence of main veins.

Attempts to homologize the wing veins with those of other insects have resulted in several interpretations. The one proposed by Ross (1936) is now generally accepted and is used here, with slight changes in terminology suggested by RASNITSYN (1969, 1975). In the family Xyelidae (suborder Symphyta, Fig. 238), which seems to have the least specialized venation among the Hymenoptera, all main veins are present, but the basal parts of veins M and CUA are fused to near midwing, and M diverges anteriorly and coalesces with RS for a short distance; RS has two branches; CUA is long but very irregular; CUP is short, obsolescent, or absent; 1A is long and strong; 2A is irregular and close to the posterior border of the wing; R is the strongest vein in the wing and terminates at a conspicuous pterostigma; a distinct break or interruption of the sclerotization may occur just before the pterostigmal area, and the pterostigma itself may have a clear or white spot near its center. The size and shape of the pterostigma, the extent and nature of the coalescence of RS and M, and the positions of the several crossveins are structural features usually employed in the diagnoses of genera and families of the Symphyta and many of the Apocrita. Within the Apocrita, however, there is a much greater diversity of venational patterns than within the Symphyta. In the Tiphidae, for example, the venation is sufficiently similar to that of the xyelids to enable the determination of the homologies without difficulty (Fig. 239,1); but in other families of parasitic wasps the venation may be reduced to one or two veins, with stumps of a few others. In these the homologies are not clear, and different terms are usually applied to such veins (Fig. 239,2). The venation of the hind wing of the Hymenoptera is generally much more reduced than that of the fore wing, and since the hind wing is very rarely preserved

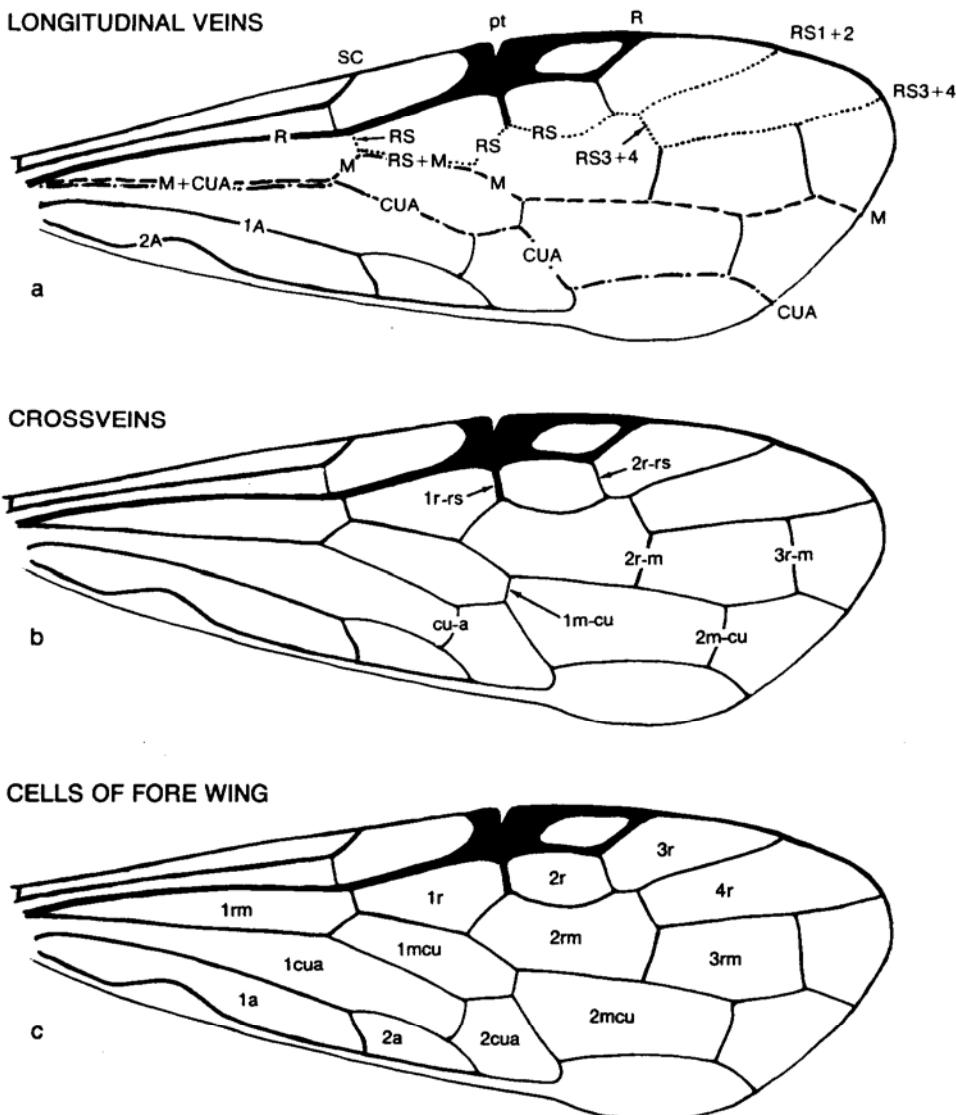


FIG. 238. Hymenoptera; suborder Symphyta, venational pattern of the fore wing of *Angaridyela vitimica* RASNITSYN, Xyelidae, from the Cretaceous of the USSR; *a*, terminology of the longitudinal veins; *b*, terminology of the crossveins; *c*, terminology of the cells. The symbols for crossveins are hyphenated to avoid confusion with those for the cells. SC, subcosta; pt, pterostigma; R, radius; RS, radial sector (dotted line); M, media (dashed line); CUA, anterior cubitus (dot-and-dash line); A, anal (adapted from Rasnitsyn, 1969).

in fossils, it is not used here in the taxonomic diagnoses.

The legs of the Hymenoptera are basically cursorial, but in some, as in certain wasps, they are adapted for digging or nest building. In others, the fore tibiae and basal segments

of the fore tarsi combine to form a comblike structure, used for cleaning the antennae; and in the bees the hind legs may have structures in the form of a brush (scopa) or a basket (corbicula) for carrying pollen.

Larvae develop from eggs usually depos-

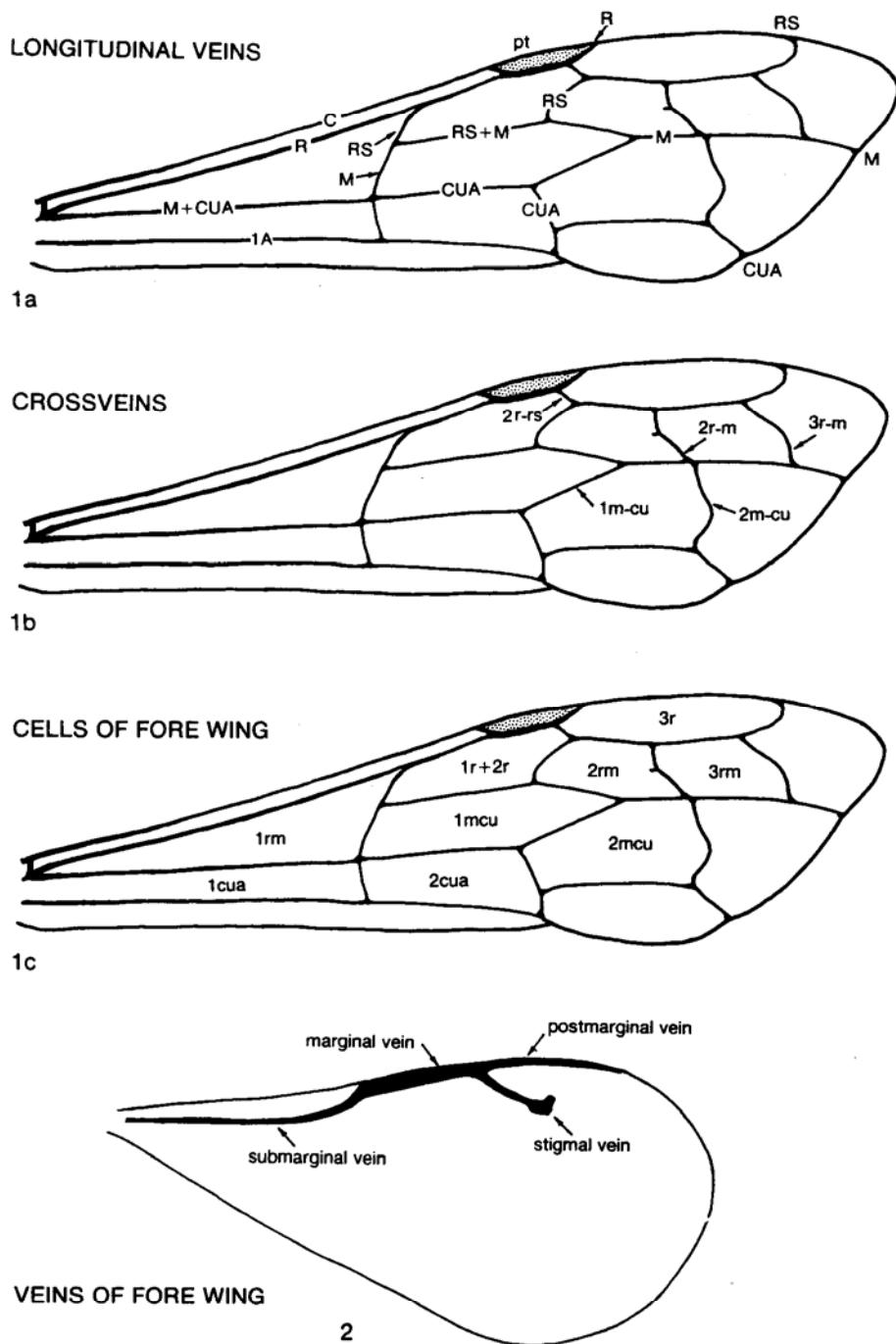


FIG. 239. Hymenoptera; fore wing venation in the suborder Apocrita.—1a-c. Venational pattern of the fore wing of *Myzinum* sp., Tiphidae; a, veins; b, crossveins; c, cells. Terms are as in Figure 238 with the addition of C, costa. Note the slight reduction of the venation with the apparent loss of the subcosta, the absence of the fork in the radial sector, and the loss of crossvein 1r-rs.—2. Fore wing of *Meraporus* sp., Pteromalidae, showing the terminology of the reduced venation (from Brues, Melander, & Carpenter, 1954).

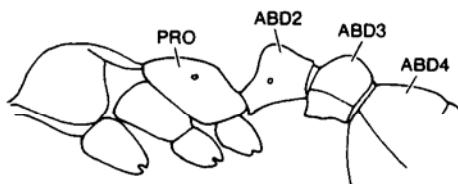


FIG. 240. Hymenoptera; lateral view of the thorax and basal abdominal segments of *Myrmica* sp., suborder Apocrita, Formicidae; PRO, propodeum or first abdominal segment; ABD2, second abdominal segment; ABD3 and ABD4, third and fourth abdominal segments (adapted from Brues, Melander, & Carpenter, 1954).

ited in specific environments and show even greater diversity of form than those of the Diptera. The larvae of the Symphyta, with a strongly sclerotized head capsule, well-developed mandibles, and three pairs of thoracic legs, resemble caterpillars (Fig. 241,*b*). These are mostly foliage feeders and apparently represent the primitive type of hymenopterous larvae. The larvae of the Apocrita, on the other hand, have at most a weakly sclerotized head and are apodous (Fig. 241,*a*). Most of them are parasitoid or predaceous; only a few are phytophagous, feeding on pollen and nectar. Pupation occurs in various environments, and in most species the pupae are exarate and encased in a cocoon.

Adults are very diverse in habitat. Most feed to some extent on nectar and are therefore important pollinators. *Trias.-Holo.*

The order Hymenoptera is at least as large and diverse as the Diptera, and probably even more of its recent species remain undescribed. Nearly 90 existing families are generally recognized. The present division of the order into two suborders, Symphyta and Apocrita, extends well back into the last century, and the general evolutionary implications of that division still seem valid. Some existing families of the Symphyta, such as the Xyelidae, are far more generalized than any family of the Apocrita. Morphological and geological evidence suggests that the Apocrita may have been derived from unknown ancestors related to the Siricidae, early in the Jurassic Period. The Apocrita is

by far the larger and more complex of the two suborders at the present time, but attempts to group its families into two categories have resulted in only informal sections. One of these includes the parasitic wasps (previously termed the Terebrantia) and the other, the ants, wasps, bees, and their relatives, collectively referred to as the aculeates. However, there are no characteristics, morphological or behavioral, that actually delimit these sections.

The families of both suborders are usually grouped into superfamilies, but there is much difference of opinion about the positions of certain families in this hierarchy and the degrees of relationship between the superfamilies. Grouping of the families becomes even more difficult when the Mesozoic genera are added, because many of the Jurassic families, often represented by few genera, do not fall into existing superfamilies as defined on recent species. The most detailed and significant account of the evolution of the Hymenoptera is that of Dr. A. P. RASNITSYN (1980b), who is responsible for most of our knowledge of the Mesozoic Hymenoptera.

The earliest appearance of the order is in the Triassic of Australia and the Soviet Union. All of these Triassic fossils appear to belong to the existing family Xyelidae (suborder Symphyta), and their diversity is remarkable, especially in comparison with the small size of the family at present. Not until the Upper Jurassic are other existing families known: the Pamphiliidae, Anaxyelidae, and Siricidae of the Symphyta and the Megalyridae and Heloridae of the Apocrita. In the Cretaceous many existing families appear, including the highly specialized chalcidoid families Trichogrammatidae, Mymaridae, and Tetracampidae among the parasitic wasps, and the family Formicidae among the aculeates. At present 78 families of the order are represented in the fossil record; 22 of them are extinct, but of that number only two are aculeates.

The diversity of the Xyelidae in the Triassic is an indication that the order probably arose in the early Triassic or possibly the very

late Permian. Study of some 40,000 Permian insects from the Soviet Union, United States, and Australia has failed to turn up any recognizable members of the order, but most of the Permian specimens are from the middle Permian or later. In the absence of evidence to the contrary, the Hymenoptera are generally assumed to have arisen from primitive neuropteroid stock, probably unknown terrestrial relatives of the sialoid Neuroptera. RASNITSYN (1980b) has recently proposed that the ancestral line was within the extinct order Miomoptera, which is known from the Upper Carboniferous and Permian. This order has previously been considered to belong to the orthopteroid complex, but RASNITSYN believes it to have been endopterygote and closely related to the Neuroptera. Whether or not the Miomoptera are in fact reasonable candidates for the ancestors of the Hymenoptera, however, will not really become clear until we have more information than we do now about the structure and life history of the members of that order.

Suborder SYMPHYTA Gerstaecker, 1867

[*Sympyta* GERSTAECKER, 1867, p. 2]

Adults with abdomen broadly attached to thorax, without pronounced constriction between the first and second segments of abdomen. Larvae with thoracic legs. *Trias.*—*Holo.*

Family XYELIDAE Newman, 1835

[*Xyelidae* NEWMAN, 1835, p. 379]

Fore wing with vein RS usually having 2 branches; basal section of RS at least slightly slanted toward wing apex; crossveins 1r-rs always present; crossvein 2r-rs attached to RS proximally to crossvein 2r-m; crossveins 3r-m and 2m-cu always present. Antennae with many segments, third segment compound, much longer and thicker than remaining flagellar segments; fore tibiae with 2 apical spurs; ovipositor well developed, usually flat. Larvae living in plant tissues or on foliage. *Trias.*—*Holo.*

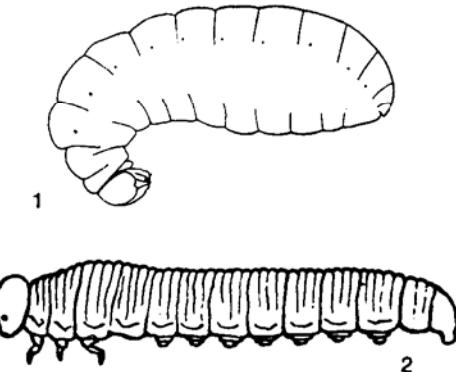


FIG. 241. Hymenoptera, larvae.—1. Apocrita, family Formicidae (from Wheeler & Wheeler, 1952).—2. Symphyta, family Tenthredinidae (from Brues, Melander, & Carpenter, 1954).

Xyela DALMAN, 1819, p. 122. STATZ, 1936b. *Oligo.*, Europe (Germany)—*Holo.*

Angaridylela RASNITSYN, 1966, p. 75 [**A. vitimica*; OD]. Fore wing with pterostigma sclerotized basally and membranous distally; SC connected to R (by a short crossvein or branch of SC) just before origin of RS; basal section of RS slightly shorter than basal section of M. RASNITSYN, 1969. *Cret.*, USSR (Kazakh).—FIG. 242,6. **A. vitimica*; wings and body, X7 (Rasnitsyn, 1969).

Anomoxyla RASNITSYN, 1966, p. 72 [**Anaxyela incerta* RASNITSYN, 1963, p. 95; OD]. Fore wing similar to that of *Lydoxyela*, but RS3+4 only slightly curved distally and without a sharp angle at crossvein 3r-m; termination of RS1+2 closer to pterostigma than to end of RS3+4. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).—FIG. 242,5. **A. incerta* (RASNITSYN); wings and body, X5.5 (Rasnitsyn, 1966).

Anthoxyela RASNITSYN, 1977a, p. 99 [**S. baissensis*; OD]. Fore wing with pterostigma sclerotized basally only; SC connected to R only a very short distance beyond origin of RS; basal section of RS 1.5 times length of basal section of M; crossvein 2m-cu slightly basad of middle of cell 3rm. KRASSILOV & RASNITSYN, 1982. *Cret.*, USSR (Asian RSFSR).—FIG. 242,1. **A. baissensis*; fore wing, X4 (Rasnitsyn, 1977a).

Archoxyela RIEK, 1955, p. 657 [**A. crosbyi*; OD]. Fore wing with crossvein 1r-rs running into base of pterostigma; pterostigma sclerotized at base only; crossvein 2m-cu situated slightly before apex of cell 3rm; crossvein 2r-rs meeting RS1+2 close to fork of RS. RASNITSYN, 1969. *Trias.*, Australia (Queensland).—FIG. 242,2. **A. crosbyi*; fore wing, X4 (Riek, 1955).

Asioxyla RASNITSYN, 1964, p. 92 [**A. smilodon*;

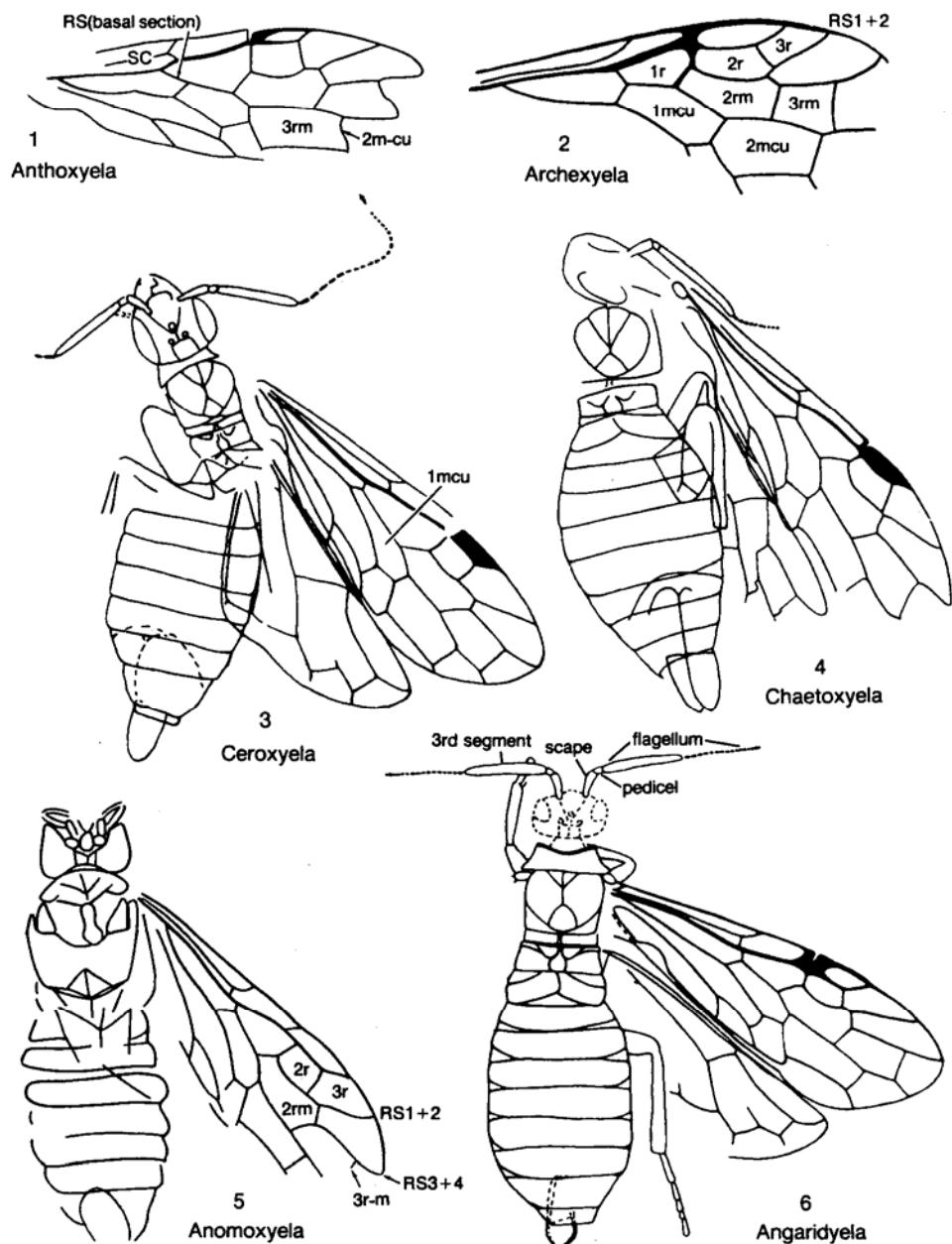


FIG. 242. Xyelidae (p. 449-451).

OD]. Fore wing with pterostigma sclerotized, but with center membranous; basal section of RS about 1.5 times length of basal section of M; crossvein 2r-rs joined to RS just beyond its fork. Head with large, crescent-shaped mandibles. RASNITSYN, 1969. *Trias.*, USSR (Kirghiz).

Baissoxyela RASNITSYN, 1969, p. 54 [**B. tarsalis*; OD]. Little-known genus. Fore wing with R almost straight; space between costal margin and R uniform. Terminal part of flagellum of antennae short but with about 16 segments. *Cret.*, USSR (Asian RSFSR).

- Ceroxyela** RASNITSYN, 1966, p. 80 [**C. dolichocera*; OD]. Fore wing with pterostigma sclerotized but with membranous area basally; SC connected to R beyond origin of RS; basal section of RS slightly shorter than basal section of M; cell 1mcu very narrow. RASNITSYN, 1969. *Cret.*, USSR (Kazakh). — FIG. 242,3. **C. dolichocera*; wings and body, $\times 6$ (Rasnitsyn, 1969).
- Chaetoxyla** RASNITSYN, 1966, p. 82 [**C. hirsuta*; OD]. Fore wing with pterostigma fully sclerotized; SC connected to R at origin of RS; basal section of RS slightly shorter than basal section of M. RASNITSYN, 1969. *Cret.*, USSR (Kazakh). — FIG. 242,4. **C. hirsuta*; wings and body, $\times 4$ (Rasnitsyn, 1969).
- Enneoxyela** RASNITSYN, 1966, p. 73 [**E. crassicauda*; OD]. Little-known genus. Fore wing with pterostigma narrow; SC connected to R beyond origin of RS; termination of RS1+2 closer to pterostigma than to end of RS3+4. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).
- Eoxyela** RASNITSYN, 1965, p. 487 [**E. scoliura*; OD]. Fore wing shorter than body; R nearly straight; basal section of RS much longer than basal section of M; cell 4r much longer than cell 3r. RASNITSYN, 1969, 1983a. *Jur.*, USSR (Kazakh). — FIG. 243,7. **E. scoliura*; fore wing, $\times 9$ (Rasnitsyn, 1969).
- Euryxyla** RASNITSYN, 1964, p. 94 [**E. euryptera*; OD]. Fore wing unusually broad; pterostigma fully sclerotized; basal section of RS longer than basal section of M; RS3+4 diverging anteriorly at crossvein 3r-m; crossvein 2r-rs joining RS at its fork. RASNITSYN, 1969. *Trias.*, USSR (Kirghiz). — FIG. 243,1. **E. euryptera*; fore wing, $\times 5.8$ (Rasnitsyn, 1969).
- Ferganoxyela** RASNITSYN, 1969, p. 47 [**F. sogdiana*; OD]. Fore wing broadly triangular; pterostigma large; RS1+2 terminating halfway between pterostigma and RS3+4. *Trias.*, USSR (Kirghiz). — FIG. 243,6. **F. sogdiana*; fore wing, $\times 8.5$ (Rasnitsyn, 1969).
- Gigantoxyla** RASNITSYN, 1966, p. 81 [**G. quadrifurcata*; OD]. Fore wing as in *Chaetoxyla*, but SC connected to R well before origin of RS. RASNITSYN, 1969. *Cret.*, USSR (Kazakh).
- Kirghizoxyela** RASNITSYN, 1966, p. 70 [**K. mirabilis*; OD]. Fore wing similar to that of *Orthoxyela*, but SC absent and R only slightly thickened at base of pterostigma. RASNITSYN, 1969. *Jur.*, USSR (Kirghiz).
- Leioxyela** RASNITSYN, 1969, p. 49 [**L. mollis*; OD]. Fore wing with pterostigma fully sclerotized; crossvein 2r-rs much nearer to apex of pterostigma than to crossvein 1r-rs; cells 1r and 2r of about same length. *Trias.*, USSR (Kirghiz).
- Liadoxyela** MARTYNOV, 1937a, p. 41 [**L. praecox*; OD]. Little-known genus. Fore wing with R strongly thickened at base of pterostigma, curved; area between R and costal margin widest near origin of RS; cell 1r only slightly longer than cell 2r. RASNITSYN, 1966, 1969, 1983a. *Jur.*, USSR (Kirghiz, Asian RSFSR). — FIG. 243,2. **L. praecox*; fore wing, $\times 4$ (Rasnitsyn, 1969).
- Lithoxyla** RASNITSYN, 1969, p. 43 [**L. fenestralis*; OD]. Fore wing with uniformly narrow costal area; pterostigma not fully sclerotized; end of RS1+2 closer to end of RS3+4 than to pterostigma. *Trias.*, USSR (Kirghiz). — FIG. 243,4. **L. fenestralis*; fore wing, $\times 5.5$ (Rasnitsyn, 1969).
- Lydoxyela** RASNITSYN, 1966, p. 71 [**L. excellens*; OD]. Fore wing with SC connected to R proximal of origin of RS; basal section of RS about half as long as basal section of M; crossvein 1r-rs longer than 2r-rs; RS3+4 with an abrupt anterior bend at crossvein 3r-m; RS1+2 apparently absent. RASNITSYN, 1969. *Jur.*, USSR (Kazakh). — FIG. 243,5. **L. excellens*; wings and body, $\times 6$ (Rasnitsyn, 1966).
- Madygella** RASNITSYN, 1969, p. 51 [**M. analoga*; OD]. Fore wing with pterostigma well sclerotized; SC distinct and well developed; R straight; basal section of RS shorter than RS+M. *Trias.*, USSR (Kirghiz). — FIG. 243,3. **M. analoga*; fore wing, $\times 12$. (Rasnitsyn, 1969).
- Madygenius** RASNITSYN, 1969, p. 45 [**M. extraradius*; OD]. Fore wing with costal area narrow; pterostigma sclerotized; end of RS1+2 much closer to RS3+4 than to pterostigma; 2 crossveins between RS1+2 and RS3+4. *Trias.*, USSR (Kirghiz). — FIG. 244,7. **M. extraradius*; fore wing, $\times 7.5$ (Rasnitsyn, 1969).
- Megaxyela** ASHMEAD, 1898, p. 206. BRUES, 1908b; ZHELOCHOVTEV & RASNITSYN, 1972. *Oligo.*, USA (Colorado)—*Holo*.
- Microxyelecia** RASNITSYN, 1969, p. 54 [**M. brachycera*; OD]. Fore wing with R straight; distance between costal margin and R uniform but narrower than in *Baissoxyela*. Flagellum relatively longer than in *Baissoxyela*. *Jur.*, USSR (Kazakh).
- Nigrimonticola** RASNITSYN, 1966, p. 77 [**N. longicornis*; OD]. Little-known genus. Fore wing as in *Ophthalmoxyla*, but basal section of RS half as long as basal section of M; RS1+2 terminating closer to pterostigma than to end of RS3+4. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).
- Ophthalmoxyla** RASNITSYN, 1966, p. 78 [**O. brachyura*; OD]. Little-known genus. Fore wing with pterostigma sclerotized but with clear spot near center; basal section of RS almost twice as long as basal section of M. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).
- Orthoxyela** RASNITSYN, 1983a, p. 91 [**O. rectiradiata*; OD]. Related to *Kirghizoxyela*, but fore wing with SC well developed; R conspicuously thickened at base of pterostigma. *Jur.*, USSR (Asian RSFSR).
- Oryctoxyela** RASNITSYN, 1969, p. 45 [**O. anomala*; OD]. Fore wing with costal area narrow; RS1+2

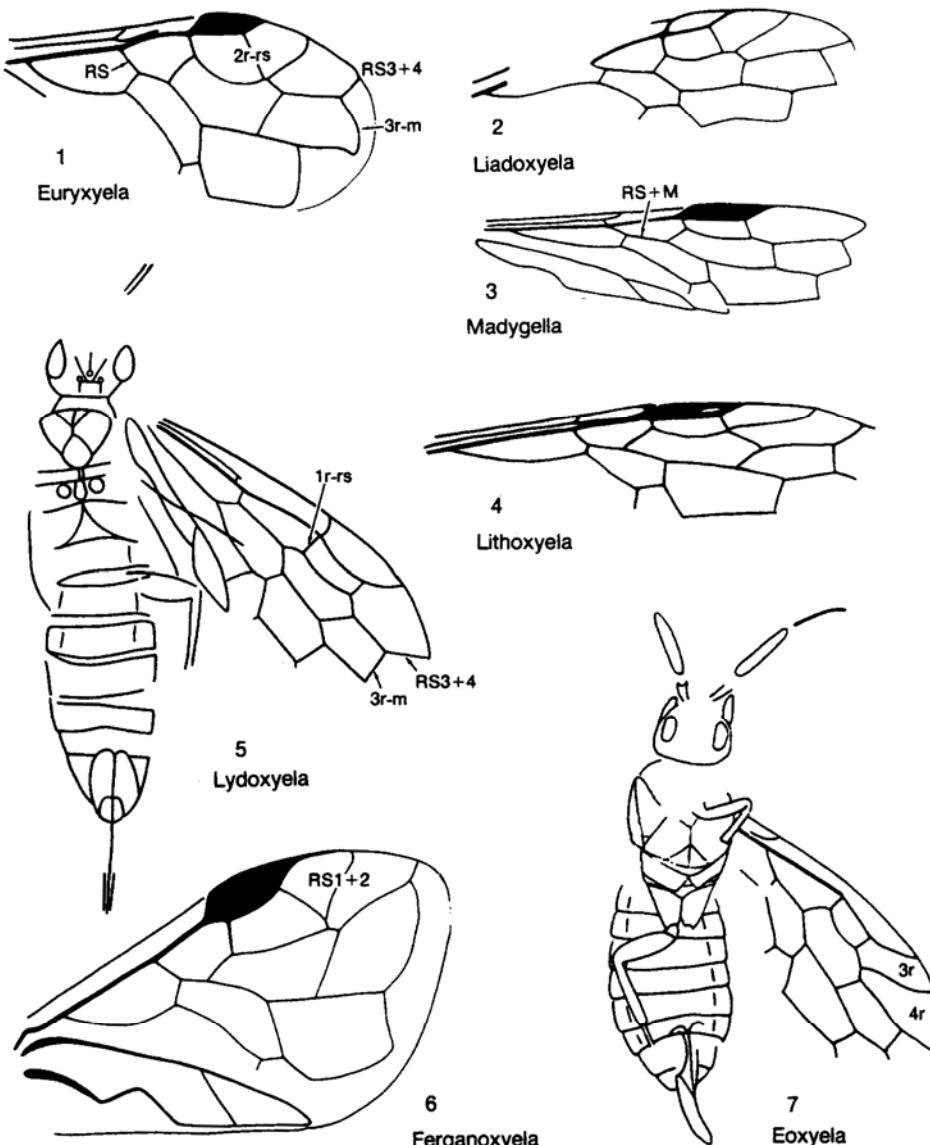


FIG. 243. Xyelidae (p. 451).

about twice as far from pterostigma as from RS₃₊₄. *Trias.*, USSR (Kirghiz).—FIG. 244,3.
• *O. anomala*; fore wing, $\times 5$ (Rasnitsyn, 1969).

Pinicolites MEUNIER, 1920c, p. 896 [*P. graciosus*; OD]. Similar to *Pleroneura* (recent), but SC in fore wing extending beyond level of origin of RS. STATZ, 1936b; RASNITSYN, 1969. *Oligo.*, Europe (Germany).

Sirecomima RASNITSYN, 1969, p. 51 [**S. xiphophora*; OD]. Fore wing with pterostigma weakly sclerotized and narrow; basal section of RS much

longer than RS+M. *Trias.*, USSR (Kirghiz).

—FIG. 244,6. **S. xiphophora*; fore wing, $\times 16$ (Rasnitsyn, 1969).

Spathoxyela RASNITSYN, 1969, p. 53 [**Exoxyela fonscolosi* RASNITSYN, 1965, p. 487; OD]. Fore wing with R straight; distance between R and costal margin narrow and uniform; SC free from R; termination of RS₁₊₂ slightly closer to end of RS₃₊₄ than to pterostigma; crossvein 2r-rs distal to center of pterostigma. KRASSILOV & RASNITSYN, 1982. *Cret.*, USSR (Kazakh, Asian

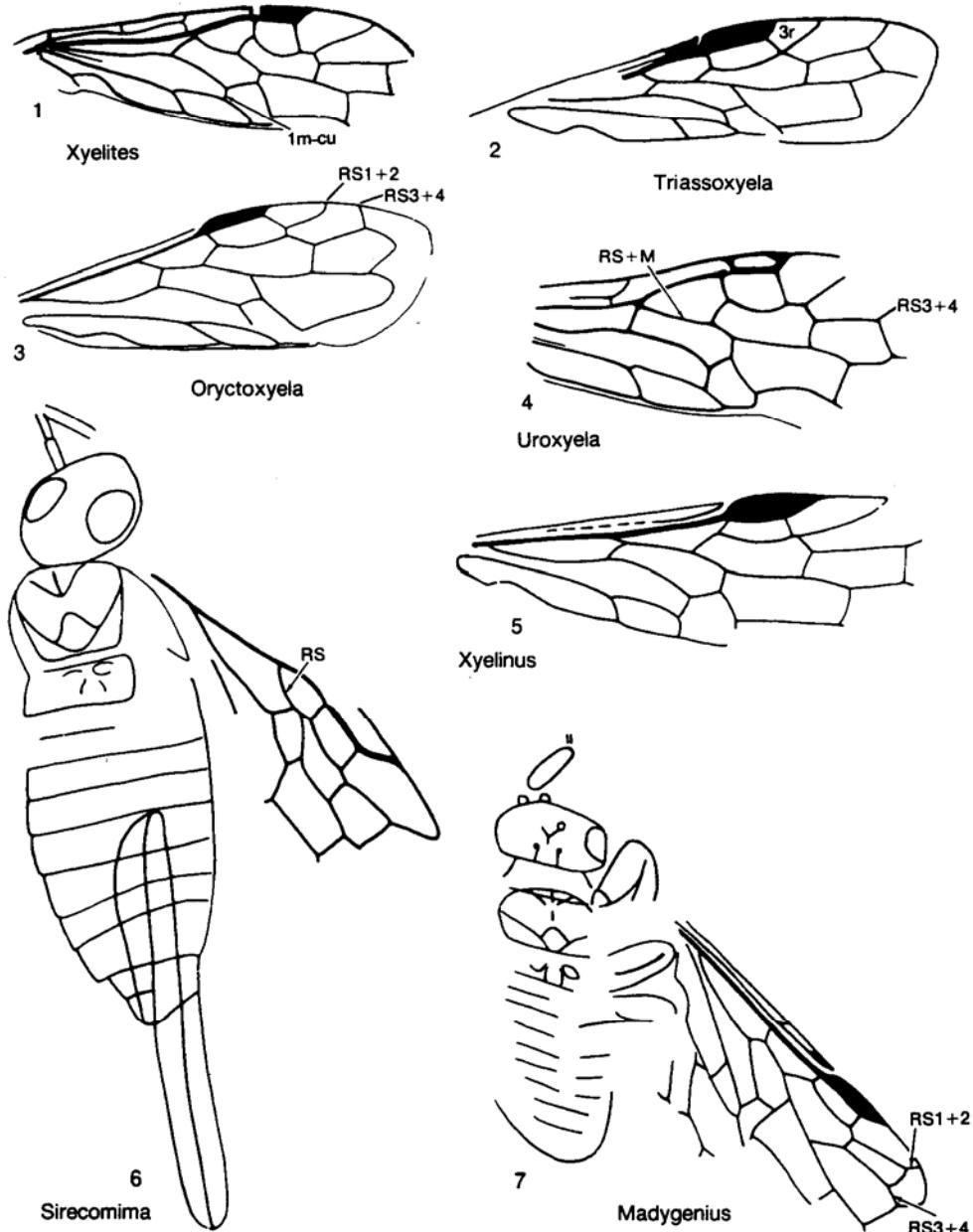


FIG. 244. Xyelidae (p. 451-454).

