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An illustrated Key to the Genera and Subgenera of the Western Palaearctic Limoniidae (Insecta: Diptera), including a Description of the External Morphology

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With 195 figures

Summary

In this paper a key is presented by which the adult Limoniidae (Diptera, Nematocera) of the western Palaearctic region can be identified unto genus-group level (section 3.). Also, the external morphology of adult Limoniidae is dealt with (2.). The taxonomic position of the genus-group taxa, as mentioned in the key, according to the two main classification systems of Alexander and of Savchenko is given in an appendix (5.), as well as a list of the most frequently used synonym names for genus-group taxa (6.).

Zusammenfassung

In dieser Arbeit wird eine Bestimmungstabelle für die Gattungen und Untergattungen (ohne Unterschied) der westpaläarktischen Limoniidae (Diptera, Nematocera) veröffentlicht (Kapitel 3.). Neben dieser Tabelle, in der nur die Merkmale der Imaginalphase berücksichtigt worden sind, wird eine Beschreibung des äußeren Körperbaus der Imagines gegeben (Kap. 2.). Die in der Bestimmungstabelle erwähnten Taxa wurden im Anhang den zwei vorherrschenden Klassifikationssystemen von Alexander und Savchenko zugeordnet (5.). Eine Liste mit den am häufigsten verwendeten Synonymen der Namen einiger Gattungen oder Untergattungen ist angefügt (6.).

Contents

1. Introduction

The Limoniidae, one of the main groups of crane-flies, is represented by about 600 species in the western Palaearctic region. Its diversity of forms is reflected by the number of genera, which in this area is at least 35, as may be derived from Edwards (1938) and Alexander & Byers (1981), and may be as large as 58, as indicated by Savchenko (1982, 1983, 1985).

The main purpose of this paper is to present a key by which the adult limoniid crane-flies of the western Palaearctic region can be identified to subgeneric rank (section 3). No such key exists at the moment. Some of the keys available until now cover one subfamily only, e. g. Limoniinae (Geiger, 1984 – in French). The other ones deal with only a part of the region, e. g. Czechoslovakia (Slípka & Starý, 1977 – in Czech), or the Ukraine (Savchenko, 1982 – in Ukrainian; id. 1985, 1986 – in Russian).

Preceding the key, an explanation is given of the external morphology of limoniid crane-flies, as far as needed for their correct identification (section 2).

1.1. Methods

Starting-point for the key of this paper was the key by Slípka & Starý (1977). As these authors deal with Czechoslovakian taxa only, it was necessary to check whether the characters used for separating particular genus-group taxa were still valid for all those species of the region, which belong to these taxa, but do not occur in Czechoslovakia. In addition to this, genus-group taxa not represented in Czechoslovakia had to be inserted. So an inventarisation was made of all genus-group taxa in question, using a vast amount of literature, largely present as separate papers only. Obviously, characters as used by Slípka & Starý (l.c.) were compared with those used by Savchenko & Krivolutskaya (1976), Savchenko (1983), and Alexander & Byers (l.c.), amongst others. As a consequence, the key as presented here has a completely new appearance. Especially the part dealing with the Eriopterinae had to be rearranged. Finally, the key was checked by identifying material preserved in the collection of the Zoological Museum of Amsterdam.

1.2. Classification

In the present paper, Limoniidae are treated as a separate family. In this respect it is in accordance with the views of both SLÍPKA & STARÝ (1977) and SAVCHENKO (1983). It differs, however, with the work of ALEXANDER & BYERS (1981), which treats them as subfamily of Tipulidae s. l. Neither of these opinions, however, is probably correct, as the Limoniidae do not seem to represent a monophyletic group.

HENNIG (1954) already made the suggestion that "the Tipulidae are more closely related to certain Limoniidae as now seems to be the case, that, consequently, the Tipulidae would not be at all the sister group of the Limoniidae". This view seems to be confirmed by a recent study of larval and pupal characters of tipulid, limoniid and cylindrotomid crane-flies all over the world, as available from literature (OOSTERBROEK & THEOWALD, in press). The same study makes it likely that the traditional distribution of the Limoniidae into the four subfamilies Limoniinae, Pediciinae, Hexatominae and Eriopterinae is phylogenetically incorrect. Nevertheless, in this paper the term Limoniidae and those of the four subfamilies are maintained for practical reasons (see also section 4).

The key leads eventually to genus-group names, which correspond to the taxa of both generic and subgeneric level. Whether such a name refers to a genus or a subgenus is not indicated in the key itself. Instead, the taxonomic position of each genus-group taxon according to the classification systems of ALEXANDER and of SAVCHENKO is found in section 5.

1.3. Area of distribution

The western Palaearctic region, as conceived in this paper, includes all of Europe (but not Greenland), and the countries bordering the Mediterranean in N. Africa and in the Near East.

1.4. Immature stages

A key to the genera for larval and pupal stages of Limoniidae is given by BRINDLE (1967). Records about their ecology as well as further references may be found in BRINDLE (l. c.) and MENDL (1978).

1.5. Preservation of terminalia

Of much importance for a correct identification are the male, and in same cases the female, terminalia. These structures can only roughly be studied in a dried condition. For any exact observation, however, especially when the clasping organs of the male individuals are strongly folded inwards, it is preferable to make a preparation. This may be done as follows:

(1) The tip of the abdomen is cut off and placed in a small glass tube.
(2) A small quantity of a 10% solution of KOH in water is added.
(3) The tube is placed in a larger vessel containing some water, which is boiled for a few minutes.
(4) The tube is taken out of the vessel, and the tip of the abdomen is washed three times, once with water and twice with 70% alcohol.
(5) The tip of the abdomen is placed in alcohol or glycerine for further study.
(6) For storage, the tip of the abdomen is placed with a few drops of glycerine in a polyethene microvial. The microvial is attached to the pin of the dried specimen to which the terminalia belong.

1.6. Short bibliography

No extensive account exists on the Limoniidae of the region. Whereas for both Tipulidae (Mannheims & Theowald, 1951–1980 and Savchenko, 1961–1983) and Cylindrotomidae (Peus, 1952) of the western Palaearctic there are rather complete, albeit somewhat out-dated, surveys, a comparable work does not exist for the Limoniidae. A good start was made by Lackschewitz & Pagast (1940–1942), whose work, however, has never been completed. Some major works of reference are those of De Meijere (1919–1921), Edwards (1938), Lackschewitz (1940a, b), Czižek (1933) and Savchenko (1982, 1985, 1986). Many original drawings of male terminalia are given by Starý & Rozkošný (1969). These works, however, are partly out of date, partly they cover only one of the subfamilies or only a part of the region, or have both restrictions.

2. Morphology and terminology

This section deals with the external morphology of the adult Limoniidae. Successively the various parts of head, thorax and abdomen are mentioned and their terminology explained (Figs. 1–9).

2.1. Head

The head is composed of a hardened capsule, the cranium, which bears the antennae, the eyes and the mouthparts. Taxonomically important regions of the cranium are the vertex, situated dorsally, and the frons, anteriorly.

2.1.1. Antenna

The basal segments of each antenna, scape and pedicel, normally differ in size and shape from the remaining segments, the flagellomeres. The number of flagellomeres is usually 12–14; sometimes there may be less, as in *Hexatoma* Latreille s. l., or more, as in *Ludicia* Hutson & Vane-Wright. The flagellomeres are mostly of a simple shape, globular to oval or cylindrical. Sometimes they are very elongated, as in the males of some species of *Hexatoma* s. l. and *Rhabdomastix* Skuse, where the antenna may be as long as the whole body or even longer.

In other cases, as in *Neolimnophila* Alexander, *Crypteria* Bergroth and *Chionea* Dalman (Fig. 180) some of the flagellomeres are fused and so the number of antennal segments is also reduced. In *Rhipidia* Meigen each flagellomere may have one or more processes, in which case the antenna is called pectinate. The antennal segments may bear hairs of two different types: Short soft hairs and longer bristle-like hairs, the so-called verticillar hairs.

2.1.2. Eye

The compound eyes are usually widely separated above, but sometimes may be so large as to leave only a very narrow strip of the posterior vertex between them (*Atypophthalmus* Brunetti). Between the lenses of the individual eye units, the ommatidia, short erect hairs may be present, as in all Pediciinae. Simple eyes or ocelli are always absent.

2.1.3. Mouthparts

The mouthparts comprise the unpaired elements labrum, hypopharynx and labium, and the paired maxillae, which arise between labrum and labium. Of some taxonomic importance is the palpus, the segmented appendage of each maxilla. The first (basal)

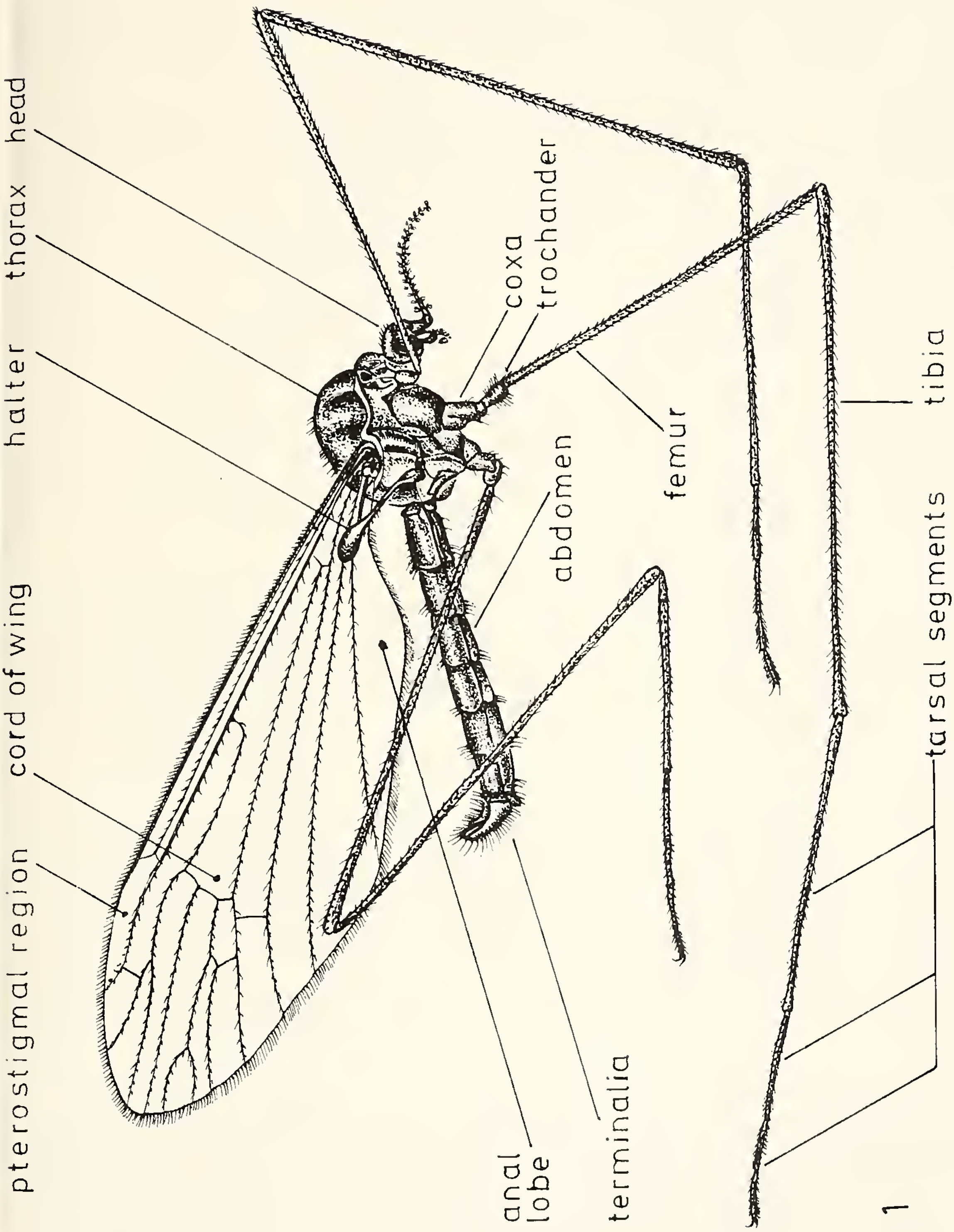


Fig. 1. Male of *Neolimnophila carteri* Tonn., lateral view. – After Savchenko.

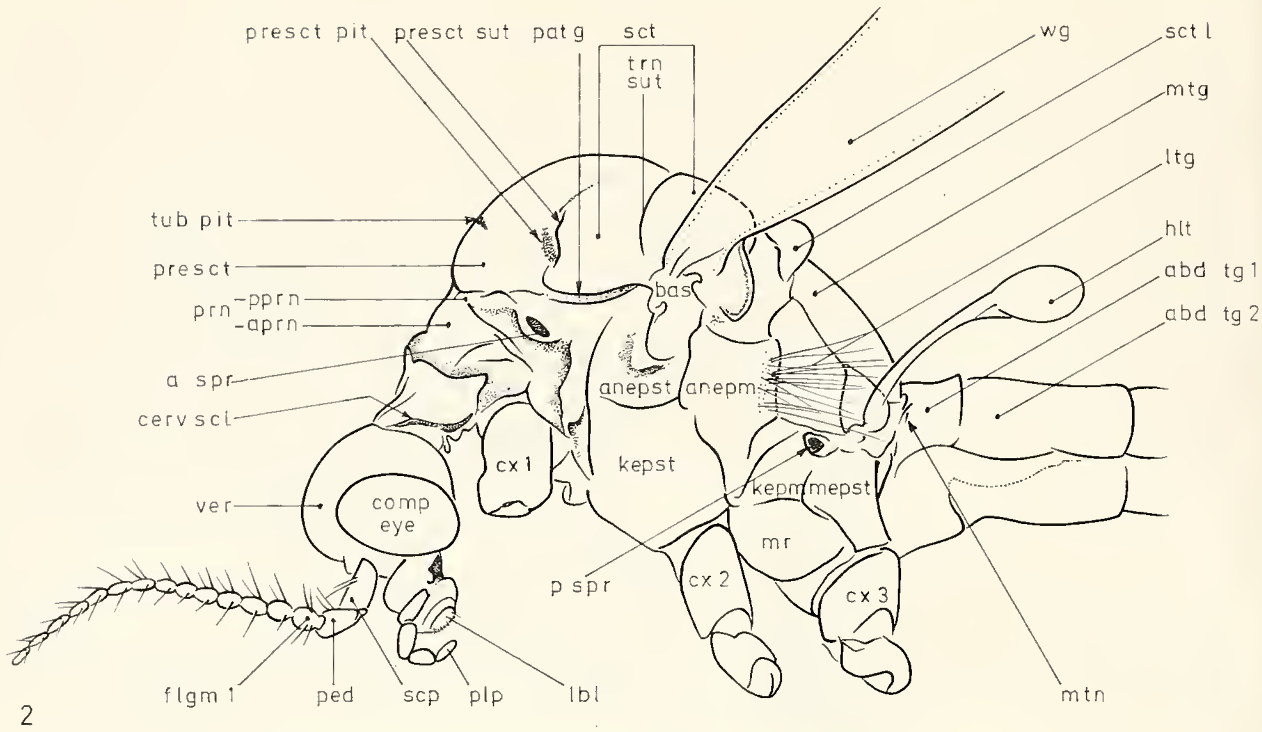


Fig. 2. Head and thorax of *Erioconopa trivialis* Mg., lateral view. – Orig.
Abbreviations:

abd tg	abdominal tergite	*mtn*	metanotum
anepm	anepimeron	*patg*	paratergite
anepst	anepisternum	*ped*	pedicel
aprn	antepronotum	*plp*	palpus
a spr	anterior spiracle	*pprn*	postpronotum
bas	basalare	*presct*	prescutum
cerv scl	cervical sclerite	*presct pit*	prescutal pit
comp eye	compound eye	*prest sut*	prescutal suture
cx	coxa	*prn*	pronotum
flgm	flagellomere	*p spr*	posterior spiracle
hlt	halter	*scp*	scape
kepm	katepimeron	*sct*	scutum
kepst	katepisternum	*sctl*	scutellum
lbl	labellum	*trn sut*	transverse suture
ltg	laterotergite	*tub pit*	tuberculate pit
mr	meron	*ver*	vertex
mepst	metaepisternum	*wg*	wing.
mtg	mediotergite		

segment of the palpus is very small and mostly with difficulty to be seen. Including this basal one, each palpus has usually five segments. Sometimes, however, there may be less. So, in *Achyrolimonia decemmaculata* Loew, the apparent number of palpal segments is only two. The paired labella are the modified labial palpi, which are appendages of the labium. Labrum, hypopharynx and labella are very long and slender in *Geranomyia* Haliday.

No elongate mouthparts, but a long to very long rostrum is found in *Helius* Lepeletier & Serville and *Elephantomyia* Osten Sacken. The snout-like rostrum, which is a prolongation of the head capsule beyond the eyes, is in most Limoniidae short and inconspicuous. Its distal end is indicated by the position of the palpi.

2.2. Thorax

The terminology of the various elements of the thorax is explained in Fig. 2. The dorsal plate of the prothorax is called pronotum, which is divided into anterior and posterior parts, antepronotum and postpronotum, respectively. The mesonotum represents the dorsum of the mesothorax. Its basic components are prescutum, scutum and scutellum. It also includes a fourth part posteriorly, the postnotum. The metanotum, which represents the dorsum of the metathorax, is vestigial, as in nearly all other Diptera.

A characteristic V-shaped groove, the transverse suture, divides the scutum into an anterior and posterior region. The prescutal suture, separating the prescutum from the scutum, is only partially present. Its position coincides closely with the prescutal pits (humeral pits), a pair of mostly large, shallow depressions of the integument. Another pair of smaller depressions, the tuberculate pits (anterior pits) are found in the anterior half of the prescutum.

The mediotergite lies directly behind the scutellum. It belongs to the postnotum, which includes all the parts of the mesonotum behind and below the scutellum.

Two elements of the mesopleuron, the pleural region of the mesothorax, are still to be mentioned. They are the anepimeron (pteropleuron), which lies directly below the base of the wing, and the meron, situated immediately posterior to the middle coxa. The size of the meron is of taxonomic importance in Eriopterinae (Figs. 115–119).

2.2.1. Legs

Articulated spurs may be present at the distal end of the tibia. Sometimes these spurs are very small, but may be distinguished from hairs or bristles by having microscopic barbules on their surface. Normally the front tibiae have one spur each, the middle and hind tibiae two each, but in a few cases these numbers may be reduced.

2.2.2. Wings

As in all Diptera, only the front or mesothoratic pair of wings is well-developed; the metathoracic pair is reduced to the small, club-like halteres.

The membranous area of the wing between the supporting frame-work of the wing veins is referred to as the wing membrane. The wing membrane may bear hairs of two different kinds: microtrichia and macrotrichia. The microtrichia, which cover the whole wing surface, are merely extensions of the cuticle and are not associated with cells of the unterlying epithelium. They may be distinguished from macrotrichia by having no socket and by their very small size.

The macrotrichia may also be very small sometimes, but a macrotrichium is always placed on a distinct socket, which is formed by a special cell of the epithelium. Actually, there is no morphological difference between a seta and a macrotrichium, but the latter term is usually reserved for the setae of the wing membrane.

A clearly defined opaque or pigmented area, the pterostigma, is often found in the wing membrane near the point where R1 reaches the wing margin. In some cases macrotrichia may be present in the pterostigmal region, whilst they are lacking in the rest of the wing membrane.

Near the apical third of the wing a distinctive area may be found, the cord, where branching of Rs, M and CuA often results in a more or less linear, transverse line. The anal lobe is the more or less triangular part of the wing in the area of cell A2. The curvature of the wing margin here is indicated as the anal angle (see Fig. 1).

A thickening of the wing blade, near the basal hind margin of the wing is called the squama. It may be provided with setae, as in *Pilaria* Sintenis (Fig. 71).

2.2.2.1. Wing venation

The terminology of the wing venation, which is in accordance with the COMSTOCK-NEEDHAM system as interpreted by McALPINE (1981), is explained in Figs. 6–9. Each of the primary veins consists of two main branches, an anterior branch (A) and a posterior branch (P). The abbreviations are as follows (for a further explanation see McALPINE l. c.):

C	costa
Sc	subcosta
Sc1, Sc2	branches of subcosta
R	radius
R1	anterior branch of radius
Rs	radial sector (posterior branch of radius)
R2–R5	branches of Rs
MA	anterior branch of media (arculus)
M	(posterior branch of) media
M1–M3	branches of M
CuA	anterior branch of cubitus
CuA1, CuA2	branches of CuA
CuP	posterior branch of cubitus
A1	anterior branch of anal vein (first anal vein)
A2	posterior branch of anal vein (second anal vein)
h	humeral crossvein
r–m	radial-medial crossvein
m–cu	medial-cubital crossvein
m–m	medial crossvein (situated between M2 and M3).

The cells of the wing are mostly named after the (part of the) vein which forms their anterior border. Some of them are named *br* (basal radial), *bm* (basal medial) and *dm* (discal medial).

Some points of interest are still to be mentioned:

(1) A free tip of Sc2, by ALEXANDER (1929) assumed to be present in some Limoniinae, probably never occurs (HENNIG, 1954).

(2) R2 never reaches the wing margin as a separate vein, but merges into R1 (cephalization of vein R2) (ALEXANDER, 1918, 1927, 1929).

(3) The primary forking of Rs into R2+3 and R4+5 in many cases has been lost by a shifting in position of R4 (capture of R4 by R2+3) (ALEXANDER, 1918, 1927, 1929); the primary fork here is formed by R2+3+4 and R5.

(4) MA appears as a short transverse vein ("arcular crossvein") between R and M near the base of the wing (Fig. 71).

(5) M has only three free branches: M1 to M3. The branch of vein here indicated as CuA1 may have been arisen from coalescion of originally separate branches M4 und CuA1 (HENNIG, 1954). Consequently, this branch of vein may equally well be designated as M4, and so it is called by most authors of Limoniidae. The crossvein m-cu of these authors is indicated here as "basal section of CuA1".

(6) CuP is a weak vein without tracheae, situated closely behind CuA. It is indicated as a dotted line in Figs. 6–9.

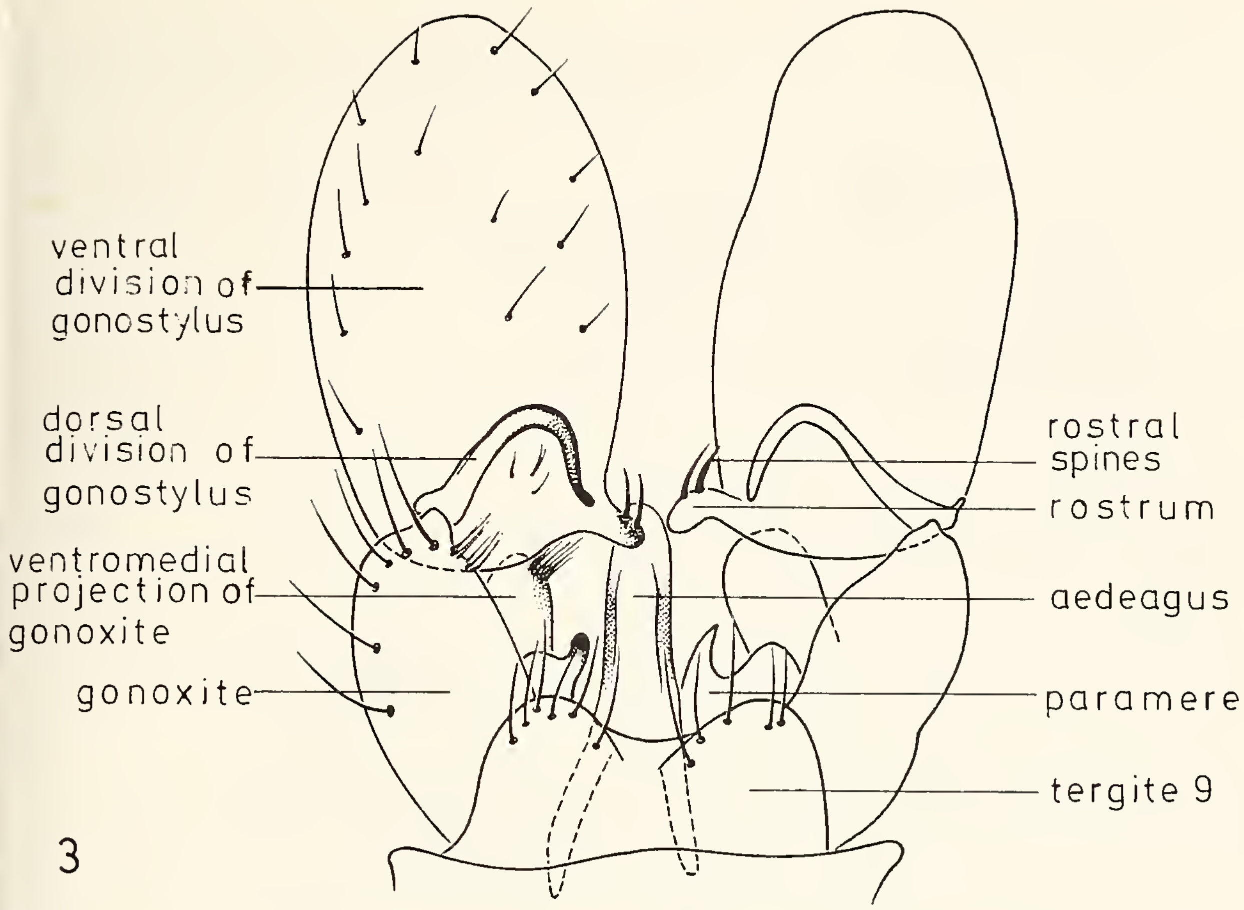


Fig. 3. Male terminalia of *Dicranomyia mitis* Mg., dorsal view. – After STARÝ.

