

Keys to the  
**INSECTS**  
of the European Part  
of the USSR

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**III**  
Part Four

Editor-in-Chief  
**G.S. MEDVEDEV**

Part IV of Volume III provides keys for 20 subfamilies of braconids covering 1700 species belonging to 165 genera; 123 species have been described for the first time. Besides species reported for the European part of the USSR, the *Keys . . .* includes species known from Western Europe, Kazakhstan, Soviet Central Asia and the Caucasus. For all the species, information is provided on their geographic distribution, host-plants (if available) and synonymy. The introduction briefly outlines the morphology, biology, general features of geographic distribution and economic significance of braconids.

This book is the first compendium since the last century on the Palearctic braconids, and may be used for their identification throughout the USSR and as a reference book.







Keys to the Insects

Volume III, Part IV



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Zoologicheskii Institut

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ACADEMY OF SCIENCES OF THE USSR  
Institute of Zoology

# Keys to the Insects of the European Part of the USSR

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Tom III, Pereponchatokrylye, Chetvertaia Chast'*]

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HYMENOPTERA  
Part IV

*Editor-in-Chief*  
G.S. Medvedev

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This part provides keys for 20 subfamilies of braconids covering 1,700 species belonging to 165 genera; 123 species have been described for the first time. Besides species reported for the European part of the USSR, the *Keys* . . . includes species known from Western Europe, Kazakhstan, Soviet Central Asia and Caucasus. For all the species, information is provided on their geographic distribution, host-plants (if available) and synonymy. The introduction briefly outlines the morphology, biology, general features of geographic distribution and economic significance of braconids.

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Bibliography 80 citations, illustrations 263.



## FOREWORD

- 3 Braconids constitute one of the largest families of parasitic hymenopterans and include nearly 15,000 species. In the fauna of the USSR, nearly 2,000 species have been reported from the European part and from other regions. The large volume of the group and the specificity of keys to braconids precluded inclusion of all species of the family in a single book. This book covers all groups of braconids except the two large subfamilies Opiinae and Alysiinae, including parasites of Diptera, which we intend to describe in the next part along with the family Aphidiidae, the aphid parasites.

The specificity of keys to Braconidae clearly distinguishes this from other books in the present series, primarily in that many species new to science are covered. This is necessary since the braconid fauna has still not been studied adequately and the number of redescribed species (including those from Europe) is constantly increasing. It must be said that in the ever expanding literature on braconid systematics the description of species in the keys has long been an accepted norm.

Naturally, the description of new species has necessitated enlarging the scope of couplets in terms of characters covered in them. In view of the mandatory existing rules for new species, the type material has been presented. Moreover, since many species in the past were described by Russian and Soviet authors (primarily N.A. Telenga) without mentioning holotypes for such species (when the type material was preserved), lectotypes and paralectotypes have been created.

This book includes keys for 165 genera and 1,723 species. Some of them are so far known only from Western Europe. However, the probability of their occurrence in the European part of the USSR is quite high. It is also probable that many (or most) species known only from Caucasus enter the European part, since it has been established that, on the whole, the braconid fauna of Caucasus in its species composition is closer to the European. The book also includes most species described from Kazakhstan and Central Asia. This has been done to

increase the reliability of identification of species of the so far very sparingly investigated southeast European part of the USSR. Here, along the desert and steppe habitats, so far known to us, the Kazakhstan and Central Asian species penetrate fairly extensively. Hence the keys to braconids can be used far beyond the European part of the USSR. The *Keys* . . . provides information about most of the Palearctic braconid fauna. Of course, we admit that the Asiatic part of the Palearctic and even Southern Europe have been investigated scantily. Scores of species from these regions await description. As for the already described species from Siberia and the Far East USSR, their number is not large and for most genera these have been indicated at appropriate places in the text. This has extended the possibility of using the book as a manual and, moreover, it may serve as a good basis for compiling the list of braconid species found in the USSR.

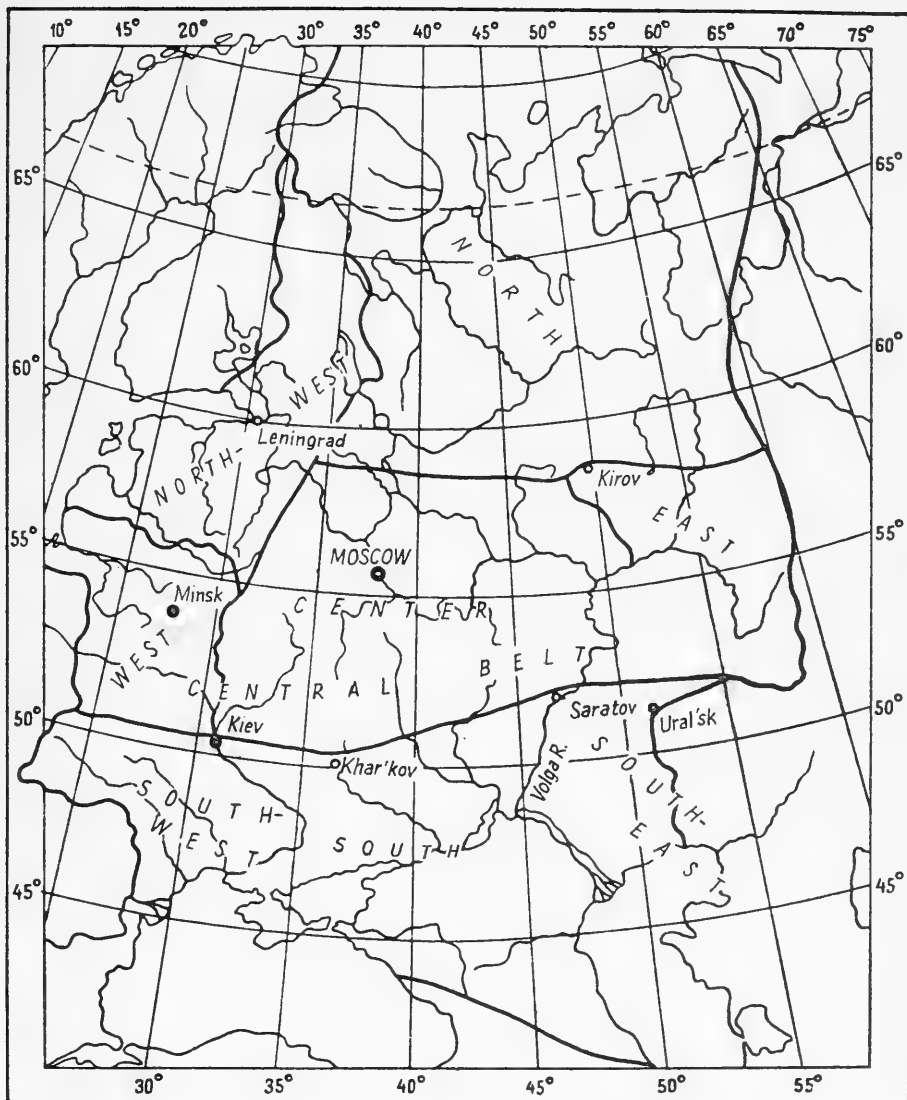
- 4 The *Keys* . . . lists many synonyms including the ones restored. Since the number of synonyms is great and so that a complete synonymy is provided, many old synonyms have been omitted. Special attention has been paid to those names in synonymy, which were used in Soviet literature. The synonymy is fully outlined in the recently published catalog of the world braconid fauna, given in the list of literature at the end of the introductory section.

The preparation of the *Keys* . . . was arduous because the recently published comprehensive revisions in literature on braconid systematics necessitated addition to the *Keys* . . . of newer and newer species and, on the other hand, exclusion of names included in synonymy. The nomenclature, too, changed greatly. This is apparent on comparing this book with the relatively recently published keys to *Braconids of Canada* (Tobias, 1976).

- V.I. Tobias (Institute of Zoology of the Academy of Sciences of the USSR) collaborated in the preparation of these keys, contributing a large part. S.A. Belokobyl'skii, in coauthorship with Tobias, worked on the subfamily Doryctinae. He was a postgraduate student at the Institute during the period these keys were being prepared. Tobias with  
5 A.G. Kotenko (Institute of Zoology of the Academy of Sciences of the Ukraine SSR) worked on the keys to the largest genus *Apanteles*.

Most of the borrowed illustrations and all original drawings were made by artists T.N. Shishlova (the majority), N.N. Fuzeeva, I.N. Klebanova and N.D. Ogloblina. V.P. Rudol'f and N.V. Dzhelomanova rendered great help in finalizing the manuscript. The authors express their gratitude to all of them.

Holotypes and most of the paratypes of all redescribed species as well as lectotypes and paratypes identified here (except for the type



Map of the European part of the USSR.

material of W. Hellén from the Zoological Museum of Helsinki University and specially mentioned places) are preserved in the Institute of Zoology of the Academy of Sciences of the USSR in Leningrad. Some paratypes of species of the genus *Apanteles* described by A.G. Kotenko are preserved in the Institute of Zoology of the Academy of Sciences of the Ukraine SSR in Kiev.



**LIST OF ABBREVIATIONS OF NAMES OF AUTHORS  
OF SPECIES OF BRACONIDAE**

Abdinb.—Abdinbekova	Marsh.—Marshall
Acht.—Van Achterberg	Mues.—Muesebeck
Ashm.—Ashmead	Niez.—Niezabitoski
Belok.—Belokobylskij	Panz.—Panzer
Cam.—Cameron	Ratz.—Ratzeburg
Curt.—Curtis	Reinh.—Reinhard
D.-T.—Dalla Torre	Rich.—Richards
F.—Fabricius	Schm.—Schmiedeknecht
Fahr.—Fahringer	Shenef.—Shenefelt
Fi.—M. Fischer	Shest.—Shestakov
Förs.—Förster	Šnofl.—Šnoflák
Gaut.—Gautier	Spin.—Spinola
Goid.—Goidanich	Szépl.—Szépligeti
Grav.—Gravenhorst	Tel.—Telenga
Haes.—Haeselbarth	Thoms.—Thomson
Hal.—Haliday	Thunb.—Thunberg
Hedqv.—Hedqvist	Vier.—Viereck
H.-Sch.—Herrich-Schäffer	Voin.-Kr.—Voinovskaja-Kruger
Htg.—Hartig	Wat.—Watanabe
Jakim.—Jakimavičius	Wesm.—Wesmael
Kok.—Kokoujev	Westw.—Westwood
Kriechb.—Kriechbaumer	Wilk.—Wilkinson
Kurd.—Kurdjumov	Woll.—Wollaston
L.—Linnaeus	Zett.—Zetterstedt
Latr.—Latreille	





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## 27. Order HYMENOPTERA

### Family BRACONIDAE\*\*

7\* The body of braconids (Fig. 1), like other members of the suborder of petiolate hymenopterans (Hymenoptera, Apocrita), consists of the head, the thorax including the three thoracic segments and the first abdominal segment fused with them—the propodeum—and the abdomen. Antennae and the labiomaxillary complex are articulated with the head, while the legs and wings (the latter seldom reduced) are with the thorax. The abdomen in the female terminates in a somewhat developed ovipositor which sometimes may be longer than the body.

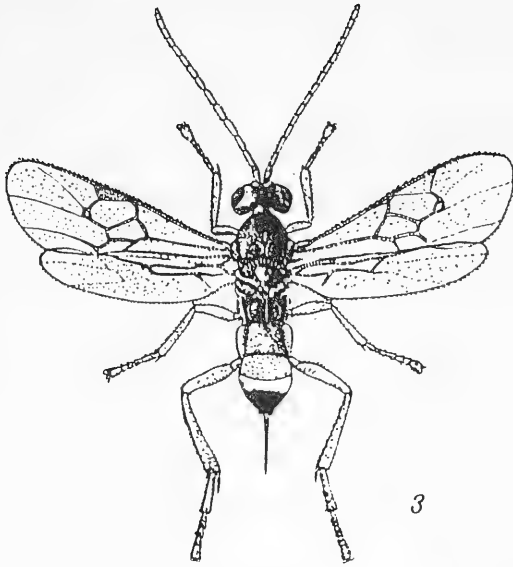
The characteristic feature of braconids and of the other members of the superfamily Ichneumonoidea is the presence of the sclerotized pterostigma in the forewings, broad triangular or semioval in shape (rarely cuneate and linear, mostly in subfamilies Opiinae and Alysiinae). From ichneumonids (family Ichneumonidae with Braconidae comprise the majority of species of the superfamily Ichneumonoidea), braconids differ by the absence of the 2nd recurrent vein in the forewings (in ichneumonids, it is very rarely absent), the branch of the radial vein ( $R_s$ ) in the hind wing beyond the cross-vein (in braconids called basal vein— $M$ ) joining the first two ( $S_c + R$  and  $M + Cu_1$ ) longitudinal veins (in ichneumonids a cross-vein joins the radial branch ( $R_s$ ) and medial ( $M$ ) veins) and 2nd and 3rd abdominal tergites fused into a single plate (in ichneumonids they are separate in a vast majority of cases). In braconids, unlike other hymenopterans, the first three abdominal tergites concealing the remaining tergites could be fused into a unified plate (Fig. 2).

The above special features (except for the fusion of the three tergites into a single plate) are typical of the family Aphidiidae

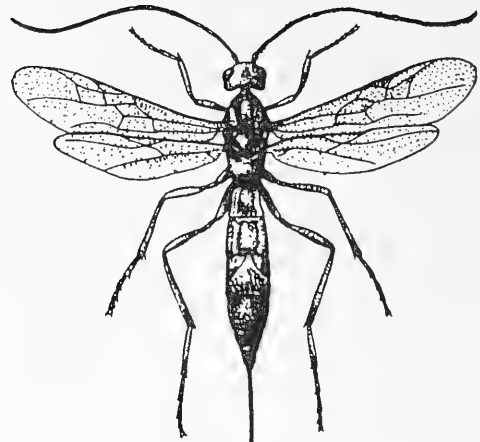
\* Pagination of the Russian original—General Editor.

\*\* Treatment by V.I. Tobias.

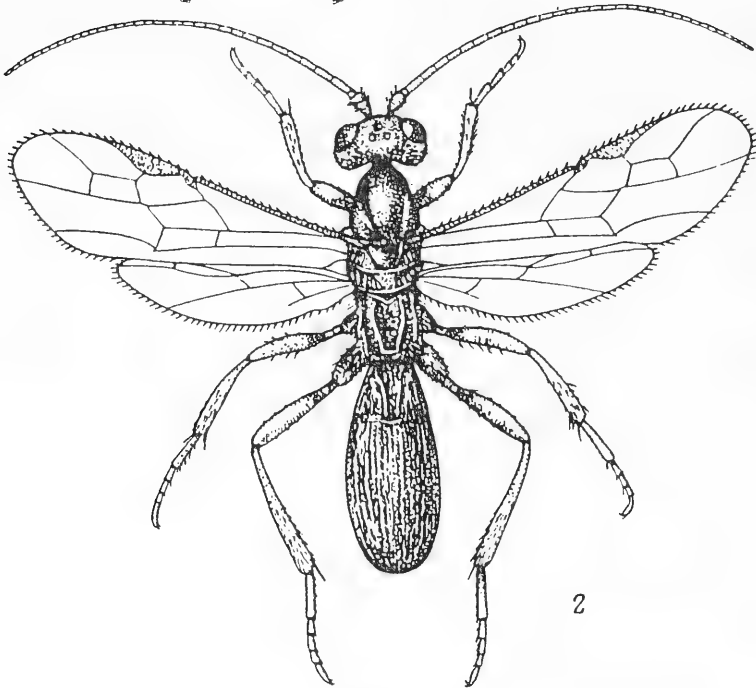
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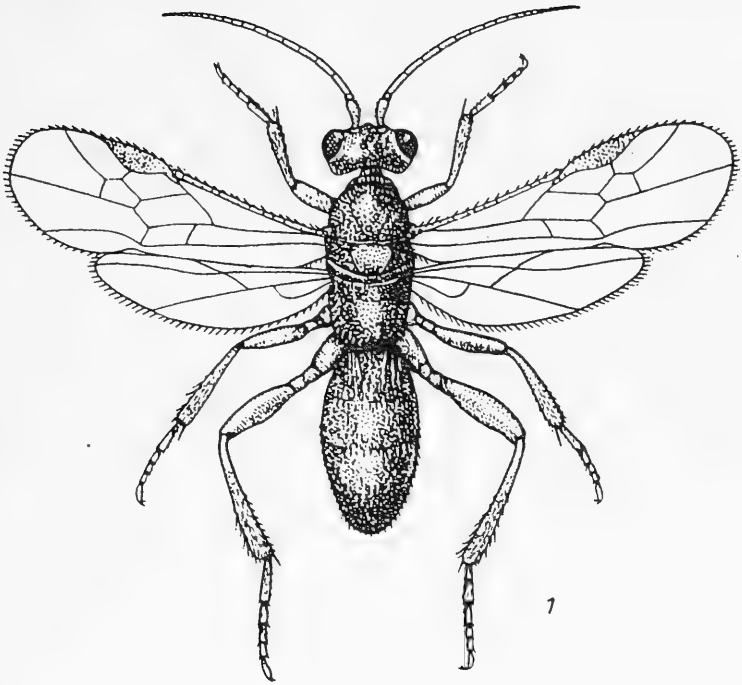


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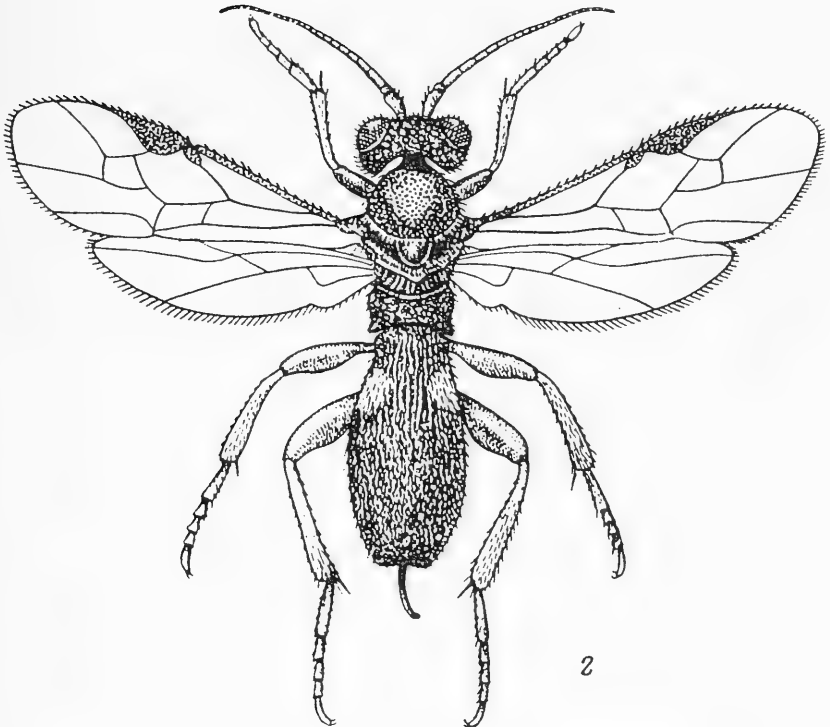
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Fig. 1. Braconidae (from Telenga and original).

1—*Glyptomorpha pectoralis* Brullé; 2—*Acampsis alternipes* Nees; 3—*Hygroplitis russata* Hal.



1



2

Fig. 2. Braconidae (original).

1—*Phanerotoma parva* Kok.; 2—*Chelonus inatitus* L.

which, on this basis, is sometimes considered only as a subfamily of Braconidae. However, parasitization of aphidiids exclusively on aphids (among braconids, parasitization in insects with incomplete metamorphosis—bugs and booklice or Psocoptera—is rare and only in highly specialized members), their different external appearance, the impossibility of including them with one of the braconid groups (the attempts in literature to club them with subfamily Euphorinae lack sufficient validity)—all these suggest that Aphidiidae is an independent family (undoubtedly closer to Braconidae). It is not easy to distinguish aphidiids from braconids. Reports are available in literature (especially old literature) about the isolation of the 2nd and 3rd abdominal tergites in aphidiids, unlike braconids. This is erroneous. (However, in aphidiids the suture between the 2nd and 3rd tergite is inconspicuous while in braconids most often it is visible if the tergites are not fused into a thick plate.) The abdomen in aphidiids often has a characteristic bend between the 2nd, 3rd and 4th tergites and the ovipositor is always short. The wing venation in aphidiids is usually somewhat reduced and in cases with fairly complete venation (in the most numerous genus *Aphidius*) it is characterized by the presence of a large central (“discocubital”) cell which is similar in shape to that in ichneumonids. However, there are aphidiids (*Ephedrus*) with rather complete venation of the type of *Bracon*. An important feature of aphidiids is the small number of antennal segments (rarely more than 20). In braconids these number more than 20 and only in the large subfamily Microgasterinae, characterized by a unique, absolutely different venation than in aphidiids (see pp. 605–817), these number 18; in females of the large genus *Microchelonus* with abdominal tergites fused into a plate the antennae are 16-segmented. On the average, aphidiids are much smaller than braconids (aphidiids usually 1–2 mm, braconids rarely 1–2, often 2–5 and up to 10–15 and in the tropics up to 25 mm).

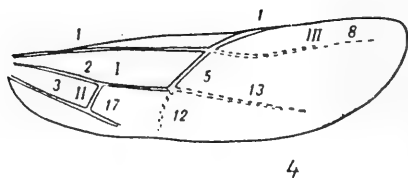
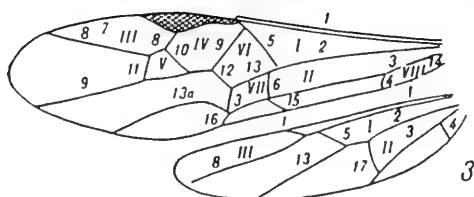
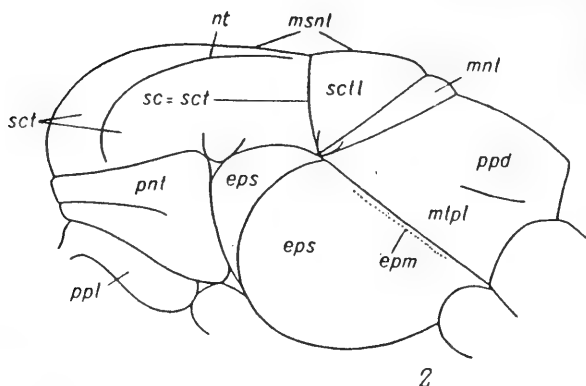
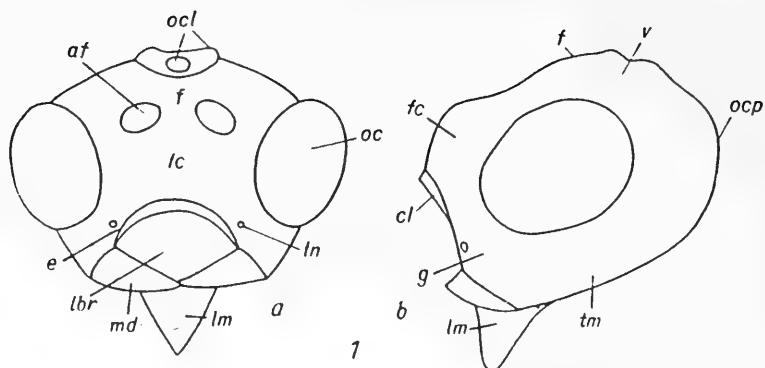
The head of braconids (Fig. 3: 1) is orthognathous (only the polytypic Australian subfamily Betylobraconinae is characterized by a prognathous head). Ocelli form a triangle which is sometimes surrounded by a fine groove demarcating the ocellar field. The vertex anteriorly lacks a distinct boundary with the frons and is merged with it (the arbitrary boundary is drawn along the tangent to the anterior ocellus); medially it may have a longitudinal groove or ridge. The frons 8 ventrally borders with the face. The boundary between them passes along the antennal sockets usually situated approximately at the level of the center of the compound eye. Between the antennal sockets and below them (on the face) processes could be developed (the facial

processes are usually found in tropical braconids and in *Victoroviella* in our country). The clypeus is separated by somewhat deep tentorial pits and often by a distinct suture—the epistomal suture. The clypeus on the anterior margin may have teeth or is notched so that the labrum articulated with its anterior margin becomes visible. The labrum is often (in round-mouthed braconids—subfamilies Doryctinae, Rogadinae, and Braconinae) noticeably sunken, cochleariform/spoon-shaped, forming the oral cavity. Compound eyes are usually oval or somewhat ovoid (narrowed below), rarely reniform. Below the eyes lie the genae which are often transected by a distinct genal furrow running from the eye to the base of the mandible. Behind the eyes lie the temples which posteriorly could be demarcated by a ridge. The right and left ridges are always (but not in the subfamily Opiinae!) joined above, separating (by the occipital ridge) the temples from the occiput. In the middle of the posterior part of the head there is an occipital foramen. Below it the head capsule opens broadly, forming the labio-maxillary or haustellar hollow, separated from the inner structures of the head by the hypostomal membrane or sclerotized hypostoma and from the occipital foramen in many doryctins by the hypostomal bridge. Usually the haustellar hollow directly adjoins the occipital foramen. The labio-maxillary complex often extends into the proboscis. With mandibles and the labrum, the labio-maxillary complex represents the mouthparts. The labiomaxillary complex is formed by the labium and the paired maxillae bearing, respectively, the labial and maxillary palps.

11 The mandibles of braconids (except most Alysiinae and some Opiinae) are bidentate, of medium length, differing less in shape and therefore in systematics; their features are almost never used except in genera *Macrocentrus* and *Meteorus*. The species of these genera have variable mandible lengths and tooth shape. Mandibles are quite important in the systematics of the subfamily Alysiinae where teeth number 3 to 4 or more and their shape is highly varied. Unlike mandibles of almost all other insects, the mandibles in Alysiinae can extend outward, working like the paws of a bear or mole. In the subfamily Opiinae, a variable degree of stepped broadening of the basal part of the mandibles is observed.

The head of braconids is generally transverse, that is, its width is much more than its length. However, it could also be cubic. In that case, the length and width are approximately equal.

The antennae of braconids comprise a large basal segment (scape), a small pedicel and a flagellum whose segments in different groups vary from 10 (*Ropalophorus*) to several tens.



10

Fig. 3. Braconidae (from Tobias).

1—*Bracon pliginskii* Tel., head (a—frontal view; b—lateral view): *af*—antennal sockets, *cl*—clypeus, *e*—epistomal (clypeal) suture, *f*—frons, *fc*—face, *g*—gena, *lbr*—labrum, *lm*—labio-maxillary complex, *md*—mandibles, *oc*—eyes, *ocl*—ocelli, *ocp*—occiput, *tm*—temples, *m*—tentorial pits, *v*—vertex; 2—*B. sabulosus* Szépl., thorax: *epm*—mesepimera, *eps*—mesepisterna, *mnl*—metanotum, *msnl*—mesonotum, *mpl*—metapleura, *nt*—notaulices, *pnt*—pronotum, *ppd*—propodeum, *ppl*—propleuron, *sc-sct*—scuto-scutellar suture, *sct*—scutum (or mesonotum proper), *sctl*—scutellum; 3—*Helcon* sp., wings (veins: 1—costal, 2—mediocubital, 3—1st anal, 4—1st anal cross-vein, 5—basal, 6—nervulus, 7—metacarpus, 8—radial, 9—medial, 10—1st radiomedial, 11—2nd radiomedial, 12—recurrent, 13—cubital, 13a—parallel, 14—2nd anal, 15—2nd



The thorax (Fig. 3: 2) comprises the pro-, meso- and metathorax and the propodeum. The prothorax is divided into the immovable pronotum—anteriorly narrow, forming the collar and posteriorly broadened—and the movably articulated propleuron, divided below by a longitudinal suture into two parts and posteriorly bearing forecoxae.

The mesothorax comprises the mesonotum whose posterior part is separated by a transverse (scuto-scutellar) suture (or prescutellar suture) and forms the scutellum which is triangular in shape above. On the disk of the mesonotum (scutum) there are often two somewhat developed furrows (notaulices) directed toward the scutellum. Mesopleura are present on the sides and below the mesonotum. The mesosternum is reduced and concealed in the groove passing through the middle of the mesothorax ventrally. The mesopleura almost entirely comprise the episterna. The epimera are represented by a narrow band attached to the groove between the meso- and metapleura and divided by a faint groove and the upper and lower pits. Along the lower part of the sides of the mesothorax pass somewhat developed grooves (sternauli or precoxal sutures). In the anterior part of the sides of the mesothorax there is sometimes a prepectal ridge running across it ventrally and from the sides. To the posterior lower part of the mesopleura are articulated the middle coxae and to its upper part the forewings.

The metathorax is poorly developed: the metanotum (more precisely postscutellum) is in the shape of a narrow transverse band while the sides of the metathorax (metapleura) form a slightly broadened triangle below. To it are articulated the hind coxae. The metanotum is separated from the propodeum by a distinct suture. The suture separating the metapleura from it is not always distinct. The hind wings are attached to the upper part of the sides of the metathorax.

The propodeum is the modified 1st abdominal tergite fused with the thorax. It forms the posterior wall of the thorax. Often it has a longitudinal and/or transverse ridge. There may be two closely situated longitudinal ridges (Agathidinae). It has somewhat developed fields, usually three in the lower half of which the middle one is pentagonal, and two in the upper half. The latter are separated by a transverse ridge continued from the apex of the pentagonal cell.

The braconid wings are generally well developed; seldom are they reduced or strongly reduced. Noticeable on the forewing is the semi-oval or triangular (at times linear in some members of Alysiniinae

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anal cross-vein, 16—brachial, 17—nervellus; cells: I—medial, II—submedial, III—radial, IV—1st radiomedial, V—2nd radiomedial, VI—discoidal, VII—brachial, VIII—anal);  
4—*Doryctes leucogaster* Nees, hind wing (legend same as above).

and Opiinae) sclerotized area: the pterostigma or stigma with a basal broadening. This broadening is called the parastigma. The stigma formed by the thickened vein may also be found on the hind wing (in the supertribe Doryctidii). The anterior margin of the wing proximal to the stigma is formed by the thickened vein which is the result of the merger of the costal and subcostal veins and for simplification of terminology is called costal. The terminology of veins and cells has been given in the legend to Fig. 3: 3. Its corresponding morphological notation may be found in Part 1 of Volume III of the *Keys* (1978). The wing venation in braconids is highly varied because of the reduction of veins compared to the rather complete primitive venation presented in Fig. 3: 3. This becomes apparent when we compare illustrations of venation in the text.

The braconid leg comprises the coxa, the 2-segmented trochanter, the femur, the tibia and the 5-segmented tarsus. The apical segment of the tarsus terminates in two claws and two pulvilli (arolium). The claws may be furcate either with a denticle or pecten of stiff bristles; all of these are important taxonomical characters. The middle and hind tibiae apically have two spurs, one of which, inner or larger, is longer than the other. The foretibiae have one curved spur with dense bristles on the inner side. Between it and the base of the tarsal segment the antennal flagellum is passed during its cleaning.

The abdomen of a braconid female has seven tergites and six sternites not including the apical ones forming the ovipositor. The male abdomen has eight tergites and an equal number of sternites. Typical of braconids, as mentioned, is the fusion of the 2nd and the 3rd tergites. The suture between them is usually quite distinct but may be absent. In the structure of the abdomen these taxonomic features are also important: the degree of separation of the laterotergites, that is, the lateral parts of tergites, the positioning of the spiracles above or below the line separating the laterotergites, the presence of fields—somewhat raised areas surrounded by furrows; in addition there are oblique furrows running from the base of the tergite (usually 2nd) to the sides of its lateral margins and transverse furrows running parallel to the posterior margin of the tergite. In many braconid groups the first three tergites are fused into a plate concealing the remaining tergites; the sutures between the tergites may be completely reduced (Cheloninae).

12 The relative length of the ovipositor (more precisely its valves) is an important taxonomic feature. The structure of male and female genitalia for use in separating taxa at species and genus levels in the systematics of braconids is generally not considered since reliable features have so far not been found or have been found only in a few

groups (for example, *Coeloides*) where species are well distinguished even by external morphological characters.

The body sculpture in many cases is diagnostically very important. The sculpture may be rugose, formed by integumentary folds. It may be irregular in the form of reticulation, intertwined (reticulo-rugose sculpture) or form large, sharply demarcated cells (cellular). Another type of sculpture is punctation—dense or sparse. The punctate sculpture consists of deep punctures. Punctures may be even convex forming a granular sculpture (fine or coarse). The fine granular sculpture is sometimes erroneously called shagreen sculpture.

The pubescence of the body (hair on it) is intimately related to punctation since each puncture at the center of the depression usually bears hair. Hair could be erect or appressed, often sparse, at times on individual body parts quite dense. Very dense pubescence on the hind-coxae and 1st abdominal tergite is quite typical of many members of the tribe Dacnusiini (subfamily Alysiinae).

Braconid color is very highly variable and has limited taxonomic importance. It is often a combination of black and reddish or yellowish dark brown. Often we find pure yellow or brick red, rarely raspberry (*Iphiaulax*) or whitish coloration.

## BIOLOGY

Braconids represent two biological groups substantially differing in mode of life and morphology of larvae. All ectoparasites have been combined in the subfamilies Doryctinae and Braconinae and endoparasites in the remaining subfamilies.

Larvae of ectoparasites develop on the body of the host which is invariably the insect larva, most often of lepidopterans or coleopterans, very rarely dipteran or hymenopteran. The hosts of ectoparasites, with rare exceptions, are cryptobionts (in burrows under tree bark, in galls, mines, fruits and curled or rolled leaves) and are infected by adult flies usually by piercing the surface with the ovipositor. Rarely does the female enter the burrow of the concealed host. The eggs are laid either directly on the larva or near it. Usually the ectoparasitic braconids are group parasites. The number of eggs laid by the female on the host depends on its size: more eggs are laid on larger larvae and fewer on smaller ones.

Before laying eggs, the ectoparasite, as a rule, uses its ovipositor to paralyze the larva on which its progeny would develop. The ovipositor not only serves as an organ of egg laying but to inject secretions of the poison gland. Paralysis is usually permanent, that is, the mobility of

the host and its ability to molt are never restored. The host cannot free itself of the eggs or larvae of the parasite. Only less mobile hosts are little paralyzed so they can resume activity or they are not paralyzed at all. (In such cases, the parasite averts the danger of host molting by rapid development.)

The paralyzed host generally cannot live long. Hence, the development of the ectoparasite from egg to prepupa proceeds rapidly, in a matter of a few days depending mainly on temperature.

The ectoparasites are not highly host specific and can develop on larvae of various insect orders. Many species could be described as polyphagous. However, their ecological adaptation may be fairly narrow. For example, the ectoparasites of larvae living under tree bark are usually associated with coleopterans although some of them could also infect larvae of clearwings. Sometimes the host specificity of the ectoparasite (undoubtedly ecological and not physiological) may be still narrower, related to the kind of damage caused to the host and to its external appearance. Thus, species of the genus *Coeloides* infect only larvae of bark beetles, some members of the tribe Hecabolini apparently only metallic wood borers, some species of *Bracon* only larvae of *Coleophora* in their cases.

The eggs of ectoparasites are large, rich in yolk, and often stalked. The stalk is used to pass the egg through the thin, as a rule, long ovipositor (its length somewhat corresponds to the depth of the cavity or thickness of the tissue concealing the host). The contents of the egg are poured into the stalk as it passes through the canal of the ovipositor; the average diameter of the egg thereby decreases by several fractions.

Larvae of ectoparasitic braconids of the hymenopteroid type have open spiracles throughout their life and their mouthparts are well developed in all larval instars. Their body is compact, 12–13-segmented, covered with transverse rows of bristles or spines. Generally there are five larval instars.

Endoparasitic braconids could be larval, egg-larval and imaginal parasites infecting, respectively, the larva, egg (the development proceeds and is completed in the larva) or the adult insect. Among braconids (unlike chalcids and proctotrupoids) there are no egg-parasites  
13 or pupal parasites. In this they differ from chalcids and ichneumonids. Members of the subfamilies Opiinae and Alysini, parasites of dipterans, complete their development in the host pupae. However, the eggs are laid by them in the larva or even in the egg.

On the whole, the spectrum of hosts of endoparasites is wider than that of ectoparasites. They generally have the same taxonomic groups

of hosts. Primarily these are the lepidopterans and coleopterans. However, if among ectoparasitic braconids the parasites of dipterans are rare, among endoparasites two large subfamilies—the above mentioned Alysiinae and Opiinae (their hosts mainly belong to families Agromyzidae and Tephritidae)—are related to them. Braconids of the subfamily Euphorinae have also adapted to hemipteran families Myriidae (*Leiophron*) and Pentatomidae (*Wesmaelia*, *Aridelus*), Psocoptera (*Leiophron*) as well as adult neuropterans—golden eyes (*Chrysophthorus*) and hymenopterans—bumble bees and ichneumonids (*Syntretus*). The members of this subfamily generally parasitize adult beetles. Thus, the host range of endoparasites is wider not only because of orders not available to ectoparasites but because of adaptation to adult insects. Moreover, endoparasites can infect not only the concealed but the exposed hosts. The latter are especially important since among the exposed lepidopteran larvae there are many agricultural pests.

Endoparasites usually do not paralyze their hosts but lay eggs through rapid piercing by the ovipositor. If the host is exposed and piercing by the ovipositor is not necessary, the eggs may be laid in a few seconds. Only in Rogadinae, the subfamily of related ectoparasitic braconids, is paralyzing of the host common. The host larva is temporarily paralyzed. The purpose of temporary paralysis is to immobilize the host for easier oviposition in it. Some parasites of adult beetles (*Cosmophorus*) and larvae of dipterans (some species of Alysiinae) can also paralyze their host temporarily.

The smaller size of eggs containing less yolk or devoid of it as well as the usually short ovipositor facilitate the higher rate of egg laying. The endoparasite embryo receives its nutrition from the host hemolymph through osmosis. The volume of the egg thereby increases ten-, even hundredfold (in Euphorinae up to 3000 times). To imbibe the fluid from the host body a special embryonal sheath—the trophamnion—is used. In Euphorinae after the larvae emerge from the eggs the trophamnion disintegrates to individual cells which continue to grow nourished by substances from the host hemolymph, attain giant size and are used later for feeding by the parasite larvae.

Endoparasitic larvae generally develop for a long time concurrently with the host. After hatching from the egg, the larva usually enters a brief or prolonged diapause which terminates with the activation of life processes in the body of the host. A brief diapause is also observed in the actively developing host and it terminates when the host larva begins to metamorphose into the pupa. Prolonged diapause is concomitant with the diapause of the host and terminates when its active development begins; this is usually after

wintering. With activation the molting from one larval instar to the other occurs rapidly. Usually there are three larval instars in endoparasites. The parasite larva leaving the body of the host after molting into the 3rd instar often feeds on the host ectoparasitically until it consumes it entirely. At this stage the spiracles of the larva are open. At the completion of feeding larvae of three braconid subfamilies do not leave the host body. These are the parasites of dipterans: Opiinae and Alysiniinae, remaining within the pupae and, generally, not making their own cocoons, and Rogadinae pupating in the cocoon under the integument of the host larva, called the "mummy".

Endoparasites may be solitary or gregarious. Most often they are solitary. This solitary mode is achieved by two mechanisms: firstly, by the capacity of the female to distinguish the already infested host and avoid (in view of optimum host-parasite density relationships) repeat infestation; secondly, by killing excess larvae in case of overinfestation of the host. Cannibalism is accomplished by 1st instar larvae usually by biting with their well developed mandibles. In later instars the size of the mandibles is greatly reduced.

There are four types of endoparasitic braconid larvae: hymenopteroid—similar to ectoparasitic but with closed spiracles (typical for Rogadinae), polypodal—with pairs processes on the ventral side of the segments (Agathidinae), vesicular—with an anal vesicle which is the everted hind gut (Microgasterinae, Cheloninae, Brachistinae) and caudate—with a conical process at the end of the body. The latter is the most common and may be found with the vesicular. At present the caudal process is considered to be a locomotor organ. The anal vesicle appeared to perform the respiratory function. However, since the anal vesicle is most developed in the 1st instar larva when small body size makes a special organ for respiration redundant and allows body surface respiration, its respiratory function seems likely. Generally, the last three types of larvae are observed in the most developed form in their 1st instar. In later instars the ventral processes, the vesicle and the caudal process, become reduced and by the end of larval development become hymenopteroid. From the clear development of body processes in the 1st instar larva, after which faster growth and development of the parasite begin, that is, the stage responsible for the perception of the physiological state of the host, we can suggest that larval instars serve this purpose.

- 14 Endoparasites are always confined to a somewhat narrow taxonomic group of hosts. None of them is polyphagous. Thus, the subfamilies Microgasterinae, Cheloninae, and Agathidinae are associated with lepidopterans, Acaeliinae with mining lepidopterans,

Brachistinae with coleopterans, most often with weevils, Helconinae with cerambycid beetles, Ichneutinae with sawflies. Still narrower specificity is typical of the subfamily Euphorinae in which individual genera or groups of closely related genera are adapted to specific hosts. Among endoparasitic braconids several instances of narrow oligophagy or even monophagy are known.

Adult braconids need proteins and carbohydrates. Proteins are obtained from the host hemolymph that exudes from the wound caused by the piercing of the ovipositor after paralyzing the host. This is typical of the ectoparasite female. Since the host is usually concealed, the hemolymph reaches the female by capillary action; it flows through the canal of the ovipositor and coagulates. Among endoparasites, the Rogadinae feed on hemolymph when their hosts—the larvae—are temporarily paralyzed.

Carbohydrates are obtained by braconids from flowers and exudates of homopterans. The flowers most preferred are from the families Umbelliferae and Euphorbiaceae, rarely Brassicaceae and other plants with open nectaries since most braconids have less specialized mouthparts. However, there are species with a well developed proboscis that can feed on flowers with deeply hidden nectaries, such as species of Compositae, for example, *Agathis*, some species of *Zavipio*, *Glyptomorpha*, *Bracon*, and *Cardiochiles*. The Central Asian *Asiacardiochiles*, closer to the last genus, has such a long proboscis that it can procure nectar while hovering over the flower.

The flowering plants may serve as mating sites. For this taller covering shrubs, branches or herbaceous plants are used; males congregate there due to their negative geotaxy while females appear from time to time. Sometimes a rather dense male swarm is formed here, as has been established for some species of *Bracon*. Parasites of flat bugs (Aradidae) often behave differently. Their males collect on the bark near the emergence site of the female and lie in wait. They may form small swarms flying close to the tree trunk in a 'dancing' flight. Cases are known of even more specialized nuptial flights in large swarms, resembling chironomids (*Blacus*).

Adult braconids are found only in the summer. They do not as a rule winter as adults. They winter by diapausing: either as mature larva in the cocoon or as 1st instar larva in the body of the host. Some species (endoparasites) can winter in the body of the host as 1st instar larvae (for example, *Apanteles glomeratus* when its host is the cabbage-worm). In species producing several generations in a year and wintering in the cocoon, the latter, when wintering larva has been formed in it, is denser than cocoons of the summer generations. In species of

*Microgaster*, moreover, the summer cocoons could be bright bluish or greenish while wintering cocoons could be brownish and ribbed.

### GEOGRAPHIC DISTRIBUTION

Three important facts must be considered in studying the geographic distribution of braconids. First, the study of the area of distribution of most species (in view of their small body size, ecological peculiarities requiring special collections and the rarity of many species in complex relationships with hosts) is far from adequate. New species continue to be described from Europe, the one region of the world where this subject has been well studied and where reports of new genera continue to appear. Some of the very old monotypic genera are to this day known from lone specimens.

Secondly, as is clear from the distribution of the most common species (*Bracon intercessor* Nees, *B. fulvipes* Nees, *B. esculator* Nees, *B. variator* Nees, *B. variegator* Spin., *Rogas dimidiator* Spin., *R. bicolor* Spin., *Triapsis obscurellus* Nees, *Schizoprymnus obscurus* Nees, *Meteorus versicolor* Wesm., *M. rubers* Wesm., *Blacus ruficornis* Nees, *Macrocentrus collaris* Spin., *M. linearis* Nees, *Chelonus inanitus* L., *C. oculator* Panz., *C. annulipes* Wesm., *Microgaster tuberculifera* Wesm., *M. spinolae* Nees, *Apanteles glomeratus* L., *A. falcatus* Nees, *A. circumscriptus* Nees, and many other species), the area of their distribution is quite extensive, covering a large part of the Palearctic. They could probably enter through narrow ecological niches far to the north and along oases and other humid habitats deep into the arid zones. It may be assumed that many species so far known from a small number of specimens (however, from remote places in the Palearctic) are equally geographically adaptable and have equally wide areas of distribution. In Caucasus such widely distributed species are already estimated at 71.2% (Tobias, 1976).