RSFSR).—FIG. 245,2. **S. fossilis* (RASNITSYN); wings and body, $\times 10$ (Rasnitsyn, 1977a).

Triassoxyela RASNITSYN, 1964, p. 89 [**T. foveolata*; OD]. Fore wing similar to that of *Xyelinus*, but cell 3 r short. RASNITSYN, 1969. *Trias.*, USSR (Kirghiz).—FIG. 244,2. **T. foveolata*; fore wing, $\times 9.5$ (Rasnitsyn, 1969).

Uroxyela RASNITSYN, 1966, p. 84 [**U. sicicauda*; OD]. Fore wing with center of pterostigma not sclerotized; termination of SC before origin of RS; basal section of RS obsolescent; RS3+4 directed anteriorly beyond crossvein 3 r -m. *Cret.*, USSR (Kazakh).—FIG. 244,4. **U. sicicauda*; fore wing, $\times 11$ (Rasnitsyn, 1966).

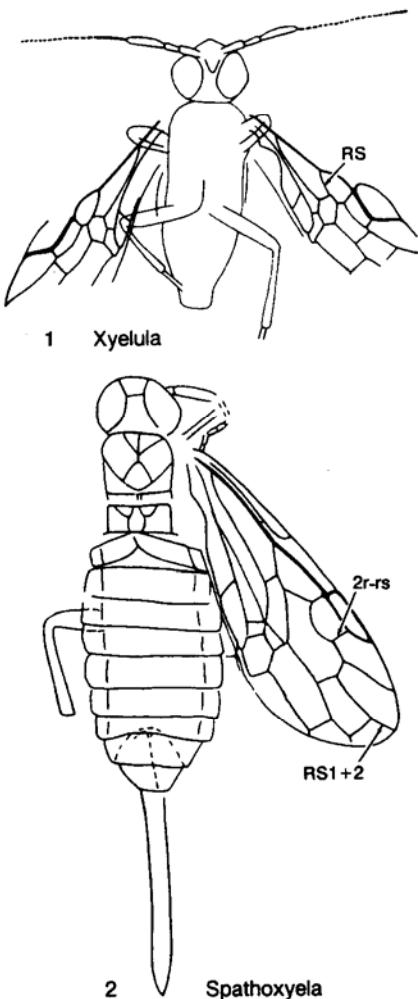


FIG. 245. Xyelidae (p. 454).

Xiphoxyla RASNITSYN, 1969, p. 46 [**X. procrusta*; OD]. Costal area narrow; pterostigma sclerotized; RS1+2 apparently absent or weak. *Trias.*, USSR (Kirghiz).

Xyelinus RASNITSYN, 1964, p. 95 [**X. angustiradius*; OD]. Fore wing slender, at least twice as long as wide; costal area narrow; basal section of RS much shorter than basal section of M; cells 2r, 3r, and 4r elongate. RASNITSYN, 1969. *Trias.*, USSR (Kirghiz).—FIG. 244,5. **X. angustiradius*; fore wing, $\times 10$ (Rasnitsyn, 1969).

Xyelisca RASNITSYN, 1969, p. 53 [**S. leptopoda*; OD]. Little-known genus. Fore wing with SC terminating at level of origin of RS. Thorax punctate. *Jur.*, USSR (Kazakh).

Xyelites RASNITSYN, 1966, p. 83 [**X. trigeminus*;

OD]. Fore wing with pterostigma fully sclerotized; SC terminating just before origin of RS; basal section of RS very short; end of RS1+2 slightly closer to end of RS3+4 than to pterostigma; RS3+4 straight or nearly so; crossvein 1m-cu very short. RASNITSYN, 1969. *Cret.*, USSR (Kazakh).—FIG. 244,1. **X. trigeminus*; fore wing, $\times 7$ (Rasnitsyn, 1969).

Xyelula RASNITSYN, 1969, p. 52 [**X. hybrida*; OD]. Fore wing with pterostigma very broad; R strongly curved; basal section of RS more than twice as long as basal section of M. *Jur.*, USSR (Kazakh).—FIG. 245,1. **X. hybrida*; head, thorax, and fore wings, $\times 10$ (Rasnitsyn, 1969).

Family XYELOTOMIDAE

Rasnitsyn, 1968

[Xyelotomidae RASNITSYN, 1968, p. 224]

Fore wing: vein RS developed between M and crossvein 1r-rs; 2r-rs present; cell 3r closed at wing apex. Antennae as in Xyelidae but with fewer (not more than 8) and thicker segments, third segment fully as large as in Xyelidae. RASNITSYN, 1969. *Jur.-Cret.*

Xyelotoma RASNITSYN, 1968, p. 225 [**X. nigricornis*; OD]. Little-known genus. Fore wing with pterostigma fully sclerotized. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).

Pseudoxyela RASNITSYN, 1968, p. 227 [**P. heterocilia*; OD]. Fore wing with pterostigma sclerotized basally only, mostly membranous; SC connected to R well before origin of RS; basal section of RS about half as long as basal section of M. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).

Undatoma RASNITSYN, 1977a, p. 100 [**U. dahurica*; OD]. Fore wing with pterostigma very large and center membranous; SC apparently absent; RS not forked; basal section of RS very short, about one-eighth length of basal section of M; cell 1r very small. *Cret.*, USSR (Kazakh).—FIG. 246,1. **U. dahurica*; fore wing, $\times 8.5$ (Rasnitsyn, 1977a).

Xyelocerus RASNITSYN, 1968, p. 226 [**X. admirandus*; OD]. Fore wing with pterostigma sclerotized but with clear area in center; SC weak, apparently not connected to R; basal section of M about 5 times as long as that of RS. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).—FIG. 246,2. **X. admirandus*; fore wing, $\times 7$ (Rasnitsyn, 1968).

Family TENTHREDINIDAE

Latreille, 1804–1805

[Tenthredinidae LATREILLE, 1804–1805, p. 109]

Fore wing: vein RS usually unbranched; crossvein 2r-rs sometimes present; M joining RS near its origin or joining directly to R

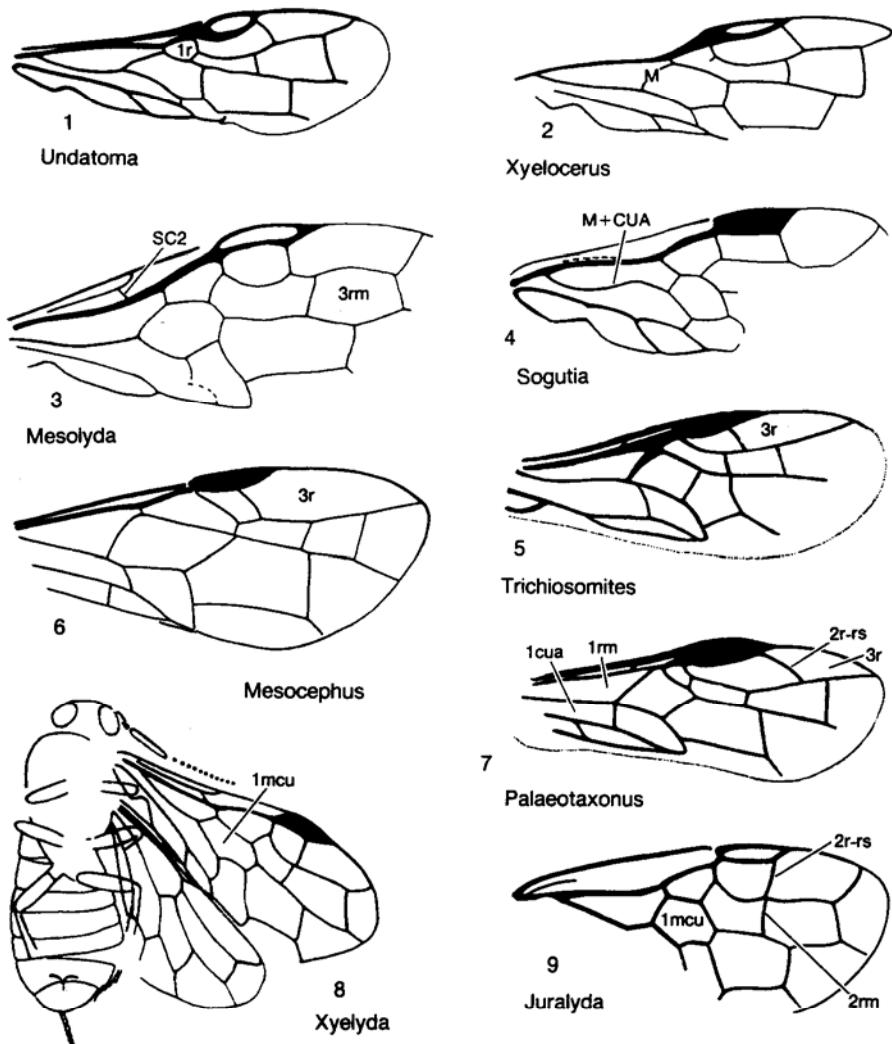


FIG. 246. Xyelotomidae, Tenthredinidae, Cimbicidae, Xyelydidae, Pamphiliidae, Cephidae, and Uncertain (p. 454–463).

near origin of RS; crossvein 2m-cu present. Antennae filiform, rarely with more than 9 segments, third segment short; pronotum with hind border deeply emarginate; fore tibiae with 2 apical spurs; ovipositor short, flat. Larvae foliage feeders. Eoc.—*Holo.*

Tenthredo LINNÉ, 1758, p. 555. BRUES, 1908b; ROHWER, 1908c; COCKERELL, 1914a, 1917f, 1927d; MEUNIER, 1923c; STATZ, 1936b; PITON, 1940a. *Oligo.*, USA (Colorado); Europe (Germany, France)—*Holo.*

Athalia LEACH, 1817, p. 126. [Generic assignment of fossil doubtful.] COCKERELL, 1906c, 1927d; ZHELOCHOVTZEV & RASNITSYN, 1972. *Oligo.*, USA (Colorado)—*Holo.*

Caliroa COSTA, 1859, p. 59. COCKERELL, 1909n, 1916b, 1917f. *Oligo.*, USA (Colorado)—*Holo.*

Cladius ILLIGER, 1807, p. 190. COCKERELL, 1914f. *Oligo.*, USA (Colorado)—*Holo.*

Dineura DAHLBOM, 1835, p. 5. BRUES, 1908b; ROHWER, 1908b, 1908c. *Oligo.*, USA (Colorado)—*Holo.*

Dolerus PANZER, 1801, pl. 11. MEUNIER, 1923b.

- Oligo.*, Europe (Germany); *Mio.*, Europe (France)—*Holo.*
- Eohemicroa** ZHELOCHOVTZEV & RASNITSYN, 1972, p. 323 [**Hemicroa eophila* COCKERELL, 1906d, p. 501; OD]. Similar to *Hemicroa* but with a short distance between anal cells of fore wing, stouter antennae, and longer first segment of hind tarsus. ADAMS, 1967. *Oligo.*, USA (Colorado).
- Eriocampa** HARTIG, 1837, p. 279. BRUES, 1908b; COCKERELL, 1910c, 1911b, 1914f, 1922d; THÉOBALD, 1937a. *Oligo.*, USA (Colorado), Europe (France)—*Holo.*
- Fenusia** LEACH, 1817, p. 126 [= *Lithoryssus* BRUES, 1906, p. 491 (type, *L. parvus*)]. ROHWER, 1908b; ZHELOCHOVTZEV & RASNITSYN, 1972. *Oligo.*, USA (Colorado)—*Holo.*
- Florissantinus** ZHELOCHOVTZEV & RASNITSYN, 1972, p. 320 [**F. angulatus*; OD]. Similar to *Hemicroa*, but M of fore wing straight, not bent at crossveins 2r-m and 3r-m. *Oligo.*, USA (Colorado).
- Hemicroa** STEPHENS, 1835, p. 55. COCKERELL, 1906d, 1916b. *Oligo.*, USA (Colorado)—*Holo.*
- Hoplocampa** HARTIG, 1837, p. 276. COCKERELL, 1927c; STATZ, 1936b. *Oligo.*, Europe (Germany), USA (Colorado)—*Holo.*
- Leucempria** ENSLIN, 1913, p. 187. STATZ, 1936b. *Oligo.*, Europe (Germany)—*Holo.*
- Mesoneura** HARTIG, 1837, p. 228 [= *Lisconeura* ROHWER, 1908b, p. 529 (type, *Scolioneura vexabilis* BRUES, 1908b, p. 263)]. RASNITSYN, 1969; ZHELOCHOVTZEV & RASNITSYN, 1972. *Oligo.*, USA (Colorado)—*Holo.*
- Nortonella** ROHWER, 1908c, p. 592 [**N. typica*; OD]. Fore wing as in *Macrophyia* (recent) but SC absent. *Oligo.*, USA (Colorado).
- Palaeotaxonus** BRUES, 1908b, p. 266 [**P. typicus*; OD]. Fore wing as in *Taxonus*, but cell 1cu not longer than cell 1rm; cell 3r long, pointed apically; crossvein 2r-rs strongly oblique. ROHWER, 1908b; COCKERELL, 1917f. *Oligo.*, USA (Colorado). — FIG. 246,7. **P. typicus*; fore wing, $\times 5.2$ (BRUES, 1908b).
- Pseudosiobia** ASHMEAD, 1898, p. 308. [Generic assignment of fossil doubtful.] ROHWER, 1908b. *Oligo.*, USA (Colorado)—*Holo.*
- Rhogogaster** KONOW, 1884, p. 338. [Generic assignment of fossil doubtful.] BRUES, 1908b; GIBSON, 1980. *Oligo.*, USA (Colorado)—*Holo.*
- Selandria** LEACH, 1817, p. 126. COCKERELL, 1910c. *Oligo.*, USA (Colorado)—*Holo.*
- Taeniurites** COCKERELL, 1917b, p. 382 [**T. fortis*; OD]. Fore wing as in *Macrophyia* (recent), but body structure as in *Strongylogaster* (recent). COCKERELL, 1927d. *Oligo.*, USA (Colorado).
- Taxonus** HARTIG, 1837, p. 297. HEER, 1849; KONOW, 1897; PONGRÁCZ, 1928. *Eoc.*, USA (Wyoming); *Mio.*, Europe (Germany)—*Holo.*
- Tenthredinites** MEUNIER, 1915a, p. 11 [**T. bifasciata*; OD]. Little-known genus. Fore wing with 2 dark transverse bands. [Possibly a junior synonym of *Tenthredo*.] LOEW, 1850. *Oligo.*, Europe (France).
- ### Family ELECTROTMIDAE
- RASNITSYN, 1977
- [Electrotomidae RASNITSYN, 1977b, p. 1304]
- Little-known family, apparently related to the Argidae, and based on mature larva (prepupa). Head relatively large, as in Blasticotomidae; tenth abdominal tergite conical, as in Xyelidae; antennae not contiguous with ocelli; false legs absent from ninth abdominal segment. *Oligo.*
- Electrotoma** RASNITSYN, 1977b, p. 1307 [**E. succini*; OD]. Head capsule with 15 to 20 long setae; body with short pubescence. *Oligo.*, Europe (Baltic).
- ### Family ARGIDAE Konow, 1890
- [Argidae KONOW, 1890, p. 229]
- Fore wing with crossvein 2r-rs absent; vein M joined to R before origin of RS; RS joined or nearly joined to R distally near wing apex. Antennae with 3 segments, the last compound and very long; fore tibiae with 2 apical spurs. Larvae foliage feeders. *Oligo.*—*Holo.*
- Arge** SCHRANK, 1802, p. 209. *Holo.*
- Sterictiphora** BILLBERG, 1820, p. 99. ROHWER, 1908c; ZHELOCHOVTZEV & RASNITSYN, 1972. *Oligo.*, USA (Colorado)—*Holo.*
- ### Family CIMBICIDAE Kirby, 1837
- [Cimbicidae KIRBY IN RICHARDSON, SWAINSON, & KIRBY, 1837, p. 254]
- Fore wing with crossvein 2r-rs present. Antennae clubbed but third segment not enlarged; pronotum with hind border deeply emarginate. Larvae foliage feeders. *Eoc.*—*Holo.*
- Cimbex** OLIVIER, 1790, p. 762. COCKERELL, 1922d. *Oligo.*, USA (Colorado)—*Holo.*
- Eopachysticta** MALAISE, 1945, p. 14 [**Amasis byrami* COCKERELL, 1924a, p. 10; OD]. Similar to *Pseudopachysticta* (recent), but head strongly enlarged behind eyes and mesonotal lobes separated by deep furrows. ZHELOCHOVTZEV & RASNITSYN, 1972. *Eoc.*, USA (Colorado).
- Trichiosomites** BRUES, 1908b, p. 259 [**T. obliviosus*; OD]. Similar to *Zeraea* (recent); cell 3r long; cell 1cu only a little longer than cell 1rm. Antennae with 6 segments. *Oligo.*, USA (Colo-

rado).—FIG. 246,5. **T. obliviosus*; fore wing, $\times 5.5$ (Brues, 1908b).

Family BLASTICOTOMIDAE Thomson, 1871

[Blasticotomidae THOMSON, 1871, p. 13]

Fore wing with vein R close to and nearly coalesced with costa; M extending distally beyond crossvein 3r-m; CUA extending distally beyond crossvein 2m-cu. Antennae with 3 or 4 segments, third very long, fourth short or absent. Larvae stem borers. *Oligo*.—*Holo*.

Blasticotoma KLUG, 1834, p. 251. *Holo*.

Parempphytus BRUES, 1908b, p. 265. ZHELOCHOVTZEV & RASNITSYN, 1972. *Oligo*, USA (Colorado)—*Holo*.

Family DIPRIONIDAE Rohwer, 1911

[Diprionidae ROHWER, 1911, p. 220]

Fore wing with crossvein 2r-rs absent. Antennae with at least 13 segments and almost always serrate or pectinate; third segment not elongate, shorter than total length of all other flagellar segments. Larvae on coniferous foliage. *Oligo*.—*Holo*.

Diprion SCHRANK, 1802, p. 209. BRUES, 1908b. *Oligo*, USA (Colorado)—*Holo*.

Family XYELYDIDAE Rasnitsyn, 1968

[Xyelydidae RASNITSYN, 1968, p. 192]

Fore wing: vein SC with 2 branches, posterior branch joining R basad of origin of RS; crossvein 1m-cu much shorter than half length of section of M distal to it; cell 1mcu large; M+CUA only slightly curved. Antennae multisegmented; third segment commonly much enlarged and elongate, more than a third length of antenna. *Jur*.

Kyelyda RASNITSYN, 1968, p. 193 [**X. excellens*; OD]. Fore wing with posterior branch of SC strongly oblique; cells 1r and 1mcu narrow and long; cell 1r longer than cell 2rm; length of cell 1mcu more than twice its width; pterostigma fully sclerotized; crossvein 1m-cu much shorter than the section of CUA adjoining it distally. RASNITSYN, 1969, 1983b. *Jur*, USSR (Kazakh).—FIG. 246,8. **X. excellens*; fore wing, $\times 5.6$ (Rasnitsyn, 1969).

Ferganolyda RASNITSYN, 1983b, p. 61 [**F. cubitalis*; OD]. Similar to *Kyelyda*, but cell 1r shorter

than cell 2rm; anterior border of cell 1mcu almost straight. *Jur*, USSR (Kazakh).

Mesolyda RASNITSYN, 1963, p. 86 [**M. jurassica*; OD]. Fore wing with basal section of RS very short and almost perpendicular to longitudinal axis of wing; posterior branch of SC only slightly oblique; cell 3rm not widened distally, shorter than cell 2mcu. RASNITSYN, 1969, 1983b. *Jur*, USSR (Kazakh).—FIG. 246,3. **M. jurassica*; fore wing, $\times 6$ (Rasnitsyn, 1969).

Prolyda RASNITSYN, 1968, p. 194 [**P. karatavica*; OD]. Fore wing with posterior branch of SC very short; basal section of RS oblique and relatively long; cell 3rm widened distally. RASNITSYN, 1963, 1983b. *Jur*, USSR (Kazakh).

Sagulyda RASNITSYN, 1983b, p. 57 [**S. ferganica*; OD]. Similar to *Kyelyda*. Fore wing with crossvein 1m-cu about as long as section of CUA adjoining it distally. *Jur*, USSR (Kirghiz).

Strophandria RASNITSYN, 1968, p. 195 [**S. grossa*; OD]. Similar to *Mesolyda*. Fore wing with basal section of RS more than half as long as basal section of M; cell 3rm widened distally and longer than cell 2mcu. RASNITSYN, 1969, 1983b. *Jur*, USSR (Kazakh).

Family PARAPAMPHILIIDAE

Rasnitsyn, 1968

[Parapamphiliidae RASNITSYN, 1968, p. 191]

Fore wing with vein SC apparently absent; area between R and costal margin broad, widest at origin of RS; basal section of RS much longer than basal section of M; cell 3r very narrow and long. *Jur*.

Parapamphilius RASNITSYN, 1968, p. 192 [**P. confusus*; OD]. Fore wing with pterostigma sclerotized at base. Head considerably wider than pronotum. RASNITSYN, 1969. *Jur*, USSR (Kazakh).

Family PAMPHILIIDAE

Cameron, 1890

[Pamphiliidae CAMERON, 1890, p. 84]

Fore wing with vein SC absent or obsolescent; RS unbranched; crossvein 2r-rs present. Antennae with at least 13 segments, third not elongate; pronotum with hind margin straight or only slightly concave; fore tibiae with 2 apical spurs; ovipositor short. Larvae foliage feeders, usually in rolled leaves. *Jur*.—*Holo*.

Pamphilus LATREILLE, 1802, p. 303. *Holo*.

Atocus SCUDDER, 1892, p. 25 [**A. defessus*; OD]. Similar to *Neurotoma* (recent), but antennae very

short and with a small number of segments; basal section of RS in fore wing longer than in *Neurotoma*. BRUES, 1908b; COCKERELL, 1908c; ZHELOCHOVTZEV & RASNITSYN, 1972; RASNITSYN, 1983b. *Oligo.*, USA (Colorado).

Juralyda RASNITSYN, 1977a, p. 102 [**J. udensis*; OD]. Fore wing with pterostigma narrow, only margins sclerotized; basal section of RS about equal in length to crossvein 1r-rs; crossvein 3r-m nearly perpendicular to longitudinal axis of wing; cell 1mcu very short. *Jur.*, USSR (Kazakh). — FIG. 246,9. **J. udensis*; fore wing, $\times 5$ (Rasnitsyn, 1977a).

Tapholyda RASNITSYN, 1983b, p. 65 [**Cephalcia caplani*; OD]. Apparently related to *Acantholyda* (recent). Antennae with less than 20 segments, third segment only a little longer than fourth; head transverse. Fore wing with cells 1r and 1mcu twice as long as their width. COCKERELL, 1933a, 1940b; ZHELOCHOVTZEV & RASNITSYN, 1972. *Oligo.*, USA (Colorado); *Mio.*, USSR (Asian RSFSR).

Family CEPHIDAE Newman, 1835

[Cephidae NEWMAN, 1835, p. 411]

Fore wing with vein SC absent; RS unbranched; basal section of RS very short; crossvein 2r-rs joined to RS proximally to 2r-m; cell 2r short; cell 1mcu large. Antennal segments little differentiated; prothorax large; fore tibiae with 1 apical spur; abdomen somewhat constricted between first and second segments; ovipositor flat. Larvae stem or twig borers. *Jur.*—*Holo.*

Cephus LATREILLE, 1802, p. 303. *Holo.*

Electrocephus KONOW, 1897, p. 37 [**E. stralen-dorffii*; OD]. Similar to *Janus*, but 18-segmented antennae much shorter and thicker; third antennal segment almost a third longer than fourth, penultimate segment shorter than broad. *Oligo.*, Europe (Baltic).

Janus STEPHENS, 1835, p. 107. COCKERELL, 1913b. *Oligo.*, USA (Colorado)—*Holo.*

Mesocephus RASNITSYN, 1968, p. 196 [**M. sibiricus*; OD]. Similar to *Pachycephus* (recent), but cell 3r of fore wing wide and cell 2rm nearer wing apex. RASNITSYN, 1963. *Jur.*, USSR (Kazakh). — FIG. 246,6. **M. sibiricus*; fore wing, $\times 7$ (Rasnitsyn, 1969).

Family GIGASIRICIDAE Rasnitsyn, 1968

[Gigasiricidae RASNITSYN, 1968, p. 197]

Fore wing: vein SC well developed; basal section of RS slanted toward apex of wing,

longer than basal section of M; crossveins 2r-m, 3r-m, and 2m-cu well developed. Antennae with third segment enlarged and elongate. *Jur.*

Gigasirex RASNITSYN, 1968, p. 197 [**G. longipes*; OD]. Fore wing with pterostigma fully sclerotized; SC free from R; RS+M shorter than basal section of RS. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).

Liasirex RASNITSYN, 1968, p. 198 [**L. sogdianus*; OD]. Fore wing with pterostigma incompletely sclerotized; section of R between base of RS and pterostigma strongly arched; basal section of RS more than twice as long as basal section of M. RASNITSYN, 1969. *Jur.*, USSR (Kazakh). — FIG. 247,2. **L. sogdianus*; fore wing, $\times 4$ (Rasnitsyn, 1969).

Protosirex RASNITSYN, 1969, p. 62 [**P. xylopterus*; OD]. Fore wing with SC contiguous with R; pterostigma narrow, strongly sclerotized; basal section of RS less than twice as long as basal section of M; RS+M longer than basal section of RS. *Jur.*, USSR (Kazakh). — FIG. 247,1. **P. xylopterus*; fore wing, $\times 6$ (Rasnitsyn, 1969).

Family KARATAVITIDAE

Rasnitsyn, 1963

[Karatavitidae RASNITSYN, 1963, p. 96]

Fore wing with vein SC apparently absent; basal section of RS directed toward wing apex and longer than basal section of M; crossvein 2r-rs situated before center of pterostigma. Antennae setaceous; ovipositor very slender. *Jur.*

Karatavites RASNITSYN, 1963, p. 97 [**K. angustus*; OD]. Fore wing with basal section of RS 1.5 times as long as basal section of M; cell 2rm longer than cell 1r but shorter than cell 3rm. Antennae thin, setaceous, with long segments. RASNITSYN, 1968, 1969. *Jur.*, USSR (Kazakh). — FIG. 247,4. *K. medius* RASNITSYN; fore wing, $\times 6$ (Rasnitsyn, 1969).

Family SEPULCIDAE Rasnitsyn, 1968

[nom. transl. RASNITSYN, 1969, p. 63, ex Sepulicinae RASNITSYN, 1968, p. 210]

Fore wing with basal section of vein RS slanting toward wing apex; cell 1mcu large, with basal-posterior margin sigmoidal. *Jur.*

Sepulca RASNITSYN, 1968, p. 210 [**S. mirabilis*; OD]. Fore wing with pterostigma completely sclerotized; SC coalesced with R, only distal end of SC free, appearing like a crossvein. RASNITSYN,

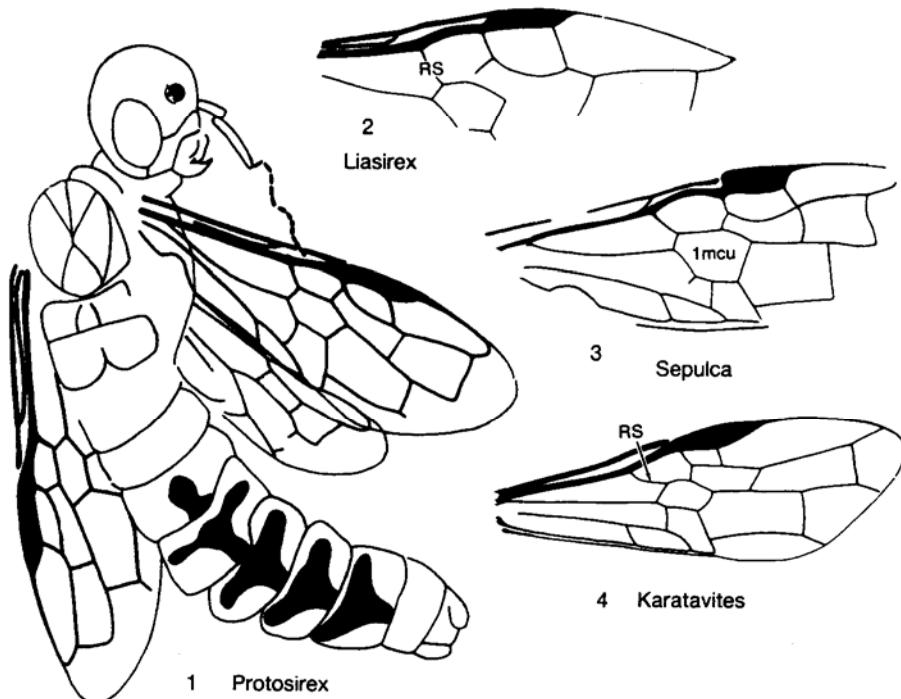


FIG. 247. Gigasiricidae, Karatavitidae, and Sepulcidae (p. 458–459).

1969. *Jur.*, USSR (Kazakh).—FIG. 247,3. **S. mirabilis*; fore wing, $\times 7$ (Rasnitsyn, 1969).

Sepulenia RASNITSYN, 1968, p. 210 [**S. syricta*; OD]. Similar to *Sepulca*, but SC completely coalesced with R. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).

Family ANAXYELIDAE Martynov, 1925

[Anaxyelidae MARTYNOV, 1925d, p. 754] [=Syntexidae BENSON, 1935, p. 539]

Fore wing: vein SC coalesced with R, at most appearing as a crossvein proximal to origin of RS; basal section of RS slanted toward wing apex and longer than basal section of M; crossveins 3r-m and 2m-cu present; cell 1mcu with 5 or 6 corners. No recent genera of the family are known as fossils. *Jur.*—*Holo.*

Anaxyela MARTYNOV, 1925d, p. 754 [**A. gracilis*; OD]. Fore wing with pterostigma weakly sclerotized, extending only slightly beyond basal margin of cell 3r; RS+M distinct. Basal half of antennae dark; ovipositor sheaths thin. RASNITSYN, 1963, 1968. *Jur.*, USSR (Kazakh).

—FIG. 248,3. **A. gracilis*; wings and body, $\times 5$ (Rasnitsyn, 1969).

Anasyntexis RASNITSYN, 1968, p. 208 [**A. strophandra*; OD]. Fore wing with pterostigma sclerotized; basal section of RS 1.5 times longer than basal section of M. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).—FIG. 249,5. **A. strophandra*; fore wing, $\times 6.5$ (Rasnitsyn, 1969).

Brachysyntexis RASNITSYN, 1969, p. 70 [**Syntexyla brachyura* RASNITSYN, 1968, p. 202; OD]. Fore wing with pterostigma sclerotized, not extending to middle of cell 3r; RS+M shorter than section of CUA between its divergence from M and its union with crossvein cu-a; basal section of RS more than twice as long as basal section of M. Antennae broad basally, much narrowed distally. *Jur.*, USSR (Kazakh).—FIG. 248,2. **B. brachyura* (RASNITSYN); wings and body, $\times 8$ (Rasnitsyn, 1969).

Dolichostigma RASNITSYN, 1968, p. 200 [**D. tenuipes*; OD]. Fore wing with pterostigma sclerotized, extending at least to center of cell 3r; RS and M joined at a single point of contact; cell 1mcu narrowed distally. RASNITSYN, 1969. *Cret.*, USSR (Kazakh).—FIG. 249,4. **D. tenuipes*; wings and body, $\times 4.5$ (Rasnitsyn, 1969).

Kempendaja RASNITSYN, 1968, p. 207 [**K. jacu-*

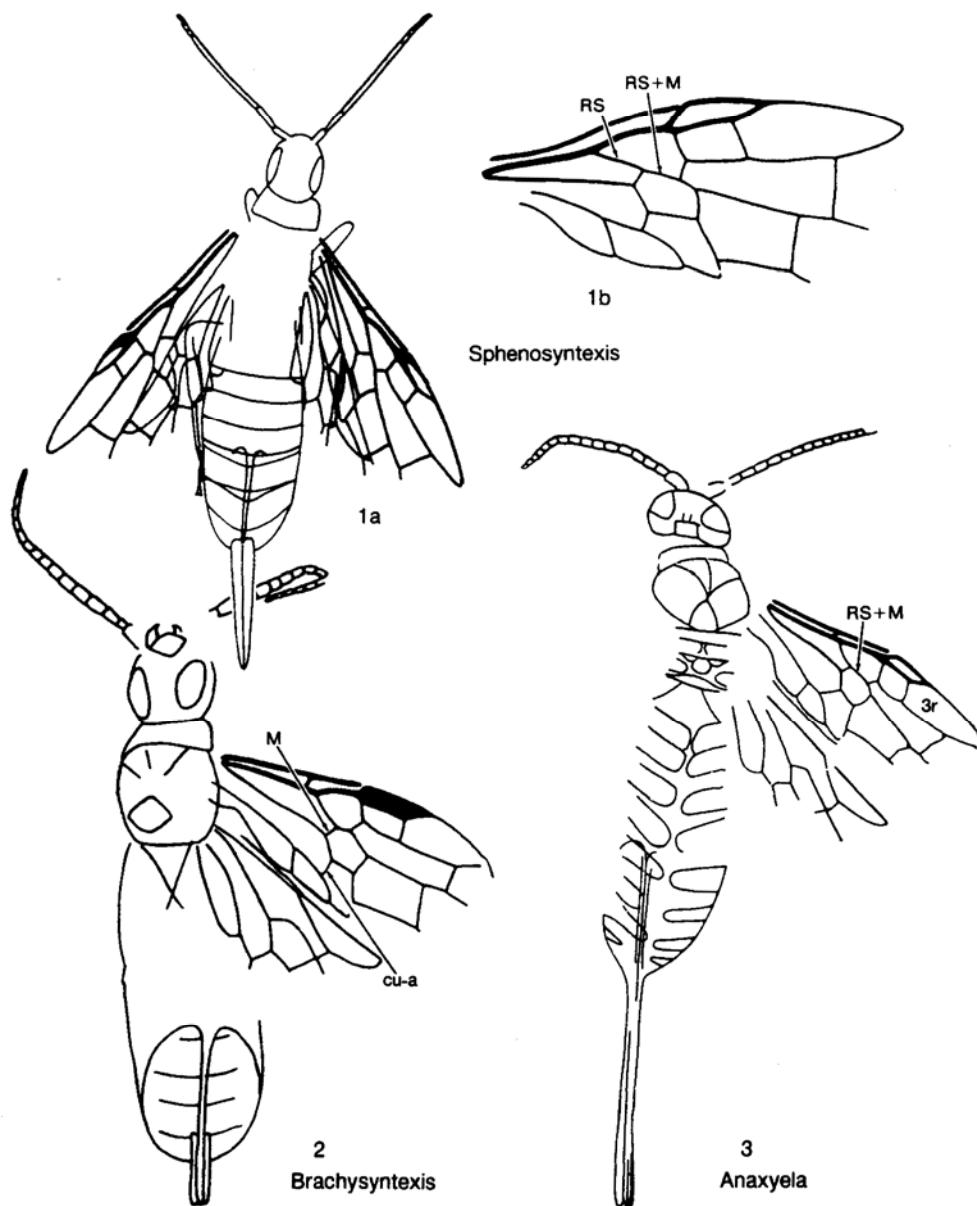


FIG. 248. Anaxyelidae (p. 459-461).

tensis; OD]. Similar to *Brachysyntaxis*, but pterostigma not sclerotized. RASNITSYN, 1969. Cret., USSR (Kazakh). — FIG. 249,2. **K. jacutensis*; fore wing, $\times 7.3$ (Rasnitsyn, 1969).