2.2.2.2. Reduction of wing

The normal condition, with fully developed wings, is called macropterous. In a minority of species the wing is found to be reduced in size. Several cases may be distinguished:

(1) The wings are moderately shortened (brachypterous forms) (Figs. 184, 187, 194).
(2) The wings are narrowed; the main veins that have been retained are the radial veins (stenopterous forms) (Figs. 183, 186, 195).
(3) The wings have been reduced to very small knobs (micropterous forms) (Figs. 176, 188, 189).

Obviously, these three categories cannot be separated strictly. So the difference between the brachypterous and micropterous condition is a gradual one. Moreover, a wing may be both shortened and narrowed (Fig. 195), and this condition might be designated as both brachypterous and stenopterous.

A reduction of the wing may be found in both sexes, as in *Dactylolabis wodzickii* Nowicki, in females only, as in *Idioptera pulchella* Meigen, or in populations or races of a particular species, as in *Paradicranota parviuncinata* Savchenko (Figs. 185–193).

2.3. Abdomen

The terminal segments of the abdomen show various kinds of structures, which play a role in copulation and oviposition. These last segments and their appendages, referred to as the terminalia, are of great taxonomic importance, especially in the male. For a more detailed discussion of male and female reproductive systems in tipulid craneflies, see FROMMER (1963).

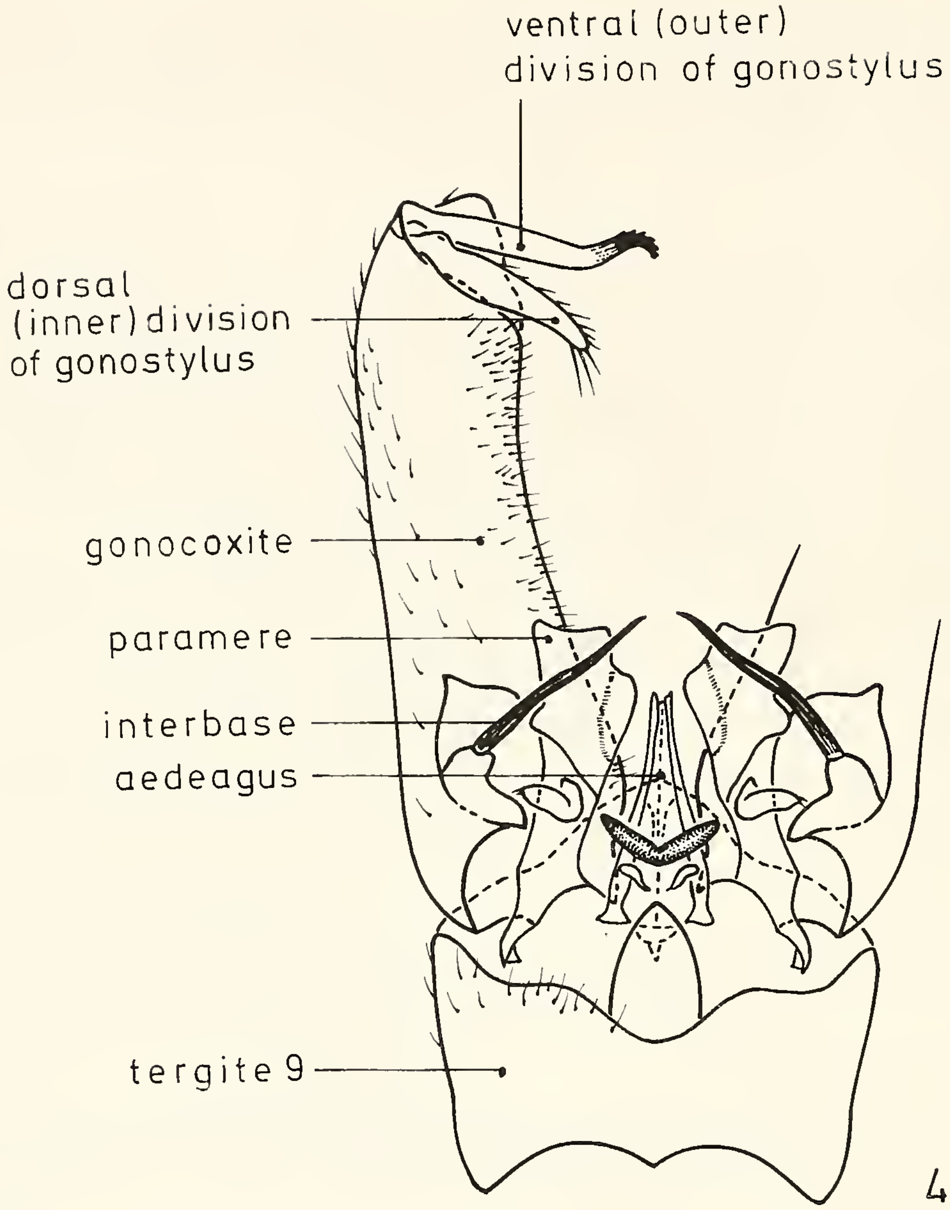


Fig. 4. Male terminalia of *Neolimnophila carteri* Tonn., dorsal view. – After SAVCHENKO.

2.3.1. Male terminalia

The male terminalia, also called hypopygium, include the following parts (cf. Figs. 3,4):

(1) Tergite 9, the dorsal plate of the 9th segment.
(2) Sternite 9, the ventral plate of the 9th segment.
(3) A pair of gonopods, two-segmented clasping organs, which arise posterolaterally on sternite 9.
(4) A pair of parameres, unsegmented processes arising between the bases of aedeagus and gonopod.
(5) The aedeagus or intromittent organ, occupying a median position at the ventral side of the terminalia.
(6) The proctiger or anal segment, situated between tergite 9 and the aedeagus.

Tergite 9 is a conspicuous plate; its hind margin may be plain, incised or bear processes of various kinds. Usually tergite 9 is separate, but in some cases it is fused with sternite 9 to form a more or less continuous ring, as in *Phyllolabis* Osten Sacken (Fig. 65).

Mostly tergite 9 occupies a dorsal position, but in some Eriopterinae, where the terminalia are inverted (section 2.3.1.1.), it is found at the ventral side of the abdomen.

The gonopods are composed of a basal gonocoxite and a distal gonostylus. The gonocoxite is clearly separate from the sternite and often provided with lobes or processes. These lobes and processes may be of various forms and situated at various places of the gonocoxite, either more dorsal (as in *Gonomyia bifida* Tonnoir, Fig. 125) or ventral, at the apex (as in *Cheilotrichia exigua* Lackschewitz) or near the base (as in *Dicranomyia coeiana* Nielsen, Fig. 21).

The gonocoxite may have a structure in form of a long rod or spine, situated medially at its base. This so-called interbase may be found in Pediciinae, in *Rhabdomastix* and in *Neolimnophila* (Fig. 4), amongst others.

The second segment of the gonopod, the gonostylus, articulates at its proximal end with the gonocoxite and so it may easily be distinguished from the above mentioned processes, which never articulate. Mostly the gonostylus is divided into two parts, which articulate more or less separately. These parts are called ventral and dorsal division, because of their position. As the divisions may be flexed inwards (compare Fig. 4), the ventral and dorsal division are also indicated as outer and inner division, respectively.

The divisions of the gonostylus are of very varied forms. In *Dicranomyia* Stephens and some of its allied subgenera the dorsal division is a curved, darkly coloured bare hook, whereas the ventral division is mostly large and swollen. At its inner side this ventral division bears a projection, the so-called rostrum, which is usually provided with two heavy spines (Fig. 3). In *Sphaeropyga* Savchenko (Figs. 23, 24) the huge ventral style comprises various parts of rather bizarre form.

One of the two divisions may be completely lacking, as in *Limonia* Meigen (Fig. 22) or *Dasymolophilus* Goetghebuer (Figs. 111, 112). In other cases the two parts may be more or less fused, as in *Tricyphona* Zetterstedt (Fig. 43). Rather exceptional is the presence of three separate divisions, as may be seen in *Idiocera* Dale and some allied subgenera.

The unsegmented parameres (also called gonapophyses) are movable processes, which are located on, and articulate with, the area between the base of the aedeagus and the dorsomedial base of each gonocoxite. They may be of very different size and shape, and serve as accessory structures for supporting and directing the aedeagus during copulation. Usually one pair of parameres is present, sometimes there may be two pairs, as in *Archilimnophila* Alexander (Fig. 79).

Above the aedeagus, separating it from the proctiger, a transverse sclerotized plate may be found. This plate, indicated as tegmen by Edwards (1938), is often closely allied with the parameres, which may be poorly developed in these cases. An example of such a tegmen may be found in *Pedicia rivosa* Linnaeus. Sometimes plate and parameres are completely fused into a more or less closed ring round the base of the aedeagus.

The aedeagus is a two-walled, tubular organ with an inner tube, the endophallus, and an outer wall comprising a distal distiphallus and a basal basiphallus (Snodgrass, 1957). At its proximal end the endophallus is connected with the sperm duct, at its distal end it opens with a gonopore. The endophallus may be simple, with a single gonopore, or branched. In the latter case there are two or three gonopores, when the endophallus is bifid or trifid, respectively. Accordingly, the distiphallus may also be simple, bifid or trifid.

The outer wall of the aedeagus may bear processes without a gonopore. Such processes might be mistaken for parameres, but, unlike these, are never articulated.

The proctiger represents the last segment of the abdomen, which bears the anus. This mostly membranous structure of conical shape, lying dorsally between the bases of the gonopods, has no appendages. It is of little taxonomic importance, except for the cases where it is partly sclerotized, as in *Scleroprocta* Edwards (Fig. 146) and in *Amalopis occulta* Meigen (Fig. 51).

2.3.1.1. Rotation

In some genus group taxa of Eriopterinae the apical portion of the male abdomen is twisted along the longitudinal axis. As a result of this so-called rotation, the morphologically dorsal side of the male terminalia is found at a lateral or even ventral position. If the abdomen is in a dried condition, rotation may difficult be observed because of the effect of wrinkling. In such a situation it is preferable to make a preparation as indicated in Section 1.5.

The angle of rotation may vary from about 45-90°, as in *Erioconopa* Starý, *Ormosia* Rondani s. str., *Rhypholophus* Kolenati and *Oreophila* Lackschewitz, to about 180°, as in *Molophilus* Curtis, *Dasymolophilus* Goetghebuer, *Empeda* Osten Sacken, *Cheilotrichia* Rossi s. str. and *Ilisia* Osten Sacken s. l. A rotation through 180° is called inversion.

2.3.2. Female terminalia

The female terminalia, also called the ovipositor, include the modified segments 8 and 9 and their appendages (Fig. 5). Tergite 8, also referred to as the epigynium, is much shorter than the preceding tergite 7. The hypogynium or sternite 8 (also referred to as subgenital plate) is much more elongate, reaching far beyond tergite 8. At its distal end it bears two long, slender processes, the hypogynial valves (hypovalvae), which point backwards. Tergite 9 is usually present as a very narrow band. Tergite 10 is rela-

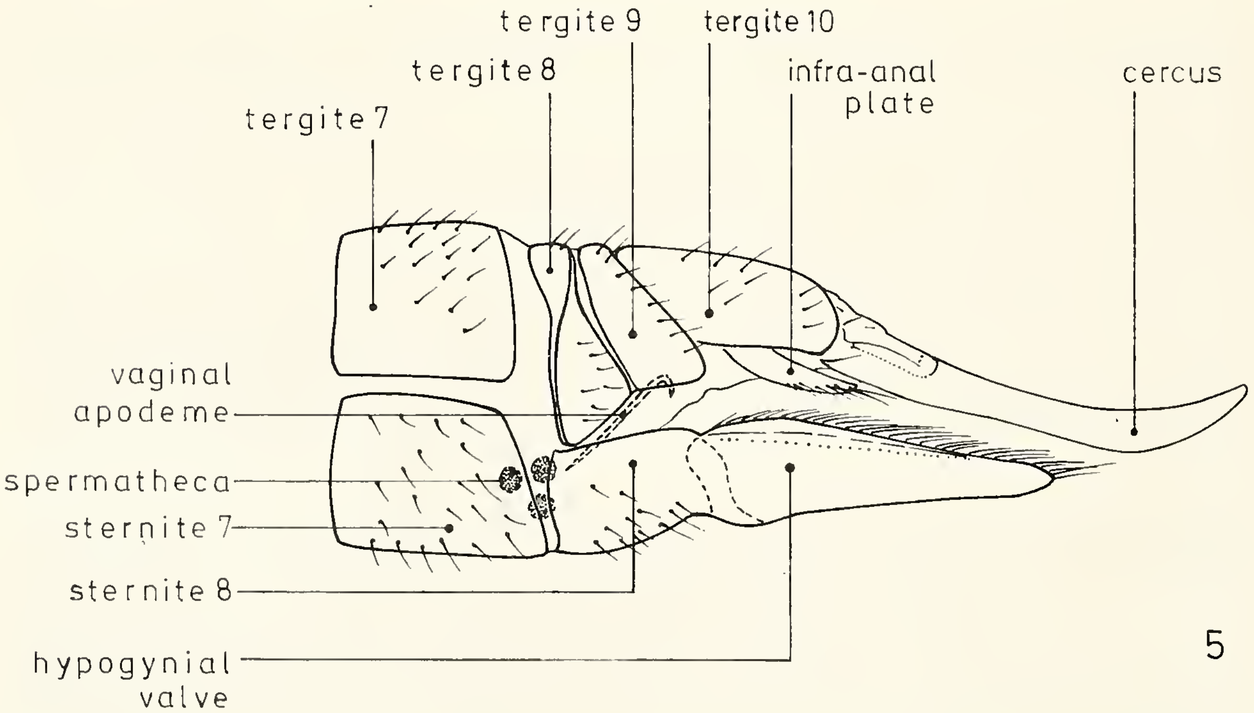


Fig. 5. Female terminalia of *Sacandaga parva* Siebke, lateral view. – After Tjeder.

tively large, bearing two cerci at its apex. Each cercus is usually a strong, blade-like element, which tapers towards its end, but sometimes may be reduced to a short, fleshy lobe as in *Baeoura* Alexander (Fig. 152) or *Protogonomyia* Alexander (Figs. 131, 132).

Directly above sternite 8 the genital chamber is found. Here are the openings of the oviduct, the gonopore, and of the common spermathecal duct. Sternite 9 is strongly reduced and situated dorsally of the gonopore where it extends as a small, more or less triangular plate. The more distal infra-anal plate (subanal plate), which lies directly below the anus, may represent sternite 10 or sternite 11.

The mainly internal vaginal apodeme (furca) is a sclerotized structure in the ventral wall of the genital chamber. In a preparation of the ovipositor the more or less spherical spermathecae may be seen shining through the wall of the abdomen. Their number is typically three, but may be reduced to two. In these mostly heavily sclerotized structures the spermatozoa are stored.

3. Keys

3.1. Key to the families of Tipulidae, Limoniidae, and Cylindrotomidae

The holarctic Limoniidae and Cylindrotomidae species may be distinguished from those belonging to the Tipulidae by means of the following characters:

– Sc 1 usually completely atrophied (but sometimes a rudiment may be present). – Last segment of palpus usually much longer than the three preceding ones together. – Rostrum mostly well developed, often anteriorly projecting into a sharply pointed nasus. – Antenna usually with 11 flagellomeres .... **Tipulidae**

– Sc 1 present (all Limoniidae, part of Cylindrotomidae), absent (part of Cylindrotomidae), or appearing as a rudiment and not connected with C (part of Cylindrotomidae). – Last segment of palpus rather short, about as long as the two preceding ones together (exceptions: the limoniid genus *Pedicia* Latreille and some Cylindrotomidae, with a rather long last palpal segment). – Nasus always absent; rostrum usually very short (exceptions: the limoniid genera *Elephantomyia* Osten Sacken and *Helius* Lepeletier & Serville, with a very elongate rostrum). – Antenna usually with 12 to 14 flagellomeres .... **Limoniidae** and **Cylindrotomidae.**

A clear separation of Cylindrotomidae and Limoniidae on account of venational characteristics is hardly possible. Instead, the following characters may be used (cf. BRODO, 1967):

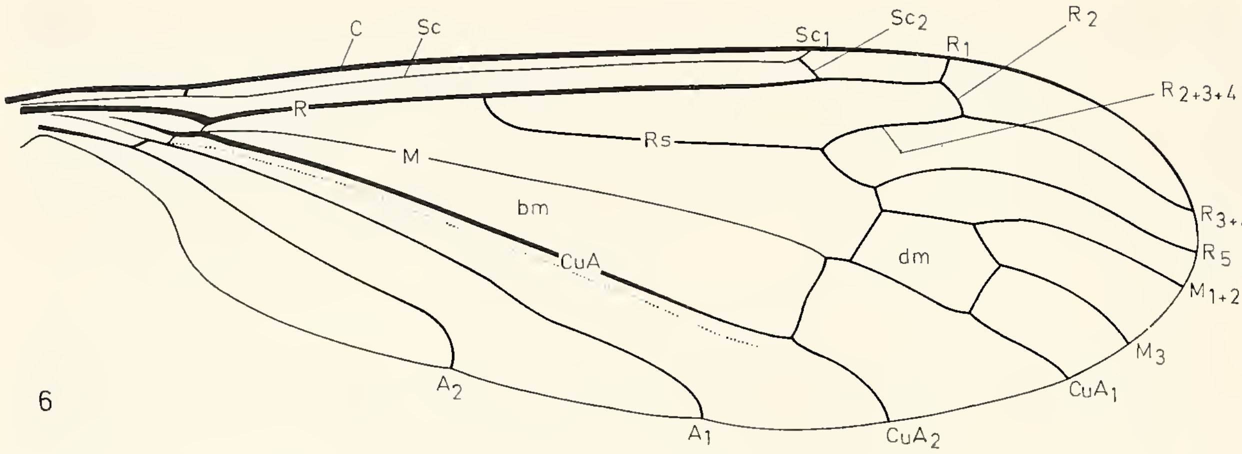
– Male: aedeagus tripartite (but bipartite in *Diogma* Edwards), often extruded in dried specimens; 1 pair of gonostyli.
Female: cerci short, broad. Mesonotal suture distinct only in median third of thorax, fading out laterally .... **Cylindrotomidae**

– Male: aedeagus usually having one or two openings, sometimes three; mostly two pairs of gonostyli, sometimes one or three.
Female: cerci usually elongate, pointed. Mesonotal suture distinctly V-shaped .... **Limoniidae.**

3.2. Key to the genus-group taxa

1 Wing fully developed 2
– Wing reduced or almost completely atrophied 102

2 Eye hairy, with short hairs between ommatidia; Sc 1 very long, exceeding fork of Rs; Sc 2 basal to origin of Rs (Fig. 7) .... (Pediciinae) 31
– Eye bare; Sc 2 usually situated distal to origin of Rs (as in Fig. 6); when Sc 2 basal to origin of Rs, Sc 1 not exceeding fork of Rs 3



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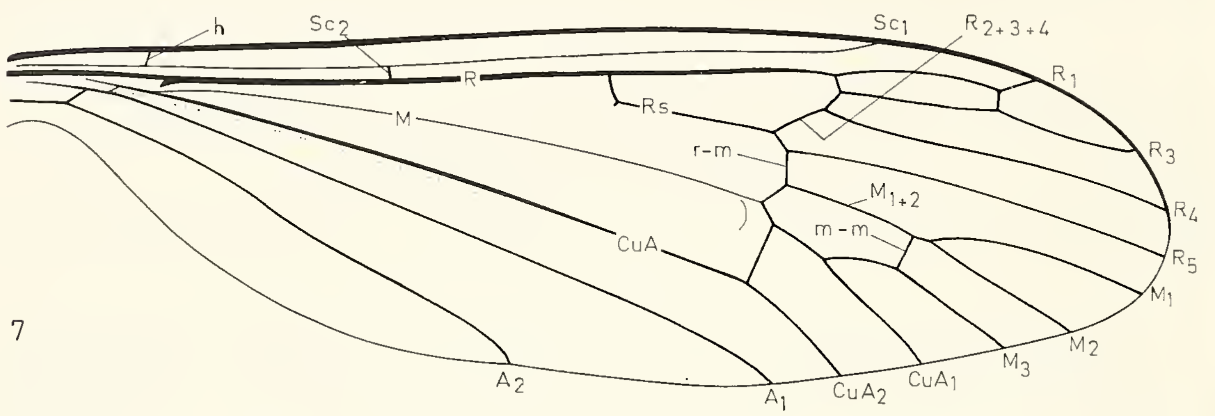

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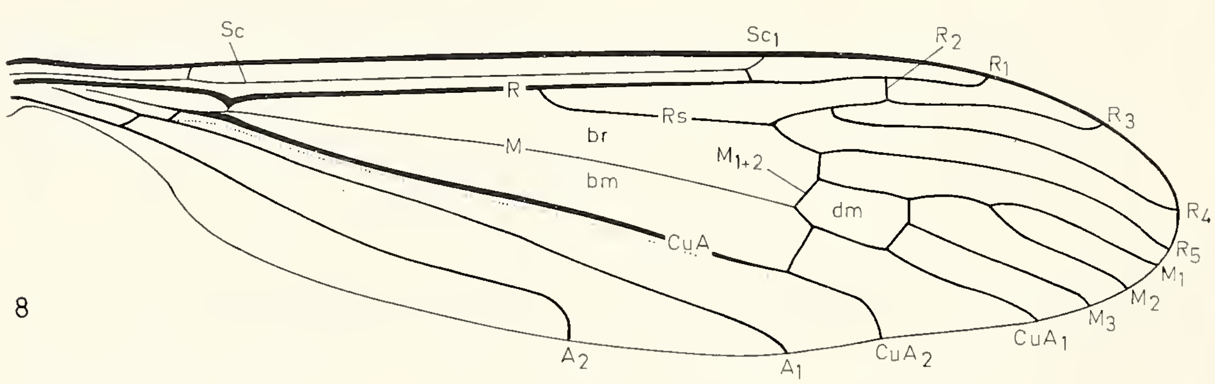

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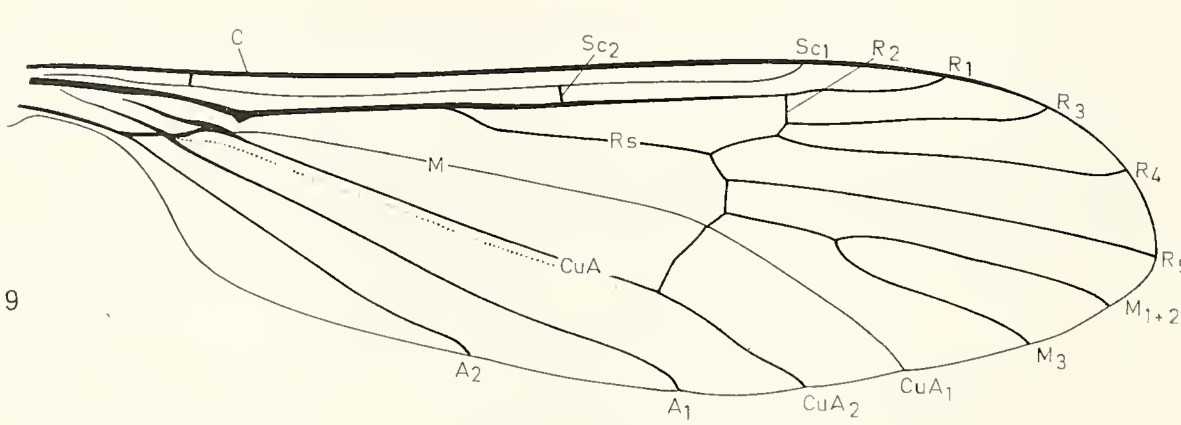

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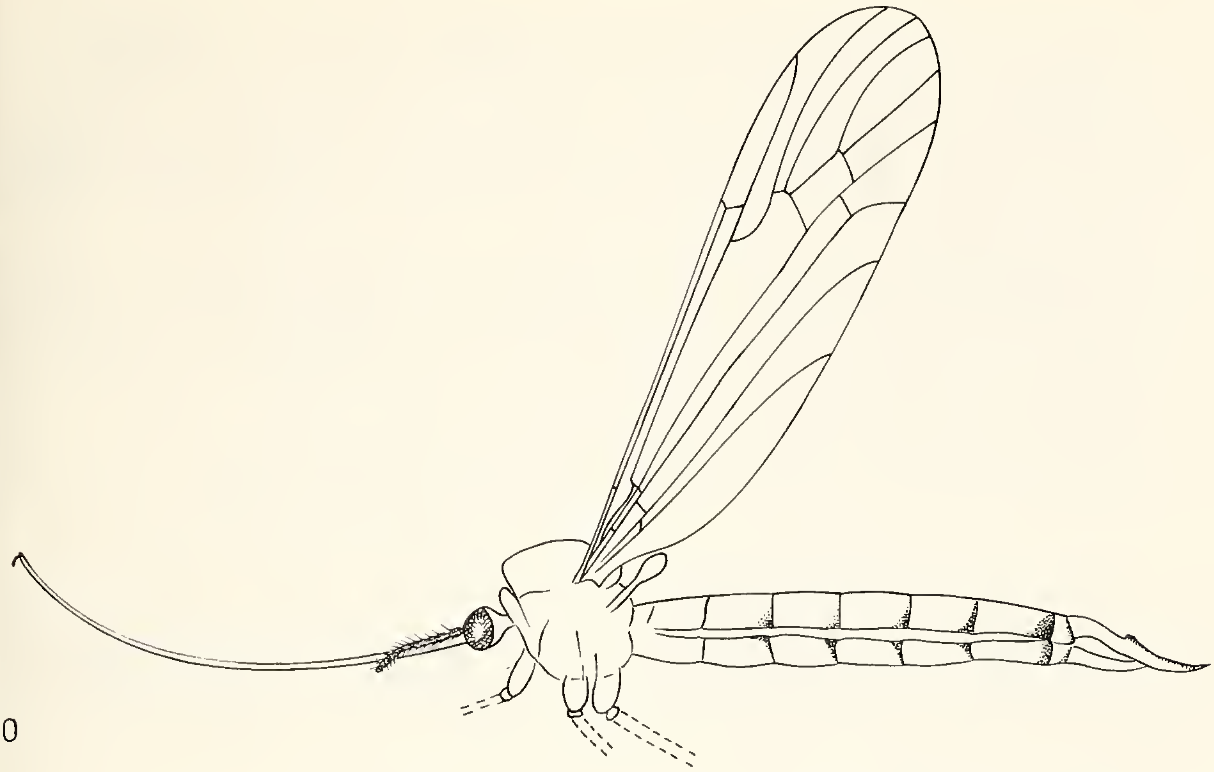
Figs. 6–9. Wing venation in representatives of the four subfamilies of Limoniidae. -6. *Metalimnobia* sp. (Limoniinae), -7. *Dicranota* sp. (Pediciinae), -8. *Pseudolimnophila* sp. (Hexatominae), -9. *Ormosia* sp. (Eriopterinae). – After ALEXANDER & BYERS.