Thirdly, a similar analysis of geographic distribution for the European part of the USSR, a very extensive region, is difficult because all of Siberia has been studied very inadequately and most fragmentarily for the braconid fauna. For example, more thoroughly studied are the entomoparasites damaging timber whereas braconids associated with grass-stand (and this is the majority of the braconid fauna) have remained almost unstudied.

These reasons preclude analysis of the geographic distribution of braconids in the European part of the USSR. We can mention only broad Palearctic distribution of species. Many species, apparently, 15 have Holarctic distribution. This has not been seriously researched



(although already several tens of Holarctic species have been confirmed) since interest in them has arisen only recently.

At least three braconid species are distributed almost universally. These are the parasites of storehouse pests: *Bracon (Habrobracon) hebetor* Say and *Apanteles carpatus* Say, as well as parasites of adult bark beetles *Dinocampus coccinellae* Schr. We emphasize that both parasites of storehouse pests thrive in the open where they parasitize other insects (for example, the well known *Habrobracon* is an important entomophage of the cotton bollworm).

An analysis of their habitat adaptability and morphological features suggests the geographic affinity of the species. Many species, pronounced mesophils, though adapted to herbaceous—shrubby vegetation, are also found in forest habitats. They are not found far beyond the forest and are morphologically characterized by long wings and their well developed apical part—elongate stigma and cells; their antennae are usually much longer than their body. The body is dark. Primarily all this relates to most species—from parasites of Diptera belonging to subfamilies Opiinae and Alysinae (especially from tribe Alysiini) to parasites of sawflies of the tribe Exothecini.

Desert and steppe species have contrasting features. These are associated with their wild habitats and short wings with venation shifted to the base of the wings (in particular, by the short separating cell). This includes practically all the Central Asian light colored species (primarily from the tribe Hormiini) and species in the entire steppe subgenus *Leucobracon*. Such species with a distinct affinity for arid habitats could (although data on this aspect are inadequate) enter regions corresponding to their ecological requirements in southeastern or southern areas of the European part of the USSR (this fact forced us to include in these keys many species so far only known from Central Asia and Kazakhstan).

Species with arid orientation have areas of distribution of different magnitude. Sometimes confined to the southern parts of Central Asia (several species of large bodied *Glyptomorpha* which usually comprise general collections of entomologists and not included in the *Keys* belong to this category), they are found to have much broader distribution covering even the European part of the USSR.

Wide distribution of eurybiotic species (listed on page 14 and many others) has extended the areas of distribution (latitudinal as well as meridional). Such species are numerous, if not the majority, since braconids as a whole are a thermophilous group preferring arid to humid conditions (except subfamilies Alysinae, Opiinae and some other smaller groups) and, at the same time, are adequately eurybiotic.

Finally, there is a large group of species with trans-Palearctic areas of distribution covering mainly the southern part of the forest zone (reports about such species may be found in the text but there are many more).

### ECONOMIC IMPORTANCE

Most braconids are useful since they are associated with phytophagous insects causing damage to agriculture and forestry. Significantly, among them there are practically no secondary parasites adversely affecting the number of other entomophages. Some of them are important as regulators of pest populations. These are the parasites of lepidopterous larvae (*Macrocentrus collaris* Spin., *Meteorus rubens* Nees, *Microgaster spectabilis* Hal., *Apanteles telengai* Tobias) and parasites of the shoot borer *Chelonus annulipes* Wesm. The entomophage *Bracon* (*Habrobracon*) *hebetor* Say is associated with the last pest as well as with cotton bollworm and some other pests. At present, it is extensively used in biological control of pests in Central Asia; it is reared and released in the fields in millions.

Moreover, like *Apanteles carpatus* Say, *B. hebetor* is useful in storehouses as an entomophage of the pests of grains, dry fruits and textiles. Both these useful species may be found in our houses. Even *Spathius exarator* L., a parasite of the furniture moth, is found with them.

Braconids could play a significant and beneficial role in orchards as parasites of harmful codling moths (*Ascogaster quadridentata* Wesm., *Microdus rufipes* Nees) and apple borer (*Apanteles circumscriptus* Nees). *Macrocentrus linearis* Nees and *Apanteles ater* Ratz. are associated with several leaf roller moths and *A. glomeratus* L. parasitizes cabbageworms. The latter is particularly important as an entomophage of the cabbage and turnip white butterfly caterpillars in vegetable crops. *A. rubripes* Hal. is also quite remarkable. Many species of the genus *Opius* significantly decrease the population of fruit flies damaging cabbage and beet. The entomophage of the cabbageworm, *A. phutellae* Kurd., deserves special mention (this species has largely controlled an introduced pest, the American white fly).

Many other braconid species known as entomophages of important agricultural pests may be mentioned. Their very beneficial role becomes apparent in forestry where, in many instances, they are the major entomophages of timber- and leaf cutting caterpillars.

## IMPORTANT LITERATURE\*

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\* Pertains to the family as a whole or some of its large groups; literature on individual groups is cited in footnotes.

**Key to the Subfamilies**  
(V.I. Tobias)

- 1 (44). Mandibles 2-dentate (sometimes in Opiinae basally step-like broadened and appearing 3-dentate, but then additional tooth basal), touching at apices (or in any case could touch if not joined), sometimes not thinned laterally, their apices directed inward from their longitudinal axis.
- 2 ( 3). Second abdominal tergite with transverse basal elevation posteriorly separated generally by a furrow (Fig. 4: 1). Labial palp 3-segmented. Venation of forewing relatively complete, with 2 radiomedial veins. Generally clypeus somewhat incised on anterior margin; between it and mandibles oral cavity developed; occipital ridge and sternauli not developed. Submedial cell on hind wing distinctly longer than one-third medial cell. Ovipositor very short .....3. **Gnaptodontinae** (p. 142).
- 3 ( 2). Second abdominal tergite without transverse basal elevation. Labial palp 4-segmented (as a rule, 4-segmented when wing venation complete). If oral cavity developed, then either, at least on sides in temporal region, occipital ridge and usually sternauli present or if both not developed then submedial cell of hind wing very short, not longer than one-third medial cell. Ovipositor usually somewhat long, projecting noticeably over abdominal tip.
- 4 (11). Clypeus incised on outer margin, deep round or oval cavity developed between it and mandibles (Fig. 3: 1). Apical half of wing (beyond basal vein) not longer or slightly longer than basal half. Punctures or longitudinal furrow absent anterior to scutellum. Occiput and temples not bordered or if bordered by ridge, then ridge usually developed on both temples and occiput. Anal cross-vein usually not developed.
- 5 (10). Articulation of 1st and 2nd abdominal tergite movable, 4th and 5th tergites differ in shape and sculpture from 2nd and 3rd. Ocelli usually in equilateral or obtuse triangle.
- 6 ( 9). In hind wing, submedial cell long, occupying more than half, in any case, more than 1/3 length of medial cell, much longer

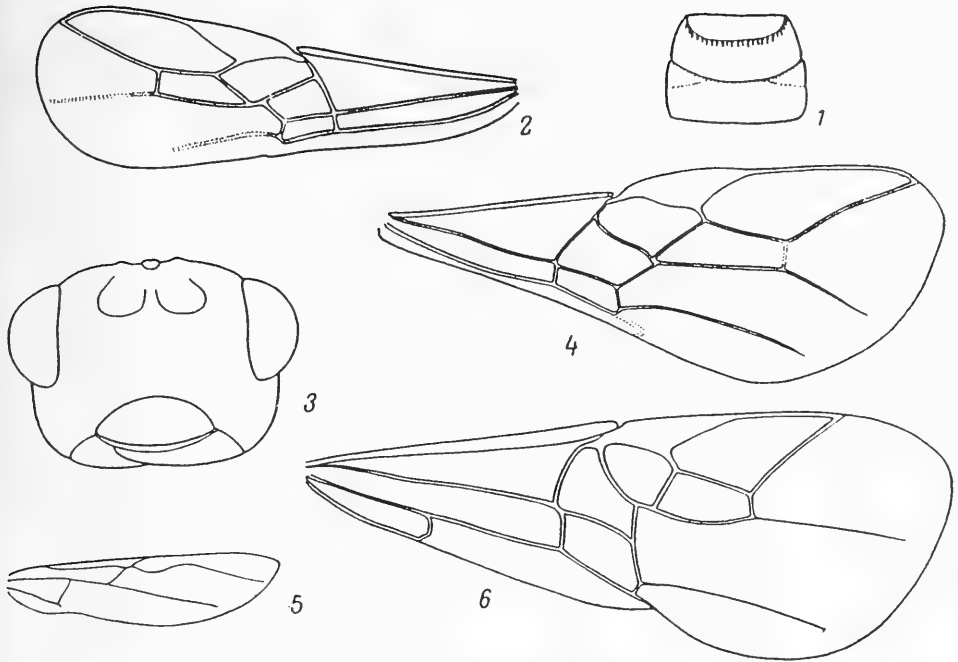


Fig. 4. Braconidae (from Tobias).

- 1—*Gnaptodon pumilio* Nees: 1—3rd abdominal tergites; 2—*Bracon* sp., forewing;  
 3—*Aspicolpus carinator* Nees, head, front view; 4—*Opius fulvicollis* Thoms., forewing;  
 5—*Homolobus annulicornis* Nees, hind wing; 6—*Ichneutes reunitor* Nees, forewing.

than broad, recurrent vein usually developed (Fig. 3: 4; 16: 2), rarely are these cells not developed (Fig. 10: 9, 10). Occiput, at least temples, generally, bordered with somewhat distinct ridge. Maxillary palp usually 6-segmented, 1st abdominal tergite without anteriorly narrowed large convex central field (except *Histeromerus*), often with small flat posteriorly narrowed basal field, prepectal ridge and sternauli usually somewhat developed. Nervulus generally postfurcal. Propodeum most often sculptured and usually with somewhat developed fields or fine medial longitudinal ridge. Sometimes apterous.

- 7 (8). Groove between 1st and 2nd abdominal tergites shallow, vertical margin of 1st and 2nd tergites concealed, inconspicuous. Propodeum without fine medial longitudinal ridge over entire length, sometimes with fields (in that case, anterior to median field, longitudinal ridge may be present),

- 1st abdominal tergite usually, 2nd always without fine medial longitudinal ridge. Ovipositor long (often shorter than abdomen) or if short, propodeum usually with somewhat distinct fields. Generally ectoparasites or cryptobiont larvae (under bark, in rolled leaves, mines, etc.) ..... 1. **Doryctinae** (p. 28).
- 8 ( 7). Groove between 1st and 2nd abdominal tergites deep, posteroventral margin of 1st tergite and anteroventral margin of 2nd tergite distinct (Fig. 39: 12). Usually propodeum, 1st and 2nd abdominal tergites with fine medial longitudinal ridge; propodeum always without fields. Ovipositor short. Endoparasites of exposed lepidopteran larvae; pupating under integument of caterpillars, forming so-called mummies ..... 2. **Rogadinae** (p. 118).
- 9 ( 6). On hind wing submedial cell short, occupying not more than one-third length of medial cell, 2 times as long as wide, recurrent vein always absent (Fig. 80: 1). Occiput and temples not bordered by ridge. Maxillary palp 5-segmented, 1st abdominal tergite with anteriorly narrowed convex median field (Fig. 56: 18). Prepectal ridge and sternauli not developed. Nervulus, as a rule, interstitial. Propodeum usually glabrous, always without fields. Wings always developed ..... 4. **Braconinae** (p. 156).
- 10 ( 5). Articulation between 1st and 2nd abdominal tergites immovable; 4th and 5th tergites differing little in shape and sculpture from 2nd and 3rd (Fig. 91: 4). Ocelli in acute angled triangle with base considerably smaller than sides. Radial cell reduced (Fig. 91: 2), Monotypic Central Asian subfamily ... 5. **Telengainae** (p. 255).
- 11 ( 4). Clypeus not incised, its outer margin usually straight or raised, oral cavity between it and mandibles not developed (Fig. 4: 3), slit-like or almost shallow (if clypeus somewhat incised—*Microgasterinae*). If oral cavity fairly deep, oval (*Opiinae*), then apical half of wing (beyond basal vein) usually much longer than basal half (Fig. 4: 4); mesonotum anterior to scutellum often with punctures or longitudinal furrow and occiput generally not bordered when temples bordered with ridge.
- 12 (37). Radial vein in forewing throughout sclerotized (rarely apically desclerotized; *Ademon*, *Neoneurini*). Eyes not pubescent, if pubescent then, generally, 1st to 3rd abdominal

- tergites fused into plate. Spiracles of 1st abdominal segment on sclerotized tergite.
- 13 (32). Forewing with 2 radiomedial veins, 2 closed radiomedial cells (in *Baeognatha* these veins fused and 2nd radiomedial cell not developed; Fig. 170: 11). Abdomen not petiolate, that is, 1st tergite short, gradually and slightly narrowing toward base. Radial cell without accessory cell. Brachial cell closed or open (mostly in Agathidinae).
- 14 (29). 1st to 3rd abdominal tergites not forming coarsely sculptured plate concealing remaining segments; usually, at least, 4th and 5th segments visible.
- 18 15 (26). 2nd radiomedial cell large, 4 to 5 angled, genae always weakly developed, labio-maxillary complex usually not extended into prominent proboscis.
- 16 (25). Apical section of radial vein forming obtuse angle with preceding radial cell not reduced or slightly reduced, generally longer than stigma.
- 17 (22). Spurs of hind tibiae short, not longer than 1st segment of hind tarsi. Radial vein on hind wing slightly concave.
- 18 (21). Coxae normally developed, hind coxae much shorter than distance between them to base of hind wing, length of fore-coxae much less than maximum height of pronotum. Second segment of hind trochanters without denticle.
- 19 (20). Occiput sharply bordered with ridge. Notaulices deep, convergent before scutellum. Head often massive, subtransverse (Fig. 93: 5). Stigma broad triangular (Fig. 92: 16). At least one anal cross-vein developed on forewing; recurrent vein not developed on hind wing (Fig. 92: 2). Ovipositor usually long, often of same length as body, generally projecting far behind tip of abdomen. Antennae not as long as body. Sternauli broad, rugose. Body often more than 5\*. Parasites of beetle larvae under bark and wood.....  
..... 6. **Helconinae** (p. 255).
- 20 (19). Occiput at least at top not bordered (except in *Ademon*). Notaulices usually only distinct anteriorly, smooth on pronotal disk, anterior to scutellum often foveolate or with longitudinal furrow. Head generally strongly transverse. Stigma often cuneate, sometimes linear, rarely broad triangular (Fig. 4: 4). Anal cross-vein on forewing not developed; recurrent vein on hind wing sometimes developed. Ovipositor usually short,

\* Here and throughout the text body size in mm.

- rarely longer than abdomen. Antennae often longer than body. Sternauli narrow, smooth or rugose, sometimes not developed. Body length seldom more than 5. Parasites of dipteran larvae, emerging from pupae ..... 21. **Opiinae** (Vol. III, Part 5).
- 21 (18). Coxae highly elongate, length of hind coxae equal to distance from them to base of hind wing (Fig. 155: 1), length of fore-coxae almost equal to maximum height of pronotum at its posterior margin. Second segment of hind trochanters with denticles (Fig. 151: 4). Head strongly transverse, occiput not bordered. Notaulices deep. Recurrent vein distinctly antefurcal. Ovipositor long, usually equal to body length or longer, rarely equal to length of abdomen. Sternauli not developed or somewhat distinct only posteriorly at base of coxae. Parasites of lepidopterans, often gregarious (polyembryonic).... 9. **Macrocentrinae** (p. 438).
- 19 22 (17). Spurs of hind tibiae long, not shorter than halflength of 1st segment of hind tarsus. Radial vein on hind wing strongly concave (Fig. 4: 5). Head transverse. Notaulices deep. Recurrent vein distinctly antefurcal. Ovipositor short, not longer than halflength of abdomen. Sternauli very broad, sculptured. Parasites of lepidopteran larvae.
- 23 (24). Spiracles of 1st abdominal tergite located at its base (Fig. 160: 8). Nervellus forming almost right angle with anal vein on hind wing (Fig. 4: 5). Occiput bordered with ridge .. 11. **Homolobinae** (p. 454).
- 24 (23). Spiracles of 1st abdominal segment far removed from its base. Nervellus forming acute angle with anal vein on hind wing. Occiput not bordered ..... 10. **Xiphozelinae** (p. 454).
- 25 (16). Apical section of radial vein forming right angle or almost so with preceding radial cell reduced, not longer than stigma (Fig. 4: 6). Abdominal tergite with numerous hair. Parasites of sawfly larvae..... 15. **Ichneutinae** (p. 508).
- 26 (15). Second radiomedial cell small, triangular or neatly triangular, if large then always triangular (Fig. 5: 5, 6). Genae often very well developed, labiomaxillary complex forming long proboscis (Fig. 5: 7). Sternauli usually not developed. Parasites of lepidopteran larvae.
- 27 (28). Occiput bordered with ridge, slightly notched. Genae weakly developed, proboscis not developed. Radial cell on forewing broad, longer than stigma; second radiomedial cell large, brachial cell closed (Fig. 5: 3) ..... 12. **Orgilinae** (p. 463).



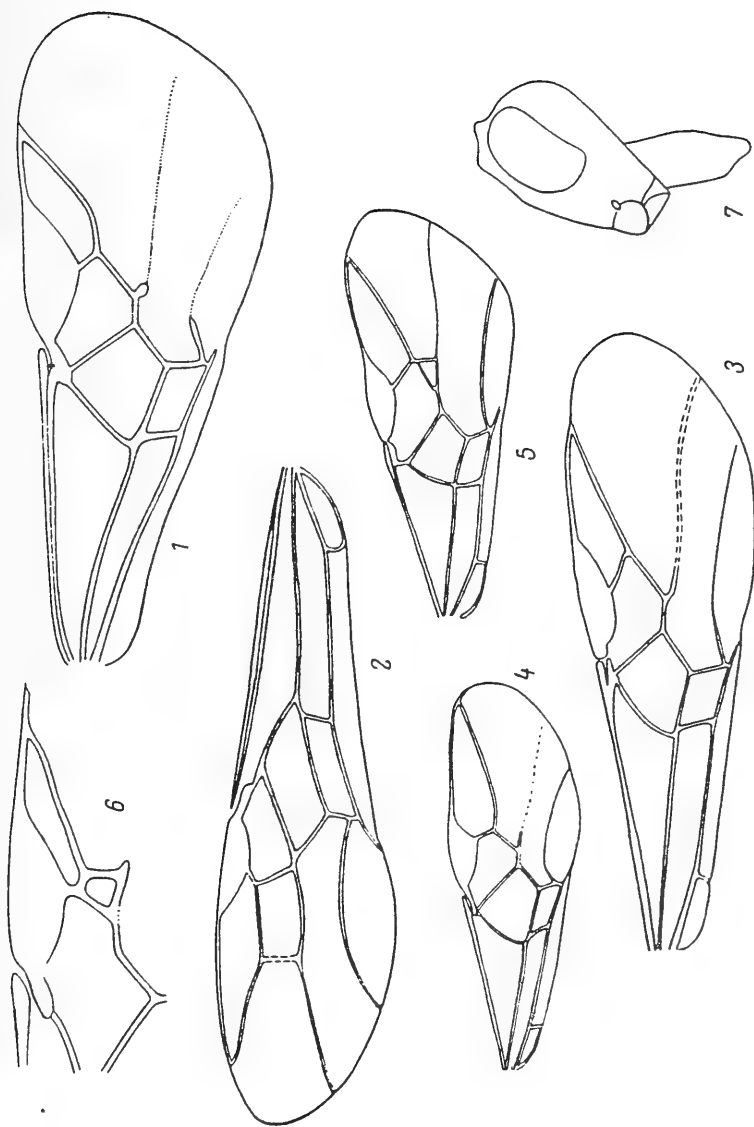


Fig. 5. Braconidae (from Tobias).

1-5—forewing: 1—*Triaspis* sp.; 2—*Sigalphus irrorator* F.; 3—*Oxygilus obscurator* Nees; 4—*Charmon extensor* L.; 5—*Microgypus trigonus* Nees; 6—*Agathis montana* Shest., part of forewing; 7—*Agathis schmedeknechti* Kok., head.

- 28 (27). Occiput not bordered, deeply notched. Genae always well developed, in this case labiomaxillary complex generally forming long proboscis (Fig. 5: 7). Radial cell narrow, shorter than stigma; second radiomedial cell small; brachial cell in outer posterior corner open (Fig. 5: 6) ..... 14. **Agathidinae** (p. 480).
- 29 (14). Abdominal tergites 1 to 3 forming plate concealing remaining segments, rugose.
- 30 (31). Articulation between 1st and 2nd abdominal tergites movable (Fig. 1: 2). Forewing with longitudinal veins almost reaching its apex (Fig. 5: 2). In hind wing apical section of cubitus well developed, pigmented (Fig. 1: 2). Postpectal (anterior to middle coxae) ridge not developed; pronotum glabrous, with deep notaulices. Parasites of lepidopteran larvae ..... 13. **Sigalphinae** (p. 478).
- 31 (30). Articulation between 1st and 2nd abdominal tergites not movable, often suture between them not developed. Forewing with longitudinal veins not reaching up to its apex (Fig. 186: 6). On hind wing, apical section of cubitus absent or barely noticeable, non-pigmented. Postpectal ridge developed, pronotum sculptured, usually with indistinct notaulices. Egg-larval parasites of lepidopterans ..... 16. **Cheloninae** (p. 512).
- 32 (13). Forewing with only one radiomedial vein, only one radiomedial cell closed; rarely 2 radiomedial veins, then brachial cell on hind wing roundish on outer corner and abdomen petiolate or radial cell with accessory cell (*see* Euphorinae).
- 33 (36). Brachial cell on forewing generally closed (Fig. 97: 13). Abdomen sessile, often abdominal tergites 1 to 3 forming sculptured plate concealing remaining segments (Fig. 99).
- 34 (35). Second section of radial vein curved (Fig. 97: 13). Occiput bordered with ridge. Sternauli usually developed. Abdominal tergites 1 to 3 often forming plate concealing remaining segments (Fig. 99). Parasites of larvae of beetles, often egg-larval. .... 7. **Brachistinae** (p. 273).
- 35 (34). Second section of radial vein straight (Fig. 5: 3) and occiput not bordered above; if second section of radial vein curved (Fig. 5: 4) and occiput bordered with ridge, then lower part of sides of mesothorax absolutely glabrous, without traces of ridge. Abdominal tergites 1 to 3 never forming plate. Parasites of lepidopteran larvae ..... 12. **Orgilinae** (p. 463).

- 36 (33). Brachial cell on forewing in outer posterior corner generally open (that is, brachial vein not developed). Abdomen often petiolate (always when brachial vein partially developed). Abdominal tergites 1 to 3 not forming sculptured plate although sometimes 2nd and 3rd tergites could be well developed (but glabrous) and conceal subsequent segments (Fig. 133: 7). Radiomedial vein usually one (Fig. 6: 2–4) but sometimes may be 2 (Fig. 6: 1); radial cell sometimes with accessory cell (Fig. 6: 5). Parasites of adult holometabolous insects, generally beetles, rarely their larvae, sometimes caterpillars (*Meteorus*) as well as larval and adult hemipterans, rarely psocopterans ..... 8. **Euphorinae** (p. 317).
- 37 (12). Apical part of radial vein usually behind 2nd radial vein, if latter not developed then behind 1st radiomedial vein, weakly sclerotized, often almost inconspicuous, persisting only as distinct trace (Fig. 7: 3, 5–8). Eyes usually pubescent, with distinct hair.
- 38 (43). First abdominal tergite not fused with 2nd, on sides from sclerotized central part with more weakly sclerotized, well developed laterotergites; spiracles on laterotergites or right on margin of sclerotized central part. Radial vein originating from middle or at some distance behind middle of stigma; 1st radiomedial vein originates from radial vein.
- 21 39 (42). On hind wing radiomedial vein (and radiomedial cell) not developed. Antennal segments more than 18, rarely less.
- 40 (41). On forewing 2nd radiomedial cell large, much longer than wide (Fig. 7: 3). First abdominal tergite with median convex field somewhat oval in shape surrounded by deep furrows. Antennae multisegmented (usually about 30) ..... 18. **Cardiochilinae** (p. 592).
- 41 (40). On forewing 2nd radiomedial cell not developed because of reduction of 2nd and also 1st radiomedial veins (Fig. 7: 7). First abdominal tergite without central field, its sclerotized part (in Palearctic genera) long and narrow. Antennal segments fewer ..... 20. **Miracinae** (p. 816).
- 42 (39). On hind wing 2nd radiomedial vein weak but distinct, adjoining 2nd radiomedial cell formed by weaker veins (Fig. 7: 4). Antennae 18-segmented ..... 19. **Microgasterinae** (p. 605).
- 43 (38). First abdominal tergite fused with 2nd (Fig. 7: 1), spiracles on its sides on weakly developed laterotergites. Radial vein originating from apical third of stigma at some distance from radiomedial vein or with it (Fig. 7: 8). Parasites

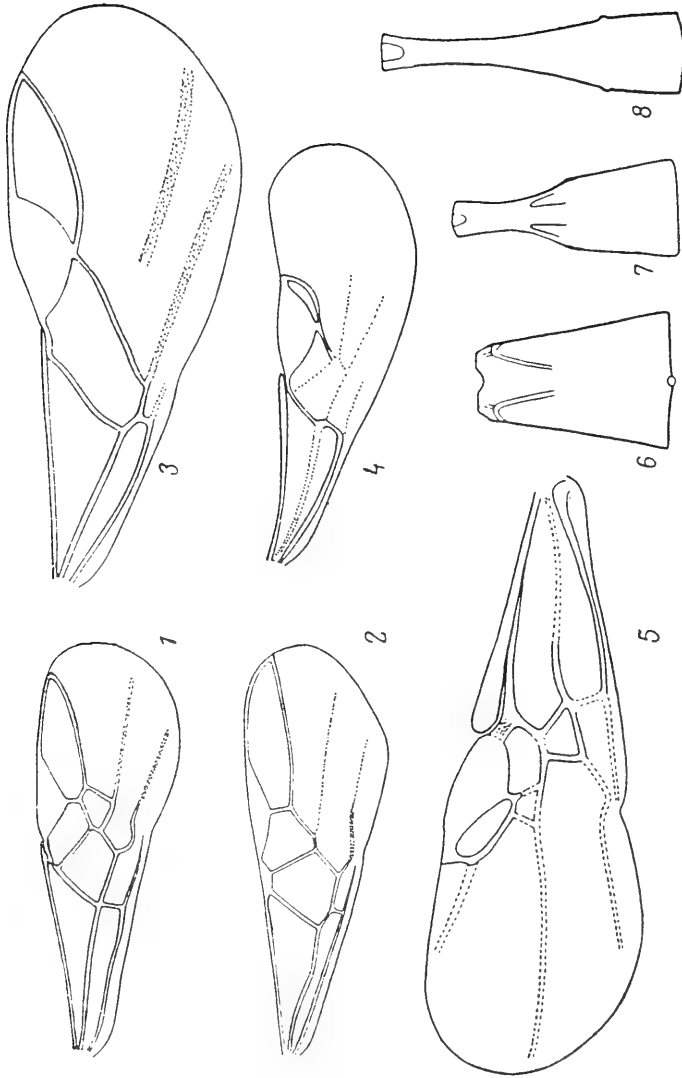


Fig. 6. Braconidae (from Tobias).

1-5—forewing: 1—*Chrysopophthorus elegans* Tobias; 2—*Blacus* sp., 3—*Cosmophorus klugii* Ratz.,  
 4—*Leiothron* sp., 5—*Neoneurus auctus* Thoms., 6-8—1st abdominal tergite: 6—*Blacus ruficornis* Nees,  
 7—*Syntretus elegans* Ruthe,  
 8—*Zele chlorophthalmus* Spin.

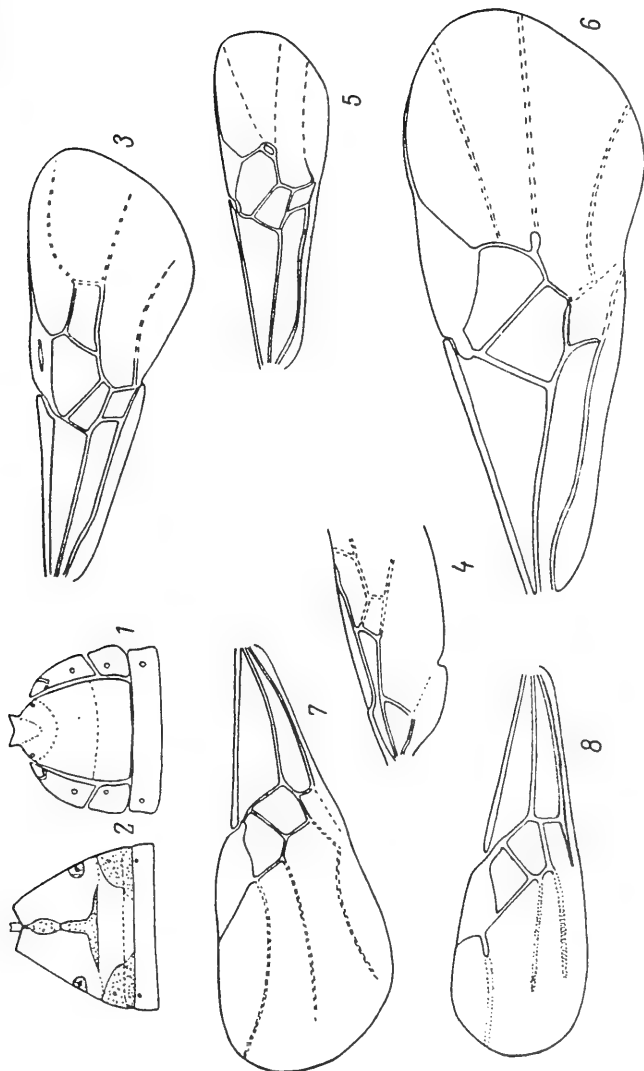


Fig. 7. Braconidae (from Tobias).

1-2—abdominal tergites 1-4: 1—*Acaelium subs fasciatum* Hal., 2—*Mirax* sp.; 3—*Cardiochiles saltator* F., forewing; 4—*Apanteles* sp., hind wing; 5-8—forewing: 5—*Lisso-gaster globata* L., 6—*Apanteles* sp., 7—*Mirax* sp., 8—*Acaelium subs fasciatum* Hal.

- of lepidopteran larvae, usually leaf miners.....  
 ..... 17. *Acaeliinae* (p. 588).  
 44 (1). Mandibles 3 to 4 dentate (sometimes more; rarely lower den-  
 ticle reduced and mandibles with only 2 large teeth), never  
 touching at apices, often extended laterad (live insect always  
 capable of extending mandibles to sides), their apices di-  
 rected outward from their longitudinal axis (Fig. 8: 1, 2).  
 Forewings as in Fig. 8: 3—6. Parasites of dipterans .....  
 ..... 22. *Alysiinae* (Vol. III, Part 5).

### 1. Subfamily Doryctinae\*

Head cubical or transverse with roundish oral cavity; occipital ridge usually fully developed. Length of thorax 1.5—2 times its height, rarely thorax depressed, prepectal ridge and sternauli usually developed. Foretibiae with (*Doryctidii*) or without (*Exothecidii*) spurs; hind femora often thickened. Forewing sometimes with developed 2nd anal cross-vein; sometimes 2nd radiomedial vein reduced; brachial cell closed, rarely open; hind wing usually with developed recurrent vein, in male sometimes stigmal thickening present. First abdominal tergite sometimes stretched into petiole; rarely abdominal tergites 1 to 3 form a plate concealing remaining tergites. Ovipositor valves very long, sometimes as long as body but could be even short, barely projecting behind tip of abdomen. Propodeum always with rugose sculpture, rarely with fields.

In number of genera it is the largest subfamily of braconids. Many genera (about 140) known only from the tropics.

The subfamily is mainly represented by ectoparasites, which are biologically more primitive than ichneumonoid endoparasites. Morphologically their features are fairly common although their typical oral cavity is undoubtedly a sign of specialization. Because of significant generalization (plesiomorphy) of features characterizing *Doryctinae* genera, many of these genera are poorly differentiated, differing from each other in few and often indistinct apomorphic features.

The subfamily is divided into two groups of genera. The first is the most primitive, associated mostly with bark beetles (ancient hosts of ichneumonids). The other, more specialized, is adapted often to lepidopterans, mostly leaf rollers and leaf miners of trees. N.A. Telenga

\* Treatment by S.A. Belokobyl'skij and V.I. Tobias.

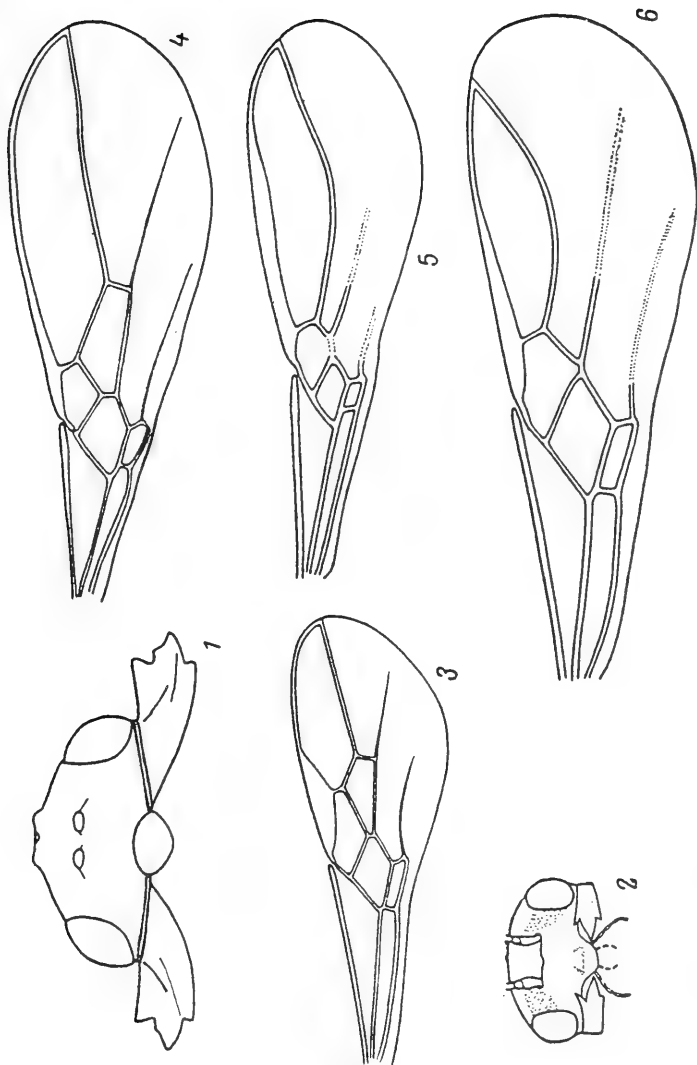


Fig. 8. Braconidae (from Tobias and Fischer).

1, 2—Head: 1—*Alysia manducator* Panz. (with extended mandibles), 2—*Phaenocarpa collaris* Papp (with unextended mandibles); 3—*Alysia* sp., 4—*Aspilota* sp., 5—*Dacnusa* sp., 6—*Chorebus* sp.

(1952) separated them into supertribes Doryctina and Rogadina (Doryctidii and Exothecidii as considered here). Many authors continue to consider the latter under the subfamily Rogadinae. However, although the morphological and biological boundary with the subfamily Rogadinae is not distinct (for example, *Clinocentrus* which has been rather arbitrarily included here under Doryctinae, has many features common with Rogadinae—see note to this genus), the qualitative distinction of specialized endoparasitic Rogadinae from primitive, largely ectoparasitic Doryctinae is fairly evident.

Within subfamily Doryctinae, the supertribe Exothecidii is still more difficult to separate from another supertribe Doryctidii with which it is generally similar biologically (ectoparasitism, partially on beetles, for example, in *Chremylus*). The morphological boundary between them is also not distinct. The only significant morphological character typical of Doryctinae is the presence of spines on the foretibiae and that is not always clearly manifest. The remaining features (see the key) are quantitative in nature and are considerably transgressive.

#### *Key to Genera*

- 1 (100). Wings developed.
- 2 ( 53). Legs short, hind femora 3 to 4 times as long as wide (Fig. 13: 13, 14). Forefemora usually apically broadened, slightly shorter than foretibiae, foretibiae with somewhat developed spines (Fig. 17: 2), middle and hind femora usually non-uniformly narrowed apically and toward base (apically less so), inner margin often somewhat concave, outer margin tuberculately raised in basal third. Thorax not more than twice as long as high. Head usually massive, slightly transverse or cubical. Ovipositor often longer than abdomen, very rarely much shorter than it. Wings often with smoky spots. Most species parasites of bark beetles and xylophages (Supertribe Doryctidii).
- 3 ( 4). First abdominal segment petiolate (Fig. 11: 3), 2 times or more as long as wide at apex. Recurrent vein meets 2nd radiomedial cell. Mesonotum with granulose sculpture (Tribe Spathiini) ..... 1. **Spathius**
- 4 ( 3). First abdominal segment sessile, less than 2 times as long as wide at apex, often equal to it or smaller; if first segment petiolate (*Spathiomorpha*) then recurrent vein meets 1st



- radiomedial cell and mesonotum glabrous or with sparse punctures.
- 5 ( 22). Second, or more rarely 1st, radiomedial vein reduced (except in *Pareucorystes* and *Doryctosoma* in which sometimes 2nd radiomedial vein and 1st are developed). Hind wing of male often with stigmal thickening covering costal, basal and medial veins. Brachial cell of forewing open on outside (except in *Ecphyllus*).
- 6 ( 7). Brachial cell of forewing closed on outside. Nervulus, nervellus, anal and recurrent veins in hind wing not developed (Fig. 11: 4). Hind wing of male without stigmal thickening. Maxillary palps 5-segmented, labial palps 3-segmented (Tribe Ecphylini) ..... 2. **Ecphyllus**
- 7 ( 6). Brachial cell of forewing not closed on outside. Nervulus, nervellus, anal and recurrent veins of hind wings developed. Hind wings of male with stigmal thickening (except in *Monolexis* and *Polystenus*). Maxillary palps 6-segmented, labial palps 4-segmented (Tribe Hecabolini).
- 8 ( 21). Wings normally developed.
- 9 ( 10). Antennae appreciably thickened. Hind coxae anteroven-  
trally with distinct projection (Fig. 18: 7). Ovipositor  
valves much longer than abdomen, almost as long as body.  
Mesosternum smooth, except rugose areola anterior to  
scutellum; vertex usually smooth ..... 3. **Hecabolus**
- 10 ( 9). Antennae thin. Hind coxae without ventral projection.  
Ovipositor valves usually not longer than abdomen.
- 11 ( 12). First radiomedial vein strongly reduced, 2nd radiomedial  
vein always well developed. Ovipositor valves sometimes  
as long as body, 4th and 5th abdominal tergites usually  
smooth, more rarely sculptured at base .....  
..... 4. **Heterospilus**
- 12 ( 11). First radiomedial vein always well sclerotized; 2nd radio-  
medial vein usually not developed (except in *Pareucorystes*  
and *Doryctosoma*, in which it is sometimes developed).
- 23 13 ( 20). Recurrent vein antefurcal or almost interstitial to 1st ra-  
diomedial vein.
- 14 ( 17). Thorax strongly depressed mesonotum almost at level  
of pronotum, thorax almost 4 times as long as wide  
(Fig. 13: 1). 1st to 6th abdominal tergites with longitudinal  
rugose sculpture at least basally.
- 15 ( 16). Radial vein originating from apical third of stigma.  
Vertex transversely rugose. 2nd and 3rd abdominal

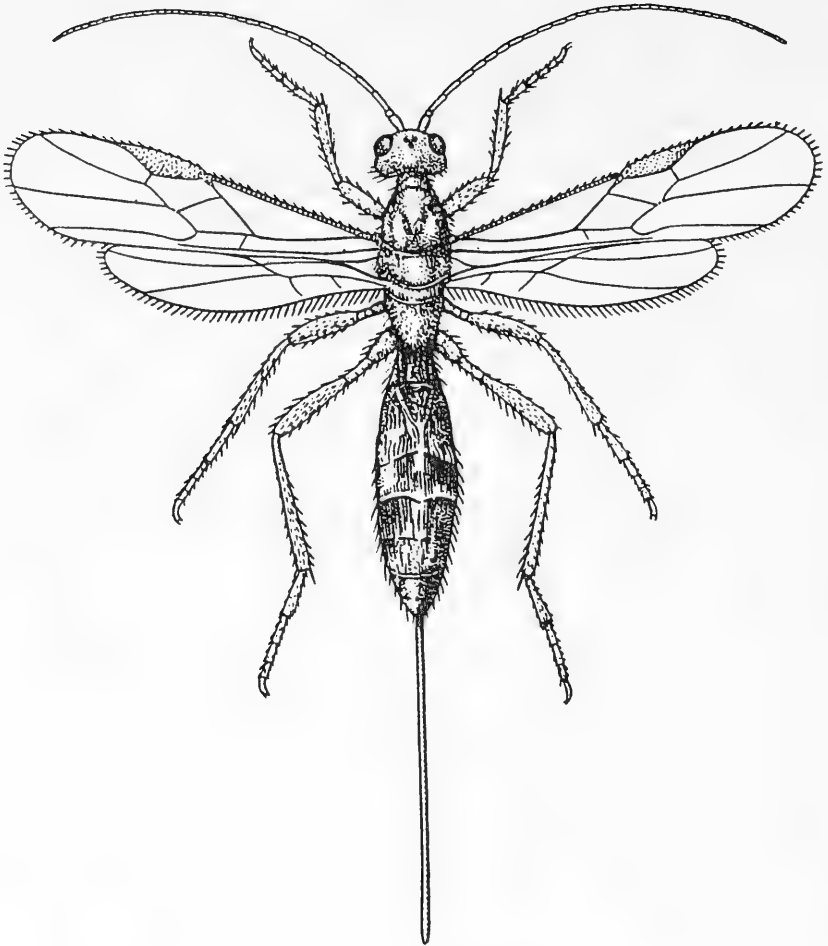


Fig. 9. Doryctinae (original).

*Polystenus rugosus* Först.

tergites with Y-shaped, light colored pattern (Fig. 9). Second radiomedial vein not always developed. Hind wing of male without stigmal thickening..... 5. **Polystenus** 16 ( 15). Radial vein originating from middle of stigma. Vertex with dense granulose sculpture. 2nd and 3rd abdominal tergite without Y-shaped pattern, with twinned suture (Fig. 13: 3). Second radiomedial vein in forewing sometimes developed.

- Hind wing of male with stigmal thickening .....  
 ..... 6. **Pareucorystes**
- 17 ( 14). Thorax not depressed, somewhat raised above pronotum. Rugose sculpture only on abdominal tergites 1 to 3, sometimes 4th and 5th tergites laterally at base with weak granulose sculpture. Stigmal thickening developed in hind wing of male.
- 18 ( 19). Radial cell strongly reduced, metacarpus much shorter than stigma, radial vein originating from middle of stigma (Fig. 13: 6). Mesonotum slightly raised above pronotum, gently sloping to it. Second abdominal tergite without arcuate light colored pattern. Head slightly transverse. Second radiomedial vein always absent .... 7. **Hecabolodes**
- 19 ( 18). Radial cell usually not reduced; if reduced then metacarpus as long as or slightly longer than stigma, radial vein originating anterior to middle of stigma. Mesonotum greatly raised above pronotum, sharply inclined to it (except in *D. hungaricum* Szépl.). Second abdominal tergite with distinct arcuate light colored pattern. Head usually strongly transverse. Second radiomedial vein sometimes developed ..... 8. **Doryctosoma**
- 24 20 ( 13). Recurrent vein postfurcal. Vertex transversely rugose. Nervulus almost interstitial. Head transverse. Mesonotum with dense granulose sculpture ..... 9. **Monolexis**
- 21 ( 8). Wings strongly reduced, of same length as thorax, metacarpus not developed. Ovipositor valves somewhat shorter than abdomen, second abdominal tergite with weak rugose sculpture ..... 10. **Lituania**
- 22 ( 5). Both radiomedial veins developed. Hind wings of male without stigmal thickening, if thickening developed (*Dendrosoter*) then covers only costa and uppermost part of basal vein. Brachial cell of forewing closed (except in *Allorhogas*).
- 23 ( 52). Antennae much longer than head and thorax together. Oral cavity small, much smaller than eyes; face with distant antennal sockets and clypeus. Labium well developed. Maxillary stipes basally not fused. First segment of hind tarsus shorter than rest together; foretibiae with spines usually in a single row. Prepectal ridge always well developed; notaulices on mesonotal disk distinct; propodeum always with rugose sculpture, 1st abdominal tergite without median field.