Kulbastavia RASNITSYN, 1968, p. 207 [**Anaxyela macrura* RASNITSYN, 1963, p. 92; OD]. Fore wing with pterostigma sclerotized; basal section of RS more than twice as long as basal section of M and slightly longer than RS + M; crossvein cu-a

nearly at level of center of cell 1mcu. Ovipositor longer than body. RASNITSYN, 1969. Jur., USSR (Kazakh). — FIG. 249,1. **K. macrura* (RASNITSYN); wings and body, $\times 4$ (Rasnitsyn, 1969). **Sphenosyntaxis** RASNITSYN, 1969, p. 67 [**Anaxyela antonovi* RASNITSYN, 1963, p. 90; OD]. Fore wing with pterostigma weakly sclerotized; basal section of RS aligned with RS + M, forming a straight line. Antennae filiform, with dark basal

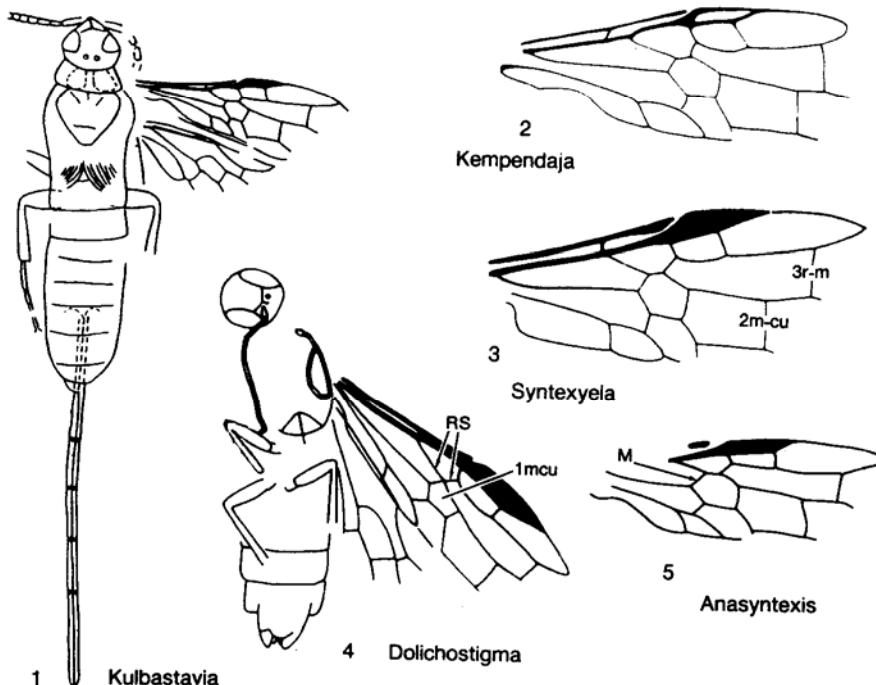


FIG. 249. Anaxyelidae (p. 459–461).

and apical segments. RASNITSYN, 1968. *Jur.*, USSR (Kazakh).—FIG. 248, 1a. *S. pallicornis* RASNITSYN; wings and body, X6 (Rasnitsyn, 1969).—FIG. 248, 1b. **S. antonovi* (RASNITSYN); fore wing, X10 (Rasnitsyn, 1969).

Syntexyela RASNITSYN, 1968, p. 201 [**Anaxyela media* RASNITSYN, 1963, p. 94; OD]. Fore wing with pterostigma sclerotized; section of M between crossveins 2m-cu and 3r-m about equal in length to crossvein 2m-cu. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).—FIG. 249, 3. **S. media* (RASNITSYN); fore wing, X7 (Rasnitsyn, 1969).

Urosyntexis RASNITSYN, 1969, p. 71 [**Syntexyela magna* RASNITSYN, 1968, p. 201; OD]. Similar to *Syntexyela*, but section of M between crossveins 2m-cu and 3r-m about half length of crossvein 2m-cu. RASNITSYN, 1963. *Jur.*, USSR (Kazakh).

Family PRAESIRICIDAE

Rasnitsyn, 1968

[nom. transl. RASNITSYN, 1983b, p. 62, ex Praesiricinæ RASNITSYN, 1968, p. 216]

Antennal segmentation nearly homonomous, third segment usually slightly longer than following segments; head large, mandibles long and narrow. Fore wing with vein SC apparently absent; origin of RS remote

from pterostigma; cell 3r not broadened distally; M+CUA arcuate. *Jur.*—*Cret.*

Praesirex RASNITSYN, 1968, p. 216 [**P. birtus*; OD]. Fore wing with basal section of RS short, inclined toward wing base; cell 1mcu large; cross-vein 1m-cu much shorter than section of CUA adjoining it distally. RASNITSYN, 1969, 1983b. *Cret.*, USSR (Asian RSFSR).

Aulidontes RASNITSYN, 1983b, p. 64 [**A. mandibulatus*; OD]. Similar to *Praesirex*. Fore wing with basal section of RS long; cell 1mcu relatively large and long. *Jur.*, USSR (Kazakh).

Xyelydontes RASNITSYN, 1983b, p. 64 [**X. sculpturatus*; OD]. Similar to *Praesirex*. Fore wing with basal section of RS short and inclined toward wing apex; cell 1mcu small. *Cret.*, USSR (Mongolia).

Family PSEUDOSIRICIDAE

Handlirsch, 1906

[Pseudosiricidae HANDLIRSCH, 1906b, p. 574] [=Myrmecidae MAA, 1949, p. 17; Megapteritidae MAA, 1949, p. 77]

Fore wing with venation reduced; crossveins 3r-m and 2m-cu absent; vein SC either present or obsolescent; basal section of RS slanted toward wing apex or wing base. *Jur.*—*Eoc.*

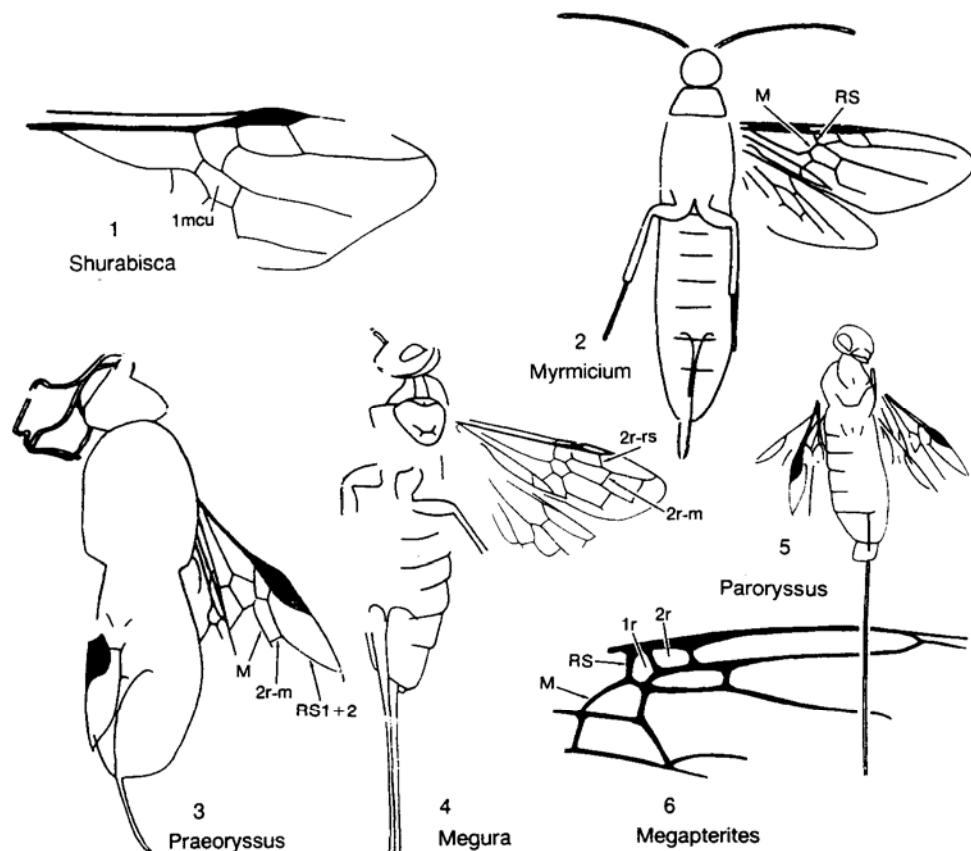


FIG. 250. Pseudosiricidae, Siricidae, and Paroryssidae (p. 462-463).

Myrmicum WESTWOOD, 1854, p. 396 [**M. heeri*; OD] [=*Hagenia* WEYENBERGH, 1869, p. 250 (type, *Sphinx schroeteri* GERMAR, 1839, p. 193); *Pseudosirex* WEYENBERGH, 1873, p. 238 (type, *P. darwini*); *Rhipidorhabdus* OPPENHEIM, 1885, p. 344 (type, *Sphinx schroeteri* GERMAR, 1839, p. 193); *Fabellouena* OPPENHEIM, 1885, p. 344 (type, *F. karschi*)]. Fore wing with basal section of RS strongly slanted toward wing apex and only slightly longer than basal section of M; RS+M very short, touching only a corner of cell 1mcu. MAA, 1949; RASNITSYN, 1968, 1969; SMITH, 1978. Jur., England, Europe (Germany). — FIG. 250,2. *M. schroeteri* (GERMAR); wings and body, ventral view, $\times 1$ (Rasnitsyn, 1969). **Eponera** CARPENTER, 1929b, p. 301 [**E. berryi*; OD]. Little-known genus, apparently related to *Myrmicum*; basal section of M much longer than basal section of RS; crossvein 2r-rs absent. BARONI URBANI, 1980d; RASNITSYN, 1980b. Eoc., USA (Tennessee). **Formicium** WESTWOOD, 1854, p. 388 [**F. brodei*; OD]. Little-known genus. Fore wing with basal

section of RS arising from R at an acute angle and about one-quarter as long as basal section of M. COCKERELL, 1921b; RASNITSYN, 1969, 1980b. Jur., England.

Megapterites COCKERELL, 1920a, p. 278 [**M. mirabilis*; OD]. Fore wing with basal section of RS perpendicular to R and about half as long as basal section of M; cell 1r shorter than cell 2r. COCKERELL, 1921b; MAA, 1949; RASNITSYN, 1969, 1980b. Eoc., England. — FIG. 250,6. **M. mirabilis*; fore wing, $\times 1$ (Cockerell, 1921b).

Shurabisca RASNITSYN, 1968, p. 217 [**S. liassica*; OD]. Fore wing with basal section of RS almost twice as long as basal section of M; cell 1mcu much wider distally than basally. RASNITSYN, 1969. Jur., USSR (Kazakh). — FIG. 250,1. **S. liassica*; fore wing, $\times 3.8$ (Rasnitsyn, 1969).

Family SIRICIDAE Billberg, 1820

[Siricidae BILLBERG, 1820, p. 98]

Fore wing with vein SC short or absent; crossveins 1r-rs, 3r-m, and 2m-cu present;

basal section of RS perpendicular to R or slanted toward wing base. Antennae with many segments, not markedly differentiated; pronotum with hind margin deeply emarginate; fore tibiae with 1 of the 2 apical spurs small or absent; abdomen terminating in a spine or horn. Larvae wood boring. *Jur.*—*Holo.*

Sirex LINNÉ, 1761, p. 396 [=*Urocerites* HEER, 1867, p. 36 (type, *U. spectabilis*)]. KONOW, 1898; MAA, 1949; SMITH, 1978. *Mio.*, Europe (Yugoslavia)—*Holo.*

Aulisca RASNITSYN, 1968, p. 212 [**A. odontura*; OD]. Fore wing with basal section of RS about equal in length to RS+M and directed posteriorly; crossvein 2r-rs more distal than crossvein 2r-m. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).

Eosirex PITON, 1940a, p. 229 [**E. ligniticus*; OD]. Little-known genus. Fore wing with cell 2rm broad; crossvein 2r-m sigmoidal. *Eoc.*, Europe (France).

Exoxeris MAA, 1949, p. 78 [**Urocerus klebsi* BRUES, 1926, p. 168; OD]. Similar to *Urocerus* (recent). Fore wing with apical angle of cell 1rm obtuse; cell 2r relatively short and below proximal part of pterostigma; cell 2cua very long. MAA, 1949. *Oligo.*, Europe (Baltic).

Megaulisca RASNITSYN, 1968, p. 213 [**M. grossa*; OD]. Fore wing as in *Megura*, but basal section of RS much longer than RS+M. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).

Megura RASNITSYN, 1968, p. 214 [**M. magnifica*; OD]. Fore wing with basal section of RS about as long as RS+M and curved posteriorly or apically; crossvein 2r-rs situated proximally to 2r-m. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).—FIG. 250,4. **M. magnifica*; wings and body, $\times 2.4$ (Rasnitsyn, 1969).

Family PARORYSSIDAE

Martynov, 1925

[Paroryssidae MARTYNOV, 1925d, p. 755]

Fore wing with reduced venation; crossveins 2m-cu and 3r-m absent; vein RS distinct between cells 1r and 2rm. Ovipositor well developed. *Jur.*

Paroryssus MARTYNOV, 1925d, p. 756 [**P. extensus*; OD]. Little-known genus, similar to *Praeoryssus*. Fore wing with R sharply curved between origin of RS and pterostigma. Prothorax elongate; ovipositor straight and longer than body. RASNITSYN, 1963, 1968. *Jur.*, USSR (Kazakh).—FIG. 250,5. **P. extensus*; wings and body, $\times 5.5$ (Rasnitsyn, 1969).

Microroryssus RASNITSYN, 1968, p. 221 [**M. brachyurus*; OD]. Similar to *Praeoryssus*, but crossvein

2r-m absent. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).

Praeoryssus RASNITSYN, 1968, p. 219 [**P. venosus*; OD]. R straight between origin of RS and pterostigma; crossvein 2r-m present. Prothorax short; ovipositor shorter than body, curved forward. RASNITSYN, 1969. *Jur.*, USSR (Kazakh).—FIG. 250,3. **P. venosus*; wings and body, $\times 8$ (Rasnitsyn, 1969).

Family UNCERTAIN

The following genera, apparently belonging to the order Hymenoptera, suborder Symphyta, are too poorly known to permit assignment to families.

Phenacoperga COCKERELL, 1908c, p. 113 [**Perga coloradensis* COCKERELL, 1907f, p. 446; OD]. Little-known genus, probably related to the Cimbicidae; cell 3r of fore wing with very smoothly curved posterior margin. ROHWER, 1908b. *Oligo.*, USA (Colorado).

Pseudocimbex ROHWER, 1908b, p. 526 [**P. clavata*; OD]. Similar to *Phenacoperga*, but cell 3r with very irregular posterior margin. *Oligo.*, USA (Colorado).

Sogutia RASNITSYN, 1977a, p. 101 [**S. liassica*; OD]. Fore wing with pterostigma fully sclerotized; basal section of vein RS slightly longer than RS+M, which is about as long as basal section of M; M+CUA sigmoidally curved. [Probably related to Xyelydidae.] *Jur.*, USSR (Kirghiz).—FIG. 246,4. **S. liassica*; fore wing, $\times 17$ (Rasnitsyn, 1977a).

Suborder APOCRITA

Gerstaecker, 1867

[Apocrita GERSTAECKER, 1867, p. 1]

Adults: first abdominal segment (propodeum) fused to metathorax and structurally a part of it (see Fig. 240); deep constriction between propodeum and second abdominal segment; gaster often petiolate. Larvae apodous. *Jur.*—*Holo.*

Family EPHIALTITIDAE

Handlirsch, 1906

[Ephialtitidae HANDLIRSCH, 1906b, p. 577]

Fore wing with crossvein 2r-m present; crossvein 1r-rs obsolescent, occasionally reaching pterostigma; cell 2a often closed. Antennae diverse, setaceous or clubbed, with 12 to 30 segments; propodeum commonly large, flat or weakly convex, often not ele-

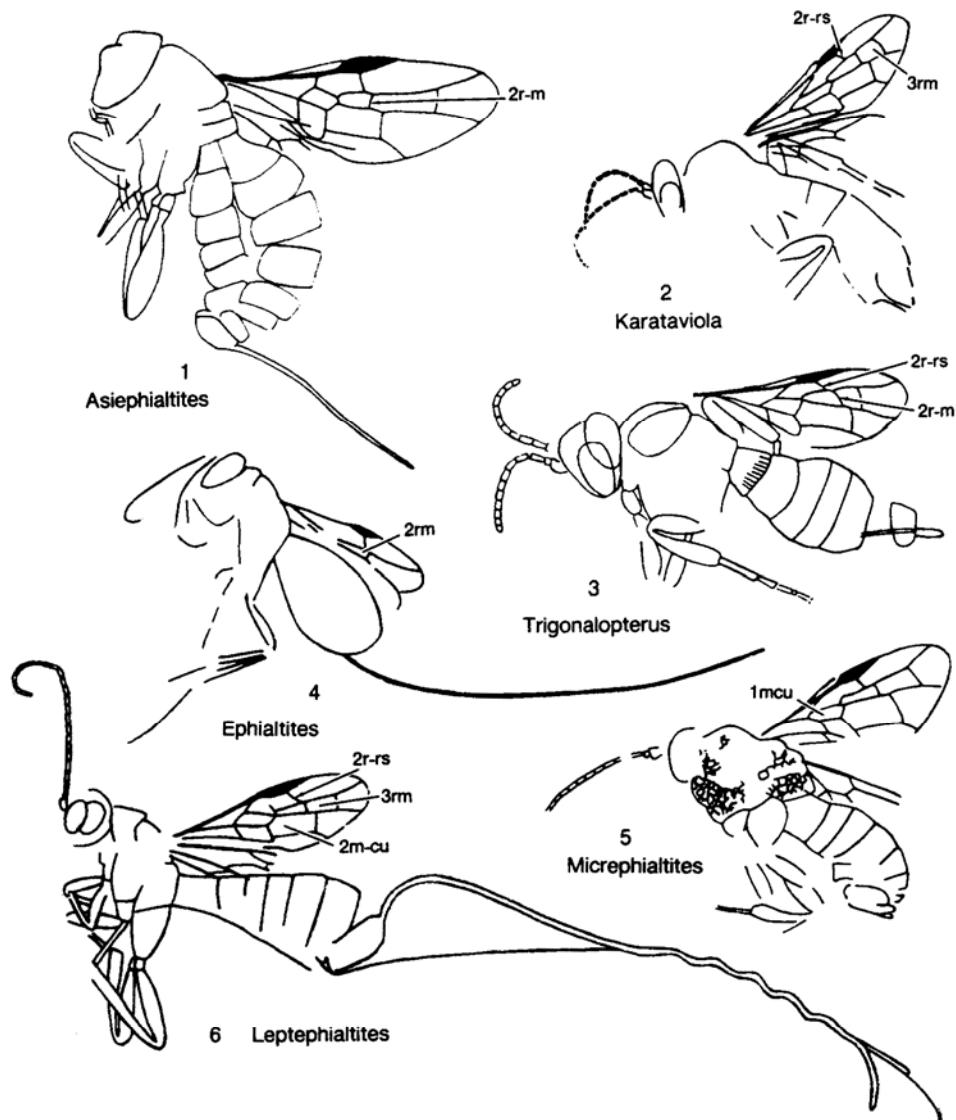


FIG. 251. Ephialtitidae (p. 464-466).

vated over base of second abdominal segment. *Jur.*

Ephialtites MEUNIER, 1903c, p. 4 [**E. jurassicus*; OD]. Little-known genus. Fore wing with pterostigma short; crossvein cu-a situated at origin of M from CUA+M; cell 2rm very narrow and long. Ovipositor twice length of body, strongly curved. HANDLIRSCH, 1906b; RASNITSYN, 1975. *Jur.*, Europe (Spain). — FIG. 251,4. **E. jurassicus*; wings and body, X4 (Rasnitsyn, 1975).

Asiephialtites RASNITSYN, 1975, p. 29 [**A. niger*; OD]. Fore wing similar to that of *Stephanogaster* but not more than 4 mm long. Gaster widest at middle. *Jur.*, USSR (Kazakh). — FIG. 251,1.

A. niger*; wing and body, X9 (Rasnitsyn, 1975). **Karataviola RASNITSYN, 1975, p. 51 [**K. micrura*; OD]. Fore wing with basal section of RS arising near pterostigma and directed toward wing base; crossvein 1r-rs absent; crossvein 2r-m not slanted and situated distally to 2r-rs; cell 3rm shorter than cell 2rm. Antennae setaceous, with at least

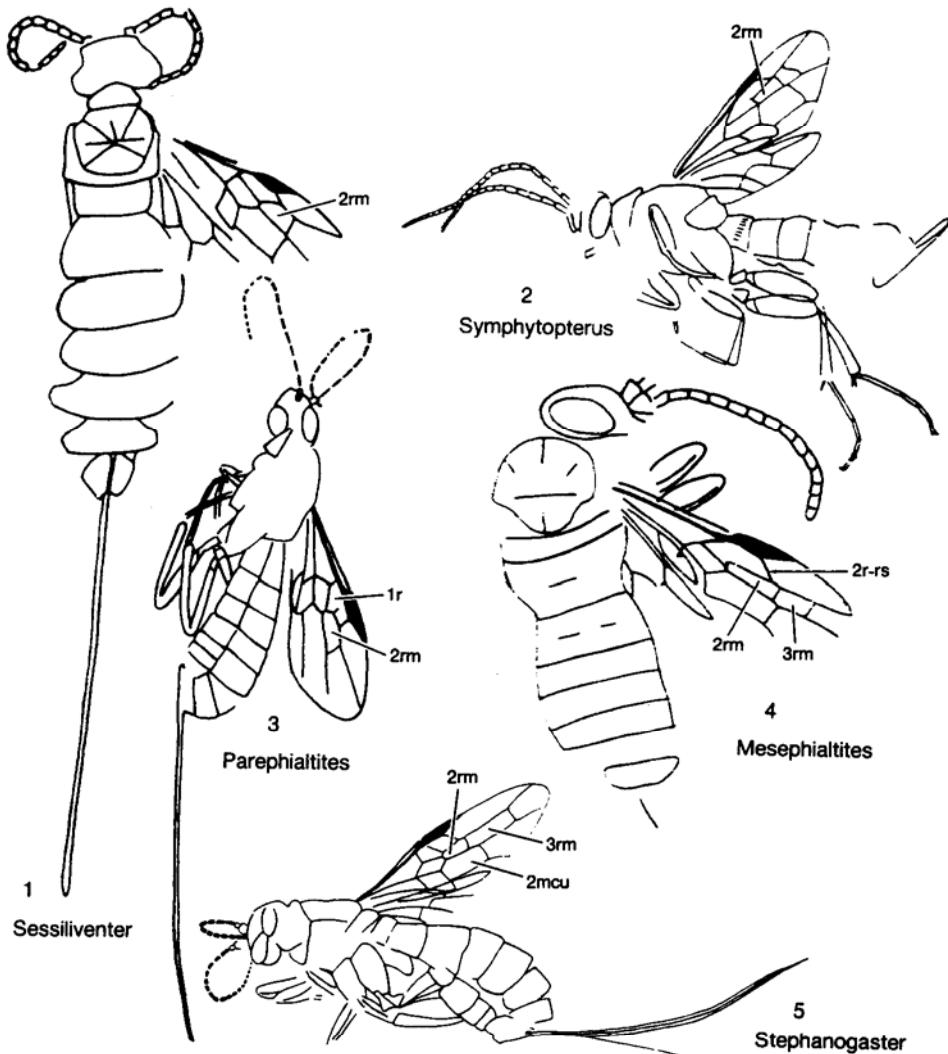


FIG. 252. Ephialtitidae (p. 465–466).

15 segments; ovipositor very short. Jur., USSR (Kazakh). — FIG. 251,2. **K. micrura*; wings and body, $\times 3.6$ (Rasnitsyn, 1975).

Leptephialtites RASNITSYN, 1975, p. 33 [**L. caudatus*; OD]. Fore wing with basal section of RS arising close to pterostigma and directed toward wing base; proximal border of cell 2rm distal of base of pterostigma; cell 3rm shorter than 2mcu; crossvein 1r-rs missing in some species. Antennae with from 16 to 30 segments; ovipositor longer than gaster, often much longer than body; gaster usually broadest distally. Jur., USSR (Kazakh). — FIG. 251,6. **L. caudatus*; body and wings, $\times 6$ (Rasnitsyn, 1975).

Mesephialtites RASNITSYN, 1975, p. 32 [**M. paurocerus*; OD]. Fore wing with basal section of RS arising close to base of pterostigma and directed obliquely toward wing base; proximal border of cell 2rm slightly distal to base of pterostigma; cell 3rm shorter than cells 2rm and 2mcu; crossvein 1r-rs absent. Antennae with 15 segments; gaster widest along middle. Jur., USSR (Kazakh). — FIG. 252,4. **M. paurocerus*; wings and body, $\times 9$ (Rasnitsyn, 1975).

Microphialtites RASNITSYN, 1975, p. 48 [**M. minor*; OD]. Fore wing with basal section of RS remote from pterostigma and directed toward wing base; crossvein 1r-rs absent; cells 2rm and 3rm long.

Ovipositor very short, barely projecting beyond end of gaster. *Jur.*, USSR (Kazakh). — FIG. 251,5. **M. minor*; wings and body, $\times 8$ (Rasnitsyn, 1975).

Parephialites RASNITSYN, 1975, p. 32 [**P. reductus*; OD]. Fore wing with basal section of RS very short, directed slightly toward wing apex; crossveins 3r-m and 2m-cu absent; cell 2a closed; cell 2rm with proximal border distal to base of pterostigma. Antennae with 20 segments; pro-podeum barely extending over base of second abdominal segment; gaster widest at level of segments 6 and 7; ovipositor only slightly longer than body. *Jur.*, USSR (Kazakh). — FIG. 252,3. **P. reductus*; wings and body, $\times 6.7$ (Rasnitsyn, 1975).

Sessiliventris RASNITSYN, 1975, p. 39 [**S. temporalis*; OD]. Fore wing with basal section of RS very short and slanted toward wing base; proximal border of cell 2rm distal to base of pterostigma; crossveins 1r-rs and 3r-rm absent. Antennae with 15 to 17 segments; gaster broadest near middle; ovipositor longer than abdomen, but not longer than body. *Jur.*, USSR (Kazakh). — FIG. 252,1. **S. temporalis*; wings and body, $\times 7.8$ (Rasnitsyn, 1975).

Stephanogaster RASNITSYN, 1975, p. 27 [**S. magna*; OD]. Fore wing at least 5 mm long; pterostigma long; basal section of RS arising near base of pterostigma and nearly perpendicular to R; proximal border of cell 2rm distal to base of pterostigma; cell 3rm longer than cell 2mcu; crossvein cu-a situated at origin of M from M+CUA. Antennae setaceous, with at least 20 segments; gaster broad posteriorly; ovipositor long, but not as long as body. *Jur.*, USSR (Kazakh). — FIG. 252,5. **S. magna*; wing and body, $\times 3.5$ (Rasnitsyn, 1975).

Symphyogaster RASNITSYN, 1975, p. 49 [**S. cylindrica*; OD]. Similar to *Micrephialites*, but cross-vein 3r-m absent in fore wing. Antennae with 19 segments. *Jur.*, USSR (Kazakh).

Sympyopterus RASNITSYN, 1975, p. 42 [**S. nigricornis*; OD]. Fore wing with basal section of RS strongly slanted toward base of wing; proximal border of cell 2rm at about level of base of pterostigma. Antennae apparently with from 12 to 24 segments; gaster narrowed toward apex, widest near middle. *Jur.*, USSR (Kazakh). — FIG. 252,2. **S. nigricornis*; wings and body, $\times 5$ (Rasnitsyn, 1975).

Trigonalopterus RASNITSYN, 1975, p. 51 [**T. brachycerus*; OD]. Fore wing with basal section of RS close to pterostigma and directed toward wing base; crossvein 1r-rs absent; crossvein 2r-m oblique, close to crossvein 2r-rs. Antennae with 12 segments; ovipositor short. *Jur.*, USSR (Kazakh). — FIG. 251,3. **T. brachycerus*; wing and body, $\times 7.7$ (Rasnitsyn, 1975).

Family STEPHANIDAE Leach, 1815

[Stephanidae LEACH, 1815, p. 142]

Fore wing with costal space broad; distal veins weak or obsolescent. Antennae multi-segmented, with at least 20 segments; head spherical, with a circular row of 5 teeth around median ocellus; cervix long; hind coxae long, hind femora swollen. Larvae parasitic on wood-boring insects, mostly Coleoptera. *Oligo.*—*Holo.*

Stephanus PANZER, 1805, p. 77. *Holo.*

Electrostephanus BRUES, 1933, p. 12 [**E. brevicornis*; OD]. Fore wing similar to that of *Stephanus* (recent), but basal section of M directed slightly anteriorly. Antennae with not more than 23 segments. *Oligo.*, Europe (Baltic). — FIG. 253,6. **E. brevicornis*; wings and body, $\times 10$ (Brues, 1933).

Protostephanus COCKERELL, 1906b, p. 57 [**P. ashmeadi*; OD]. Little-known genus. Hind femora toothed. [Family assignment doubtful.] BRUES, 1933; RASNITSYN, 1963. *Oligo.*, USA (Colorado).

Family MEGALYRIDAE

Schletterer, 1890

[Megalyrinae SCHLETTERER, 1890, p. 198]

Similar to the Stephanidae, but antennae commonly with fewer segments, segments long and narrow; gaster subsessile. Larvae apparently parasitic on certain wood-boring beetles. *Jur.*—*Holo.*

Megalyra WESTWOOD, 1832, p. 790. *Holo.*

Brachycleistogaster RASNITSYN, 1975, p. 64 [**B. karatavica*; OD]. Fore wing with basal section of RS shorter than basal section of M; crossveins 3r-m and 2m-cu absent; crossvein 2r-m present. Antennae filiform, with 13 to 15 segments; ovipositor short. *Jur.*, USSR (Kazakh). — FIG. 253,1. **B. karatavica*; wings and body, $\times 13$ (Rasnitsyn, 1975).

Cleistogaster RASNITSYN, 1975, p. 53 [**C. buriatica*; OD]. Fore wing with pterostigma slender; basal section of RS shorter than basal section of M; crossveins 2r-m and 3r-m present. *Jur.*, USSR (Kazakh); *Cret.*, USSR (Asian RSFSR). — FIG. 253,5. **C. buriatica*, *Jur.*; wings and body, $\times 6$ (Rasnitsyn, 1975).

Cretocleistogaster RASNITSYN, 1975, p. 72 [**C. vitimica*; OD]. Fore wing with pterostigma very short and broad at middle; basal section of RS longer than basal section of M; crossveins 2r-m, 3r-m, and 2m-cu absent. Antennae with about 15 segments; ovipositor short. *Cret.*, USSR (Asian RSFSR).

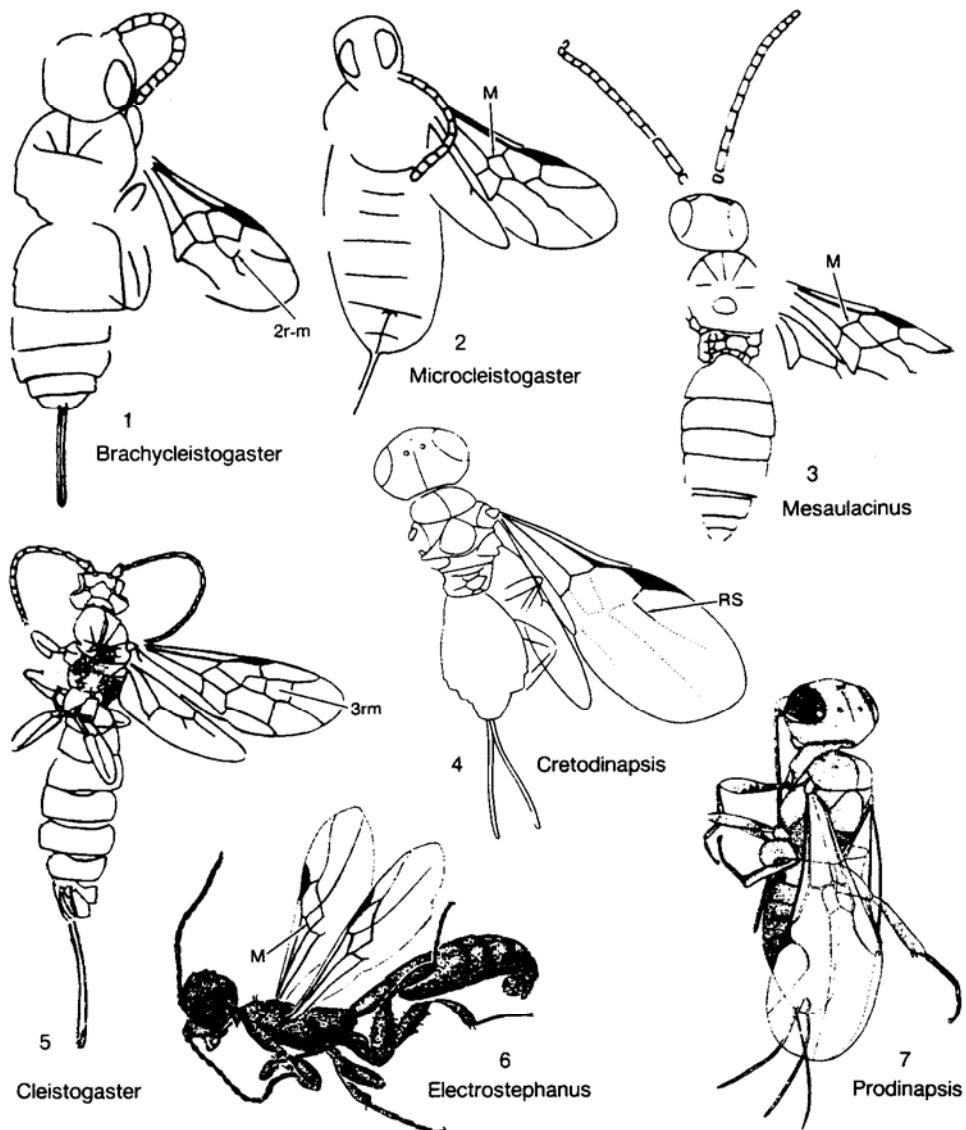


FIG. 253. Stephanidae and Megalyridae (p. 466–468).