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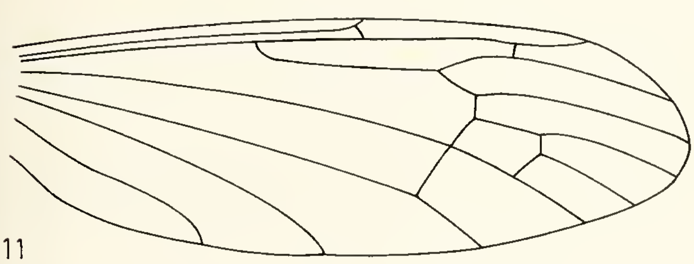

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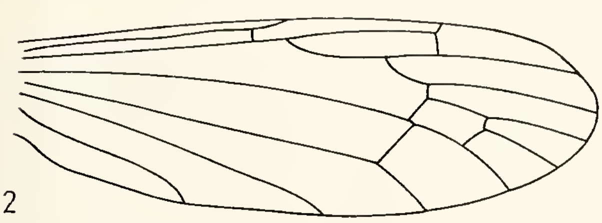

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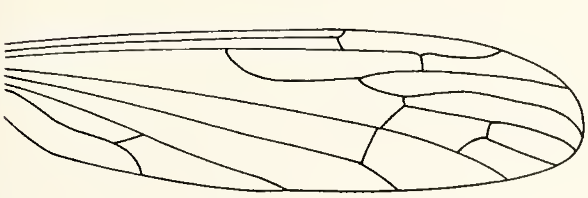

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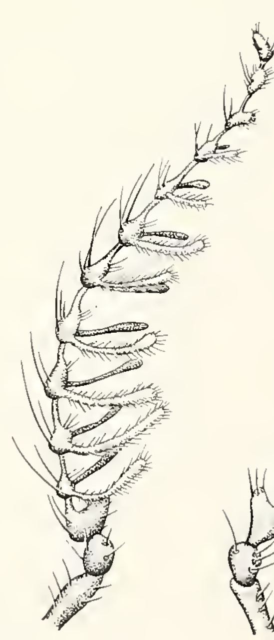

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Figs. 10–15. Fig. 10. Female of *Elephantomyia edwardsi* Lack., lateral view. – Figs. 11–13. Wings. -11. *Limonia tripunctata* Fabr., -12. *Dicranomyia modesta* Mg, -13. *Discobola annulata* L. –Figs. 14–15. Antennae of *Rhipidia duplicata* Doane. -14. male, -15. female. – After Tjeder (Fig. 10) and Slípka & Starý (Figs. 11–15).

3 Rs two-branched (three branches of R reaching wing margin) (Fig. 6) 4
– Rs three-branched (four branches of R reaching wing margin) (Figs. 8,9) 7

4 Rostrum greatly elongated, almost as long as remainder of body (Fig. 10) .... Hexatominae: ***Elephantomyia*** Osten Sacken
– Rostrum usually of normal length; when elongated, not longer than half length of remainder of body 5

5 Only one branch of M reaching wing margin (Fig. 58); antenna with only six flagellomeres, which are cylindrical and elongated; tibial spurs present; colouration of body all black .... Hexatominae: ***Cladolipes*** Loew
– Two branches of M reaching wing margin; antenna with 12 or 14 flagellomeres which are not elongated; tibial spurs absent 6

6 General colouration of body black with yellow scutellum and yellow markings on thoracic pleurae; antenna with 14 flagellomeres; male terminalia as in Fig. 123 .... Eriopterinae: ***Ptilostenodes*** Alexander
1 sp., *omissa* Lackschewitz
– Antenna with 12 or 14 flagellomeres; other characters not as above ...... (Limoniinae) 8

7 Tibial spurs present, although sometimes barely visible (as in *Paradelphomyia* and *Phyllolabis*); body size mostly medium, wing 8 mm or more (Fig. 8) .... (Hexatominae) 41
– Tibial spurs absent; body size mostly small to very small, wing 8 mm or less (Fig. 9) .... (Eriopterinae) 65

3.2.1. LIMONIINAE, key nos. 8–30

8 Antenna with 12 flagellomeres; R 2 always present 9
– Antenna with 14 flagellomeres, R 2 present or absent 23

9 Supernumerary crossvein in cell a 1 (Fig. 13); male terminalia as in Fig. 16 .... ***Discobola*** Osten Sacken
– No supernumarery crossvein in cell a 1 10

10 Rostrum, including mouthparts, about as long as head and thorax together; mouthparts, especially labellum, elongate .... ***Geranomyia*** Haliday
– Rostrum shorter than remainder of head; mouthparts not elongate 11

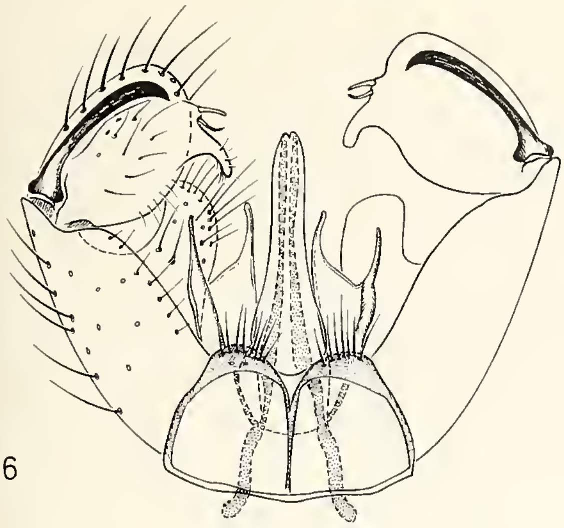
11 Flagellomeres of male antenna more or less produced, antenna appearing bipectinate or unipectinate; flagellomeres in female less-developed, antenna appearing serrated (Figs. 14, 15) .... ***Rhipidia*** Meigen
– Flagellomeres in both sexes oval to elongate, not produced, antenna not appearing pectinate or serrated 12

12 Terminal section of R 1 (i. e. the section beyond point of fusion with R 2) continuing the direction of R 1 and longer than R 2 (often at least two times longer than R 2) (Figs. 11,13) 13
– Terminal section of R 1 in a nearly transverse position, not continuing the direction of R 1 and about as long as R 2 (Figs. 6, 12) 14

13 Gonostylus of male terminalia divided; its ventral division large, in addition to its rostral prolongation provided with a dorsal accessory lobe, bearing long setae (Fig. 20) .... ***Afrolimonia*** Alexander
1 sp., *ladogensis* Lackschewitz
– Male terminalia with a simple undivided gonostylus (Fig. 22) .... ***Limonia*** Meigen

14 Sc 1 ending nearly opposite fork of Rs (Fig. 6) 15
– Sc 1 extending at most as far as half length of Rs 16

15 Wing with five more or less circular, dark spots, situated near tip of Sc 1, R 2, tip of R 3 and at both ends of Rs; palpus with only two segments; anterior vertex silvery shining;



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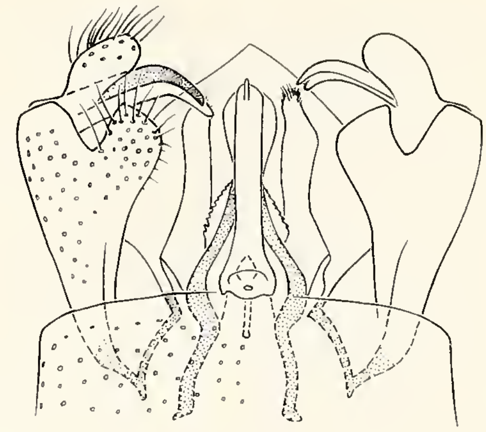

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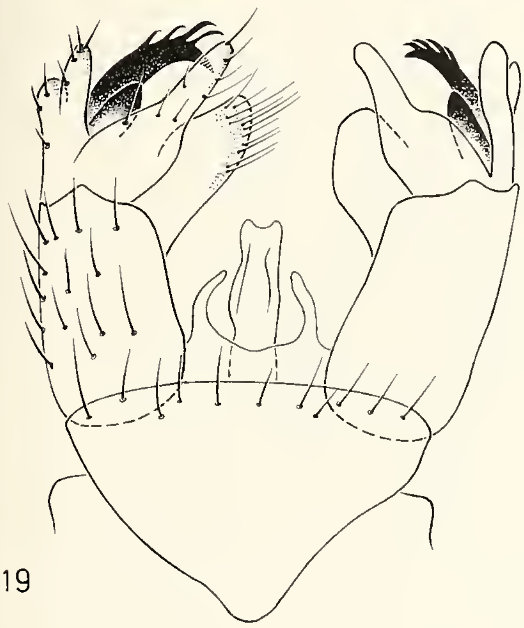

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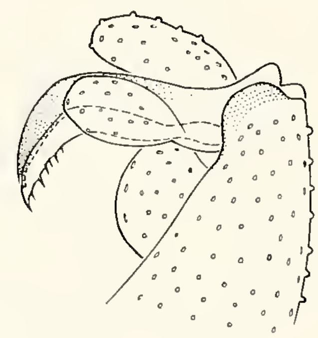

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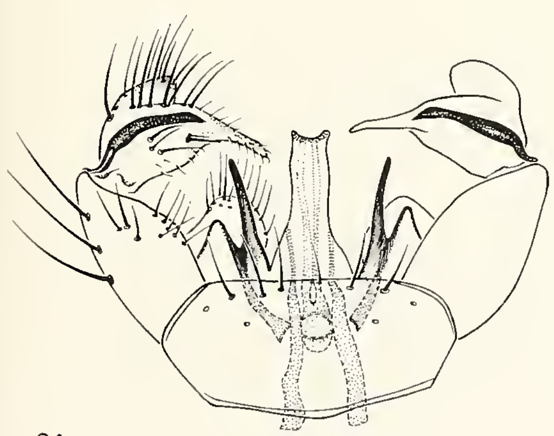

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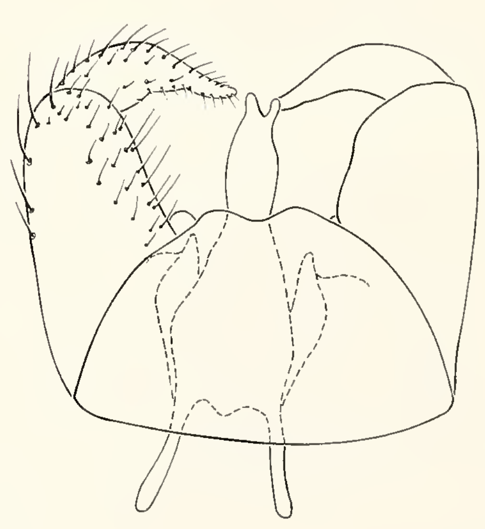

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Figs. 16–22 Male terminalia. -16. *Discobola annulata* L., dorsal view; -17. *Metalimnobia quadrimaculata* L., ventral view; -18. id., left gonostyle, dorsal view; -19. *Atypophthalmus inusta* Mg., dorsal view; -20. *Afrolimonia ladogensis* Lacksch, gonopod, dorsal view; -21. *Dicranomyia coeiana* Niels., dorsal view; -22. *Limonia taurica*, dorsal view. – After Stary (Figs. 16, 19, 21), Thomas & Vaillant (Figs. 17, 18), Savchenko (Fig. 20), and Stary & Rozkošný (Fig. 22).

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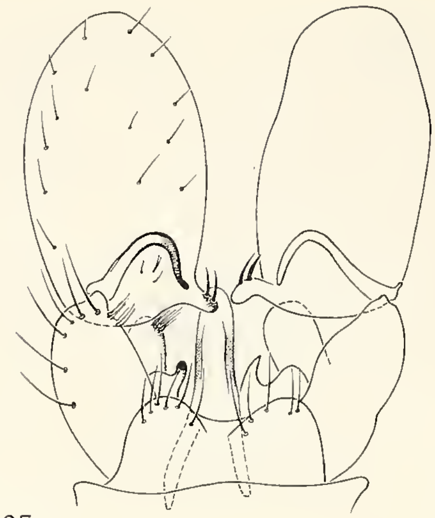

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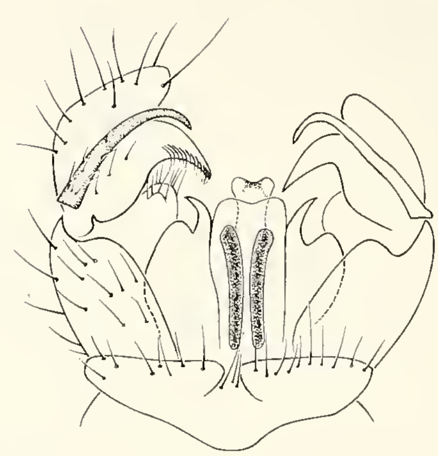

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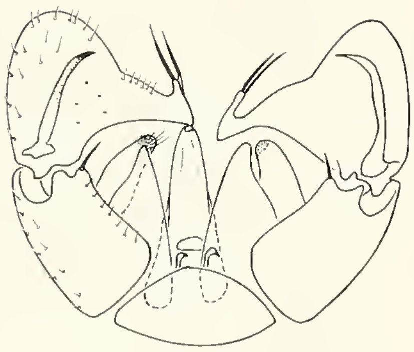

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Figs. 23–28. Male terminalia. -23. *Sphaeropyga nigristigma* Niels., dorsal view; -24. id., lateral view; -25. *Dicranomyia mitis* Mg., dorsal view; -26. *Neolimonia dumetorum* Mg., dorsal view; -27. *Salebriella tristis* Schumm., dorsal view; -28. *Helius longirostris* Mg., dorsal view. – After THOMAS (Figs. 23, 24), STARÝ (Fig. 25), DE MEIJERE (Fig. 26), and STARÝ & ROZKOŠNÝ (Figs. 27, 28).

body size small, wing shorter than 12 mm; gonostylus of male terminalia not as below ... . *Achyrolimonia* Alexander
1 sp., *decemmaculata* Loew

– Wing variously patterned, but not as above; palpus with four segments; anterior vertex not silvery; body size large, wing longer than 12 mm; gonostylus of male terminalia deeply divided, with a third oval lobe at base of ventral division (Figs. 17, 18) .... *Metalimnobia* Matsumura

16 Eyes with their borders at dorsal side parallel for some distance, leaving only a very narrow strip of the vertex between them; male terminalia as in Fig. 19 .... *Atypophthalmus* Brunetti

– Eyes with their borders at dorsal side rounded, and clearly separated above 17

17 Gonostylus of male terminalia undivided, dorsal division of gonostylus wholly atrophied .... *Microlimonia* Savchenko
1 sp., *machidai* Alexander

– Gonostylus of male terminalia divided, dorsal division usually in form of a hook ... 18

18 Sc 1 ending in C almost opposite half length of Rs; wing membrane with macrotrichia in distal cells; male terminalia as in Fig. 21 .... *Dicranomyia* Stephens, in part

– Sc 1 ending in C opposite base of Rs or only hardly more proximal or distal to this point; wing membrane without macrotrichia (Fig. 12) 19

19 Prescutum shining black or dark brown, appearing polished; mesopleuron and anterior vertex of head mostly with a fine, silvery pubescence .... *Melanolimonia* Alexander

– Combination of characters not as above 20

20 Wing with two spots, at base of Rs and in pterostigmal region; anterior vertex conspiciously silvery; thoracic pleura with a longitudinal dark brown stripe; rostral prolongation of male terminalia with a tuft of fine hairs at its dorsal side (Fig. 26) .... *Neolimonia* Alexander
1 sp., *dumetorum* Meigen

– Combination of characters not as above 21

21 Male terminalia conspicously enlarged, sometimes almost disc-like; inner division of gonostylus of very complicated construction; ventro-medial projection of gonocoxite mostly modified or at least strongly lengthened or broadened (Figs. 23, 24) .... *Sphaeropyga* Savchenko

– Male terminalia only moderately enlarged; inner division of gonstylus and ventro-medial projection of gonocoxite of more simple construction 22

22 Gonocoxite of male terminalia medially with one or two prominent tubercles, each of which bears a tuft of hairs at the apex (Fig. 27) .... *Salebriella* Savchenko

– Gonocoxite of male terminalia without such tubercles (Fig. 25) .... *Dicranomyia* Stephens, in part

23 R2 absent (Figs. 29–31) 24

– R2 present (Figs. 32–34) 26

24 Rostrum at least twice as long as remainder of head; male terminalia as in Fig. 28; wing as in Fig. 29 .... *Helius* Lepeletier & Serville

– Rostrum of normal length, i. e. shorter than remainder of head 25

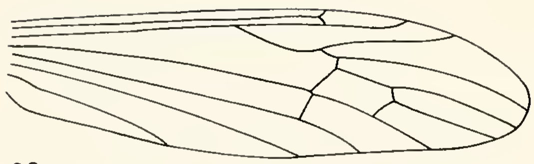
25 Rs over its entire length parallel with and very close to R1; cell dm absent (Fig. 30) .... *Elliptera* Schiner

– Rs arising from R at a very small angle, but not parallel with R1; cell dm present (Fig. 31) .... *Antocha* Osten Sacken, in part

26 CuA 1 joining M close to fork of M or distal to this point; cell dm present or absent (Fig. 32) 27

– CuA 1 joining M far proximal to fork of M; cell dm always absent (Figs. 33, 34) 30

27 R2 about opposite crossvein r-m; R2+3 and R3 together about as long as or shorter than Rs; anal angle of wing prominent, almost rectangular; no conspicuous pale fold in cell cua2 (Fig. 31) 28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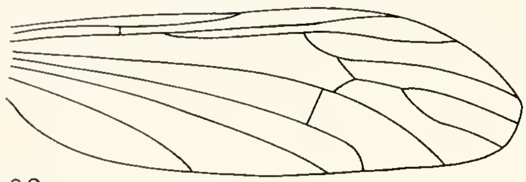
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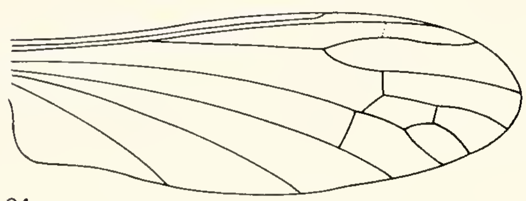
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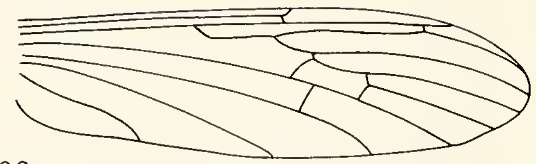
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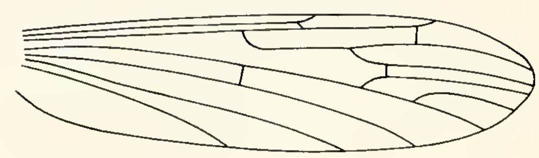
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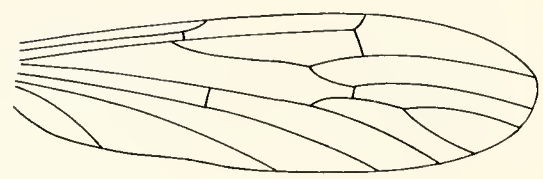
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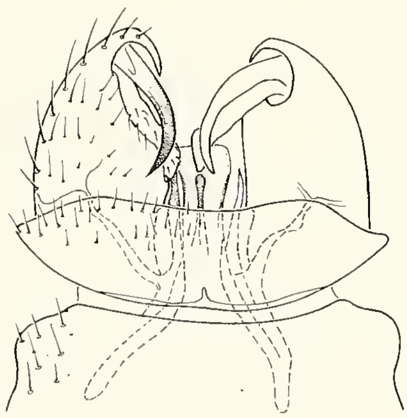
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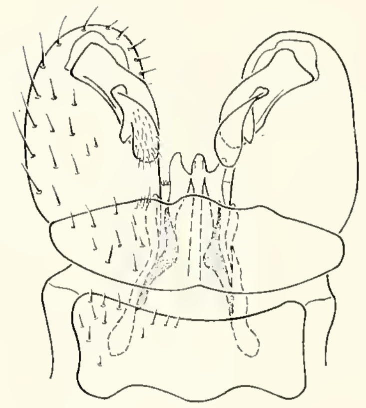
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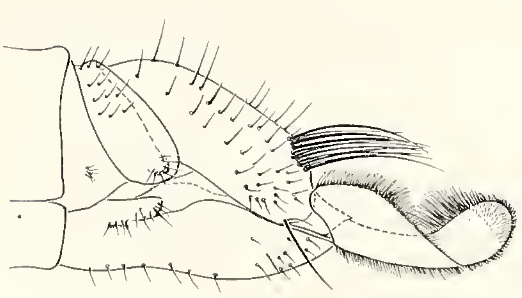
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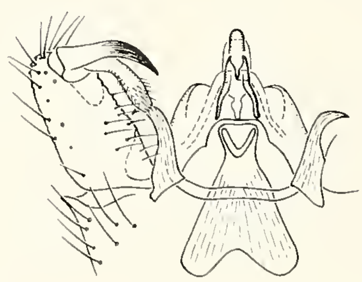
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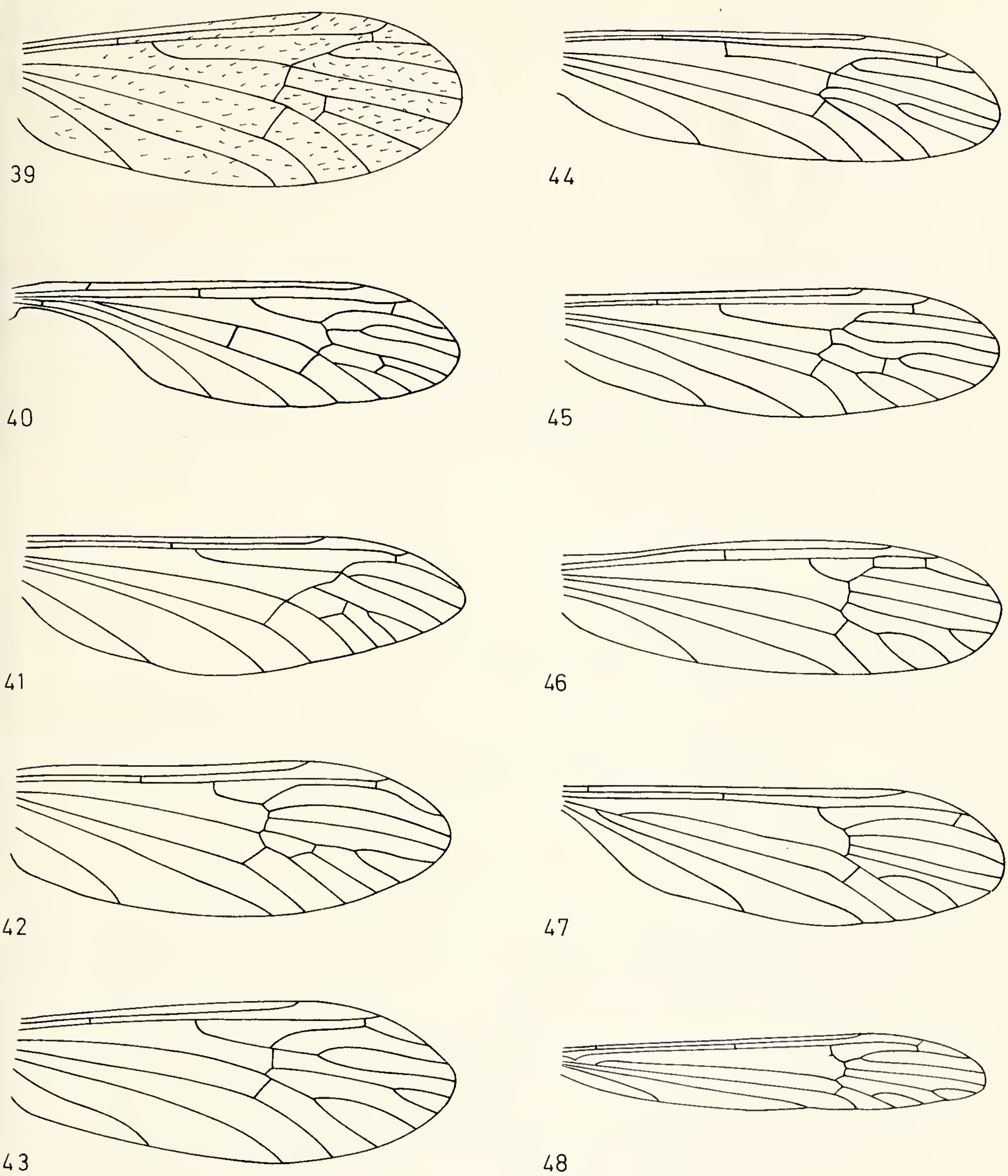
Figs. 29–38. – Figs. 29–34. Wings. -29. *Helius longirostris* Mg., -30. *Elliptera omissa* Egg., -31. *Antocha vitripennis* Mg., -32. *Dicranoptycha fuscescens* Schumm., -33. *Orimarga attenuata* Walk., -34. *Thaumastoptera* sp. – Figs. 35–36. Male terminalia. -35. *Antocha vitripennis* Mg., dorsal view; -36. *Orimargula alpigena* Mik, dorsal view. – Figs. 37–38. *Ulugbekia savtshenkoi* Mendl. -37. female terminalia, lateral view; -38. male terminalia, dorsal view. – After Slípka & Starý (Figs. 29–34), Starý & Rozkošný (Figs. 35, 36), and Mendl (Figs. 37, 38).