- 24 ( 51). Hind coxae apically without spines. Recurrent vein on hind wing short, bent to base of wing or straight (sharply raised to apex in *Allorhogas*). Propodeum with distinct fields, usually with irregular rugose sculpture.
- 25 ( 50). Fifth abdominal tergite enlarged, smaller than 4th but concealing remaining tergites (Tribe Doryctini).
- 26 ( 37). Recurrent vein merging in 2nd radiomedial cell, if almost interstitial then 1st radiomedial vein reduced or radial vein crossing beyond middle of stigma. 4th to 6th abdominal tergites appreciably stretched under 3rd; hind tibiae of male thickened.
- 27 ( 36). Frons uniformly convex, without tubercular elevation on sides. Ocelli in equilateral triangle or in triangle with base much longer than sides. Hind wing of male without stigmal thickening.
- 28 ( 31). Parallel vein not interstitial, originating from middle of vein adjoining on outer side with brachial cell. Head usually without granulose sculpture, vertex and temples smooth or with rugose sculpture. Ovipositor valve often as long as body or slightly smaller.
- 29 ( 30). Radial vein originating from middle of stigma, second section of radial vein twice as long as 1st radiomedial vein. Mesonotum with dense coarsely granulose sculpture; metanotum without denticle. 4th to 6th abdominal tergites not stretched under 2nd and 3rd tergites. Hind femora oblong-oval; hind tibiae of male not broadened ..  
..... 11. **Rhoptrocentrus**
- 30 ( 29). Radial vein originating from beyond middle of stigma, often from apical third; second section of radial vein approximately equal to 1st radiomedial vein or somewhat shorter than it. Mesonotum usually smooth, rarely with weakly granulose sculpture; metanotum with acute denticle. 4th to 6th abdominal tergites appreciably stretched under 2nd and 3rd tergites. Hind femora clavate, widest in apical third; hind tibiae of male often broadened (Fig. 14: 8) ..  
..... 12. **Rhyssalus**
- 31 ( 28). Parallel vein interstitial. Head often with granulose sculpture, especially on vertex and temples. Ovipositor valves much smaller than body.
- 32 ( 33). Forewings with smoky spots. Nervulus not developed. Second abdominal tergite throughout smooth. Median ridge of propodeum larger than its halflength. Ovipositor

- valves as long as abdomen without 1st segment .....  
 ..... 13. **Gildoria**
- 33 ( 32). Forewings without smoky spots, usually transparent. Nervulus developed. Second abdominal tergite usually rugose at least basally.
- 34 ( 35). Second abdominal tergite with semioval, weakly rugose areola. First radiomedial vein distinctly sclerotized. Ocelli in equilateral triangle. Head smooth ..... 14. **Ipodoryctes**
- 35 ( 34). Second abdominal tergite without semioval areola, smooth or with rugose sculpture. 1st radiomedial vein sometimes reduced. Ocelli often in a triangle with base much longer than sides. Head often with granulose sculpture.....  
 ..... 15. **Dendrosotinus**
- 36 ( 27). Sides of frons tuberculately raised (Fig. 16: 3). Anterior ocellus usually shifted far forward, base of ocellar triangle much smaller than its sides. Hind wings of male with stigmal thickening (Fig. 16: 8). Parallel vein interstitial; brachial cell closed; wings usually darkened .....  
 ..... 16. **Dendrosoter**
- 37 ( 26). Recurrent vein merging in 1st radiomedial cell; if interstitial to 1st radiomedial vein, then characters different.
- 38 ( 39). Brachial cell on forewing open, recurrent vein of hind wing arcuate towards its apex ..... 17. **Allorhogas**
- 39 ( 38). Brachial cell on forewing closed, recurrent vein of hind wing arcuate at its base or straight.
- 40 ( 41). Abdomen petiolate, petiole formed by long and thin 1st abdominal tergite (Fig. 16: 19). Mesonotum smooth, without granulose sculpture ..... 18. **Spathiomorpha**
- 41 ( 40). Abdomen sessile, 1st tergite less than 2 times as long as apical width.
- 42 ( 49). Mesonotum steeply inclined to pronotum and considerably raised above it (Fig. 17: 1). Ocelli in equilateral triangle.
- 25 43 ( 44). 1st and 2nd abdominal tergites completely and 3rd to 6th basally with rugose sculpture; 2nd abdominal tergite often with V-shaped light colored pattern. Mesonotum with deep punctures. Vertex always smooth. Ovipositor valves as long as body. Wings light colored .....  
 ..... 19. **Hypodoryctes**
- 44 ( 43). Abdominal tergites starting from apical half of 3rd entirely smooth; 2nd abdominal tergite always without V-shaped light colored pattern. Mesonotum usually with dense granulose sculpture, rarely smooth.

- 45 ( 46). 1st and 2nd abdominal tergites throughout, and 3rd in basal half with longitudinal rugose sculpture. Forewing with distinct smoky spots. Vertex and temples with coarse, irregular, rugose sculpture. Median ridge on propodeum passing beyond its middle. Nervulus interstitial or slightly postfurcal..... 20. **Wachsmannia**
- 46 ( 45). Longitudinal rugose sculpture at best on 1st and 2nd abdominal tergites, if 3rd also rugose basally then striae in concentric semicircles. Forewings without smoky spots, light colored or darkened. Vertex and temples usually smooth, sometimes vertex with sparse deep punctures or slightly transversely rugose. Median ridge on propodeum usually short, not longer than its halflength.
- 47 ( 48). Forewing with developed 2nd anal cross-vein. Median lobe of mesonotum with distinct projecting anterolateral angles. Laterotergites on 2nd abdominal segment not divided; spiracles mediolaterally on 2nd abdominal tergite; 3rd segment of labial palps strongly reduced, almost spherical ..  
..... 21. **Dolopsidea**
- 48 ( 47). Forewing without anal cross-veins. Median lobe of mesonotum without projecting anterolateral angles. Laterotergites of 2nd abdominal segment divided; spiracles above line of articulation on margin of 2nd abdominal tergite; 3rd segment of labial palps normal ..... 22. **Ontsira**
- 49 ( 42). Mesonotum very gently inclined to pronotum, slightly raised above it. Ocelli often in triangle with base distinctly longer than sides ..... 23. **Doryctes**
- 50 ( 25). Fifth abdominal tergite very well developed, much larger than 4th, concealing remaining tergites (Fig. 17: 7). Body with dense granulose sculpture, abdomen usually rugose. Hind wings without recurrent vein (Fig. 16: 16) (Tribe Rhaconotini) ..... 24. **Rhaconotus**
- 51 ( 24). On hind coxae apically two spines each (anterior much longer than posterior). Recurrent vein on hind wing long and strongly curved to wing apex. Propodeum without fields, strongly reticulate-rugose. Occipital ridge ventrally eroded to level of center of eyes. Second abdominal tergite with semioval areola. Third segment of labial palps reduced, almost half of second. Row of cells on forewing reduced (Tribe Odontobraconini) ..... 25. **Zombrus**
- 52 ( 23). Antennae short, shorter than head and thorax together. Oral cavity very large, much larger than eyes; face with

- very proximate antennal sockets and clypeus (Fig. 17: 8). Labium strongly reduced, maxillary stipes fused at base. First segment of hind tarsus much larger than remaining segments together (Fig. 18: 4), foretibiae with irregular group of spines in lower third. Prepectal ridge reduced; notaulices on mesonotal disk smooth; propodeum smooth, First abdominal tergite with median field (Fig. 17: 10) (Tribe Histeromerini) ..... 26. **Histeromerus**
- 53 ( 2). Legs long, hind femora usually 5 to 6 times as long as wide. Forefemora not broadened or broadened apically, much shorter than tibiae which have only hair, without spines; middle and hind femora uniformly narrowed apically and basally (if femora thickened, then abdomen with plate formed by 2nd and 3rd tergites or in apical half laterally compressed). Thorax usually 1.5 times, rarely 2 times, as long as high. Head often transverse. Ovipositor usually not longer than abdomen, often shorter. Wings without smoky spots. Most species associated with leaf eating caterpillars, many with miners (Supertribe Exothecidii).
- 54 ( 59). Occipital ridge markedly smooth above, below not joined with hypostomal ridge, parallel to it, reaching lower margin of head capsule (Fig. 18: 5). Prepectal ridge completely reduced; sternauli not developed. Mesonotum always smooth. Pronotum apically often with deep roundish depression (Tribe Exothecini).
- 55 ( 56). Abdominal tergites 1 to 3 forming plate concealing remaining tergites. 3rd tergite on posterior margin with a transparent border. Pronotum apically with roundish, deep depression. Radial vein originating before middle of stigma ..... 27. **Colastinus**
- 56 ( 55). Abdominal tergites 1 to 3 not forming plate, remaining tergites greatly projecting from under them; 3rd tergite on posterior margin without transparent border.
- 57 ( 58). On forewing radial vein originating beyond middle of stigma; stigma of male markedly enlarged. Abdominal tergites 1 and 2 entirely sculptured, 3rd only basally. Abdomen behind 1st tergite usually reddish brown. Pronotum apically with round deep depression ..... 28. **Xenarcha**
- 58 ( 57). Radial vein usually originating before middle of stigma, sometimes from base of third, rarely from middle; stigma of male not enlarged, only sometimes slightly elongate.

- Abdominal tergites 2 to 5 either entirely smooth or sculptured, sometimes entirely ..... 29. **Colastes**
- 26 59 ( 54). Occipital ridge fully developed, usually ventrally joining hypostomal ridge (Fig. 18: 6). Prepectal ridge usually developed; if reduced then vertex and mesonotum with dense granulose sculpture (*Avga*) or mesonotum with three furrows and prescutellar depression very narrow (*Parahormius*). Sternauli developed.
- 60 ( 63). Several veins and metacarpus apically strongly desclerotized. Hind tibiae of male usually thickened. Second and third abdominal tergites almost covering terminal tergites (Tribe Acrisidini).
- 61 ( 62). Forewing with 2 radiomedial veins (Fig. 27: 1). Hind wing with recurrent vein and nervellus (Fig. 27: 2) ..... 30. **Proacrisis**
- 62 ( 61). Forewing only with one, 1st radiomedial vein (Fig. 27: 3). Hind wing without recurrent vein and nervellus (Fig. 27: 4) ..... 31. **Acrisis**
- 63 ( 60). Radial vein and metacarpus throughout their length well sclerotized. Hind tibiae of male not thickened.
- 64 ( 73). Second and third abdominal tergites well developed, concealing remaining segments; if relatively weakly developed then propodeum on sides with distinct spines or length of 1st abdominal tergite half its width at apex and mesonotum always with granulose sculpture.
- 65 ( 68). Parallel vein not interstitial. Propodeum on sides with distinct spines (Fig. 28: 3). Second and third abdominal tergites either smooth or with granulose sculpture; if 1st and 2nd tergites (end only basally) rugose, then 3rd always smooth. Females often brachypterous, sometimes (*Eupambolus*) entirely apterus. In winged forms sometimes 2nd radiomedial vein not developed (Tribe Pambolini).
- 66 ( 67). Fourth to sixth abdominal tergites considerably projecting from under coriaceous 2nd and 3rd tergites; 1st abdominal tergite with two distant longitudinal ridges, its length more than half its width at apex. Wings always well developed with radiomedial veins. Spines on sides of propodeum weak. Ovipositor valves as long as hind tarsi ..... 33. **Chremylus**
- 67 ( 66). Fourth to sixth abdominal tergites entirely concealed or slightly projecting from under highly sclerotized 2nd and



- 3rd tergites. 1st abdominal tergite only basally with rising ridges, its length equal to width at apex or much less but never half of width. Females often with reduced wings; in winged forms 2nd radiomedial vein sometimes reduced. Spines on sides of propodeum usually long. Ovipositor valves as long as 1st segment of hind tarsi .....  
 ..... 34. **Pambolus**
- 68 ( 65). Parallel vein interstitial (Fig. 30: 6). Propodeum without spines. Second and third abdominal tergites like 1st, always with coarse rugose sculpture. Wings always well developed, often 1st radiomedial vein not developed, 2nd radiomedial vein always developed (Tribe Lysitermini).
- 69 ( 70). First radiomedial vein well sclerotized almost throughout its length. Third abdominal tergite with distinct spines on posterior margin ..... 35. **Acanthormius**
- 70 ( 69). First radiomedial vein reduced, only sometimes its weak trace present. Third abdominal tergite without spines on posterior margin.
- 71 ( 72). Brachial cell wide open; stigma narrow cuneate, seven times as long as its maximum width. First and second abdominal tergites articulated immovably. Vertex and temples with coarse granulose sculpture .....  
 ..... 36. **Tritermus**
- 72 ( 71). Brachial cell closed; stigma broad, oval, 4.5 times as long as its maximum width (Fig. 34: 1). First and second abdominal tergites movably articulated. Vertex and temples smooth .....  
 ..... 37. **Lysitermus**
- 73 ( 64). Second and third abdominal tergites normally developed, remaining segments projecting far beyond from under them. Propodeum without distinct spines. Mesonotum rarely with granulose sculpture, usually smooth.
- 74 ( 83). Parallel vein interstitial; nervulus often interstitial (Fig. 32: 3); if parallel vein not interstitial then prepectal ridge reduced and mesonotum with granulose sculpture or abdominal tergites except 1st weakly sclerotized, coriaceous and ovipositor very short (Tribe Hormiini).
- 75 ( 80). Parallel vein not forming straight line with vein separating discoidal and brachial cell; nervulus usually postfurcal (Fig. 28: 6).
- 76 ( 79). Mesonotum smooth and weakly pubescent. Prepectal ridge in lower anterior part of mesosternum weak but always distinct on sides.

- 77 ( 78). Radial vein originating considerable distance behind middle of stigma. Recurrent vein branched at considerable distance anterior to 1st radiomedial vein (Fig. 28: 6, 7). Prescutellar depression broad, crenulate..... 38. **Noserus**
- 78 ( 77). Radial vein originating anterior to middle of stigma. Recurrent vein postfurcal. Prescutellar depression narrow, smooth ..... 39. **Parahormius**
- 79 ( 76). Mesonotum with granulose sculpture, densely pilose. Prepectal ridge not developed. Radial vein originating near middle of stigma. Recurrent vein antifurcal .... 40. **Avga**
- 80 ( 75). Parallel vein interstitial (or almost interstitial), that is, forming straight line with vein separating discoidal and brachial cell (Fig. 32: 3, 4); nervulus interstitial, rarely slightly postfurcal. All abdominal tergites except 1st coriaceous.
- 81 ( 82). Mesonotum smooth, anterior to scutellum with rugose depression; sides of mesothorax smooth above ..... 41. **Hormius**
- 82 ( 81). Mesonotum with three sculptured longitudinal depressions; sides of mesothorax rugose above ..... 42. **Pseudohormius**
- 83 ( 74). Parallel vein not interstitial; nervulus distinctly postfurcal. Mesonotum usually without granulose sculpture. At least 1st and 2nd abdominal tergite sculptured; if coriaceous then occipital and hypostomal ridges not joined, reaching lower margin of head capsule and ovipositor valves not shorter than halflength of abdomen (Tribe Rhysipolini).
- 84 ( 87). Occipital and hypostomal ridges not joined, parallel to each other, reaching lower margin of head capsule. Second to sixth abdominal tergites always without rugose sculpture.
- 85 ( 86). Head with projecting antennal tubercles; scape of antennae with horny process (Fig. 34: 5-7), sometimes relatively weak. Occiput dorsally along ridge densely ciliate. .... 43. **Cerophanes**
- 86 ( 85). Head with slightly projecting antennal tubercles; scape of antennae without horny process ..... 44. **Rhysipolis**
- 87 ( 84). Occiput and hypostomal ridges joined above basal angle of mandible. Second abdominal tergite at least basally and sometimes even 3rd with rugose sculpture, rarely 2nd to 6th tergites smooth or coriaceous.

- 88 ( 89). Forewings in middle with large pea-shaped sclerotized area (Fig. 36: 1) ..... 45. **Neurocrassus**
- 89 ( 88). Forewing without sclerotized area in middle.
- 90 ( 91). Abdomen in apical half laterally flattened. Femora thickened. Sternauli weak, smooth. Notaulices only anteriorly distinct. Mesonotum anterior to scutellum with longitudinal furrow. Propodeum with granulose sculpture, with weak fields. Radial vein originating from middle of stigma, recurrent vein interstitial ..... 46. **Compressaria**
- 91 ( 90). Abdomen in apical half at most slightly depressed on sides but not flattened. Femora not thickened.
- 92 ( 93). Radial vein originating from middle of stigma, very prominent and strongly sclerotized. Abdomen smooth behind 1st tergite, lustrous. Recurrent vein originating from 1st radiomedial cell ..... 47. **Pachystigmus**
- 93 ( 92). Radial vein originating from middle of stigma; if sometimes behind its middle, then stigma of usual size, normally sclerotized.
- 94 ( 95). Second radiomedial cell small, triangular; radial cell reduced (Fig. 36: 5). Maxillary palps 5-segmented, labial palps 3-segmented. First to third abdominal tergites sclerotized. .... 48. **Artocella**
- 95 ( 94). Second radiomedial cell large, not triangular; radial cell longer. Maxillary palps 6-segmented, labial palps 4-segmented but 3rd segment often greatly reduced.
- 96 ( 99). Abdomen, except for rugose 1st tergite and base of 2nd tergite, smooth, rarely 3rd tergite weakly rugose. Third segment of labial palps strongly reduced (Fig. 34: 10). Second anal cross-vein developed. Propodeum sometimes with distinct fields. Stigma monochromatic.
- 97 ( 98). Second and third abdominal tergites smooth. Ovipositor valves roughly as long as abdomen. Recurrent vein merges with 2nd radiomedial cell (Fig. 34: 11). Propodeum fields distinct ..... 49. **Pseudobathystomus**
- 98 ( 97). Second abdominal tergite at least basally with rugose sculpture, rarely 2nd and 3rd tergites entirely sculptured. Ovipositor valves half or less than half as long as abdomen. Recurrent vein interstitial to 1st radiomedial vein. Fields on propodeum often indistinct ..... 50. **Oncophanes**
- 99 ( 96). First to third abdominal tergites with rugose sculpture, rarely 3rd tergite weakly rugose, almost smooth. Third

- segment of labial palp not reduced. Second anal cross-vein not developed. Propodeum densely reticulate-rugose, without fields. Stigma dark brownish, usually with basal yellow spot ..... 51. **Clinocentrus**
- 100 ( 1). Wings not developed or strongly reduced, venation markedly reduced.
- 101 (112). Second and third abdominal tergites not concealing remaining tergites. Propodeum on sides without denticles. Thorax much larger than head.
- 102 (103). Abdomen petiolate, 1st abdominal tergite long and thin, more or less parallel-sided, its length not less than twice its width. Wings not at all developed (from tribe Spathiini) ..... 1. **Spathius**
- 103 (102). Abdomen sessile, 1st tergite distinctly broadened apically, its length not more or slightly more than width at apex.
- 104 (109). Abdomen behind 1st tergite without transverse furrow.
- 105 (106). Antennal segments about 20. Wings as elongate scales with longitudinal veins (from tribe Doryctini) ..... 12. **Rhysalus**
- 106 (105). Antennal segments about 15. Wings not at all developed.
- 107 (108). Ovipositor not shorter than half length of abdomen. Abdomen smooth behind 1st tergite (from tribe Ecphyliini) ..... 2. **Ecphylius**
- 108 (107). Ovipositor short, slightly projecting beyond tip of abdomen. Abdomen beyond 1st tergite with granulose sculpture (from tribe Acrisidini) ..... 31. **Acrisis**
- 109 (104). Abdomen beyond 1st tergite with transverse furrows on 2nd or 3rd tergite. Wings reduced but venation distinct.
- 28 110 (111). Fourth abdominal tergite with transverse furrow. Propodeum basally with longitudinal ridge, bifurcate towards middle of segment (from tribe Hecabolini) ..... 4. **Heterospilus**
- 111 (110). Fourth abdominal tergite without transverse furrow. Propodeum without longitudinal fork (from tribe Hecabolini) ..... 10. **Lituania**
- 112 (101). Second and third abdominal tergites very well developed, concealing apical segments. Wings not developed or as scales (from tribe Pambolini).
- 113 (114). Thorax normally developed, much larger than head; mesonotum much longer than scutellum; propodeum on sides with spines. Occipital and hypostomal ridges joined above basal angle of mandibles. Maxillary palp

- 5–6-segmented; labial palps 4-segmented ..... 34. **Pambolus**  
 114 (113). Thorax weakly developed, slightly larger than head; mesonotum much shorter than scutellum; propodeum uniformly bulged, without spines (Fig. 28: 1). Occipital and hypostomal ridges not joined, independently reaching lower margin of head capsule. Maxillary palps 4-segmented, labial palps 3-segmented .... 32. **Eupambolus**

*Keys to Genera and Species of Subfamily Doryctinae*

1. **Spathius** Nees, 1818<sup>1</sup>—About 270 species in world fauna, about 15 in the Palearctic, 10 in the USSR.

- 1 ( 4). Wings reduced, mesothorax of same size as propodeum (Fig. 10: 1, 2).  
 2 ( 3). Ovipositor almost 1.5 times as long as abdomen. Propodeum weakly sculptured, with very weak fields, without lateral tubercles. Mesonotum with granulose sculpture; scutellum tapered, projecting as denticle. Body with sparse, short hair (Fig. 10: 2). Fig. 19: 2. Body 2–3. Parasite of beetles *Anobium fulvicorne* Sturm., *A. punctatum* Deg., *Gastrallus laevigatus* Ol., *Stegobium paniceum* L., and weevil *Pentarthrum huttoni* Woll. Center, south (Crimea); Western Europe .....  
 ..... **S. pedestris** Wesm. (*apterus* Woll.)  
 3 ( 2). Ovipositor shorter than abdomen or equal to it. Propodeum with coarse irregular rugose sculpture with distinct fields, with two pointed tubercles on sides. Mesonotum smooth, scutellum roundish, slightly projecting. Body with long, sparse hair (Fig. 10: 1). Body 2–2.3. Krasnodarsk territory (Sochi); Spain ..... **S. hirtus** Hedqv.  
 4 ( 1). Wing developed, mesonotum much larger than propodeum.  
 5 ( 6). Ovipositor as long as body. Petiole of 1st abdominal segment very long and thin, approximately equal in length to remaining part of abdomen (Fig. 11: 3). Basal third of hind tibiae pale yellow, usually separated from its darker part by black or dark brown spot. Body dark brown. Fig. 19: 1. Body 3–7. Parasite of beetles *Anobium pertinax* L., *A. punctatum* Deg.,

<sup>1</sup>Nixon, 1943. *Trans. Roy. Entomol. Soc. London*, 93, 2: 172–456; Fischer, 1966. *Ztschr. angew. Zool.*, 53, 2: 215–229; Hedqvist, 1976. *Eos*, 51: 51–63.

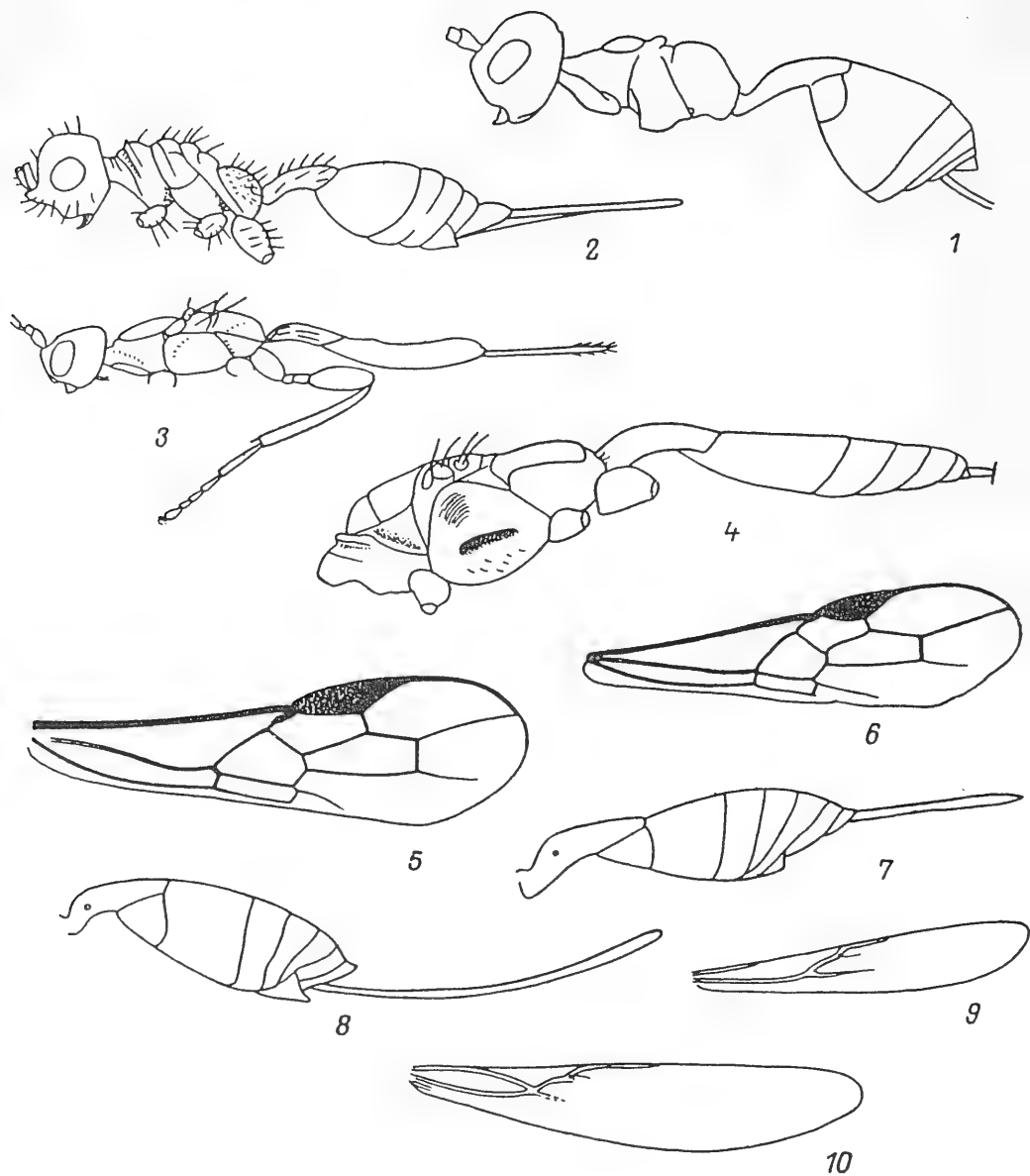


Fig. 10. Doryctinae (from Fischer, Nixon and Hedqvist).

1-4—Body: 1—*Spathius hirtus*, 2—*S. pedestris*, 3—*S. phymatodis*, 4—*S. depressus*; 5, 6—forewings: 5—*S. radzayanus*, 6—*S. rubidus*; 7, 8—abdomen: 7—*S. rubidus*, 8—*S. curvicaudis*; 9, 10—hind wings: 9—*E. caudatus*, 10—*E. silesiacus*.

*Ptilinus pectinicornis* L., *Ernobius mollis* L., *E. nigrinus* Sturm., *Xestobium rufovillosum* Deg., *Grynobius planus* F., *Ochina ptinoides* Marsh., white marked spider beetle *Ptinus fur* L., bark beetles *Hylesinus fraxini* Panz., *Pityophthorus micrographus* L., *Phloeosinus serrifer* Wichm., *Cryphalus tiliae* Panz., *Scolytus scolytus* F., *Ips cembrae* Heer, *I. typographus* L., weevils *Rhynchaenus quercus* L., *Rhyncolus culinaris* Germ., *Pentarthrum huttoni* Woll., longhorned beetles *Clytus tropicus* Panz., *Phymatodes testaceus* L., *Callidium variabile* L., often found in residential premises, parasitize furniture beetles. North, northwest, west, center, south; Caucasus, Central Asia, Buryatia, Eastern Siberia, Far East; Western Europe; northern Africa; Asia Minor; Japan; New Zealand.....  
..... **S. exarator** L. (? *strandii* Fahr.)

6 ( 5). Ovipositor not longer or slightly longer than abdomen (if equal to thorax and abdomen together, then propodeum with blunt denticles on sides). Petiolate, petiole shorter than its broader part. Hind tibiae with less contrasting colors, usually only basally pale yellow.

7 ( 8). Sides of mesothorax entirely rugose. Propodeum with blunt denticles on sides. Ovipositor as long as abdomen and thorax together, straight. Body 4, black; head, prothorax and petiole of abdomen reddish. Vertex smooth, temples with vertical wrinkles. Center.....**S. dentatus** Tel.

Lectotype: Female, ? Yaroslav district (location label not clear), "B. sl. mountains, under bark of 8-year-old birch, 9.VI.1896, collection of Kokuev".

8 ( 7). Sides of mesothorax smooth in middle. Propodeum on sides without denticles, uniformly bulged. Ovipositor short; if almost equal to abdomen and thorax together, then bent upward.

9 (12). Thorax depressed, 2.5–3 times as long as high (Fig. 10: 3, 4).

10 (11). Head and thorax depressed; propodeum uniformly rounded. Antennae 22–31-segmented. Head dorsally somewhat transversely striate. Body 2.3–3.2. Parasite of beetles *Phymatodes fasciatus* Vill. (Cerambycidae), *Agrilus viridis* L., *A. roberti* Chev. (Buprestidae). South (Voroshilovograd, Volgograd districts); Chelyabinsk, Chita districts, Buryatia, Pacific Coastal Region, Khabarovsk territory, Kunashir Island; France; Mongolia .....**S. phymatodis** Fi.

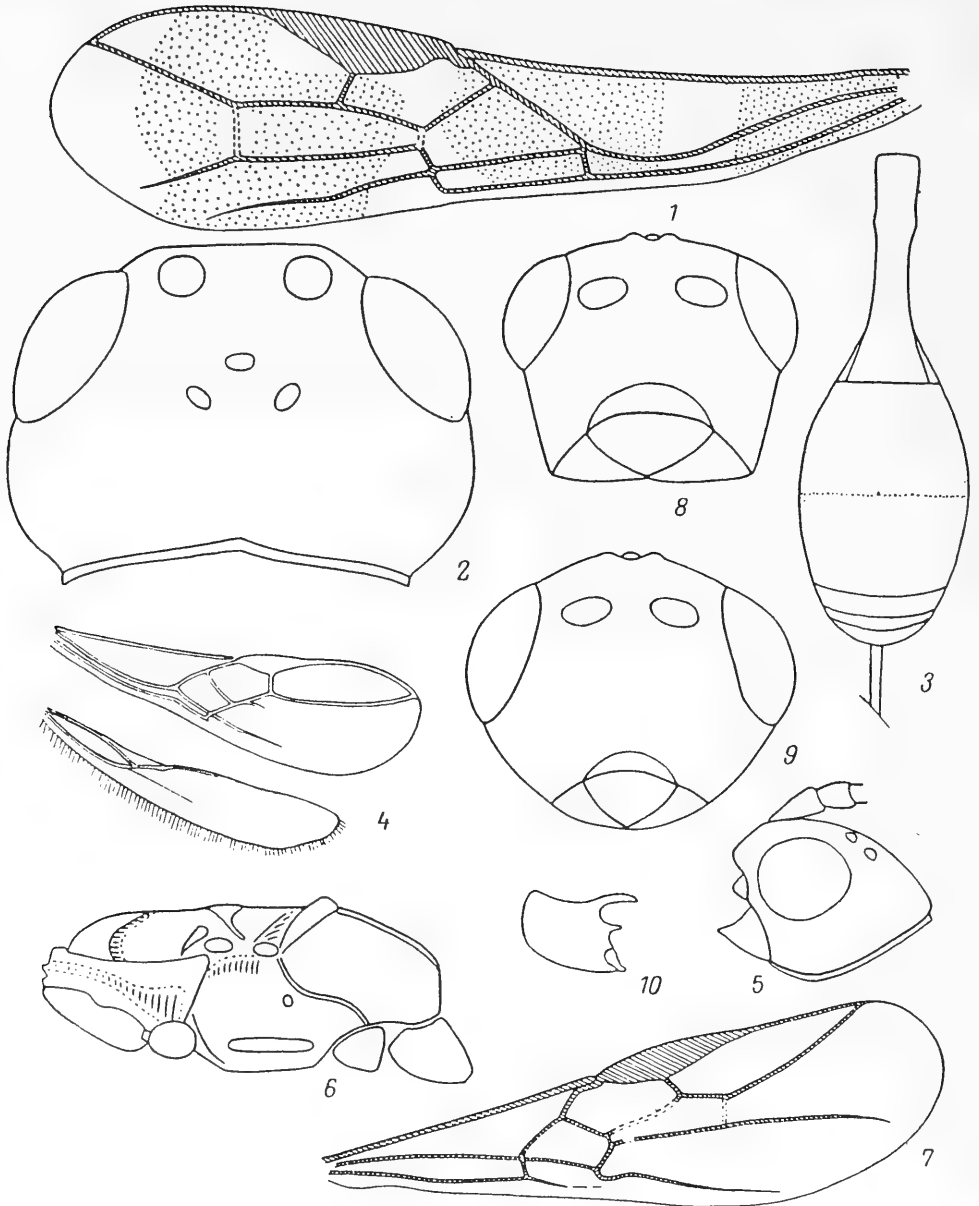


Fig. 11. Doryctinae (from Tobias and original).

1, 2—*Spathius polonicus*: 1—forewing, 2—head; 3—*S. exarator*, abdomen; 4—*Ecphylus silesiacus*, wings; 5, 6—*Heterospilus rubicola*: 5—head, 6—thorax; 7—*H. tadzhicus*, forewing; 8, 9—head: 8—*H. genalis*, 9—*H. austriacus*; 10—*Zombrus sjoestedti*, hind coxa.



- 11 (10). Body almost spherical; propodeum dorsally flat (Fig. 10: 4). Head almost smooth. Antennae 30-segmented. Body 3.5. Sweden ..... **S. depressus** Hedqv.
- 12 (9). Thorax not depressed, long, not more than 2 times as long as high.
- 13 (16). Vertex and temples transversely rugose.
- 14 (15). Ovipositor slightly longer than abdomen. Body reddish-dark brown; wings with smoky spots. Head behind eyes appreciably broadened (Fig. 11: 2). Mediocubital vein with strong bend toward anal vein (Fig. 11: 1). Body 3–4.5. Parasite of golden eyed *Melanophila decastigma* F., *Lampra mirifica* Muls., *Sphaenoptera kaznakovii* Jak., *Cratomerus* sp. Caucasus (Armenia), Tadzhikistan, Uzbekistan; Poland ..... **S. polonicus** Niez.
- 30 15 (14). Ovipositor shorter than abdomen. Head and thorax dorsally dark colored. Body 5. Parasite of *Melanophila picta* Pall. (Buprestidae). Spain ..... **S. malonophilae** Fi.
- 16 (13). Vertex and temples smooth.
- 17 (20). Ovipositor longer than abdomen, bent upward (Fig. 10: 8). Body reddish dark brown, wings usually with smoky spots.
- 18 (19). First radiomedial vein 1–5 times as long as 2nd section of radial vein (see Fig. 10: 5). Body 2–4. Parasite of longhorned beetles *Phymatodes testaceus* L., *Xylotrechus pantherinus* Sav., *Callidium aeneum* Deg., *Obrium cantharinum* L., *Clytus* sp., *Pyrrhidium sanguineum* L., *Hedobia pubescens* Ol., bark beetles *Scolytus intricatus* Ratz., *S. morawitzi* Sem., *Ips subelongatus* Motsch., goldeneye *Agrilus sulcicollis* Lac., *A. hastulifer* Ratz., *A. olivicolor* Ksw., *A. subauratus* Gebl., *A. biguttatus* F., *A. roberti* Chev., horntails *Xiphydria prolongata* Geoffr., *X. longicollis* Geoffr. Center, south (including Ciscaucasia); Transcaucasia; Western Europe; Turkey .....  
..... **S. curvicaudis** Ratz.<sup>1</sup>
- 31 19 (18). First radiomedial vein as long as 2nd section of radial vein or only slightly longer (see Fig. 10: 6). Body 3–4.5. Parasite of beetles *Rhynchaenus fagi* L., *R. pilosus* F., *R. quercus* L., *R. salicis* L., *R. testaceus* Müll., *Magdalis violacea* L., *M. frontalis* Gyll., *Pissodes notatus* F. (Curculionidae), *Dryocoetes autographus* Ratz., *Hylesinus fraxini* Panz., *Carphoborus minimus* F., *Blastophagus piniperda* L., *B. minor*

<sup>1</sup> The hosts of this and the species following may be for both due to differences among systematists in the interpretation of these species. These species *per se* are variants of a single *S. rubidus* Rossi.

- Htg., *Ips acuminatus* Gyll., *I. typographus* L., *Scolytus multistriatus* Marsh., *S. rugulosus* Ratz., *S. mali* Bechst., *S. laevis* Chap., *Pityogenes bidentatus* Hbst., *P. chalcographus* L., *Pityophthorus bidens* F., *P. micrographus* L. (Scolytidae), *Anthaxia quadripunctata* L., *Agrilus viridis* L. (Buprestidae), *Exocentrus lusitanus* L. (Cerambycidae), horntail *Xiphydria longicollis* Geoffr. (Xiphydriidae). Northwest, west, center, south; Caucasus (Sochi, Azerbaidzhan), Kazakhstan, Siberia (Novosibirsk, Irkutsk), Far East; Western Europe .....
- ..... **S. brevicaudis** Ratz. (? *erythrocephalus* Wesm.)
- 20 (17). Ovipositor usually shorter than abdomen, straight (Fig. 10: 7). Body yellowish or reddish dark brown, wings with smoky spots or without them.
- 21 (22). First radiomedial vein 1.5 times as long as 2nd section of radial vein (Fig. 10: 5). Body 3.5–4.5. Parasite of beetles *Rhinocyllus conicus* Fröl., *Pissodes obscurus* Roelofs (Curculionidae), *Rhagium inquisitor* L., *Exocentrus lusitanus* L., *Clytus* sp. (Cerambycidae), *Agrilus bipunctatus* F., *A. viridis* L., *A. auricollis* Ksw. (Buprestidae), *Blastophagus piniperda* L. (Scolytidae), clear-winged moths *Aegeria conopiformis* Esp., *A. vespiformis* L. (Sesiidae). Center, south; Caucasus (Georgia); Western Europe; Japan .....
- ..... **S. radzayanus** Ratz.
- 22 (21). First radiomedial vein as long as 2nd section of radial vein or slightly longer (Fig. 10: 6). Body 1.5–4. Parasite of beetles *Scolytus multistriatus* Marsh., *S. intricatus* Ratz., *S. pygmaeus* F., *Hylesinus fraxini* Panz., *Carphoborus minimus* F., *Taphrorhynchus* sp., *Pityogenes quadridens* Htg., *P. identatus* Hbst., *P. chalcographus* L., *P. lipperti* Hensch., *Pityophthorus bidens* F., *Crypturgus cinereus* Hbst., *Blastophagus minor* Htg., *Phloeosinus bicolor* Brullé, *Ips subelongatus* Motsch., *Phloeotribus scarabaeoides* Bern. (Scolytidae), *Rhynchaenus quercus* L., *Magdalis rufa* Germ., *M. frontalis* Gyll., *Pissodes notatus* F. (Curculionidae), *Pyrrhidium sanguineum* L., *Phymatodes alni* L., *Pogonocherus fasciculatus* Deg., *Leioptus nebulosus* L., *Rhagium* sp. (Cerambycidae), *Scobicia chevrieri* Villa, *Sinoxylon sexdentatus* Ol., *S. bipustulalus* F., *Xylonites praeustus* Germ. (Bostrychidae), *Rhizophagus* sp. (Rhizophagidae), *Ernobius longicornis* Sturm., *Ochina ptioides* Marsh., *Anobium punctatum* Deg. (Anobiidae), *Agrilus angustulus* Ill. (Buprestidae), horntails *Xiphydria dromedarius* F., *X. prolongata* Geoffr. (Xiphydriidae). West, northwest, center, south; Caucasus, Kazakhstan (Borovoe), Siberia, Far

East; Western Europe; Asia Minor; Japan; Java Islands . . .  
 ..... **S. rubidus** Rossi

2. **Ecphylylus** Förster, 1862. In world fauna 25–30 species, mostly in the Nearctic. Number of species in the Palearctic under dispute; some authors count up to 10 species (Telenga, 1936, Hedqvist, 1967, *Entomol. Tidskr.*, 88, 1–2: 66–71); others consider them variates of a single species (Russo, 1938, *Bull. Lab. Entomol. Agrar. Portici*, 2: 1–420).

1 (2). Apterous; if winged then costal vein of hind wing developed only up to half its length (Fig. 10: 9). Notaulices distinct only anteriorly. In male abdomen strongly, and abruptly narrowed at apex. Body 1.3–2. Parasite of beetles *Liparthrum colchicum* Sem., *Hypoborus ficus* Er., *Pityokteines vorontzovii* Jak., *Cryphalus piceae* Ratz. (Scolytidae), *Sinoxylon sexdentatus* Ol. (Bostrychidae). ? south; southern part of Western Europe; northern Africa; Japan . . . . . **E. caudatus** Ruschka

2 (1). Winged; costal vein of hind wing developed over its entire length (Fig. 10: 10; 11: 4). Notaulices complete, sculptured or smooth. Head smooth or vertex transversely rugose. Ovipositor as long as abdomen or almost half as long. Antennal segments 11 to 22, color dark brownish-yellow to almost black. Body 1–4, as in Fig. 21: 1. Parasite of many species of bark beetles of genera *Ips*, *Scolytus*, *Pteleobius*, *Hylesinus*, *Phloeotribus*, as well as *Pityogenes chalcographus* L., *Cryphalus piceae* Ratz., *Polygraphus subopacus* Thoms., *Pityophthorus micrographus* L. In European part throughout in forests; Caucasus, Western Siberia, Far East; Western Europe . . . . . **E. silesiacus** Ratz. (*eccoptigastri* Ratz., *hylesini* Ratz., *minutissimus* Ratz., *chaetoptelii* Gaut., ?? *carinatus* Hedqv., *pinicola* Hedqv., *beltrani* Docavo).

3. **Hecabolus** Curtis, 1834.—In this genus one palearctic species is reliably known (*Hecabolus cinctus* described by Walker from Japan belongs to the genus *Bracon*).

32 1 (1). First, 2nd and base of 3rd abdominal tergites sclerotized, most of 3rd and remaining tergites smooth. Antennae 25–26-segmented. Body 2–7. Parasite of beetles *Hylesinus fraxini* Pz., *Phloeosinus bicolor* Brullé, *P. thujae* Perr. (Scolytidae), *Ptilinus pectinicornis* L., *P. fuscus* Geoffr., *Anobium rufipes* F., *A. punctatum* Deg., *A. thomasi* Kr., *Ochina pinoides* Marsh.

(Anobiidae), *Ptinus fur* L. (Ptinidae), *Phymatodes alni* L. (Cerambycidae). Northwest, south; Caucasus, Chelyabinsk Region; Western Europe..... **H. Sulcatus** Curt.

4. **Heterospilus** Haliday, 1833.<sup>1</sup>—More than 90 species in the world fauna, about 20 in the Palearctic. Many species described from variable characters and, possibly, are synonyms of earlier described species.