Cretodinapsis RASNITSYN, 1977a, p. 106 [**C. caucasica*; OD]. Fore wing with RS, as it connects to crossvein 2r-rs, perpendicular to it; RS obsolescent, but distinct between cells 1r + 2r and 3r; R curved at origin of RS. Head broader than thorax; ovipositor shorter than body. *Cret.*, USSR (Azerbaijan). — FIG. 253,4. **C. caucasica*; wings and body, $\times 24$ (Rasnitsyn, 1977a).

Leptocleistogaster RASNITSYN, 1975, p. 57 [**L. pallida*; OD]. Fore wing as in *Cleistogaster*, but

crossvein 2m-cu absent or reduced to only stubs. Antennae with 10 to 21 segments. *Jur.*, USSR (Kazakh).

Mesaulacinus MARTYNOV, 1925d, p. 757 [**M. oviformis*; OD]. Fore wing with basal section of RS shorter than basal section of M; crossvein 3r-m absent or obsolescent, with stubs present. Antennae apparently with 12 to 20 segments, distal ones shortened. RASNITSYN, 1975. *Jur.*, USSR (Kazakh). — FIG. 253,3. *M. areolatus*

RASNITSYN; wings and body, $\times 11$ (Rasnitsyn, 1975).

Microcleistogaster RASNITSYN, 1975, p. 69 [*M. parvula*; OD]. Fore wing with pterostigma narrow; basal section of RS shorter than basal section of M; crossveins 2r-m, 3r-m, and 2m-cu absent. Body stout; antennae with less than 15 segments; distal segment shorter than others. Jur., USSR (Kazakh).—FIG. 253,2. **M. parvula*; wings and body, $\times 18$ (Rasnitsyn, 1975).

Prodinapsis BRUES, 1923c, p. 31 [*P. succinalis*; OD]. Similar to *Dinapsis* (recent). Fore wing with pterostigma small, elongate; RS short, curved. Antennae filiform, with 14 segments; antennal grooves (scrobes) present; hind coxae very large; ovipositor long. BRUES, 1923a, 1933. Oligo., Europe (Baltic).—FIG. 253,7. **P. succinalis*; wings and body, $\times 16$ (Brues, 1933).

Family TRIGONALIDAE Cresson, 1887

[Trigonalidae CRESSON, 1887, p. 37]

Fore wing: venation generalized, with pterostigma, veins RS2 and RS3 (usually), RS+M, and cells 2rm and 3rm present; costal space open. Antennae multisegmented. Larvae mostly hyperparasites on other Hymenoptera or Diptera. *Cret.*—*Holo.*

Trigonalyx WESTWOOD, 1835, p. 52. [Generic assignment of fossils doubtful.] COCKERELL, 1917e; STATZ, 1938b. Oligo., Europe (Germany); Mio., Burma—*Holo.*

Cretogonalys RASNITSYN, 1977a, p. 106 [*C. taimyricus*; OD]. Fore wing with basal section of RS nearly perpendicular to R; cell 1mcu very short, much shorter than cell 2rm. Head narrow, with large, protruding eyes; antennae with 16 segments. *Cret.*, USSR (Asian RSFSR).

Family MAIMETSHIDAE Rasnitsyn, 1975

[Maimetshidae RASNITSYN, 1975, p. 73]

Fore wing with costal area distinct; pterostigma narrow; basal section of vein RS slanted slightly toward wing base; distal part of RS (beyond crossvein 2r-rs) curved, closing cell 3r; crossvein 2r-m present. Hind wing with venation reduced; RS very short; abdomen with second segment short and narrow; ovipositor well developed. *Cret.*

Maimetsha RASNITSYN, 1975, p. 74 [*M. arctica*; OD]. Fore wing with basal section of RS arising far from pterostigma; cell 3r short, broad; cross-

veins 3r-m and 2m-cu obsolescent. Gaster broadly oval. *Cret.*, USSR (Asian RSFSR).—FIG. 254,4. **M. arctica*; a, body, lateral view, b, wings and body, dorsal view, both $\times 22$ (Rasnitsyn, 1975).

Family STIGMAPHRONIDAE Kozlov, 1975

[Stigmaphronidae KOZLOV, 1975, p. 75]

Fore wing widest distally, venation greatly reduced; veins C and R thick; pterostigma long. Antennae with 11 segments; posterior ocelli almost contiguous with compound eyes; hind tibiae broad and flattened; tibial spurs long; tarsi long, with 5 segments. *Cret.*

Stigmaphron KOZLOV, 1975, p. 77 [*S. orphne*; OD]. Fore wing with RS absent. Antennae clubbed; tibial spur formula 1,2,3; spurs long and thin; hind coxae as long as wide; all femora strongly broadened; hind legs twice as long as forelegs. *Cret.*, USSR (Asian RSFSR).—FIG. 254,1. **S. orphne*; wings and body, $\times 50$ (Kozlov, 1975).

Allocotidus MUESEBECK, 1963, p. 129 [*A. bruesi*; OD]. Female similar to those of *Stigmaphron*, but antenna short, not clubbed, and flagellar segments (except the last) broader than long. RASNITSYN, 1975. *Cret.*, USA (Alaska).

Elasmomorpha KOZLOV, 1975, p. 78 [*E. melopomene*; OD]. Fore wing with RS almost reaching wing apex. Tibial spur formula 2,2,2. Antennal scape 3 times as long as maximum width and as long as following 5 segments combined. *Cret.*, USSR (Asian RSFSR).—FIG. 254,3. **E. melopomene*; wings and body, $\times 38$ (Kozlov, 1975).

Hippocoon KOZLOV, 1975, p. 80 [*H. evadne*; OD]. Fore wing with RS almost reaching wing margin. Tibial spur formula 2,2,2. Antennae not clubbed, length of antennal scape only about 1.3 times its greatest width and equal to 2 following segments combined. *Cret.*, USSR (Asian RSFSR).—FIG. 254,5. **H. evadne*; wings and body, $\times 50$ (Kozlov, 1975).

Family MEGASPILIDAE Ashmead, 1888

[Megaspilidae ASHMEAD, 1888, p. 49]

Fore wing with pterostigma large, linear, or absent. Antennae with same number of segments in both sexes; middle tibiae with 2 spurs; sixth gastric tergite lacking a net-like area. Larvae parasitic on braconids and chalcids. MASNER & DESSART, 1967. *Cret.*—*Holo.*

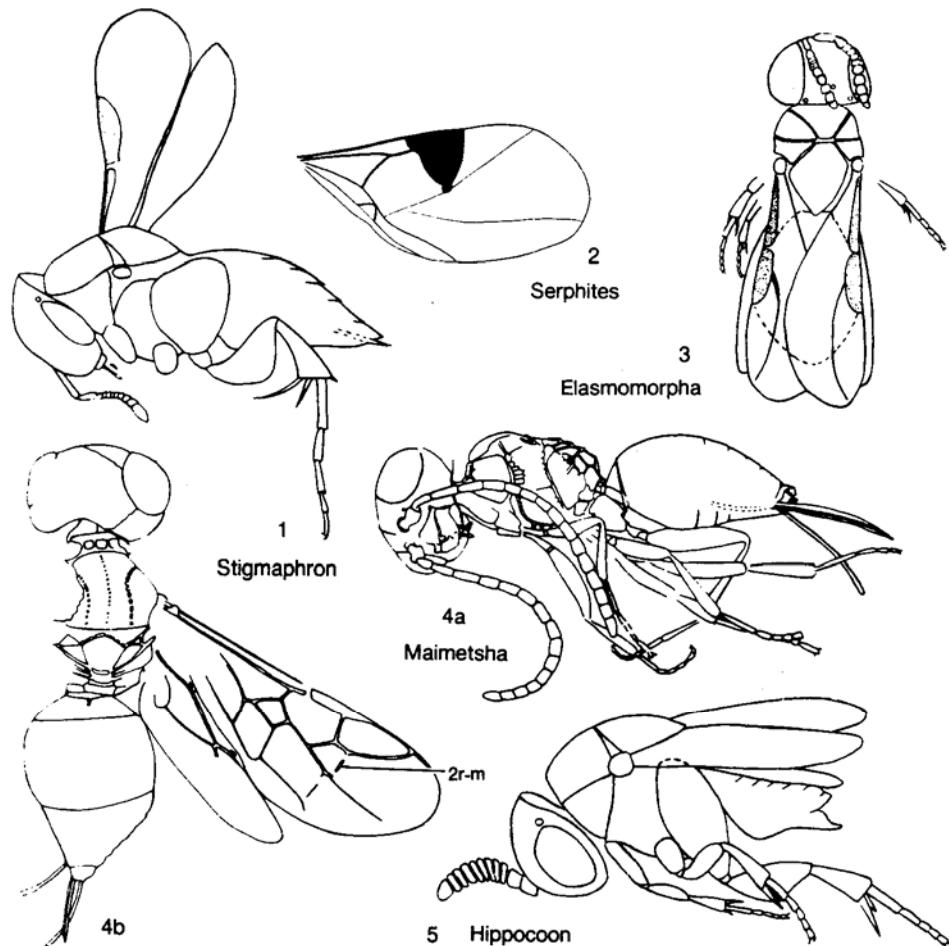


FIG. 254. Maimetshidae, Stigmaphronidae, and Serphitidae (p. 468–470).

Megaspilus WESTWOOD, 1829, p. 37. *Holo.*

Conostigmus DAHLBOM, 1858, p. 291. BRUES, 1940a; DESSART, 1977; ALEKSEYEV & RASNITSYN, 1981. *Cret.*, USSR (Asian RSFSR); *Oligo.*, Europe (Baltic)—*Holo.*

Lagynodes FÖRSTER, 1841, p. 46. BRUES, 1940a; DESSART, 1976. *Oligo.*, Europe (Baltic)—*Holo.*

Lygocerus FÖRSTER, 1856, p. 97. [Generic assignment of fossils doubtful.] CARPENTER & others, 1937. *Cret.*, Canada (Manitoba)—*Holo.*

Prolagynodes ALEKSEYEV & RASNITSYN, 1981, p. 127 [**P. penniger*; OD]. Related to *Lagynodes*. Female: wings fully developed; marginal vein of fore wing forming a slightly conical pterostigma; mesonotum with 3 complete furrows. *Cret.*, USSR (Asian RSFSR).

Family MESOSERPHIDAE

Kozlov, 1970

[*nom. transl.* Kozlov, 1975, p. 82. *ex* Mesoserphinae Kozlov, 1970, p. 205]

Similar to Proctotrupidae, but cells 1mcu and 2cua present in fore wing; gaster of female with 7 visible tergites; antennae of female with 15 or more segments. *Jur.*

Mesoserphus Kozlov, 1968, p. 239 [**M. kاراتавicus*; OD]. Cell 1mcu of fore wing nearly rectangular; M curved distally. Kozlov, 1970, 1975. *Jur.*, USSR (Kazakh).

Mesohelorus MARTYNOV, 1925d, p. 758 [**M. muchini*; OD]. Similar to *Mesoserphus*, but cell

1mcu nearly triangular in fore wing; M straight distally. RASNITSYN, 1975. *Jur.*, USSR (Kazakh). *Udaserphus* RASNITSYN, 1983a, p. 91 [$*U. transbaicalicus$; OD]. Similar to *Mesoserphus*, but much smaller; antennal segments broadened apically. Fore wing with RS+M, basal section of RS, and crossvein 1m-cu complete; basal section of M reduced. *Jur.*, USSR (Asian RSFSR).

Family SERPHITIDAE Brues, 1937

[*Serphitidae* BRUES, 1937, p. 33]

Male: fore wing with pterostigma very large, extending to center of wing; vein SC remote from C; other veins reduced; M and CU nearly obsolescent. Antennae with 10 segments and long scape; flagellum clavate; mandibles large; prothorax short. *Cret.*

Serphites BRUES, 1937, p. 33 [$*S. paradoxus$; OD]. Right mandible with 3 long, curved teeth directed inward; antennae inserted below middle of frons; femora slightly thickened near middle. *Cret.*, Canada (Manitoba). —FIG. 254,2. $*S. paradoxus$; fore wing, $\times 33$ (Brues, 1937).

Family PROCTOTRUPIDAE Leach, 1815

[*Proctotrupidae* LEACH, 1815, p. 145]

Fore wing with venation reduced; distal veins obsolescent or absent; pterostigma usually prominent; cell $2r+3r$ small to very small, closed; cells 1mcu and 2cua absent. Antennae with 13 segments, inserted at middle of frons, not on a projection; gaster of female terminating in a series of fused plates; ovipositor appearing to arise from apex of gaster. *Oligo.*—*Holo.*

Proctotrupes LATREILLE, 1796, p. 108. BRUES, 1910, 1923a. *Oligo.*, Europe (Baltic), USA (Colorado)—*Holo.*

Cryptoserphephus KIEFFER, 1907, p. 288. BRUES, 1940a. *Oligo.*, Europe (Baltic)—*Holo.*

Family HELORIDAE Förster, 1856

[*Heloridae* FÖRSTER, 1856, p. 20]

Fore wing with pterostigma present, sometimes small; costal space open, commonly narrow; cell $2r+3r$ small, triangular; several closed cells usually present. Antennae not arising from a projection, commonly with 15 segments. Larvae parasitic on diverse types of insects. *Jur.*—*Holo.*

Helorus LATREILLE, 1802, p. 309. STATZ, 1938b. *Oligo.*, Europe (Baltic)—*Holo.*

Protohelorus KOZLOV, 1968, p. 237 [$*P. mesozicus$; OD]. Fore wing with cell 1mcu more than 3 times as long as its maximum width. Antennae with 20 segments. *Jur.*, USSR (Kazakh).

Family DIAPRIIDAE Haliday, 1833

[*Diapriidae* HALIDAY, 1833, p. 274]

Fore wing venation usually reduced to a compound vein extending along anterior border of wing and consisting of the submarginal and marginal veins and a very small stigmal vein. Antennae with 11 to 15 segments, usually arising on a frontal projection. *Oligo.*—*Holo.*

Diapria LATREILLE, 1796, p. 110. *Holo.*

Aclista FÖRSTER, 1856, p. 128. BRUES, 1906; THÉOBALD, 1937a; STATZ, 1938b. *Oligo.*, USA (Colorado), Europe (Germany, France)—*Holo.*

Aneuryynchus WESTWOOD, 1832, p. 129. COCKERELL, 1921a. *Oligo.*, England—*Holo.*

Archaeobelyta MEUNIER, 1923b, p. 84 [$*A. superba$; OD]. Little-known genus, apparently related to *Lithobelyta*; pterostigma absent in fore wing. [Family assignment doubtful.] MEUNIER, 1923c. *Oligo.*, Europe (Germany).

Cinetus JURINE, 1807, p. 310. BRUES, 1910; MANEVAL, 1938. *Oligo.*, Europe (Baltic), USA (Colorado)—*Holo.*

Galesimorpha BRUES, 1910, p. 12 [$*G. wheeleri$; OD]. Similar to *Psilus* (recent); compound vein of fore wing submarginal, ending at pterostigma near midwing. *Oligo.*, USA (Colorado).

Lithobelyta COCKERELL, 1921a, p. 22 [$*L. reducta$; OD]. Similar to *Cinetus*, but pterostigma absent. *Oligo.*, England.

Miota FÖRSTER, 1856, p. 13. [Generic assignment of fossils doubtful.] COCKERELL, 1921a. *Oligo.*, England—*Holo.*

Pantolyta FÖRSTER, 1856, p. 128. MANEVAL, 1938. *Oligo.*, Europe (Baltic)—*Holo.*

Paramesius WESTWOOD, 1832, p. 129. BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*

Zygota FÖRSTER, 1856, p. 128. [Generic assignment of fossils doubtful.] COCKERELL, 1921a. *Oligo.*, England—*Holo.*

Family JURAPRIIDAE

Rasnitsyn, 1983

[*Jurapriidae* RASNITSYN, 1983a, p. 92]

Similar to Diapriidae; venation much reduced. Antennal scape relatively small, only slightly longer than twice its width; cells $1r+2r+1\text{mcu}$ forming an undivided compound cell. *Jur.*

Jurapria RASNITSYN, 1983a, p. 93 [**J. sibirica*; OD]. Antennae of female with 15 segments and slightly thickened distally but not forming a club; RS arising from R close to pterostigma. *Jur.*, USSR (Asian RSFSR).

Family PELECINOPTERIDAE Brues, 1933

[*Pelecinopterae* BRUES, 1933, p. 17]

Fore wing similar to that of Pelecinidae (recent). Antennae with 13 segments; hind tibiae clavate; hind tarsus with fourth segment short; female abdomen with 6 tubular segments, male abdomen with 7 tubular segments. [Probably a synonym of Pelecinidae.] *Oligo.*

Pelecinopteron BRUES, 1933, p. 19 [**P. tubuliforme*; OD]. Fore wing with pterostigma very narrow, acute apically; cell 1muc small; cell 2rm larger. KOZLOV, 1974. *Oligo.*, Europe (Baltic). —FIG. 255,8. **P. tubuliforme*; a, male, wings and body, $\times 6$; b, female, wings and body, $\times 5$ (both Brues, 1933).

Family SCELIONIDAE Thomson, 1858

[*Scelionidae* THOMSON, 1858, p. 417]

Fore wing with venation much reduced, without closed cells, and with a distinct compound vein along anterior margin of wing; costal space often open; stigmal vein usually present, but often thin or obsolescent. Antennae with 10 to 12 segments, rarely the distal 4 or 5 segments fused to form a club; middle tibia with 1 spur. Larvae parasitic on eggs of diverse insects. *Cret.-Holo.*

Scelio LATREILLE, 1805, p. 226. *Holo.*
Aneurobaeus KIEFFER, 1912, p. 87. BRUES, 1940b. *Oligo.*, Europe (Baltic)—*Holo.*

Archaeoscelio BRUES, 1940b, p. 88 [**A. rugosus*; OD]. Male: fore wing with SC apparently remote from costal margin, several thickenings associated with its termination. Body very short and stout; antennae with 14 segments, geniculate and filiform; legs slender, femora and tibiae clavate. Female: similar to male, but segments of flagellum thick, forming a long club. [Family assignment doubtful.] *Oligo.*, Europe (Baltic). —FIG. 255,5. **A. rugosus*, female; wings and body, $\times 17$ (Brues, 1940b).

Baryconus FÖRSTER, 1856, p. 101. CARPENTER & others, 1937. *Cret.*, Canada (Manitoba)—*Holo.*

Brachyscelio BRUES, 1940b, p. 76 [**B. cephalotes*; OD]. Female: fore wing with venation present;

basal section of M strong, nearly perpendicular to costal margin of wing; pterostigma absent; SC free from C. Head about twice as wide as long; antennae with 12 segments, geniculate; legs slender. [Family assignment doubtful.] *Oligo.*, Europe (Baltic). —FIG. 255,1. **B. cephalotes*; wings and body, $\times 23$ (Brues, 1940b).

Ceratobaeoides DODD, 1913, p. 337. BRUES, 1940b. *Oligo.*, Europe (Baltic)—*Holo.*

Chromoteleia ASHMEAD, 1893, p. 209. MANEVAL, 1938; BRUES, 1940b. *Oligo.*, Europe (Baltic)—*Holo.*

Dissolcus ASHMEAD, 1893, p. 164. BRUES, 1940b. *Oligo.*, Europe (Baltic)—*Holo.*

Electroteleia BRUES, 1940b, p. 80 [**E. stigmatica*; OD]. Female: fore wing with pterostigma forming a thick ridge on wing margin; RS terminating on wing margin just beyond pterostigma but well before wing apex. Antennae long, with 12 segments, terminal 7 or 8 segments shorter and thicker than others. Male: similar to female, but antennae filiform, distal segments not thickened. *Oligo.*, Europe (Baltic). —FIG. 255,2. **E. stigmatica*; male, wings and body, $\times 11$ (Brues, 1940b).

Hadronotooides DODD, 1913, p. 171. BRUES, 1940b. *Oligo.*, Europe (Baltic)—*Holo.*

Hadronotus FÖRSTER, 1856, p. 101. COCKERELL, 1909k. *Oligo.*, Europe (Baltic)—*Holo.*

Hoploteleia ASHMEAD, 1893, p. 227. BRUES, 1940b. *Oligo.*, Europe (Baltic)—*Holo.*

Macroteleia WESTWOOD, 1835, p. 70. COCKERELL, 1921a. *Oligo.*, England—*Holo.*

Microtelenomus DODD, 1913, p. 173. BRUES, 1940b. *Oligo.*, Europe (Baltic)—*Holo.*

Palaeogron MASNER, 1969, p. 398. *Oligo./Mio.*, Mexico (Chiapas)—*Holo.*

Palaeoteleia COCKERELL, 1914f, p. 637 [**P. oxyura*; OD]. Similar to *Chromoteleia*, but SC well developed; antennae inserted very close to middle line of frons; gaster broader. *Oligo.*, USA (Colorado).

Parabaeus KIEFFER, 1910, p. 294. BRUES, 1940b. *Oligo.*, Europe (Baltic)—*Holo.*

Proplatyscelio BRUES, 1940b, p. 85 [**P. depressus*; OD]. Female: similar to those of *Platyscelio* (recent), but fore wing with SC submarginal and extending beyond midwing; pterostigma reduced to a thickening beyond end of SC. *Oligo.*, Europe (Baltic). —FIG. 255,3. **P. depressus*, female; wings and body, $\times 13$ (Brues, 1940b).

Proteroscelio BRUES, 1937, p. 39 [**P. antennalis*; OD]. Apparently a scelionine genus, but antennae with 14 segments, scape reaching vertex of head; scape and flagellum flattened. *Cret.*, Canada (Manitoba).

Pseudobaeus PERKINS, 1910, p. 620. BRUES, 1940b. *Oligo.*, Europe (Baltic)—*Holo.*

Sembilanocera BRUES, 1940b, p. 70 [**S. clavata*; OD]. Related to *Baeus* (recent), but antennae of female with 9 segments and strongly clubbed. Wing veins present but reduced. *Oligo.*, Europe

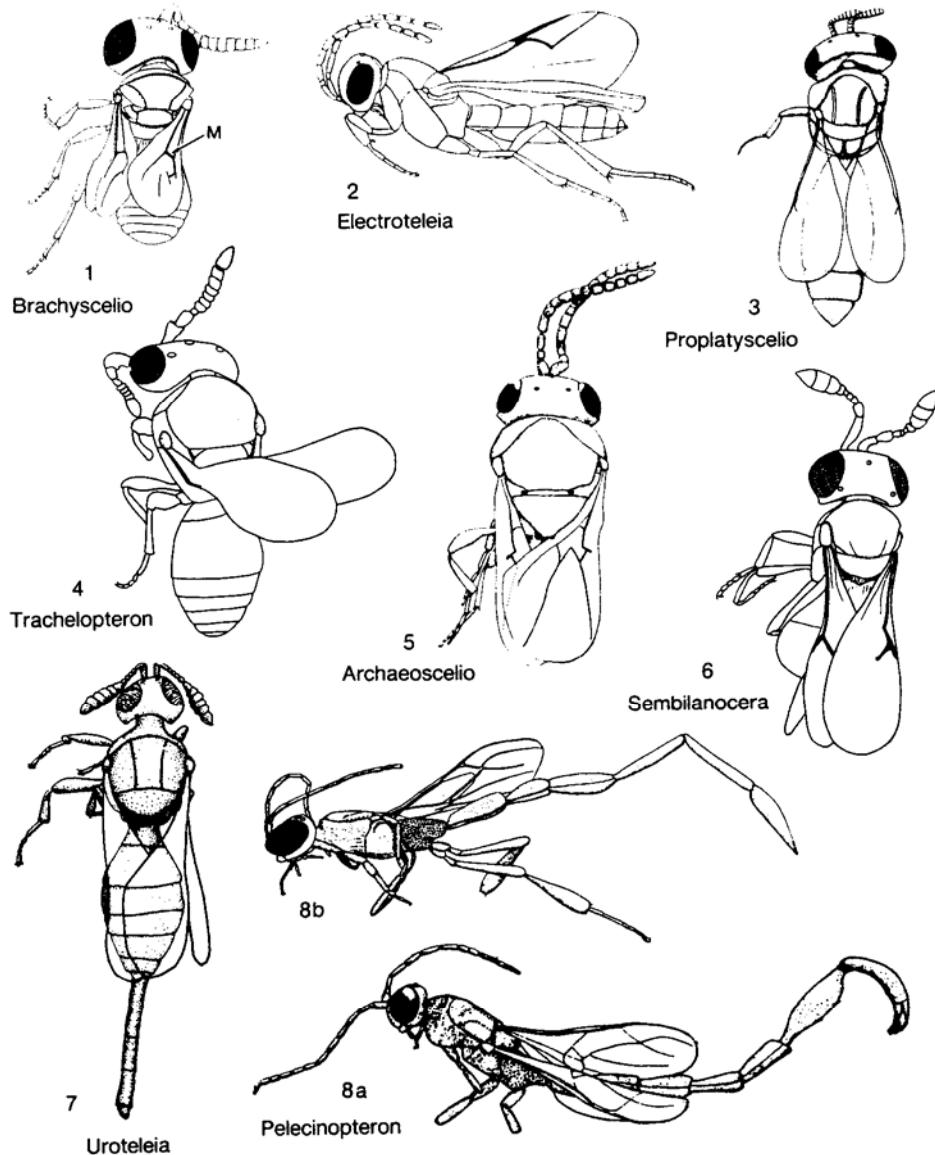


FIG. 255. Pelecinopteridae and Scelionidae (p. 471-473).

(Baltic).—FIG. 255,6. **S. clavata*; female, wings and body, $\times 40$ (Brues, 1940b).

Sparasion LATREILLE, 1802, p. 316. BRUES, 1940b. *Oligo.*, Europe (Baltic)—*Holo.*

Trachelopteron BRUES, 1940b, p. 86 [$*T. angulipenne$; OD]. Male: fore wing apparently bent sharply upward near base, basal part narrow and strap-shaped. Head, thorax, and abdomen flattened; antennae with 10 segments; scape short.

[Family assignment doubtful.] *Oligo.*, Europe (Baltic).—FIG. 255,4. $*T. angulipenne$; male, wings and body, $\times 57$ (Brues, 1940b).

Uroteleia BRUES, 1940b, p. 87 [$*U. synthetica$; OD]. Female: SC of fore wing extending beyond midwing; pterostigma reduced to a thickened marginal vein extending well beyond end of SC; part of basal section of RS apparently present. Antennae with 12 segments; scape long and slender.

der, 6 terminal segments forming a large club; prothorax long; gaster narrowed basally; apical segments also narrow, tip with a tubular process extending straight backward. [Family assignment doubtful.] *Oligo.*, Europe (Baltic). — FIG. 255, 7. **U. synthetica*; wings and body, $\times 17$ (Brues, 1940b).

Family PRAEAULACIDAE

Rasnitsyn, 1972

[Praeaulacidae RASNITSYN, 1972, p. 70]

Related to Aulacidae but with fuller venation, especially of hind wing. Fore wing: basal section of vein RS long, about equal to basal section of M; crossvein 1r-rs obsolescent or absent; crossveins 2r-m, 3r-m, and 2m-cu always present; crossvein 1m-cu reaching cell 2rm. Hind wing: costa not developed but R strong, extending to level of end of RS as a distinct vein. Antennae with 14 to 27 segments; ovipositor long. *Jur.*

Praeaulacus RASNITSYN, 1972, p. 72 [**P. ramosus*; OD]. Fore wing with basal section of RS at least half its length from pterostigma; crossvein 2r-rs about as long as maximum width of cell 2rm. *Jur.*, USSR (Kazakh). — FIG. 256, 4. **P. ramosus*; wings and body, $\times 5$ (Rasnitsyn, 1972).

Aulacogastrinus RASNITSYN, 1983c, p. 103, nom. subst. pro *Aulacogaster* RASNITSYN, 1972, p. 85, non AGASSIZ, 1846 [**Aulacogaster ater* RASNITSYN, 1972, p. 85; OD]. Fore wing with basal section of RS separated from pterostigma by less than half its length; crossvein 2r-rs distinctly longer than width of cell 2rm; crossvein 3r-m not slanted. Distal part of first gastral segment dilated. *Jur.*, USSR (Kazakh).

Evanigaster RASNITSYN, 1972, p. 85 [**E. petiolatus*; OD]. Similar to *Aulacogastrinus*, but first gastral segment narrow, tubular. *Jur.*, USSR (Kazakh).

Evaniops RASNITSYN, 1972, p. 85 [**E. rostratus*; OD]. Fore wing with basal segment of RS separated from pterostigma by a distance greater than its length; crossvein 2r-rs much longer than width of cell 2rm; crossvein 3r-m not oblique; gaster broad; second segment of abdomen forming a cylindrical petiole. *Jur.*, USSR (Kazakh).

Praeaulacinus RASNITSYN, 1972, p. 77 [**P. parvus*; SD RASNITSYN, 1973, p. 122, nom. subst. pro *minus* RASNITSYN, 1972, p. 77, non *minor* RASNITSYN, 1972]. Similar to *Praeaulacus*, but crossvein 2r-rs longer than width of cell 2rm; base of gaster broadly rounded. *Jur.*, USSR (Kazakh).

Praeaulacites RASNITSYN, 1972, p. 83 [**P. pachygaster*; OD]. Similar to *Praeaulicops*, but crossvein 3r-m slightly oblique. *Jur.*, USSR (Kazakh).

Praeaulacon RASNITSYN, 1972, p. 79 [**P. elongatum*; OD]. Similar to *Praeaulacus*, but base of gaster broadly rounded, nearly sessile. *Jur.*, USSR (Kazakh).

Praeaulicops RASNITSYN, 1972, p. 83 [**P. lucidus*; OD]. Fore wing with basal section of RS separated from pterostigma by a distance less than its length; crossvein 3r-m strongly slanted. *Jur.*, USSR (Kazakh).

Family CRETEVANIIDAE

Rasnitsyn, 1975

[Cretevaniidae RASNITSYN, 1975, p. 83]

Similar to Aulacidae and Evaniidae. Fore wing with costal area relatively broad; basal section of vein RS remote from pterostigma, very short and perpendicular to R; cell 3r very narrow. Hind wing very short, about half as long as fore wing. Antennae with 12 segments; hind tibiae thickened. *Cret.*

Cretevania RASNITSYN, 1975, p. 84 [**C. minor*; OD]. Head without sculpturing; mandibles with 4 teeth; maxillary palpi apparently with 5 segments; labial palpi with 3 segments. *Cret.*, USSR (Asian RSFSR).

Family ANOMOPTERELLIDAE

Rasnitsyn, 1975

[Anomopterellidae RASNITSYN, 1975, p. 88]

Fore wing with costal area broad; basal section of vein RS directed toward base of wing; crossvein 2r-rs situated at apex of pterostigma; crossvein 2r-m present; cells 1mcu and 2mcu narrow. Antennae with at least 15 segments. *Jur.*

Anomopterella RASNITSYN, 1975, p. 90 [**A. mirabilis*; OD]. Fore wing with basal section of RS very close to pterostigma; cell 3r very broad; gaster widest beyond its middle; ovipositor short. *Jur.*, USSR (Kazakh). — FIG. 256, 6. **A. mirabilis*; wing and body, $\times 9$ (Rasnitsyn, 1975).

Family EVANIIDAE Leach, 1815

[Evaniidae LEACH, 1815, p. 142]

Fore wing with pterostigma present, commonly small; costal space open and wide; crossveins 2r-m, 3r-m, and 1m-cu commonly present; crossvein 2m-cu absent; venation greatly reduced in some species. Antennae with 13 or 14 segments; gaster short, oval, with long petiole, arising abruptly just pos-

terior to scutellum. Larvae parasitic on eggs of Blattaria. *Oligo.*—*Holo.*

Evania FABRICIUS, 1775, p. 345. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo.*

Family AULACIDAE Shuckard, 1841

[Aulacidae SHUCKARD, 1841, p. 115] [=Gasteruptionidae ASHMEAD, 1901, p. 7; Kotujellidae RASNITSYN, 1975, p. 87; Baissidae RASNITSYN, 1975, p. 90]

Gaster attached very high on propodeum; first and second segments of gaster partially or completely fused; male with 13 antennal segments, female with 14. Venation of fore wing very diverse, relatively complete in some genera, apically reduced in others. Larvae mostly parasitic on wood-boring Coleoptera or bees and wasps nesting in wood. TOWNES, 1950; RASNITSYN, 1980b. *Cret.*—*Holo.*

Aulacus JURINE, 1807, p. 89. *Holo.*

Aulacostethus PHILIPPI, 1873, p. 302 [=Aulacites COCKERELL, 1916c, p. 102 (type, *A. secundus*)]. BRUES, 1910, 1923a, 1933. *Oligo.*, Europe (Baltic), USA (Colorado)—*Holo.*

Baissa RASNITSYN, 1975, p. 91 [**B. anomala*; OD]. Fore wing with cell 1mcu small and narrow; cell 2cua with a small distal projection. RASNITSYN, 1980b. *Cret.*, USSR (Asian RSFSR).

Electrofoenus COCKERELL, 1917g, p. 364 [**E. gracilipes*; OD]. Similar to *Gasteruption* (recent). Fore wing with basal section of RS very long, directed toward wing base; cell 3r large, its face on cell 2rm about equal in length to crossvein 2r-rs. Head large and broad, with prominent eyes; legs very long and slender. *Mio.*, Burma. —FIG. 256, 1. **E. gracilipes*; fore wing, $\times 10$ (Cockerell, 1917g).

Hyptiogastrites COCKERELL, 1917c, p. 19 [**H. electrinus*; OD]. Similar to *Hyptiogaster* (recent), but crossvein 2r-rs in fore wing perpendicular to front margin of wing. Antennae long, filiform; hind tibiae thickened. *Mio.*, Burma.

Kotujella RASNITSYN, 1975, p. 87 [**K. crucis*; OD]. Fore wing with pterostigma triangular; apex of cell 3r pointed; crossvein 3r-m absent; cell 2rm long. RASNITSYN, 1980b. *Cret.*, USSR (Asian RSFSR).

Protofoenus COCKERELL, 1917c, p. 19 [**P. swinhonis*; OD]. Similar to *Gasteruption* (recent). Gaster of female thick and short, with a long, slender ovipositor, directed obliquely upward. Fore wing with pterostigma shallow; cell 1r+2rm very broad. *Mio.*, Burma.

Vectevania COCKERELL, 1922b, p. 33 [**V. vetula*; OD]. Similar to *Protofoenus*, but cell 1r+2rm of fore wing narrow; pterostigma broadly triangular. BRUES, 1933. *Oligo.*, England.

Family PRAEICHNEUMONIDAE

RASNITSYN, 1983

[Praeichneumonidae RASNITSYN, 1983d, p. 259]

Related to Ichneumonidae, but fore wing with vein RS+M present; crossveins 2r-m, 3r-m, and 2m-cu equally well developed; cells 2rm and 3rm large. *Cret.*

Praeichneumon RASNITSYN, 1983d, p. 259 [**P. townesi*; OD]. Female with head transverse, eyes moderately large; pronotum short centrally; mesonotum transverse; legs apparently short. *Cret.*, Asia (Mongolia). —FIG. 257. **P. townesi*; fore wing and body, $\times 9$ (Rasnitsyn, 1983d).