Figs. 39–48. Wings. -39. *Ula sylvatica* Mg., -40. *Nasiternella varinervis* Zett., -41. *Pedicia rivosa* L., -42. *Ludicia lucidipennis* Edw., -43. *Tricyphona immaculata* Mg., -44. *Amalopis occulta* Mg., -45. *Crunobia littoralis* Mg., -46. *Dicranota* sp., -47. *Plectromyia acuminata* Mendl, -48. *Rhaphidolabis mesasiatica* Sav. – After Slípka & Starý (Figs. 39, 41–46), Mannheims (Fig. 40), Mendl (Fig. 47), and Savchenko (Fig. 48).

– R2 situated far distal to crossvein r-m; R2+3 and R3 together three to five times longer than Rs; anal angle of wing less prominent; a conspicuous pale fold in outer end of cell cua2 (Fig. 32) 29

28 Cell dm absent; R2 clearly present; male terminalia as in Fig. 36 ..... ***Orimargula*** Mik
1 sp., *alpigena* Mik
– Cell dm present; R2 mostly faintly indicated; male terminalia as in Fig. 35 .... ***Antocha*** Osten Sacken, in part

29 Cerci of ovipositor in female laterally extended in form of curved, hairy wings; hind margin of tergite 10 in female with posteriorly directed, long bristle-like setae (Fig. 37); male terminalia as in Fig. 38 .... ***Ulugbekia*** Savchenko
– Ovipositor of female not as above .... ***Dicranoptycha*** Osten Sacken

30 Cell dm absent by atrophy of lower distal side of cell dm; terminal section of R1 equal to or shorter than R2, ending about opposite R2 (Fig. 34) .... ***Thaumastoptera*** Mik
– Cell dm absent by atrophy of upper distal side of cell dm; terminal section of R1 longer than R2, ending distal to R2 (Fig. 33) .... ***Orimarga*** Osten Sacken.

3.2.2. PEDICIINAE, key nos. 31–40

31 Wing membrane with abundant macrotrichia (Fig. 39) .... ***Ula*** Haliday
– Wing membrane without macrotrichia (Figs. 40–48) 32

32 Supernumerary crossvein present in cell bm; body size large, wing 10 mm or more (Fig. 40) .... ***Nasiternella*** Wahlgren
Wing venation extremely variable; supernumerary crossvein may be lacking in one or both wings
– Supernumerary crossvein absent; combination of other characters not as above 33

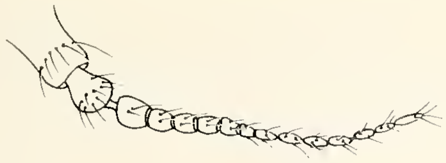
33 Antenna with 13–15 flagellomeres (Fig. 49) 34
– Antenna with 10–11 flagellomeres (Fig. 50) 38

34 Wing with a darkened pattern in form of a triangle along costa, cubitus, and cord of wing; crossvein r-m, base of cell dm, and basal (transverse) section of CuA1 forming a straight and very oblique line (Fig. 41) .... ***Pedicia*** Latreille
– Combination of characters not as above 35

35 Cell r3 longer than cell r4 (lower branch of Rs forked) (Figs. 42, 43) 36
– Cell r3 shorter than cell r4 (upper branch of Rs forked) (Figs. 44, 45) 37

36 Antenna with 14–15 flagellomeres; crossvein r-m distal to fork of R4+5 (Fig. 42); gonocoxite of male terminalia with an apical dorsal lobe; inner and outer division of gonostylus not fused (Fig. 52) .... ***Ludicia*** Hutson & Vane-Wright
According to some authors *Ludicia* is synonymous with *Rhaphidolabina* Alexander
– Antenna with 13–14 flagellomeres; crossvein r-m proximal to fork of R4+5 (Fig. 43); gonocoxite of male terminalia without an apical dorsal lobe; inner and outer division of gonostylus fused (Fig. 54) .... ***Tricyphona*** Zetterstedt

37 Cell m3 very oblong, reaching as far as fork of M (Fig. 44); cell dm absent; hind margin of tergite 9 in male terminalia plain without medial projection; gonostylus resembling that of *Crunobia*, but without stout black thorns at dorsal side; proctiger partially sclerotized (Fig. 51) .... ***Amalopis*** Haliday
1 sp., *occulta* Meigen
– Cell m3 rather short, not reaching as far as fork of M (Fig. 45); cell dm mostly present; hind margin of tergite 9 in male terminalia often with a medial projection; gonostylus with only one complicated division which bears dorsally 2–7 stout black thorns, sometimes hooded by a chitinous membrane; proctiger not sclerotized (Fig. 53) .... ***Crunobia*** Kolenati



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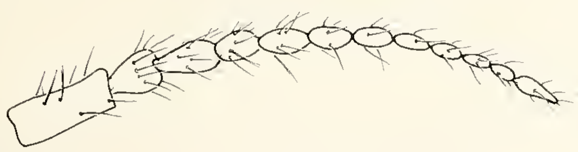

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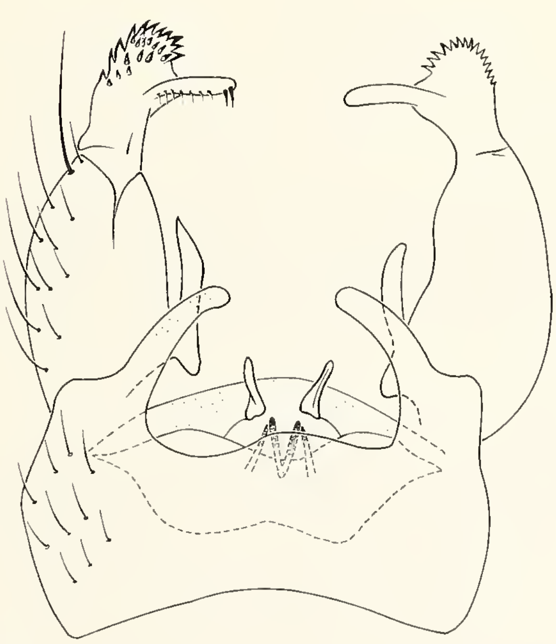

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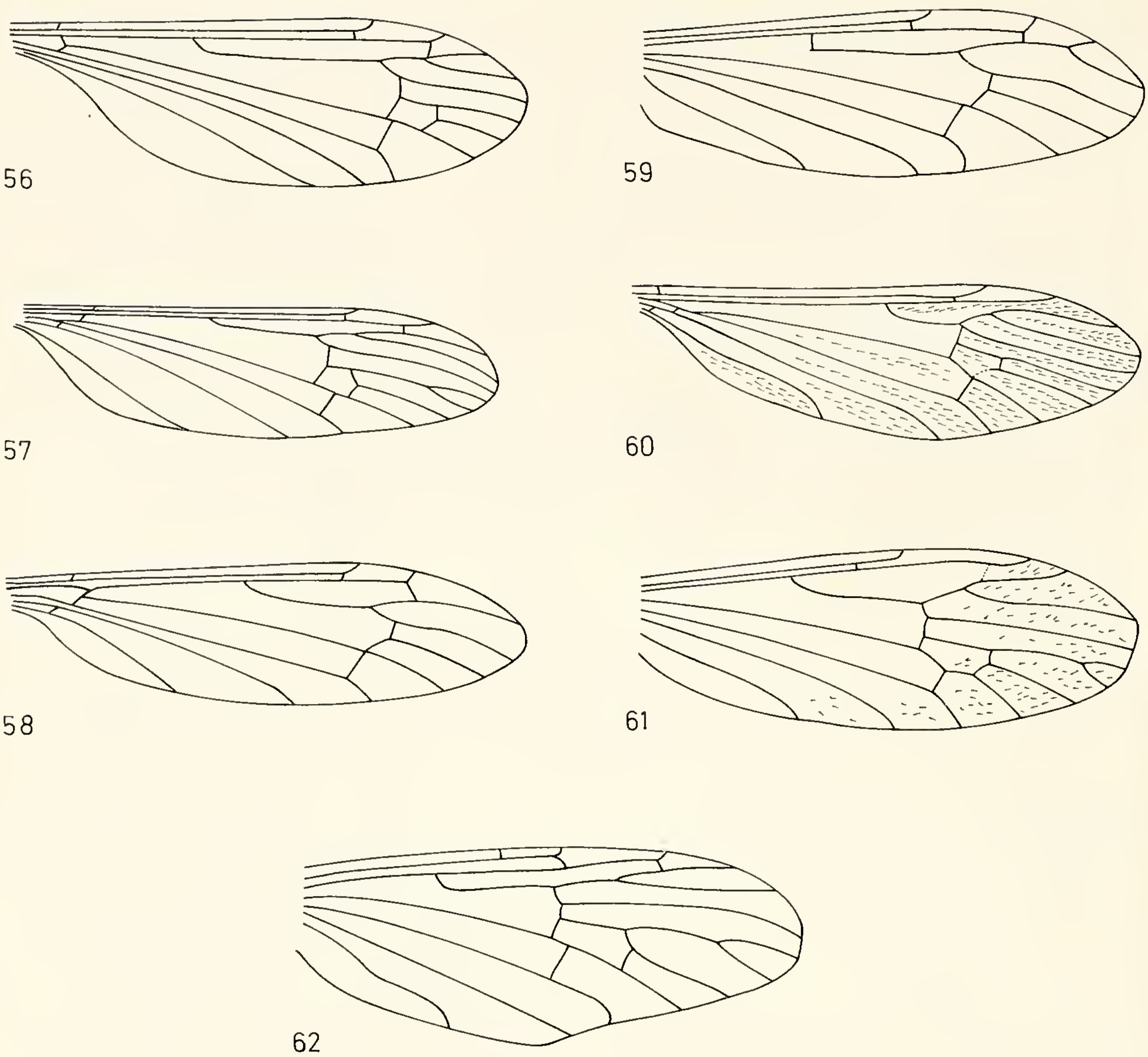
Figs. 49–55. – Figs. 49–50. Antennae. -49. *Tricyphona zwicki* Mendl, -50. *Plectromyia acuminata* Mendl. – Figs. 51–55. Male terminalia. -51. *Amalopis occulta* Mg., dorsal view; -52. *Ludicia lucidipennis* Edw., dorsal view; -53. *Crunobia zernyi* Lacksch., lateral view; -54. *Tricyphona livida* Mad., dorsal view; -55. *Plectromyia acuminata* Mendl, dorsal view. – After Mendl (Figs. 49, 50, 53, 55), Starý & Rozkošný (Figs. 52, 54), and orig. (Fig. 51).



Figs. 56–62. Wings. -56. *Eriocera cimicoides* Scop., -57. *Eriocera chirothecata* Scop., -58. *Cladolipes simplex* Loew, -59. *Hexatoma burmeisteri* Loew, -60. *Phyllolabis gohli* Mendl, -61. *Oxyrhiza senilis* Halid., -62. *Epiphragma ocellaris* L. – After Slípka (Fig. 56), Czižek (Fig. 57), Mendl (Figs. 58, 60), and Slípka & Starý (Figs. 59, 61, 62).

38 Supernumerary crossvein in cell r1 (Fig. 46) 39
– No supernumerary crossvein in cell r1 (Figs. 47, 48) 40

39 Antenna of male with rather long flagellomeres, and about as long as head and thorax together; pterostigmal spot clearly present .... *Dicranota* Zetterstedt
– Flagellomeres short in both sexes; pterostigmal spot faint .... *Paradicranota* Alexander, in part

40 M1 and M2 fused (cell m1 absent) (Fig. 47); male terminalia as in Fig. 55 .... *Plectromyia* Osten Sacken
– M1 and M2 separate (cell m1 present) (Fig. 48) .... *Rhaphidolabis* Osten Sacken
Sometimes a supernumerary crossvein present in cell r1, in *exclusa* Walker.

3.2.3. HEXATOMINAE, key nos. 41–64

41 Antenna with 4–8 flagellomeres; flagellomeres sometimes greatly elongated (Figs. 67–69) 42
– Antenna of normal shape, with more than 8 (mostly 14) flagellomeres 44

42 Two branches of M (M1+2 and M3) or three (M1, M2, and M3) reaching wing margin; cell dm present (Figs. 56, 57) .... *Eriocera* Macquart
– Only one branch of M (M1+2) reaching wing margin; cell dm absent (Figs. 58, 59) . 43

43 R3+4 not branched (Fig. 58); colouration of body completely black . *Cladolipes* Loew
– R3+4 branched (Fig. 59) .... *Hexatoma* Latreille

44 Macrotrichia present in distal wing cells (Fig. 60); when absent, R2 lacking (some *Phyllolabis* spp.) 45
– No macrotrichia in wing cells except in pterostigmal region when latter present; R2 present 47

45 R2 lacking; M2 fused with M1 (two branches of M reaching wing margin) (Fig. 60); sternite 9 and tergite 9 of male terminalia fused to form a strikingly large, almost spherically swollen ring (Fig. 65) .... *Phyllolabis* Osten Sacken
– R2 present, although sometimes very faint; M1 and M2 mostly separate (three branches of M reaching wing margin) (Fig. 61); male terminalia not with such a large swollen ring of fused tergite and sternite 46

46 Inner division of gonostylus in male terminalia deeply bilobed; hind margin of tergite 9 with a deeply incised medial projection (Fig. 66) .... *Adelphomyia* Bergroth
1 sp., *punctum* Meigen
– Inner division of gonostylus in male terminalia not or only slightly bilobed; hind margin of tergite 9 without such a deeply incised medial projection (Fig. 63) .... *Oxyrhiza* De Meijere

47 Supernumerary crossvein in distal part of cell c (Fig. 62); wing patterned with ring-like markings; antenna with 13 flagellomeres (basal two flagellomeres more or less fused); male terminalia as in Fig. 64 .... *Epiphragma* Osten Sacken
1 sp., *ocellaris* Linnaeus
– No supernumerary crossvein in cell c; wing pattern, when present, without ring-like markings; antenna with 14 flagellomeres 48

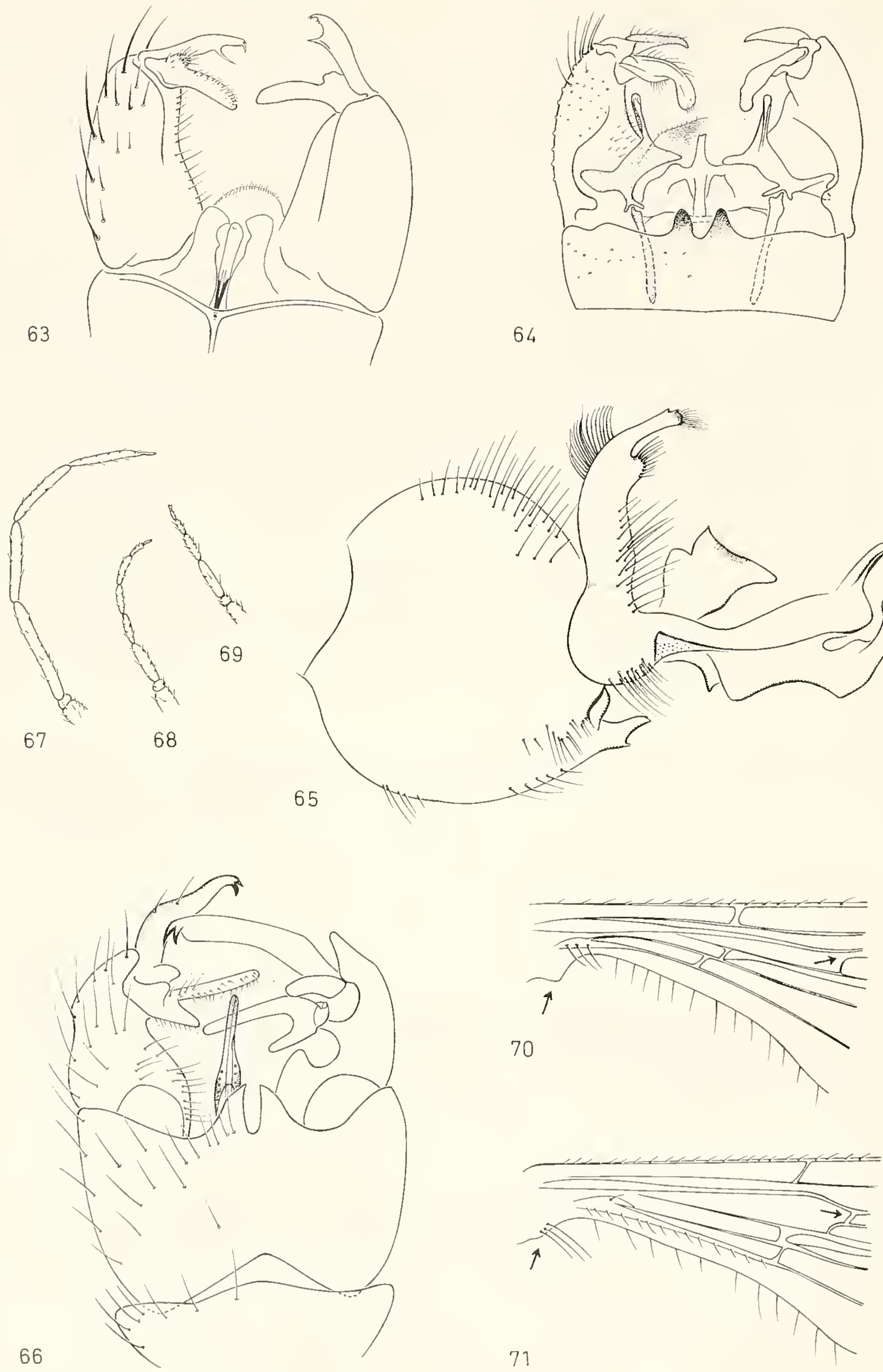
48 Wing with MA (arculus, anterior branch of vein M) absent (Fig. 70) 49
– Wing with MA present (Fig. 71) 52

49 CuA1 joining M at or close to fork of M (base of cell dm); R2+3+4 shorter than 1/5 length of anterior branch of Rs (R2+3 + R3) (Fig. 72); male terminalia mostly very elongate, curved upwards; proctiger partly sclerotized (Figs. 84, 85) 50
– CuA1 joining M at about opposite half length of cell dm; R2+3+4 at least 1/3 length of anterior branch of Rs (Figs. 73, 76); male terminalia not curved upwards and not very elongate; proctiger not sclerotized (Figs. 78, 79) 51

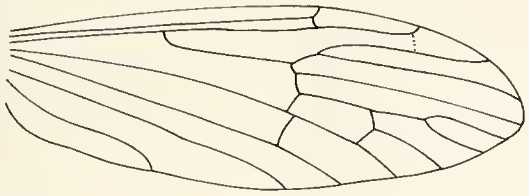
50 Gonostylus of male terminalia divided; both inner and outer division simple, elongate and continuing the direction of the gonocoxite (Fig. 84) .... *Dactylolabis* Osten Sacken
– Gonostylus of male undivided; its single division swollen, bilobed, perpendicular on the direction of the gonocoxite (Fig. 85) .... *Coenolabis* Savchenko

51 Antenna of male greatly elongate, when bent backwards reaching as far as base of abdomen or even farther; R2+3+4 about as long as anterior branch of Rs (R2+3 + R3) (Fig. 76); gonocoxite of male terminalia with a ventro-medial projection; two pairs of parameres, outer ones in form of black, heavy spines (Fig. 79) . *Archilimnophila* Alexander
– Antenna of male not so elongate; R2+3+4 short, at most half as long as anterior branch of Rs (Fig. 73); gonocoxite of male terminalia without a ventro-medial projection; one pair of weak parameres (Fig. 78) .... *Austrolimnophila* Alexander

52 Head strongly narrowed and prolonged posteriorly; antepronotum with sides of anterior margin produced forward (Fig. 80); wing as in Fig. 8 *Pseudolimnophila* Alexander
– Head mostly rounded posteriorly; when head narrowed behind, sides of anterior margin of antepronotum not produced forward (Figs. 81, 82) 53



Figs. 63–71. – Figs. 63–66. Male terminalia. -63. *Oxyrhiza ecalcarata* Edw., dorsal view; -64. *Epiphragma ocellaris* L., dorsal view.; -65. *Phyllolabis lindneri* Mannh., lateral view; -66. *Adelphomyia punctum* Mg., dorsal view. – Figs. 67–68. Antennae of *Eriocera cimicoides* Scop. -67. male, -68. female. – Fig. 69. Antenna of *Hexatoma burmeisteri* Loew, female. – Figs. 70–71. Base of wing. -70. *Austrolimnophila* sp., -71. *Pilaria* sp. – After Starý & Rozkošný (Fig. 63), Thomas & Vaillant (Fig. 64), Mannheims (Fig. 65), De Meijere (Fig. 66), Slípka (Figs. 67–69), and Edwards (Figs. 70, 71).



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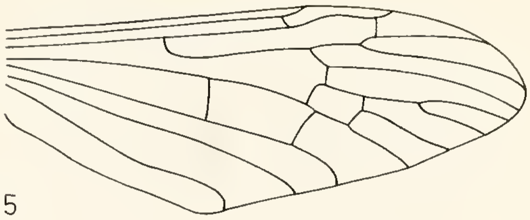

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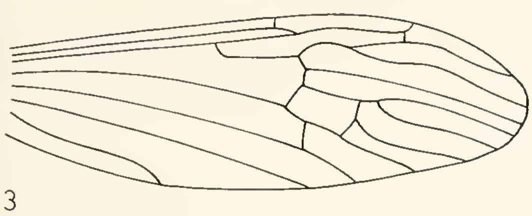

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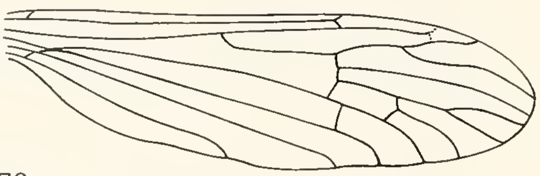

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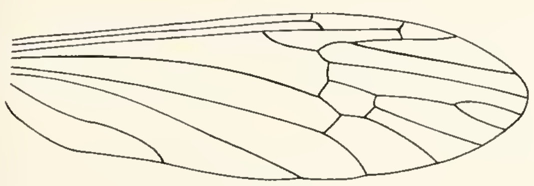

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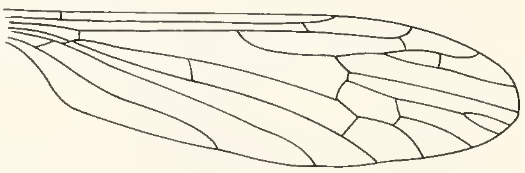

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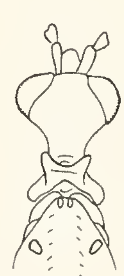

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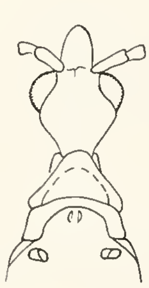

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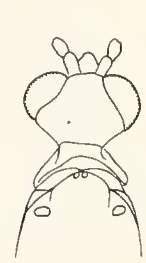

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Figs. 72–82. – Figs. 72–77. Wings. -72. *Dactylolabis transversa* Mg., -73. *Austrolimnophila ochracea* Mg., -74. *Phylidorea fulvonervosa* Schumm., -75. *Eloeophila maculata* Mg., -76. *Archilimnophila harperi* Alex., -77. *Afrolimnophila minima* Sav. – Figs. 78–79. Male terminalia. -78. *Austrolimnophila ochracea* Mg., dorsal view.; -79. *Archilimnophila harperi* Alex., dorsal view. – Figs. 80–82. Dorsal view of head and anterior part of thorax. -80. *Pseudolimnophila* sp., -81. *Limnophila* sp., -82. *Pilaria* sp. – After Slípka & Starý (Figs. 72–75), Mendl (Figs. 76, 77, 79), Starý (Fig. 78) and Edwards (Figs. 80–82).