- 1 ( 2). Wings strongly reduced, barely reaching tip of 1st abdominal tergite, venation reduced. Head transverse. Third to fifth abdominal tergites basally with transversely rugose pattern. Body light brown. Hind wing of male with large stigmal thickening, 2.2. Sweden; Yugoslavia ..... **H. hemipterus** Thoms.
- 2 ( 1). Wings not reduced, of usual length, sometimes slightly reduced, venation not reduced.
- 3 ( 4). Body depressed, mesonotum slightly raised above pronotum. Stigmal thickening in male large, originating from wing base to half its length, 4th to 6th abdominal tergites smooth. Body 1.9–2, as in Fig. 11: 5, 6. Krasnodarsk territory (Sochi); Yugoslavia..... **H. rubicola** Fl. (*tobiasi* Belok., syn. n.)
- 4 ( 3). Body not depressed, mesonotum strongly raised above pronotum.
- 5 ( 6). Radial cell distinctly reduced, metacarpus as long as stigma (Fig. 11: 7). Ovipositor as long as abdomen. Mesonotum with weak granulose sculpture, 3rd to 6th abdominal tergites smooth. Body 2. Tadzhikistan ..... **H. tadjicus** Belok.
- 6 ( 5). Radial cell not reduced, metacarpus longer than stigma.
- 7 (10). Second abdominal tergite sculptured only basally, remaining tergites entirely smooth.
- 8 ( 9). Head 1.5 times as wide as long, 1st flagellar segment 6 times as long as wide. Mesonotum with dense granulose sculpture. Prescutellar depression deep with 3 ridges, second section of radial vein 1.5 times as long as first. Body light brown, 1.7. Crimea; Madeira Islands. .... **H. divisus** Woll.
- 9 ( 8). Head 2 times as wide as long. First flagellar segment 4 times as long as wide. Mesonotum with weak granulose sculpture.

<sup>1</sup> Fischer, 1960. *Polsk. Pismo Entomol.*, 30, 1: 33–64; Belokobylskii, 1983. *Tr. Vsesoyuzn. Entomol. Ob-va.* 65: 168–186.

- Prescutellar depression shallow, without ridges. Second section of radial vein 3 times as long as first. Body black, abdomen more lightly colored. Body 1.6–1.8. Fig. 12: 1, 2. Austria ..... **H. minimum** Fi.<sup>2</sup>
- 10 (7). Second abdominal tergite entirely with rugose sculpture, often transverse pattern on 3rd to 5th tergites with rugose sculpture.
- 11 (12). Head below eyes rectilinearly slightly narrowed (Fig. 11: 8). Height of genae  $\frac{2}{3}$  longitudinal diameter of eye. Body weakly rugose. Stigmal thickening in hind wing of male large, originating from base of wing to half its length, 3rd abdominal tergite with slightly rugosely sculptured pattern. Head behind eyes weakly roundly narrowed. Body 2.5. Caucasus ..... **H. genalis** Tobias
- 12 (11). Head below eyes roundly narrowed. Height of genae almost  $\frac{1}{2}$  longitudinal diameter of eye.
- 13 (16). Mesonotum and vertex usually smooth, lustrous, rarely mesonotum with very slight rugose sculpture.
- 14 (15). Ovipositor almost as long as body. Length of first abdominal tergite almost 1.2 to 1.4 times its width at apex. Genae  $\frac{1}{2}$ – $\frac{2}{5}$  the longitudinal diameter of eye. Body 4.1–4.4. Fig. 12: 3, 4. Southern part of Far East; Bulgaria ..... **H. longicaudatus** Zaykov
- 15 (14). Ovipositor as long as abdomen. Stigma dark brown. Body 1.7–3.4. South; Caucasus, Buryatia, Chita Region, south of Far East, Sakhalin Island, Kunashir Island; Austria; Mongolia ..... **H. separatus** Fi.
- 16 (13). Mesonotum and vertex always with dense granulate sculpture.
- 17 (22). Ovipositor almost as long as abdomen. Brachial cell wide open.
- 18 (19). Third to fifth abdominal tergites usually with rugose sculpture in transverse depressions. Abdomen often with reddish bands on 3rd to 5th tergites. Body 1.9–3.9. West (Lithuania), south; Caucasus, southern Urals, Buryatia, Chita Region, southern part of Far East ..... **H. tauricus** Tel. (*graefferi* Fi.,? *Cephi* Rohwer) (Lectotype): female, Simferopol, May 17, 1927 (Kuznetsovs).

<sup>2</sup> Species diagnosis based on males; possibly this is another species, *H. divisus*.

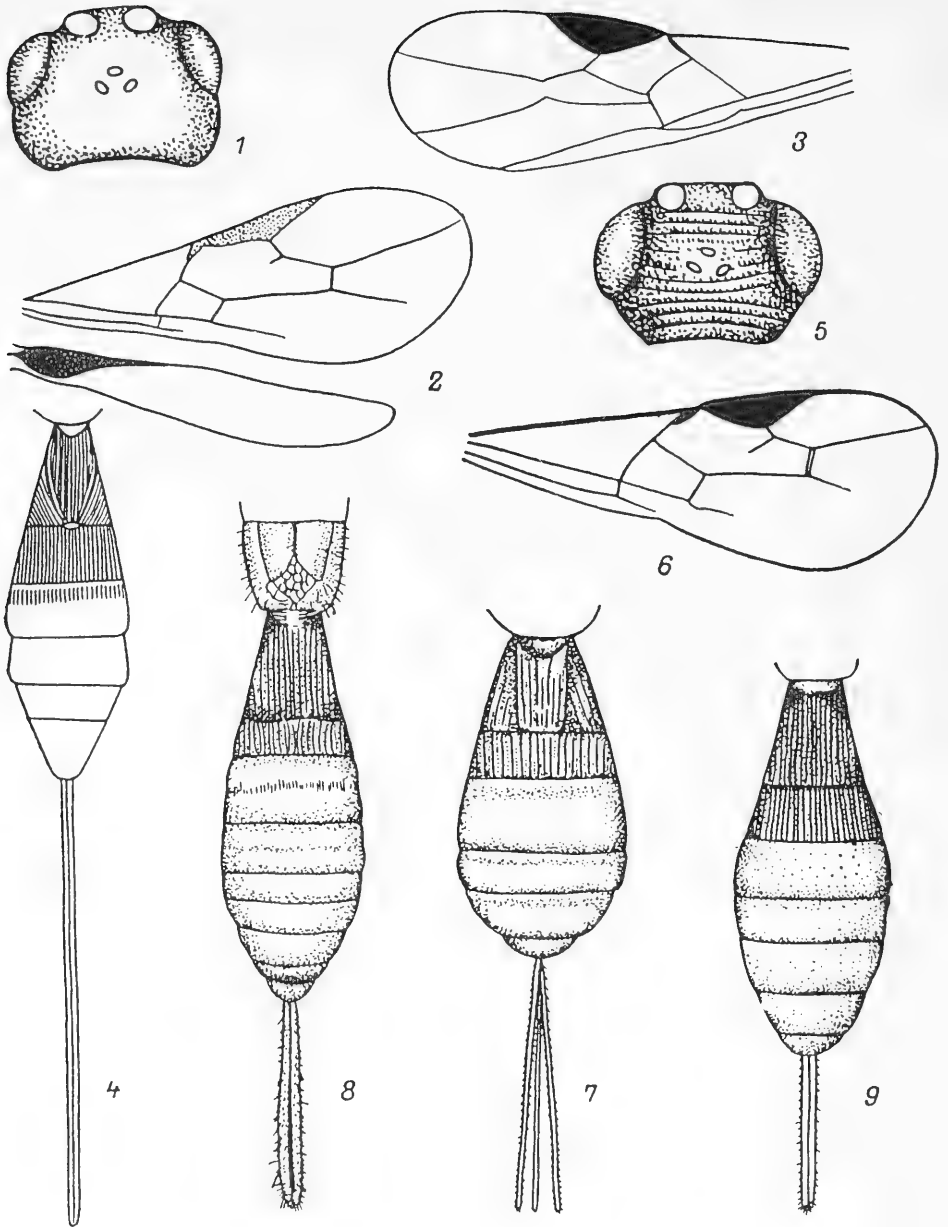


Fig. 12. Doryctinae (from Fischer and Zaykov).

1, 2—*Heterospilus minimus*: 1—head, 2—wings; 3, 4—*H. longicaudatus*: 3—forewing, 4—abdomen; 5–7—*H. Corsicus*: 5—head, 6—forewing, 7—abdomen; 8—*H. leptosoma*, abdomen with propodeum; 9—*H. ater*, abdomen.

- 19 (18). Only 3rd abdominal tergite entirely smooth. Abdomen without reddish bands.
- 20 (21). Anterolateral corners of middle lobe of mesonotum slightly pointed. Antennae slightly thickened; 1st flagellar segment 5 times as long as wide, 1.2 times as long as 2nd segment. Fields on propodeum distinct, median ridge bifurcate in basal third of segment. Second abdominal tergite entirely coarsely rugose sculptured. Body compact, thorax almost 2 times as long as high. Forewings slightly reduced. Body 2–3.2. Fig. 12: 5–7. South; Pacific Coastal Region; Hungary; Rumania; Italy....  
 ..... **H. corsicus** (*H. cingulatus* Szépl., syn. n.)
- 33 21 (20). Anterolateral angles of middle lobe of mesonotum distinctly pointed. Antennae thin; first flagellar segment 7 times as long as wide, equal to second. Fields on propodeum not distinct, median ridge slightly bifurcate in the basal fourth of segment. Wrinkles of 2nd abdominal tergite very smooth apically. Body stout, thorax 1.5 times longer than high. Forewings not reduced. Body 2.6. Italy, Sicily ..... **H. sicanus** Marsh.
- 34 22 (17). Ovipositor not longer than halflength of abdomen.
- 23 (24). Third to fifth abdominal tergites usually entirely yellow; stigma yellow. Fig. 21: 2. Body 2–4.1. South; Caucasus, Central Asia, Kazakhstan, Pacific Coastal Region, Kunashir Island; Austria; Mongolia.....  
 ..... **H. testaceus** Tel. (*H. rubicundus* Fi.)  
 Lectotype: female, "Paraboch forest farm, Kizl. district—Tersk, July 16, 1927 (Kirpichenko)". Paralectotypes: 2 females, "Bairam-Ali, June 9, 1932 (Boguşh)".
- 24 (23). Third to fifth abdominal tergites smooth, only third tergite often with rugose transverse depression. Body black or reddish dark brown.
- 25 (26). Width of 2nd abdominal tergite at apex twice its length; width of 1st abdominal tergite at apex almost equal to its length (Fig. 12: 8). Body well proportioned, mesonotum gently inclined to pronotum, 1.7–2.9. Moldavia, Caucasus, Kazakhstan, Yakutia, Pacific Coastal Region; Austria; Mongolia ..... **H. leptosoma** Fi.
- 26 (25). Width of 2nd abdominal tergite at apex more than its length; width of 1st abdominal tergite at apex about 1.2 times its length. Body stout, mesonotum usually abruptly sloping to pronotum.

- 27 (28). Third abdominal tergite smooth, only rarely with weakly sculptured depression (Fig. 12: 9). Body often reddish dark brown, head darker, 1.4–2.6. Parasite of *Xylocleptes bispinus* Duft. (Scolytidae). Southwest; Pacific Coastal Region; Austria ..... **H. ater** Fi.
- 28 (27). Third abdominal tergite basally almost always with rugosely sculptured depression. Body always black, sometimes abdomen lighter colored, 1.7–3.5. Fig. 11: 9. Parasite of beetles *Pissodes notatus* F., *Xylocleptes bispinus* Duft., *Phloeosinus thujae* Perr., *Phymatodes maaki* Kr. Center, southwest, south; Caucasus, Kazakhstan, Chelyabinsk Region, Buryatia, Pacific Coastal Region, Kunashir Islands; Western Europe .....  
..... **H. austriacus** Szépl. (*incompletus* auct.)

5. **Polystenus** Förster, 1862 (*Eucorystoides* Ashm., *Eucorystes* Marsh.).—Four species; one in the Palearctic.

- 1 (1). Antennae 25–40-segmented. Body dark brown; 2nd and 3rd abdominal tergites with yellowish Y-shaped pattern. Fig. 9; 13: 1–3. Body 3–8. Parasite of *Agrilus viridis* L. (Buprestidae). Center, south; Caucasus, Central Asia (Tadzhikistan), Pacific Coastal Region and Khabarovsk District; Central Europe ...  
..... **P. rugosus** Först (*aciculatus* Reinh.)

6. **Pareucorystes** Tobias, 1961.—Two species.

- 1 (2). Recurrent vein originating from 1st radiomedial cell. Sternauli and notaulices not developed. Radial cell reaching wing apex. Antennae 20-segmented. Body black; head with dark brown pattern, legs dark brownish yellow. Body 3. Parasite of *Tetrops pravesta* L. (Cerambycidae). France ..... **P. depressus** Fi.<sup>1</sup>
- 2 (1). Recurrent vein interstitial or slightly postfurcal (Fig. 13: 4, 5). Sternauli developed, notaulices distinct. Antennae of female 25–27-segmented, of males 21–25-segmented. Body black, legs except hind coxae yellowish dark brown; 2nd abdominal tergite often with yellowish arcuate pattern. Body 3–4.5. Parasite of *Agrilus viridis* L. (Buprestidae). South (Voroshilovgrad Region); Azerbaidzhan (Lenkoran'), Pacific Coastal Region.....  
..... **P. varinervis** Tobias

<sup>1</sup> According to Papp (1984), *Folia entomol. hung.*, 65, 1: 173–185, a synonym of *P. varinervis* Tobias.



7. *Hecabolodes* Wilkinson, 1929.—Five species from Africa, Middle East and Central Asia; in the fauna of the USSR 2 Central Asian species: *H. radialis* Tobias (Fig. 13: 6) and *H. tadzhicus* Tobias.

8. *Doryctosoma* Picard, 1938 (*Euhecabolodes* Tobias, 1962 syn. n.)<sup>1</sup>—Seven species, of which 6 known in the fauna of the USSR.

- 1 (2). Second abdominal tergite with raised, coarse non-uniform rugose, almost square field separated by deep, steeply arcuate furrow. Second tergite laterally and posterior to middle field and 3rd tergite except apex longitudinally rugose, 4th tergite punctate. Antennae about 35-segmented. Body black; head, abdomen except 1st tergite and middle field of 2nd tergite and legs yellowish dark brown; spot in middle of 2nd tergite and arcuate pattern on margins of middle field yellow. Body 5–6. ? South; Hungary ..... *D. hungaricum* Szépl.<sup>2</sup>, comb. n.
- 35 2 (1). Second abdominal tergite without raised coarse rugose field, entirely longitudinally rugose. Antennae at best about 25-segmented. Body dark brown or yellowish.
- 3 (4). Vertex with dense granulose sculpture, without wrinkles. Second abdominal tergite with slightly bent suture, in male suture straight. Ovipositor valves half as long as abdomen. Head 1.7 times as broad as long, temples 2 times as long as transverse diameter of eye; longitudinal diameter of eye 3 times height of genae. Antennae 23-segmented, 1st flagellar segment 5 times longer than wide, slightly longer than 2nd segment. First section of radiomedial vein 1/5–1/6 of 2nd segment, 1st abdominal vein 1.3 to 1.4 times as long as second segment. Width of 1st abdominal tergite at apex 1.2 times its length. Body dark reddish dark brown, flagellum, ovipositor valves and stigma black. Vertex and temples, scutellum and sides of mesothorax, hind femora and tibiae, 4th and 5th abdominal tergites with dense granulose sculpture; propodeum with weak, long median ridge, irregularly rugose; 1st to 3rd abdominal tergites with rugose sculpture. Stigmal thickening in hind wing of male less than
- 36

<sup>1</sup> Tobias. 1980. *Nasekomye Mongolii* (Insects of Mongolia) 7: 280–295.

<sup>2</sup> It was suggested (Tobias. 1971. *Tr. Vsesoyuzn. Entomol. Ob-va.* 54: 199) that this species described under genus *Hecabolus* is a synonym of *H. sulcatus* Curt. However, characters present in the specimen in the collections of ZIN AN SSSR (female, label: “pl. 2, der 301, 25 Aug. 1935”) corresponding to the lectotype (Papp, 1984. *Folia entomol. hung.*, 65, 1: 173–185) forces us to include it under the genus *Doryctosoma*.

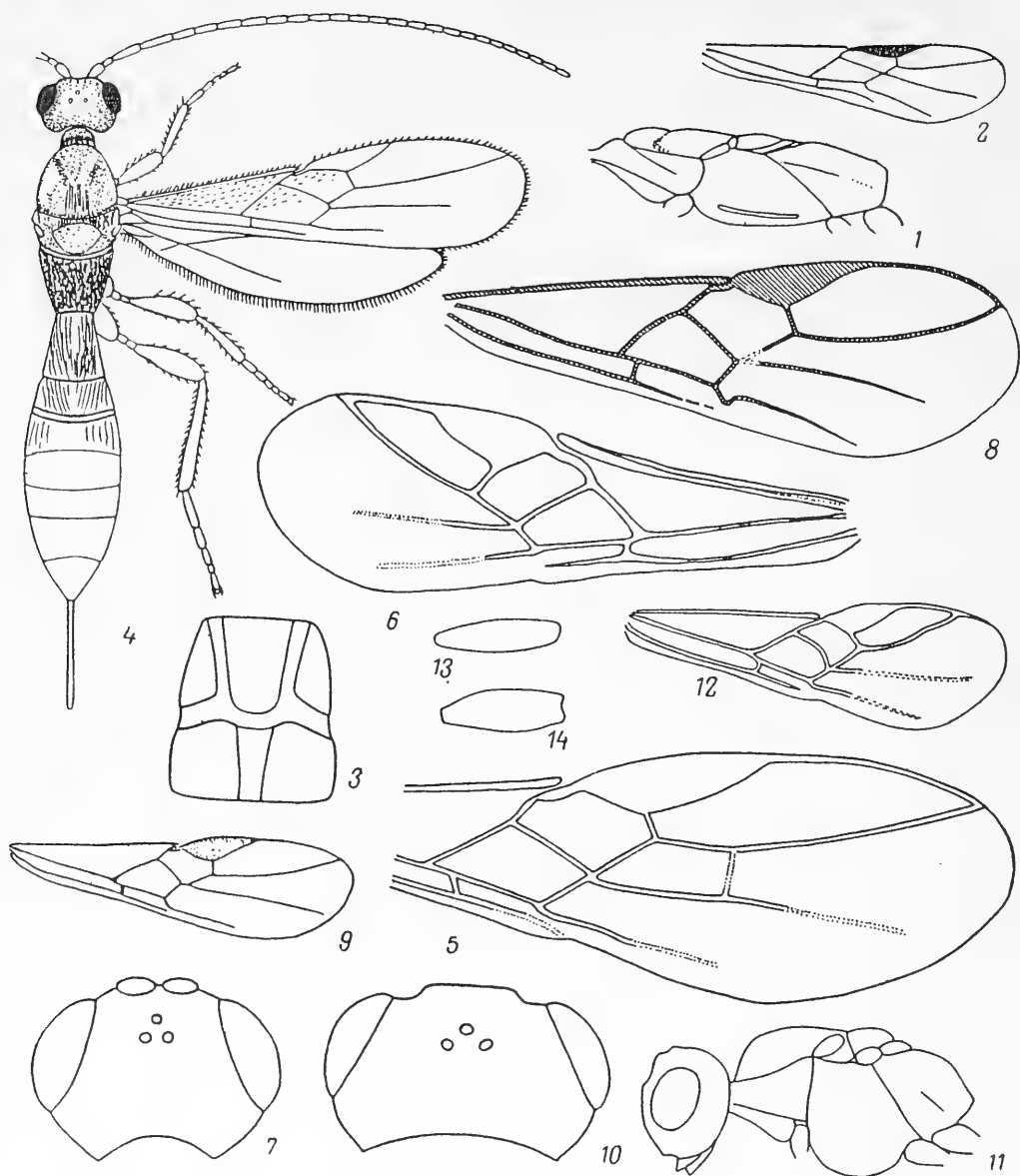


Fig. 13. Doryctinae (from Tobias and original).

1—3—*Polystenus rugosus*: 1—thorax, 2—forewing, 3—2nd—3rd abdominal tergites; 4, 5—*Pareucorystes varinervis*: 4—general appearance, 5—forewing (variation), 6—*Hecabolodes radialis*, forewing; 7, 8—*H. tadzhicus*: 7—head, 8—forewing; 9—*Doryctosoma acceptum* sp. n., forewing; 10, 11—*D. reguloscolyti*: 10—head, dorsal view, 11—head and thorax, lateral view; 12—*D. asiaticum*, forewing; 13, 14—hind femora: 13—*Onisira imperator*, 14—*Wachsmannia spathiformis*.

its length, divergent from wing base—Figs. 13: 9; 14: 1, 2. Body 4.2–5.4. Caucasus; Israel . . . **D. acceptum** Belokobylskij, sp. n.

Holotype: Female—Georgia, Adigeni, glades, forest belt, 10 Sept. 1982. (Kasparyan). Paratypes: Israel, Jaffa, Abu-Sabir, apple orchard, 9–10 May 1966 (Tryapitsyn), 1 female, 4 males.

- 4 (3). Vertex always with wrinkles, granulose sculpture between them. Suture on 2nd abdominal tergite strongly bent (Fig. 14: 3). Ovipositor valves usually  $2/3$  as long as abdomen or slightly shorter than abdomen.
- 5 (8). Radial vein of forewing not reduced, terminating near wing apex.
- 37 6 (7). First section of radial vein of forewing  $2/3$  as long as radiomedial vein. Palps yellowish dark brown. Body dark colored. Fig. 14: 3. Body 2–3. Parasite of *Phloeosinus bicolor* Brullé (Scolytidae). Transcaucasus . . . . .  
 . . . . . **D. transcausicum** Tobias, comb. n.
- 7 (6). First section of radial vein of forewing half or less than half as long as radiomedial vein. Palps somewhat darkened. Body yellowish or reddish dark brown. Fig. 13: 12. Body 2.5–3.7. Parasite of *Scolytus schevyrevi* Sem. (Scolytidae). Kazakhstan; Moldavia . . . . . **D. asiaticum** Tobias, comb. n.
- 8 (5). Radial cell of forewing reduced, terminating far below wing apex (Fig. 14: 4). First section of radial vein  $1/4$ – $1/5$  as long as 2nd section and  $2/3$  as long as radiomedial vein. Body yellowish dark brown. Fig. 13: 10, 11. Body 2–2.5. Parasite of *Scolytus rugulosus* Ratz. (Scolytidae). Central Asia; Iran . . . . .  
 . . . . . **D. ruguloscolyti** Fi., comb. n. (*minuta* Tobias, syn. n.).

9. *Monolexis* Förster, 1862.—Five to six species in the world fauna, 2 to 3 in the Palearctic.

- 1 (2). First abdominal tergite slightly longer than its width at apex (Fig. 14: 5). Only 1st and 2nd abdominal tergites, except for their apices, longitudinally rugose. Radial cell of forewing not reduced. First flagellar segment shorter than 2nd segment. Body color variable, from dark brownish yellow to dark brown; legs light colored. Body 1.5–4. Parasite of beetles *Lyctus* spp. (Lyctidae), *Laemophloeus capensis* Waltl. (Curculionidae), *Schistoceros bimaculatus* Ol., *Scobicia postulata* F., *Sinoxylon sexdentatus* Ol. (Bostrychidae), *Mesosa curculionoides* L. (Cerambycidae). Caucasus; Western Europe,

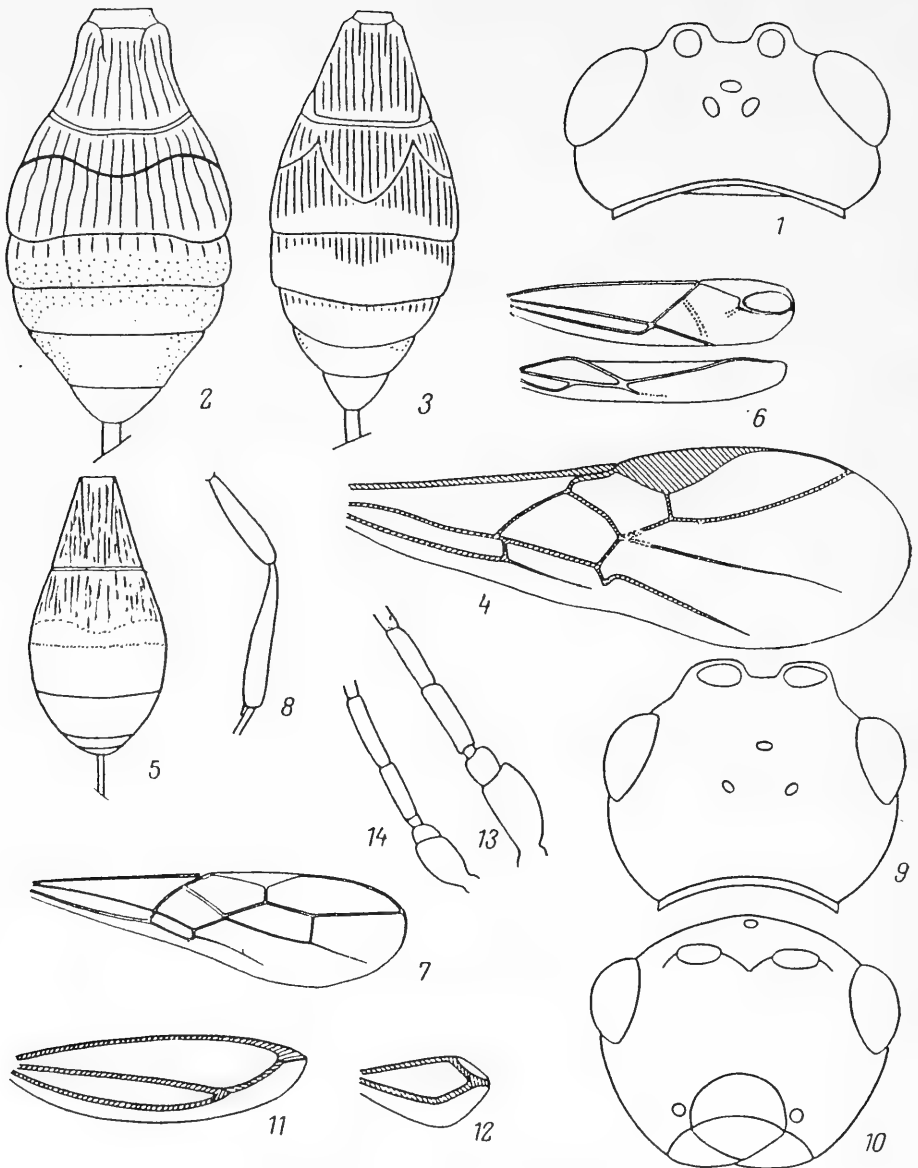


Fig. 14. Doryctinae (from Tobias and original).

1, 2—*Doryctosoma acceptum* sp. n.: 1—head, 2—abdomen; 3—*D. transcaasicum*, abdomen; 4—*D. ruguloscolyti*, forewing; 5—*Monolexis fuscicornis*, abdomen; 6. *Lituania brachyptera*, wings; 7, 8—*Rhyssalus clavator*: 7—forewing, 8—hind leg; 9—12—*R. longicaudis*: 9—head, dorsal view, 10—head, front view, 11—forewing, 12—hind wing; 13, 14—antennal base: 13—*Ontsira imperator*, 14—*Dendrosoter protuberans*.

- North and South America, Hawaiian Islands .....  
 .....**M. fuscicornis** Först (*lavagnei* Picard, *doderoi* Mantero)  
 2 (1). First abdominal tergite longer than its width at apex. First and  
 2nd and base of 3rd abdominal tergites longitudinally rugose,  
 others smooth. Radial cell of forewing reduced. Body black.  
 Orbits of eyes, prothorax and abdomen light colored. Body 4.5.  
 Central Europe ..... **M. foersteri** Marsh.

10. **Lituania** Jakimavičius, 1968<sup>1</sup>.—One Species.

- 1 (1). Wings greatly reduced with reduced venation (Fig. 14: 6). An-  
 tennae 22–23-segmented. Thorax with granulose sculpture;  
 head dorsally smooth. First, 2nd and base of 3rd abdominal  
 segments longitudinally rugose, other tergites smooth. Ovipositor  
 as long as abdomen. Body black; legs yellowish dark brown.  
 Body 2.3. Lithuania .....**L. brachyptera** Jakim.

11. **Rhoptrocentrus** Marshall, 1896.—One species.

- 1 (1). Height of genae  $2/3-1/2$  longitudinal diameter of eye. Vertex  
 delicately transversely striate, lustrous; face, thorax, 1st and  
 base of 2nd abdominal tergites with dense granulose punctures,  
 with longitudinal wrinkles. Body black; coxae dark brownish  
 yellow, femora dark brown to black. Body 3–4.2. Parasite  
 of beetles *Phloeotribus scarabaeoides* Bern., *Hylotrupes bajulus*  
 L., horntail *Xiphydria camelus* L., butterflies *Eupoecilia am-  
 biguella* Hb. Center, south; northern Kazakhstan, Central Asia  
 (Turkmenia); Western Europe; North America .....  
 .....**R. piceus** Marsh. (*syrmienensis* Szépl.)

12. **Ryssalus** Haliday, 1833. (*Eurhoptrocentrus* Tobias syn. n.).  
 —Seven to eight species in the world fauna, 3 in the Palearctic.

- 1 (2). Head transverse, behind eyes strongly roundly narrowed; eyes  
 large, temples appreciably shorter than transverse diameter of  
 eye. Antennae of female not thickened, dark brown stigma nar-  
 row (approximately 4 times as long as wide), dark brown or  
 yellowish; 2nd section of radial vein 2.5–3 times as long as  
 1st section. Body black or dark brown, basal half of abdomen  
 lighter than upper half; legs dark brownish yellowish, tibiae of

<sup>1</sup>One of the authors (Belokobyl'skii. 1983. *Tr. Vsesoyuzn. Entomol. Ob-va*,  
 65: 168–186) has included this genus in the synonymy of genus *Heterospilus*.

male dark. Antennae 24–28-segmented, Figs. 14: 7, 8; 15: 1. Body 2–4. Center, south; Caucasus; Western Europe .....

..... **R. clavator** Hal.

- 2 (1). Head almost cubical, weakly narrowed behind eyes, eyes small, temples appreciably longer than transverse diameter of eye. Antennae of female thickened. Vertex and temples with weak granulose sculpture. Ovipositor as long as thorax and abdomen together. In female wings strongly reduced. Fig. 14: 9–12. Body 1.9–2.3. Northwest; Sverdlovsk Region, Pacific Coastal Region; Finland ..... **R. longicaudis** Tobias and Belok., comb. n.

13. **Gildoria** Hedqvist, 1974.—One species (*G. elegans* Hedqv.) from Canary Islands (Fig. 15: 4).

14. **Ipodoryctes** Granger, 1949. One species (*I. nadezhdae* Tobias and Belok.) in the Palearctic from the southern part of the Far East • USSR.

15. **Dendrosotinus** Telenga, 1941.<sup>1</sup>—Five species in the Palearctic.

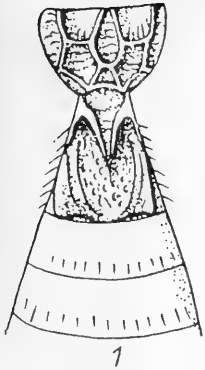
- 1 (2). First radiomedial vein entirely absent (Fig. 16: 1). Second abdominal tergite with rugose sculpture only basally. Vertex and temples with dense granulose sculpture. Ovipositor shorter than abdomen. Parasite of *Pityogenes bidentatus* Hbst. (Scolytidae), *Tetrops pravesta* L., *Pogonocherus fasciculatus* Deg. (Cerambycidae). Body 1.8–2.8. Southeast; Novosibirsk Region; France ..... **D. [Caenophanes (Astigmatandrus** Belok., syn. n.)] **incompletus** Ratz. (*tetropis* Fi.).
- 2 (1). First radiomedial vein well developed; if sometimes somewhat desclerotized then vertex without granulose sculpture (Subgenus *Dendrosotinus* s. str.).
- 3 (6). First abdominal tergite entirely and 2nd only basally with rugose sculpture.

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Fig. 15. Doryctinae (from Achterberg, Zaykov and Fischer).

1—*Rhyssalus clavator*, 1st–3rd abdominal tergites with propodeum; 2, 3—*Dolopsidea indagator*: 2—forewing, 3—1st and 2nd tergites; 4—*Gildoria elegans*, general appearance; 5–7—*Dendrosotier protuberans*: 5—head, dorsal view, 6—head, frontal view, 7—wings; 8, 9—*Hypodoryctes sibiricus*: 8—general appearance, 9—1st–3rd abdominal tergites with propodeum.

<sup>1</sup> Belokobyl'skii 1983. Tr. Vsesoyuzn. Entomol. Ob-va, 65: 168–186.



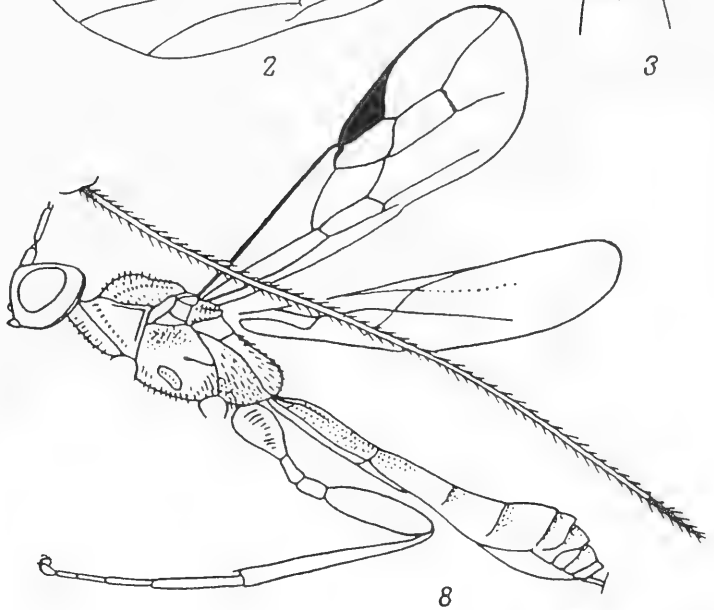
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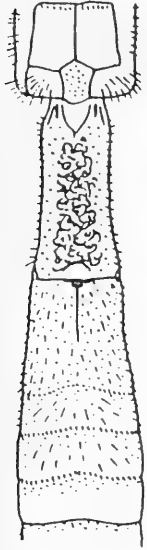
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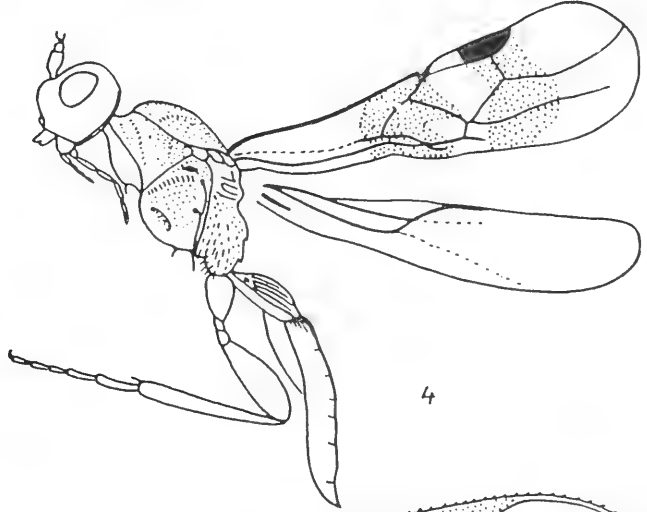
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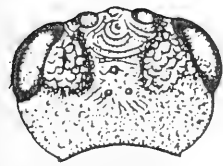
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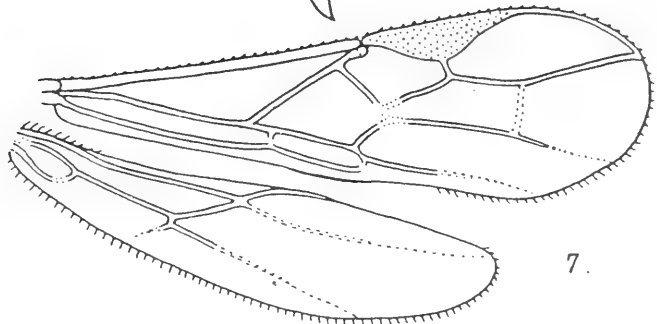
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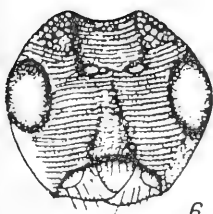
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6

- 4 (5). Vertex smooth or with weakly rugose sculpture, temples smooth. Median ridge on propodeum long,  $1/3$  as long as propodeum. Mesonotum high and sharply raised above pronotum. Ocelli in equilateral triangle. Body light brown, head dark brown. Ovipositor  $2/3$  as long as abdomen. Parasite of *Pityophthorus polonicus* Karp., *Cryphalus piceae* Ratz., *C. abietis* Ratz. (Scolytidae). Body 1.5–1.8. Caucasus; Poland .....  
 ..... **D. (D.) similis** Bouček.
- 5 (4). Vertex and temples with dense granulose sculpture. Median ridge on propodeum indistinct, very short. Mesonotum slightly and gently raised above pronotum. Base of ocellar triangle 1.5 times as long as sides. Body dark brown. Parasite of *Anthaxia conradti* Sem. (Buprestidae). Body 3.3. Central Asia .....  
 ..... **D. (D.) anthaxiae** Belok.
- 6 (3). First and 2nd abdominal tergites entirely and 3rd in its basal half with rugose sculpture. Ocellar triangular with its base 1.5 times as long as sides. Vertex and temples with very dense granulose sculpture. Stigma black, basally and apically yellow. Postgenal bridge broad. Parasite of *Sinoxylon sexdentatus* Ol., *Scobicia chevrieri* Vill. (Bostrychidae), *Phloeotribus scarabaeoides* Bern., *Chaetoptelius vestitus* Muls. and Rey (Scolytidae). Fig. 20: 1. Body 2.4–3.2. Caucasus; France, Italy .....  
 ..... **D. (D.) ferrugineus** Marsh.

16. **Dendrosoter** Wesmael, 1838.—About 25 species in the world fauna, 7 in the Palearctic, some were possibly only variants of species reported below.

- 1 (8). Ovipositor shorter than body.
- 2 (7). Stigma dark brown, basally with light spot; head and abdomen dark brown.
- 3 (4). Height of genae half of longitudinal diameter of eye (Fig. 15: 6). Recurrent vein originating from near 1st radiomedial vein. Second segment of maxillary palp of male enlarged and its hind wing with very small stigma. Ovipositor 1.5–2 times as long as abdomen. Radial and medial veins of forewing of male usually thickened. Second abdominal tergite basally with semioval rugose field. Body black or brown; often head and pattern on abdomen yellowish dark brown; legs yellowish dark brown. Figs. 14: 14; 15: 5–7; 16: 3, 5. Body 2.5–5. Parasite of bark beetles *Scolytus scolytus* F., *S. intricatus* Ratz., *S. carpini* Ratz., *S. aceris* Knot., *S. rugulosus* Ratz., *S. amygdali* Guer.,



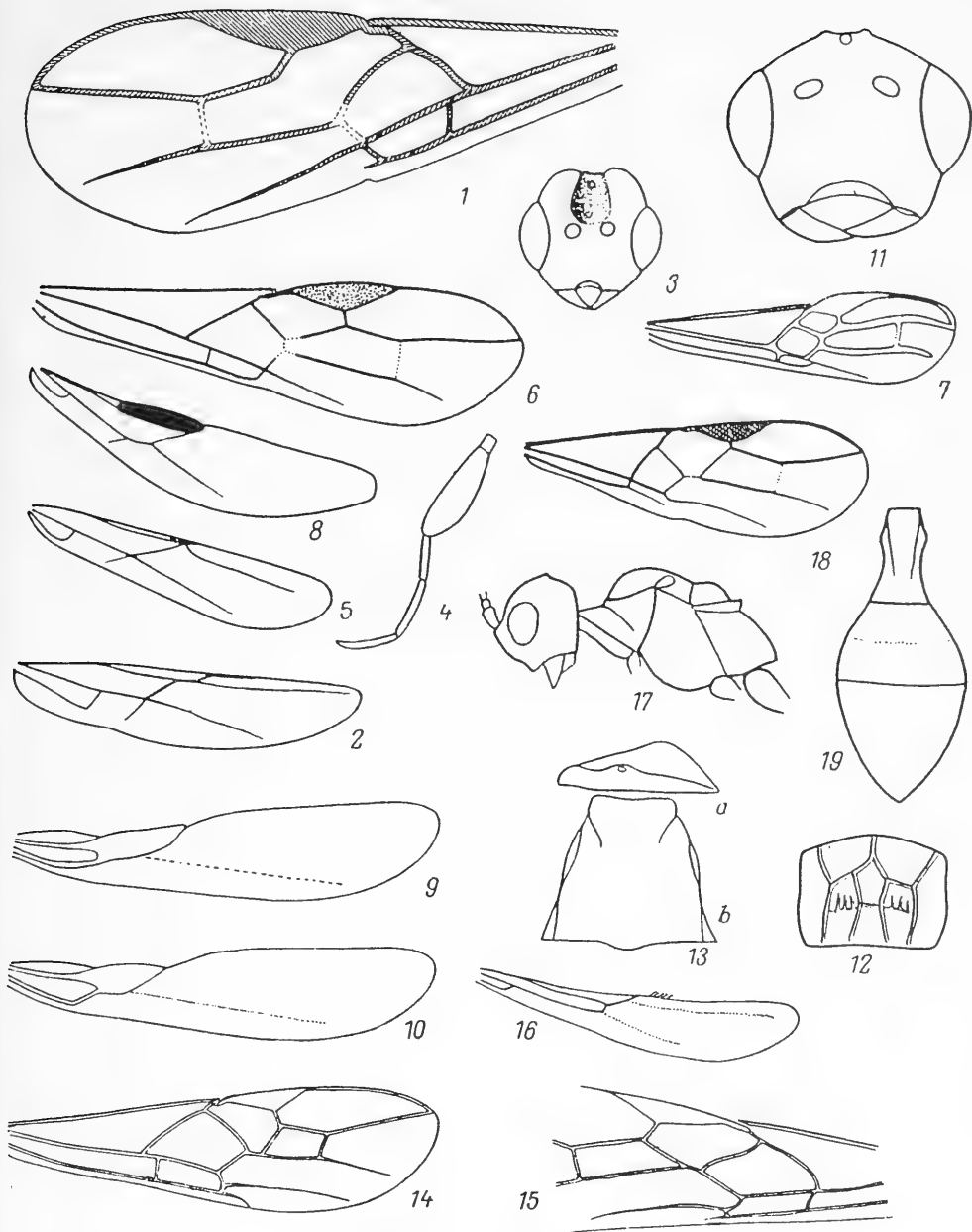


Fig. 16. Doryctinae (from Tobias and original).

1—*Dendrosotinus incompletus*, forewing; 2—*Doryctes multillator*, hind wing; 3—5—*Dendrosoter pronuberans*: 3—head, front view, 4—maxillary palp, male, 5—hind wing; 6—*D. middendorffi*, forewing; 7—*D. hartigi*, forewing; 8—10—hind wings of male: 8—*D. middendorffi*, 9—*Hecabolodes radialis*, 10—*Doryctosoma ruguloscoliti*; 11—*Dolopsidea indagator*, head; 12—*D. tatjanae*, propodeum; 13—*Onisira flavicoxa* sp. n., 1st abdominal tergite (a—lateral view, b—dorsal view); 14—*O. imperator*, forewing; 15—*Wachsmannia spathiiiformis*, part of forewing; 16—*Rhacononus* s. *varinervis*, hind wing; 17—19—*Spathiomorpha varinervis*: 17—head and thorax, 18—forewing, 19—abdomen.