Family ICHNEUMONIDAE

Latreille, 1802

[Ichneumonidae LATREILLE, 1802b, p. 309]

Fore wing with pterostigma distinct, usually triangular; vein R marginal; costal space closed; RS+M typically absent; cell 2rm commonly very small or absent; cell 2mcu usually present. Body generally slender; antennae long, with at least 16 segments; trochanters with 2 segments; ovipositor long, often longer than body. Larvae parasitic on diverse groups of insects and a few other arthropods. *Cret.*—*Holo.*

Ichneumon LINNÉ, 1758, p. 343. BRUES, 1910; COCKERELL, 1921a; THÉOBALD, 1937a. *Oligo.*, USA (Colorado), England, Europe (France)—*Holo.*

Absyrtus HOLMGREN, 1858, p. 32. BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*

Acocenites LATREILLE, 1810, p. 300. GIEBEL, 1856; BRUES, 1906; MEUNIER, 1923b. *Oligo.*, USA (Colorado), Europe (Germany); *Mio.*, Europe (Yugoslavia)—*Holo.*

Acourtia COCKERELL, 1921a, p. 11 [**A. perplexa*; OD]. Little-known genus. Fore wing with pterostigma triangular; RS+M apparently absent; cell 2rm absent. [Family assignment doubtful.] *Oligo.*, England. —FIG. 256, 2. **A. perplexa*; fore wing, $\times 8$ (Cockerell, 1921a).

Ambyteles WESMAEL, 1845, p. 114. COCKERELL, 1927e. *Oligo.*, USA (Colorado)—*Holo.*

Anomalon PANZER, 1804, pl. 15. BRUES, 1910; COCKERELL, 1919b; THÉOBALD, 1937a. *Oligo.*, USA (Colorado), Europe (France)—*Holo.*

Astiphromma FÖRSTER, 1868, p. 170. BRUES, 1923a. *Oligo.*, Europe (Baltic)—*Holo.*

Barylypa FÖRSTER, 1868, p. 146. BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*

Campoplex GRAVENHORST, 1829, p. 453. [Generic assignment of fossil doubtful.] STATZ, 1938b. *Oligo.*, Europe (Germany)—*Holo.*

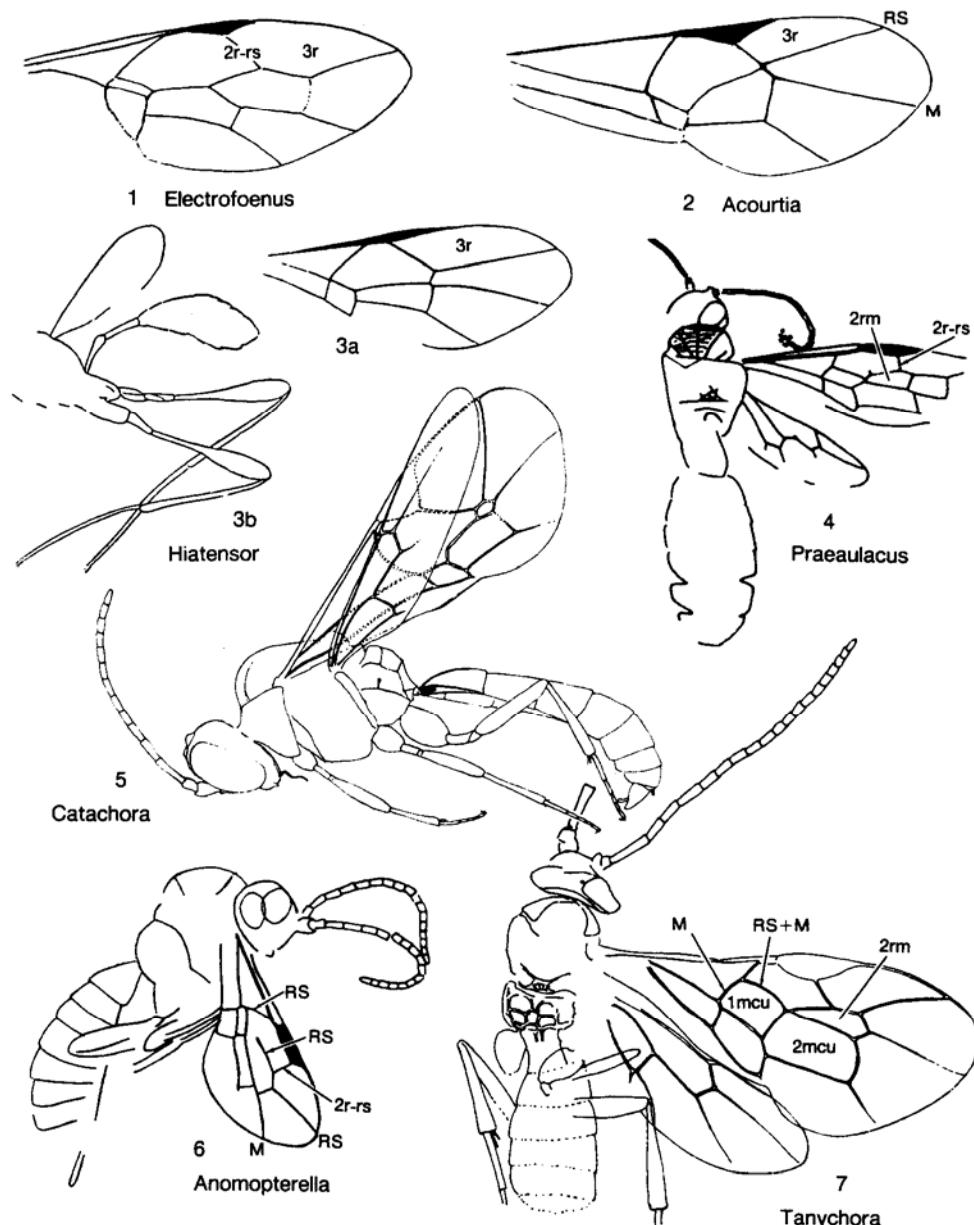


FIG. 256. Praeaulacidae, Anomopterellidae, Aulacidae, and Ichneumonidae (p. 473–477).

Catachora TOWNES, 1973b, p. 284 [**C. minor*; OD]. Related to *Grypocentrus* (recent), but cell 3r very broad. *Cret.*, USSR (Asian RSFSR). — FIG. 256, 5. **C. minor*; wings and body, $\times 28$ (Townes, 1973b).

Coleocentrus GRAVENHORST, 1829, p. 437. COCKERELL, 1921a. *Oligo.*, England—*Holo.* **Cremastus** GRAVENHORST, 1829, p. 730. [Generic assignment of fossils doubtful.] COCKERELL,

1921a; THÉOBALD, 1937a. *Oligo.*, England, Europe (France)—*Holo.*

Cubocephalus RATZEBURG, 1848, p. 121. STATZ, 1936b. *Oligo.*, Europe (Germany)—*Holo.*

Demophorus THOMSON, 1890, p. 1457. [Generic assignment of fossils uncertain.] BRUES, 1910; THÉOBALD, 1937a. *Oligo.*, USA (Colorado), Europe (France)—*Holo.*

Eopimpla COCKERELL, 1920c, p. 257 [**E. grandis*;

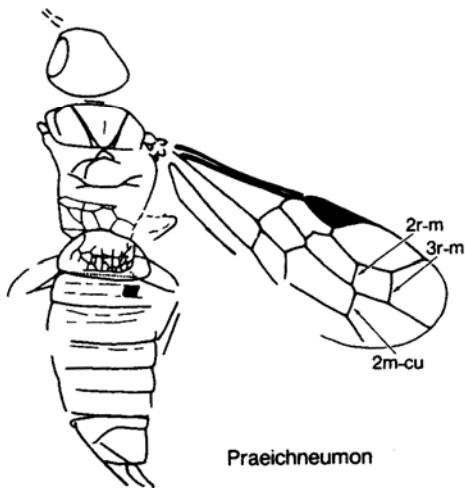


FIG. 257. Praeichneumonidae (p. 474).

OD]. Little-known genus, apparently related to *Pimpla*. Large species; fore wing with crossvein 2r-rs connected to middle of pterostigma; cells 1r+2r and 1mcu combined to form a large cell projecting distally well beyond pterostigma. *Eoc.*, USA (Colorado).
Eubaeus TOWNES, 1973b, p. 287 [**E. leiponeura*; OD]. Fore wing lacking crossvein 2m-cu; cell 2rm absent. *Cret.*, USSR (Asian RSFSR).
Exacrodus FÖRSTER, 1868, p. 210. THÉOBALD, 1937a. *Oligo.*, Europe (France)-*Holo*.
Exenterus HARTIG, 1837, p. 156. COCKERELL, 1924c. *Oligo.*, USA (Colorado)-*Holo*.
Exestastes GRAVENHORST, 1829, p. 395. BRUES, 1910; NAORA, 1933a; STAZZI, 1936b. *Oligo.*, USA (Colorado), Europe (Germany); *Pleist.*, Asia (Mongolia)-*Holo*.
Exochus GRAVENHORST, 1829, p. 328. BRUES, 1910. *Oligo.*, USA (Colorado)-*Holo*.
Glypta GRAVENHORST, 1829, p. 3. BRUES, 1910. *Oligo.*, USA (Colorado)-*Holo*.
Hellwigia GRAVENHORST, 1823, p. 318 [= *Protohellwigia* BRUES, 1910, p. 66 (type, *P. obsoleta*)]. TOWNES, 1966. *Oligo.*, USA (Colorado)-*Holo*.
Hemiteles GRAVENHORST, 1829, p. 780. BRUES, 1910; STAZZI, 1936b. *Oligo.*, USA (Colorado), Europe (Germany)-*Holo*.
Hiatensor BRUES, 1910, p. 73 [**H. semirutus*; JD]. Apparently related to *Campoplex* (recent). Fore wing with pterostigma elongate, nearly linear; cell 3r long. Hind legs elongate, tip of femora extending beyond end of abdomen. TOWNES, 1966. *Oligo.*, USA (Colorado). — FIG. 256, 3. **H. semirutus*; a, fore wing, $\times 10$; b, hind leg and abdomen, $\times 5$ (Brues, 1910).
Holomeristus FÖRSTER, 1868, p. 171. COCKERELL, 1921a. *Oligo.*, England-*Holo*.

- Horogenes* FÖRSTER, 1868, p. 152. STAZZI, 1936b. *Oligo.*, Europe (Germany)-*Holo*.
Hypsicera LATREILLE, 1829, p. 288. COCKERELL, 1921a. *Oligo.*, England-*Holo*.
Itoplectis FÖRSTER, 1868, p. 164. COCKERELL, 1921a. *Oligo.*, England-*Holo*.
Labryrchus FÖRSTER, 1868, p. 146. BRUES, 1910. *Oligo.*, USA (Colorado)-*Holo*.
Lampronota CURTIS, 1832, p. 407. BRUES, 1910; COCKERELL, 1921a. *Oligo.*, USA (Colorado)-*Holo*.
Lapton NEES, 1815, p. 46. BRUES, 1910. *Oligo.*, USA (Colorado)-*Holo*.
Lithotorus SCUDDER, 1890, p. 609 [**L. cressoni*; OD]. Little-known genus, possibly within the subfamily Diplazontinae. [Family assignment doubtful.] TOWNES, 1966. *Eoc.*, USA (Wyoming).
Megatryphon COCKERELL, 1924c, p. 9 [**M. mortiferus*; OD]. Little-known genus, apparently similar to *Tryphon*. Fore wing with pterostigma very long, narrowly lanceolate; cell 2rm very small, triangular. Metathorax truncate posteriorly, but dorsal surface straight in lateral view. *Oligo.*, USA (Colorado).
Melanichneumon THOMSON, 1893, p. 1954. [Generic assignment of fossil doubtful.] BRUES, 1910. *Oligo.*, USA (Colorado)-*Holo*.
Mesochorus GRAVENHORST, 1829, p. 960. BRUES, 1910. *Oligo.*, USA (Colorado)-*Holo*.
Mesoleptus GRAVENHORST, 1829, p. 3. BRUES, 1910. *Oligo.*, USA (Colorado)-*Holo*.
Mesopimpla COCKERELL, 1919b, p. 376 [**M. sequoiarum*; OD]. Little-known genus, apparently related to *Theronia* (recent). Fore wing with basal section of M slightly curved, joined to very base of pterostigma; pterostigma narrow, elongate. Hind femora very stout. *Oligo.*, USA (Colorado).
Mesostenus GRAVENHORST, 1829, p. 750. BRUES, 1906. *Oligo.*, USA (Colorado)-*Holo*.
Nemeritis HOLMGREN, 1858, p. 105. THÉOBALD, 1937a. *Oligo.*, Europe (France)-*Holo*.
Netelia GRAY, 1860, p. 341. BRUES, 1910. *Oligo.*, USA (Colorado)-*Holo*.
Olesicampe FÖRSTER, 1868, p. 153. BRUES, 1910. *Oligo.*, USA (Colorado)-*Holo*.
Opion FABRICIUS, 1798, p. 210. PONGRÁCZ, 1928; THÉOBALD, 1937a. *Oligo.*, Europe (France); *Mio.*, Europe (Yugoslavia)-*Holo*.
Orthocentrus GRAVENHORST, 1829, p. 358. BRUES, 1906, 1910. *Oligo.*, USA (Colorado)-*Holo*.
Orthopelma TASCHENBERG, 1865, p. 137. STAZZI, 1936b. *Oligo.*, Europe (Germany)-*Holo*.
Parapimpla THÉOBALD, 1937a, p. 191 [**P. rheanna*; OD]. Little-known genus. Similar to *Apechthis* (recent), but crossvein 1m-cu close to posterior margin of wing. *Oligo.*, Europe (France).
Phaenolobus FÖRSTER, 1868, p. 168. PITON, 1940a. *Eoc.*, Europe (France)-*Holo*.
Phygadeuon GRAVENHORST, 1829, p. 635.

- COCKERELL, 1920c; STATZ, 1936b. *Eoc.*, USA (Colorado); *Oligo.*, Europe (Germany)—*Holo.*
- Pimpla** FABRICIUS, 1804, p. 112. BRUES, 1906, 1910; COCKERELL, 1919c; HENRIKSEN, 1922b; STATZ, 1936b; THÉOBALD, 1937a. *Eoc.*, USA (Colorado), Europe (Denmark); *Oligo.*, USA (Colorado)—*Holo.*
- Plectiscidea** VIERECK, 1914, p. 118. *Eoc.*, USA (Colorado)—*Holo.*
- Polysphincta** GRAVENHORST, 1829, p. 112. BRUES, 1910; COCKERELL, 1921a; STATZ, 1936b. *Oligo.*, USA (Colorado), England—*Holo.*
- Porizon** FALLÉN, 1813, p. 18. BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*
- Promethes** FÖRSTER, 1868, p. 162. THÉOBALD, 1937a. *Oligo.*, Europe (France)—*Holo.*
- Protarchus** FÖRSTER, 1868, p. 201. STATZ, 1936b. *Oligo.*, Europe (Germany)—*Holo.*
- Rhyssa** GRAVENHORST, 1829, p. 260. BRUES, 1906. *Oligo.*, USA (Colorado)—*Holo.*
- Scambus** HARTIG, 1838, p. 267. BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*
- Spudaeus** GISTEL, 1848, p. 11. BRUES, 1910; COCKERELL, 1941. *Oligo.*, USA (Colorado)—*Holo.*
- Stenomacrus** FÖRSTER, 1868, p. 160. BRUES, 1910; STATZ, 1936b. *Oligo.*, Europe (Baltic), USA (Colorado)—*Holo.*
- Stilpnus** GRAVENHORST, 1829, p. 664. COCKERELL, 1921a. *Oligo.*, England—*Holo.*
- Tanychora** TOWNES, 1973a, p. 216 [**T. petiolata*; OD]. Fore wing with RS+M present, separating cells 1r+2r from 1mcu; cell 2rm relatively large. *Cret.*, USSR (Asian RSFSR), Asia (Mongolia). —FIG. 256,7. **T. petiolata*; wings and body, $\times 11$ (Townes, 1973a).
- Tanychorella** RASNITSYN, 1975, p. 91 [**T. parvula*; OD]. Similar to *Tanychora*, but cell 2rm of fore wing shorter. *Cret.*, USSR (Asian RSFSR).
- Theronia** HOLMGREN, 1859, p. 123. [Generic assignment of fossil doubtful.] BRUES, 1910; COCKERELL, 1919b. *Oligo.*, USA (Colorado)—*Holo.*
- Tilgidopsis** COCKERELL, 1921e, p. 37 [**T. haestans*; OD]. Little-known genus. Fore wing with pterostigma lanceolate, narrow; cell 3r pointed posteriorly; crossvein 2r-rs slightly sigmoidal. *Eoc.*, USA (Colorado).
- Trachysphyrus** HALIDAY, 1836, p. 317. BRUES, 1910; MEUNIER, 1920a; STATZ, 1936b, 1938b. *Oligo.*, Europe (Baltic), USA (Colorado)—*Holo.*
- Trogus** PANZER, 1806, p. 80. BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*
- Tryphon** FALLÉN, 1813, p. 16. BRUES, 1910; GRISSELL, 1976. *Eoc.*, USA (Colorado); *Oligo.*, USA (Colorado)—*Holo.*
- Urotryphon** TOWNES, 1973b, p. 286 [**U. pusillus*; OD]. Related to *Idiogramma* (recent), but propodeum nearly completely areate. *Cret.*, USSR (Asian RSFSR).
- Xorides** LATREILLE, 1809, p. 4. BRUES, 1910; HANDLIRCH, 1910b. *Eoc.*, Canada (British Columbia); *Oligo.*, USA (Colorado)—*Holo.*

Family ICHNEUMONOMIMIDAE Rasnitsyn, 1975

[Ichneumonomimidae RASNITSYN, 1975, p. 92]

Fore wing with costal space broad; vein R+M weak; crossveins 2r-m and 3r-m present; cell 2rm longer than 3rm; cell 3rm short and high. *Cret.*.

Ichneumonomima RASNITSYN, 1975, p. 92 [**I. paradoxa*; OD]. Fore wing with crossvein 2r-rs short; cell 3rm higher than its width. Antennae apparently with 13 to 14 segments. SCHMIDT, 1963. *Cret.*, USSR (Asian RSFSR). —FIG. 258,2. **I. paradoxa*; wings and body, $\times 4.3$ (Rasnitsyn, 1975).

Family BRACONIDAE Latreille, 1829

[Braconidae LATREILLE, 1829, p. 289]

Adults small. Fore wing with costal area obsolescent or closed; basal sections of vein RS and RS+M usually present; crossveins 2m-cu and sometimes 1m-cu absent; veins in distal part of wing often obsolescent. Body stout; antennae usually long. Larvae parasitic on diverse types of insects. *Cret.*—*Holo.*

Bracon FABRICIUS, 1805, p. 102. [Generic assignment of fossils doubtful.] HEYDEN, 1858; FÖRSTER, 1891; BRUES, 1910; MEUNIER, 1915b; COCKERELL, 1919b. *Oligo.*, USA (Colorado), Europe (Germany)—*Holo.*

Agathis LATREILLE, 1804, p. 173. BRUES, 1910; COCKERELL, 1927b. *Oligo.*, Europe (Baltic), USA (Colorado)—*Holo.*

Alysia LATREILLE, 1804, p. 173. BRUES, 1910; THÉOBALD, 1937a; STATZ, 1938b. *Oligo.*, Europe (Germany, France), USA (Colorado)—*Holo.*

Anacanthobracon BRUES, 1939b, p. 251 [**A. femorator*; OD]. Apparently related to *Doryctes*. Male with hind legs greatly thickened; coxae large; tibiae stout and thickened distally; gastral tergites forming a dorsal shield. *Oligo.*, USA (Colorado).

Apanteles FÖRSTER, 1862, p. 245. STATZ, 1938b. *Oligo.*, Europe (Germany)—*Holo.*

Aphidius NEES, 1818, p. 302. BRUES, 1933; PÉREZ, 1940. *Oligo.*, Europe (Baltic, France)—*Holo.*

Ascogaster WESMAEL, 1835, p. 226. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo.*

Aspicolpus WESMAEL, 1838, p. 155. BRUES, 1933; STATZ, 1936b. *Oligo.*, Europe (Baltic, Germany)—*Holo.*

Aspilota FÖRSTER, 1862, p. 268. STATZ, 1938b. *Oligo.*, Europe (Germany)—*Holo.*

Astrohelcon TURNER, 1918, p. 166. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo.*

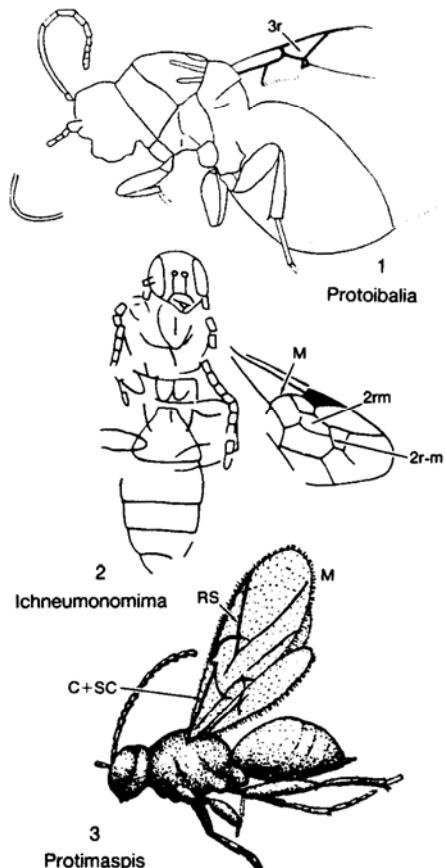


FIG. 258. Ichneumonomimidae, Cynipidae, Iabidae (p. 477-482).

Blacus NEES, 1818, p. 306 [= *Electroblacus* BRUES, 1933, p. 85 (type, *E. facialis*)]. BRUES, 1923a, 1939b; ACHTERBERG, 1982. *Oligo.*, Europe (Baltic)-Holo.

Calyptoides COCKERELL, 1921a, p. 13 [**C. veterinus*; OD]. Little-known genus, apparently related to *Eubazus*. Fore wing with pterostigma large and triangular; gaster slender basally. *Oligo.*, England.

Cantharoctonus VIERECK, 1912, p. 617. BRUES, 1933; STATZ, 1936b. *Oligo.*, Europe (Baltic, Germany)-Holo.

Chelonohelcon BRUES, 1933, p. 61 [**C. mirabundus*; OD]. Fore wing with RS terminating on costa before wing apex; crossvein 2r-rs situated slightly distal of middle of pterostigma; basal section of RS less than half as long as basal section of M. Eyes large, extending nearly to base of mandibles; mandibles long, curved, and bidentate; antennae with 21 segments, as long as body; basal segment of flagellum enlarged; gaster narrow, elongate; tergites fused to form carapace;

fore and hind femora stout. *Oligo.*, Europe (Baltic).—FIG. 259.6. **C. mirabundus*; wings and body, $\times 6.5$ (Brues, 1933).

Chelonus PANZER, 1806, p. 99. BRUES, 1910. *Oligo.*, USA (Colorado)-Holo.

Clinocentrus HALIDAY, 1833, p. 266. BRUES, 1933; STATZ, 1938b. *Oligo.*, Europe (Baltic, Germany)-Holo.

Coeloreuteus ROMAN, 1910, p. 112. BRUES, 1933. *Oligo.*, Europe (Baltic)-Holo.

Colastes HALIDAY, 1833, p. 266. BRUES, 1910. *Oligo.*, USA (Colorado)-Holo.

Cremnops FÖRSTER, 1862, p. 246. COCKERELL, 1919b; BRUES, 1933. *Oligo.*, USA (Colorado)-Holo.

Dacnusites COCKERELL, 1921a, p. 19 [**D. sepultus*; OD]. Similar to *Polemon* (recent), but RS of fore wing bent posteriorly just beyond its contact with crossvein 2r-rs; cells 2rm and 3rm absent. *Oligo.*, England.—FIG. 260.1. **D. sepultus*; fore wing, $\times 17$ (Cockerell, 1921a).

Diaeretus FÖRSTER, 1862, p. 249. PÉREZ, 1940. *Oligo.*, Europe (France)-Holo.

Digastrotheca BRUES, 1933, p. 39 [**D. mirabilis*; OD]. Related to the Rhogadiniinae (recent), but basal abdominal tergites fused into long plates, forming carapace over abdomen; basal plate with 2 pairs of longitudinal ridges, second pair widely separated. *Oligo.*, Europe (Baltic).—FIG. 260.6. **D. mirabilis*; body, $\times 9$ (Brues, 1933).

Diodontogaster BRUES, 1933, p. 59 [**D. bidentata*; OD]. Related to *Chelonus*. Fore wing with cell 3r acute apically; cells 1r+2r and 1mcu present. Head large; eyes bare, oval; antennae with about 30 segments; abdomen elongate, with apex rounded above but ventrally projecting posteriorly to form a pair of prolongations. *Oligo.*, Europe (Baltic).—FIG. 259.4. **D. bidentata*; wings and body, $\times 6$ (Brues, 1933).

Diospilites BRUES, 1933, p. 81 [**D. brevicornis*; OD]. Related to *Diospilus*. Small species, with stout body. Fore wing with pterostigma broad, triangular; crossvein 2r-rs at middle of pterostigma; RS terminating almost at wing apex. Antennae less than half length of body, with 11 segments; propodeum rugose; gaster short and broad, smooth above. *Oligo.*, Europe (Baltic).—FIG. 259.5. **D. brevicornis*; wings and body, $\times 15$ (Brues, 1933).

Diospiloidea COCKERELL, 1921a, p. 14 [**D. hooleyi*; OD]. Little-known genus, apparently related to *Diospilus*. Fore wing with pterostigma of moderate size, its posterior border smoothly curved; crossvein 2r-rs slightly distal of middle of pterostigma; basal section of M distinctly curved. *Oligo.*, England.

Diospilus HALIDAY, 1833, p. 262. BRUES, 1910; COCKERELL, 1921a; CARPENTER & others, 1937; MASON, 1976. *Cret.*, Canada (Manitoba); *Oligo.*, USA (Colorado), England-Holo.

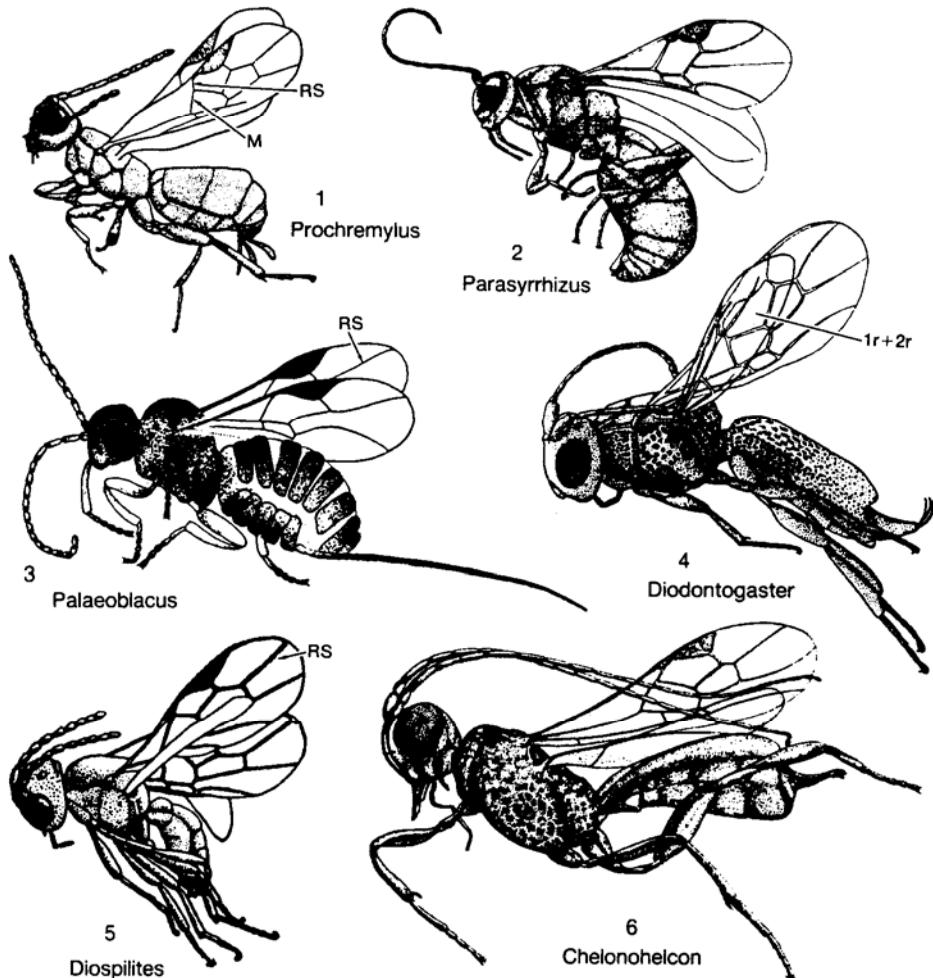


FIG. 259. Braconidae (p. 477–482).

Doryctes HALIDAY, 1836, p. 45. BRUES, 1933; STATTZ, 1938b. *Oligo.*, Europe (Baltic, Germany)—*Holo.*

Doryctomorpha ASHMEAD, 1901, p. 144. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo.*

Ecphylus FÖRSTER, 1862, p. 237. MUESEBECK, 1960. ?*Mio.*, Mexico (Chiapas)—*Holo.*

Elasmosomites BRUES, 1933, p. 97 [**E. primordialis*; OD]. Related to *Elasmosoma* (recent). Female: antennae with 14 segments, as long as head and thorax; flagellum tapering, its first segment as long as scape; maxillary palpus with 4 segments; propodeum abruptly truncate, its posterior face nearly vertical; legs very stout; ovipositor short. *Oligo.*, Europe (Baltic).

Electrohelcon BRUES, 1933, p. 62 [**E. grandis*; OD]. Similar to *Chelonobelcon*, but gastral tergites separated and articulated. *Oligo.*, Europe (Baltic).

Eobracon COCKERELL, 1920c, p. 258 [**E. cladurus*; OD]. Fore wing as in *Diospilus*, but gaster as in *Chelonus*; wing base sessile but narrow, apex enlarged. *Eoc.*, USA (Colorado).

Eobraconus RASNITSYN, 1985, p. 163, nom. subst. pro *Eobracon* RASNITSYN, 1983d, p. 263, non COCKERELL, 1920c [**Eobracon inopinatus* RASNITSYN, 1983d; OD]. Fore wing with R extending only a short distance beyond pterostigma and without a distinct break at base of pterostigma; basal section of RS only slightly shorter than basal section of M; M and CU almost reaching wing margin; crossvein 1m-cu reduced apically; cell 3rm closed. Antennae with about 16 segments. *Cret.*, Mongolia.

Eocardiochiles BRUES, 1933, p. 92 [**E. fritschii*; OD]. Similar to *Cardiochiles* (recent), but antennae with only 18 segments, first 12 flagellar seg-

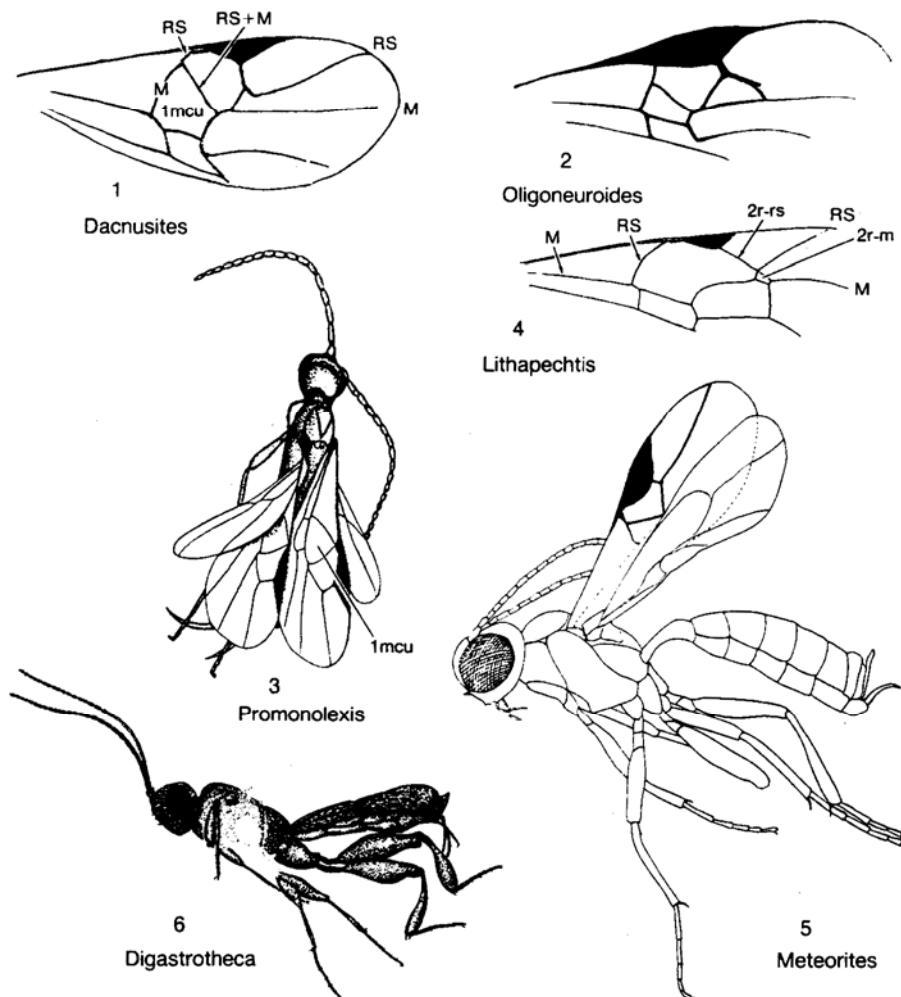


FIG. 260. Braconidae (p. 478-481).

ments at least twice as long as thick; cell 2rm very short. *Oligo.*, Europe (Baltic).

Ephedrus HALIDAY, 1833, p. 261. BRUES, 1933; TIMON-DAVID, 1944b. *Oligo.*, Europe (Baltic, France)-*Holo.*

Eubazus NEES, 1814, p. 214. BRUES, 1910, 1923a; BURKS, 1979; ACHTERBERG, 1982. *Oligo.*, Europe (Baltic), USA (Colorado)-*Holo.*

Eumacrocentrus ASHMEAD, 1901, p. 120. BRUES, 1933. *Oligo.*, Europe (Baltic)-*Holo.*

Euphorus NEES, 1834, p. 360. BRUES, 1910. *Oligo.*, USA (Colorado)-*Holo.*

Hecabolus HALIDAY, 1834, p. 127. STATZ, 1936b. *Oligo.*, Europe (France)-*Holo.*

Helcon NEES, 1814, p. 216. BRUES, 1933. *Oligo.*, Europe (Baltic)-*Holo.*

Holocnodus PÉREZ, 1940, p. 50 [**H. braconiformis*; OD]. Fore wing with RS extending to wing apex. Antennae with 13 or 14 segments, all almost equal in length and thickness. *Oligo.*, Europe (France).