53 Squama with macrotrichia (Fig. 71); antenna with basal flagellomeres bearing verticillar hairs that are at least two times longer than single flagellomeres; wing mostly with pterostigmal macrotrichia .... *Pilaria* Sintenis

– Squama without macrotrichia; verticillar hairs of basal flagellomeres at most twice longer than single flagellomeres; wing without pterostigmal macrotrichia 54

54 Supernumerary crossvein in cell bm (Figs. 75, 77) 55

– No supernumerary crossvein in cell bm (Fig. 74) 57

55 Besides supernumerary crossvein in cell bm also a supernumerary crossvein present in cell r3 (Fig. 77); male terminalia as in Figs. 86, 87 .... *Afrolimnophila* Alexander
1 sp., ? *minima* Savchenko (see MENDL, 1979)

– No supernumerary crossvein present in cell r3 56

56 Wing with dark spots that are arranged to form two more or less complete transverse bands; outer division of gonostylus in male terminalia not flattened, the outer margin not serrated (Fig. 83); antenna of male longer than that of female; female of some spp. brachypterous .... *Idioptera* Macquart, in part
Supernumerary crossvein in cell bm sometimes lacking in one or both wings

– Wing spotted, but spots mostly not arranged to form transverse bands; outer division of gonostylus mostly flattened, heavily sclerotized, the outer margin of it distally serrated (Fig. 88); antenna short in both sexes; female not brachypterous . *Eloeophila* Rondani

57 Body size very large, wing length 15 mm or more; legs stoutly built .... *Eutonia* Van der Wulp
1 sp., *barbipes* Meigen

– Body size smaller, wing length not exceeding 15 mm 58

58 M 1 and M 2 fused (two medial veins reaching wing margin); outer division of gonostylus of male terminalia much longer than the inner one, with the apex simple or bidentate (Fig. 89) .... *Prionolabis* Osten Sacken, in part

– M 1 and M 2 separate (three medial veins reaching wing margin) (Fig. 74) 59

59 Antenna of male very elongate, about three times longer than thorax; colouration of body all black; wing tinged yellowish, 11–12 mm in length .... *Prionolabis* Osten Sacken, in part
1 sp., *longeantennata* Strobl

– Combination of characters not as above 60

60 Terminal section of R 1 short, subequal in length to R 2, not in alignment with R 1 (Fig. 74) 61

– Terminal section of R 1 longer than R 2, and in alignment with R 1 63

61 Wing with rather large spots, more or less arranged in transverse bands; outer division of gonostylus of male terminalia in form of a sharp-pointed hook, inner division broadened, plate-like; aedeagus long and slender, curved ventrally (Figs. 86, 87) .... *Afrolimnophila* Alexander
1 sp., *minima* Savchenko

– Apart from a pterostigmal darkening, which is clearly present or not, no or only a few spots on wing; gonostylus and aedeagus of male terminalia not as above (Figs. 93, 94) 62

62 Aedeagus simple (Fig. 97) .... *Phylidorea* Bigot, in part

– Aedeagus trifid (Figs. 98, 99) .... *Euphylidorea* Alexander
This is not an easy character. Sometimes the aedeagus has only three short teeth at its apex (e. g. in *fulvonervosa* Schummel), in other cases the ramifications are much longer (e. g. in *meigeni* Verrall). Parameres running close to the aedaegus might be confused with ramifications of the aedeagus

63 Head narrowed posteriorly (but, as opposed to the situation in *Pseudolimnophila*, sides of anterior margin of antepronotum not produced forward) (Fig. 81); wing mostly with

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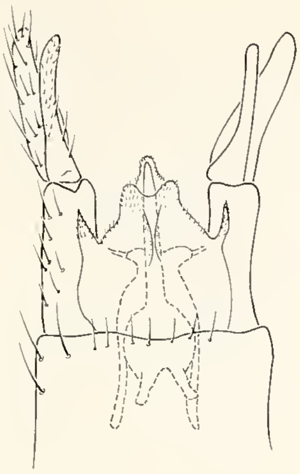

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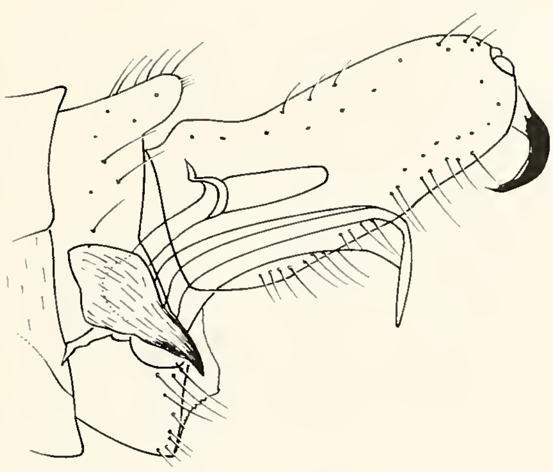

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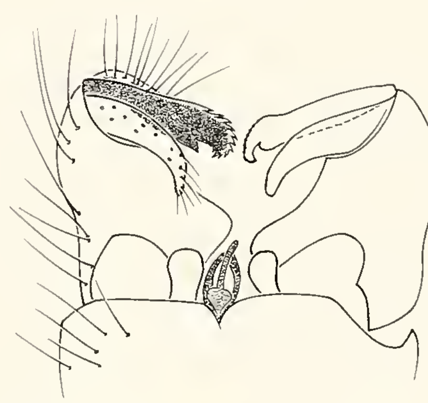

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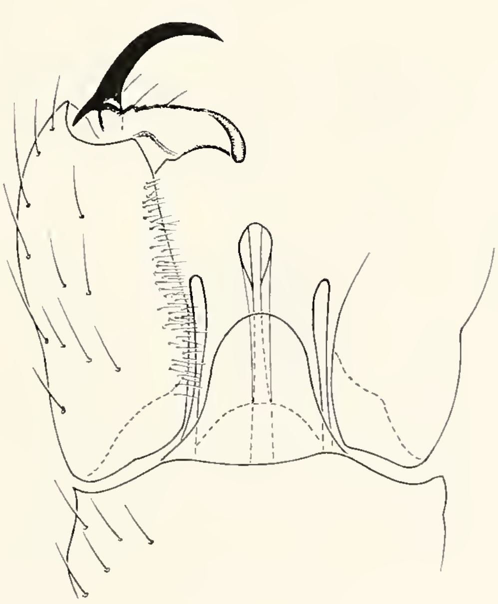

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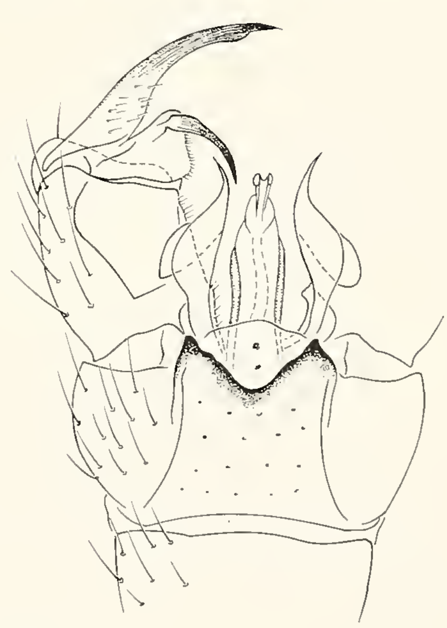

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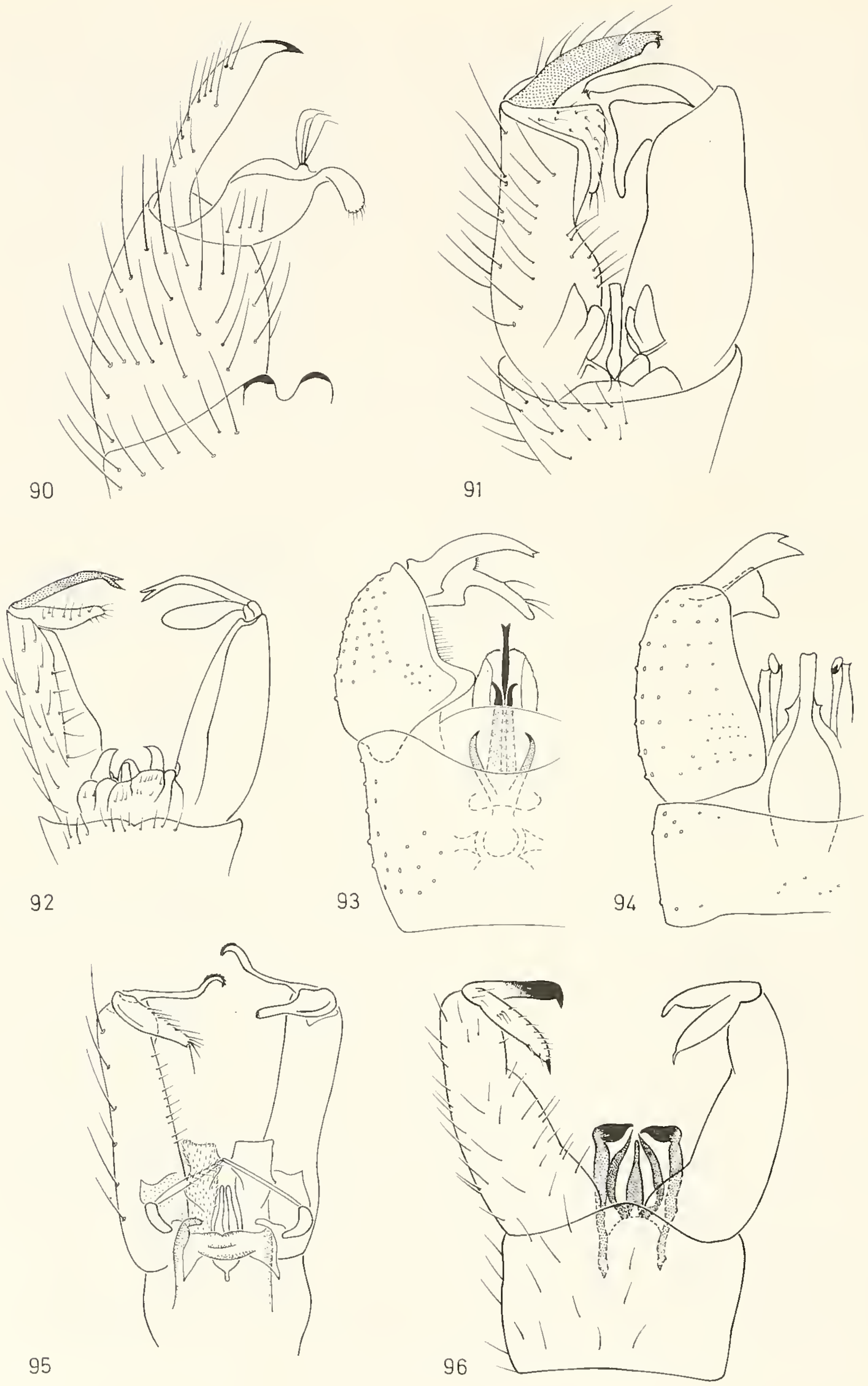
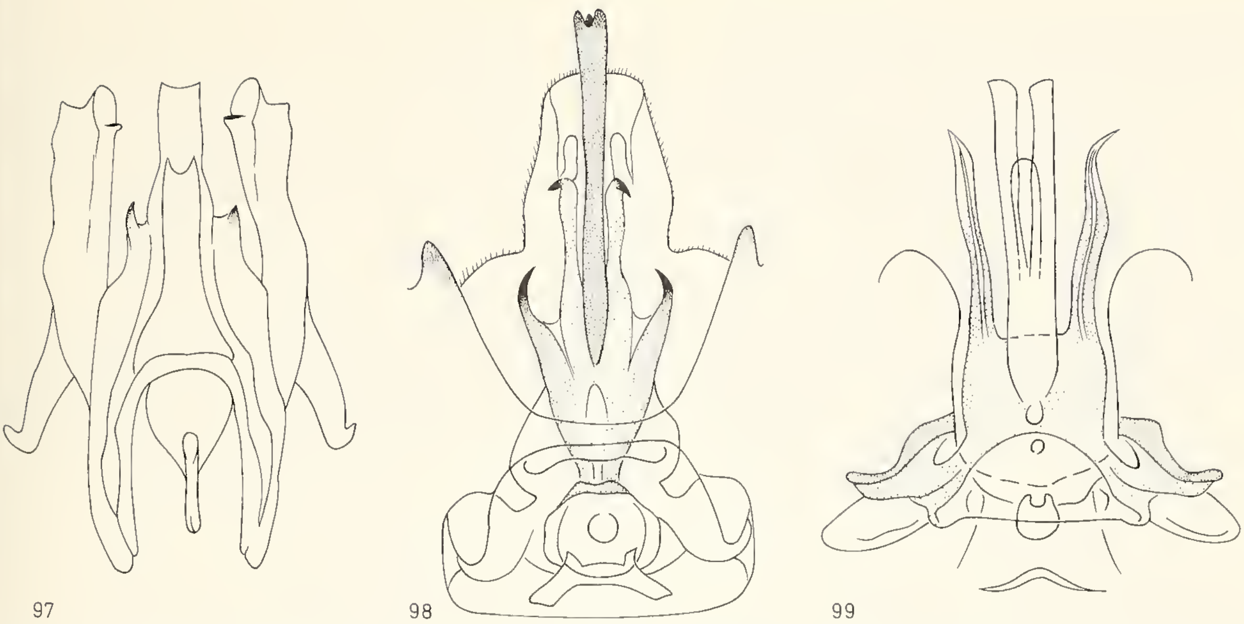
Figs. 83–89. Male terminalia. -83. *Idioptera pulchella* Mg., gonostyle; -84. *Dactylolabis denticulata* Bergr., dorsal view; -85. *Coenolabis aberrans* Sav., dorsal view; -86. *Afrolimnophila minima* Sav., lateral view; -87. idem, dorsal view; -88. *Eloeophila trimaculata* Zett., dorsal view; -89. *Prionolabis subcognata* Sav., dorsal view. – After Edwards (Fig. 83), Starý & Rozkošný (Fig. 84), Savchenko (Figs. 85, 87, 89), Mendl (Fig. 86), and De Meijere (Fig. 88).



Figs. 90–96. Male terminalia. -90. *Limnophila punctata* Schrank, tergite 9 and gonopod; -91. *Neolimnomyia batava* Edw., dorsal view; -92. *Brachylimnophila adjuncta* Walk., dorsal view.; -93. *Euphylidorea fulvonervosa* Schumm., ventral view; -94. *Phylidorea abdominalis* Staeg., ventral view; -95. *Neolimnophila carteri* Tonn., dorsal view.; -96. *Crypteria limnophiloides* Bergr., dorsal view. – After Theowald (Fig. 90), De Meijere (Figs. 91, 92), Thomas, Vaillant & Brunhes (Figs. 93, 94), Starý & Rozkošný (Fig. 95), and Krzemiński (Fig. 96).



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Figs. 97–99. Aedeagal complex, ventral view. -97. *Phylidorea abdominalis* Staeg., -98. *Euphylidorea fulvonervosa* Schumm., -99. *Euphylidorea meigeni* Verr. – After THOMAS, VAILLANT & BRUNHES.

numerous small, dark spots; outer division of gonostylus of male terminalia at the apex plain (Fig. 90) .... ***Limnophila*** Macquart

– Head rounded posteriorly; wing, apart from pterostigmal region, unpatterned; apex of outer division of gonostylus bifid or slightly serrated at the outer margin (Figs. 91, 92) 64

64 Prescutal pits small; tuberculate pits clearly separated; Sc 1 joining C distally to fork of Rs; R 2 clearly present; outer division of gonostylus of male terminalia bifid at the apex (Fig. 92) .... ***Brachylimnophila*** Alexander

– Prescutal pits large; tuberculate pits large and mostly united to form a shining patch near anterior margin of prescutum; Sc 1 joining C about opposite of fork of Rs or proximally to that point; R 2 often faintly indicated; apex of outer division of gonostylus finely serrated at the outer margin (Fig. 91) .... ***Neolimnomyia*** Séguy.

3.2.4. ERIOPTERINAE, key nos. 65–101

65 M 1 and M 2 separate, three branches of M reaching wing margin (Figs. 1, 100) 66

– M 1 fused with M 2, two branches of M reaching wing margin (Fig. 9) 67

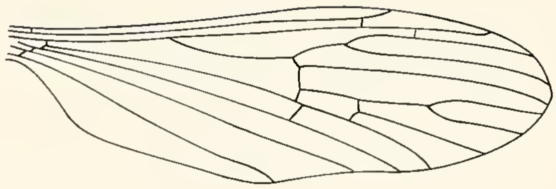
66 Sc 1 and Sc 2 subequal in length; anterior branch of Rs (R 2+3 + R 3) about as long as R 2+3+4 (Fig. 1); gonocoxite of male terminalia with a least one long, dark thorn (interbase) near its base (Fig. 95), coxa 2 and coxa 3 close together (Fig. 115) .... ***Neolimnophila*** Alexander

– Sc 1 longer than Sc 2; anterior branch of Rs much longer than R 2+3+4 (Fig. 100); gonocoxite of male terminalia without long thorns at its base (Fig. 96); coxa 2 and coxa 3 more widely separated (Fig. 117) .... ***Crypteria*** Bergroth
1 sp., *limnophiloides* Bergroth

67 Rs forking into R 2+3 and R 4+5 (lower branch of Rs forked); basal section of CuA 1 uniting with M near mid-length or even proximal to mid-length of wing (Figs. 101, 102) 68

– Rs forking into R 2+3+4 and R 5 (upper branch of Rs forked); basal section of CuA 1 uniting with M considerably distal to mid-length of wing (Fig. 9) 69

68 Cell a 2 short and very narrow, no anal angle present (Fig. 101); whole body, including postnotum, with numerous long setae; wing membrane with macrotrichia, even if some-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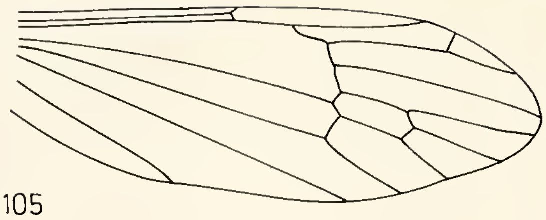
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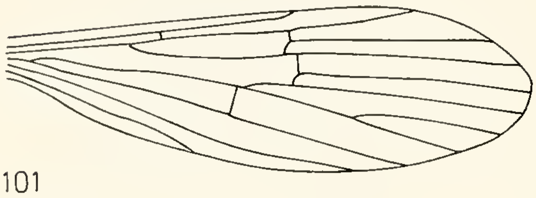
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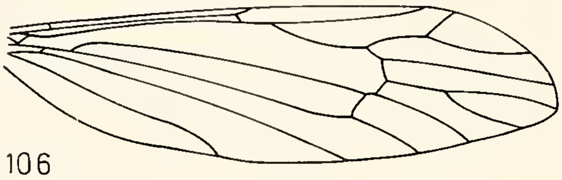
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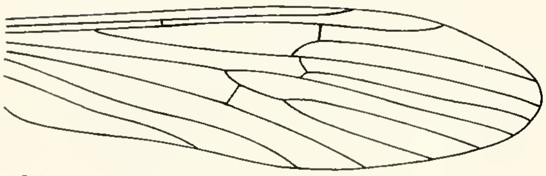
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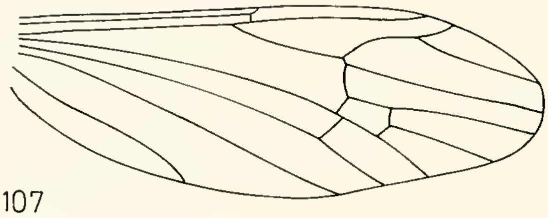
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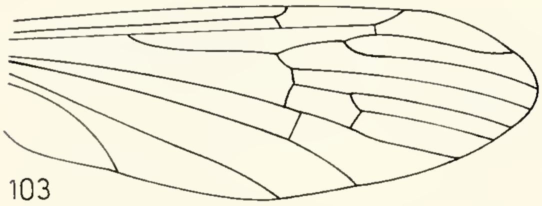
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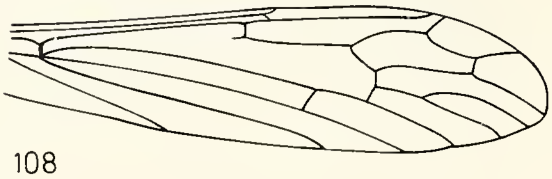
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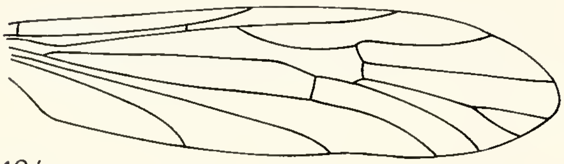
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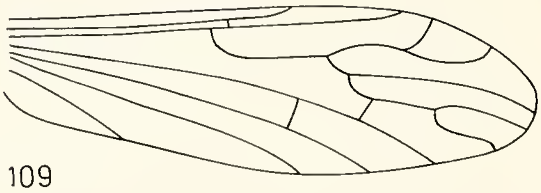
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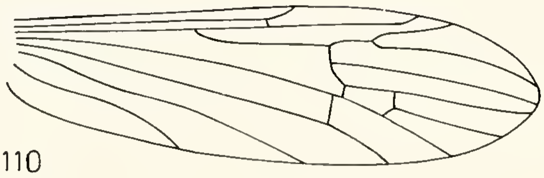
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Figs. 100–110. Wings. -100. *Crypteria limnophiloides* Berg., -101. *Dasymolophilus murina* Mg., -102. *Molophilus* sp., -103. *Lipsothrix errans* Walk., -104. *Ptilostenodes omissa* Lacksch., -105. *Prolipophleps abbreviata* Loew, -106. *Idiocerodes diabarica* Sav., -107. *Gonomyia tenella* Mg., -108. *Euptilostena jucunda* Loew, -109. *Idiocera pulchripennis* Loew, -110. *Protogonomyia limbata* v. Ros. – After Edwards (Fig. 100), Slípka & Starý (Figs. 101–103, 105, 107, 109, 110), Lackschewitz (Fig. 104), and Savchenko (Figs. 106, 108).