*S. ratzeburgi* Jans., *S. koenigi* Schev., *S. multistriatus* Marsh., *S. pygmaeus* F., *Pityogenes quadridens* Htg., *P. bidentatus* Hbst., *Hylesinus fraxini* Panz., *H. oleiperda* F., *H. crenatus* F., *Phloeosinus bicolor* Brullé, *Blastophagus piniperda* L., *B. minor* Htg., *Phloeotribus scarabaeoides* Bern., *Dryocoetes minor* Eg., *Ips sexdentatus* Börn., *I. typographus* L., *Orthotomicus suturalis* Gyll., and also longhorned beetles *Callidium variable* L., *Phymatodes testaceus* L., *Stromatium fulvum* Vill., *Stromatina unicolor* Ol., *Pyrrhidium sanguineum* L. Northwest, center, south; Caucasus, Central Asia, Western Europe; Turkey; North America. ....

- ..... **D. protuberans** Nees (*insignis* Först.)
- 4 (3). Height of genae only slightly less than longitudinal diameter of eye or equal to it. Recurrent vein originating at considerable distance, often equal to length of this vein, from 1st radiomedial vein (Fig. 16: 6). Second segment of maxillary palp of male not enlarged; its hind wing with large stigma (Fig. 16: 8). Ovipositor as long as abdomen, slightly larger or shorter than it.
- 5 (6). Radial vein originating from middle of stigma. Second abdominal tergite basally usually sculptured. Radial and medial veins of forewing of male not thickened. Body 2.5–7. Parasite of many species of bark beetles of genera *Ips*, *Pityophthorus*, *Pityogenes*, *Blastophagus*, *Scolytus* as well as of *Hylurgops palliatus* Gyll., *Dendroctonus micans* Klug, *Pityokteines vorontzovi* Jak., *P. curvidens* Germ., *Orthotomicus laricis* F., *O. erosus* Woll., *Polygraphus poligraphus* L., *P. grandiclava* Thoms., *Hylesinus fraxini* Panz., *Trypodendron lineatum* Ol., *Cryphalus piceae* Ratz., also infests weevils *Pissodes notatus* F., *Magdalis memnonia* Gyll. North, northwest, west, center, east, south (Crimea); Georgia, Urals, Eastern Siberia, Pacific Coastal Region; Western Europe; Turkey; Iran. .... **D. middendorffi** Ratz.
- 6 (5). Radial vein originating from basal third of stigma. Second abdominal tergite smooth. Radial and medial veins of forewing of male greatly thickened (Fig. 16: 7)—Fig. 20: 2. Body 1.2–3.2. Parasite of many species of bark beetles of genera *Pityogenes* as well as *Ips acuminatus* Gyll., *Blastophagus minor* Htg., *Carphoborus minimus* F., *Pityophthorus lichtensteini* Ratz., *Scolytus mali* Bechst., *Crypturgus cinereus* Hbst., *Ernoporus caucasicus* Lind., *Orthotomicus proximus* Eichh., *O. suturalis* Gyll. and *Hypophloeus linearis* F. Northwest, west, center, south; Caucasus, Western Siberia; Western Europe. .... **D. hartigi** Ratz.

- 7 (2). Stigma pale yellow; head and abdomen yellow; thorax yellowish dark brown. Ovipositor shorter than abdomen. Body 2. Central Europe. .... **D. flaviventris** Först.
- 40 8 (1). Ovipositor slightly longer than body. Body dark brown, mesonotum and scutellum reddish, wings with smoky spots. Antennae about 30-segmented. Maxillary palps of male without enlarged segment, stigma on its hind wing equal to quarter length of wing. Body 3–4. Parasite of bark beetles *Scolytus scolytus* F., *S. intricatus* Ratz., *Hylesinus crenatus* F., *H. fraxini* Panz. and longhorned beetle *Phymatodes alni* L. Western Europe. .... **D. curtisii** Ratz.

17. **Allorhogas** Gahan, 1912. Two species in the Palearctic; one from the Far East (*A. hasanicus* Belok.), another from Iraq (*A. semitemporalis* Fi.).

- 41 18. **Spathiomorpha** Tobias, 1976.—Two species, one (*S. longipalpis* Belok.) from southern part of the Far East USSR.

1 (1). Ovipositor as long as abdomen. Propodeum with weak fields, on both sides with small denticle. Sternauli weakly sculptured. Abdomen, except sculptured 1st tergite, smooth. Body dark brown, legs yellowish dark brown. Second radiomedial vein sometimes not developed. Fig. 16: 17–19. Body 1.5–2.8. South (Crimea); Krasnodar District (Sochi), Azerbaidzhan, Georgia. ....  
..... **S. varinervis** Tobias

19. **Hypodoryctes** Kokujev, 1900.—Two species; one *H. bilobus* Shest. reported in the Far East and Eastern Siberia.

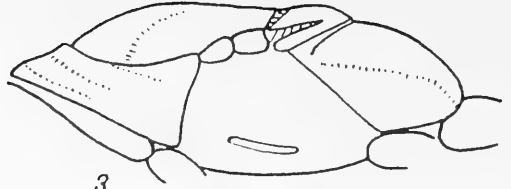
1 (1). Antennae 50–70-segmented, slender, longer than body. Body black, legs dark brown, wings weakly darkened. Fig. 15: 8, 9. Body 3.5–10. Northwest; Caucasus, Western Siberia, Far East; Finland; Japan. .... **H. sibiricus** Kok.

20. **Wachsmannia** Szépligeti, 1900.—One species.

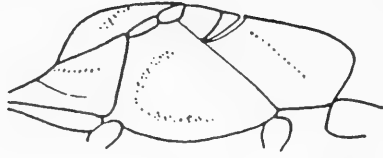
1 (1). Third abdominal tergite in basal third or entirely with granulo-seulpture, also with longitudinal wrinkles (in males entirely smooth). First tergite 1.3 to 1.5 times as long as its width at apex. Body dark brown or black with diffused reddish or yellowish pattern; legs yellowish dark brown with non-contrasting darkening or coxae, femora and tibiae, costal vein dark brown.



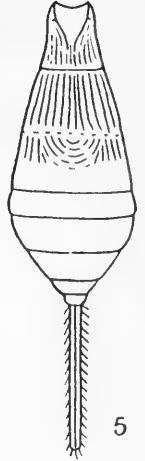
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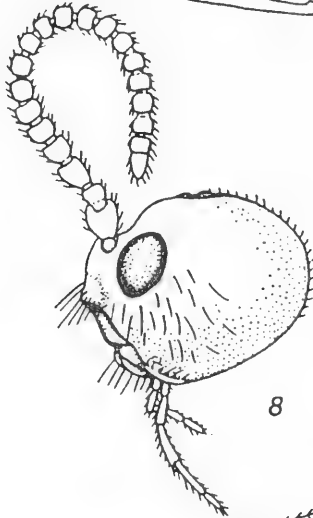
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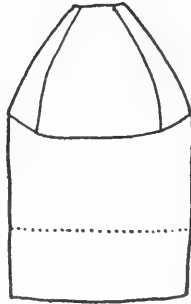
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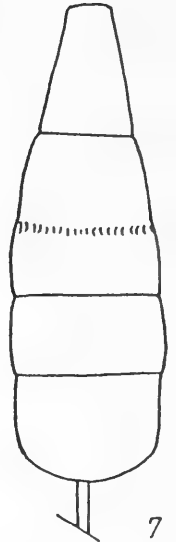
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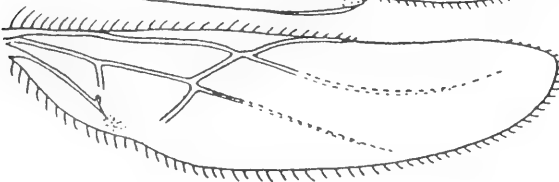
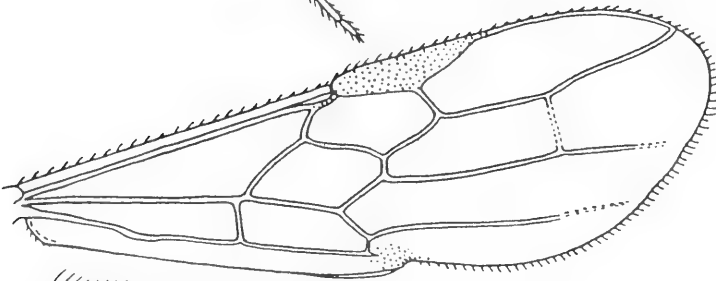
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9

Antennae 30-segmented. Fig. 16: 15. Body 2–5. Krasnodar District (Sochi); England; France; Romania; Hungary; Yugoslavia. .... **W. spathiiformis** Ratz. (*maculipennis* Szépl.)

21. **Dolopsidea** Hincks, 1944 (*Exontsira* Belok. syn. n.)<sup>1</sup>—Four species in the Palearctic, all reported in the USSR. Besides the ones reported hereunder there are the Mongolian-Siberian *D. mongolica* Tel. and the Far Eastern *D. maes* Belok.

1 (2). Height of genae 1/4 longitudinal diameter of eye. Face punctate. Length of 1st abdominal tergite almost 1.5 times its width at apex. Body black; legs dark brown-yellow, hind femora darkened. Antennae 36-segmented (in male 45-segmented). Fig. 16: 2. Body 3–4. West (Lithuania), center, southwest (Moldavia). ....

..... **D. tatianae** Tel. (*Rhysipolis mediator* sensu Tobias)  
Lectotype: Female, "Belkino, Yaroslavsk, VI.1897. N.R. Kokuev."

2 (1). Height of genae 2/5–1/3 longitudinal diameter of eye (Fig. 16: 11). Face smooth. Length of 1st abdominal tergite equal to its width at apex or slightly more. Body black; legs yellowish dark brown. Fig. 15: 2, 3. Body 2.7–4. West (Lithuania), southwest; Ciscaucasia, Armenia, Azerbaïdzhân, Chita Region, Pacific Coastal Region; Western Europe. ....  
..... **D. indagator** Hal. (*caucasica* Tobias, syn. n.; *Rhyssalus rhodopeus* Zaykov, syn. n.)

22. **Ontsira** Cameron, 1900 (*Doryctodes* Hellén).—Twenty-six species in the world fauna, 17 in the Palearctic, 12 in the USSR.

1 (4). Ovipositor shorter than abdomen or equal to it. Mesonotum with granulose sculpture, head smooth dorsally. Hind coxae anteriorly uniformly rounded.

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Fig. 17. Doryctinae (from Achterberg, Fischer and Tobias).

1, 2—*Ontsira imperator*: 1—thorax; 2—foretibia; 3—*Doryctes leucogaster*, thorax; 4–5—*D. molorchi*: 4—forewing, 5—abdomen; 6, 7—*Rhaconotus aciculatus*: 6—thorax, 7—abdomen; 8–10—*Histeromerus mystacinus*: 8—head, 9—wings, 10—1st–3rd abdominal tergites.

<sup>1</sup>Belokobylskij, 1982. *Entomol. Obozrenie*, 61, 3: 600–614.

2 (3). Metanotum in middle with an obtuse denticle. Width of head less than 1.5 times its length, temples as long as eyes. Parallel

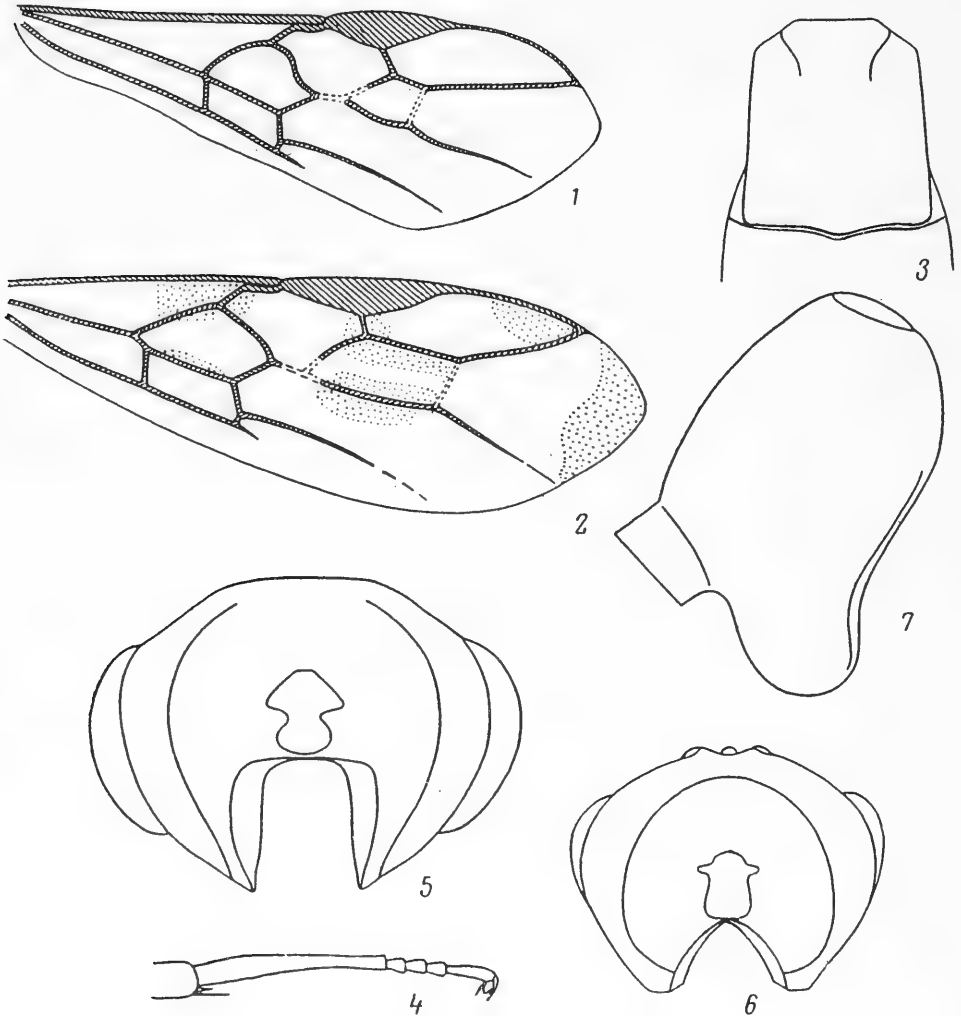


Fig. 18. Doryctinae (from Tobias and original).

1, 2—forewing: 1—*Doryctes inopinatus*, 2—*D. tadzhicus*; 3—*D. leucogaster*, 1st abdominal tergite; 4—*Histeromerus mystacinus*, hind tarsus; 5, 6—head posterior view: 5—*Colastes* sp., 6—*Pseudobathystomus funestus*; 7—*Hecabolus sulcanus*, hind coxa.

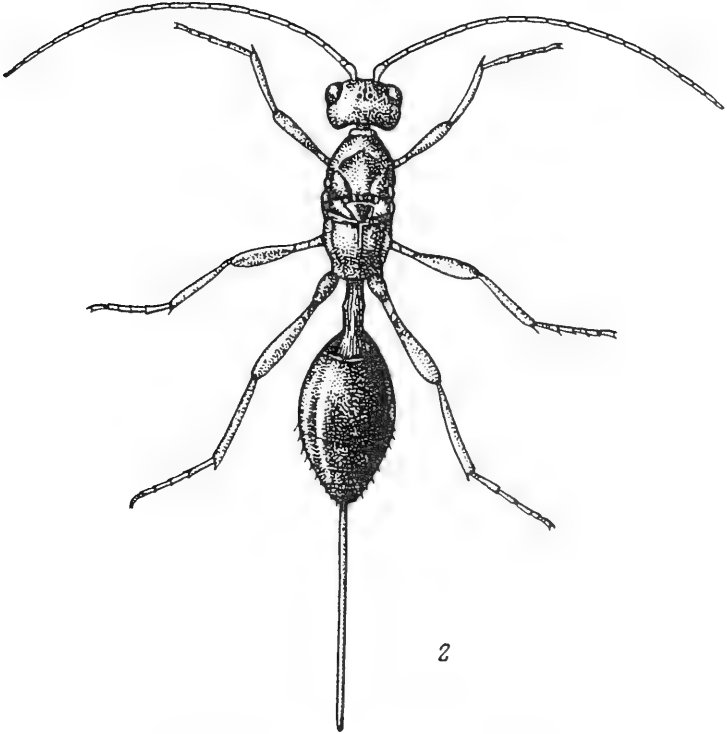
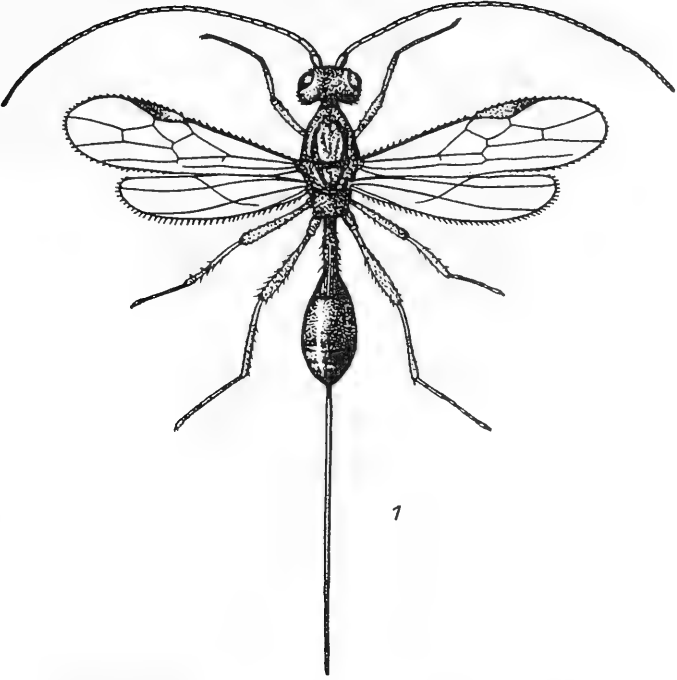


Fig. 19. Doryctinae (original).

1—*Spathius exarator* L., 2—*S. pedestris* Wesm.

vein originating much below middle of brachial cell, recurrent vein distinctly antefurcal. Face rugose. Sternauli long, much longer than halflength of sides of mesonotum, with weak but distinct sculpture; hind coxae with granulose sculpture. Body black; sometimes abdomen posterior to 1st tergite light colored. Wings often with somewhat developed smoky spots. Body 3–5. Parasite of longhorned beetles *Pyrrhidium sanguineum* L., *Plagionotus arcuatus* L., *P. floralis* Pall., *Phymatodes testaceus* F.; goldeneyes *Chrysobothris igniventris* Rtt.; weevil *Magdalis frontalis* Gyll., bark beetles *Blastophagus piniperda* L., *Ips acuminatus* Gyll. Northwest, center, south; Caucasus, Western Siberia, southern Far East, Sakhalin Island; Western Europe; Turkey; North America. .... **O. antica** Woll.

(*gallicus* Reinh., *Oncophanes caudalis* Hellén, syn. n.)<sup>1</sup>

3 (2). Metanotum with only a slight median elevation. Width of head more than 1.5 times its length, temples much shorter than eyes. Parallel vein originating from middle of brachial cell; recurrent vein interstitial. Face smooth. Sternauli short, equal to halflength of sides of mesothorax, smooth; hind coxae smooth. Body dark brown; wings light colored; stigma and veins dark brown. Body 2.5. Southwest; Caucasus, Pacific Coastal Region. .... **O. rara** Belok.

4 (1). Ovipositor much longer than abdomen. Sternauli sculptured.

5 (6). Recurrent vein interstitial to 1st radiomedial, 1st abdominal tergite with tubercularly raised median field, its length almost  $\frac{2}{3}$  its width at apex (Fig. 16: 13). Head behind eyes appreciably broadened, posteriorly slightly narrowed; vertex rugose or smooth (in smaller specimens). First segment of antennal flagellum twice as long as second. Body black; legs light brown, coxae yellowish. Antennae about 40-segmented. Body 5–6.5 (male up to 3.3). Parasite of *Megopsis scabricornis* Scop. (Cerambycidae). Krasnodarsk territory ..... **O. flavicoxa** Tobias, sp. n.

Holotype: Female, Krasnodar, from *M. scabricornis*, XII. 1980 (in laboratory) (Miroshnikov). Parasites: 6 females, 3 males, from the same host larva.

6 (5). Recurrent vein antefurcal. First abdominal tergite with slightly raised median field, its length equal to width at apex or slightly longer. Head behind eyes weakly, roundly, uniformly narrowed;

<sup>1</sup> Lectotype of *O. caudalis*: Female, Finland, "Loio, 4618" (Hellén).



vertex smooth, 1st flagellar segment at most 1.5 times as long as 2nd.

- 7 (8). Ovipositor 1.5 times as long as body. Head dorsally sculptured, matte. Body dark brown, abdomen posterior to 1st tergite yellowish dark brown with dark transverse stripes. Body 9–10. Caucasus, including Ciscaucasia; Central Europe ..... **O. longicaudis** Giraud (*ustulata* Fahr.)
- 8 (7). Ovipositor as long as body. Head smooth. Hind coxae anteriorly with tooth like projection. Body usually dark brown, rarely black, head and abdomen often yellowish in middle. Figs. 14: 13; 16: 14; 17: 1, 2. Body 4–7. Parasite of longhorned beetles *Hylotrupes bajulus* L., *Pogonocherus fasciculatus* Deg., *Tetropium castaneum* L., *Acanthocinus aedilis* L., *A. griseus* F., *Callidium* sp., *Rhagium* sp., goldeneyed *Dicerca berolinensis* Hbst., *Ancyclocheira strigosa* Gebl., bark beetles, *Blastophagus minor* Htg., *B. piniperda* L., *Scolytus scolytus* F., capucine beetle, *Bostrychus capucinus* L. Holarctic species ..... **O. imperator** Hal. (*ignea* Ratz., syn. n.)

23. **Doryctes** Haliday, 1836<sup>1</sup>—About 70 species in the world fauna, 20 in the Palearctic.

- 1 ( 2). Ovipositor as long as body. Antennae about 60-segmented; 1st abdominal tergite and base of 2nd rugose. Body dark brown; legs yellowish, wings darkened. Body 9–11. Center, south; Czechoslovakia; Hungary; Yugoslavia; Romania (cf. also couplet 17) ..... **D. grandis** Szépl.
- 2 ( 1). Ovipositor distinctly smaller than body.
- 3 ( 4). Nervulus interstitial or almost interstitial; 2nd radiomedial vein as long as or slightly longer than 2nd section of radial vein (Fig. 18: 1). Head red, sometimes darkening near orbital triangle. Body 3.6–4.6. Tadzhikistan ..... **D. inopinatus** Belok.
- 4 ( 3). Nervulus distinctly postfurcal; 2nd radiomedial vein much shorter than 2nd section of radial vein.
- 5 ( 6). Radial cell greatly shortened, metacarpus 5/6 of stigma (Fig. 18: 2). Notaulices weakly developed; mesonotum with dense granulose sculpture. Forewing with smoky spots. Body 2.9. Tadzhikistan ..... **D. tadzhicus** Belok.

<sup>1</sup>Fischer. 1971. *Entomophaga*, 16, 1: 101–109.

- 6 ( 5). Radial cell slightly shortened, metacarpus distinctly longer than stigma. Notaulices distinct; mesonotum usually smooth or with sparse deep punctures.
- 7 (12). Abdomen reddish yellow.
- 8 (11). Ovipositor not shorter than abdomen, often appreciably larger. Legs dark colored.
- 9 (10). Mesonotum smooth, lustrous. Recurrent vein on forewing antefurcal, far from 1st radiomedial vein. Antennae about 60-segmented. Wings smoky, abdomen distinctly light colored; body color variable: head and thorax could be black and yellowish dark brown. Figs. 3: 4; 17: 3; 18: 3. Body 4–10. Parasite of *Rhagium inquisitor* L., *Clytus pilosus* Först., *Hylotrupes bajulus* L., *Tetropium castaneum* L., *Phymatodes variabilis* L., *Acanthocinus aedilis* L., *Acanthoderes cinereus* F., *Anaestetus testacea* F., *Exocentrus lusitanus* L. and other longhorned beetles, furniture beetles *Anobium pertinax* L., *A. punctatum* Deg., goldeneyed *Lampra mirifica* Muls., *Chrysobothris affinis* F., *Agrilus* spp. and beetles of other families (*Bostrichus capucinus* L., *Ptinus fur* L., *Ips typographus* L., *Pissodes notatus* F.) as well as some lepidopterans *Pyrausta sticticalis* L. Northwest, center, south; Caucasus, Central Asia, Siberia (Irkutsk); Western Europe; Iran ..... **D. leucogaster** Nees.
- 10 ( 9). Mesonotum with granulose sculpture, matte. Recurrent vein almost interstitial. Antennae about 40-segmented. Wings light colored, 1st abdominal tergite and body black. Body 4–5. Ukraine (Kupyansk); Western Siberia ..... **D. heydeni** Reinh.
- 11 ( 8). Ovipositor more than half as long as abdomen. Legs dark brown-yellow. Head 1.5 times as wide as long. Eyes 1.3 times as long as temples, face in middle with weak but distinct smooth longitudinal ridge. Antennae 36–38-segmented; 1st abdominal tergite rectilinearly broadened posteriorly, longitudinally rugose; like 2nd tergite even 3rd in basal half with semicircular folds. Body black, upper margins of abdominal tergites from 3rd tergite onward dark brown; in male apical half of abdomen black. Fig. 17: 4, 5. Body 4–4.5. Parasite of longhorned beetle *Molorchus umbellatarum* Schreb. Caucasus, including Ciscaucasia; Austria ..... **D. molorchi** Fi.
- 12 ( 7). Abdomen black, sometimes dark brown; if rarely with distinctly developed light (reddish) colored pattern then head just barely wider than long, temples as long as eyes, face in middle below antennae lacking ridge but with depression.

- 44 13 (14). Vertex flat; face projecting, bulged, distinctly transverse. Second radiomedial cell almost square. Mesonotum densely punctate, slightly lustrous, notaulices rugose; propodeum with fields. 2nd abdominal tergite basally with semicircular folds. Wings light colored; body black; legs except coxae, reddish (male). Body 5. Kaliningrad Region .....  
 ..... **D. planiceps** Reinh.
- 14 (13). Vertex bulged, face slightly bulged. Length of 2nd radiomedial cell much more than its width.
- 15 (16). Head reddish yellow. Antennae about 60-segmented. Ovipositor as long as abdomen. First and 2nd abdominal tergites sometimes and base of 3rd rugose; propodeum usually in anterior half with smoothed sculpture, sometimes entirely reticulate-rugose, with narrow median cell. Body black, often prothorax, sometimes forecoxae reddish yellow; wings smoky. Center (Voronezh), south (Kharkov Region); Central Asia, Pacific Coastal Region; Hungary; Yugoslavia ..... **D. fulviceps** Reinh.
- 16 (15). Head black.
- 17 (18). Ovipositor longer than abdomen. Antennae about 60-segmented. First abdominal tergite and base of 2nd rugose. Body dark brown, legs yellowish, wings darkened. Body 9–11. (cf. also couplet 1) ..... **D. grandis** Szépl.<sup>1</sup>
- 46 18 (17). Ovipositor as long as abdomen or shorter, rarely slightly longer.
- 19 (20). Ovipositor longer than abdomen. Third abdominal tergite granulosely punctate without longitudinal or transverse wrinkles. 1st to 3rd abdominal tergites yellowish or reddish dark brown. Body 5.5–7. Parasite of horntail *Xiphydria camelus* L. on black alder. Arkhangel'sk, Voronezh, Kharkov regions, Magadan Region, Pacific Coastal Region .....  
 ..... **D. rossicus** Tel.  
 Lectotype: Female, "Velskii in Vologoda Region, 1.V.1902. V. Pomerantsev.<sup>2</sup> Paratypes: 4 females, with same label.

<sup>1</sup> Synonymized with *D. fulviceps* Reinh. (Papp, 1984. *Folia Entomol. hung.*, 65, 1: 173–185).

<sup>2</sup> In the first description of the species [Telenga, 1941. Fauna SSSR (Fauna of the USSR). Vol. 5, 3: 103] another label was reproduced: "Yaroslavsk., 1.V.1902 (Yakovlev)". This interpretation of the label was made because the collection material, without specific geographic data, from N.P. Kokuev's collection, preserved in ZIN Acad. Sci. USSR, originated from Yaroslavl' Region. In the above cited series, except for five specimens collected on 1.V.1902, there are five more dated 30.IV.1902. Velsk and Velsk district are presently included in Arkhangel'sk Region.

- 20 (19). Ovipositor not longer than abdomen. Combination of other characters different.
- 21 (22). First abdominal tergite 1.5 times as long as its width at apex, at midpoint of apex terminating in lustrous tubercle, 2nd abdominal tergite only basally longitudinally rugose. Wings with dark spots, sometimes light colored. Antennae 35-segmented. Body 3–5. Parasite of *Pogonocherus fasciculatus* Deg., *Acanthocinus aedilis* L. (Cerambycidae), *Ips cembrae* Heer., *Orthotomicus laricis* F., *Scolytus rugulosus* Ratz., *S. pruni* Ratz., *S. kirschi* Scal., *S. scolytus* F., *S. multistriatus* Marsh. (Scolytidae). Northwest; Western Europe ..... **D. pomarius** Reinh.
- 22 (21). First abdominal tergite not or only slightly longer than its width at apex, apically without lustrous tubercle, 2nd tergite rugose-punctate at least along basal half. Wings uniformly darkened, without smoky spots.
- 23 (24). Ovipositor as long as half length of abdomen or slightly longer. Second abdominal tergite rugose-punctate, 3rd basally softly sculptured with wrinkles forming more or less distinct concentric semicircles. Length of second radiomedial cell on lower side usually almost 2 times its width. Body 3–6.5. Parasite of longhorned beetles *Pogonocherus hispidus* L., *P. fasciculatus* Deg., *P. hispidulus* Pill., *P. bidentatus* Thoms., goldeneyed *Agrilus mendax* Mannh., *A. viridis* L., weevil *Magdalis armigera* Geoffr., bark beetle *Pityogenes bidentatus* Hbst. Center, east, south; Western Siberia, Chita Region, Far East; Western Europe; Mongolia ..... **D. undulatus** Ratz.
- 24 (23). Ovipositor as long as abdomen or slightly shorter. Second abdominal tergite in basal half entirely sculptured, 3rd tergite smooth or if basally sculptured then with longitudinal wrinkles. Length of 2nd radiomedial cell on lower side less than 2 times its width. Body 3–6.5. Parasite of longhorned beetles *Tetropium castaneum* L., *T. gabrieli* Weise, *T. gracilicorne* Rtt., *T. fuscum* F., *Stenostola ferrea* Schr., *Exocentrus lusitanus* L., *Phymatodes testaceus* L., *P. pusillus* L., *P. alni* L., *Acanthocinus aedilis* L., *Molorchus minor* L., *Callidium abdominale* Bon., *C. violaceum* L., *Pogonocherus hispidus* L., Rhagium *inquisitor* L., *Clytus* sp., *Monochamus* sp., *Agapanthia* sp., goldeneyed *Phaenops cyanea* F., *P. guttulata* Gebl., weevils *Pissodes notatus* F., *P. harcyniae* Hbst., *Rhynchaenus fagi* L.,

*R. quercus* L., *R. salicis* L., *R. testaceus* Müll., *R. pilosus* F., *Magadalis violacea* L., stamping beetle *Dorcatoma dresdensis* Hbst.; *D. setosella* Muls. and Rey., *Ernobius mollis* L., bark beetles *Ips typographus* L., *I. sexdentatus* Börn., *I. subelongatus* Motsch., *Blastophagus piniperda* L., lepidopterans *Laspeyresia strobilella* L., *Grapholitha funebrana* Tr., hymenopterans *Xiphydria dromedarius* F., *Xyela pusilla* Dlbm. Forests throughout the Palearctic .....  
 ..... **D. mutillator** Thunb. (*petrovskii* Kok., *strigatus* Kok., ? *striatellus* Nees, ? *striatelloides* Strand, ? *brachyurus* Marsh., *rex* Marsh.)

24. **Rhaconotus** Ruthe, 1854 (*Hormiopterus* Giraud).—In the world fauna there are about 70 species, of which 7 have been described from the Palearctic (not counting *H. dimidiatus* Nees and *H. dusmeti* Docavo, which clearly do not belong to this genus).

- 1 ( 2). Stigma monochromatic, yellow; wings without dark bands, light colored. Body light brown. Abdominal tergites 1 to 5 coarsely rugose. Body 3–5. Ciscaucasia; Central Asia .....  
 ..... **R. flavistigma** Tel.  
 Lectotype: Female “Dzhili-Kul’ on Vaksh River, Tadzhikistan, 15.VI.1934, Gussakovskii.”
- 2 ( 1). Stigma bichromatic, dark brown, in basal third yellow; wings with broad dark bands. Body often dark brown with reddish tinge.
- 3 ( 4). Abdominal tergites 2 to 4 with paired roundish areolae with smooth sculpture; abdomen black, sometimes with reddish dark brown bands on tergites 2 to 4, passing through smooth areolae. Body 3.1. Central Asia ..... **R. kerzhneri** Belok.
- 4 ( 3). Abdominal tergites 2 to 4 lacking smooth areolae, entire abdomen rugose or with granulate sculpture, black or dark brown.
- 5 (10). Fifth abdominal tergite distinctly sculptured, matte.
- 6 ( 9). Propodeum lacking longitudinal folds. Body yellowish or reddish dark brown. Antennae 25–35-segmented.
- 49 7 ( 8). Abdominal tergites 1 to 5 or at least 1 and 2 with distinct longitudinal wrinkles. Wings sometimes shortened and barely reaching middle of abdomen. Figs. 17: 6, 7; 16: 16. Body 2–4. Parasite of goldeneye *Anthaxia lgoeckii* Obenb. South;

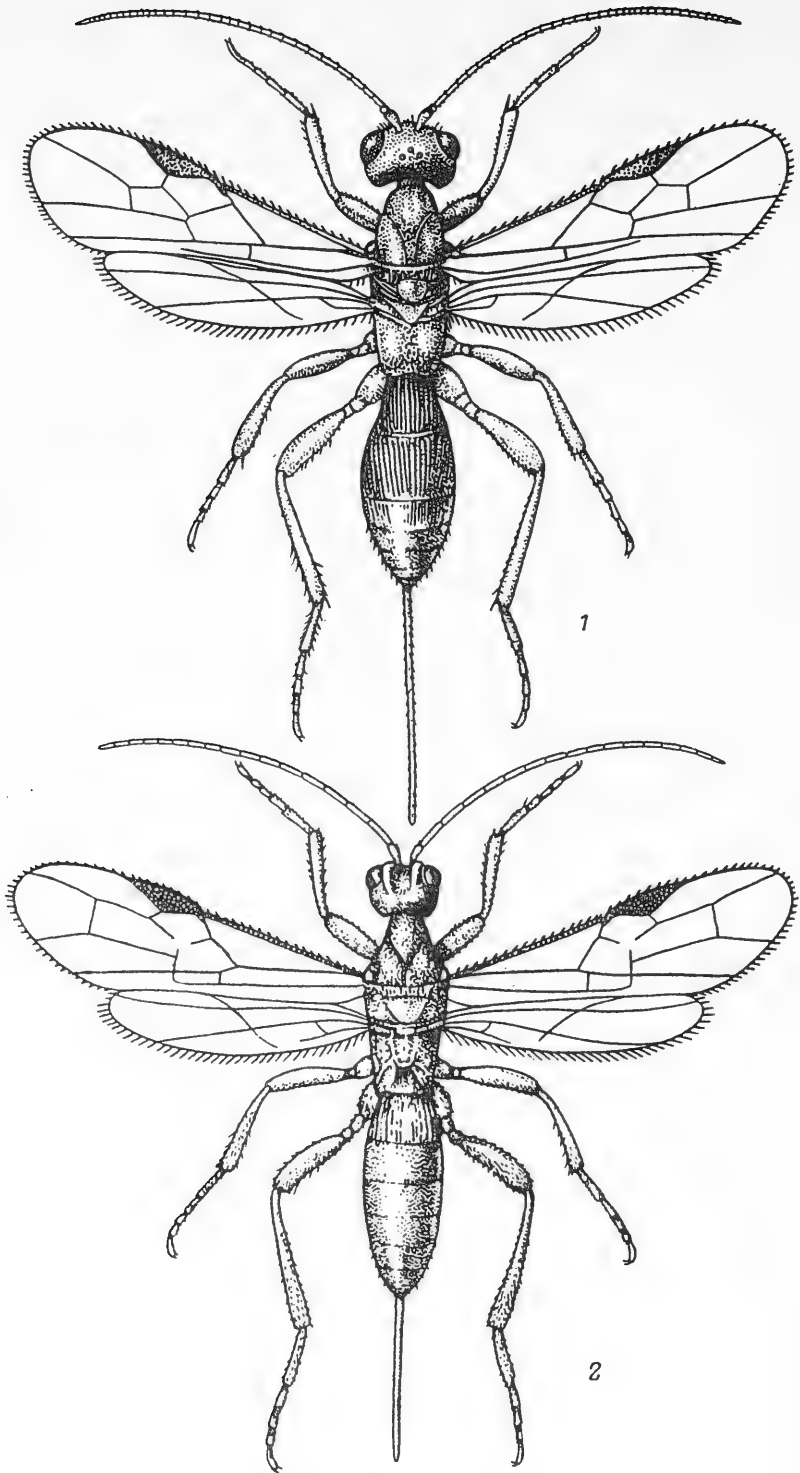


Fig. 20. Doryctinae (original)

1—*Dendrosotinus ferrugineus* Marsh., 2—*Dendrosoter hortigi* Ratz.

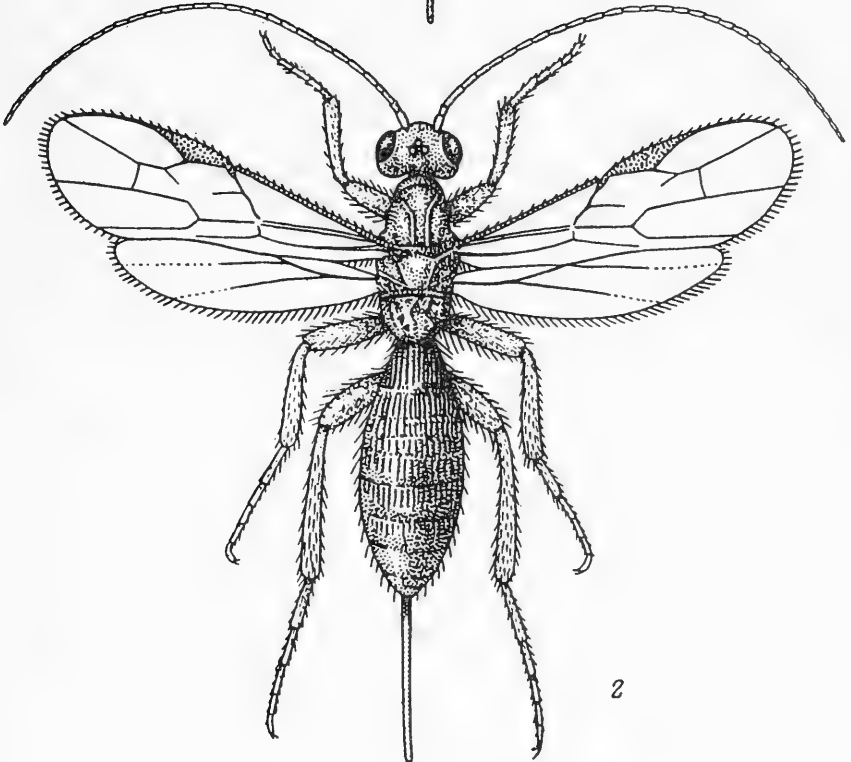
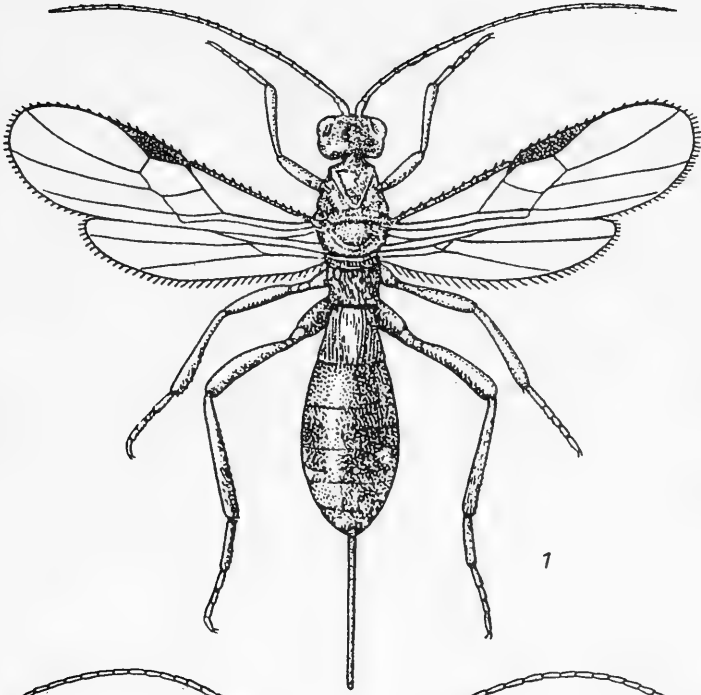


Fig. 21. Doryctinae (original).

1—*Ephylyus silesiacus* Ratz., 2—*Heterospilus testaceus* Tel.

- Caucasus, Kazakhstan, Central Asia, Pacific Coastal Region; Western Europe; Israel; Mongolia .....
- ..... **R. aciculatus** Ruthe (*elegans* Först.)
- 8 ( 7). All abdominal tergites with dense granulose sculpture, without longitudinal wrinkles. Body 2.5. South, southeast (Astrakhan Region); Kazakhstan, Central Asia. Mongolia.....
- ..... **R. scaber** Kok.
- Lectotype: Female, "Melitop[olskii], 30.VIII.1898, M.M. Katkov."
- 9 ( 6). Propodeum with coarse longitudinal folds. Body black, head and legs reddish dark brown. Antennae about 40-segmented. Abdomen with coarse longitudinal folds. Body 5. Kazakhstan, Central Asia .....
- ..... **R. major** Tobias
- 10 ( 5). Abdominal tergite 5 smooth, lustrous. Propodeum lacking longitudinal folds. Body yellowish dark brown, 5. Western Europe; northern Africa .....
- ..... **R. ollivieri** Giraud

25. **Zombrus** Marshall, 1897 (*Odontobracon*, part.)—In the world fauna (mostly in the tropics of the Old World) there are about 45 species. One found in the Soviet Union (*Z. sjoestedti* Fahr.) in the southern part of Eastern Siberia.

26. **Histeromerus** Wesmael, 1838.—Two species: one Palearctic, the other Nearctic.

- 1 (1). Ovipositor slightly shorter than abdomen. Suture between 2nd and 3rd tergite indistinct. Antennae 17–20-segmented. Body dark brown, legs dark brownish yellow. Figs. 17: 8–10; 18: 4. Body 3–4. Parasite of *Leptura scutellata* F., *Strangalia aurulenta* F. (Cerambycidae), *Sinodendron cylindricum* L. (Lucanidae), *Dicerca alni* Fisch. (Buprestidae). Center, south (Crimea); Ciscaucasia, Georgia; Western Europe .....
- ..... **H. mystacinus** Wesm.

27. **Colastinus** Belokobylskij, 1984.—One species from the southern part of the Far East (*C. crustatus* Belok.).

28. **Xenarcha** Förster, 1862.—Four species, two in the Palearctic.<sup>1</sup>

- 1 (2). Radial cell distinctly shortened. Section of medial vein from recurrent to 1st radiomedial vein half as long as recurrent vein.

<sup>1</sup> See footnote to genus *Colastes*.



(Fig. 22: 1). Abdomen distinctly black, all legs dark brown; palps dark. Head behind eyes roundly narrowed, below eyes almost rectilinearly narrowed, temples somewhat shorter than transverse diameter of eye. Antennae 32–34-segmented; 1st flagellar segment 3.5 times as long as wide, 1.3 times as long as 2nd. Pronotum with deep pit; notaulices entire, crenulate. Metacarpus 1.2 times as long as stigma; 2nd section of radial vein 2.5–2.8 times as long as 1st,  $2/3$ – $1/2$  as long as 3rd. First abdominal tergite  $5/6$  its width at apex. Ovipositor valves slightly shorter than 1st abdominal tergite. Body 2.3–3.1. Kazakhstan, Central Asia . . . . . **X. montana** Tobias and Belokobylskij sp. n.