Hormiellus ENDERLEIN, 1912, p. 20. BRUES, 1933. *Oligo.*, Europe (Baltic)-*Holo.*

Hormiopterus GIRAUD, 1869, p. 478. BRUES, 1910, 1933. *Eoc.*, USA (Colorado)-*Holo.*

Ichneutes NEES, 1816, p. 275. BRUES, 1933. *Oligo.*, Europe (Baltic)-*Holo.*

Iphiaulax FÖRSTER, 1862, p. 234. BRUES, 1910;

- COCKERELL, 1919b, 1921a. *Oligo.*, USA (Colorado); England—*Holo*.
- Lithapechitis** COCKERELL, 1921a, p. 6 [**L. fumosus*; OD]. Little-known genus, apparently related to *Apechitis* (recent). Fore wing with basal section of M nearly straight; crossvein 2r-rs straight; crossvein 2r-m very short. *Oligo.*, England. — FIG. 260,4. **L. fumosus*; fore wing, X6 (Cockerell, 1921a).
- Meteorites** BRUES, 1939b, p. 258 [**M. inopinata*; OD]. Similar to *Meteorus*, but fore wing lacking crossveins 2r-m and 3r-m. *Oligo.*, Europe (Baltic). — FIG. 260,5. **M. inopinata*; wings and body, X20 (Brues, 1939b).
- Meteorus** HALIDAY, 1835, p. 24. [Generic assignment of fossils doubtful.] BRUES, 1933; STAZZI, 1936b. *Oligo.*, Europe (Baltic, Germany)—*Holo*.
- Microctonus** WESMAEL, 1835, p. 54. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo*.
- Microgaster** LATREILLE, 1804, p. 175. BRUES, 1906, 1910. *Oligo.*, USA (Colorado)—*Holo*.
- Microplitis** FÖRSTER, 1862, p. 245. BRUES, 1910; TIMON-DAVID, 1944b. *Oligo.*, USA (Colorado), Europe (France)—*Holo*.
- Microtypus** RATZEBURG, 1848, p. 47. BRUES, 1933, 1939b. *Oligo.*, Europe (Baltic)—*Holo*.
- Miracoides** BRUES, 1933, p. 98 [**M. proteus*; OD]. Fore wing: cell 1rm slightly longer than cell 1cu; RS obsolescent beyond pterostigma and diverging posteriorly. Antennae with 16 or 17 segments, shorter than body; 6 basal segments of flagellum long; head large, twice as broad as thick; legs slender. *Oligo.*, Europe (Baltic).
- Neoblaucus** ASHMEAD, 1901, p. 122. BRUES, 1933; CARPENTER & others, 1937; ACHTERBERG, 1982. *Cret.*, Canada (Manitoba); *Oligo.*, Europe (Baltic)—*Holo*.
- Oligoaphidius** PÉREZ, 1940, p. 52 [**O. sannoniensis*; OD]. Little-known genus. Fore wing with RS almost reaching wing margin. Funicula of antennae with 9 thick segments. *Oligo.*, Europe (France).
- Oligoneuroides** BRUES, 1910, p. 103 [**O. destructus*; OD]. Similar to *Oligoneurus* (recent), but cell 2rm nearly triangular, its posterior side about as long as RS + M. Antennae with about 25 segments. *Oligo.*, USA (Colorado). — FIG. 260,2. **O. destructus*; fore wing, X17 (Brues, 1910).
- Onychoura** BRUES, 1933, p. 105 [**O. petiolata*; OD]. Fore wing with pterostigma triangular. Eyes large, extending to base of mandibles; antennae short, with oval segments; gaster petiolate, swollen; ovipositor short, stout, terminating in very slender hook. *Oligo.*, Europe (Baltic).
- Opius** WESMAEL, 1835, p. 115. COCKERELL, 1921a. *Oligo.*, England—*Holo*.
- Orgilus** HALIDAY, 1833, p. 262. BRUES, 1939b; ACHTERBERG, 1982. *Oligo.*, Europe (Baltic)—*Holo*.
- Palaeoblacus** STAZZI, 1936b, p. 277 [**P. aculeatus*; OD]. Little-known genus. Fore wing with RS + M apparently absent; pterostigma broad; ovipositor about as long as body; antennae with 17 segments. *Oligo.*, Europe (Germany). — FIG. 259,3. **P. aculeatus*; wings and body, X18 (Stazz, 1936b).
- Palaeorhyssalus** BRUES, 1933, p. 37 [**P. dubitosis*; OD]. Probably related to the Rhodadinae. First 4 gastral segments irregularly striated, second much longer than third and separated from it by a deep furrow. *Oligo.*, Europe (Baltic).
- Parasyrrhizus** BRUES, 1933, p. 91 [**P. ludens*; OD]. Similar to *Syrrhizus* (recent) but with deep grooves on lateral parts (parapsides) of scutum. *Oligo.*, Europe (Baltic). — FIG. 259,2. **P. ludens*; wings and body, X13 (Brues, 1933).
- Pentapleura** FÖRSTER, 1862, p. 264. [Generic assignment of fossil doubtful.] STAZZI, 1938b. *Oligo.*, Europe (Germany)—*Holo*.
- Phanerotoma** WESMAEL, 1838, p. 165. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo*.
- Phanomeris** FÖRSTER, 1862, p. 235. [Generic assignment of fossil doubtful.] COCKERELL, 1921a. *Oligo.*, USA (Colorado), England—*Holo*.
- Polystenus** FÖRSTER, 1862, p. 237. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo*.
- Praon** HALIDAY, 1833, p. 261. PÉREZ, 1940. *Oligo.*, Europe (France)—*Holo*.
- Prochremylus** BRUES, 1933, p. 26 [**P. brevicornis*; OD]. Similar to *Chremylus* (recent). Fore wing with basal section of RS at least half as long as basal section of M. Antennae with 11 segments; legs stout, especially femora; ovipositor less than half length of gaster. *Oligo.*, Europe (Baltic). — FIG. 259,1. **P. brevicornis*; wings and body, X20 (Brues, 1933).
- Pronomolexis** BRUES, 1933, p. 34 [**P. klebsi*; OD]. Similar to *Monolexis* (recent), but RS arising at very base of pterostigma; cell 1mcu triangular; ovipositor thick and strongly curved. *Oligo.*, Europe (Baltic). — FIG. 260,3. **P. klebsi*; wings and body, X20 (Brues, 1933).
- Propraon** BRUES, 1933, p. 108 [**P. cellularis*; OD]. Fore wing: venation as in *Praon*. Antennae longer than body; eyes small; legs slender, hind coxae long; gaster lanceolate. *Oligo.*, Europe (Baltic).
- Protephedrus** PÉREZ, 1940, p. 55 [**P. tertarius*; OD]. Fore wing as in *Ephedrus*, but RS obsolescent, not reaching wing apex. Antennal segments thick; 13 funicular segments. *Oligo.*, Europe (France).
- Pygostolus** HALIDAY, 1833, p. 263. BRUES, 1933; CARPENTER & others, 1937. *Cret.*, Canada (Manitoba); *Oligo.*, Europe (Baltic)—*Holo*.
- Rhaconotus** RUTHE, 1854, p. 349. [Generic assignment of fossil doubtful.] SCUDER, 1890; BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo*.
- Rhysipolis** DALLA TORRE, 1898, p. 4. THÉOBALD, 1937a. *Oligo.*, Europe (France)—*Holo*.

- Rhysipolis** FÖRSTER, 1862, p. 235. THÉOBALD, 1937a. *Oligo.*, Europe (France)—*Holo.*
- Rhyssalus** HALIDAY, 1833, p. 266. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo.*
- Rogas** NEES, 1818, p. 306. BRUES, 1906, 1910, 1933; STATZ, 1938b. *Oligo.*, Europe (Baltic, Germany), USA (Colorado)—*Holo.*
- Semirhytus** SZÉPLIGETI, 1902, p. 55. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo.*
- Sigalpus** LATREILLE, 1802, p. 327. [Generic assignment of fossil doubtful.] COCKERELL, 1921a. *Oligo.*, England—*Holo.*
- Sinobracon** HONG, 1974, p. 135 [*S. speciosus*; OD]. Fore wing as in *Dacnusites*, but cell $1m_{cu}$ much larger, and vein M ending well beyond wing apex. Antennae of female with 12 segments. *Eoc.*, China (Liaoning).
- Snellenius** WESTWOOD, 1882, p. 19. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo.*
- Spathius** NEES, 1818, p. 301. STATZ, 1938b. *Oligo.*, Europe (Germany)—*Holo.*
- Tanycarpa** FÖRSTER, 1862, p. 265. STATZ, 1936b. *Oligo.*, Europe (Germany)—*Holo.*
- Taphaeus** WESMAEL, 1835, p. 189. BRUES, 1906. *Oligo.*, Europe (Baltic)—*Holo.*
- Triaspis** HALIDAY, 1835, p. 124. COCKERELL, 1921a; BRUES, 1933, 1939b. *Oligo.*, Europe (Baltic), England—*Holo.*
- Trioxys** HALIDAY, 1833, p. 261. PÉREZ, 1940. *Oligo.*, Europe (France)—*Holo.*
- Urosigalpus** ASHMEAD, 1889, p. 637. BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*
- Xenarcha** FÖRSTER, 1862, p. 235. [Generic assignment of fossil doubtful.] COCKERELL, 1921a. *Oligo.*, England—*Holo.*

Family CYNIPIDAE Leach, 1815

[Cynipidae LEACH, 1815, p. 142]

Fore wing (sometimes absent): pterostigma and basal part of costa absent; venation much reduced, but cell $2r+3r$ usually present and closed. Antennae filiform, with from 13 to 19 segments; second gastral tergite usually at least half as long as entire gaster. Larvae mainly gall makers; a few parasitic on other Hymenoptera and Diptera. *Cret.*—*Holo.*

- Cynips** LINNÉ, 1758, p. 553. *Holo.*
- Andricus** HARTIG, 1840, p. 185. COCKERELL, 1921a. *Oligo.*, England—*Holo.*
- Aulacidea** ASHMEAD, 1897, p. 68. KINSEY, 1919. *Oligo.*, Europe (Baltic), USA (Colorado)—*Holo.*
- Diplolepis** GEOFFROY, 1762, p. 308. COCKERELL, 1921a. *Oligo.*, England—*Holo.*
- Protimaspis** KINSEY, 1937, p. 22 [*P. costalis*; OD]. Similar to *Timaspis* (recent) and *Aulacidea* (recent), but abdomen more lenticulate in profile

and its second segment larger; R and SC fused and submarginal, lacking a terminal process leading to C; costal margin much thickened near termination of RS; distal part of RS very straight. *Cret.*, Canada (Manitoba). — FIG. 258,3. **P. costalis*; wings and body, $\times 22$ (Carpenter & others, 1937).

Family FIGITIDAE Förster, 1869

[Figitidae FÖRSTER, 1869, p. 329]

Similar to Cynipidae, but second gastral tergite less than half as long as gaster. Larvae parasitic on certain Diptera and Neuroptera. *Oligo.*—*Holo.*

- Figitis** LATREILLE, 1802, p. 307. BRUES, 1910; STATZ, 1938b. *Oligo.*, USA (Colorado), Europe (Germany)—*Holo.*

Family IBALIIDAE Förster, 1869

[Ibaliiidae FÖRSTER, 1869, p. 329]

Similar to Cynipidae, but cell $2r+3r$ very narrow, at least 9 times as long as wide; sixth gastral tergite larger than others. *Oligo.*—*Holo.*

- Ibalia** LATREILLE, 1802, p. 306. *Holo.*

Protoibalia BRUES, 1910, p. 15 [**P. convexa*; OD]. Similar to *Ibalia* (recent), but fore wing with cell $3r$ much shorter and broader. *Oligo.*, USA (Colorado). — FIG. 258,1. **P. convexa*; wings and body, $\times 10$ (Brues, 1910).

Family AGAONTIDAE Walker, 1871

[Agaontidae WALKER, 1871, p. 58]

Adults with marked sexual dimorphism. Males usually wingless; antennae with 3 to 9 segments. Females with fore wing broadened distally; venation much reduced; submarginal vein weak and very close to wing margin, or entirely absent; pterostigma and postmarginal vein absent. Females with 11 or 12 antennal segments; front and hind legs stout; fore tibiae short, without spurs; middle tibiae with a single spur. Larvae developing in figs. *Oligo.*—*Holo.*

- Agaon** DALMAN, 1818, p. 69. *Holo.*

Tetrapus MAYR, 1885, p. 156. BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*

Family TORYMIDAE Walker, 1833

[Torymidae WALKER, 1833a, p. 115]

Minute insects. Venation of fore wing much reduced; submarginal vein weakly developed

and commonly short; stigmal vein usually small; pterostigma obsolescent or absent. Mandibles well developed, with 3 or 4 teeth; hind coxae very large, at least 5 times length of fore coxae; tarsi with 5 segments; ovipositor usually long and exserted. Larvae mostly parasitic on gall-making Diptera and Hymenoptera. *Oligo.*—*Holo.*

Torymus DALMAN, 1820, p. 135. FÖRSTER, 1891; BRUES, 1910, 1923a; GRISSELL, 1976. *Oligo.*, Europe (Baltic, France), USA (Colorado)—*Holo.*
Monodontomerus WESTWOOD, 1833, p. 443. BRUES, 1923a. *Oligo.*, Europe (Baltic)—*Holo.*
Neopalachia BOUČEK, 1978, p. 104. GRISSELL, 1980. *Oligo./Mio.*, Dominican Republic—*Holo.*
Palaeotorymus BRUES, 1910, p. 18 [**P. typicus*; OD]. Similar to *Torymus*, but costa extending nearly to apex of wing. *Oligo.*, USA (Colorado).
Zophodetus GRISSELL, 1980, p. 253 [**Z. woodruffi*; OD]. Similar to *Microdontomerus* (recent), but propodeum carinate; metanotum more than half length of propodeum. *Oligo./Mio.*, Dominican Republic.

Family CHALCIDAE Leach, 1815

[Chalcidae LEACH, 1815, p. 144]

Similar to Torymidae, but ovipositor usually short and stout; hind coxae cylindrical in cross section; hind femora much swollen, denticulate. *Oligo.*—*Holo.*

Chalcis FABRICIUS, 1789, p. 272. COCKERELL, 1907c; BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*
Eterochalcis BURKS, 1939, p. 184. *Oligo.*, USA (Colorado)—*Holo.*

Family EURYTOMIDAE Walker, 1833

[Eurytomidae WALKER, 1833a, p. 12]

Similar to Chalcidae, but hind coxae not enlarged and hind femora without teeth; thorax usually coarsely punctate. Larvae parasitic on diverse types of insects; some phytophagous, on grasses. *Oligo.*—*Holo.*

Eurytoma ILLIGER, 1807, p. 192. BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*

Family PTEROMALIDAE Haliday, 1833

[Pteromalidae HALIDAY, 1833, p. 267]

Very small insects. Fore wing as in Chalcidae, with much diversity; thorax usually not coarsely punctate; hind coxae normal, not

enlarged; hind femora without teeth; tarsi with 5 segments. Larvae parasitic on diverse types of insects. *Oligo.*—*Holo.*

Pteromalus SWEDERUS, 1795, p. 201. [Generic assignment of fossils doubtful.] BRUES, 1910; COCKERELL, 1921a; STATZ, 1938b. *Oligo.*, England, Europe (Germany), USA (Colorado)—*Holo.*

Bruesisca HEQUIST, 1961, p. 93 [**Cleonymus submersus* BRUES, 1910, p. 27; OD]. Little-known genus, resembling *Cleonymus* (recent), but head shape and venation of fore wing different. *Oligo.*, USA (Colorado).

Ferriherelus THÉOBALD, 1937a, p. 311 [**F. bernardi*; OD]. Similar to *Lamprotatus* (recent), but antennae much shorter. *Oligo.*, Europe (France).

Heydeniopsis HEQUIST, 1961, p. 94 [**H. cleonymoides*; OD]. Similar to *Heydenia* (recent). Wings unknown. Head subglobular; antennae with 12 segments, inserted near clypeus; ocelli in an equilateral triangle; propodeum long, with median carina. *Oligo.*, Europe (Baltic).

Ormyrodes BRUES, 1907, p. 46. BRUES, 1910. *Oligo.*, USA (Colorado)—*Holo.*

Family ENCYRTIDAE Förster, 1856

[Encyrtidae FÖRSTER, 1856, p. 18]

Very small insects. Fore wing with submarginal vein usually short; stigmal vein near midwing. Middle tibia modified for jumping, with enlarged spur and commonly with patch of modified setae on ventral surface; hind tibiae usually with 2 spurs, 1 often reduced. Larvae parasitic on diverse insects. *Oligo.*—*Holo.*

Encyrtus LATREILLE, 1809, p. 31. [Generic assignment of fossils doubtful.] STATZ, 1938b. *Oligo.*, Europe (Germany)—*Holo.*

Propelma TRJAPITZIN, 1963, p. 89 [**P. rohdendorfi*; OD]. Similar to *Metapelma* (recent), but hind tibiae normal, not flattened and broad. *Oligo.*, Europe (Baltic).

Family EULOPHIDAE Haliday, 1833

[Eulophidae HALIDAY, 1833, p. 268]

Fore wing with submarginal vein close to wing margin and commonly concurrent with it; stigmal vein present but often very short and situated well toward wing apex. Fore tibial spur short and straight; fore basitarsus with an oblique comb basally. Larvae parasitic on diverse types of insects. *Oligo.*—*Holo.*

Eulophus GEOFFROY, 1762, p. 312. [Generic assignment of fossils doubtful.] STATZ, 1938b. *Oligo.*, Europe (Germany)—*Holo.*

Family TRICHOGRAMMATIDAE
Förster, 1856

[Trichogrammatidae FÖRSTER, 1856, p. 20]

Minute insects. Fore wing broad and fringed with hairs; venation greatly reduced, the veins not developed beyond midwing; proximal veins forming a short marginal compound vein; stigmal vein absent. Larvae parasitic on insect eggs. *Cret.-Holo.*

Trichogramma WESTWOOD, 1833, p. 444. *Holo.*
Enneagmus YOSHIMOTO, 1975, p. 512 [**E. pristinus*; OD]. Fore wing long and narrow, as long as body and hyaline; longest cilia at distal end of wing; cilia on anterior and posterior margins gradually shorter toward base of wing. Antennae with 9 segments, funicle with 4; tarsi with 3 segments; all tibiae with a single spur; gaster short, broadly sessile. *Cret., Canada (Manitoba).*

Family MYMARIDAE Haliday, 1833

[Mymaridae HALIDAY, 1833, p. 269]

Minute insects. Fore wing usually with a long marginal fringe, venation commonly limited to basal third of wing; basal portion of wing often reduced to a single, thin vein, forming a stalk for the broader distal part. Hind wings linear, often threadlike. Larvae parasitic on eggs of insects. *Cret.-Holo.*

Mymar CURTIS, 1832, p. 411. *Holo.*
Alaptus WESTWOOD, 1839, p. 79. [Fossils are specimens of *A. globosicornis* and *A. psocidivorus*, both recent.] DOUTT, 1973b. ?*Mio.*, Mexico-Holo.
Anaphes HALIDAY, 1833, p. 269. MEUNIER, 1901b. *Oligo.*, Europe (Baltic)-*Holo.*
Archaeromma YOSHIMOTO, 1975, p. 503 [**Ooctonus minutissimus* BRUES, 1937, p. 44; OD]. Similar to *Palaeomyimar*. Fore wing not reticulate; antennal club with 4 segments in both sexes; scape short. CARPENTER & others, 1937. *Cret., Canada (Manitoba, Alberta).*
Arescon WALKER, 1846, p. 50. MEUNIER, 1901b, 1905a; DOUTT, 1973b. *Oligo.*, Europe (Baltic)-*Holo.*
Carpenteriana YOSHIMOTO, 1975, p. 510 [**C. tumida*; OD]. Female as in *Ooctonus*, but antennae with 10 segments, funicle with 7 segments; gaster elongate-oval. Pterostigma of fore wing well defined. *Cret., Canada (Manitoba).*
Galloromma SCHLÜTER, 1978a, p. 74 [**G. bezonainensis*; OD]. Little-known genus, similar to *Archaeromma*. Antennae with 14 segments, 4 terminal segments forming a club. [Probably a synonym of *Archaeromma*.] *Cret., Europe (Germany).*

Gonatocerus NEES, 1834, p. 192. MEUNIER, 1905a; DOUTT, 1973b; BURKS, 1979. *Oligo.*, Europe (Baltic)-*Holo.*

Litus HALIDAY, 1833, p. 269. MEUNIER, 1901b; DOUTT, 1973b. *Oligo.*, Europe (Baltic); *Oligo./Mio.*, Mexico (Chiapas)-*Holo.*

Macalpinia YOSHIMOTO, 1975, p. 527 [**M. canadensis*; OD]. Fore wing elongate, about 3.5 times as long as broad; stigmal vein very large, subtriangular; anterior marginal setae about half as long as posterior ones; gaster conical at base, elongate-oval in dorsal view; antennae with 13 segments, pedicel enlarged, about twice as long as broad. *Cret., Canada (Alberta).*

Malfattia MEUNIER, 1901b, p. 285 [**M. molitoriae*; OD]. Little-known genus. Tarsi with 5 segments, antennae with 9 segments. DOUTT, 1973b; YOSHIMOTO, 1975. *Oligo.*, Europe (Baltic).

Ococtonus HALIDAY, 1833, p. 269. CARPENTER & others, 1937; DOUTT, 1973b; YOSHIMOTO, 1975. *Oligo.*, Europe (Baltic)-*Holo.*

Palaeomyimar MEUNIER, 1901b, p. 289 [**Myrmaduisburgi* STEIN, 1877, p. 30; OD] [= *Myrmromma* GIRault, 1920, p. 38 (type, *M. goethei*, recent); *Petiolaria* BLOOD & KRYGER, 1922, p. 229 (type, *P. anomala*, recent); *Myramomella* GIRault, 1931, p. 4 (type, *M. mira*, recent)]. STEIN, 1877; BAKKENDORF, 1948; DOUTT, 1973b. *Oligo.*, Europe (Baltic)-*Holo.*

Polynemoidea GIRault, 1913, p. 116. DOUTT, 1973a, 1973b. ?*Mio.*, Mexico-Holo.

Protooctonus YOSHIMOTO, 1975, p. 511 [**D. masoni*; OD]. Similar to *Carpenteriana*, but antennae of female with 13 segments; gaster subpetiolate. Antennae of male with 12 segments. *Cret., Canada (Manitoba).*

Triadomerus YOSHIMOTO, 1975, p. 508 [**T. bulbosus*; OD]. Fore wing elongate-spatulate, about 3 times as long as broad. Antennae of female with 13 segments; scape not greatly elongate, unusually swollen and flattened; tarsi with 5 segments; gaster elongate-oval. *Cret., Canada (Manitoba, Alberta).*

Family TETRACAMPIDAE

Förster, 1856

[Tetracampidae FÖRSTER, 1856, p. 79]

Minute insects. Antennae with 11 or 12 segments, often clubbed; pronotum usually large, bell-shaped; anterior tibiae with a single furcate spur or with 2 small spurs. Legs slender and long. Larvae endoparasites of eggs or larvae of Coleoptera, Hymenoptera, or Diptera. *Cret.-Holo.*

Tetracampe FÖRSTER, 1841, p. 34. *Holo.*
Baeomorpha BRUES, 1937, p. 41 [**B. dubitata*; OD]. Antennae with 12 segments, scape broad

except at base; tarsi 5-segmented in female, 4-segmented in male. Fore wing broad and spatulate; submarginal and marginal veins nearly equal in length; stigmal vein large; postmarginal vein long, extending nearly to apical margin. YOSHIMOTO, 1975. *Cret.*, Canada (Manitoba, Alberta).

Bouceklytus YOSHIMOTO, 1975, p. 516 [**B. arcuodens*; OD]. Antennae with 12 segments; tarsi with 5 segments; petiole consisting of a single segment; mandibles concave, protruding downward. *Cret.*, Canada (Manitoba).

Distylopus YOSHIMOTO, 1975, p. 514 [**D. bisegmentus*; OD]. Antennae with 11 segments; scape short; tarsi with 5 segments; petiole 2-segmented, first segment very short. *Cret.*, Canada (Manitoba).

Family KARATAIDAE

Rasnitsyn, 1977

[*Karataidae* RASNITSYN, 1977a, p. 103]

Fore wing as in Ephialtitidae, but vein 2A complete or nearly complete and reaching base of wing. *Jur.*

Karataus RASNITSYN, 1977a, p. 103 [**K. pedalis*; OD]. Fore wing with basal segment of RS long, directed toward wing base; crossvein 1r-rs absent; crossvein 2r-m closer to 2m-cu than to 2r-rs; cell 2rm very long. Antennae with many segments; hind femora very thick. *Jur.*, USSR (Kazakh). —FIG. 261,1. **K. pedalis*; wings and body, $\times 5$ (Rasnitsyn, 1977a).

Family BETHYLYNOMIDAE

Rasnitsyn, 1975

[*Bethylonymidae* RASNITSYN, 1975, p. 94]

Fore wing with costal area broad; basal section of vein RS directed slightly basally; antennae filiform, with 8 to 27 segments; legs short; abdomen spindle-shaped, segments nearly alike. *Jur.*

Bethylonymus RASNITSYN, 1975, p. 94 [**B. curtipes*; OD]. Fore wing with crossvein 2m-cu present; cell 2a absent. Antennae with 11 to 13 segments; pronotum short. *Jur.*, USSR (Kazakh, Asian RSFSR). —FIG. 261,5. **B. curtipes*, Kazakh; body and base of wing, $\times 10$ (Rasnitsyn, 1975).

Arthrogaster RASNITSYN, 1975, p. 103 [**A. seticornis*; OD]. Fore wing with pterostigma broad; basal section of RS short; cell 2a absent. Antennae setaceous, with more than 25 segments; pronotum short. *Jur.*, USSR (Kazakh). —FIG. 261,6. **A. seticornis*; wing and body, $\times 5.5$ (Rasnitsyn, 1975).

Bethylonymellus RASNITSYN, 1975, p. 98 [**B. cervicalis*; OD]. Fore wing with crossveins 2r-m and 2m-cu absent or obsolescent; cell 2a absent. Antennae with 8 to 12 segments; pronotum long. *Jur.*, USSR (Kazakh). —FIG. 261,8. **B. cervicalis*; wing and body, $\times 12$ (Rasnitsyn, 1975). **Leptogastrella** RASNITSYN, 1975, p. 103 [**L. leptogastra*; OD]. Fore wing with crossveins 1r-rs and 3r-m absent; crossveins 2r-m and 2m-cu and cell 2a present. Antennae with 17 to 19 segments. *Jur.*, USSR (Kazakh).

Family CHRYSIDIDAE Latreille, 1802

[*Chrysidae* LATREILLE, 1802b, p. 316]

Antennae elbowed, with 12 or 13 segments; pronotum short and broad; hind tibial spurs and basitarsus not modified for grooming; fore wing with reduced venation; hind wing without closed cells; gaster with 2 to 4 exposed tergites and with dorsal surface convex and ventral surface concave. Larvae parasitic on immature stages of certain aculeate Hymenoptera and occasionally on Lepidoptera and Phasmatodea. *Cret.*—*Holo.*

Chrysis LINNÉ, 1761, p. 414. COCKERELL, 1907c; ROHWER, 1909c. *Oligo.*, USA (Colorado)—*Holo.*

Hypocleptes EVANS, 1973, p. 175 [**H. rasnitsyni*; OD]. Female similar to those of *Procleptes*, but lacking dentiform processes on propodeum and apical processes on front coxae; scapes short. *Cret.*, USSR (Asian RSFSR). —FIG. 261,3. **H. rasnitsyni*; body, $\times 20$ (Evans, 1973).

Omalus PANZER, 1801, no. 13. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo.*

Procleptes EVANS, 1969, p. 257 [**P. carpenteri*; OD]. Similar to *Cleptes* (recent), but mandibles broad and with 3 or 4 teeth apically; scape long and slender. *Cret.*, Canada (Manitoba). —FIG. 261,4. **P. carpenteri*; dorsal view, $\times 15$ (Evans, 1969).

Protamisega EVANS, 1973, p. 176 [**P. khatanga*; OD]. Female similar to those of *Hypocleptes*, but venation less reduced and scape longer. *Cret.*, USSR (Asian RSFSR).

Protochrysidis CARPENTER, 1986, p. 577, *nom. subst.* *pro Protochrysis* BISCHOFF, 1917, p. 139, *non* PASCHER, 1911 [**Protochrysis succinalis*; OD]. Little-known genus. Head flattened; postscutellum extending as a horizontal lamella as long as scutellum and mesonotum combined; 6 visible gastral tergites present; all legs very short; femora flattened and very broad; coxae excavated for femora. [Family assignment doubtful.] BRUES, 1933. *Oligo.*, Europe (Baltic). —FIG. 261,7. **P. succinalis* (BISCHOFF); body and wings, $\times 5.5$ (Brues, 1933).

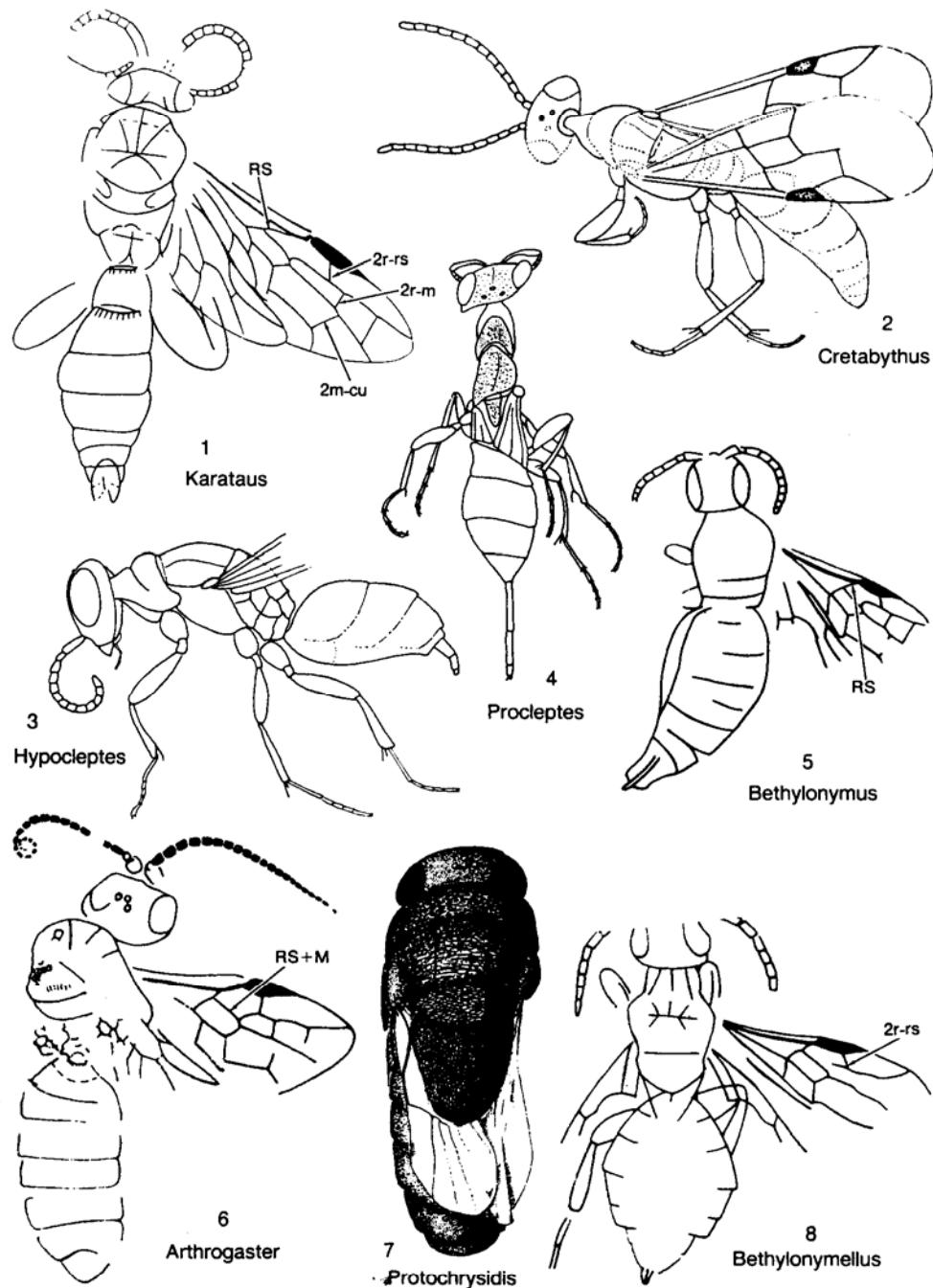


FIG. 261. Karataidae, Bethylonymidae, Chrysidae, and Scolebythidae (p. 485-487).

Family SCOLEBYTHIDAE Evans, 1963

[Scolebythidae H. E. EVANS, 1963, p. 7]

Small wasps, without marked sexual dimorphism. Labial palpi short, with 4 segments; maxillary palpi with 6 segments; antennae with 13 segments, scape flattened; hind wing without closed cells; no constriction between first and second gastral segments. *Cret.*—*Holo.*

Scolebythus H. E. EVANS, 1963, p. 9. *Holo.*

Cretabythus EVANS, 1973, p. 171 [**C. sibiricus*; OD]. Male with fore wing similar to that of pemphredomines (Sphecidae), but mandibles broad and with 4 teeth; 2 midtibial spurs present. [Family position doubtful.] *Cret.*, USSR (Asian RSFSR). — FIG. 261,2. **C. sibiricus*; wings and body, $\times 16$ (Evans, 1973).

Family BETHYLIDAE Förster, 1856

[Bethylidae FÖRSTER, 1856, p. 95]

Antennae with 11 to 13 segments; pronotum extending back to tegulae; gaster with 7 or 8 exposed segments; wings present in some species but reduced or absent in others, especially in females. Larvae parasitic on immature stages of Coleoptera and Lepidoptera. *Cret.*—*Holo.*

Bethylus LATREILLE, 1802, p. 315. *Holo.**Apenesia* WESTWOOD, 1874, p. 170. COCKERELL, 1917d. *Mio.*, Burma—*Holo.*

Archaeopyris EVANS, 1973, p. 174 [**A. minutus*; OD]. Male with antennae simple, with 13 segments; eyes large, protruding; mandibles short, broad, with apical teeth; legs not spinose. Fore wing with RS+M present only as short, basal stub. *Cret.*, USSR (Asian RSFSR). — FIG. 262,1. **A. minutus*; fore wing, $\times 35$ (Evans, 1973).

Artiepyris KIEFFER, 1913, p. 108. BRUES, 1933. *Oligo.*, Europe (Baltic)—*Holo.*

Bethylitella COCKERELL, 1917g, p. 365 [**B. cylindrella*; OD]. Fore wing as in *Mesitius* (recent); head elongate; eyes very small; mandibles large, with 5 small teeth on apical margin; antennae with 13 segments, scape stout; petiole short. *Mio.*, Burma.

Bethylopteron BRUES, 1933, p. 121 [**B. ambiguum*; OD]. Head large, globose; antennae with 13 segments; compound eyes large, ocelli very large; propodeum very short, truncate posteriorly; petiole lacking; legs stout. [Family position doubtful.] *Oligo.*, Europe (Baltic).

Calyoza WESTWOOD, 1837, p. 56. BRUES, 1923a. *Oligo.*, Europe (Baltic)—*Holo.*

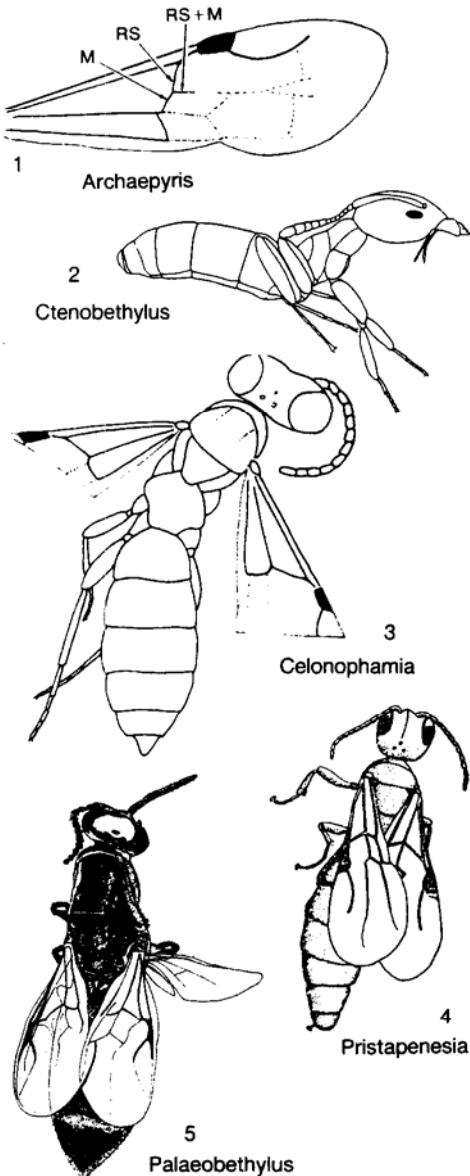


FIG. 262. Bethylidae (p. 487–488).