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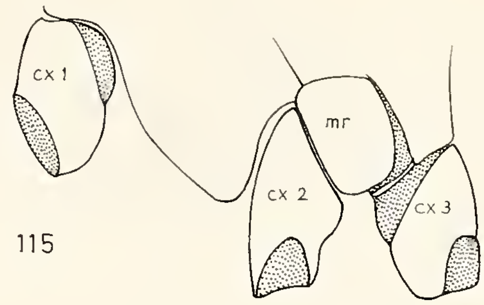

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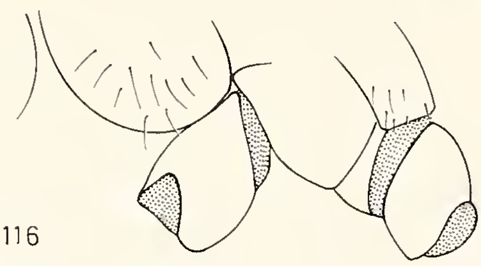

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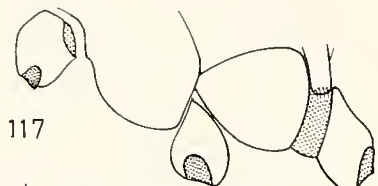

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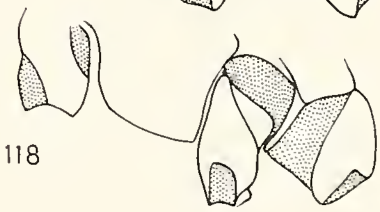

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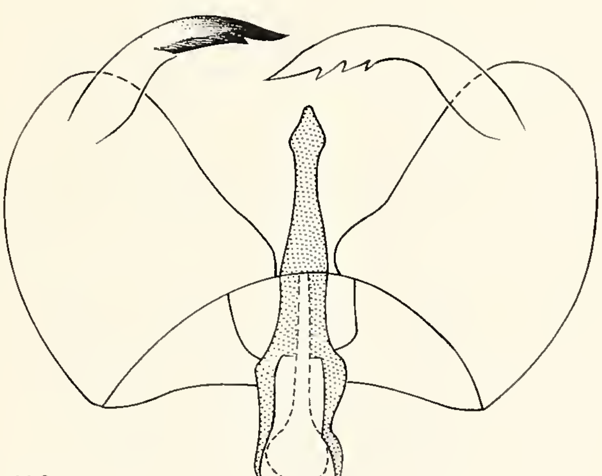

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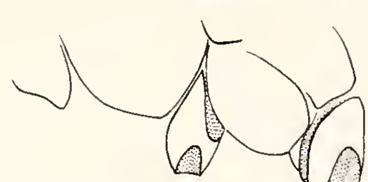

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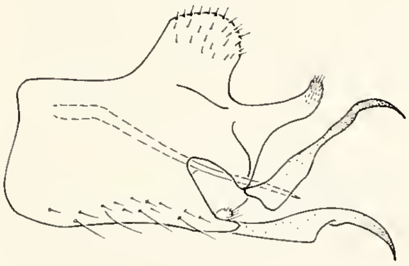

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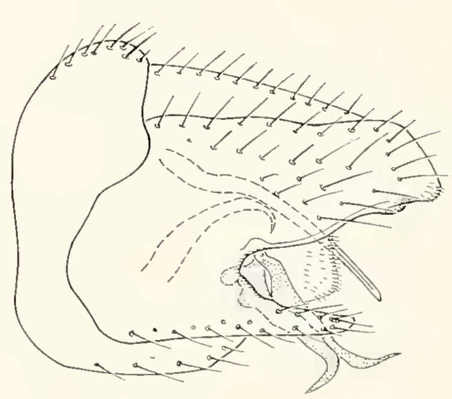
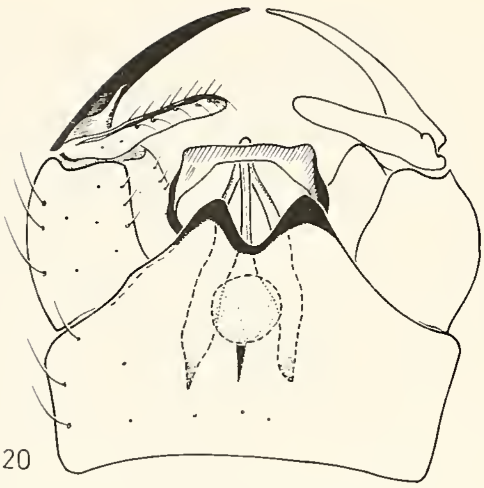


114

Figs. 111–119. – Figs. 111–114. Male terminalia. -111. *Dasymolophilus murina* Mg., lateral view; -112. idem, dorsal view; -113. *Molophilus lackschewitzianus* Alex., lateral view; -114. *Molophilus medius* De Meij., lateral view. – Figs. 115–119. Inferior part of thoracic pleura, with coxa 2 and coxa 3. -115. *Neolimnophila* sp., -116. *Erioptera* sp., -117. *Crypteria* sp., -118. *Gonomyia* sp., -119. *Rhabdomastix* sp. – After Schmid (Fig. 111), Krzemiński (Fig. 112), Starý & Rozkošný (Figs. 113, 114), and Edwards (Figs. 115–119).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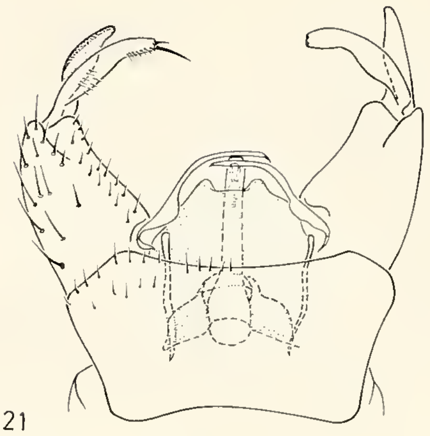
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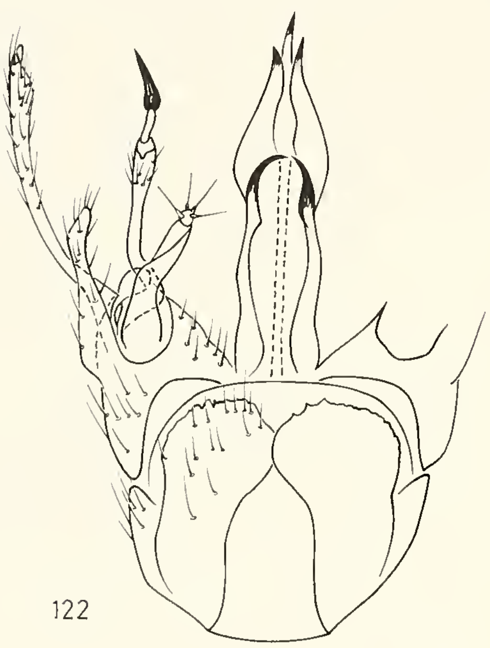
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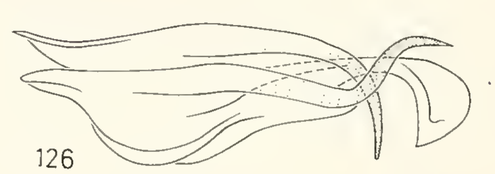
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Figs. 120–126. Male terminalia. -120. *Gnophomyia lugubris* Zett., dorsal view; -121. *Lipsothrix errans* Walk., dorsal view; -122. *Idiocerodes diabarica* Sav., dorsal view; -123. *Ptilostenodes omissa* Lacksch., ventral view; -124. *Teuchogonomyia edwardsi* Lacksch., dorsal view; -125. *Gonomyia bifida* Tonn., dorsal view; -126. idem, aedeagus, lateral view. – After Starý (Fig. 120), Starý & Rozkošný (Figs. 121, 123, 125, 126), and Savchenko (Figs. 122, 124).

times a few of them; gonostylus of male terminalia undivided (Figs. 111, 112); body size very small, wing at most 3 mm in length .... *Dasymolophilus* Goetghebuer
– Cell a2 long and broad, anal angle present (Fig. 102); veins of wings with numerous long setae; setae sometimes present on other parts of body, but not on postnotum; wing membrane without macrotrichia; gonostylus of male terminalia with two divisions, of which one sometimes reduced to a knob-like projection (Figs. 113, 114); body size larger, wing at most 8 mm in length .... *Molophilus* Curtis, in part

69 Coxa 2 and coxa 3 only slightly separated by meral region; meron small, not exceeding coxa in diameter (Fig. 118) 70
– Coxa 2 and coxa 3 widely separated by a large meron; meron subequal to or larger than coxa (Figs. 116, 119) 80

70 R2 present (Fig. 103) 71
– R2 absent (Figs. 104–110) 72

71 Sc1 and Sc2 subequal in length; R2 near tip of R1 (Fig. 103); hind margin of tergite 9 in male plain (Fig. 121) .... *Lipsothrix* Loew
– Sc1 longer than Sc2; R2 distinctly proximal to tip of R1+2; hind margin of tergite 9 in male deeply incised (Fig. 120) .... *Gnophomyia* Osten Sacken

72 Rs two-branched (three branches of R reaching wing margin) (Fig. 104); male terminalia as in Fig. 123 .... *Ptilostenodes* Alexander
1 sp., *omissa* Lackschewitz
– Rs three-branched (four branches of R reaching wing margin) 73

73 Wing with MA (arculus) absent 74
– Wing with MA present 77

74 Rs very short; Sc1 ending far before origin of Rs, the distance between these two points at least as long as Rs; R3 and R4 forming an angle of nearly 90° (Fig. 105) ....
.... *Prolipophleps* Savchenko
– Rs longer; Sc1 ending about opposite origin of Rs or beyond this point (when Sc1 ends before the origin of Rs, then the distance between these two points is considerably shorter than the length of Rs); angle between R3 and R4 mostly far less then 90° (Figs. 106, 107) 75

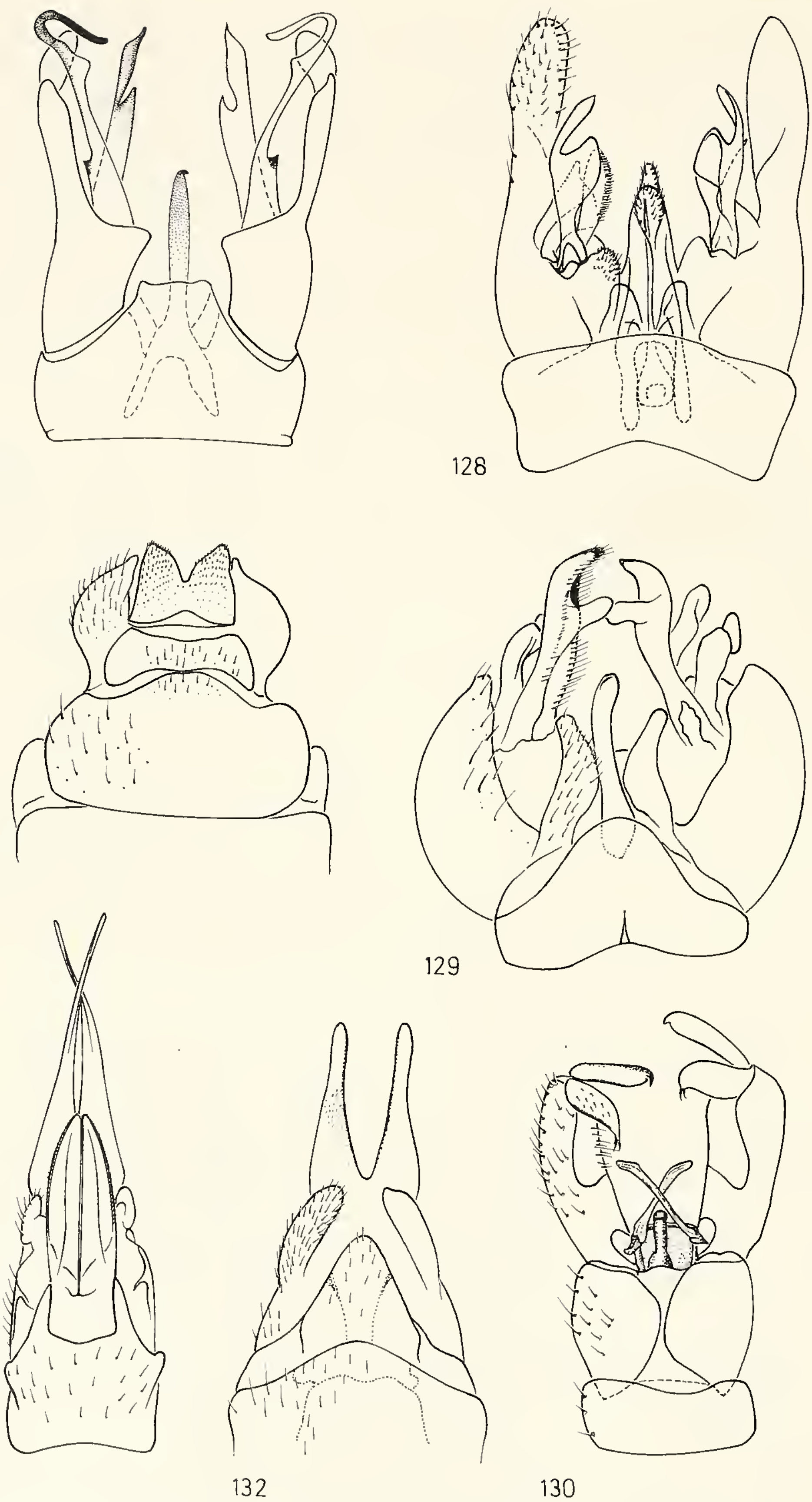
75 Cell dm absent (Fig. 106); male terminalia as in Fig. 122 .... *Idiocerodes* Savchenko
1 sp., *diabarica* Savchenko
– Cell dm present (Fig. 107) 76

76 Gonocoxite of male terminalia without a dorsal lobe at its distal end; aedeagus very large and complex in structure, always symmetrical (Fig. 124) . *Teuchogonomyia* Alexander
– Gonocoxite of male terminalia with a dorsal, fleshy lobe at its distal end; aedeagus not very large and mostly asymmetrical (Figs. 125, 126) .... *Gonomyia* Meigen

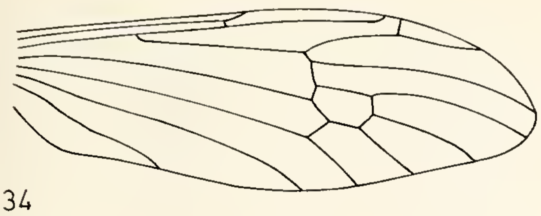
77 Basal section of CuA1 joining M before fork of M, at a distance of at least its own length; cell r3 small; R4 less than two times longer than R2+3+4; cell dm absent (Figs. 108, 109)
.... 78
– Basal section of CuA1 joining M hardly before fork of M, at a distance of less than its own length; cell r3 large; R4 at least two times longer than R2+3+4; cell dm present or absent (Fig. 110) 79

78 Supernumerary crossvein in cell r4 (Fig. 108); gonostylus of male terminalia with two divisions (Fig. 127) .... *Euptilostena* Alexander
– No supernumerary crossvein in cell r4 (Fig. 109); gonostylus of male terminalia with three divisions .... *Idiocera* Dale

79 Cell dm present (Fig. 110); scutellum yellowish; gonocoxite of male terminalia about as broad as long, not or only hardly produced at apex (Fig. 129); female with cerci and valves of ovipositor shortened or modified (Figs. 131, 132) .... *Protogonomyia* Alexander
– Cell dm absent; scutellum dark; apex of gonocoxite strongly produced (Fig. 128); cerci and valves of ovipositor normal (Fig. 133) .... *Ellipteroides* Becker



Figs. 127–133. – Figs. 127–130. Male terminalia. -127. *Euptilostena jucunda* Loew, dorsal view; -128. *Ellipteroides lateralis* Macq., ventral view; -129. *Protogonomyia alboscutellata* v. Ros., ventral view; -130. *Sacandaga edwardsi* Tjeder, dorsal view. – Figs. 131–133. Female terminalia. -131. *Protogonomyia limbata* v. Ros., dorsal view; -132. *Protogonomyia alboscutellata* v. Ros., ventral view; -133. *Ellipteroides lateralis* Macq., ventral view. – After Krzemiński (Fig. 127), Starý & Rozkošný (Figs. 128, 129, 131–133), and Tjeder (Fig. 130).



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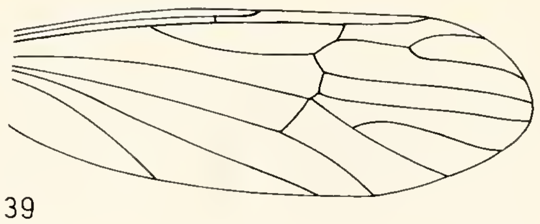

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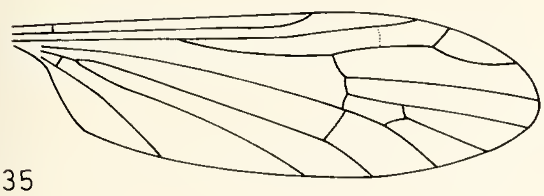

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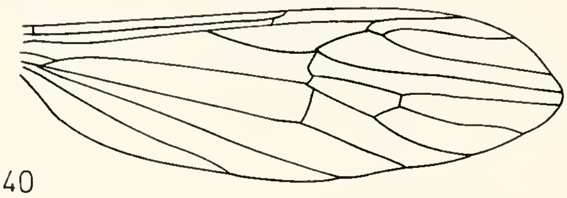

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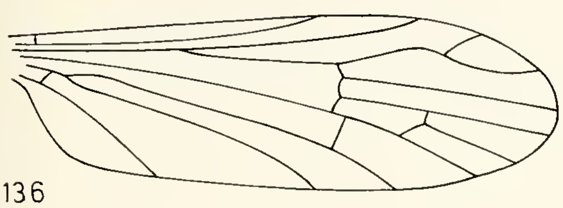

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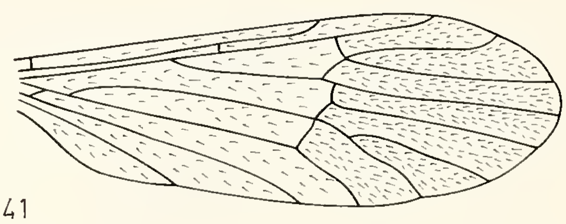

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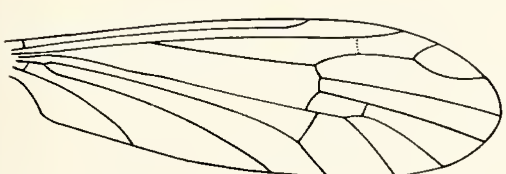

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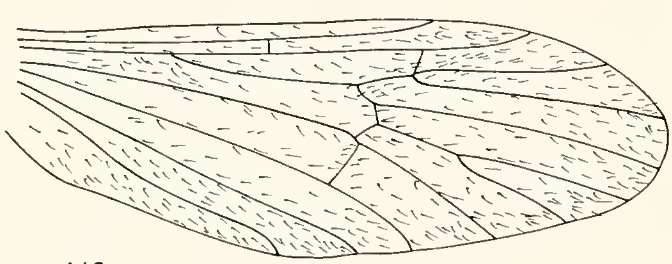

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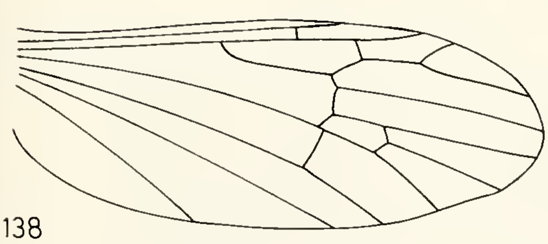

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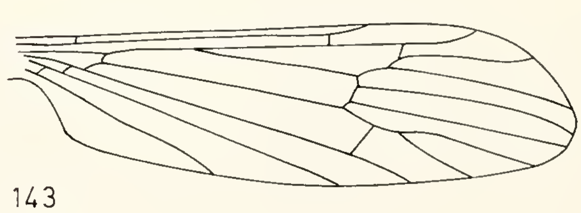

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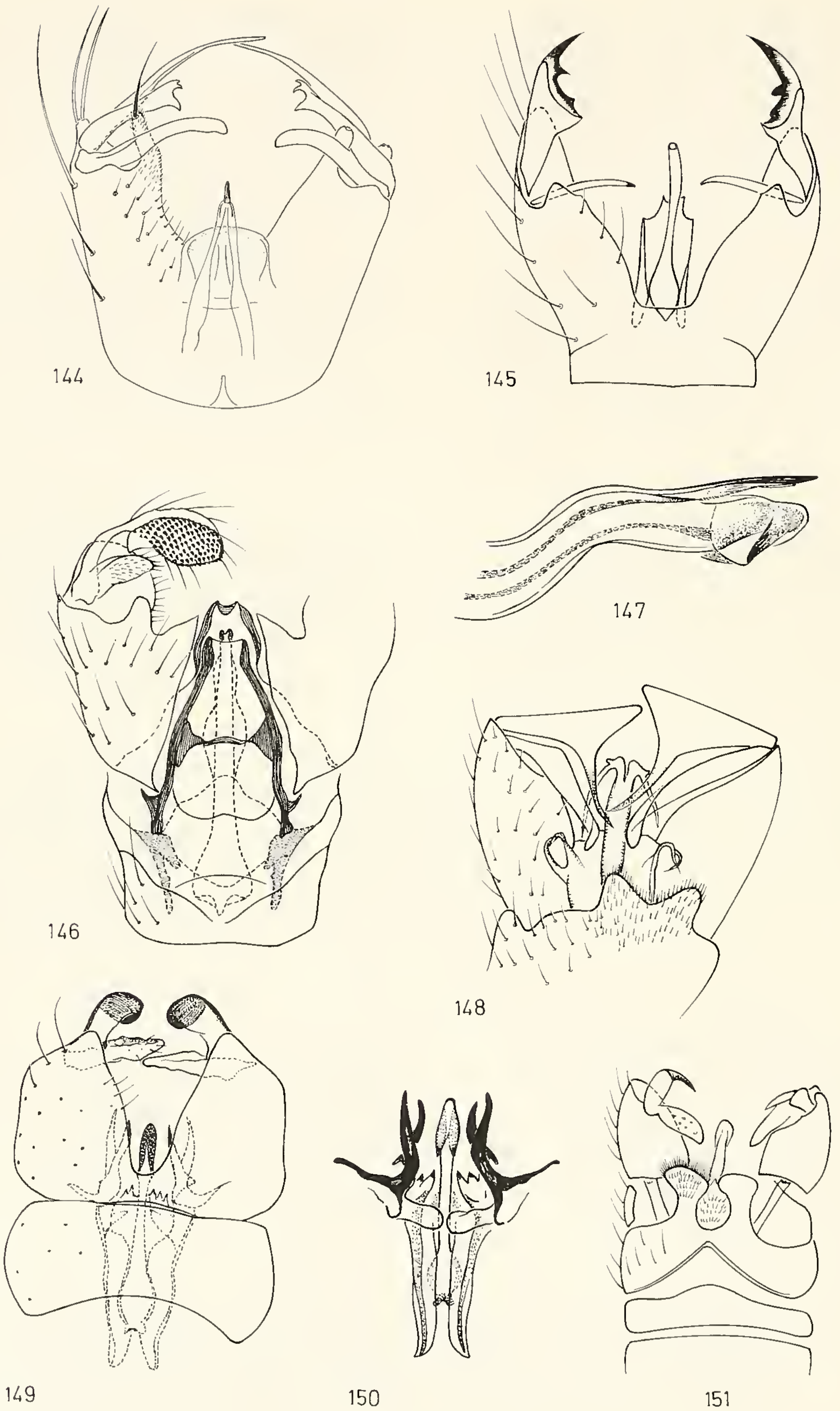
Figs. 134–143. Wings. -134. *Sacandaga laeta* Loew, -135, 136. *Sacandaga parva* Siebke, specimens from Iceland; -137. idem, specimen from Lappland; -138. *Gonempeda flava* Schumm., -139. *Empeda cinerascens* Mg., -140. *Cheilotrichia vagans* Sav., -141. *Oreophila longicornis* Sav., -142. *Rhypholophus haemorrhoidalis* Zett., -143. *Baeoura alexanderi* Mendl & Tjeder. – After Slípka & Starý (Figs. 134, 138, 139, 142), Tjeder (Figs. 135–137), Savchenko (Figs. 140, 141), and Mendl & Tjeder (Fig. 143).



Figs. 144–151. Male terminalia. -144. *Empeda cinerascens* Mg., dorsal view; -145. *Gonempeda flava* Schumm., dorsal view; -146. *Scleroprocta sororcula* Zett., dorsal view; -147. idem, aedeagus, lateral view; -148. *Rhypholophus haemorrhoidalis* Zett., ventral view; -149. *Ormosia rostrifera* Sav., dorsal view; -150. idem, aedeagal complex, ventral view; -151. *Ormosia lineata* Mg., ventral view. – After Starý & Rozkošný (Fig. 144), Krzemiński (Fig. 145), Savchenko (Figs. 146, 147), De Meijere (Figs. 148, 151), and Starý (Figs. 149, 150).

80 Cell r3 about as long as or shorter than its petiole (Figs. 134–139) 81
– Cell r3 at least twice longer than its petiole (Fig. 9) 86

81 R2 lacking, R3 short, mostly about 1/3 length of R4 or less (Figs. 134, 136); gonostylus of male terminalia terminal; outer division of gonostylus simple, its outer surface densely spinose; interbase long and slender (Fig. 130) 82
– R2 present (Figs. 135, 137–139) 83

82 Antenna of male strongly elongate, nearly equal in length to remainder of body .... *Palaeogonomyia* Meunier
– Antenna short in both sexes, usually not reaching as far as wing base when bent backwards .... *Sacandaga* Alexander, in part

83 R4 short, gently curved; Sc2 absent (Figs. 135, 137) ..... *Sacandaga* Alexander, in part
Sometimes in specimens of *parva* Siebke
– R4 long, rather straight; Sc2 present (Figs. 138, 139) 84

84 R3 oblique, straight (Fig. 138); apex of gonocoxite of male terminalia at ventral side produced; outer division of gonostylus strongly dilated and darkened towards its end, with several stout, pointed projections; inner division long and slender; male terminalia not twisted (Fig. 145) .... *Gonempeda* Alexander
– R3 more longitudinal in position (Fig. 139); gonocoxite of male terminalia with a hairy apical lobe, usually situated between the bases of outer and inner division of gonostylus (Fig. 144); gonostylus not as above; male terminalia twisted through nearly 180° 85

85 Anepimeron completely without hairs; cell dm absent (Fig. 139) (but present in *minima* Strobl and *areolata* Lundström) .... *Empeda* Osten Sacken
– Anepimeron with hairs, even if only a few of them; cell dm present .... *Cheilotrichia* Rossi, in part

86 Sc1 short, equal or subequal in length to Sc2, ending well before fork of Rs (Fig. 140) .... *Cheilotrichia* Rossi, in part
– Sc1 much longer than Sc2, ending about opposite fork of Rs or beyond (Fig. 9) 87