Holotype: Female—Tarbagatai, vicinity of Staropyatigorsk, subalpine meadow, 2.VII.1962 (Tobias). Paratypes: 6 females and 1 male, with the same label as for the holotype; 1 female, Dzhungarian Alatau, southern Koktuma on Alakol, 25.VI.1962 (Kerzhner); 1 female, 2 males, Salyk Mt. Saur Range, 2000 m, herbage meadow, 19.VI.1961 (Tobias); 1 female, 2 males, Tadzhikistan, 20 km SW of Shakhristan, juniper forest, 12–13.VI.1982 (Belokobylskij).

- 2 (1). Radial cell not shortened. Section of medial vein from recurrent to 1st radiomedial vein  $1/4$  as long as recurrent vein (Fig. 22: 2). Abdominal tergites 1 and 2 black, others reddish dark brown; all legs light brown; palps yellow. Fig. 23: 1, 2. Body 2.5–3. Parasite of *Fenella nigrita* Westw., *Metallus pumilus* Klug (Tenthrecinidae). Northwest, west, south; Caucasus; Western Europe . . . . . **X. lustrator** Hal. (*Phanomeris thomsoni* Szépl.)

29. *Colastes* Haliday, 1836 (*Exothecus* Wesm., *Phanomeris* Först. syn. n.)<sup>1</sup>—About 30 species in the world fauna, about 20 in the

<sup>1</sup> Papp. 1975. *Acta Zool. Acad. sci. hung.*, 21, 3–4: 411–423. A new revision of the genus and tribe Exothecini s. str. was done by van Achterberg in 1983 (*Zool. Mededelingen* 57, 26: 339–355). He separated the genus *Colastes* based on the absence of a pit (pronope) on the pronotum and separated another genus *Shawiana* Acht. differing from *Xenarcha* by posteriorly smooth, not adjacent notaulices. In the latter genus Achterberg included these species: *lustrator* Hal., *laticarpus* Thoms., *abnormis* Wesm., *effecta* Papp. In *Shawiana* he included *catenator* Hal., *phyllotomae* Hal., *lapponica* Thoms., *foveolator* Thoms., *laevis* Thoms. The above characters (as noted by Achterberg himself) are expressed to varying degrees in different species and could be variable. The established biological differences between them need to be confirmed in a large number of species (*Xenarcha* and *Shawiana*—parasites mostly of mining sawflies, rarely beetles; species of genus *Colastes* rarely parasitize sawflies, infesting mainly mining larvae of Lepidoptera, Coleoptera and Diptera). All this forces us (according to the revision of our own and almost all type materials) to accept here the old interpretation of the genus *Colastes* and

Palaearctic, usually rare. According to the revision made by Papp using several characters which were earlier considered diagnostically inadequate, we are forced to reject the earlier interpretation of some species (Tobias, 1976). The key does not include the Far Eastern *C. effectus* Papp.

- 50 1 (18). Second abdominal tergite longitudinally rugose or rugose with granulose sculpture.
- 2 ( 5). Abdominal tergites 1 and 2 entirely and 3rd in basal half or entirely with rugose sculpture, sometimes 4th basally rugose.
- 3 ( 4). Radial vein originating from middle of stigma. Stigma yellow (Fig. 22: 3). Notaulices developed over entire length, crenulate. Pronotum in middle with weak pit, with densely granulose sculpture. Body 2.—Moldavia, Armenia, Kazakhstan; Hungary ..... *C. hungaricus* Szépl, comb. n. (*sculptiventris* Tobias, syn. n.)
- 4 ( 3). Radial vein originating anterior to middle of stigma; stigma dark. Notaulices on scutum, mesonotum smooth, not crenulate. Vertex smooth. Figs. 23: 3–8; 24: 2. Body 4–4.5. Parasite of *Heterarthrus nemoratus* Fall. (Tenthredinidae). Central Ural, Chita Region, Pacific Coastal Region, Sakhalin Islands; Austria; ?USA (Introduced) ..... *C. phyllotomae* Mues., comb. n.
- 52 5 ( 2). At most 2nd abdominal tergite and suture between 2nd and 3rd tergite sculptured.
- 6 ( 9). Head behind eyes strongly narrowed (Fig. 22: 4), 2nd abdominal tergite entirely, densely, longitudinally rugose.
- 7 ( 8). Pronotum in middle with large pit. First flagellar segment 2.5 times as long as wide. First and second sections of radial vein almost in one straight line. Depression on sides of mesothorax smooth before forewing. Propodeum basally smooth. Vertex bulged. Ovipositor valves as long as 1st segment of hind tarsi. Fig. 25: 1, 2. Body 3–7. Parasite of sawflies *Fenusa pusilla* Lep., *F. ulmi* Sund., *F. dohrnii* Tischb., *Parnatenella* Klug, *Messa hortulana* Klug, *M. nana* Klug, *Profenusa pygmaea* Klug, *Heterarthrus aceris* Kalt., *H. vagans* Fall., *Scolioneura betuleti* Klug, *Fenella nigrita* Westw., butterflies *Eriocrania semipurpurella* Steph., *Coleophora* sp. Northwest,

*Xenarcha*, considering that for the former a peculiar tendency for shifting the point of branching of the radial vein toward the basal part of the stigma is characteristic, while for *Xenarcha* the shift is to its apical part.

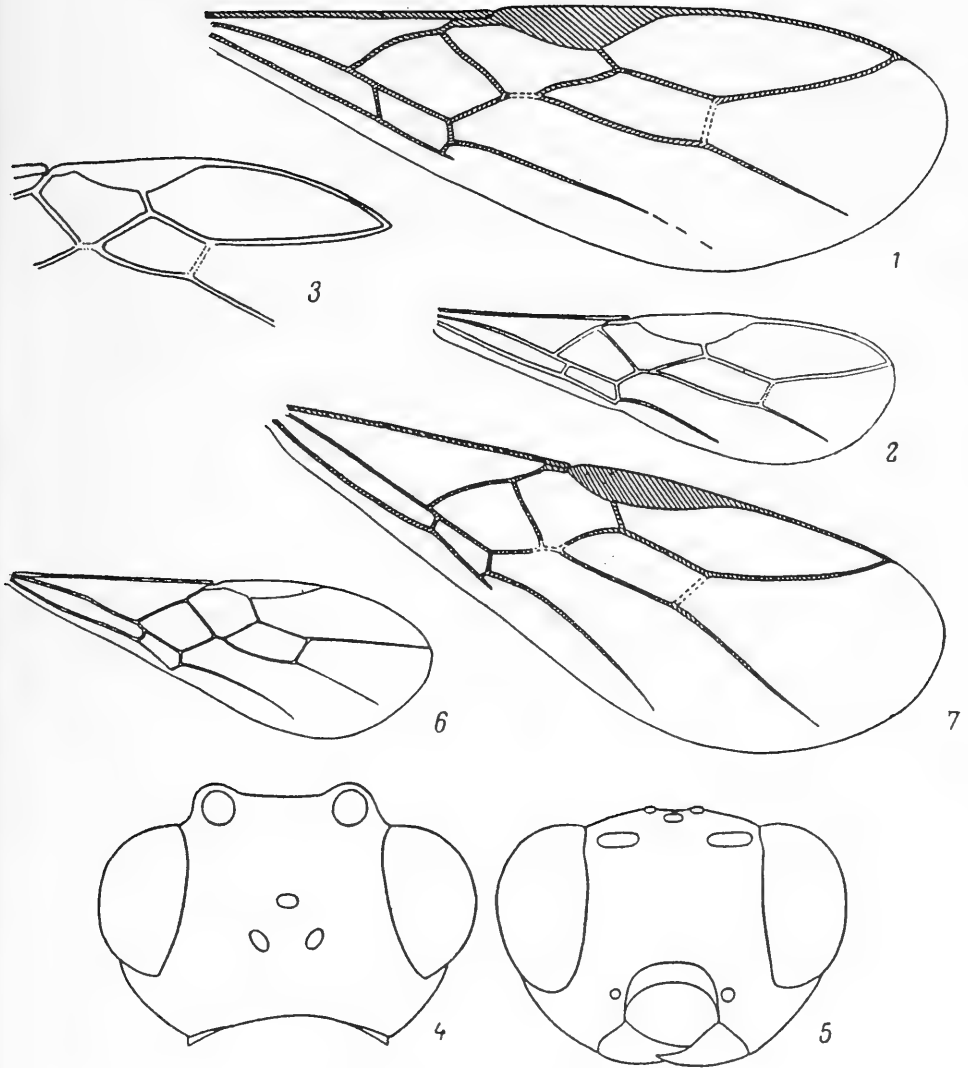
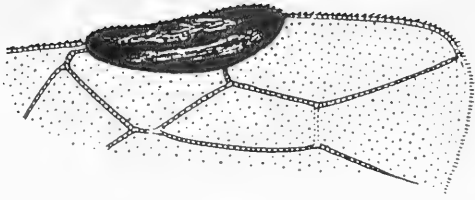


Fig. 22. Doryctinae (from Tobias and original).

1, 2—forewing: 1—*Xenarcha montana* sp. n., 2—*X. lustrator*; 3—*Colastes hungaricus*, part of forewing; 4, 5—*C. affinis*: 4—head, dorsal view, 5—head, frontal view; 6-7—forewing: 6—*C. braconisus*, 7—*C. pubescens*, sp. n.

west; Caucasus; Western Europe .....  
 ..... *C. catenator* Hal., comb. n.



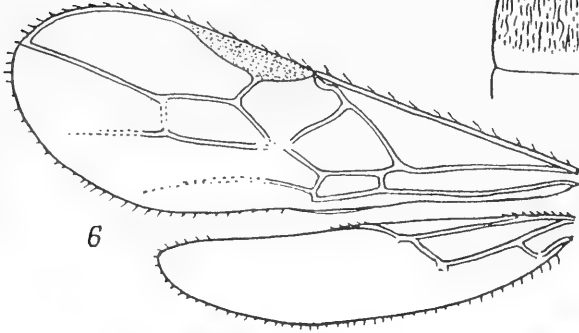
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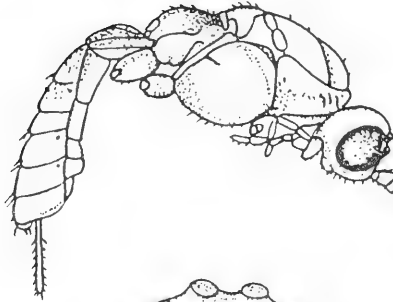
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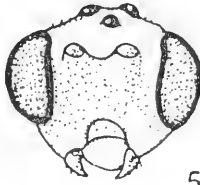
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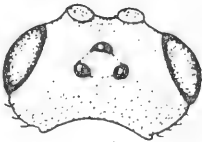
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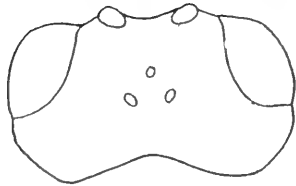
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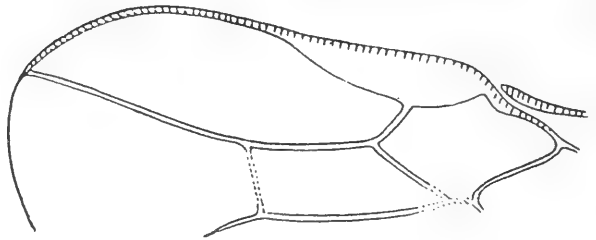
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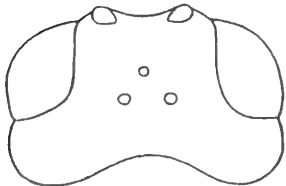
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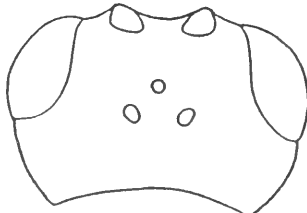
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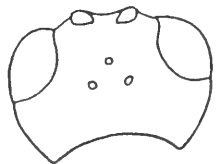
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- 8 ( 7). Pronotum in middle with weak roundish depression. First flagellar segment 3 times as long as wide. First and second sections of radial vein forming a distinct angle. Depression on sides of mesothorax rugose before forewing. Propodeum entirely with irregular rugose sculpture. Vertex flat. Ovipositor valves as long as first two segments of hind tarsi. Fig. 22: 4, 5. Body 3.5. Belgium ..... *C. affinis* Wesm.

Lectotype: Female—“*E. affinis* female” “Coll. Wesmael”, “*E. affinis* det. C. Wesmael”. Type preserved in Belgian Institute of Natural Sciences (Brussels).

- 9 ( 6). Head behind eyes not strongly narrowed. Second abdominal tergite longitudinally rugose, often only in basal half, its posterior half or apex smooth.
- 10 (13). First abdominal tergite short, much shorter than its width at apex.
- 11 (12). Radial vein originating somewhat anterior to middle of stigma, angle between 1st and 2nd sections of radial vein distinct. Face, except weakly sculptured tubercle, with dense granulose sculpture. Head behind eyes roundly narrowed, its width almost 2 times its length, temples  $\frac{2}{3}$  as long as eyes. Antennae 40-segmented; 1st flagellar segment 3 times as long as wide, 1.2 times as long as 2nd segment. Thorax 1.6 times as long as high; notaulices complete, weaker on scutum; pronotum dorsally with weak pit. Second section of radial vein 2.5–3 times as long as 1st, 3rd 1.8 times as long as 2nd. First abdominal tergite  $\frac{5}{6}$  as long as its width at apex. Ovipositor valves as long as 1st segment of hind tarsi. Propodeum entirely with irregular rugose sculpture; 1st and 2nd abdominal tergites rugose. Body black; abdomen posterior to 1st tergite and tarsi yellow. Body 3.2–3.3. Central Ural ..... *C. abdominalis* Belokobyl'skij, sp. n.

Holotype: Female—Central Ural, vicinity of Kungur, isolated on 14.V.1980 from *Pseudodineura fuscula* Klug (Zinov'ev). Paratypes: 2 females with the same label.

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Fig. 23. Doryctinae (from Papp and Achterberg).

- 1, 2—*Xenarcha lustrator*: 1—part of forewing, male, 2—abdominal tergites 1–2; 3–8—*Colastes phyllotomae*: 3—body, 4—head, dorsal view, 5—head, frontal view, 6—wings, 7—hind leg, 8—abdominal tergites 1–3 with propodeum; 9, 10—*C. laticarpus*: 9—head, 10—part of forewing; 11–13—head: 11—*C. incertus*, 12—*C. foveolator*, 13—*C. braconius*.

- 12 (11). Radial vein originating from basal third of stigma, angle between 1st and 2nd section of radial vein not manifest. Face above lacking granulate sculpture. Head 2 times as wide as long, temples much shorter than eyes. Antennae 35–37-segmented, 1st flagellar segment 2.5 times and 2nd 2 times their width. Thorax 1.7 times as long as high; notaulices deep, sculptured. Second section of radial vein 1.7–2 times as long as 1st; recurrent vein far from 1st radiomedial vein. Hind femora 5 times as long as wide. Face softly and densely

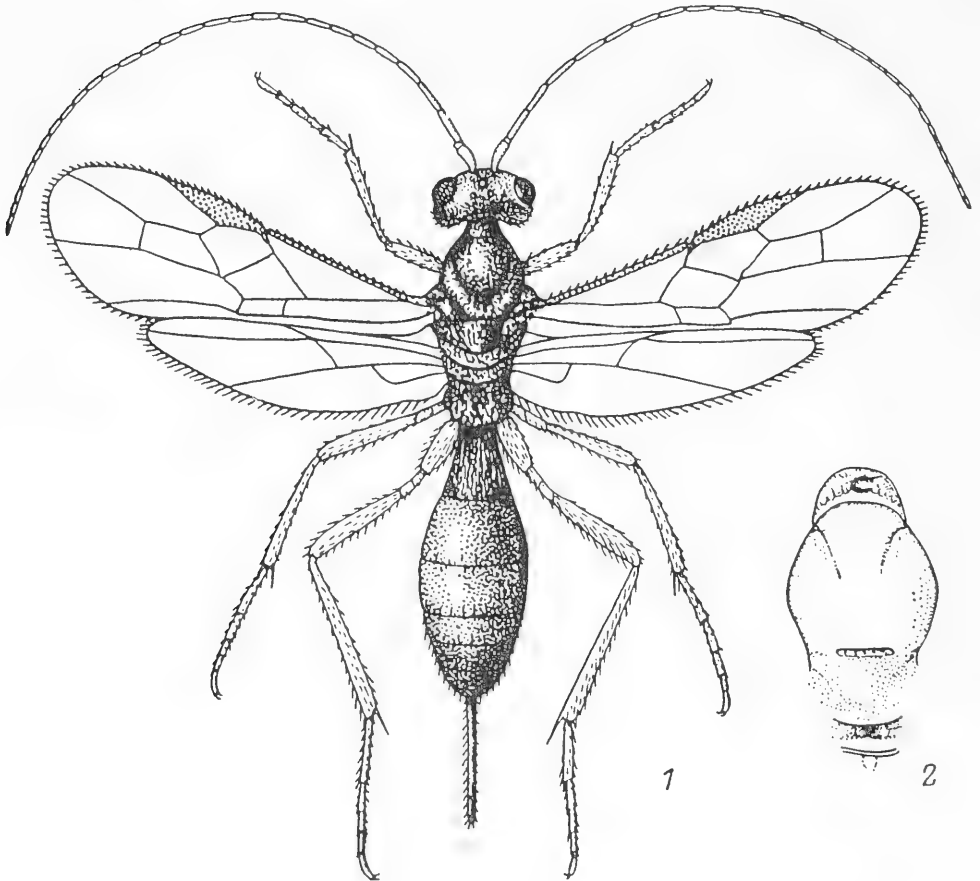


Fig. 24. Doryctinae (from Achterberg and original).

1—*Colastes braconius* Hal.; 2—*C. phyllotomae*, abdomen, dorsal view.

punctate, above almost smooth; propodeum coarsely rugose-punctate; 1st abdominal tergite with numerous longitudinal folds and punctures; 2nd tergite, except apex, with longitudinal folds, sometimes sculpture on 2nd tergite weak. Head, thorax and 1st abdominal tergite black; remaining tergites, legs and tegulae dark brownish yellow or abdomen apically darkened; wings darkened. Body 2.6–3.4. Central Ural, Caucasus, Irkutsk Region, Buryatia; Mongolia .....

..... **C. brevipetiolatus** Tobias, sp. n.

Holotype: Female, Il'men Reserve, 14.VII.1958 (Tobias). Paratype: Female, 5 km south of Vedeno, Chechen-Ingusk ASSR 5.VI.1972 (Kasparyan); 1 female, Malaya Bystraya River, Irkut basin, 10.VI.1970 (Kasparyan); 1 female, Khamnei, Buryatia, left bank of Dzhida River, 27.VI.1971 (Kasparyan); 1 female, Mongolia, Eastern District, 20 km E–NE of Bayan-Ula, 8.VII.1976 (M. Kozlov).

13 (10). First abdominal segment not shorter than its width at apex.

14 (15). Face with dense and soft sculpture, only above clypeus almost smooth and lustrous. Flagellar segments 4 to 6 slightly longer than wide. First abdominal tergite apically twice as wide as at base; stigma 4 times as long as wide, radial vein originating from its middle. Head, thorax and 1st abdominal tergite dark brown; abdomen yellow, posterior margin of tergites brownish; palps and legs light yellow. Fig. 23: 9, 10. Body 3.7–3.9. Northwest, west; Azerbaidzhan, Irkutsk Region; Sweden; Finland .....

..... **C. laticarpus** Thoms. (*flaviventris* Thoms.)

Lectotype: Female—"Coll. L-gh. (= Coll. Ljungh). Paralectotype: Male—"Rsiö" (=Ringsjön). Types preserved in Lund University Museum (Sweden).

15 (14). Face more weakly sculptured, lustrous, but above clypeus rugose. Flagellar segments 4 to 6 two times as long as wide. First abdominal tergite apically 2.5 times as wide as at base. Stigma 5 times as long as wide.

16 (17). Radial vein originating from basal third of stigma. Middle lobe of mesonotum entirely densely pilose. Color as in previous species but 2nd abdominal tergite dark brown; scape and pedicel yellow, flagellum dark brown. Body 3.2. North, northwest; Far East; Sweden; Finland .....

..... **C. pubicornis** Thoms.

Lectotype: Female—"Ydd" (=Yddinge). Preserved in Lund University Museum (Sweden).

- 17 (16). Radial vein originating closer to middle of stigma. Middle lobe of mesonotum not pilose. Antennae 37-segmented. Temples with distinct border such that anterior to ridge there is a fairly deep notch. Small roundish depression in middle of pronotum. Ovipositor valves shorter than 1st segment of hind tarsi. Notaulices deep but weakly sculptured, convergent in middle of mesonotum; mesonotum rugose beyond notaulices, with long longitudinal ridge in middle. Propodeum rugose-punctate, in middle of anterior half with longitudinal ridge; suture between 2nd and 3rd tergite sculptured. Body black, scape below, tegulae, legs yellow; palps yellowish dark brown; abdominal tergites 2 to 4 sometimes with well developed yellow coloration. Fig. 25: 3–9. Body 3. North, northwest; Chelyabinsk, Chita, Magadan Regions, Buryatia, Kunashir Islands; Belgium .....  
 ..... **C. abnormis** Wesm., stat. n. (*glabricollis* Thoms.)
- 18 ( 1). Second abdominal tergite smooth, lustrous or only basally with short longitudinal wrinkles (*C. lapponicus* var.; *C. aciculatus*).
- 19 (30). Notaulices not developed or weak, smooth and not contiguous posteriorly.
- 20 (29). Radial vein originating from basal third of stigma; if sometimes (in male) closer to middle than legs yellow.
- 21 (24). Propodeum rugose.
- 22 (23). First abdominal tergite longitudinally rugose, as long as width at apex or slightly more. Thorax 1.5–1.7 times as long as high. Head behind eyes uniformly narrowed roundly. Hind femora 6 times as long as wide. Ovipositor valves as long as 1st segment of hind tarsi. Head, thorax and 1st abdominal tergite black, remaining tergites dark brown, sternauli yellow, legs light yellow. Fig. 26: 8–15. Parasite of sawflies *Pontania vesicator* Brems, *Heterarthrus aceris* Kalt., *H. microcephalus* Klug, *H. vagans* Fall., *Fenusa dohrnii* Tischb.; ? beetles *Rhynchaenus* (*Orchestes*) sp. Body 2.5–3.5. Northwest, west, center; Far East; Western Europe .....  
 ..... **C. laevis** Thoms.
- 54 23 (22). First abdominal tergite lacking distinct longitudinal wrinkles (densely rugose-punctate), much longer than width at apex. Thorax 2 times as long as high. Head laterally almost round, behind eyes narrowed roundly. Radial vein originating from almost middle of stigma (in male closer to middle); 1st section of radial vein half as long as 2nd. Hind femora 5 times



as long as wide. Ovipositor valves as long as 1st segment of hind tarsi. Body black or dark brown; palps, legs, tegulae yellow; 3rd to 4th basal segments, of antennae and middle of abdomen dark brownish yellow; wings light colored; stigma pale dark brown. Female 1.8; male 1.7–2. Moldavia .....

..... **C. moldavicus** Tobias, sp. n.

Holotype: Female, Badul-lui-Vode, forest, 29.VIII.1963 (Talitskii). Paratypes: 14 males, details same; 5 females, Crimea, Angara Pass, 29.VIII.1971 (Kasparyan); 1 female, Crimea, Chatyr-Dag, beech forest, 7.VIII.1971 (Kasparyan).

- 24 (21). Propodeum smooth, only apically or along middle sometimes with weak sculpture.
- 25 (26). Body stout. Head behind eyes of same width as in region of eyes (Fig. 23: 11), temples as long as eyes, 1st and 2nd flagellar segments of equal length, 1.7–1.8 times their width. Second section of radial vein slightly longer than 1st radiomedial vein. First abdominal tergite slightly longer than its width at apex. Ovipositor valves as long as 1st segment of hind tarsi. Head, antennae, thorax and 1st abdominal tergite black; abdomen dark brown; legs yellow; hind coxae somewhat darkened. Body 3.8. North, northwest, south (Crimea); Caucasus, Buryatia, Irkutsk Region, Far East; Western Europe .....
- ..... **C. incertus** Wesm.
- 26 (25). Body not stout. Head behind eyes more distinctly narrowed than in region of eyes. Second flagellar segment slightly shorter than 1st, 3 times as long as wide.
- 27 (28). Second section of radial vein 1.7 times as long as 1st radiomedial vein. First abdominal tergite with longitudinal folds, as long as width at apex. Ovipositor valves as long as abdomen. Head, thorax and 1st abdominal tergite black; abdomen dark brown or black; legs light yellow, hind coxae dark brown. Second abdominal tergite basally sometimes with longitudinal wrinkles. Body 3.2. North, northwest; Magadan Region, Wrangel Island, Sakhalin Island; Sweden; Finland .....
- ..... **C. lapponicus** Thoms.
- Lectotype: Female, "Lpl" (=Lapland). Paralectotypes: 2 males, "Lpl". Preserved in Lund University Museum (Sweden).
- 28 (27). Second section of radial vein 2–3 times as long as 1st radiomedial vein. First abdominal tergite lacking longitudinal folds, almost smooth, shorter than width at apex. Ovipositor valves as long as 1st and 2nd segment of hind tarsi.

Mesonotum posteriorly with longitudinal furrow. Antennae 31–35-segmented. Body black; palps, tegulae, spot on sides of mesothorax, legs and below them yellow, basal part of antennae dark brown; wings light colored; stigma pale dark brown. Body 3–3.2 (male 2.2). Leningrad Region, Lithuania, Komi ASSR, Yamalo-Nenets Autonomous Region, Magadan Region, Sakhalin Islands ..... *C. lissogaster* Tobias, sp. n.

Holotype: Female, Vijritsa, from the gall of sawfly *Euura atra* L. on *Salix aurita*, 5.V.1977 (Zinov'ev). Paratypes: 5 females, 1 male, Salekhard, airport, northern taiga, 20.VIII.1972 (Kasparyan); 2 females, 1 male, Kharp railroad station, Yamalo-Nenets Autonomous Region, 15, 17, VIII.1972 (Kasparyan); 1 female Sakhalin Island Tymovskoe, mixed forest, 5.VII.1981 (Belokobylskij); 1 female, Magadan Region, 40 km NE of Sporny, 19.VII.1981 (Ionaitis); 1 female, 10 km NW of Seimchan, 28.VII.1981 (Yakimavichyus); 1 female Magadan, Novoe Velesoe, 11.VIII.1981 (Yakimavichyus); 2 females, 4 km NW of Magadan, 12.VIII.1981 (Yakimavichyus); 1 female, Magadan, Marchekan monticule, 14.VIII.1978 (Vedernikov); 1 female, vicinity of Vil'nyas, 28.V.1975 (Ionaitis).

- 29 (20). Radial vein originating from almost middle of stigma. Head behind eyes slightly broadened. Antennae 24–25-segmented, 2nd flagellar segment shorter than 1st, 4 times as long as wide. Second section of radial vein 4 times as long as 1st. Thorax 1.7 times as long as high. First abdominal tergite uniformly narrowed toward base, slightly longer than width at apex. Hind femora 4 times as long as wide. Ovipositor valves as long as 1st segment of hind tarsi. Face softly sculptured, lustrous; propodeum and 1st abdominal tergite densely rugose-punctate, matte; longitudinal folds on 1st tergite weak. Body black; abdomen sometimes dark brown; legs dark brown, hind coxae darker. Body 1.8–2. Lithuania, Moldavia; Siberia; Western Europe .....  
..... *C. fragilis* Hal. (*semeyticus* Jakim., syn. n.)
- 30 (19). Notaulices developed.
- 31 (34). Recurrent vein interstitial or almost interstitial. Head 1.5–1.6 times as wide as long. First flagellar segment slightly longer than 2nd. First abdominal tergite slightly larger than its width at apex and 2.5 times as long as width at base.
- 32 (33). Pronotum in middle with pit. First abdominal tergite slightly broadened posteriorly to spiracular tubercles (situated in

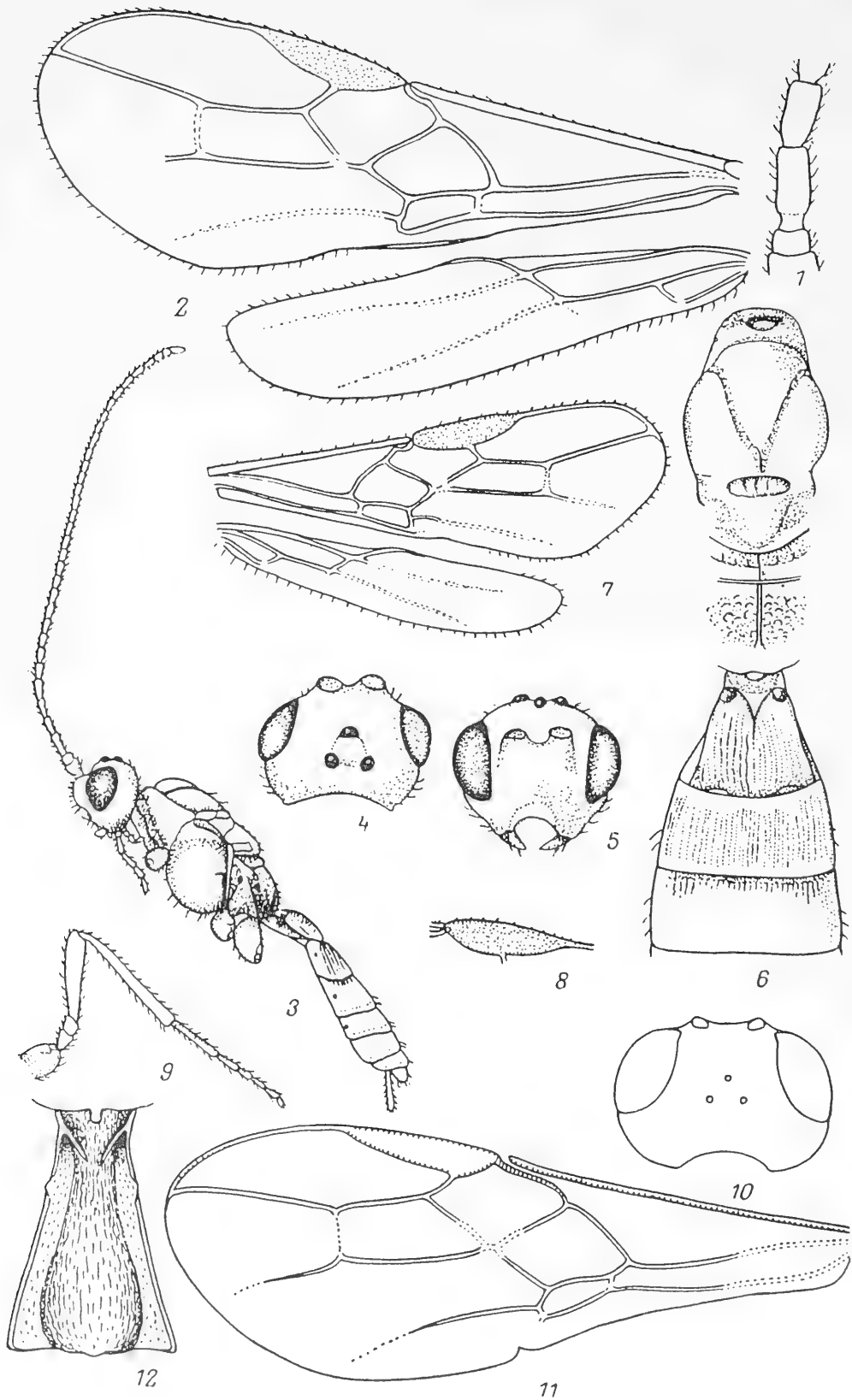
middle of tergite), towards base greatly narrowed. First flagellar segment 3 times as long as wide. Ovipositor valves as long as abdomen. Head, thorax and 1st abdominal tergite dark brown; other tergites dark brownish yellow, sternauli light yellow; palps reddish yellow; legs pale yellow; scape and pedicel yellow, flagellum dark brown. Fig. 23: 12. Body 4.5. Parasite of butterflies *Lithocolletis rajella* f. *alpina* Frey (Gracillariidae), sawfly *Blasticotoma filiceti* Klug (Blasticotomidae). Siberia, Far East; Sweden .... *C. foveolator* Thoms.

Lectotype: Female—pinned on green square card. Preserved in Lund University Museum (Sweden).

- 33 (32). Pronotum lacking pit in middle. First abdominal tergite uniformly broadened from base to apex. First flagellar segment almost 5 times as long as wide. Ovipositor valves as long as first 2 tarsal segments. Color as in previous species but abdomen apically darkened or entirely yellow. Figs. 22: 6; 23: 13. Body 2.5–4. Parasite of miners of many species from genus *Lithocolletis* (Gracillariidae) and other lepidopterans: *Tischeria dodonaea* Stt., *T. marginea* Hw., *T. ekebladella* Bjerk. (Tischeriidae), *Nepticula aucupariae* Frey, *N. splendidissimella* H.-S. (Nepticulidae), *Heliozela betulae* Stt., *Antispila treitschkiella* F.R. (Heliozelidae), *Psacaphora raschkiella* Z., *Mompha epilobiella* Den. and Schiff. (Momphidae), *Ypsolophus dentellus* F. (Plutellidae), *Lampides boeticus* L. (Lycaenidae), *Dyseriocrania subpurpurella* Hw. (Eriocraniidae), *Tortrix viridana* L. (Tortricidae), many species of dipterans from genus *Phytomyza* and *Agromyza albitarsis* Mg., *Liriomyza pusilla* Mg., *Phytobia approximata* Hendel, *P. verbasci* Bouché, *Phytomyza hendeliana* Her. (Agromyzidae), beetles *Rhynchaenus fagi* L., *Cryptorrhynchus lapathi* L. (Curculionidae), in young shoots of trees sawflies in galls: *Pontania pedunculi* Htg., *Fenusa ulmi* Sund., *Heterarthrus vagans* Fall. (Tenthredinidae). Northwest, center, east, south; Caucasus, Kazakhstan, Urals, Siberia, Pacific Coastal Region, Sakhalin Island, Kunashir Island; Western Europe .....  
.....*C. braconius* Hal.

34 (31). Recurrent vein distinctly antefurcal.

35 (36). Radial cell distinctly shortened; metacarpus slightly shorter than stigma (Fig. 22: 7). Prothorax dark brown. Head 1.5 times as wide as long, behind eyes strongly narrowed roundly, temples 2/3 transverse diameter of eye. Antennae 22–30-segmented, 1st flagellar segment 6 times as long as wide,

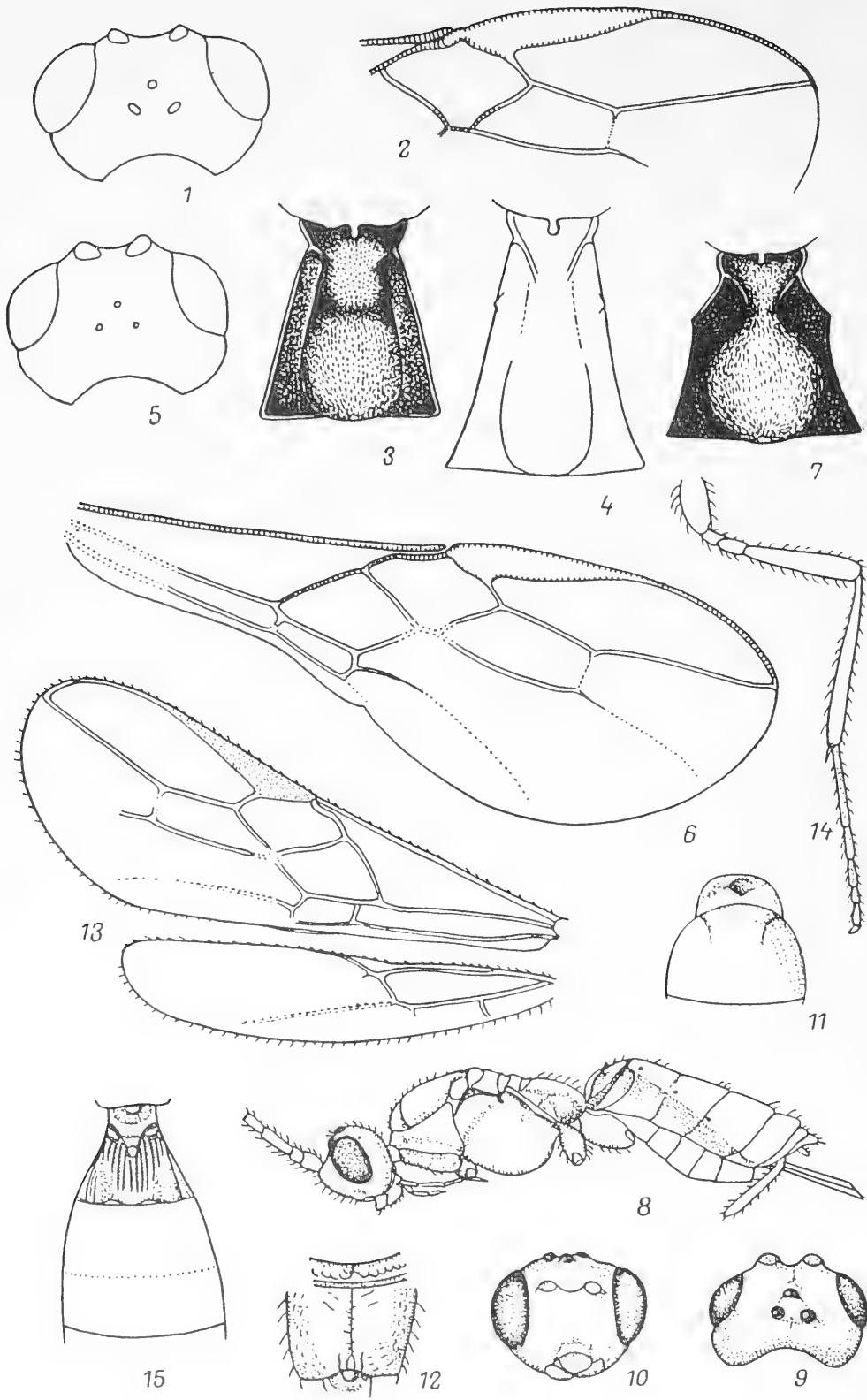


1.5 times as long as 2nd. Pronotum without pit; notaulices complete. Radial vein originating from basal third of stigma, its last section 2.5–3 times as long as 1st, 3rd 1.7–2 times as long as 2nd. First abdominal tergite slightly longer than its width at apex. Ovipositor valves as long as 1st and 2nd segments of hind tarsi together. Face except genae, smooth; propodeum smooth in basal third. Mesoscutum with dense light colored hair. Body 1.7–2.9. Kazakhstan, Central Asia  
 ..... **C. pubescens** Belokobylskij, sp. n.

Holotype: Female—Tadzhikistan, 10 km west of Vorukho, ravine, 16.VII.1982 (Belokobylskij). Paratypes: 3 females, vicinity of Dushanbe, Kondara, 9.X.1970 (Tobias); 24 females, 14 males, 10 km west of Vorukho, ravine, 16.VII.1982 (Belokobylskij); 2 females, 5 km NW of Aral, floodplain forest, 5.VII.1982 (Belokobylskij); 1 female, Kazakhstan, Aksu-Dzhabaglinskij Preserve, Dzhabagli Ravine, 3.VII.1979 (Kasparyan); 6 females, 3 males, Karatau Range, 30 km NE of Chayan, 20.VI.1982 (Belokobylskij); 7 females, 3 males, Dzhungarian Alatau, north of Koktum on Alakol, 25.VI.1962 (Tobias); 1 male, Saur Range, 2000 m, 19.VI.1961 (Tobias); 4 females, Uzbekistan, 5 km NW of Khamzabad, 11–12.VII.1982 (Belokobylskij); 1 female, 3 males, 15 km SW of Sokho 14.VII.1982 (Belokobylskij); 3 females, Kirgizia, 20 km north of Toktogul, Chychkan River, 26–27.VII.1982 (Belokobylskij).

- 36 (35). Radial cell not shortened; metacarpus distinctly longer than stigma. Prothorax usually black.
- 37 (44). Ovipositor short, not longer than first two segments of hind tarsi. Second abdominal tergite smooth.
- 38 (41). Thorax 2 times as long as high. Head behind eyes strongly narrowed (Fig. 26: 1). Middle lobe of mesonotum entirely with light colored hair. First abdominal tergite longitudinally rugose. Body large: 3–4.
- 39 (40). First abdominal tergite fairly short, slightly longer than width at apex. First section of radial vein  $2/5$  as long as

1, 2—*Colastes catenator*: 1—antennal base, 2—wings; 3–9—*C. abnormis*: 3—body, 4—head, dorsal view, 5—head, frontal view, 6—thorax and base of abdomen, 7—wings, 8—stigma, 9—hind leg; 10–12—*C. gracilis*: 10—head, 11—forewing, 12—1st abdominal tergite.



- 2nd. Ovipositor valves as long as 1st segment of hind tarsi. Propodeum rugose but basally smooth, lustrous. Antennae 31-segmented. Stigma yellow. Head black, genae yellowish; thorax and abdomen dark brownish or reddish yellow, below thorax and 3 spots on mesonotum black, anterior half of propodeum and sometimes even thorax darkened; 1st abdominal tergite black, 2nd dark brown. Fig. 26: 1–3. Body 3.2. South, southwest; Hungary ..... *C. vividus* Papp
- 40 (39). First abdominal tergite longer, 1.3 times as long as width at apex (Fig. 26: 4). First section of radial vein 1/3 as long as 2nd. Ovipositor valves as long as first 2 segments of hind tarsi. Propodeum almost entirely rugose. Antennae 28–30-segmented. Stigma dark brown. Head including genae, thorax and 1st abdominal tergite black; abdomen dark brownish yellow, sometimes prothorax, upper part of sides of mesothorax, stripes on mesonotum along notaulices dark brownish yellow. Body 3.8. Parasite of mining larvae of lepidopterans *Lithocolletis geniculella* Rag., *L. muelleriella* Z. (Gracillariidae), *Tischeria ekebladella* Bjerck., *T. heinemanni* Wek., (Tischeriidae), and dipterans *Phytomyza ranunculi* Schr., *P. albipes* Mg., *P. flava* Fall. (Agromyzidae). North, northwest, south, central Ural; Kazakhstan, Far East; Western Europe ..... *C. flavitarsis* Thoms.  
 Lectotype: Female—"Pal." (=Pålsjö). Preserved in Lund University Museum (Sweden).
- 41 (38). Thorax shorter, 1.6–1.7 times as long as high. Head behind eyes less narrowed (Figs. 25: 10; 26: 5). Body small: 2–2.5.
- 42 (43). First abdominal tergite narrowed towards base from projecting tubercle, as long as width at apex. First and 2nd sections of radial vein forming distinct angle. Second radiomedial cell longer. Head, thorax and 1st abdominal tergite black; abdomen brown or dark brown; legs yellow, tarsi darkened, Fig. 26: 5–7. Body 2.2. North; Hungary .....  
 ..... *C. subquadratus* Papp
- 58

1–3—*Colastes vividus*: 1—head, 2—part of forewing, 3—1st abdominal tergite; 4—*C. flavitarsis*, 1st abdominal tergite; 5–7—*C. subquadratus*: 5—head, 6—forewing, 7—1st abdominal tergite, 8–15—*C. laevis*: 8—body, 9—head, dorsal view, 10—head, frontal view, 11—mesonotum, 12—propodeum, 13—wings, 14—hind leg, 15—abdominal tergites 1–3.