Celonophamia EVANS, 1973, p. 175 [**C. taimyria*; OD]. Similar to *Cephalonomia* (recent), but female having broader wings with fuller venation. *Cret.*, USSR (Asian RSFSR). — FIG. 262,3. **C. taimyria*; wings and body, $\times 25$ (Evans, 1973).

Ctenobethylus BRUES, 1939b, p. 261 [**C. succinialis*; OD]. Female apterous; thorax nearly normal. Similar to *Apenesia*, but mandibles with at

least 7 teeth. *Oligo.*, Europe (Baltic). — FIG. 262,2. **C. succinalis*; body, $\times 14$ (Brues, 1939b).

Epyris WESTWOOD, 1832, p. 129. BRUES, 1910, 1923a; COCKERELL, 1920a, 1921a. *Oligo.*, Europe (Baltic), England, USA (Colorado); *Mio.*, Burma-Holo.

Eupsenella WESTWOOD, 1874, p. 168. BRUES, 1923a, 1933; RASNITSYN, 1975. *Oligo.*, Europe (Baltic)—Holo.

Holepyris KIEFFER, 1904, p. 390. BRUES, 1933. *Oligo.*, Europe (Baltic)—Holo.

Homoglenus KIEFFER, 1904, p. 388. BRUES, 1939b. *Oligo.*, Europe (Baltic)—Holo.

Isobrachium FÖRSTER, 1856, p. 96. BRUES, 1933. *Oligo.*, Europe (Baltic)—Holo.

Laelius ASHMEAD, 1893, p. 50. BRUES, 1933. *Oligo.*, Europe (Baltic)—Holo.

Misepyrus KIEFFER, 1913, p. 108. BRUES, 1933, 1939b. *Oligo.*, Europe (Baltic)—Holo.

Palaeobethyloides BRUES, 1933, p. 119 [**P. longiceps*; OD]. Similar to *Palaeobethylus*, but head of female much longer and narrower. *Oligo.*, Europe (Baltic).

Palaeobethylus BRUES, 1923a, p. 334 [**P. longicollis*; OD]. Body flattened; head width about 8 times dorsoventral thickness; thorax width about 4 times thickness; mandibles long and straight, with edentate margins; antennae with 13 segments, scape long; pterostigma lanceolate. BRUES, 1933. *Oligo.*, Europe (Baltic). — FIG. 262,5. **P. longicollis*, male; wings and body, $\times 10$ (Brues, 1923a).

Parapristocera BRUES, 1933, p. 122 [**P. skwarrae*; OD]. Similar to *Pristocera* (recent), but integument of head and thorax smooth. *Oligo.*, Europe (Baltic).

Perisierola KIEFFER, 1914, p. 533. BRUES, 1933. *Oligo.*, Europe (Baltic)—Holo.

Pristapenesia BRUES, 1933, p. 131 [**P. primaeva*; OD]. Related to *Apenesia*. Male with prothorax produced anteriorly, as in *Holepyris*; hind femora without a tooth; mandibles long, enlarged apically; antennae with 13 segments. Female with wings present; RS and M almost reaching wing margin; pterostigma present. *Oligo.*, Europe (Baltic). — FIG. 262,4. **E. primaeva*; wings and body, $\times 10$ (Brues, 1933).

Prosierola KIEFFER, 1905, p. 243. BRUES, 1933. *Oligo.*, Europe (Baltic)—Holo.

Protapristocera BRUES, 1923a, p. 337 [**P. succinii*; OD]. Related to *Pristocera* (recent), but female with wings fully developed. BRUES, 1933. *Oligo.*, Europe (Baltic).

Pseudisobrachium KIEFFER, 1904, p. 368. THÉOBALD, 1937a. *Oligo.*, Europe (France)—Holo.

Rhabdepyris KIEFFER, 1904, p. 32. BRUES, 1933. *Oligo.*, Europe (Baltic)—Holo.

Scleroderma LATREILLE, 1809, p. 118. COCKERELL, 1917d. *Mio.*, Burma-Holo.

Uromesitus BRUES, 1933, p. 116 [**U. caudatus*; OD]. Similar to *Mesitius* (recent), but female

with gastral segments beyond fourth drawn out into long slender tube; gaster of male short, consisting of 5 visible segments; fore wing with cell 3r very short; RS terminating on front margin of wing before apex; antennae of female with 13 segments. *Oligo.*, Europe (Baltic).

Family DRYINIDAE Haliday, 1833

[Dryinidae HALIDAY, 1833, p. 272]

Antennae diverse in form, with 10 segments in both sexes and inserted on prominence near dorsal margin of clypeus; fore tarsi of female usually chelate; fore wing with reduced venation; females of some species apterous. Larvae endoparasites of Hemiptera (Homoptera). Cret.—Holo.

Dryinus LATREILLE, 1804, p. 176. BRUES, 1923a. *Oligo.*, Europe (Baltic)—Holo.

Ampulicomorpha ASHMEAD, 1893, p. 79. BRUES, 1933. *Oligo.*, Europe (Baltic)—Holo.

Avodryinus PONOMARENKO, 1981, p. 139 [**A. canadensis*; OD]. Female with well-developed wings; pterostigma narrow; prothorax longer than broad, narrower than mesothorax; propodeum with distinct areolation. Cret., Canada (Alberta).

Cretodryinus PONOMARENKO, 1975c, p. 104 [**C. zherichini*; OD]. Similar to *Thaumatodryinus* but with well-developed parapsidal furrows, short trochanters, and coarse rugosity of propodeum; tibial spur formula 1,1,2. Wings well developed. Cret., USSR (Asian RSFSR). — FIG. 263,4. **C. zherichini*; thorax and abdomen, $\times 11$ (Ponomarenko, 1975c).

Dicondylus CURTIS, 1829, p. 110. PONOMARENKO, 1981. Cret., USSR (European RSFSR)—Holo.

Electrodryinus PONOMARENKO, 1975a, p. 126 [**E. areolatus*; OD]. Similar to *Hesperodryinus* (recent), but enlarged claw of fore tarsus unarmed and pronotum short. *Oligo.*, Europe (Baltic). — FIG. 263,6. **E. areolatus*; wing and body, $\times 10$ (Ponomarenko, 1975a).

Embolemus WESTWOOD, 1833, p. 444. BRUES, 1933. *Oligo.*, Europe (Baltic)—Holo.

Thaumatodryinus PERKINS, 1905, p. 58. BRUES, 1923a, 1933; PONOMARENKO, 1975a. *Oligo.*, Europe (Baltic)—Holo.

Family BAISSODIDAE Rasnitsyn, 1975

[Baissodidae RASNITSYN, 1975, p. 122]

Little-known family, possibly related to the Sphecidae. Female: antennae with 12 segments; mesonotum with prominent sutures; legs without special modifications, grooming structures absent from hind legs; abdomen short, weakly sclerotized; ovipos-

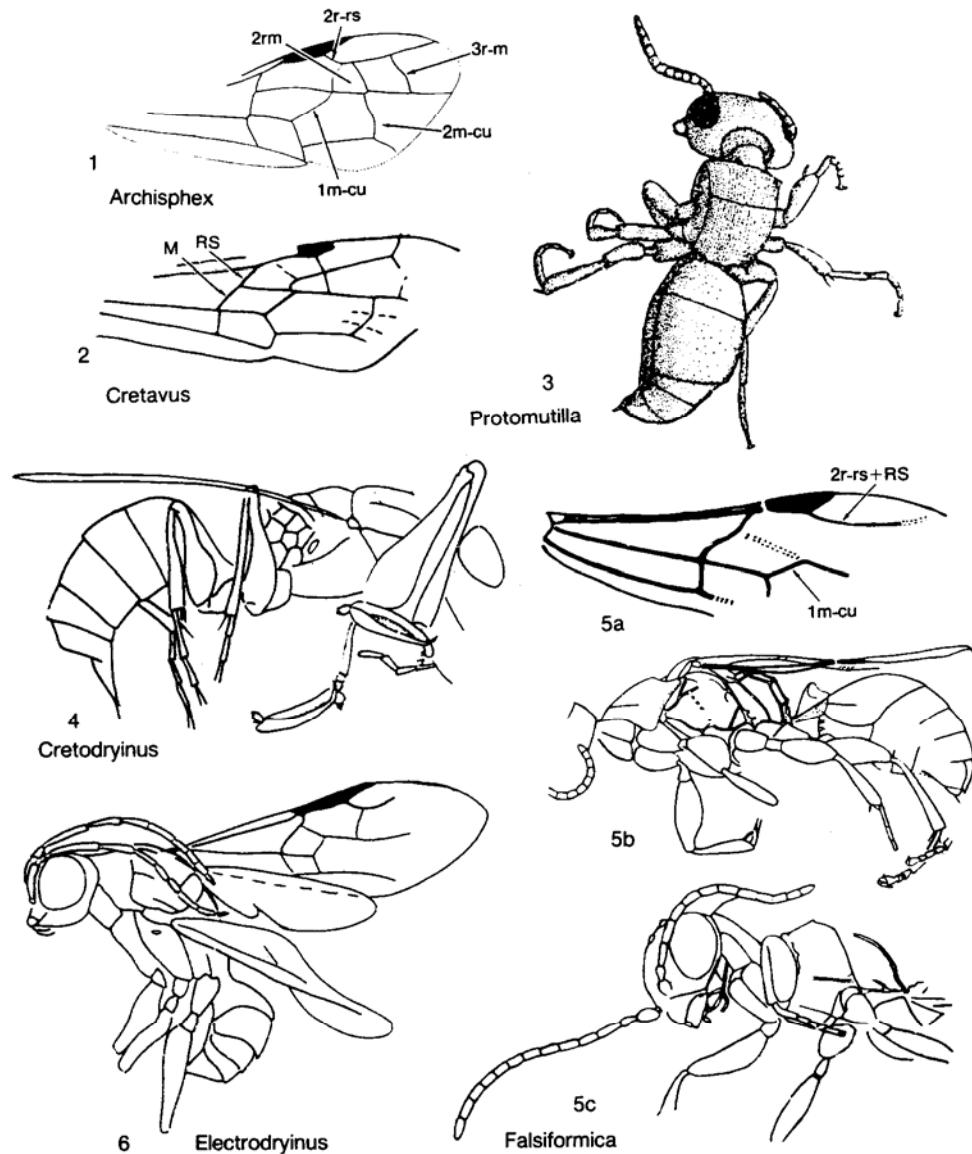


FIG. 263. Dryinidae, Baissodidae, Tiphidae, Mutillidae, and Falsiformicidae (p. 488–490).

itor short. Fore wing venation relatively primitive; crossvein 1m-cu close to end of vein RS+M. *Cret.*

Baissodes RASNITSYN, 1975, p. 123 [**B. robustus*; OD]. Fore wing with cell 2rm longer than broad; cell 3r with pointed apex. *Cret.*, USSR (Asian RSFSR).

Archisphecius EVANS, 1969, p. 252 [**A. crowsoni*; OD]. Similar to *Baissodes*, but crossvein 1m-cu

close to base of cell 2rm; crossvein 2m-cu close to apex of cell 2rm; crossvein 3rm sigmoidal. RASNITSYN, 1975. *Cret.*, England.—Fig. 263, 1. **A. crowsoni*; fore wing, X9 (Evans, 1969).

Oryctobaissodes RASNITSYN, 1975, p. 125 [**O. armatus*; OD]. Fore wing with cell 3r truncate apically; femora thick. *Cret.*, USSR (Asian RSFSR).

Trichobaissodes RASNITSYN, 1975, p. 126 [**T. antennatus*; OD]. Similar to *Baissodes*, but cell

3r rounded apically; femora not thickened. *Cret.*, USSR (Asian RSFSR).

Family TIPHIIDAE Leach, 1815

[*Tiphiidae* LEACH, 1815, p. 118]

Similar to Mutillidae but second gastral tergite without lateral bands of dense, appressed hairs; thorax and propodeum not fused into a single plate; females often apterous. Larvae ectoparasites of immature insects, usually Coleoptera, Orthoptera, or Hymenoptera. *Oligo.*—*Holo.*

Tiphia FABRICIUS, 1775, p. 353. *Holo.*

Anthobosca GUÉRIN-MÉNEVILLE, 1838, p. 236 [= *Geotiphia* COCKERELL, 1906b, p. 49 (type, *G. foxiana*)]. TURNER, 1912; COCKERELL, 1926a; ILLIES, 1941. *Oligo.*, USA (Colorado)—*Holo.*

Myrmosa LATREILLE, 1796, p. 118. [Generic assignment of fossils doubtful.] PITON, 1940a. *Oligo.*, Europe (France)—*Holo.*

Myzinum LATREILLE, 1803, p. 326. PITON, 1940a. *Oligo.*, Europe (France)—*Holo.*

Protomutilla BISCHOFF, 1917, p. 142 [= *P. succinialis*; OD]. Little-known genus, apparently related to *Myrmosa*. Thoracic dorsum with a single transverse suture; first gastral sternite with a median carina; front femora strongly thickened. All known specimens apterous. BRUES, 1933. *Oligo.*, Europe (Baltic).—FIG. 263,3. **P. succinialis*; dorsal view, X6.5 (Brues, 1933).

Family MUTILLIDAE Latreille, 1802

[*Mutillidae* LATREILLE, 1802b, p. 347] [= *Cretavidae* SHAROV, 1957a, p. 943]

Second gastral tergite with lateral bands of dense, appressed hairs; thorax and propodeum usually fused to form a single plate; body with prominent pubescence; females apterous. Larvae mostly ectoparasites of larvae and pupae of other Hymenoptera. *Cret.*—*Holo.*

Mutilla LINNÉ, 1802, p. 582. *Holo.*

Cretavus SHAROV, 1957a, p. 943 [= *C. sibiricus*; OD]. Little-known genus. Fore wing with basal sections of RS and of M forming a straight, oblique line. RASNITSYN, 1975. *Cret.*, USSR (Asian RSFSR).—FIG. 263,2. **C. sibiricus*; fore wing, X6 (Rasnitsyn, 1975).

Family FALSIFORMICIDAE

Rasnitsyn, 1975

[*Falsiformicidae* RASNITSYN, 1975, p. 111]

Female: fore wing venation reduced as in bethyloids; hind wing without veins, but

apparently with jugal lobe. Head prognathous; pronotum very long, with several small humeral protuberances; metapleural gland apparently absent; abdomen apparently shorter than head and thorax combined; gaster shorter than head and thorax combined, second tergite forming a high triangle, resembling a formicid node. Male: head hypognathous; antennae with 13 segments, not elbowed; pronotum relatively short. *Cret.*

Falsiformica RASNITSYN, 1975, p. 112 [= *F. cretacea*; OD]. Fore wing (known in female only) with pterostigma relatively narrow; crossvein 2r-rs and distal section of RS forming a single, curved vein; basal section of RS about half as long as basal section of M; RS+M obsolescent; crossvein 1m-cu present. Male with antennae filiform, scape short; maxillary palpi apparently with 6 segments. *Cret.*, USSR (Asian RSFSR).—FIG. 263,5. **F. cretacea*; a, wing of female, X20; b, thorax and abdomen of female, X19; c, head and thorax of male, X22 (all Rasnitsyn, 1975).

Family FORMICIDAE Latreille, 1802

[*Formicidae* LATREILLE, 1802b, p. 352] [= *Armaniidae* DLUSSKY, 1983, p. 65]

Antennae distinctly elbowed in females and workers, often less so in males; first gastral segment (and sometimes second) a nodiform or scalelike petiole (and postpetiole) separated from rest of gaster; males and females usually winged, but wings shed by females after nuptial flight; workers apterous. Social insects (ants); nests diverse, usually in ground. [The subfamily Sphecomyrminae is included in the Formicidae as originally proposed by WILSON, CARPENTER, and BROWN (1967a).] *Cret.*—*Holo.*

Formica LINNÉ, 1758, p. 579. WHEELER, 1914; MEUNIER, 1915b, 1917c; COCKERELL, 1920a, 1923c; CARPENTER, 1930a; PITON & THÉOBALD, 1935; THÉOBALD, 1937a; DLUSSKY, 1981. *Eoc.*, USA (Texas), England; *Oligo.*, Europe (Baltic, France, Germany), USA (Colorado); *Mio.*, Europe (France), USSR (European RSFSR)—*Holo.*

Agroecomyrmex WHEELER, 1910a, p. 265 [= *Myrmica duisburgi* MAYR, 1868; OD]. Worker and female: similar to those of *Lachnomyrmex* (recent), but funiculus of antennae without a 2-segmented club, eyes near posterior corners of head, and tip of gaster directed forward. WHEELER, 1914. *Oligo.*, Europe (Baltic).

Ameghinoia VIANA & HAEDO ROSSI, 1957, p. 109 [= *A. piatnitzkyi*; OD]. Little-known genus, pos-

sibly related to Myrmeciinae; tibiae apparently without spurs. *Oligo.* Mio., Argentina.

Aphaenogaster MAYR, 1853, p. 107. WHEELER, 1914; CARPENTER, 1930a; THÉOBALD, 1937a. *Oligo.*, Europe (Baltic), USA (Colorado); *Mio.*, Europe (France)—*Holo.*

Archaeopone DLUSSKY, 1975, p. 120 [**A. kyzylzharica*; OD]. Male: third antennal segment about 5 times as long as second; thorax distinctly segmented. [Family assignment doubtful.] DLUSSKY, 1983. Cret., USSR (Kazakh).

Archimyrmex COCKERELL, 1923a, p. 51 [**A. rostratus*; OD]. Little-known genus, possibly a myrmicine. WHEELER, 1928; CARPENTER, 1930a. Eoc., USA (Colorado).

Archiponera CARPENTER, 1930a, p. 27 [**A. wheeleri*; OD]. Closely related to *Gnamptogenys*. Worker: head large, with convex sides; mandibles linear; anterior margin of clypeus with a median incision, posterior margin with large median lobe; ocelli absent; antennae with 12 segments; petiole cuneiform. WHEELER, 1930; BROWN, 1958. *Oligo.*, USA (Colorado).—FIG. 264. **A. wheeleri*; worker, X4.6 (Carpenter, 1930a).

Armania DLUSSKY, 1983, p. 67 [**A. robusta*; OD]. Similar to *Sphecomyrma*. Female: petiole large, its width about equal to its length, its posterior part elevated and forming a node. Cret., USSR (Asian RSFSR).

Armaniella DLUSSKY, 1983, p. 71 [**A. curiosa*; OD]. Similar to *Armania*, but petiole not forming a node. Cret., USSR (Asian RSFSR).

Asymphylomyrmex WHEELER, 1914, p. 96 [**A. balticus*; OD]. A dolichoderine genus. Worker: head suborbicular, slightly flattened anteriorly; thorax short and compact; spurs absent on middle and hind tibiae. *Oligo.*, Europe (Baltic).

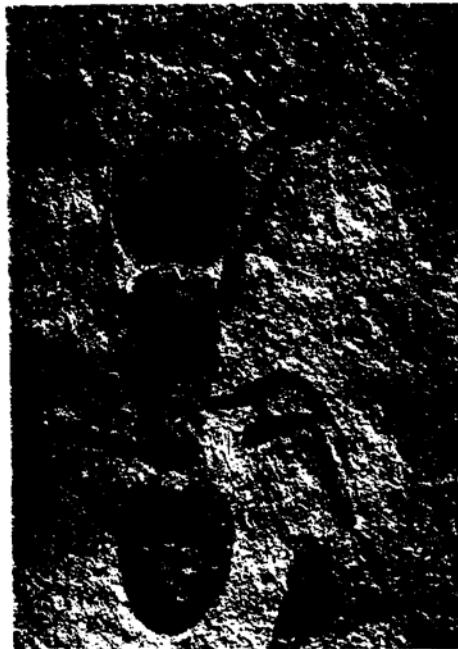
Brachyponera EMERY, 1901, p. 43. [Generic assignment of fossil doubtful.] THÉOBALD, 1937a. *Oligo.*, Europe (France)—*Holo.*

Bradoponera MAYR, 1868, p. 73 [**B. meieri*; OD]. A ponerine genus, closely related to *Discothrebia* (recent). Worker: antennae with 9 segments; eyes minute. WHEELER, 1914. *Oligo.*, Europe (Baltic).

Camponotites DLUSSKY, 1981, p. 76 [collective group]. Little-known species; fore wing lacking cells 2rm and 3rm; cell 2r+3r closed. *Mio.*, USSR (European RSFSR).

Camponotus MAYR, 1861, p. 25. MAYR, 1868; WHEELER, 1914; DONISTHORPE, 1920; CARPENTER, 1930a; NAORA, 1933a; PITON & THÉOBALD, 1935; THÉOBALD, 1937a. *Oligo.*, Europe (Baltic, France), England, USA (Colorado); *Mio.*, Europe (France); *Paleo.-Plio.*, China (Fushun)—*Holo.*

Cephalomyrmex CARPENTER, 1930a, p. 37 [**C. rotundatus*; OD]. Little-known genus, apparently a myrmicine. Female: head exceedingly large; thorax short; gaster small; funiculus of antennae apparently with only 5 or 6 segments;



Archiponera

FIG. 264. Formicidae (p. 491).

petiole pedunculate; venation unknown. *Oligo.*, USA (Colorado).

Cerapachys SMITH, 1857, p. 74 [=Procerapachys WHEELER, 1914, p. 27 (type, *P. annosus*)]. BROWN, 1975. *Oligo.*, Europe (Baltic)—*Holo.*

Cretomyrma DLUSSKY, 1975, p. 115 [**C. arnoldii*; OD]. Worker: similar to that of *Sphecomyrma* but with a short, median epinotal spine and a short sting. Cret., USSR (Asian RSFSR).

Dolichoderus LUND, 1831, p. 130. MAYR, 1868; COCKERELL, 1915; WHEELER, 1914; DONISTHORPE, 1920; CARPENTER, 1930a; THÉOBALD, 1937a. *Oligo.*, Europe (Baltic, France), England, USA (Colorado)—*Holo.*

Dolichomyrma DLUSSKY, 1975, p. 121 [**D. longiceps*; OD]. Little-known genus. Female: head elongate; thorax similar to that of *Sphecomyrma*; petiole short. [Family assignment doubtful.] DLUSSKY, 1983. Cret., USSR (Kazakh).

Drymomymex WHEELER, 1914, p. 135 [**D. fusciennis*; OD]. Related to *Aphomomyrmex* (recent), but female with 11-segmented antennae. THÉOBALD, 1937a. *Oligo.*, Europe (Baltic, France).

Elaeomyrmex CARPENTER, 1930a, p. 48 [**E. gracilis*; OD]. Related to *Iridomyrmex*. Female: head much longer than broad, lateral margins nearly straight; mandibles prominent; posterior margin of clypeus with a prominent median prolongation; clypeus striated. Worker: smaller but very similar. *Oligo.*, USA (Colorado).

- Electromyrmex** WHEELER, 1910b, p. 167 [**E. klebsi*; OD]. A myrmicine genus, close to *Podomyrma* (recent). Worker: mandibles very long, sublinear; antennae with 12 segments; thorax narrower than head; prothorax greatly elongated; petiole slender, cylindrical, with only a faint indication of a node. WHEELER, 1914. *Oligo.*, Europe (Baltic).
- Electroponera** WHEELER, 1914, p. 34 [**E. dubia*; OD]. A ponerine genus, apparently related to *Ectatomma* (recent). Worker: head subrectangular, with rounded sides, and weakly excised posterior border; antennae with 12 segments; thorax constricted in mesoepinotal region; petiole with a concave anterior face. *Oligo.*, Europe (Baltic).
- Emplastus** DONISTHORPE, 1920, p. 86 [**E. emeryi*; OD]. Little-known ponerine genus, apparently close to *Pachycondyla*. Female: eyes small, close to base of mandibles; mandibles without teeth. *Oligo.*, England.
- Eoformica** COCKERELL, 1921e, p. 38 [**E. eocenica*; OD; =*Liometopum pingue* SCUDDER, 1877a, p. 742]. Little-known genus of uncertain relationships. SCUDDER, 1890; WHEELER, 1928; CARPENTER, 1930a. *Eoc.*, USA (Colorado, Wyoming, Utah).
- Eomyrmex** HONG, 1974, p. 138 [**E. quchengzienensis*; OD]. Worker (subfamily position uncertain): antennae with 13 segments; scape of moderate length; mandibles relatively small, with 3 denticles, the terminal one being longest; petiole slender; gaster with pronounced constriction between first and second segments; legs long; middle and hind tibiae with prominent spurs. *Eoc.*, China (Liaoning).
- Eulithomyrmex** CARPENTER, 1935b, p. 91, nom. subst. pro *Lithomyrmex* CARPENTER, 1930a, p. 34, non CLARK, 1928 [**Lithomyrmex rugosus* CARPENTER, 1930a, p. 35; OD]. A myrmicine genus, related to *Agrecomyrmex*, but all castes with smaller mandibles and a larger antennal club. *Oligo.*, USA (Colorado).
- Gesomyrmex** MAYR, 1868, p. 50. EMERY, 1905; WHEELER, 1914; THÉOBALD, 1937a. *Oligo.*, Europe (Baltic, France)–*Holo.*
- Glyphyromyrmex** WHEELER, 1914, p. 131 [**G. oligocenicus*; OD]. Close to *Formica* (recent), but worker with large, flat eyes; elliptical head; short, thickset thorax; and large, convex pronotum. THÉOBALD, 1937a. *Oligo.*, Europe (Baltic, France).
- Gnampogenys** ROGER, 1863, p. 174. WHEELER, 1914; BROWN, 1958; BARONI URBANI, 1980d. *Oligo.*, Europe (Baltic); *Oligo./Mio.*, Dominican Republic–*Holo.*
- Iridomyrmex** MAYR, 1862, p. 702. WHEELER, 1914; CARPENTER, 1930a; THÉOBALD, 1937a. *Oligo.*, Europe (Baltic, France), USA (Colorado)–*Holo.*
- Kotshkorkia** DLUSSKY, 1981, p. 71 [**K. laticeps*; OD]. Similar to *Dolichoderus*. Female: head broad; front margin of clypeus convex; propodeum and petiole extended dorsally. *Mio.*, USSR (Kirghiz).
- Lasius** FABRICIUS, 1805, p. 415. WHEELER, 1914; COCKERELL, 1927b; PONGRÁCZ, 1928; CARPENTER, 1930a; POPOV, 1933; PITON & THÉOBALD, 1935; THÉOBALD, 1937a; ZALESSKY, 1949; WILSON, 1955; DLUSSKY, 1981. *Oligo.*, Europe (Baltic, France), USA (Colorado); *Mio.*, Europe (France, Croatia), USSR (European RSFSR)–*Holo.*
- Leptomyrmex** MAYR, 1862, p. 695. BARONI URBANI, 1980c. *Oligo./Mio.*, Dominican Republic–*Holo.*
- Leptomyrmula** EMERY, 1912, p. 16 [**Leptomyrmex maravignae* EMERY, 1891, p. 578; OD]. Similar to *Leptomyrmex*, but cell 3r of fore wing much larger. *Mio.*, Europe (Italy).
- Leptothorax** MAYR, 1855, p. 431. WHEELER, 1914. *Oligo.*, Europe (Baltic)–*Holo.*
- Leucotaphus** DONISTHORPE, 1920, p. 89 [**Leptothorax gurnetensis* COCKERELL, 1915, p. 485; OD]. Similar to *Formica* (recent), but cell 1mcu very small. *Oligo.*, England.
- Liometopum** MAYR, 1861, p. 25. WHEELER, 1914; PONGRÁCZ, 1928; CARPENTER, 1930a; DLUSSKY, 1981. *Oligo.*, Europe (Baltic), USA (Colorado); *Mio.*, Europe (Croatia), USSR (European RSFSR)–*Holo.*
- Mianeuretus** CARPENTER, 1930a, p. 38 [**M. mirabilis*; OD]. Close to *Paraneuretus*. Worker: eyes large, ocelli present; mandibles triangular, with blunt teeth; antennae slender, with 11 subequal segments; petiole much longer than broad, with a small node. *Oligo.*, USA (Colorado).
- Miomymrmex** CARPENTER, 1930a, p. 51 [**Formica impactus* COCKERELL, 1927b, p. 165; OD]. Apparently a dolichoderine. Female: antennae inserted close to clypeus, exceedingly short, but 12-segmented; scape not over half length of head; funiculus only a little longer than scape. *Oligo.*, USA (Colorado).
- Monomorium** MAYR, 1855, p. 452. WHEELER, 1914. *Oligo.*, Europe (Baltic)–*Holo.*
- Myrmica** LATREILLE, 1804, p. 179. WHEELER, 1914; MEUNIER, 1915b. *Oligo.*, Europe (Baltic, Germany)–*Holo.*
- Nothomyrmica** WHEELER, 1910b, p. 171 [**Macromischus rufidus* MAYR, 1868, p. 85; OD]. Related to *Tetramorium* (recent). Worker: head and thorax coarsely rugose; antennae with 12 segments; middle and hind tibiae without spurs. *Oligo.*, Europe (Baltic).
- Odontomachus** LATREILLE, 1804, p. 179. BARONI URBANI, 1980b. *Oligo./Mio.*, Dominican Republic–*Holo.*
- Oecophylla** F. SMITH, 1860, p. 101. COCKERELL, 1915, 1920a; WHEELER, 1914; EMERY, 1921; THÉOBALD, 1937a. *Eoc.*, England; *Oligo.*, Europe (Baltic, France); *Mio.*, Europe (Italy)–*Holo.*
- Oligomyrmex** MAYR, 1867, p. 110. WHEELER, 1914; PITON & THÉOBALD, 1935; THÉOBALD, 1937a. *Oligo.*, Europe (Baltic, France); *Mio.*, Europe (France)–*Holo.*

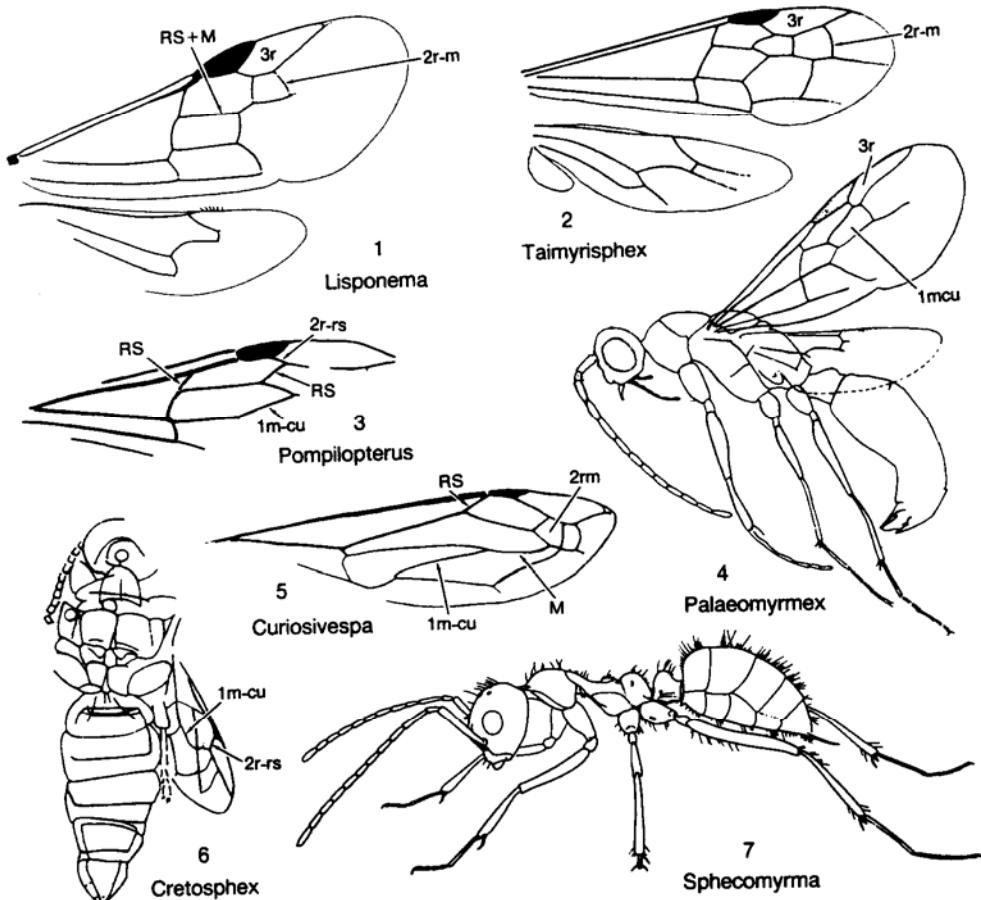


FIG. 265. Formicidae, Pompilidae, Sphecidae, and Uncertain (p. 493–498).

Pachycondyla F. SMITH, 1858, p. 105. MAYR, 1868; WHEELER, 1914; DONISTHORPE, 1920; THÉOBALD, 1937a; TAYLOR, 1964; DLUSSKY, 1981. *Oligo.*, Europe (Baltic, France), England; *Mio.*, USSR (European RSFSR)—*Holo.*

Palaeomyrmex DLUSSKY, 1975, p. 118 [**P. zherichini*; OD]. Apparently related to *Sphecomyrma*. Male: fore wing with cells $1r+2r$, $3r$, $2rm$, and $1mcu$ closed; mandibles narrow, without teeth; antennae with 13 segments; scape very short; middle and hind tibiae with 2 spurs. *Cret.*, USSR (Asian RSFSR).—FIG. 265.4. **P. zherichini*; male, wing and body, $\times 12$ (Dlušský, 1975).

Parameranoplus WHEELER, 1914, p. 69 [**P. pri-maeus*; OD]. Apparently similar to *Meranoplus* (recent), but worker with much shallower antennal scrobes. *Oligo.*, Europe (Baltic).

Paraneuretus WHEELER, 1914, p. 73 [**P. torn-quisti*; OD]. Similar to *Aneuretus* (recent) but worker much more slender; petiole with peduncle very short and with anterior slope of node

more gradual than posterior slope. *Oligo.*, Europe (Baltic).

Paraphaenogaster DLUSSKY, 1981, p. 68 [**P. microphtalmus*; OD]. Similar to *Aphaenogaster* but male with unusually small eyes. *Mio.*, USSR (European RSFSR).

Petraeomyrmex CARPENTER, 1930a, p. 55 [**P. minimus*; OD]. Little-known genus, probably a dolichoderine, possibly close to *Forelius* (recent). Female small, head quadrate, scape short and thick, petiole very small. *Oligo.*, USA (Colorado).

Petropone DLUSSKY, 1975, p. 119 [**P. petiolata*; OD]. Little-known genus. Mandibles large, curved; petiole narrow and long. [Family assignment doubtful.] DLUSSKY, 1983. *Cret.*, USSR (Kazakh).