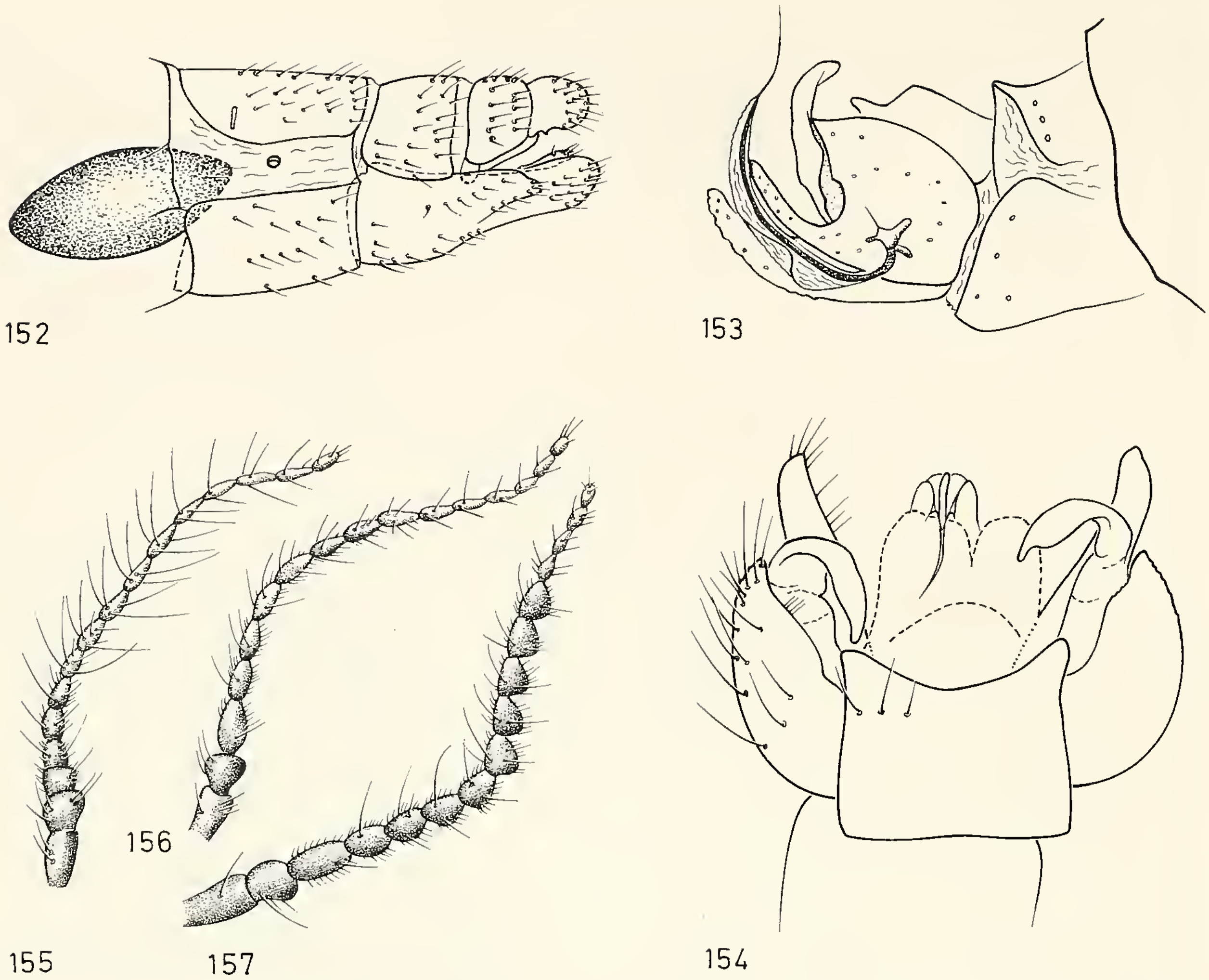
87 Wing membrane with numerous macrotrichia (Fig. 141, 142) 88
– Wing membrane without macrotrichia, setae sometimes present on veins only (Figs. 143, 158–166) 91
When, exceptionally, macrotrichia present in wing cells, then neither male terminalia twisted nor proctiger heavily sclerotized: *Mesocyphona bivittata* Loew

88 Cell dm present; tuberculate pits close to anterior margin of prescutum, and situated proximal to prescutal pits; postnotum without hairs; anal segment (proctiger) heavily sclerotized; aedeagus very large; male terminalia not twisted, tergite 9 occupies its normal, dorsal position (Figs. 146, 147) .... *Scleroprocta* Edwards
– Cell dm present or absent; tuberculate pits far behind anterior margin of prescutum and hardly proximal to prescutal pits; postnotum with hairs; anal segment (proctiger) not sclerotized; aedeagus small; male terminalia twisted, tergite 9 occupies a lateral to ventral position 89

89 Cell dm lost by atrophy of crossvein m-m, lower branch of M forked (Fig. 141) .... *Oreophila* Lackschewitz
– Cell dm present or absent; when absent, by atrophy of basal section of M3 (Fig. 142) 90

90 Apex of aedeagus divided into two long filaments, mostly bent backwards (Fig. 148) .. .. *Rhypholophus* Kolenati
– Apex of aedeagus simple (Figs. 149–151) .... *Ormosia* Rondani

91 Apical section of Sc1 short, subequal to basal section of CuA1 (Fig. 143); gonostylus of male terminalia subterminal, with only one division; apex of gonocoxite strongly produced at ventral side; aedeagus mostly strongly curved upwards (Figs. 153, 154); female with cerci and valves of ovipositor very short, fleshy (Fig. 152) .... *Baeoura* Alexander



Figs. 152–157. – Figs. 152–154. *Baeoura alexanderi* Mendl & Tjeder. -152. female terminalia, lateral view; -153. male terminalia, lateral view; -154. idem, dorsal view. – Figs. 155–157. Antennae. -155. *Erioptera gemina* Tjeder, –156. *Symplecta hybrida* Mg., -157. *Trimicra pilipes* Fabr. – After MENDL & TJEDER (Figs. 152–154), and SAVCHENKO (Figs. 155–157).

– Apical section of Sc 1 long, approximately three times length of basal section of CuA 1 or even longer; male and female terminalia not as above (Figs. 158–166) 92

92 Wing cells with numerous macrotrichia; cell dm present (Fig. 158); gonostylus of male terminalia terminal, its divisions subequal in length, narrow; outer division finely serrated at outer margin; inner division with two sharply pointed projections at about midlength (Fig. 168) .... *Mesocyphona* Osten Sacken, in part

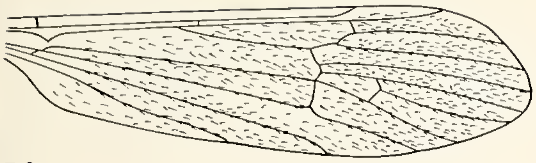
1 sp., *bivittata* Loew

– Wing cells without macrotrichia; combination of other characters not as above 93

93 Terminal 3–4 flagellomeres rather abruptly smaller than others (Figs. 157); cell dm present; gonocoxite of male terminalia about as long as broad; gonostylus terminal, its divisions about equal in length, slender; outer division of gonostylus ending in a black spine, inner division with tip rounded (Fig. 167) .... *Trimicra* Osten Sacken

1 sp., *pilipes* Fabricius: body size extremely variable, length of wing 6–11 mm; large male individuals with long hairs on tibia 1, tibia 3 and femur 3; these hairs in female and small male individuals short and inconspicuous

– Terminal flagellomeres gradually and progressively smaller than others (Figs. 155, 156); combination of other characters not as above 94



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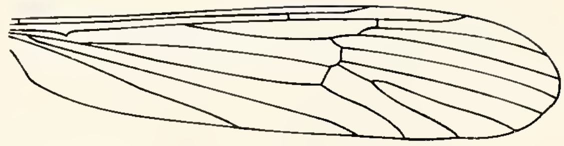

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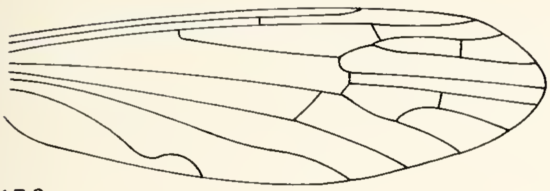

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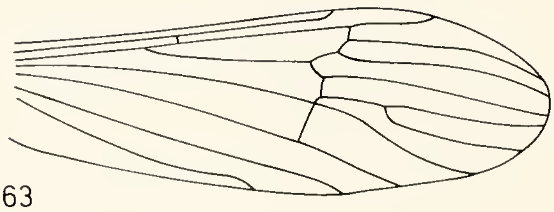

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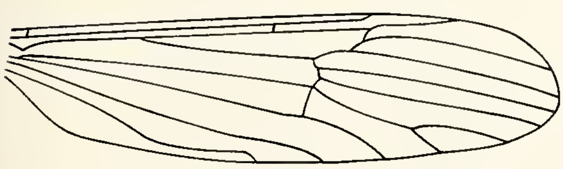

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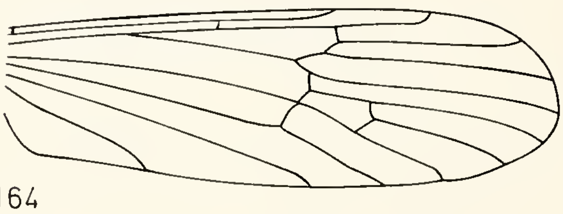

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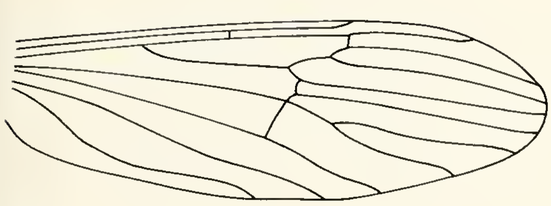

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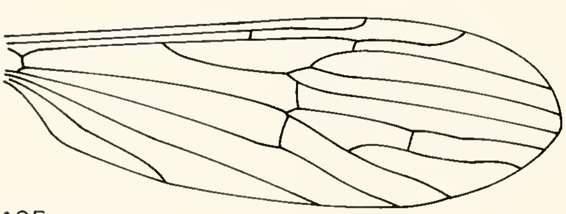

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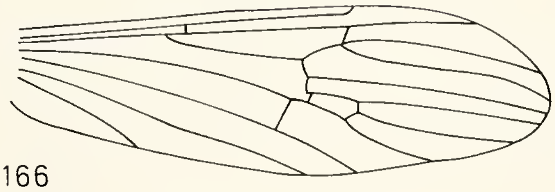

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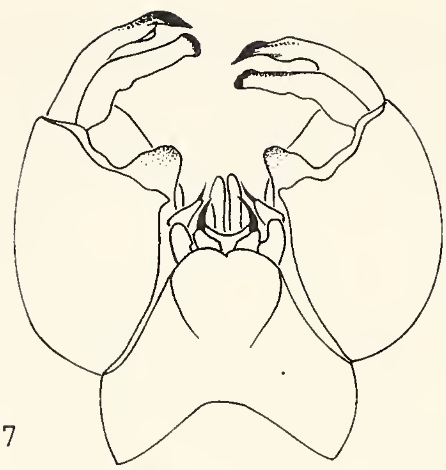
Figs. 158–166. Wings. -158. *Mesocyphona bivittata* Loew, -159. *Symplecta hybrida* Mg., -160. *Erioconopa diuturna* Walk., -161. *Erioptera lutea* Mg., -162. *Arctoconopa obscuripes* Zett., -163. *Mesocyphona fossarum* Loew, -164. *Psiloconopa pusilla* Schin., -165. *Ilisia maculata* Mg., -166. *Parilisia areolata* Siebke. – After SAVCHENKO (Figs. 158, 160, 162, 164, 165), and SLÍPKA & STARÝ (Figs. 159, 161, 163, 166).



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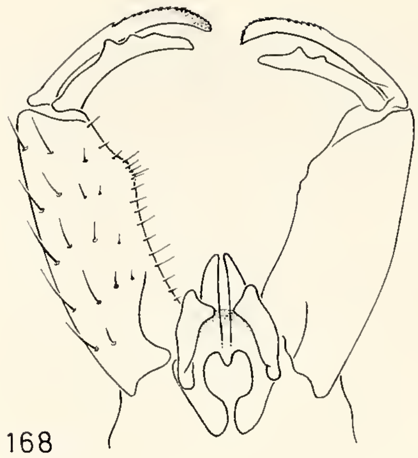

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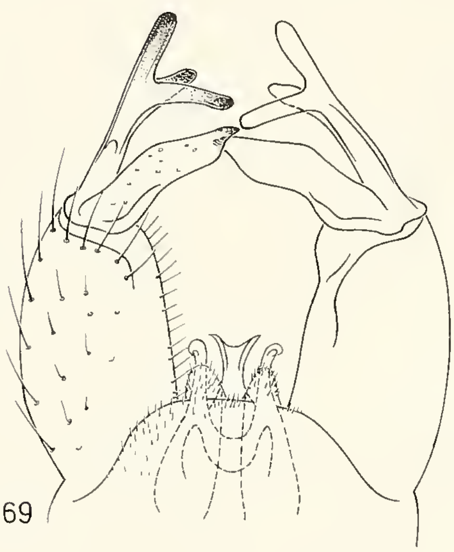

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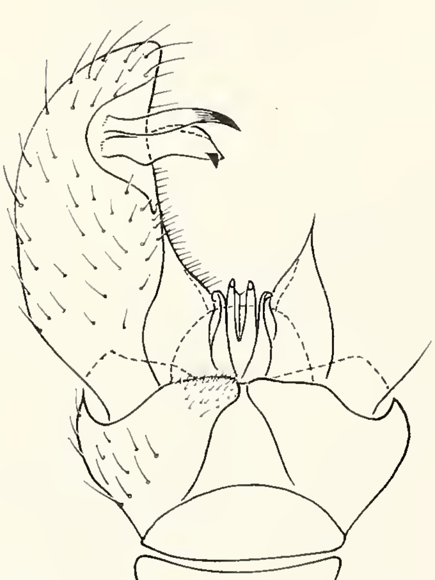

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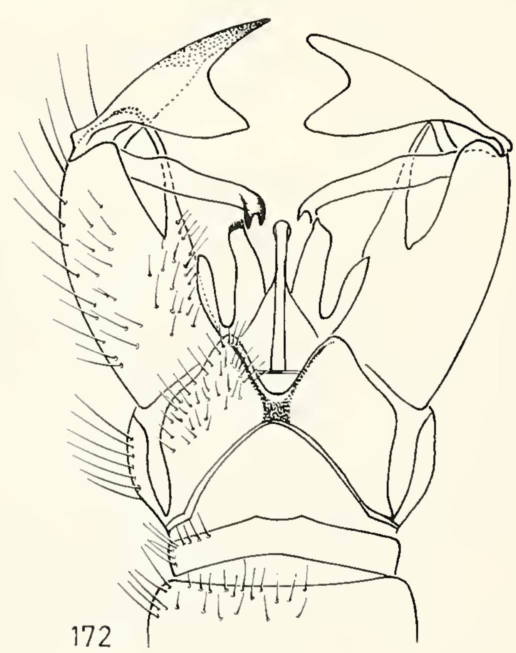

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Figs. 167–172. Male terminalia. -167. *Trimicra pilipes* Fabr., dorsal view; -168. *Mesocyphona bivittata* Loew, ventral view; -169. *Erioptera griseipennis* Mg., dorsal view; -170. *Erioconopa trivialis* Mg., dorsal view; -171. *Psiloconopa alexanderi* Sav., dorsal view; -172. *Arctoconopa lapponica* Tjeder, dorsal view. – After Krzemiński (Fig. 167), Starý & Rozkošný (Figs. 168, 169, 170), Savchenko (Fig. 171), and Tjeder (Fig. 172).

94 Supernumerary crossvein in cell r3, and/or vein A2 strongly sinouos at its distal end; distance between tips of A1 and A2 usually exceeding distance between CuA2 and A1 (Fig. 159) .... *Symplecta* Meigen

– Combination of characters not as above; when vein A2 sinuous, then distance between tips of A1 and A2 about as long as distance between CuA2 and A1 (Figs. 160–166) . 95

95 A2 long and more or less sinuous, reaching as far as mid-length of wing or even farther; A1 and A2 convergent (Figs. 160, 161) 96

– A2 straight or slightly curved, but not so long, reaching less far than mid-length of wing; A1 and A2 divergent (exception: *Mesocyphona fossarum* Loew) (Figs. 162–166) 97

96 Veins of wing with only a few and short setae; cell dm present or absent (when absent, by atrophy of cross-vein m-m) (Fig. 160); gonostylus of male terminalia subterminal; outer division of gonostylus heavily pigmented, appearing as a stout black spine or triangular blade; inner division fleshy and pale; apex of aedeagus simple; male terminalia twisted through 45–90°, tergite 9 occupies a lateral position (Fig. 170) .... *Erioconopa* Starý

– Veins of wing with long and numerous setae; cell dm absent by atrophy of cross-vein m-m (Fig. 161); gonostylus of male terminalia not as above; apex of aedeagus bifid; male terminalia not twisted, tergite 9 occupies its normal, dorsal position (Fig. 169) .... *Erioptera* Meigen

97 Cell dm absent (Figs. 162, 163) 98

Cell dm present (Figs. 164–166) 99

98 Cell dm absent by atrophy of crossvein m-m (Fig. 162); tergite 9 of male terminalia mostly longer than broad, deeply emarginate posteriorly; gonocoxite at most two times longer than broad (Fig. 172) .... *Arctoconopa* Alexander

– Cell dm absent by atrophy of basal section of M3 (Fig. 163); combination of other characters not as above .... *Mesocyphona* Osten Sacken, in part

99 Male terminalia not twisted, tergite 9 occupies its normal, dorsal position (Fig. 171); wing as in Fig. 164 .... *Psiloconopa* Zetterstedt

– Male terminalia twisted through nearly 180°, tergite 9 occupies a ventral position . 100

100 Wing spotted; cell dm about as long as cell m1+2 or even longer (Fig. 165); outer division of gonostylus of male terminalia simple, without projections (Fig. 173); female with valves of ovipositor very elongate, reaching as far as apices of cerci or even farther .... *Ilisia* Osten Sacken

– Wing unspotted, or with only a few very small spots near margin and cord of wing; cell dm distinctly shorter than cell m1+2 (Fig. 166); outer division of gonostylus with one or more projections at inner side; valves of ovipositor in female of moderate length, reaching till midlength of cerci or only a little farther 101

101 Cell dm 2.5 to 3 times shorter than cell m1+2 (Fig. 166); gonocoxite of male terminalia at ventral side produced into a rounded, conical lobe; gonostylus accordingly subterminal (Fig. 175) .... *Parilisia* Savchenko

– Cell dm 1.5 to 2 times shorter than cell m1+2; gonocoxite of male terminalia at ventral side not produced; gonostylus accordingly terminal (Fig. 174) ..... *Lunaria* Savchenko
1 sp., *idiophallus* Savchenko

102 Wing in both sexes reduced to a very small knob, much shorter than halter; adults superficially resembling spiders (Fig. 176); frequently found on snow 103

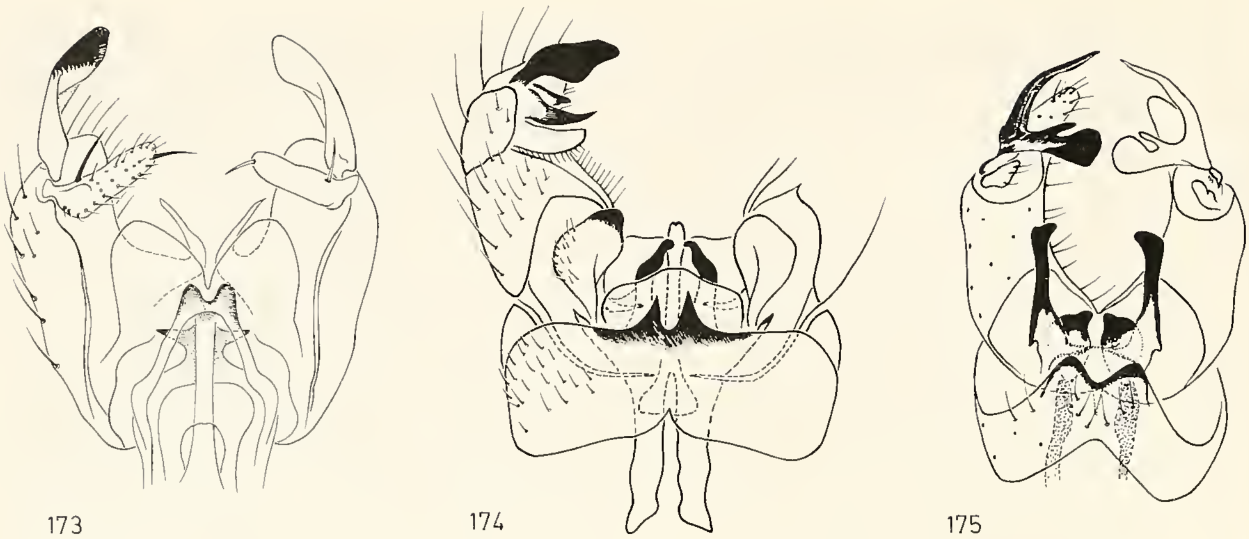
– Wing larger, at least longer than halter; adults not spider-like 104

103 Gonostylus of male terminalia simple, with a divided lobe at its base; aedeagus relatively short and thick; parameres short and triangular (Figs. 181, 182) ...... *Chionea* Dalman

– Gonostylus of male terminalia without a divided lobe at its base; aedeagus very elongate, S-shaped; parameres oblong (Figs. 177–179) .... *Niphadobata* Enderlein

104 Tibia without spurs; wing veins with numerous long setae . *Molophilus* Curtis, in part
1 sp., *ater* Meigen: small, black, body length 3–4 mm; wing reduced in both sexes

– Tibia with spurs; wing veins without setae; middle-sized species, body length more than 4 mm 105



173 174 175

Figs. 173–175. Male terminalia. -173. *Ilisia maculata* Mg., ventral view; -174 *Lunaria idiophallus* Sav., ventral view; -175. *Parilisia subalpina* Bang., ventral view. – After STARÝ & ROZKOŠNÝ (Fig. 173), SAVCHENKO (Fig. 174), and STARÝ (Fig. 175).

105 Eye with hairs between ommatidia; body length 5–6 mm (Figs. 185–189) .... *Paradicranota* Alexander, in part
– Eye without hairs 106

106 Wing nearly or about as long as abdomen, clear, with or without pattern (Fig. 195).. 107
– Wing much shorter than abdomen, unpatterned, smoky 108

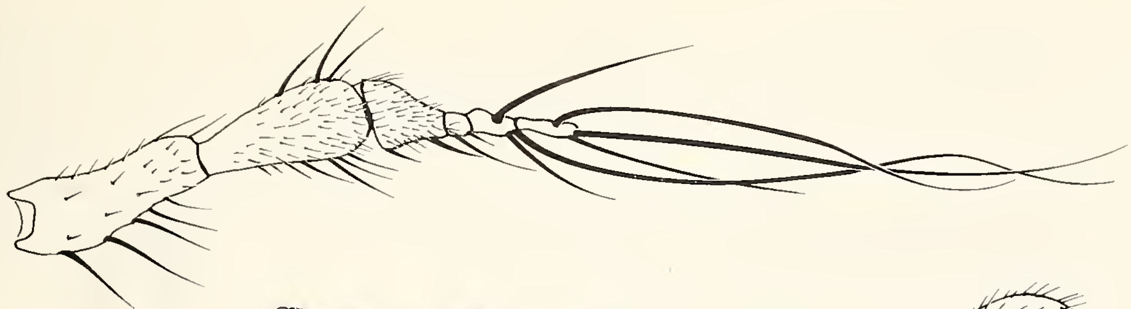
107 Wing shorter than abdomen, narrow, with three dark, transverse bands; wing reduced in both sexes (Figs. 183, 195) .... *Dactylolabis* Osten Sacken, in part
– Wing about as long as abdomen, unpatterned, without pterostigmal darkening; wing reduced in female only .... *Phylidorea* Bigot, in part
1 sp., *heterogyna* Bergroth

108 Wing yellowish at its base, about 1.5 times longer than halter (Figs. 184, 194) .... *Prionolabis* Osten Sacken, in part
– Entire wing smoky, not yellowish at its base, about two times longer than halter .... *Idioptera* Macquart, in part
1 sp., *pulchella* Meigen.

4. Conclusion

In using the key, questions will arise about the validity of characters used in separating genus-groups. From this point of view, it will be interesting to compare the key for Tipulidae s. l. of N. America (ALEXANDER & BYERS, 1981) with the key of this paper. E. g., in the former key *Dicranota* Zetterstedt s. str. and *Paradicranota* Alexander are separated by the presence or absence of a particular crossvein. This character does not seem to hold for the European species (EDWARDS, 1938: 59–60). Problems also arise with the characters for separating *Symplecta* Meigen and *Psiloconopa* Zetterstedt (THEOWALD, 1971).

More often than not, such problems are due to inadequate original definitions of the genus-group in question. More examples of such ill-defined genus-groups may be given. Further taxonomic investigation is needed before such problems can be solved. Preferably all species of a particular genus-group complex from all over the world should be taken into consideration.