- 43 (42). First abdominal tergite uniformly narrowed from apex to base, 1.3 times as long as width at apex. Second section of radial vein forming almost straight line with 1st section; 2nd radiomedial cell shorter. Body dark brown or brown, only 2nd and 3rd abdominal tergites lighter colored (sometimes yellowish brown); tarsi not darkened, like remaining parts of legs light yellow. Fig. 25: 10–12. Body 2.2–2.4. North; southern Austria; Bulgaria; Romania..... **C. gracilis** Papp
- 44 (37). Ovipositor slightly shorter than abdomen, second abdominal tergite basally with longitudinal wrinkles. Head behind eyes roundly narrowed, temples 2/3 as long as eyes. Face 2 times as wide as its height with clypeus. Antennae slightly longer than body, 21-segmented; 1st flagellar segment somewhat longer than 2nd, 2 times as long as wide. Thorax 1.5 times as long as high, notaulices deep. Radial vein originating from middle of stigma; 1st section of radial vein half as long as 2nd; nervulus very short so that brachial cell strongly narrowed proximally and submedial cell distally. Hind femora 4 times as long as wide. Propodeum densely rugose-punctate, 1st abdominal tergite with numerous longitudinal wrinkles with inconspicuous punctures. Body black or dark brown; palps, basal segment of antennae, tegulae and legs yellow; wings light colored, stigma light brown. Krasnodar Territory. ....  
..... **C. aciculatus** Tobias, sp. n.
- Holotype: Female, Sochi (Lazarevskoe), terraced slopes, forest, 7.V.1979 (Tobias). Paratypes: 2 females, same place, 15.VI.1979 and 24.V.1983 (Tobias).

30. **Proacrisis** Tobias, 1983<sup>1</sup>—Five species (besides the two Far Eastern species—*P. striatus* Tobias and *P. orientalis* Tobias—both described from the USSR).

- 1 (2). Hind tibiae thickened, with granulose sculpture, dark colored (male!). Mesonotum with granulose sculpture. Second abdominal tergite smooth. Antennae 15-segmented, shorter than body; 1st flagellar segment 4 times as long as wide. Prosternum with a tubercular prominence. Fig. 27: 1, 2. Body 1.3–1.4. Krasnodar Region (Sochi). Norway; Finland .....  
..... **P. rarus** Tobias

<sup>1</sup> Tobias, 1983. Tr. Vsesoyuzn. Entomol. Ob-va, 65: 155–168.



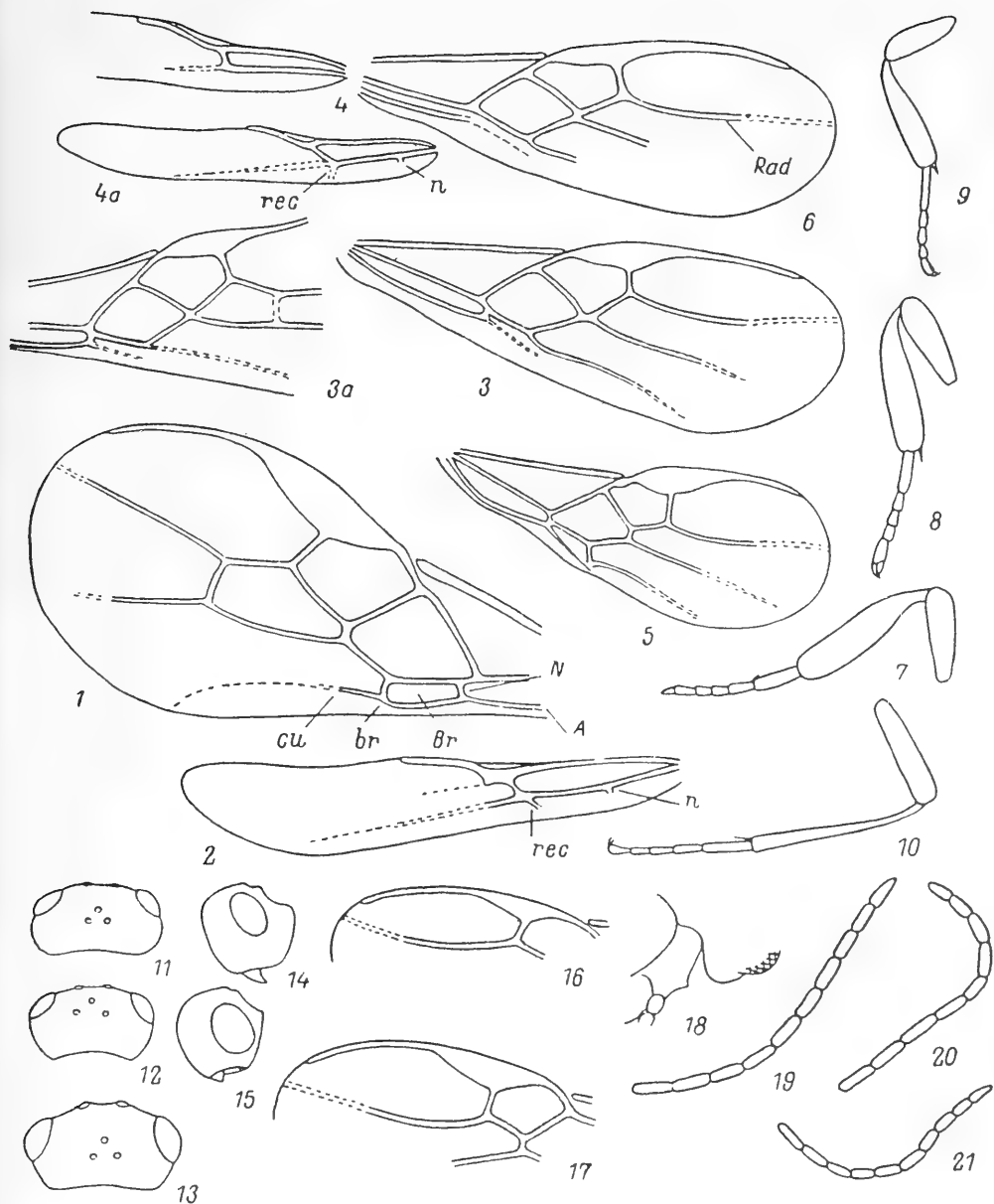


Fig. 27. Doryctinae (from Tobias).

1, 2—*Proacrisis ranus*: 1—forewing, 2—hind wing; 3, 4—*Acrisis fuscipes*: 3—forewing (3a—aberration), 4—hind wing (4a—aberration); 5, 6—forewings: 5—*A. brevicornis*, 6—*A. clavipes*; 7–10—hind legs, male: 7—*A. suomii*, 8—*A. koponeni*, 9—*A. clavipes*, 10—*A. fuscipes*; 11–13—head, dorsal view: 11—*A. suomii*, 12—*A. koponeni*, 13—*A. clavipes*; 14, 15—head, lateral view: 14—*A. suomii*, 15—*A. clavipes*; 16–17—part of forewings: 16—*A. suomii*, 17—*A. koponeni*; 18—*A. koponeni*, prosternum with adjoining parts of body, 19–21—flagellum, male: 19—*A. koponeni*, 20—*A. fuscipes*, 21—*A. brevicornis*.

- 2 (1). Hind tibiae thin, more slender than hind femora, without granulose sculpture, colored like femora or slightly darker (female!).
- 3 (6). Hind wings with distinct nervellus and recurrent vein (Fig. 27: 2). Prosternum lacking prominence or it is weak and rounded. Second abdominal tergite smooth or longitudinally weakly striate; suture between 2nd and 3rd tergites indistinct.
- 4 (5). Mesonotum with granulose sculpture. First flagellar segment 4 times as long as wide. Prosternum with somewhat distinct tubercular prominence. Antennae 14–15-segmented, preapical segment much less than 2 times as long as wide. ....  
..... **P. rarus** Tobias
- 5 (4). Mesonotum smooth. First flagellar segment 5 times as long as wide. Prosternum lacking tubercular prominence. Body 1.3. Eastern Siberia; Finland. .... **P. levis** Tobias
- 6 (3). Hind wing lacking nervellus and recurrent vein (cf. Fig. 27: 4). Prosternum with acute prominence (Fig. 27: 18). Second abdominal tergite entirely longitudinally rugose, suture between 2nd and 3rd tergites deep in middle, smooth on edges. Mesonotum smooth. Antennae 12-segmented, 1st flagellar segment 5 times as long as wide, preapical 2 times as wide. Body 1.3. Krasnodar Region (Sochi) ..... **P. acutus** Tobias
31. *Acrisis* Förster, 1982<sup>1</sup>.—Eight species (2 Nearctic, 6 Palearctic).
- 1 (16). Wings developed.
- 2 ( 7). Hind tibiae thickened, not thinner than femora (Fig. 27: 7–9), contrastingly dark colored, with granulose sculpture; matte (male!).
- 3 ( 6). Stigma lanceolate, radial vein originating from its middle. Abdomen in basal half dark brown or yellowish dark brown, hind tibiae dark brown to black. Temples roundly narrowed from middle (Fig. 27: 11, 12).
- 4 ( 5). Prosternum lacking angular projection. Stigma narrower, fairly gradually merging into metacarpus; 2nd segment of radial vein slightly arcuately curved. First flagellar segment 6 times as long as preapical, 3 times as wide. Mesonotum with soft granulose sculpture, longitudinally striate. Base of ocellar triangle 1/2 as long as ocellocular distance. Longitudinal

<sup>1</sup> Tobias, 1983. *Tr. Vsesoyuzn. Entomol. Ob-va*, 65: 155–168.

- diameter of eye slightly more than height of genae, almost half width of face. Hind femora thinner than hind tibiae, 4 times as long as wide; hind tarsi not shortened, their 2nd segment 2 times as long as wide. Fig. 27: 7, 11, 14, 16. Finland ..... **A. suomii** Tobias
- 5 ( 4). Prosternum with angular pointed projection. Stigma broader, distinctly separated from metacarpus; 2nd section of radial vein with weak but distinct 'S'-shaped bend. First flagellar segment 5 times as long as preapical, 2–2.5 times as long as wide. Mesonotum smooth. Base of ocellar triangle as long as ocellocular distance. Longitudinal diameter of eye 2 times height of genae, slightly less than width of face. Hind femora thickened, of same width as hind tibiae or wider, 3 times as long as wide; hind tarsi shortened, their 2nd segment 1.5 times as long as its width at apex. Fig. 27: 8, 12, 17–19. Body 0.9–1. North, northwest; Finland ..... **A. koponeni** Tobias
- 59 6 ( 3). Stigma very narrow, almost parallel-sided; radial vein distinctly originating beyond its middle. Basal half of abdomen dark brown-yellowish, hind tibiae dark brown. Temples strongly narrowed from eyes (Fig. 27: 13, 15). ..... **A. clavipes** Marsh.
- 7 ( 2). Hind tibiae not thickened, thinner than femora, more or less same color, almost smooth, lustrous.
- 8 (13). Antennae as long as body, 1st flagellar segment 6 times as long as preapical, 3 times as long as wide (Fig. 27: 20). Antennae 11-segmented in female, 12-segmented in male. Base of ocellar triangle approximately 1.5 times as long as ocellocular distance. Mesonotum and propodeum with granulose sculpture (sometimes weaker).
- 9 (12). Stigma lanceolate, distinctly separated from metacarpus, radial vein originating from its middle (Fig. 27: 16). Abdomen dark colored.
- 10 (11). Legs dark brownish yellow. Mesonotum with weak, softly granulose sculpture, somewhat distinctly longitudinally striate. Body 1. (Female). Finland..... **A. suomii** Tobias (female).
- 11 (10). Legs dark brownish with darkened coxae or also with femora. Mesonotum with dense granulose sculpture. Body 1. (Male, female). Finland ..... **A. fuscipes** Hellén
- 12 ( 9). Stigma very narrow, almost parallel-sided, apically gradually merging into metacarpus, radial vein clearly originating beyond its middle. Temples strongly narrowed from

- eyes. Abdomen in basal half and legs dark brownish yellow. Fig. 27: 6, 13. Body 1—1.2. (Female). Center; Western Europe ..... **A. clavipes** Marsh.
- 13 ( 8). Antennae distinctly shorter than body, 12-segmented; 1st flagellar segment 3.5—4 times as long as preapical, 1.5 times or more as long as wide (Fig. 27: 21). Base of ocellar triangle slightly shorter than ocello-ocular distance. Mesonotum and propodeum (except distinct ridges on them) smooth.
- 14 (15). Female ..... **A. koponeni** Tobias
- 15 (14). Male. Finland ..... **A. brevicornis** Hellén
- 16 ( 1). Wings reduced to short scales, lacking veins. Body 1.3. North (Kola Peninsula) ..... **A. apterus** Hellén

32. **Eupambolus** Tobias, 1964.—Two species.

- 1 (2). Suture between 2nd and 3rd abdominal tergites distinct; abdomen with densely granulose sculpture; 1st abdominal tergite short, roundly narrowing towards base. Body dark brown. Fig. 28: 1; 2.3. Kazakhstan ..... **E. apterus** Tobias
- 2 (1). Suture between 2nd and 3rd abdominal tergites very weak; 1st abdominal tergite entirely and 2nd basally with rugose sculpture, remaining tergites very weakly sculptured, almost smooth; 1st abdominal tergite elongate, rectilinearly narrowed toward base. Body dark brown, 2.5. Central Asia. ...  
..... **E. amankutani** Belok.

33. **Chremylus** Haliday, 1833.—Two species; one in the Palearctic.

- 1 (1). Ovipositor as long as abdomen or slightly shorter. Body black or dark brown, legs yellowish dark brown. Fig. 31: 1. Body 1—2. Parasite of many, particularly lepidopteran and coleopteran storage pests: *Ephestia kuehniella* Z. (Phycitidae), *Pyralis farinalis* L. (Pyralidae), *Rhyacionia buoliana* Den. and Schiff., *Archips xylosteana* L. (Tortricidae), *Tinea pellionella* L., *T. secalella* Zacher., *Nemapogon granellus* L., *Tineola biselliella* Hum., *Niditinea fuscipunctella* Hw. (Tineidae), *Ernobius abietis* F., *E. angusticollis* Ratz., *E. longicornis* Sturm., *E. mollis* L., *Stegobium paniceum* L. (Anobiidae), *Bruchidius seminarius* L., *B. granarius* L., *Bruchus atomarius* L., *B. rufimanus* Boh., *B. lentis* Fröl. (Bruchidae), *Pityogenes bidentatus* Hbst. (Scolytidae), *Sitophilus granarius* L., *S. oryzae* L. (Curculionidae)—Distributed all over the world with storage pests ..... **C. elaphus** Hal. (*rubiginosus* Nees)

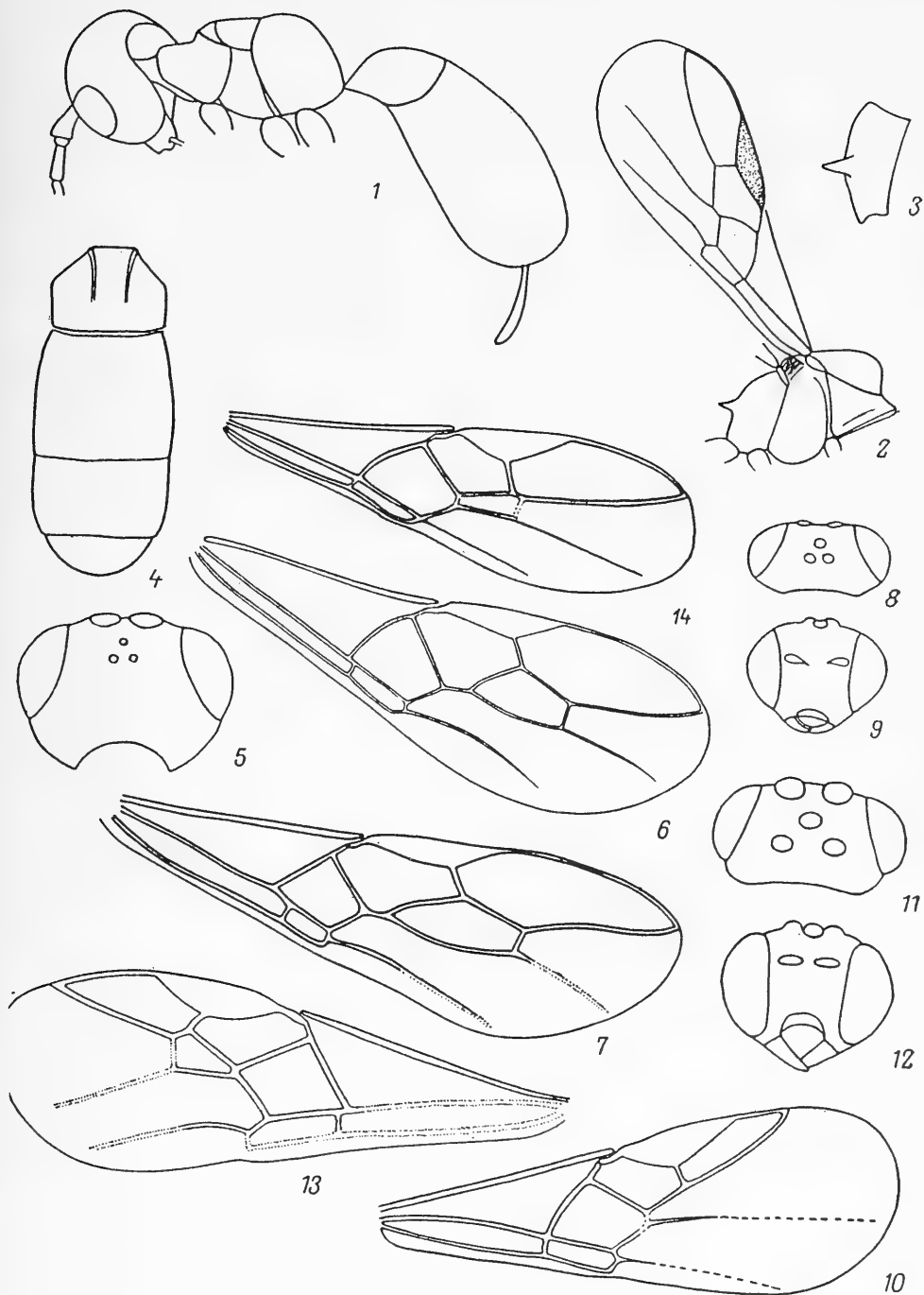


Fig. 28. Doryctinae (from Tobias).

1—*Eupambolus apterus*, body; 2—3—*Pambolus dubius*: 2—thorax and forewing, 3—propodeum; 4—*Lysitermus longiventris*, abdomen; 5, 6—*Noserus flavicoxa*: 5—head, 6—forewing; 7—*N. facialis*, forewing; 8—10—*Pseudohormius radialis*: 8—head, dorsal view, 9—head, frontal view, 10—forewing; 11—13—*Avga dorsomaculata*: 11—head, dorsal view, 12—head, frontal view, 13—forewing.

34. **Pambolus** Haliday, 1836 (*Phaenodus* Först., *Parapambolus* Dahl). Twenty species; of these more than half described from the Palearctic. Rare and poorly studied species.

- 1 (10). Wings developed, forewings with 2 radiomedial veins. (Subgenus *Phaenodus* Först.).
- 2 ( 7). Antennae entirely black. Propodeum with small denticles on sides. In male veins of hind wings well developed.
- 3 ( 4). Radial cell on forewing narrow, not reaching alar apices (Fig. 32: 1). Antennae 1.5 times as long as body, 22-segmented; middle segments of flagellum of male 1.5–2 times as long as wide. Head and thorax with dense granulate sculpture, matte; 2nd abdominal tergite more or less sculptured. Body black, legs dark brown. Body 1.5–2. Center, southwest; Kazakhstan; Finland .....  
..... **P. (Ph.) rugulosus** Hellén.
- 4 ( 3). Radial vein almost reaching alar apex, sometimes not broad. Antennae almost 2 times as long as body, their middle segments 2–2.5 times as long as wide. Head and sides of thorax smooth in middle, lustrous. Temples roundly narrowed, slightly but distinctly shorter than eyes. Face almost square; abdomen 1.5 times as high as long. First abdominal tergite slightly longer than its width at apex. Propodeum with granulate sculpture, reticulate-rugose, in lower half horizontal folds predominate, in middle with large elongate cell and transverse ridges on its sides, folds separating field in basal part of propodeum semicircular, field almost without wrinkles; mesonotum with soft granulate sculpture.
- 5 ( 6). Propodeum in lower half with numerous transverse folds; denticles on propodeum large, as long as tegulae. Second abdominal tergite usually longitudinally rugose. Antennae 26–30-segmented; basal segment and legs dark brownish yellow; wings light colored or slightly darkened. Body 1.5–2. Southwest, Krasnodar Region, Central Ural .....  
..... **P. (Ph.) pallipes** Först., f. **magnus** Tobias f. n.
- 61 6 ( 5). Propodeum in lower half with few transverse folds (2–3 within median cell); denticles of propodeum small, much shorter than tegulae. Second abdominal tergite smooth or only basally with weak wrinkles. Antennae 20–25-segmented. Body dark brown; basal segment of antennae and legs yellowish dark brown; wings slightly darkened (male!). Body

- 1.2–1.5. Northwest, Moldavia, Ukraine; Western Europe ..  
 ..... **P. (Ph.) pallipes** Först.  
 Material: 2 males, Leningrad Region, Tolmachevo, 18  
 and 19.VIII.1960 (Tobias); Moldavia—1 male, Strashenij  
 5.VI.1967 (Tobias); 1 male, Kotovskoe, 4.VI.1967 (Tobias);  
 1 male, Kanev, preserve, forest, 22.V.1975 (Tobias) (material  
 corresponding to lectotype: male, “24/724”, “Aachen”,  
 “Frst.”, “*pallipes* Frst.”).
- 7 ( 2). Antennae with white segment in apical part. Propodeum with  
 large denticle on sides (Fig. 28: 2, 3). Head and thorax with  
 granulose sculpture. Body black; head reddish below, legs  
 dark brownish yellow.
- 8 ( 9). Antennae 18-segmented, with white segments from 14th.  
 Wings short and narrow (female!). Body 2. Northern Eu-  
 rope ..... **P. (Ph.) pallipes** Först.
- 9 ( 8). Antennae 22-segmented, with white segments from 17th.  
 Wings normally developed (Fig. 29). Middle of abdomen  
 reddish. Body 4. Spain ..... **P. (Ph.) chalveri** Docavo
- 10 ( 1). Female apterous, in male wings with one radiomedial vein.  
 Head and thorax with granulose sculpture (Subgenus *Pam-  
 bolus* s. str.).
- 11 (12). First abdominal tergite semicircular, longitudinally rugose,  
 but lacking distinct longitudinal ridges. Antennae 16–17-  
 segmented in female, 19–21-segmented in male. Ovipositor  
 one-fourth as long as abdomen, 2nd and 3rd abdominal ter-  
 gites with weakly granulose sculpture, lustrous. Body dark  
 brown or dark brownish yellow, 2–2.5. Parasite of goldeneye  
*Phaenops cyanea* F. South; Kazakhstan; Western Europe ..  
 ..... **P. (P.) mirus** Ruthe
- 12 (11). First abdominal tergite rectilinearly narrowed towards base  
 with two distinct posteriorly convergent longitudinal ridges,  
 longer than width at apex, 2nd abdominal tergite basally usu-  
 ally longitudinally rugose.
- 13 (14). Antennae entirely black, 18–33-segmented. Body black or  
 dark brown, legs reddish dark brown, often somewhat  
 darkened. Fig. 28: 2, 3. Body 1.5–2. South; Transurals,  
 Kazakhstan; Western Europe ..... **P. (P.) dubius** Ruthe
- 14 (13). Antennae apically with white segments, 19–20-segmented in  
 female, 22-segmented in male. Body reddish dark brown, head  
 black, legs yellow. Ovipositor one-fourth as long as abdomen.  
 Body 1–2. Central Europe ..... **P. (P.) tricolor** Ruthe

63 35. *Acanthormius* Ashmead, 1906.—Three species in the Palearctic, one (*A. rossicus* Tobias and Belok.) is found in the southern parts of the Far East USSR; two others are described from Japan.

36. *Tritermus* Achterberg, 1982.—One species—Fig. 30.

1 (1). Body dark brown, legs yellowish dark brown. Body 1.5. Eastern Kazakhstan (Saur Range) ..... *T. tobiasi* Acht.

37. *Lysitermus* Förster, 1862 (*Rogadinaspis* Bouček, *Paracedria* Hedqv., *Prolysitermus* Tobias).—Two species.

64 1 (2). First and 2nd abdominal tergites transverse, 3rd sculptured like 1st and 2nd, posteriorly with semitransparent margin.

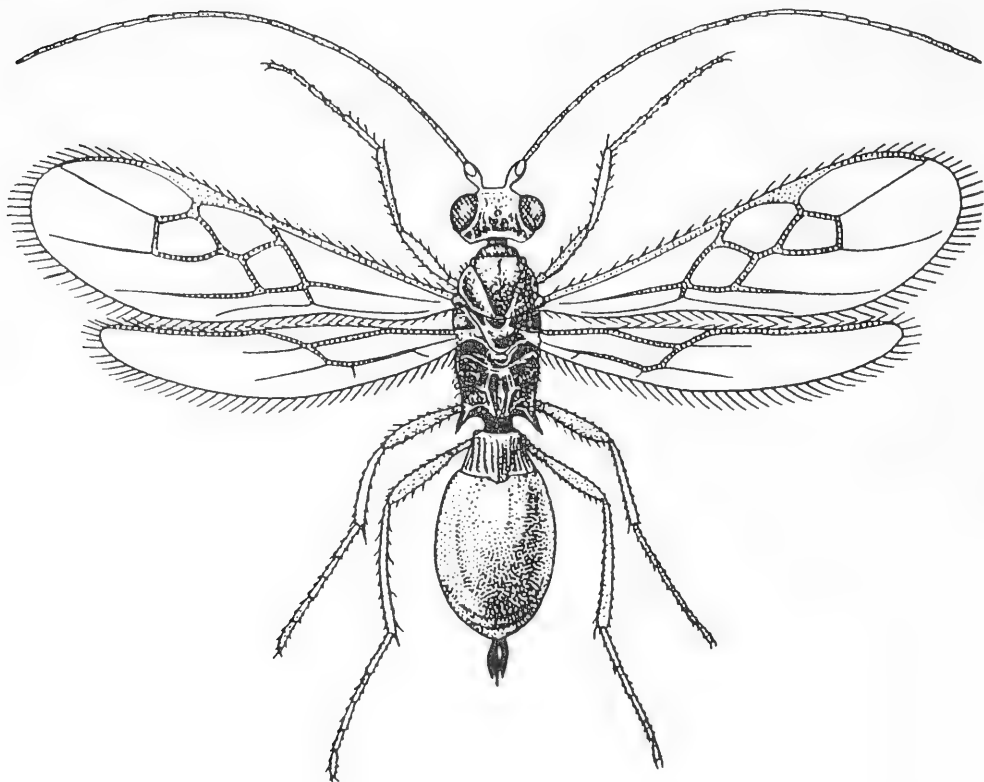


Fig. 29. Doryctinae (from Docavo Alberti).

*Pambolus (Phaenodus) chalveri* Docavo Alberti.



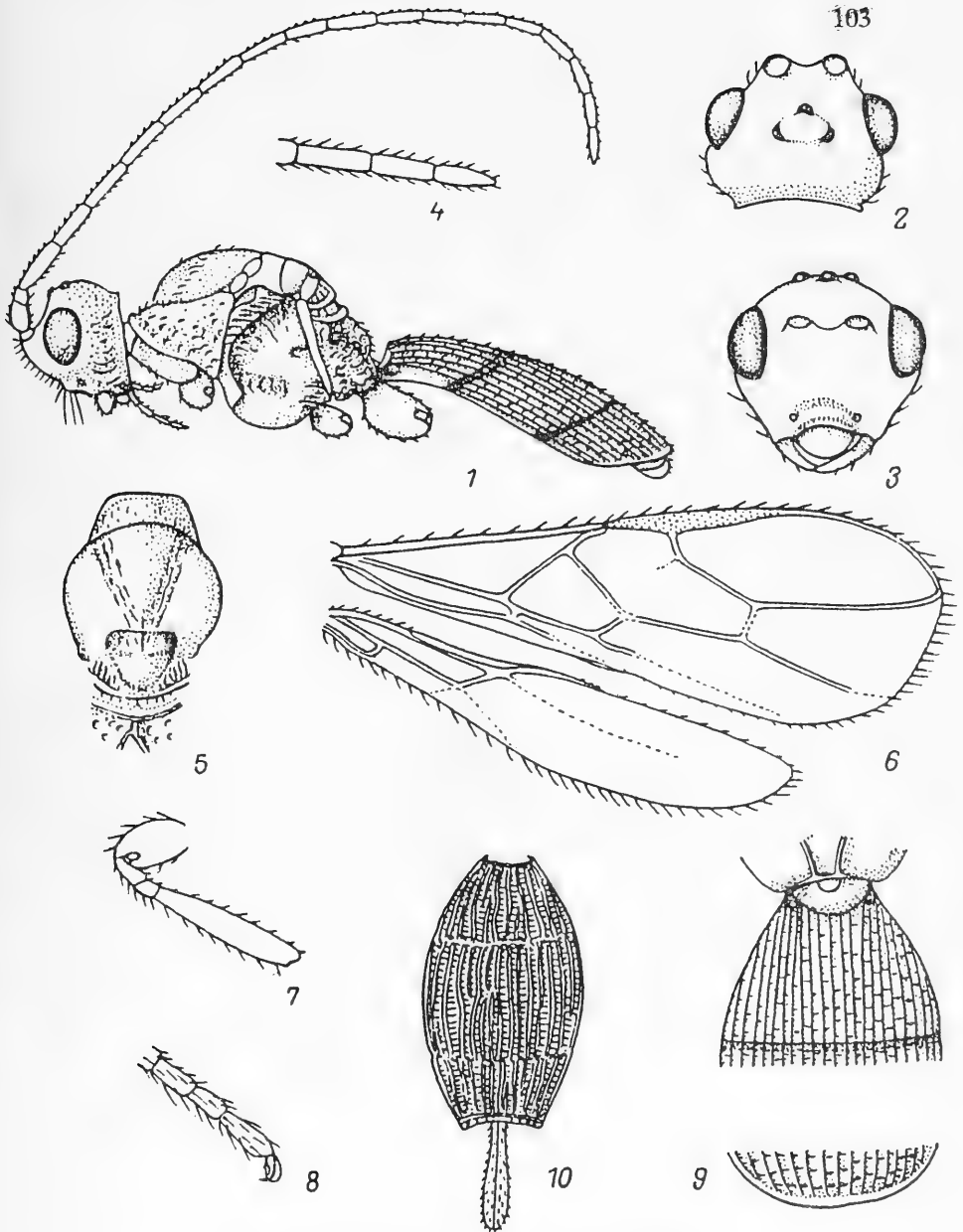


Fig. 30. Doryctinae (from Achterberg and Hedqvist).

1-9—*Tritermus tobiasi*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—antennal apex, 5—mesonotum, 6—wings, 7—hind coxa and femur, 8—3rd-5th segments of hind tarsus, 9—1st tergite and apex of 3rd abdominal tergite; 10—*Lysitermus pallidus*, abdomen.

Face slightly broader than high, width of oral cavity greatly exceeding distance from it to eyes. Body dark brown; 1st and 2nd abdominal tergites and legs yellowish dark brown, wings slightly darkened. Figs. 30: 10; 32: 2; 34: 1. Body 1.6. Moldavia, Krasnodar Region (Sochi); Western Europe.....

..... **L. pallidus** Först (*P. talitzkii* Tobias, syn. n.).

- 2 (1). First abdominal tergite as long as its width at apex, 2nd longer than its width at apex (Fig. 28: 4), 3rd sculptured much weakly than preceding two tergites, lacking longitudinal folds (unlike 1st and 2nd tergites), posteriorly lacking semitransparent border. Face 2 times as wide as high; width of oral cavity equal to distance from it to eyes. Body black, abdomen and legs dark brown. Body 1.2. Krasnodar Region (Sochi) ..... **L. longiventris** Tobias

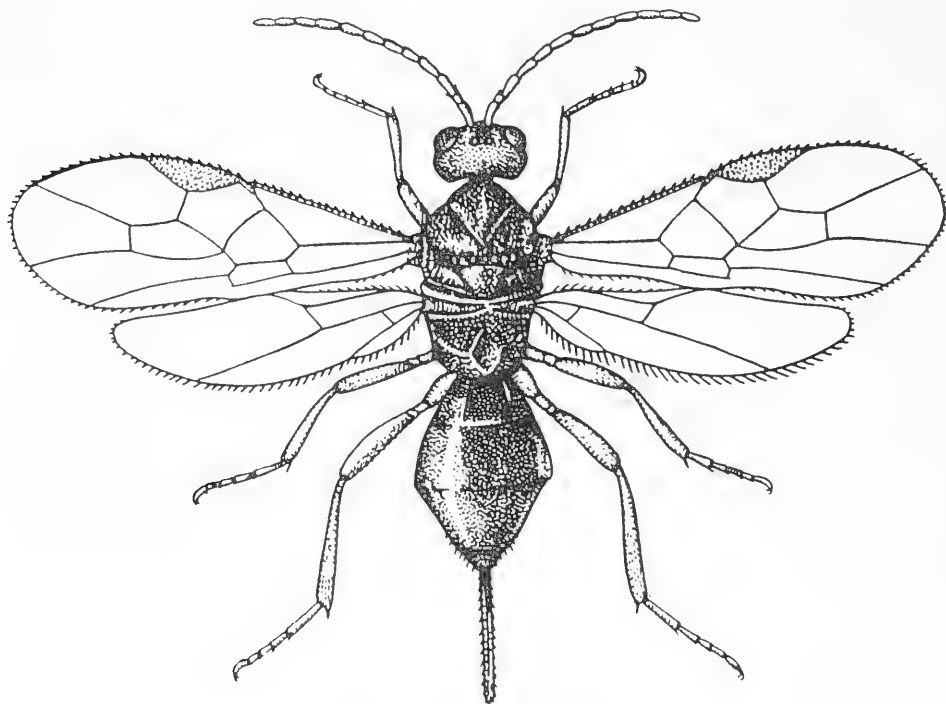


Fig. 31. Doryctinae (original).

*Chremylus elaphus* Hal.

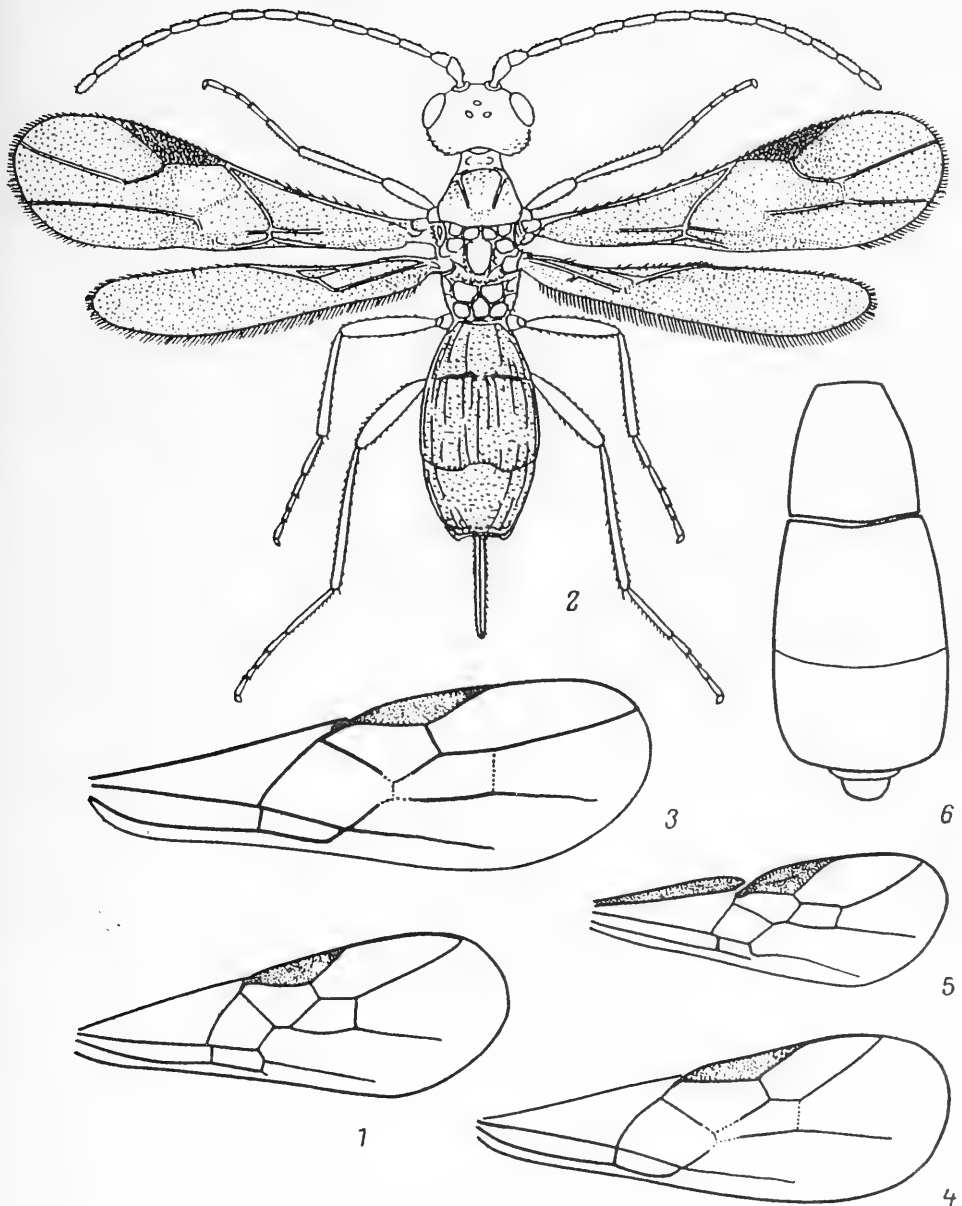


Fig. 32. Doryctinae (from Boucek and Tobias).

1—*Pambolus nigulosus*, forewing; 2—*Lysitermus pallidus*, general appearance;  
 3—5—forewings: 3—*Hormius moniliaus*, 4—*H. radialis*, 5—*Clinocentrus stigmaicus*;  
 6—*C. caucasicus*, abdomen.

38. **Noserus** Förster, 1862 (*Pseudavga* Tobias, syn. n.)—Two species.

- 1 (2). Median ridge on propodeum long, reaching its middle; field in basal half of propodeum smooth or with weak granulo-seulpture. Sternauli smooth, mesonotum anterior to prescutellar depression usually lacking rugose sculpture, notaulices smoothed. First abdominal tergite slightly longer than its width at apex or equal to it. Stigma of male not enlarged, yellow. Body yellow. Fig. 28: 5.6. Body 2—2.3. South; Central Asia, Kazakhstan, Pacific Coastal Region .....  
..... **N. flavicoxa** Tobias, comb. n.
- 2 (1). Median ridge on propodeum short, forked in its upper part; entire propodeum with deeply rugose sculpture. Sternauli crenulate. Mesonotum anterior to prescutellar depression with distinct rugose sculpture, notaulices deep throughout their length. First abdominal tergite approximately 1.3 times its width at apex. Stigma of male distinctly enlarged, black. Body black. Fig. 28: 7. Body 2.2—2.4. Parasite of miner *Bucculatrix ulmella* Z. (Bucculatricidae). South; Kazakhstan, Altai, Magadan Region; Mongolia; Central Europe .....  
..... **N. facialis** Först (*Pseudavga brevicauda* Tobias, syn. n.)

39. **Parahormius** Nixon, 1940—Twenty species, mostly from the tropics.

- 1 (1). Radial and 2nd radiomedial cells short. Antennae 23-segmented. Mesonotum with longitudinal furrow. Body smooth; depression in upper part of sides of mesothorax and deep sternauli rugose; propodeum with dense rugose-punctuation; upper part of sides of metathorax with deep transverse folds. Second and 3rd abdominal tergites coriaceous in middle. Body yellowish dark brown; legs, 1st tergite and coriaceous parts of abdomen yellow; wings light colored; stigma yellowish. Body 1.8. Moldavia .....  
..... **P. radialis** Tobias, sp. n.

Holotype: Female, Kishinev, pear, parasite of *Lithocolletis blancardella* F. (Gracillariidae), 16.VIII.1962 (Talitskii).

40. **Avga** Nixon, 1940 (*Popoviella* Tobias; *Pseudobiosteres* Hedwig, syn. n.).—Six species, 5 in the Palearctic.

- 1 (6). Radial cell of forewing not shortened. Mesonotum not highly pubescent.
- 2 (5). Temples  $2/3-1/2$  transverse diameter of eye. Body brown.
- 3 (4). Propodeum lacking fields, entirely with granulose sculpture. Stigma very narrow, 6 times as long as maximum width. First abdominal tergite smooth in middle, along margins with weak wrinkles. Temples  $2/3$  of eye; face much broader than high, as wide as longitudinal diameter of eye. Antennae slightly longer than body, 22-segmented; segment in middle part of flagellum  $2/5$  as long as wide. Sternauli smooth. Radial vein originating anterior to middle of stigma but closer to it; 2nd section of radial vein 1.5 times as long as 1st,  $1/4$  as long as 3rd,  $2/3$  as long as 1st radiomedial vein. Hind femora 4 times as long as wide. First abdominal tergite almost parallel-sided, only in basal third somewhat narrowed, 1.3 times as long as width at apex. Ovipositor valves half as long as abdomen. Upper part of thorax including propodeum with fine rugose sculpture, slightly lustrous, sides of thorax smooth. Body yellowish dark brown; stigma dark brownish yellow. Body 1.5. Krasnodar Region ..... **A. caucasica** Tobias, sp. n.  
Holotype: Female, Sochi (Lazarevskoe), forest along the rivulet. 18.V.1979 (Tobias).
- 4 (3). Propodeum with weaker fields, in apical third with irregularly rugose sculpture, basally with granulose sculpture. Stigma wide, 3.5–4.5 times as long as maximum width. First abdominal tergite entirely coarsely rugose, almost parallel-sided. Body 2.5–2.7. Parasite of *Eupoecilia ambiguella* Hb. (Tortricidae), *Pseudotelphusa paripunctella* Thunb. (Gelechiidae). Center (Voronezh), south; Chita Region; Finland .....  
..... **A. opaca** Hellén, comb. n. (*europaeica* Tobias, syn. n.)  
Lectotype: Female, Finland, "Parikkala 961" (Hellén).
- 5 (2). Temples somewhat shorter than transverse diameter of eye or equal to it. Body dark brown, almost black. Propodeum lacking fields, entirely with granulose sculpture. First abdominal tergite broadened up to its middle, then slightly narrowed toward apex. Body 1.8–2.2. Kazakhstan .... **A. kasachstanica** Tobias

- 6 (1). Radial cell of forewing shortened (Fig. 28: 13). Mesonotum with dense appressed hair. Eyes large, temples short (Fig. 28: 11, 12). Propodeum lacking fields; like head, upper side of thorax and abdominal tergites with granulose sculpture. Antennae 26-segmented. Body dark brownish yellow, wings light colored, stigma yellow. Body 2.5–3. Central Asia; Afghanistan .....  
 ..... **A. dorsomaculata** Hedwig (*Popoviella pilosa* Tobias)<sup>1</sup>

67 41. **Hormius** Nees, 1818 (*Hormisca* Tel.).—Twenty species; 7 in the Palearctic found basically in the southern USSR and, possibly, in the southwestern European part of the USSR.

- 1 (2). Radial cell of forewing not shortened, terminated at wing apex (Fig. 32: 3). Head above with transverse wrinkles or smooth. Color variable: thorax and head yellowish dark brown or black. Body 2–3. Parasite of lepidopterans *Pexicopia malvella* Hb. (Gelechiidae), *Scythris inspersella* Hb. (Scythrididae), *Pyrausta aurata* Scop., *Microstega hyalinialis* Hb., *Loxostege nudalis* Hb. (Pyraustidae), *Coleophora trifariella* Z. (Coleophoridae), *Archips crataegana* Hb. (Tortricidae). Except north; Caucasus, Kazakhstan, Central Asia, Eastern Siberia, Far East; Western Europe .....  
 ..... **H. moniliatus** Nees (*similis* Szépl., syn. n.)

- 2 (1). Radial cell of forewing shortened. Head smooth above. Body yellowish dark brown. Temples half or less than half of transverse diameter of eye.

- 3 (6). Anterior margin of radial cell as long as stigma; 2nd section of radial vein well developed (Figs. 32: 4; 34: 2).