Pheidole WESTWOOD, 1840, p. 87. CARPENTER, 1930a. *Oligo.*, USA (Colorado)—*Holo.*

Pityomyrmex WHEELER, 1914, p. 98 [**P. torn-quisti*; OD]. Little-known genus, apparently a dolichoderine. Worker: body slender, with very

- long legs and antennae; eyes large; mandibles inserted far apart, with numerous denticles; petiole much longer than broad, with a small node; middle and hind tibiae with pectinated spurs. *Oligo.*, Europe (Baltic).
- Plagiolepis** MAYR, 1861, p. 26. MAYR, 1868; WHEELER, 1914. *Oligo.*, Europe (Baltic)—*Holo.*
- Platythyrea** ROGER, 1863, p. 172. WHEELER, 1914; THÉOBALD, 1937a. *Oligo.*, Europe (Baltic, France)—*Holo.*
- Pogonomyrmex** MAYR, 1868, p. 169. CARPENTER, 1930a. *Oligo.*, USA (Colorado)—*Holo.*
- Ponera** LATREILLE, 1804, p. 179. MAYR, 1868; EMERY, 1891; WHEELER, 1914; OKE, 1956; TAYLOR, 1964. *Oligo.*, Europe (Baltic); *Mio.*, Europe (Italy); *Pleist.*, Australia (Victoria)—*Holo.*
- Poneropsis** HEER, 1867, p. 19 [collective group [=Ponerites] DLUSSKY, 1981, p. 67 (collective group)]. Little-known species, based mainly on fore wings. Cell $2r+3r$ open or closed; cells $2rm$ and $3rm$ always closed. [A diverse group of species probably belonging to the subfamily Ponerinae.] COCKERELL, 1915; MEUNIER, 1917c, 1923c; TAYLOR, 1964; DLUSSKY, 1981. *Oligo.*, England, Europe (Germany); *Mio.*, USSR (European RSFSR).
- Poneropterus** DLUSSKY, 1983, p. 73 [**P. sphacoides*; OD]. Male: second antennal segment elongate, third segment nearly 3 times as long as second; posterior part of petiole forming a distinct node. *Cret.*, USSR (Asian RSFSR).
- Prenolepis** MAYR, 1861, p. 26. WHEELER, 1914. *Oligo.*, Europe (Baltic)—*Holo.*
- Prionomyrmex** MAYR, 1868, p. 77 [**P. longiceps*; OD]. Closely related to *Myrmecia* (Myrmecinae). Mandibles of worker elongate and with a distinct, uniformly denticulate, masticatory border; clypeus triangular, well developed; petiole and gaster resembling those of the Ponerinae. WHEELER, 1914; TAYLOR, 1978. *Oligo.*, Europe (Baltic).
- Prodromorphomyrmex** WHEELER, 1914, p. 112 [**P. primigenius*; OD]. Related to *Aphomomyrmex* (recent), but antennae with 10 segments; eyes small. *Oligo.*, Europe (Baltic).
- Protamblyopone** DLUSSKY, 1981, p. 65 [**P. inversa*; OD]. Little-known genus, related to *Concoctio* (recent), but antennae longer, apparently with 12 segments. KUKALOVÁ-PECK & PECK, 1976. *Mio.*, USSR (Kirghiz).
- Protaneuretus** WHEELER, 1914, p. 71 [**P. succinatus*; OD]. Related to *Aneuretus* (recent), but worker with less cordate head and with large eyes; antennae and legs much less slender. *Oligo.*, Europe (Baltic).
- Protateteca** CARPENTER, 1930a, p. 41 [**P. elongata*; OD]. Related to *Azteca* (recent), but worker with eyes small and more posteriorly situated; node of petiole less inclined. *Oligo.*, USA (Colorado).
- Pseudoarmania** DLUSSKY, 1983, p. 69 [**P. rasnitsyni*; OD]. Similar to *Armania*, but petiole small, somewhat broader than long, and not forming a node. *Cret.*, USSR (Asian RSFSR).
- Pseudocamponotus** CARPENTER, 1930a, p. 22 [**P. elcoanus*; OD]. Little-known genus, apparently related to *Camponotus*, but female with eyes and antennal insertions farther forward on head and antennae with 12 segments. *Mio.*, USA (Nevada).
- Pseudolasius** EMERY, 1887, p. 244. WHEELER, 1914. *Oligo.*, Europe (Baltic)—*Holo.*
- Pseudomyrmex** LUND, 1831, p. 137. CARPENTER, 1930a. *Oligo.*, USA (Colorado)—*Holo.*
- Rhopalomyrmex** MAYR, 1868, p. 41 [**R. pygmaeus*; OD]. Similar to *Plagiolepis*, but worker with 10-segmented antennae, the 4 terminal segments forming a club. WHEELER, 1914. *Oligo.*, Europe (Baltic).
- Siciliomyrmex** WHEELER, 1914, p. 111 [**Gesomyrmex corniger* EMERY, 1891, p. 581; OD]. A formicine genus of uncertain affinities; worker with bicornuate head and 2-spined propodeum. WHEELER, 1926; BROWN & CARPENTER, 1978. *Mio.*, Europe (Italy).
- Solenopsis** WESTWOOD, 1840, p. 86. PONGRÁCZ, 1928; THÉOBALD, 1937a. *Oligo.*, Europe (France); *Mio.*, Europe (Croatia)—*Holo.*
- Sphecomyrma** WILSON & BROWN in WILSON, CARPENTER, & BROWN, 1967a, p. 8 [**S. freyi*; OD]. Worker: mandibles wasplike, short, narrow, bidentate; antennae 12-segmented; scape relatively short, funiculus long; eyes large, convex, near middle of sides of head; ocelli present; distinct sutures between thoracic segments; petiole with a distinct node; gaster without a constriction behind first segment; middle and hind tarsi with 2 spurs; sting exsertile. TAYLOR, 1978. *Cret.*, USA (New Jersey).—FIG. 265,7. **S. freyi*; worker, $\times 14$ (Wilson, Carpenter, & Brown, 1967b).
- Stenamma** WESTWOOD, 1840, p. 83. WHEELER, 1914. *Oligo.*, Europe (Baltic)—*Holo.*
- Stigmomyrmex** MAYR, 1868, p. 95. WHEELER, 1914. *Oligo.*, Europe (Baltic)—*Holo.*
- Stiphromyrmex** WHEELER, 1914, p. 67 [**S. robustus*; OD]. Similar to *Pristomyrmex* (recent), but worker with 12-segmented antennae, terminal 3 segments forming a club; middle and hind tibiae with spurs; mandibles short and convex. MAYR, 1868. *Oligo.*, Europe (Baltic).
- Syntaphus** DONISTHORPE, 1920, p. 84 [**S. wheeleri*; OD]. Little-known genus. Female: apparently similar to that of *Ectatomma* (recent) but with epinotal spines. CARPENTER & others, 1937. *Oligo.*, England.
- Tetraponera** F. SMITH, 1852, p. 44. WHEELER, 1914; THÉOBALD, 1937a. *Oligo.*, Europe (Baltic, France)—*Holo.*
- Trachymyrmex** FOREL, 1893, p. 600. BARONI

URBANI, 1980a. *Oligo./Mio.*, Dominican Republic—*Holo.*

Vollenhovia MAYR, 1865, p. 21. WHEELER, 1914. *Oligo.*, Europe (Baltic)—*Holo.*

Family EUMENIDAE Leach, 1815

{Eumenidae LEACH, 1815, p. 153}

Similar to Vespidae, but tarsal claws bifid and middle tibiae with 1 apical spur. Solitary wasps, mostly fossorial or mud-daubers. Larvae predaceous on larvae of other insects. *Eoc.*—*Holo.*

Eumenes LATREILLE, 1802, p. 360. HANDLIRSCH, 1910c; PITON, 1940a. *Oligo.*, Europe (France, Germany)—*Holo.*

Alastor LEPELETIER, 1841, p. 668. [Generic assignment of fossils doubtful.] SCUDDER, 1890; MEUNIER, 1915b; STATZ, 1936b; EVANS, 1966. *Eoc.*, USA (Wyoming); *Oligo.*, Europe (Germany)—*Holo.*

Ancistrocerus WESMAEL, 1836, p. 45. PITON, 1940a. *Eoc.*, Europe (France)—*Holo.*

Eunortonia CARPENTER, 1986, p. 576, *nom. subst.* *pro Pseudonortonia* TIMON-DAVID, 1944b, p. 41, *non* SOIKA, 1936 [“*Pseudonortonia sepulta*” TIMON-DAVID, 1944b, p. 41; OD]. Similar to *Nortonia* (recent) but with very different abdominal markings. *Oligo.*, Europe (France).

Odynerus LATREILLE, 1802, p. 362. COCKERELL, 1909n, 1914f; THÉOBALD, 1937a; PITON, 1940a. *Oligo.*, USA (Colorado), Europe (France)—*Holo.*

Rygeschium SPINOLA, 1806, p. 84. THÉOBALD, 1937a; PITON, 1940a. *Eoc.*, Europe (France)—*Holo.*

Family VESPIDAE Leach, 1815

{Vespidae LEACH, 1815, p. 153}

Pronotum extending back to tegulae; antennae with 11 to 13 segments; middle tibiae with 2 apical spurs; tarsal claws simple; mandibles short and broad; fore wing with cell 1mcu very long; hind wing with closed cells. Social wasps, with queens, workers, and males; larvae mostly predaceous on other insects. *Eoc.*—*Holo.*

Vespa LINNÉ, 1758, p. 343. BRUES, 1926. *Oligo.*, Europe (Germany)—*Holo.*

Palaeovespa COCKERELL, 1906b, p. 54 [**P. baltica*; OD]. Little-known genus, apparently related to *Vespa* but with differences in venational details. [Family assignment doubtful.] COCKERELL, 1907c, 1909o, 1911b, 1914f, 1923e; BEQUAERT, 1930a. *Oligo.*, Europe (Baltic), USA (Colorado).

Polistes LATREILLE, 1802, p. 363. [Generic assignment of fossils doubtful.] COCKERELL, 1914f;

STATZ, 1936b; THÉOBALD, 1937a; PITON, 1940a. *Eoc.*, Europe (Germany); *Oligo.*, Europe (Germany, France); *Mio.*, Europe (Germany)—*Holo.* Polystria LEPELETIER, 1836, p. 533. COCKERELL, 1921a, 1923e. *Oligo.*, England—*Holo.*

Family POMPILIDAE Leach, 1815

{Pompilidae LEACH, 1815, p. 149}

Pronotum produced back to tegulae, forming a lobe over anterior thoracic spiracle; mesopleuron with an oblique groove; legs long, especially posterior pair; fore wings not longitudinally folded; hind wing with at least 1 closed cell and with a small anal lobe; first segment of gaster not forming a node or scale. Solitary, fossorial wasps; larvae predaceous on spiders. *Cret.*—*Holo.*

Pompilus FABRICIUS, 1798, p. 212. MEUNIER, 1917b; THÉOBALD, 1937a. *Oligo.*, Europe (Baltic, France)—*Holo.*

Anoplius DUFOUR, 1834, p. 484. STATZ, 1936b. *Oligo.*, Europe (Germany)—*Holo.*

Cryptochelus PANZER, 1806, p. 120. COCKERELL, 1906b, 1914d; ROHWER, 1909a; THÉOBALD, 1937a. *Oligo.*, USA (Colorado), Europe (France)—*Holo.*

Dipogon FOX, 1897, p. 241. COCKERELL, 1908e; ROHWER, 1909a. *Oligo.*, USA (Colorado)—*Holo.*

Pepsis FABRICIUS, 1805, p. 207. COCKERELL, 1941. *Oligo.*, USA (Colorado)—*Holo.*

Pompipterous RASNITSYN, 1975, p. 106 [**P. ciliatus*; OD]. Fore wing thickly pubescent, especially in costal area; origin of RS remote from pterostigma; basal section of RS and M aligned to form a slightly curved oblique vein; crossvein 3r-m apparently present; crossvein 2r-rs slanted toward wing apex; crossvein 1m-cu strongly slanted; cell 3r narrow and long. [Family position doubtful.] *Cret.*, USSR (Asian RSFSR).—FIG. 265,3. **P. ciliatus*; fore wing, $\times 6$ (Rasnitsyn, 1975).

Priocnemis SCHIÖDTE, 1837, p. 324. BRUES, 1926; STATZ, 1936b. *Oligo.*, Europe (Germany)—*Holo.*

Family SPHECIDAE Leach, 1815

{Sphecidae LEACH, 1815, p. 148} [=Angarosphecidae RASNITSYN, 1975, p. 109]

Pronotum not extending as far back as tegulae; males with 13 antennal segments, females with 12; hind wing with an anal lobe and closed cells. Solitary, fossorial wasps; larvae predaceous on various insect larvae and on spiders. *Cret.*—*Holo.*

- Sphex** LINNÉ, 1758, p. 569. PONGRÁCZ, 1928; ZEUNER, 1931; STATZ, 1936b. *Oligo.*, Europe (Germany); *Mio.*, Europe (Germany, Yugoslavia)—*Holo.*
- Angarosphex** RASNITSYN, 1975, p. 110 [**A. myrmicopterus*; OD]. Fore wing with vestiges of crossvein 1r-ts very short; crossvein 2r-ts shorter than width of pterostigma; cells 2rm and 3rm elongate. Head quadrangular; pronotum moderately long. RASNITSYN, 1980b. *Cret.*, USSR (Asian RSFSR).
- Cerceris** LATREILLE, 1802, p. 367. TIMON-DAVID, 1944b. *Oligo.*, Europe (France)—*Holo.*
- Chalybion** DAHLBOM, 1844, p. 21. HAGEN, 1858a. *Oligo.*, USA (Colorado)—*Holo.*
- Ectemnius** DAHLBOM, 1845, p. 389. MEUNIER, 1912e; COCKERELL, 1910a; BOHART & MENKE, 1976. *Oligo.*, Europe (Germany), USA (Colorado)—*Holo.*
- Gallosphex** SCHLÜTER, 1978a, p. 83 [**G. cretaceus*; OD]. Apparently an ampulicine. Fore wing with pterostigma very small, triangular; basal section of M slightly longer than basal section of RS; crossvein 2r-ts very short; crossveins 2r-m and 3r-m well developed; cell 2rm larger than cell 3rm. *Cret.*, Europe (Germany).
- Gorytes** LATREILLE, 1804, p. 180. [Generic assignment of fossil doubtful.] COCKERELL, 1922h, 1924a; EVANS, 1966; BOHART & MENKE, 1976. *Oligo.*, Europe (Germany)—*Holo.*
- Harpactostigma** ASHMEAD, 1899, p. 299. COCKERELL, 1922h, 1924a; EVANS, 1966; BOHART & MENKE, 1976. *Eoc.*, USA (Colorado)—*Holo.*
- Larrophanes** HANDLIRSCH, 1907, p. 888 [**L. ophthalmicus*; OD]. Little-known genus, possibly belonging to the Larrinae. [Family assignment doubtful.] *Mio.*, Europe (Italy).
- Lisponema** EVANS, 1969, p. 255 [**L. singularis*; OD]. Similar to *Spilomena* (recent) but with pterostigma slightly longer and veins 3-rm and 2m-cu absent; tibial spur formula 1,1,2; legs very slender, smooth. *Cret.*, Canada (Manitoba). —FIG. 265.1. **L. singularis*; fore and hind wings, X3 (Evans, 1969).
- Mellinus** FABRICIUS, 1790, p. 226. ROHWER, 1908d. *Oligo.*, USA (Colorado)—*Holo.*
- Passaloecus** SHUCKARD, 1837, p. 188. ROHWER, 1909b. *Oligo.*, USA (Colorado)—*Holo.*
- Philanthus** FABRICIUS, 1790, p. 224. ROHWER, 1909c; THÉOBALD, 1937a. *Oligo.*, USA (Colorado), Europe (France)—*Holo.*
- Philoponites** COCKERELL, 1915, p. 482 [**P. clarus*; OD]. Little-known genus. Cells 1r+2r and 1mcu almost as wide as long; cell 2rm nearly triangular. *Oligo.*, England.
- Pison** JURINE, 1808, p. 255. ROHWER, 1908a; COCKERELL, 1909a. *Oligo.*, USA (Colorado), Europe (Baltic)—*Holo.*
- Pittoecus** EVANS, 1973, p. 170 [**P. pauper*; OD]. Male similar to *Passaloecus*. Head broad, with large eyes; antennae short, with 12 segments; mandibles straight, not dentate; tibial spur formula 1,1,2; claws dentate. *Cret.*, USSR (Asian RSFSR).
- Prophilanthus** COCKERELL, 1906b, p. 46 [**P. destrictus*; OD]. Similar to *Philoponites*, but cells 1r+2r and 1mcu at least twice as long as wide. *Oligo.*, USA (Colorado).
- Psammaecius** LEPELETIER, 1832, p. 72. COCKERELL, 1906b; EVANS, 1966; PULAWSKI & RASNITSYN, 1980. *Oligo.*, USA (Colorado)—*Holo.*
- Sceliphron** KLUG, 1801, p. 561. [Generic assignment of fossils doubtful.] MEUNIER, 1915a; COCKERELL, 1921a. *Oligo.*, England; *Mio.*, Europe (France)—*Holo.*
- Taimyrisphex** EVANS, 1973, p. 167 [**T. pristinus*; OD]. Male: antennae short, with 13 segments; scape only slightly longer than thick; eyes and ocelli large; pronotum with small, rounded posterior lobes nearly reaching tegulae; venation more generalized than in *Archisphex* (recent). [Family position uncertain, possibly related to Falsiformicidae.] RASNITSYN, 1980b. *Cret.*, USSR (Asian RSFSR). —FIG. 265.2. **T. pristinus*; fore and hind wings, X20 (Evans, 1973).
- Tracheliodes** MORAWITZ, 1866, p. 249. COCKERELL, 1909a, 1910a; BOHART & MENKE, 1976. *Oligo.*, Europe (Baltic), USA (Colorado)—*Holo.*
- Family ANDRENIDAE Latreille, 1802**
[*Andrenidae* LATREILLE, 1802b, p. 369]
- Glossa pointed; labial palpi with all segments similar, or first segment elongate and flattened; 2 subantennal sutures below each antennal socket. Solitary bees, nests sometimes colonial. *Oligo.*—*Holo.*
- Andrena** FABRICIUS, 1775, p. 376. COCKERELL, 1906b, 1908n, 1911b, 1914f. *Oligo.*, Europe (Baltic), USA (Colorado); *Mio.*, Europe (Germany)—*Holo.*
- Libellulapis** COCKERELL, 1906b, p. 42 [**L. antiquorum*; OD]. Apparently close to *Panurgus* (recent), but eyes very prominent. COCKERELL, 1909c, 1913b; ZEUNER & MANNING, 1976. *Oligo.*, USA (Colorado).
- Lithandrena** COCKERELL, 1906b, p. 44 [**L. saxarum*; OD]. Close to *Andrena* but differing in shape of cells 1r and 2rm. ZEUNER & MANNING, 1976. *Oligo.*, USA (Colorado).
- Pelandrena** COCKERELL, 1909f, p. 159 [**P. reducta*; OD]. Close to *Andrena*, but fore wing with cell 3rm apparently absent. ZEUNER & MANNING, 1976. *Oligo.*, USA (Colorado).
- Family HALICTIDAE Ashmead, 1899**
[*Halictidae* ASHMEAD, 1899, p. 90]
- Labial palpi with 4 equal segments; glossa pointed; mesepisternum with anterior-dorsal

groove; fore wing with basal section of vein M strongly arched and crossvein 2m-cu slightly arched. Mostly solitary, fossorial bees, some social. *Oligo.*—*Holo.*

Halictus LATREILLE, 1804, p. 182 [=*Prohalictus* ARMBRUSTER, 1938, p. 48 (type, *P. schemppi*)]. TIMON-DAVID, 1944b; ZEUNER & MANNING, 1976. *Oligo.*, Europe (France); USA (Colorado); *Mio.*, Europe (Germany)—*Holo.*

Cyrtapis COCKERELL, 1908f, p. 339 [**C. anomala*; OD]. Crossvein 3r-m sigmoidal, anterior end closer to apex than posterior end. [Family assignment doubtful.] *Oligo.*, USA (Colorado).

Family MELITTIDAE Schenk, 1860

[*Melittidae* SCHENK, 1860, p. 136]

Segments of labial palpi similar and cylindrical; glossa acute, often elongate; dorsal mesoepisternal groove absent; fore wing with 2 or 3 submarginal cells. Solitary bees. *Oligo.*—*Holo.*

Melitta KIRBY, 1802, p. 130. COCKERELL, 1909k. *Oligo.*, USA (Colorado)—*Holo.*

Ctenoplectrella COCKERELL, 1909o, p. 13 [**C. viridiceps*; OD]. Similar to *Glyptapis* but eyes bare. KELNER-PILLAULT, 1970a. *Oligo.*, Europe (Baltic).

Glyptapis COCKERELL, 1909o, p. 13 [**G. mirabilis*; OD]. Apparently related to *Ctenoplectra* (recent); eyes hairy, thorax strongly sculptured; metathorax divided by ridges into large quadrangular areas. KELNER-PILLAULT, 1970a; ZEUNER & MANNING, 1976. *Oligo.*, Europe (Baltic).

Family MEGACHILIDAE Kirby, 1837

[*Megachilidae* KIRBY in RICHARDSON, SWAINSON, & KIRBY, 1837, p. 270]

Labrum longer than broad; labial palpi with segments 1 and 2 very elongate and flattened; a single suture below each antennal socket; pollen brush (scopa), when present, on gastral sternites. Solitary bees; nests small, diversely situated. *Oligo.*—*Holo.*

Megachile LATREILLE, 1802, p. 434. COCKERELL, 1908b, 1925g; SALT, 1931; ZEUNER & MANNING, 1976. *Oligo.*, USA (Colorado); *Mio.*, USSR (Asian RSFSR)—*Holo.*

Anthidium FABRICIUS, 1805, p. 364. [Generic assignment of fossils doubtful.] COCKERELL, 1906b; STATZ, 1936b; ZEUNER & MANNING, 1976. *Oligo.*, USA (Colorado), Europe (Germany)—*Holo.*

Dianthidium COCKERELL, 1900, p. 412. COCKERELL, 1906b. *Oligo.*, USA (Colorado)—*Holo.*

Heriades SPINOLA, 1808, p. 7. COCKERELL, 1906b,

1913f, 1917b, 1923e, 1925d; ZEUNER & MANNING, 1976. *Oligo.*, USA (Colorado)—*Holo.*

Lithanthidium COCKERELL, 1911a, p. 225 [**L. pertriste*; OD]. Apparently related to *Anthidium*. Fore wing with cells 1r and 2rm present; basal part of M strongly arched. *Oligo.*, USA (Colorado).

Lithurge LATREILLE, 1825, p. 463. HEER, 1865, 1867; COCKERELL, 1909m; ZEUNER & MANNING, 1976. *Mio.*, Europe (Germany)—*Holo.*

Osmia PANZER, 1806, p. 230. HEER, 1849; HEYDEN, 1862; STATZ, 1936b; ZEUNER & MANNING, 1976. *Oligo.*, Europe (Germany); *Mio.*, Europe (Germany)—*Holo.*

Family ANTHOPHORIDAE

KIRBY, 1837

[*Anthophoridae* KIRBY in RICHARDSON, SWAINSON, & KIRBY, 1837, p. 271]

Glossa long; labrum broader than long; clypeus protuberant; fore coxae slightly broader than long; hind tibia with a scopa and 2 apical spurs; pollen basket (corbicula) absent. Solitary bees, nesting in ground. *Eoc.*—*Holo.*

Anthophora LATREILLE, 1803, p. 167. COCKERELL, 1908m, 1908n; ZEUNER & MANNING, 1976. *Oligo.*, USA (Colorado)—*Holo.*

Anthophorites HEER, 1849, p. 97 [**A. mellona*; SD COCKERELL, 1909m, p. 315]. Little-known genus, apparently related to *Anthophora*. HEER, 1867; ZEUNER & MANNING, 1976. *Oligo.*, Europe (France); *Mio.*, Croatia.

Celliforma BROWN, 1934, p. 532 [**C. spirifer*; OD]. Little-known genus. Larval chambers, with spiral apex. BROWN, 1935. *Eoc.*, USA (Wyoming).

Protomelecta COCKERELL, 1908f, p. 341 [**P. brevipennis*; OD]. Apparently related to *Melecta* (recent). Fore wings short, not reaching tip of gaster; cell 2r+3r long; cells 1r, 2rm, and 3rm present. [Family assignment doubtful.] TILL-YARD, 1926d; ZEUNER & MANNING, 1976. *Oligo.*, USA (Colorado).

Family APIDAE

Leach, 1815

[*Apidae* LEACH, 1815, p. 160]

Similar to Anthophoridae, but workers and most females with a corbicula on hind tibiae; spurs absent (except in Bombicinae). Mostly social bees. *Eoc.*—*Holo.*

Apis LINNÉ, 1758, p. 343. COCKERELL, 1907e; STATZ, 1931; ZEUNER, 1931; THÉOBALD, 1937a; ROUSSY, 1960; KELNER-PILLAULT, 1969; ZEUNER & MANNING, 1976. *Oligo.*, Europe (Germany, France); *Mio.*, Europe (Germany, Sicily)—*Holo.*

- Bombus** LATREILLE, 1802, p. 437 [=*Calyptapis* COCKERELL, 1906b, p. 41 (type, *C. florissantensis*)]. HEER, 1867; NOVÁK, 1877; CARPENTER, 1931d; COCKERELL, 1931b; MILLIRON, 1971; ZEUNER & MANNING, 1976. *Oligo.*, USA (Colorado), Europe (Czechoslovakia); *Mio.*, Europe (Germany), USA (Washington)–*Holo.*
- Ceratina** LATREILLE, 1802, p. 380. COCKERELL, 1906b; DALY, 1973. *Oligo.*, USA (Colorado)–*Holo.*
- Chalcobombus** COCKERELL, 1909a, p. 11 [**C. humilis*; OD]. Small bees of uncertain relationships but probably close to the Bombini. Vertex usually with coarse, erect bristles, sparingly plumose; eyes not usually hairy; ocelli large, close together, forming a slight curve; antennal cleaner with exceptionally long hairs. ZEUNER & MANNING, 1976. *Oligo.*, Europe (Baltic).
- Electrapis** COCKERELL, 1909a, p. 7 [**Apis melliponoides* BUTTEL-REEPEN, 1906, p. 158; OD]. Similar in general appearance to *Apis*; hind basitarsus about twice as long as broad; posterior tibiae with a single short spur or none; eyes with little or no hair. COCKERELL, 1908n; MANNING, 1961; KELNER-PILLAULT, 1969, 1970a, 1974; ZEUNER & MANNING, 1976. *Oligo.*, Europe (Baltic).
- Kelnermelia** MOURE in MOURE & CAMARGO, 1978, p. 565 [**Trigona eocenica* KELNER-PILLAULT, 1970b, p. 437; OD]. Similar to *Trigona*. Scutellum strongly projected and swollen, with scutostubellar suture deeply depressed. *Oligo.*, Europe (Baltic).
- Plebeia** SCHWARZ, 1938, p. 480. WILLE & CHANDLER, 1964; MOURE & CAMARGO, 1978. *Oligo.*, Dominican Republic–*Holo.*
- Probombus** PITON, 1940a, p. 218 [**P. hirsutus*; OD]. Little-known genus, apparently similar to *Bombus*. KELNER-PILLAULT, 1969. *Eoc.*, Europe (France).
- Sophrobombus** COCKERELL, 1909p, p. 21 [**S. fatalis*; OD]. Similar to *Chalcobombus*. Mandibles with a convex cutting edge; ocelli large and arranged in a curve; basitarsus flattened, short; inner hind tibial spur present. ZEUNER & MANNING, 1976. *Oligo.*, Europe (Baltic).
- Tetralonia** SPINOLA, 1839, p. 538. THÉOBALD, 1937a. *Oligo.*, Europe (France)–*Holo.*
- Trigona** JURINE, 1807, p. 245 [=*Meliponorytes* TOSI, 1896, p. 352 (type, *M. succini*)]. COCKERELL, 1922e; WILLE, 1959, 1977; KELNER-PILLAULT, 1970b; KERR & DA CUNHA, 1976; ZEUNER & MANNING, 1976; MOURE & CAMARGO, 1978; MICHEMER, 1982. *Oligo.*, Europe (Baltic); *Oligo./Mio.*, Mexico (Chiapas); *Mio.*, Europe (Sicily), Burma–*Holo.*
- Xylocopa** LATREILLE, 1802, p. 379. HEER, 1849; COCKERELL, 1909m; STATZ, 1936b; ZEUNER, 1938; ZEUNER & MANNING, 1976. *Oligo.*, Europe (Germany); *Mio.*, Europe (Germany)–*Holo.*

Family UNCERTAIN

The following genera, apparently belonging to the order Hymenoptera, suborder Apocrita, are too poorly known to permit assignment to families.

- Baissobius** RASNITSYN, 1975, p. 128 [**B. parvus*; OD]. Fore wing with venation much reduced; no closed cells distal to level of basal sections of RS and M, except for cell 3r; pterostigma elongate. Head large and wide, with small eyes. *Cret.*, USSR (Asian RSFSR).
- Cenomanscelio** SCHLÜTER, 1978a, p. 78 [**C. pulcher*; OD]. Little-known genus, based on body; venation unknown. Antennae with 11 segments, apical 5 enlarged and forming a club; lateral ocelli relatively close to compound eyes. [Possibly related to Scelionidae.] *Cret.*, Europe (Germany).
- Cretopone** DLUSSKY, 1975, p. 119 [**C. magna*; OD]. Little-known genus, possibly a formicid. Female: middle and hind tarsi with single spurs; petiole apparently very large. *Cret.*, USSR (Kazakh).
- Cretosphex** RASNITSYN, 1975, p. 106 [**C. incertus*; OD]. Fore wing with basal sections of RS and M aligned to form straight, oblique line; crossvein 1r-rs obsolescent; crossvein 2r-rs directed toward wing apex; apex of cell 3r acute; crossvein 1m-cu at base of cell 2rm. Pronotum of moderate length, projecting at sides; legs short; femora very short and thick; first segment of hind tarsus not broadened; abdomen long, strongly sclerotized. [Possibly related to the Sphecoidea.] RASNITSYN, 1980a, 1980b. *Cret.*, USSR (Asian RSFSR).—FIG. 265,6. **C. incertus*; wings and body, X25 (Rasnitsyn, 1975).
- Curiousvespa** RASNITSYN, 1975, p. 113 [**C. curiosa*; OD]. Fore wing with RS arising from R at base of pterostigma; pterostigma narrow; apex of cell 3r submarginal; crossvein 1m-cu far basad of cell 2rm. [Possibly related to Masaridae.] *Cret.*, USSR (Kazakh).—FIG. 265,5. **C. curiosa*; fore wing, X5.5 (Rasnitsyn, 1975).
- Diapriites** STATZ, 1938b, p. 104 [**D. insignicornis*; OD]. Little-known genus, possibly a proctotrupoid. Antennae with 12 segments. *Oligo.*, Europe (Germany).
- Iscopinus** KOZLOV, 1974, p. 145 [**I. baissicus*; OD]. Antennae with at least 15 segments; cell 3r closed; segments of gaster short, transverse. [Possibly related to Peleinidae.] *Cret.*, USSR (Asian RSFSR).
- Platygasterites** CARPENTER, herein [**P. femoralis* STATZ, 1938b, p. 106; OD]. Little-known genus; wing venation apparently absent. [The original generic name, *Platygasterites*, was a nomen nudum (STATZ, 1938b).] *Oligo.*, Europe (Germany).

Proctotrypites MEUNIER, 1918, p. 145 [**P. rotensis*; OD]. Little-known genus. Antennae with 11 segments; venation much reduced. *Oligo.*, Europe (Germany).

Scelionites STÄTZ, 1938b, p. 107 [**S. capitatus*; OD]. Little-known genus, possibly a proctotropoid. *Oligo.*, Europe (Germany).

Vitimosphex RASNITSYN, 1975, p. 127 [**V. incompletus*; OD]. Little-known genus, probably related to *Baissodes*. Fore wing with cell 3r narrowly rounded apically; RS extending beyond apex of cell 3r; cell 2rm short. *Cret.*, USSR (Asian RSFSR).

Suborder UNCERTAIN

The following genera, apparently belonging to the order Hymenoptera, are too poorly known to permit assignment to suborders.

Proapocritus RASNITSYN, 1975, p. 22 [**P. precursor*; OD]. Little-known genus, based on fore wing fragment; SC absent; area between R and costal margin narrow; basal section of RS straight and shorter than basal section of M, with slight slope toward wing apex; crossvein 1r-rs weakly developed; crossvein 2r-rs situated at center of pterostigma; cell 1muc long. [Possibly related to Karataviidae, suborder Symphyta.] *Jur.*, USSR (Kirghiz).

Protenthredo PONGRÁCZ, 1928, p. 156 [**P. trans-sylvanicus*; OD]. Little-known genus; venation unknown. *Mio.*, Europe (Croatia).

Infraclass NEOPTERA Order UNCERTAIN

The following genera, apparently belonging to the infraclass Neoptera, are too poorly known to permit assignment to orders.

Aleuronympha RIEK, 1974b, p. 272 [**A. bibulla*; OD]. Little-known genus, based on small nymph with wing buds. [Originally placed in the Hemiptera (Homoptera, family Permaleurodidae) but probably belonging to the Blattaria. The supposed eyes are cuticular protuberances on pronotum; see ROTH, 1982, figs. 16–20. Also see note under *Permaleurodes*.] *Perm.*, South Africa.

Apheloneura CARPENTER, 1976, p. 365 [**A. minutissima*; OD]. Little-known genus, based on complete wings and parts of body. [Type of the family Apheloneuridae CARPENTER, 1976.] *Perm.*, USA (Kansas).

Aphryganoneura TILLYARD, 1926e, p. 276 [**A.*

anomala; OD]. Little-known genus. [Placed in the Mecoptera by TILLYARD (1926e) and MARTYNOVA (1962e) but considered by HANDLIRSCH (1939) to belong to the Neuroptera.] RIEK, 1953; WILLMANN, 1978. *Perm.*, Australia (New South Wales).

Archipanorpa TILLYARD, 1917a, p. 191 [**A. magnifica*; OD]. Little-known genus, based on wing fragments. [Type of the family Archipanorpidae TILLYARD, 1917a; assigned by TILLYARD (1917a) to a new order, Protomecoptera.] RIEK, 1953; WILLMANN, 1978. *Trias.*, Australia (Queensland).

Austroidelia RIEK, 1954c, p. 161 [**A. perplexa*; OD]. Little-known genus, based on proximal fragment of wing. [Originally placed in the Protoorthoptera (family Ideliidae).] *Trias.*, Australia (New South Wales).

Choristosialis TILLYARD, 1932a, p. 19 [**C. enigmatica*; OD]. Little-known genus, based on wing fragment. [Type of the family Choristosialidae TILLYARD, 1932a. Originally placed by TILLYARD in the Neuroptera, but transferred to the Mecoptera by CARPENTER (1943a); ordinal position considered by WILLMANN (1978) to be uncertain.] *Perm.*, USA (Kansas).

Climaconeura PRUVOST, 1912, p. 327 [**C. remauxi*; OD]. Little-known genus, based on fragment of wing. [Type of the family Climaconeuriidae HANDLIRSCH, 1919b. Originally placed in the Protoorthoptera by PRUVOST (1912, 1919); transferred by HANDLIRSCH (1919b, 1922) to the order Mixotermitoidea, by HAUPT (1952) to the Mecoptera, and by SHAROV (1962d) to the Protoorthoptera (Paraplectoptera).] WILLMANN, 1978. *U. Carb.*, Europe (France).

Crosaphis EVANS, 1971, p. 146 [**C. anomala*; OD]. Little-known genus, based on wing. [Placed in the Hemiptera (Aphidoidea) by EVANS (1971) and in the Hemiptera (Coccoidea) by HEIE (1981); transferred to Diptera by KOVALEV (1983).] *Trias.*, Australia (Queensland).

Ctenostematopteryx HAUPT, 1952, p. 253 [**C. thuringiaca*; OD]. Little-known genus. [Originally placed in the Mecoptera, but transferred to Insecta, incertae sedis by HENNIG (1969c).] WILLMANN, 1978. *Perm.*, Europe (Germany).

Elmethone CARPENTER, 1976, p. 353 [**E. martynovae*; OD]. Little-known genus, based on incomplete fore wing. [Originally placed in the order Neuroptera.] *Perm.*, USA (Kansas).

Eopanorpella SCHMIDT, 1962, p. 849 [**E. ernsti*; OD]. Little-known genus, based on incomplete wing. [Originally placed in the Mecoptera (family Permochoristidae), but assignment to that order has been seriously questioned by HENNIG (1969c) and WILLMANN (1978).] *U. Carb.*, Europe (Germany).