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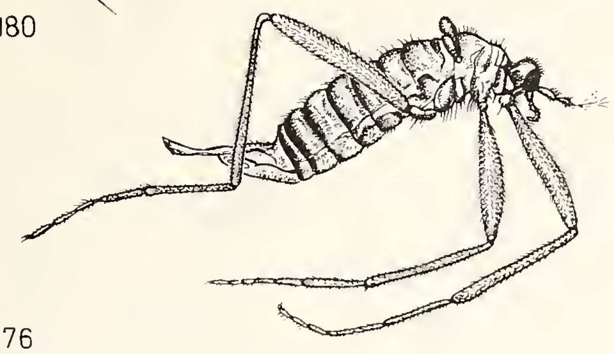

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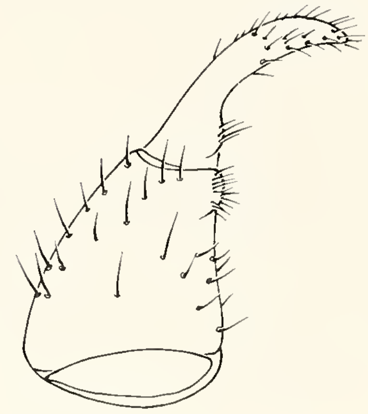

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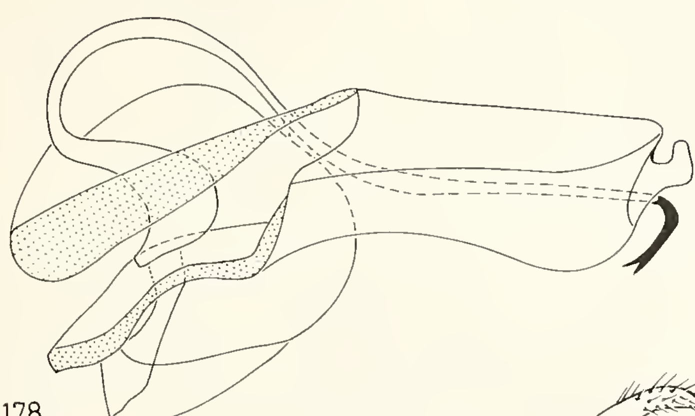

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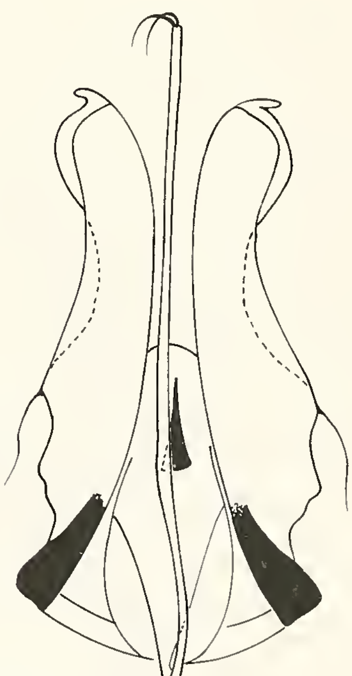

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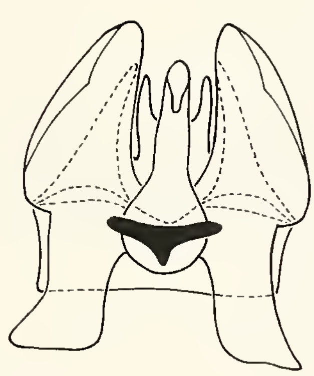

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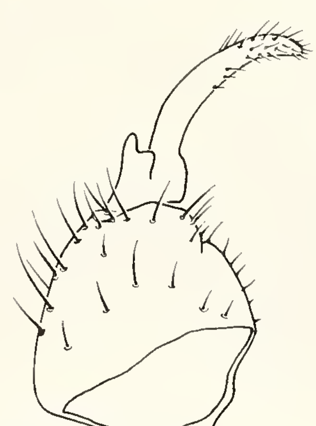

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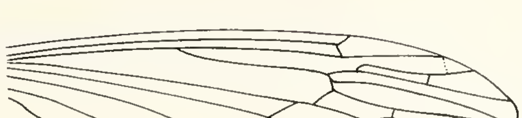

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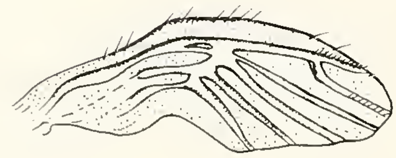

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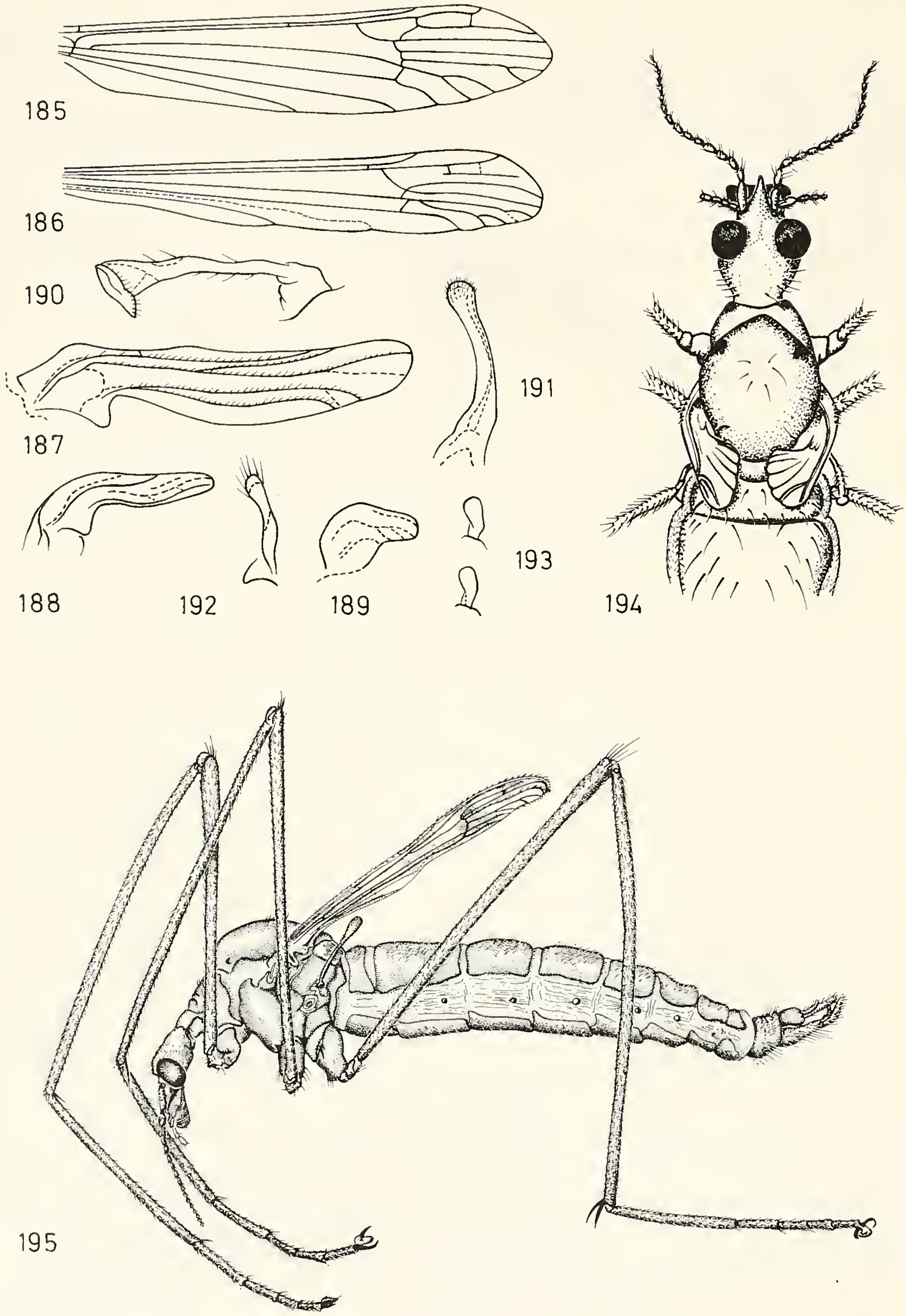
Figs. 176–184. – Figs. 176–180. *Niphadobata lutescens* Lundstr. -176. female, lateral view; -177. gonopod, -178. aedeagal complex, lateral view; -179. idem, dorsal view; -180. antenna. – Figs. 181–182. *Chionea araneoides* Dalm. -181. aedeagal complex, ventral view; -182. gonopod. – Figs. 183–184. Wings. -183. *Dactylolabis wodzickii* Now., -184. *Prionolabis platyptera* Macq., female. – After SAVCHENKO (Fig. 176), KRZEMIŃSKI (Figs. 177–182), SLÍPKA & STARÝ (Fig. 183), and MARTINOVSKÝ & STARÝ (Fig. 184).



Figs. 185-195. – Figs. 185–193. Wings (185–189) and halteres (190–193) of *Paradicranota parviuncinata* Sav. -185. normal, macropterous form; -186, 190. stenopterous form (forma *stenoptera*); -187, 191. brachypterous form (forma *brevis*); -188, 192. micropterous form (forma *perbrevis*); -189, 193. micropterous form (forma *opilionimorpha*). – Fig. 194. Female of *Prionolabis platyptera* Macq., dorsal view. – Fig. 195. Male of *Dactylolabis wodzickii* Now., lateral view. – After Savchenko & Parkhomenko (Figs. 185–193), Martinovský & Starý (Fig. 194), and Martinovský (Fig. 195).

The arrangements of genus-groups in the key is more or less according to the classification system of ALEXANDER, which is based largely on characters of wing venation. It is almost certain that this system will be subject to important modifications. For this reason, the key of the present paper leads to genus-groups, without an indication of their status as genus or subgenus.

Proposals to a new system have been made by SAVCHENKO in his last publications (SAVCHENKO & KRIVOLUTSKAYA, 1976; SAVCHENKO, 1982, 1983, 1985). Nevertheless, in this paper ALEXANDER's arrangement of genus-groups has been maintained, mainly for practical reasons.

Firstly, one of the main sources for my key was the key by SLIPKA & STARÝ (1977), which follows the system of ALEXANDER. Secondly, at the moment a satisfactory classification system cannot be given. OOSTERBROEK & THEOWALD (in press) give a classification, based on immature stages. Because these stages are not yet known for a large amount of genera and subgenera, a cladistic analysis including all genus-groups is not yet possible. For this, more taxonomic investigation on a world-wide scale will be needed.

5. Appendix I

Distribution of genus-group taxa into higher categories according to the classification systems of SAVCHENKO and of ALEXANDER.

In this section, the genus-group names as used in the key (section 3.2.) as well as the names of higher categories (tribes, subfamilies etc.) are listed in alphabetical order. The position of these taxa according to the classification systems of SAVCHENKO and of ALEXANDER is indicated in the next three columns. The first of these represents the situation as may be deduced from SAVCHENKO & KRIVOLUTSKAYA (1976). The second column has been compiled largely from SAVCHENKO (1982, 1983, 1985) and completed by records from some other sources by SAVCHENKO.

The third column represents the classification system of ALEXANDER as may be derived from ALEXANDER & BYERS (1981), partly completed by records of HUTSON & VANE-WRIGHT (1969) for some taxa, which ar not represented in the Nearctic region.

Abbreviations:
- *Sg* Subgenus
- *G* Genus
- *Tr* Tribe
- *Sf* Subfamily
- *F* Family.

Taxon	SAVCHENKO & KRIVOLUTSKAYA (1976)	SAVCHENKO (1983) SAVCHENKO (1982–1985)(*) Other sources (**)	ALEXANDER & BYERS (1981) HUTSON & VANE-WRIGHT (1969)(*) Other sources (**)
Achyrolimonia	Sg of *Dicranomyia*	Sg of *Dicranomyia*	Sg of *Limonia**
Adelphomyia	G of Limnophilini	G of Limnophilini	Sg of *Tricholimnophila***
Afrolimnophila	Sg of *Limnophila*		Sg of *Limnophila*
Afrolimonia	Sg of *Libnotes*	Sg of *Libnotes*	
Amalopis	Sg of *Pedicia*	Sg of *Pedicia*	Sg of *Pedicia**
Antocha	G of Antochini	G of Antochini	G of Limoniini
Antocha s. str.		Sg of *Antocha*	
Antochini	Tr of Limoniinae	Tr of Limoniinae	
Archilimnophila	Sg of *Austrolimnophila*	Sg of *Austrolimnophila*	Sg of *Austrolimnophila*
Arctoconopa	G of Eriopterini	G of Eriopterini	G of Eriopterini
Atypophthalmus	G of Limoniini	G of Limoniini	Sg of *Limonia**
Austrolimnophila	G of Epiphragmini	G of Epiphragmini	G of Hexatomini
Austrolimnophila s. str.	Sg of *Austrolimnophila*	Sg of *Austrolimnophila*	Sg of *Austrolimnophila*

Baeoura		G of Eriopterini	
Brachylimnophila	Sg of *Limnophila*	Sg of *Neolimnomyia*	Sg of *Limnophila*
Cheilotrichia	G of Molophilini	G of Molophilini	G of Eriopterini
Cheilotrichia s. str.	Sg of *Cheilotrichia*	Sg of *Cheilotrichia*	Sg of *Cheilotrichia*
Chionea		G of Cladurini	G of Eriopterini
Chionea s. str.		Sg of *Chionea*	
Cladolipes		Sg of *Hexatoma***	
Cladurini	Tr of Eriopterinae	Tr of Eriopterinae	
Coenolabis		Sg of *Dactylolabis***	
Crunobia		Sg of *Pedicia*	Sg of *Pedicia**
Crypteria		G of Cladurini*	
Cylindrotomidae	F of Tipuloidea	F of Tipuloidea	
Cylindrotominae			Sf of Tipulidae
Dactylolabis	G of Epiphragmini		G of Hexatomini
Dactylolabis s. str.	Sg of *Dactylolabis*		Sg of *Dactylolabis*
Dasymolophilus		Sg of *Tasiocera*	Sg of *Tasiocera*
Dicranomyia	G of Limoniini	G of Limoniini	
Dicranomyia s. str.	Sg of *Dicranomyia*	Sg of *Dicranomyia*	Sg of *Limonia*
Dicranoptycha	G of Antochini	G of Gonomyini	G of Limoniini
Dicranota	G of Pediciini	G of Pediciini	G of Pediciini
Dicranota s. str.	Sg of *Dicranota*	Sg of *Pedicia*	Sg of *Dicranota*
Discobola	G of Limoniini	G of Limoniini	Sg of *Limonia*
Elephantomyia	G of Limnophilini	G of Elephantomyini	G of Hexatomini
Elephantomyini	Tr of Hexatominae	Tr of Hexatominae	
Elliptera	G of Antochini	G of Antochini	G of Limoniini
Ellipteroides		Sg of *Idiocera**	
Eloeophila	G of Limnophilini	G of Limnophilini	Sg of *Limnophila*
Empeda	Sg of *Cheilotrichia*	Sg of *Cheilotrichia*	Sg of *Cheilotrichia*
Epiphragma	G of Epiphragmini	G of Epiphragmini	G of Hexatomini
Epiphragmini	Tr of Hexatominae	Tr of Hexatominae	
Eriocera	Sg of *Hexatoma*	Sg of *Hexatoma*	
Erioconopa		G of Molophilini	
Erioptera	G of Eriopterini	G of Eriopterini	G of Eriopterini
Erioptera s. str.	Sg of *Erioptera*	Sg of *Erioptera*	Sg of *Erioptera*
Eriopterinae	Sf of Limoniidae	Sf of Limoniidae	
Eriopterini	Tr of Eriopterinae	Tr of Eriopterinae	Tr of Limoniinae
Euphylidorea	Sg of *Phylidorea*		
Euptilostena		Sg of *Idiocera**	Sg of *Gonomyia*
Eutonia		G of Hexatominae**	Sg of *Limnophila*
Geranomyia	G of Limoniini	G of Limoniini	Sg of *Limonia*
Gnophomyia	G of Gonomyini	G of Gonomyini	G of Eriopterini
Gnophomyia s. str.	Sg of *Gnophomyia*		
Gonempeda		G of Eriopterini*	G of Eriopterini
Gonomyia	G of Gonomyini	G of Gonomyini	G of Eriopterini
Gonomyia s. str.	Sg of *Gonomyia*	Sg of *Gonomyia*	Sg of *Gonomyia*
Gonomyini	Tr of Eriopterinae	Tr of Eriopterinae	
Helius	G of Antochini	G of Elephantomyini	G of Limoniini
Hexatoma	G of Hexatomini	G of Hexatomini	G of Hexatomini
Hexatoma s. str.	Sg of *Hexatoma*		Sg of *Hexatoma*
Hexatominae	Sf of Limoniidae	Sf of Limoniidae	
Hexatomini	Tr of Hexatominae	Tr of Hexatominae	Tr of Limoniinae
Hoplolabis (see under *Parilisia*)			
Idiocera	G of Gonomyini	G of Gonomyini	
Idiocera s. str.	Sg of *Idiocera*	Sg of *Idiocera*	Sg of *Gonomyia*
Idiocerodes		Sg of *Gonomyia***	
Idioptera		G of Hexatominae**	Sg of *Limnophila*
Ilisia	G of Molophilini	G of Molophilini	
Ilisia s. str.	Sg of *Ilisia*	Sg of *Ilisia*	Sg of *Erioptera*
Libnotes	G of Limoniini	G of Limoniini	
Limnophila	G of Limnophilini	G of Limnophilini	G of Hexatomini
Limnophila s. str.	Sg of *Limnophila*	Sg of *Limnophila*	
Limnophilini	Tr of Hexatominae	Tr of Hexatominae	
Limonia	G of Limoniini	G of Limoniini	G of Limoniini
Limonia s. str.			Sg of *Limonia*
Limoniidae	F of Tipuloidea	F of Tipuloidea	
Limoniinae	Sf of Limoniidae	Sf of Limoniidae	Sf of Tipulidae
Limoniini	Tr of Limoniinae	Tr of Limoniinae	Tr of Limoniinae
Lipsothrix	G of Gonomyini	G of Gonomyini*	G of Eriopterini
Ludicia		= *Rhaphidolabina***	Sg of *Pedicia**
Lunaria		Sg of *Ilisia**	
Melanolimonia	Sg of *Dicranomyia*	Sg of *Dicranomyia*	Sg of *Limonia*
Mesocyphona		Sg of *Erioptera*	Sg of *Erioptera*

Metalimnobia	G of Limoniini	G of Limoniini	Sg of *Limonia*
Microlimonia	Sg of *Dicranomyia*	Sg of *Dicranomyia*	
Mixolimnomyia		Sg of *Neolimnomyia***	
Molophilini	Tr of Eriopterinae	Tr of Eriopterinae	
Molophilus	G of Molophilini	G of Molophilini	G of Eriopterini
Molophilus s. str.	Sg of *Molophilus*	Sg of *Molophilus*	Sg of *Molophilus*
Nasiternella	G of Pediciini	G of Pediciini	G of Pediciini
Neolimnomyia		G of Limnophilini	
Neolimnomyia s. str.		Sg of *Neolimnomyia*	
Neolimnophila	G of Cladurini	G of Cladurini	G of Eriopterini
Neolimonia		Sg of *Dicranomyia**	Sg of *Limonia**
Niphadobata		G of Cladurini*	
Oreophila	Sg of *Ormosia*	Sg of *Ormosia*	Sg of *Ormosia*
Orimarga		G of Antochini*	G of Limoniini
Orimargula		Sg of *Antocha**	
Ormosia	G of Molophilini	G of Molophilini	G of Eriopterini
Ormosia s. str.	Sg of *Ormosia*	Sg of *Ormosia*	Sg of *Ormosia*
Oxyrhiza	Sg of *Paradelphomyia*	Sg of *Paradelphomyia*	Sg of *Paradelphomyia**
Palaeogonomyia		Sg of *Rhabdomastix**	
Paradelphomyia	G of Paradelphomyini	G of Paradelphomyini	G of Hexatomini
Paradelphomyini	Tr of Hexatominae	Tr of Hexatominae	
Paradicranota		Sg of *Dicranota***	Sg of *Dicranota*
Parilisia	Sg of *Ilisia*	Sg of *Ilisia* (Krzemiński, 1984: Sg of *Hoplolabis*)	
Pedicia	G of Pediciini	G of Pediciini	G of Pediciini
Pedicia s. str.	Sg of *Pedicia*	Sg of *Pedicia*	Sg of *Pedicia*
Pediciinae	Sf of Limoniidae	Sf of Limoniidae	
Pediciini	Tr of Pediciinae	Tr of Pediciinae	Tr of Limoniinae
Phylidorea	G of Limnophilini	G of Limnophilini	
Phylidorea s. str.	Sg of *Phylidorea*	Sg of *Phylidorea*	Sg of *Limnophila*
Phyllolabis		G of Hexatominae**	G of Hexatomini
Pilaria	G of Limnophilini	G of Limnophilini	G of Hexatomini
Plectromyia		Sg of *Dicranota*	Sg of *Dicranota*
Prionolabis	G of Limnophilini	G of Limnophilini	Sg of *Limnophila*
Prolipophleps	Sg of *Gonomyia*	Sg of *Gonomyia**	
Protogonomyia		Sg of *Idiocera**	
Pseudolimnophila	G of Limnophilini	G of Hexatominae**	G of Hexatomini
Psiloconopa		Sg of *Symplecta**	Sg of *Erioptera*
Ptilostenodes		Sg of *Gonomyia***	
Rhabdomastix	G of Eriopterini	G of Gonomyini	G of Eriopterini
Rhaphidolabina	Sg of *Dicranota*	Sg of *Pedicia*	Sg of *Dicranota*
Rhaphidolabis	Sg of *Dicranota*	Sg of *Pedicia*	Sg of *Dicranota*
Rhipidia	G of Limoniini	G of Limoniini	Sg of *Limonia*
Rhypholophus	Sg of *Ormosia*	G of Molophilini*	Sg of *Ormosia*
Sacandaga	Sg of *Rhabdomastix*	Sg of *Rhabdomastix*	Sg of *Rhabdomastix*
Salebriella	Sg of *Dicranomyia*	Sg of *Dicranomyia*	
Scleroprocta	G of Eriopterini	G of Eriopterini	Sg of *Ormosia*
Sphaeropyga	Sg of *Dicranomyia*	Sg of *Dicranomyia*	
Symplecta	G of Eriopterini	G of Eriopterini	
Symplecta s. str.	Sg of *Symplecta*	Sg of *Symplecta*	Sg of *Erioptera*
Tasiocera		G od Molophilini	G of Eriopterini
Teuchogonomyia	Sg of *Gonomyia*	Sg of *Gonomyia*	Sg of *Gonomyia*
Thaumastoptera		G of Antochini*	G of Limoniini
Tipulidae	F of Tipuloidea	F of Tipuloidea	
Tipulinae	Sf of Tipulidae	Sf of Tipulidae	Sf of Tipulidae
Trentepohlia		G of Eriopterinae**	G of Eriopterini**
Trentepohlia s. str.		Sg of *Trentepohlia***	Sg of *Trentepohlia***
Tricholimnophila			G of Hexatomini**
Tricyphona	G of Pediciini	G of Pediciini	Sg of *Pedicia*
Trimicra		Sg of *Symplecta*	Sg of *Erioptera*
Ula	G of Ulini	G of Ulini	G of Pediciini
Ulini	Tr of Pediciinae	Tr of Pediciinae	
Ulugbekia		Sg of *Dicranoptycha***	

6. Appendix II

List of most frequently used synonym names for genus-group taxa

In this section a list is given of genus-group names, which may be found in literature (as mentioned in section 1.6.) along with their current synonym names as used in the key (section 3.2.). This list is not intended to be complete. A more complete list of synonym names, as far as the genus-group taxa in question are represented in the Australian-Oceanian Region, has been given by OOSTERBROEK & JONAS (1986).

Acyphona Osten Sacken, 1869	=	*Ilisia* Rondani, 1856
Anisomera Meigen, 1818	=	*Hexatoma* Latreille, 1809
Arrhenica Osten Sacken, 1859	=	*Eriocera* Macquart, 1838
Astrolabis Osten Sacken, 1865	=	*Plectromyia* Osten Sacken, 1869
Caloptera Guérin-Méneville, 1831	=	*Eriocera* Macquart, 1838
Elaeophila Rondani, 1856	=	*Eloeophila* Rondani, 1856
Ephelia Schiner, 1863	=	*Eloeophila* Rondani, 1856
Gonomyiella Kuntze, 1919	=	*Oxyrhiza* De Meijere, 1946
Helobia Lepeletier & Serville, 1828	=	*Symplecta* Meigen, 1830
Leiponeura Skuse, 1890	=	*Lipophleps* Bergroth, 1915
Leptorhina Stephens, 1829	=	*Helius* Lepeletier & Serville, 1828
Limnobia Meigen, 1818	=	*Limonia* Meigen, 1803
Megarhina Lepeletier & Serville, 1828	=	*Helius* Lepeletier & Serville, 1828
Nasiterna Wallengren, 1881	=	*Nasiternella* Wahlgren, 1904
Oxydiscus De Meijere, 1913	=	*Oxyrhiza* De Meijere, 1946
Penthoptera Schiner, 1863	=	*Eriocera* Macquart, 1838
Platytoma Lioy, 1863	=	*Empeda* Osten Sacken, 1869
Poecilostola Schiner, 1863	=	*Limnophila* Macquart, 1834
Polymeda Meigen, 1800	=	*Erioptera* Meigen, 1803
Ptilostena Bergroth, 1913	=	*Idiocera* Dale, 1842
Rhamphidia Meigen, 1830	=	*Helius* Lepeletier & Serville, 1828
Salebria Savchenko, 1976	=	*Salebriella* Savchenko, 1978
Symplectomorpha Mik, 1886	=	erected for the species *stictica* Meigen, now belonging to *Symplecta/Psiloconopa*
Taphrophila Rondani, 1856	=	*Antocha* Osten Sacken, 1859.

7. Addendum

After the text of this paper had been concluded, E.N. SAVCHENKO (Kiev) and J. STARÝ (Olomouc) have drawn my attention to a few taxa which had been overlooked. As it is no more possible to include them in the key, they will be mentioned here with a short description.

1. *Mixolimnomyia* Savchenko

   This taxon is closely related to *Brachylimnophila* Alexander and *Neolimnomyia* Séguy (couplet 64), and considered by SAVCHENKO as a subgenus of *Neolimnomyia* s.l. It differs from the above mentioned taxa mainly in the structure of the aedeagus complex. The wing venation is in agreement with the description of couplet 60, lower half. *Mixolimnomyia* is represented in the western Palaearctic region by its type species, *rufula* Savchenko 1979. Terra typica is the Krasnodar territory of the Russion SFSR.

2. *Trentepohlia* Bigot s. str.

   This taxon, which belongs to the subfamily Eriopterinae, has many representatives in the Afrotropical region. It is easily distinguished by its venational characteristics. For example, vein CuA 2 does not end in the wing margin, but is connected with vein A 1, thus closing cell cu completely. Moreover, vein A 2 is very short. *Trentepohlia* s. str. is represented in the western Palaearctic region by one species, viz. *efflatouni* Pierre 1923, which has been found in Egypt.

3. Two additional brachypterous taxa are known from the western Palaearctic region, namely *Crunobia semireducta* Savchenko 1978, (Transcaucasia), and *Pedicia rivosa mannheimsi* Lindner 1966 (Western Germany: Schwarzwald). In both sexes of *C. semireducta* the yellowish wings are narrowed and shortened, hardly reaching the hind margin of the fifth abdominal segment. The male terminalia are in agreement with the description as given in couplet 37, lower half. *P. r. mannheimsi* is brachypterous in the female only.

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