- 4 (5). Head smooth, propodeum anteriorly with smooth sculpture. Body 2–2.5. Azerbaidzhan, Kazakhstan, Central Asia .....  
 ..... **H. radialis** Tel.

Lectotype: Female, Kirovabad Region, Geoktapa, 20.VII.1901. Paratype: Female, same as above.

<sup>1</sup>van Achterberg (1980. *Entomol. Ber.*, 40, 2: 25–31) synonymized *P. pilosa* with *Pseudobioctes dorsomaculatus* Hedwig, described in the subfamily Opiinae. Regardless of Hedwig's status as a systematist, the latter fact coupled with his description of the very rare species *dorsomaculata* in which he assumed the presence of pigmented spots on the mesonotum (in *P. pilosa* the body is always uniformly light colored), compels us to suggest that the type designated by Hedwig could not correspond to the species described by him.

- 5 (4). Head rugose-punctate above, with transverse folds; propodeum coarsely rugose-punctate. Body 2.5–3. Southeast (Khar'kin on Ural River); Turkmenia .....  
..... **H. sculpturatus** Tobias
- 6 (3). Anterior margin of radial cell half or less than half of stigma; 2nd section of radial vein very short, punctiform or hardly developed.
- 7 (8). Anterior margin of radial cell half as long as stigma; 2nd section of radial vein and 1st radiomedial vein developed, 3rd section of radial vein straight (Fig. 34: 3). Body 2–2.5. Azerbaidzhan, Central Asia ..... **H. extimus** Tobias
- 8 (7). Anterior margin of radial cell  $1/4$ – $1/6$  as long as stigma; 2nd section of radial vein and often 1st radiomedial vein not developed, 3rd section of radial vein arcuately curved (Fig. 34: 4). Body 2–2.8. Western Kazakhstan, Central Asia; northern Africa; Iran ..... **H. tatianae** Tel. (*breviradiatus* Tobias)  
Lectotype: *Hormisca tatianae* Tel: Female, "Chelkar, 10.VIII.1932 (Luk'yanovich)."

42. **Pseudohormius** Tobias and Alexeev, 1973.—Two species in the Palearctic, third in South Africa. The Mediterranean *P. radialis* Tobias and Alexeev is distinguished by the very short radial cell and the absence of the 2nd radiomedial vein in the forewing and distinctly developed eyes (Fig. 28: 8–10).

- 1 (1). Radial cell reaching wing apex, both radiomedial veins developed (as in Fig. 32: 3). Antennae 24-segmented. Ovipositor valves as long as 1st segment of hind tarsi. Body for greater part smooth, yellow, 2.3. Krasnodar Region (Gelendzhik); Turkmenia, Tadzhikistan .....  
..... **P. turkmenus** Tobias and Alexeev

43. **Cerophanes** Tobias, 1971.—Two species in the Palearctic.

- 1 (2). Radial cell of forewing shortened. Process of scape short, weak (Fig. 34: 7). Stigma yellow. Body light brown, 2.2–2.5. Central Asia ..... **C. radialis** Belok.
- 2 (1). Radial cell of forewing not shortened. Process of scape long. Stigma dark brown. Body usually black; abdomen posterior to 1st tergite and sometimes mesonotum dark brown. Fig. 34: 5, 6. Body 2.4–3. Southwest, Central Ural, Caucasus, Kazakhstan; Bulgaria ..... **C. kerzhneri** Tobias

44. *Rhysipolis* Förster, 1862.—About 10 species in the Palearctic, one more in the Nearctic.

- 1 (6). Occiput above along ridge with usual pubescence, lacking dense cilia. Notaulices sculptured.
- 2 (5). Middle lobe of mesonotum glabrous, hair distinct only along notaulices. Notaulices on mesoscutum smooth or weakly crenulate; areola anterior to prescutellar depression smooth or with weakly rugose sculpture. First abdominal tergite distinctly longer than its width at apex. Radial vein originating anterior to middle of stigma.
- 3 (4). Ovipositor as long as abdomen excluding 1st tergite. Eyes always oval (Fig. 34: 8). Greater part of hind tibiae and entire hind tarsi distinctly darkened. Areola anterior to prescutellar depression always smooth. Body 3—4. Center; Caucasus; Belgium; Sweden ..... **R. decorator** Hal.

(*ruficeps* Wesm., *caudatus* Thoms., syn. n.)<sup>1</sup>

Lectotype *E. ruficeps*: Female—"Coll. Wesmael", "*E. ruficeps* det. C. Wesmael" and paralectotypes: (1 female, 2 males) designated by Belokobylskij, preserved in Brussels; types of *R. decorator* Hal. and *R. mediator* Hal. (cf. couplet 5) preserved in Dublin, designated by Stelfox ("A.W.S." [telfox], 7.VI.1935 and 18.III.1936).

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- 4 (3). Ovipositor half as long as abdomen. Eyes usually roundish. Hind tibiae and tarsi light colored, rarely slightly darkened. Areola anterior to prescutellar depression usually with weakly rugose sculpture. Body 2—3. Caucasus, Pacific Coastal Region ..... **R. enukidzei** Tobias
- 5 (2). Middle lobe of mesonotum entirely, densely pilose, hair light colored. Notaulices complete, usually crenulate; areola before prescutellar depression with strongly rugose sculpture. First abdominal tergite as long as its width at apex or slightly short (Fig. 34: 9). Radial vein originating usually from middle of stigma or slightly posterior to it. Body 3—5. Parasite of flies *Euphranta connexa* F. (Tephritidae), *Pegomyia hyoscyami* Panz. (Anthomyiidae) and lepidopterans *Caloptilia alchimiella* Scop., *C. syringella* F., *C. rufipennella* Hb., *C. robustella* Gäckh, *C. betulicola* Her., *Acrocercops brongiardiella* F. (Gracillariidae), *Pyrausta sticticalis* L.

<sup>1</sup>Lectotype: Female—"Pal (=Pälsjö), preserved in Lund University Museum (Sweden).



(Pyraustidae), *Scrobipalpa atriplicella* F.R., *Anacamptis cornillella* Tr., *Pseudotelphusa luculella* Hb. (Gelechiidae), *Leucoptera laburnella* Stt. (Lyonetiidae). Transpalearctic .....

- ..... **R. mediator** Hal. (*decorator* auct., *variabilis* Szépl., *obscuripes* Thoms., *flavicoxa* Thoms., *intermedius* Wesm., *similis* Szépl., *major* Szépl., *bianchii* Tel., *gigas* Tobias, syn. n.)
- 6 (1). Occiput above along ridge with numerous divergent cilia. Notaulices smooth. Antennae 33–42-segmented. Ovipositor slightly shorter than abdomen. Body usually black, sometimes mesonotum or also sides of thorax yellowish dark brown. Body 2.5–3. Parasite of *Parornix avellanella* Stt., *P. betulae* Stt., *P. devoniella* Stt., *Caloptilia elongella* L. (Gracillariidae). Center, south, Central Ural; Caucasus, Kazakhstan, Irkutsk and Magadan regions, Pacific Coastal Region, Khabarovsk Region, Sakhalin Islands, Kuril Islands .....
- ..... **R. hariolator** Hal.

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45. **Neurocrassus** Šnoflák, 1945.—One species.

- 1 (1). Body dark brown; mouthparts, antennal bases and legs yellow; wings light colored, stigma and veins indistinct, sclerotized area in middle of wing dark brown. Fig. 36: 1. Body 2.3. Czechoslovakia .....
- ..... **N. tesari** Šnofl.

46. **Compressaria** Königsmann, 1959<sup>1</sup>.—One species.

- 1 (1). Head transverse, half as long as wide; Vertex above not bordered. Antennae 28-segmented, 2nd flagellar segment longer than 1st. First abdominal tergite 2.5 times as long as wide. Ovipositor much shorter than abdomen. Body dark brown or yellowish brown, 4.5. Parasite of *Pegomyia* sp. England; Switzerland; Yugoslavia .....
- ..... **C. pugatrix** Marsh.

47. **Pachystigmus** Hellén, 1927.—One species.<sup>2</sup>

- 1 (1). Head above lustrous, face matte. Antennae slightly longer than abdomen, 22-segmented. Mesonotum smooth, notaulices

<sup>1</sup> This genus belongs to the subfamily Opiinae, possibly a synonym of *Opius*; included here because it is described in the given taxonomic group.

<sup>2</sup> The type specimen of the species (male) is preserved in the Zoological Museum of Helsinki University. There is no doubt that it has been wrongly described as an independent genus and belongs to the genus *Noserus* (? syn. *N. facialis* Först.).

distinct; propodeum rugose. Recurrent vein originating from 1st radiomedial cell. First abdominal tergite sculptured, matte, other tergites coriaceous. First abdominal tergite as long as its width at apex. Body black, legs dark brown. (Male!). Body 2. Finland ..... **P. nitidulus** Hellén

70 48. **Artocella** Achterberg, 1980.—One light colored species from Tunisia—*A. brevipalpis* Acht. (Fig. 36: 3–5).

49. **Pseudobathystomus** Belokobylskij, 1986.—Two species.

1 (2). Ovipositor valves  $2/3$  as long as abdomen. Prescutellar depression distinctly crenulate. Temples very thin and densely granulate, matte. Mesoscutum reddish dark brown, remaining thorax black. Body 2.7. Bulgaria (Rodopy) ..... **P. tobiasi** Zaykov

2 (1). Ovipositor valves approximately as long as abdomen. Prescutellar depression smooth, very rarely with weak longitudinal wrinkles. Temples smooth, lustrous. Entire thorax black or dark reddish brown. Fig. 34: 10, 11. Body 2–3. Parasite of butterflies *Carcina quercana* F. and *Borkhausenia augustella* Hb. (Oecophoridae). Northwest, southwest; Kunashir Island; Western Europe ..... **P. funestus** Hal.

50. **Oncophanes** Förster, 1862.—About 10 species, in the Palearctic (and the USSR) 2 or 3. One of them, *O. rugosus* Tel., is from the Pacific Coastal Region. Hellén (1957. *Notul. entomol.*, 37: 33–52) described under genus *Oncophanes* four species from Finland. An examination of the type materials preserved in the Zoological Museum of Helsinki University showed that of these species *O. caudalis* Hellén is a synonym of *Ontsira antica* Woll., *O. flaviceps* Hellén is a synonym of *Opius comatus* Wesm., *O. opacus* Hellén is conspecific with *Avga europaeica* Tobias and *O. obsoletus* Hellén with *Clinocentrus stigmaticus* Marsh.

71 1 (2). Recurrent vein interstitial; tarsi not thin. Head slightly longer than temples. Apical section of radial vein sclerotized as previous section. Propodeum with short longitudinal ridge or without it, with distinct fields. Usually 2nd and sometimes 3rd abdominal tergites sculptured; sides of thorax smooth or sculptured. Body black, sometimes with more or less developed yellowish dark brown pattern. Fig. 33. Body 2–2.5. Parasite of lepidopterans *Croesia forskaleana* L., *Tortrix viridana* L., *Eucosma aspidiscana* Hb., *Archips rosana* L.,

*A. xylostearia* L., *A. sorbiana* Hb., *Spilonota ocellana* F.,  
*Acleris rhombana* Den. and Schiff., *A. variegana* Den. and  
 Schiff., *Eudemis profundana* Den. and Schiff., *Hedya nubifer-*  
*ana* Hw., *Ptycholoma lecheana* L., *Ancylis mitterbacheriana*  
 Den. and Schiff., *Pandemis cerasana* Hb., *Rhyacionia buo-*  
*liana* Den. and Schiff., *Adoxophyes orana* F.R. (Tortrici-  
 dae), *Pseudotelphusa luculella* Hb., *Scrobipalpa acuminatella*  
 Sirc., *Recurvaria leucatella* Cl. (Gelechiidae), *Agonopterix ner-*  
*vosa* Hw. (Oecophoridae), *Choreutis pariana* Cl., *Prochoreutis*  
*sehestediana* F. (Choreutidae); reports about beetles as hosts  
 may be erroneous. Cosmopolitan, Panpalaearctic .....  
 .....*O. laevigatus* Ratz. (*minutus* Wesm., *lanceolator* Nees)

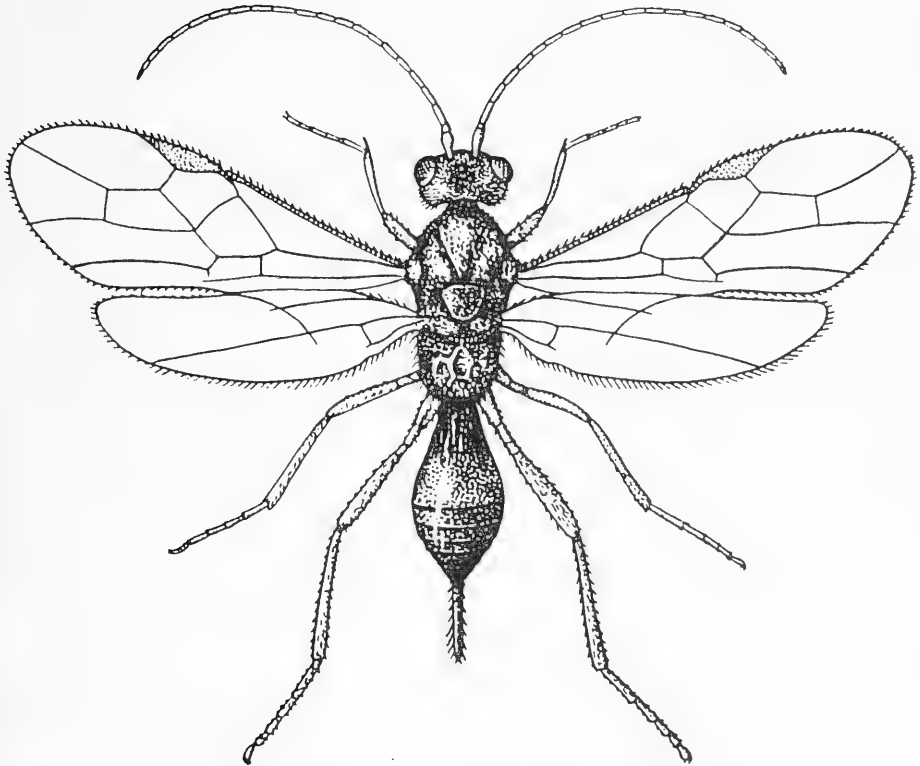


Fig. 33. Doryctinae (original).

*Oncophanes laevigatus* Ratz.

- 2 (1). Recurrent vein antefurcal; tarsi distinctly thinned. Ovipositor valves half as long as abdomen. Radial cell terminating before wing apex. Flagellar segments distinctly (almost moniliform) separate, antennae 27-segmented. Second abdominal tergite with longitudinal wrinkles. Temples almost half as long as eyes. Tarsi very thin, distinctly thinner than flagellar segments. Propodeum softly and densely rugose-punctate, with fairly narrow median cell. Body black; legs yellowish dark brown, hind coxae and palps dark brownish; wings slightly darkened, stigma yellow. Body 2. (Venation of the forewing is very similar to that in species of the genus *Rhysipolis*, however, from the latter this species differs significantly in that its occipital and hypostomal ridges are united and the 2nd abdominal tergite is sculptured.) Krasnodar Territory . . . . .  
 . . . . . **O. tenuipes** Tobias, sp. n.  
 Holotype: Female, Sochi (Lazarevskoe), terraced slopes, forest, 8.V.1979 (Tobias).

51. *Clinocentrus* Haliday, 1833<sup>1</sup>—About 30 species have been described from the Palearctic. However, in variability of color and sculpture, possibly, they are only variants of the most common species *C. excubitor* Hal.

- 1 ( 2). Costal vein thickened, as thick as antennae; in male this vein is still thicker and stigma larger and strongly sclerotized (Fig. 32: 5). Ovipositor half as long as abdomen. Ocellar diameter 1/4 of ocellocular distance. Third abdominal tergite weakly sculptured. Antennae 26–27-segmented. Body in greater part black, 3–4. West (Lithuania), center, Central Ural (Il'men Preserve); Western Siberia, Kazakhstan, Chita Region, Pacific

<sup>1</sup> The genus *Clinocentrus* has been tentatively included in the subfamily Doryctinae. It has been recently established that for its endoparasitism and mummification of the host (caterpillar) are characteristic, that is, there are biological characteristics of the subfamily Rogadinae. It has great morphological resemblance with rogadins (particularly in the sculpture of the abdomen). However, the long ovipositor and parasitization not of the exposed larvae but of leaf-miners clearly distinguish it from rogadins. Moreover, the younger stages of the host are not infected, as is common among rogadins but like ectoparasites the older ones and the eggs are laid not in the body cavity of the host but under its skin (through the body, as in the morphologically comparatively closer ectoparasitic genus *Rhysipolis*). In *Clinocentrus* the hosts are paralyzed, which leads to cessation of their molting (a typical characteristic of ectoparasites) whereas in rogadins paralysis of the host is temporary allowing it to develop normally and molt (Shaw, 1983. *Contrib. Amer. Entomol. Inst.*, 20: 307–328).

Coastal Region; Western Europe ..... *C. stigmaticus* Marsh.  
 (*Oncophanes obsoletus* Hellén, syn. n.)

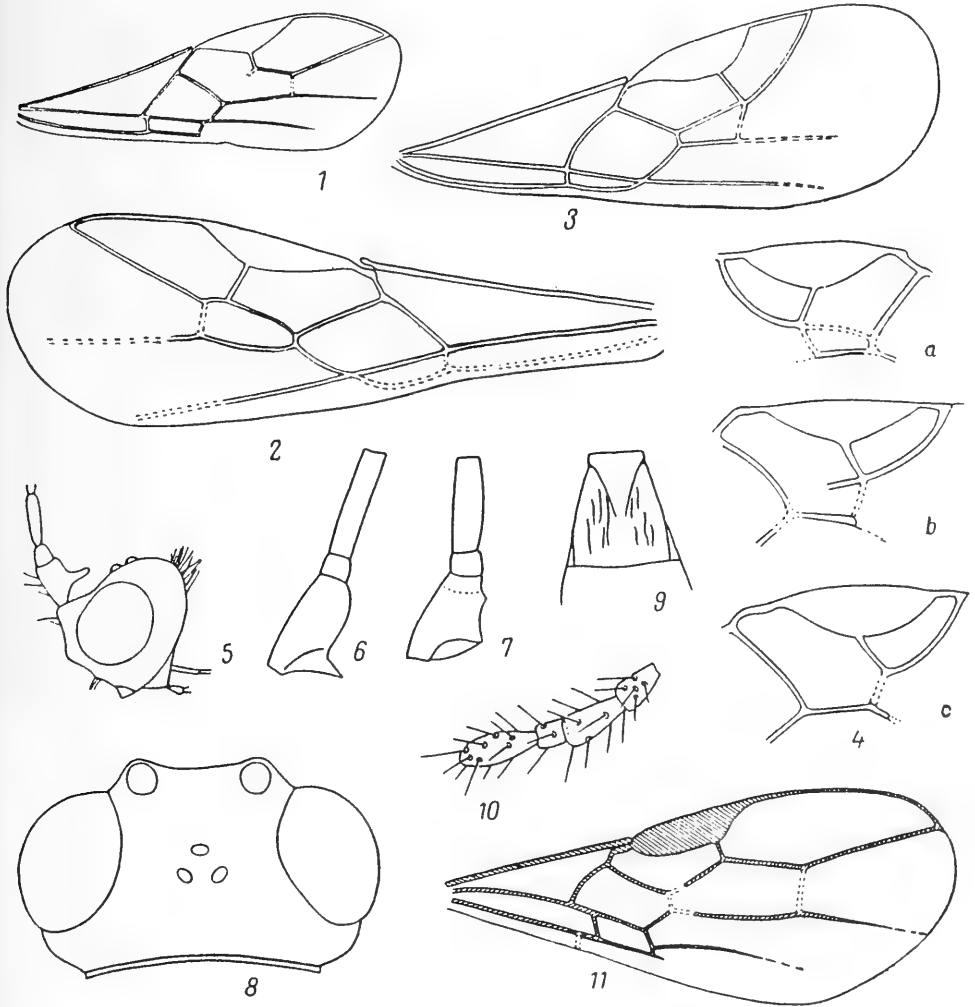


Fig. 34. Doryctinae (from Tobias and original).

1-3—forewings: 1—*Lysitermus pallidus*, 2—*Hornius sculpturatus*, 3—*H. eximus*, 4 (a, b, c)—*H. tatianae*, variation in forewing venation, 5—*Cerophanes kerzhneri*, head; 6-7—antennal base: 6—*C. kerzhneri*, 7—*C. radialis*; 8—*Rhysipolis decorator*, head; 9—*R. decorator*, 1st abdominal tergite; 10, 11—*Pseudobathystomus funestus*: 10—maxillary palp, 11—forewing.

- 2 ( 1). Costal vein in male and female hardly differentiable in thickness, slightly thinner than antennae. Ovipositor as long as abdomen or shorter. Ocelli large, their diameter usually no more than  $1/2-1/3$  of ocellocular distance.
- 3 ( 4). Second and 3rd abdominal tergites well developed, almost covering apical segments, 2nd abdominal tergite sometimes wider than long (Fig. 32: 6). Antennae thin, 2nd flagellar segment 2.5 times as long as wide. Greater part of thorax, legs and lower part of abdomen yellowish dark brown, upper part of abdomen, greater part of head and posterior part of thorax dark brown. Third abdominal tergite entirely sculptured, longitudinally striate. Body 2.5. Transcaucasia, Pacific Coastal Region, Sakhalin Island, Shikotan Island .....  
..... **C. caucasicus** Tobias
- 4 ( 3). Second and 3rd abdominal tergites weakly developed, apical segments projecting far beyond apex of 3rd abdominal tergite, 2nd tergite usually 1.5 times as wide as long. Antennae relatively thicker, 2nd flagellar segment 2 times as long as wide.
- 5 ( 6). Abdomen narrower than thorax, long; 1st abdominal tergite almost 2 times as long as its width at apex, 2nd somewhat square, 1st and 2nd tergites rugose, 3rd delicately punctate. Body black; with light colored pattern, 5-6. Lithuania, Ukraine (Kiev); Western Europe ..... **C. umbratilis** Hal.
- 6 ( 5). Abdomen not narrower than thorax; 1st abdominal tergite as long as its width at apex or longer, 2nd tergite transverse.
- 7 (14). Ocelli small, their diameter much less than ocellocular distance. Temples less than half length of eye; face much wider than high.
- 8 (11). Third abdominal tergite with very slightly curved or transverse wrinkles, sometimes almost smooth. Second section of radial vein 1.5 times as long as 1st radiomedial vein. First flageller segment 2.5-3 times as long as wide, middle flagellar segments 2-3 times as long as wide.
- 9 (10). Suture between 2nd and 3rd abdominal segments deep and complete, abdomen behind 2nd tergite laterally compressed. Sternauli short, almost smooth. First abdominal tergite 1.5 times as long as its width at apex. First flagellar segment 2.5 times as long as wide. Temples  $5/9$  transverse diameter of eye. Second section of radial vein 2.8 times as long as 1st,

- half as long as 3rd. Body light brown, 2.7. Sochi; Sweden; England ..... **C. brevicealcar** Thoms.  
 Lectotype: Female "Rsio" (= Ringsjön), "brevicealcar m." Preserved in Lund University Museum (Sweden).
- 10 ( 9). Suture between 2nd and 3rd abdominal tergites smooth; abdomen depressed. Sternauli long, crenulate. First abdominal tergite 1.3 times as long as its width at apex. First flagellar segment 3 times as long as wide. Temples  $2/3$  transverse diameter of eye. Second section of radial vein 2.4 times as long as 1st, 3rd 2.2 times as long as 2nd. Body reddish dark brown, 3.6. Sweden; England ..... **C. gracilipes** Thoms.  
 Lectotype: Female, "Yd. (= Yddinge)", "gracilipes m." Preserved in Lund University Museum (Sweden).
- 11 ( 8). Third abdominal tergite distinctly rugose, wrinkles at apex only sometimes transverse. Second section of radial vein approximately as long as 1st radiomedial vein or shorter. First flagellar segment less than 2.5 times as long as wide, middle flagellar segments 1.5 times as long as wide.
- 12 (13). Middle antennal segments longer than wide. Spiracles of 1st abdominal tergite not pedunculate. Color variable: usually thorax black with somewhat developed yellowish dark brown pattern on mesonotum, sometimes entirely black or light colored. Third abdominal tergite sculptured, rarely almost smooth. Fig. 35. Body 2.5–5. Parasite of lepidopterans *Gypsonoma sociana* Hw., *Rhyacionia buoliana* Den. and Schiff., *Cnephasia genitalana* P. and M. (Tortricidae). Throughout European part; Caucasus, Kazakhstan, Chita Region, southern part of Far East; Western Europe; Mongolia .....  
 ..... **C. exsertor** Nees (*excubitor* sensu Tel., *C. striolatus* Thoms., syn. n., ? *jaroshevskiyi* Tel)<sup>1</sup>
- 13 (12). Middle antennal segments square. First abdominal tergite with pedunculate spiracles. Body and legs black. Body 3.8. Finland; Mongolia ..... **C. arcticus** Hellén.
- 14 ( 7). Ocelli large, their diameter slightly shorter than ocellular distance; temples short,  $1/3$  as long as eyes; face as high as wide. Body black with light colored pattern, 4–5. Krasnodar Region; Transcaucasia; Western Europe .....  
 ..... **C. excubitor** Hal.

<sup>1</sup>Type of *C. jaroshevskiyi* Telenga, 1941, obviously lost.

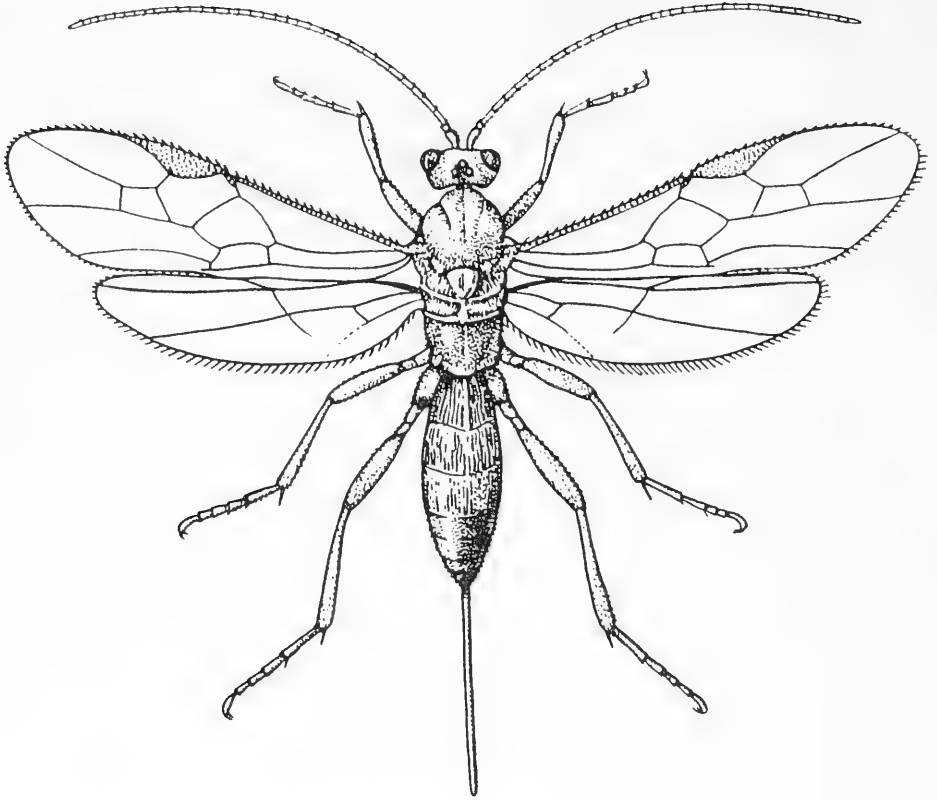


Fig. 35. Doryctinae (original).

*Clinocentrus exsertor* Nees.

## 2. Subfamily Rogadinae<sup>1</sup>

Medium to large sized (usually 5 to 10) flies with moderately elongate, usually somewhat distinctly sculptured body and short ovipositor. Wing venation complete, but without the anal cross-veins; radial and 2nd radiomedial cells relatively short. Occipital and prepectal ridges developed. Basal abdominal tergites usually fairly stiff because of somewhat coarse punctation, rugosity and granulate sculpture. Often they have longitudinal median ridge; 1st tergite often with smooth, apically narrowed basal field continuing into the ridge.

<sup>1</sup> Treatment by V.I. Tobias.



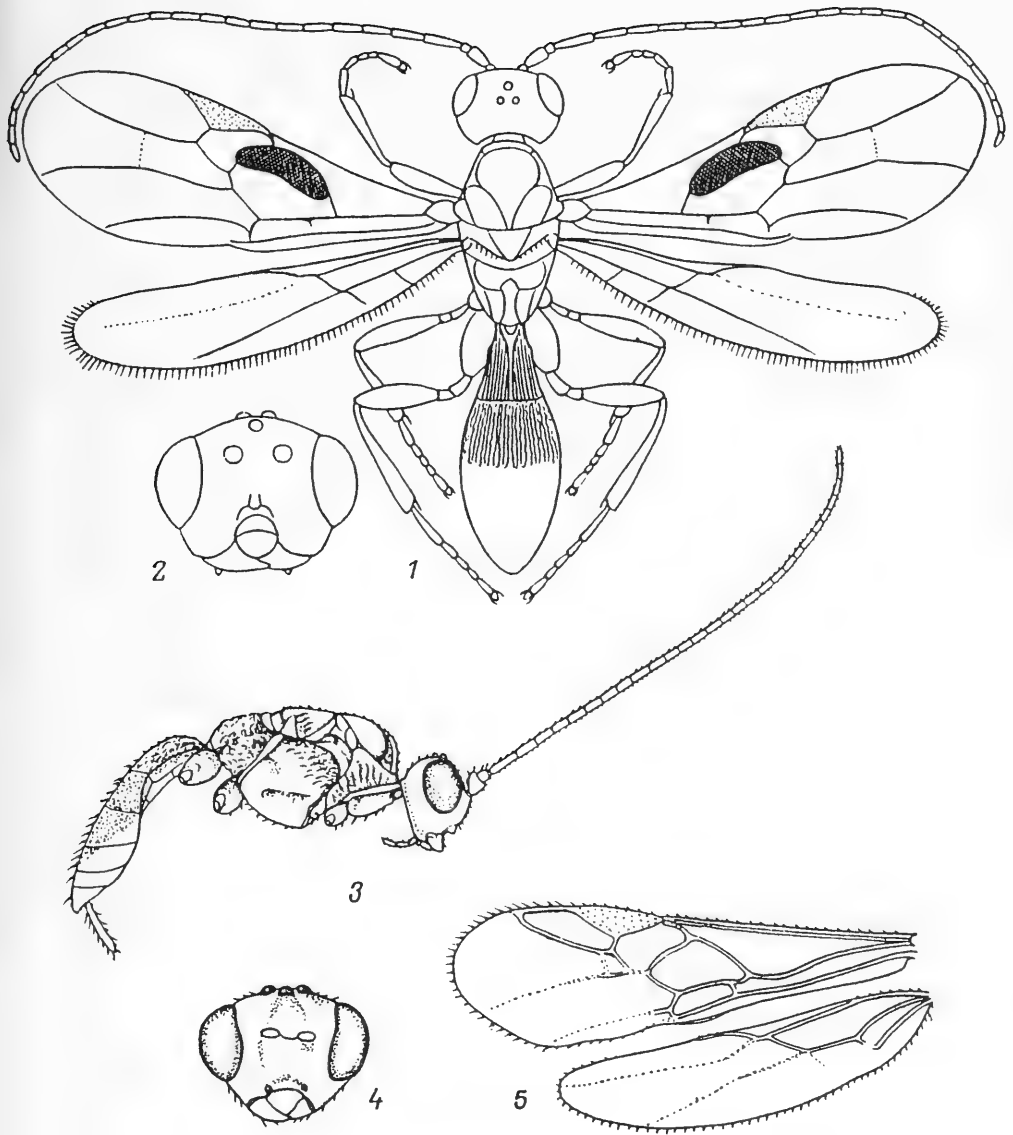


Fig. 36. Doryctinae (from Šnoflák and Achterberg).

1, 2—*Neurocrassus tesari*: 1—general appearance, 2—head; 3—5—*Artocella brevipalpis*:  
3—body, lateral view, 4—head, 5—wings.

Nearly 50 genera and over 500 species present in the world fauna. They are parasites of lepidopterans, pupating under the skin of the caterpillar which, upon hardening, forms the so-called mummy. Hosts live in open and mummies too are exposed (usually on tree leaves). The host is often partially paralyzed before laying eggs.

#### *Key to Genera*

- 1 (4). Abdomen not compressed; suture between 2nd and 3rd tergites deep; 2nd tergite usually transverse, rarely square, very rarely its length slightly exceeding width.
- 2 (3). First section of radial vein much shorter than second. Propodeum uniformly convex, apically sculptured like its remaining part but without transverse depression. Antennae rarely with whitish segment ..... 52. **Rogas**
- 3 (2). First section of radial vein not shorter, usually larger than second. Propodeum slightly convex, along posterior margin with transverse depression, distinguished by coarse sculpture. Antennae usually with a whitish segment in middle ..... 53. **Heterogamus**
- 74 4 (1). Abdomen strongly compressed; suture between 2nd and 3rd tergites weak; 2nd tergite almost 2 times as long as wide. Eyes reniform ..... 54. **Petalodes**

#### *Key to Species of Genera*

52. **Rogas** Nees, 1818 (*Aleiodes* Wesm., *Pelecystoma* Wesm.). About 320 species; about 100 in the Palearctic. The key below does not include 15 species reported in the fauna of the USSR from the Far East and Eastern Siberia (cf. Telenga, 1941. Fauna SSSR [Fauna of the USSR] V, 1: 129–214)<sup>1</sup>.

<sup>1</sup> Genus *Rogas* is considered here *sensu lato* (even broadest interpretation) since, besides species traditionally included under *Rogas* s.str. and species identified under subgenus *Aleiodes* (there is a tendency to consider the latter as an independent genus), it also includes species grouped under subgenus *Pelecystoma*. It is now established (van Achterberg, 1982. *Entomol. Ber.*, 42: 133–139) that the latter should be renamed *Rogas*. In that case the name of the genus *Rogas* in the old interpretation needs to be changed. In the interest of stability of nomenclature it would be better to conserve for all traditional species of *Rogas* their old binomial nomenclature, which is only possible by combining them with *Pelecystoma*. Such a merger is not artificial since the level of separation of the latter is hardly greater than that of *Aleiodes* (in the old interpretation). Moreover, the extra Palearctic species, to a great extent, erase the boundary between these three groups of species.

- 1 (94). Third segment of maxillary palp of usual shape, not wider or barely wider than other segments. Propodeum densely punctate, rarely also rugose, without fields, usually with longitudinal ridge. Abdomen not broadened posteriorly, broadest in middle. Eyes usually not reniform or weakly reniform.
- 2 (65). Radial cell of hind wing apically broadened (Fig. 39: 1). Larger spur of hind tibiae not shorter than one-third length of 1st tarsal segment. Sides of mesothorax, hind coxae and apical abdominal tergites usually lacking granulate sculpture, smooth, lustrous. Body usually dark brownish red with black tinge.
- 75 3 ( 4). Nervulus antefurcal. Height of gena equals width of eye, temples somewhat shorter than eye; diameter of posterior ocellus equals half ocellular distance. Antennae 41-segmented with square flagellar segments. Length of 1st abdominal tergite equal to its width at apex, 2nd tergite transverse. Face transversely rugose, head matte, sides of mesothorax on lower side smooth. 1st, 2nd and base of 3rd tergite rugose. Body black, sides of mesothorax and legs red, 6. Finland. . . . . **R. freyi** Hellén
- 4 ( 3). Nervulus postfurcal.
- 5 ( 6). Length of 1st abdominal tergite much more than its width at apex, distinctly tapered basally (Fig. 39: 2). Eyes large, diameter of posterior ocellus not less than 2 times ocellular distance. Eyes reniform frons weakly sculptured, compressed, with sharp keels near ocular notch. Antennae as long as body, setiform, 56–64-segmented. Body black; legs, sometimes mesonotum dark brownish red, basal half of hind tibiae yellowish, apical half and hind tarsi black. Body 8–10. Parasite of rustic moths *Acronycta rumicis* L., *A. tridens* Den. and Schiff., *Orthosia incerta* Hfn. (Noctuidae). West, northwest, center, south; Caucasus, Transural, Central Asia; Western Europe; Mongolia; Japan . . . . . **R. dissector** Nees
- 6 ( 5). Length of 1st abdominal tergite usually not more than its width at apex; if longer then almost not tapered basally (Fig. 39: 6) and diameter of posterior ocellus not more or slightly more than (male!) ocellular distance.
- 7 ( 8). Abdominal tergites with coarse punctures (about 15 along middle part of 2nd tergite), without distinct longitudinal folds. Temples bulged, approximately as long as transverse diameter of eye; genae well developed, their height not more than half longitudinal diameter of eye. Antennae setiform,

- about 65-segmented. Body reddish dark brown; lower and posterior part of thorax, base of abdomen, apices of femora and tibiae, antennae and tarsi black. Fig. 37: 1. Body 8–9. Northwest, center, south; Caucasus, Kazakhstan, southern Siberia; Western Europe ..... **R. miniatus** H.-Sch.
- 76 8 ( 7). Abdominal tergites weakly punctate, usually with longitudinal folds; if folds absent then punctation very weak.
- 9 (10). Head posteriorly broadened, temples longer than transverse diameter of eye; eyes small, their longitudinal diameter almost equal to height of genae (Fig. 39: 3a, 3b). Antennae shorter than body, filiform, about 50-segmented. Radial cell reduced. First, 2nd and base of 3rd abdominal tergites with longitudinal folds. Body black; antennae, greater part of thorax, abdominal apex, apices of femora, tibiae and tarsi dark brownish red; head, mesonotum, greater part of abdomen and legs and wings darkened. Fig. 37: 2. Body 7–8. South (including Ciscaucasia) ..... **R. ruficeps** Tel.  
 Lectotype: Female. Eupatoria, 7.V.1907 (V.E. Yakovlev).  
 Paralectotypes: 2 females, 1 male, Askania Nova, 6.VII.1928 (Medvedev); 1 female Sevastopol, 18.IV.1908 (V. Pliginskii); 3 females, Crimea, Baidary, 2.IV.1933 (Yu. Skalov); 1 female, Groznyi, bank of River Sunzha, 4.V.1921 (Ryabov).
- 10 ( 9). Head posteriorly not broadened, temples not longer than transverse diameter of eye (except in *R. aestuosus*); longitudinal diameter of eye much longer than height of genae.
- 11 (20). Abdominal tergites with very delicate punctation, without longitudinal folds; folds if present very weak. Oral cavity not less than 2 times as wide as its distance from eye; height of genae not more than half longitudinal diameter of eye. Mesonotum usually densely pubescent. Wings light colored.
- 12 (17). Oral cavity approximately 5 times as wide as its distance from eye.
- 13 (14). Height of genae half width of mandibles at base (Fig. 39: 4). Antennae shorter than body. Ocellar diameter equals ocellular distance. Mesonotum densely and finely punctate, slightly lustrous, with dense appressed hairs. Body black; antennae, mouthparts, mesonotum anterior to scutellum, apical part of abdominal tergites reddish dark brown; pronotum, greater part of legs, spots on abdominal sternites, tegulae yellowish. Body 7–7.5. Transcaucasia; Iran .....  
 ..... **R. agilis** Tel. (*desertus* var. *armeniaca* Tel.)

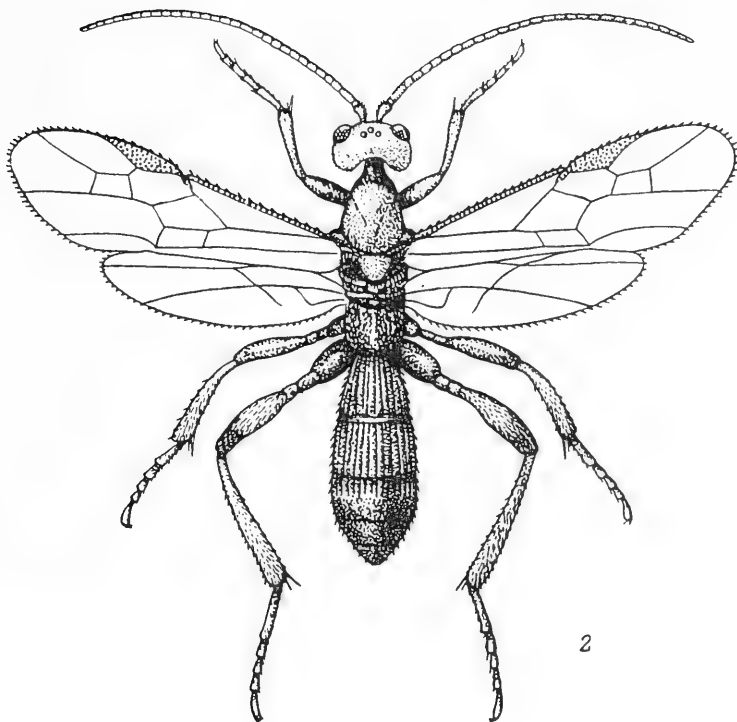
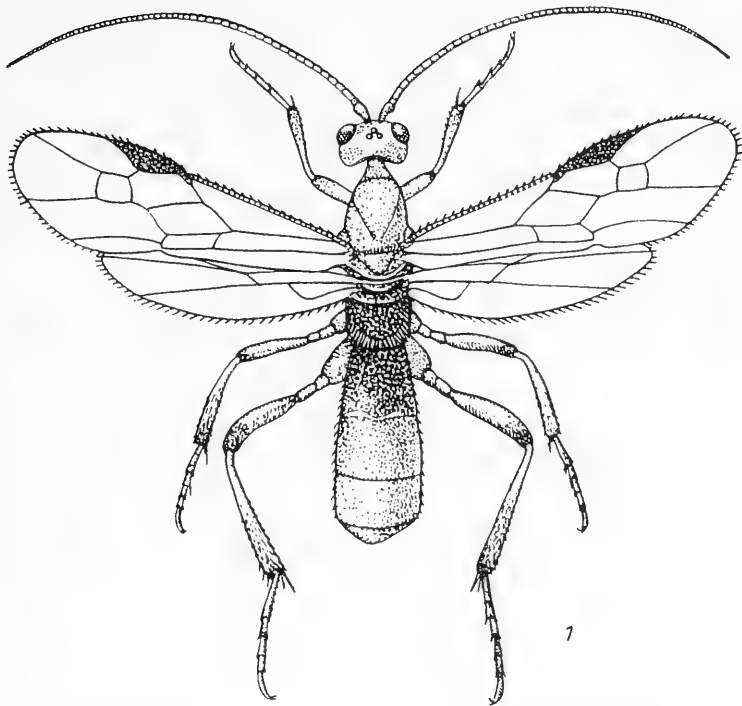


Fig. 37. Rogadinae (original).

1—*Rogas miniatus* H.-Sch.; 2—*R. ruficeps* Tel.

- Lectotype: Female, Iran, Tavis, 21.III. 1914 (Andrievskii). Paralectotypes (?): 7 females, Erevan, 19 and 22.III.1925 (Shelkovnikov); in first description of the species another date has been mentioned (possibly erroneously): 24.VII.1925.
- 14 (13). Height of genae 4 times basal width of mandibles. Antennae as long as body.
- 15 (16). Ocellar diameter slightly more than ocellular distance. Second and basal part of 3rd abdominal tergite sculptured, with weak but distinct longitudinal folds. Mesonotum almost smooth, with sparse hair. Head and thorax black, antennae, mouthparts, margins of pronotum, tegulae, legs and abdomen dark brown-yellowish; sides of mesonotum somewhat reddish. Body 7–8. Kazakhstan; Central Asia . . . . . **R. desertus** Tel.  
Lectotype: Female, Khiva, 30.IV.1927 (Zimin). Paralectotypes: 5 females, other details same; 1 female, Ashkhabad, 25.III.1905 (Ahnger).
- 16 (15). Ocelli very large, almost touching eyes. Second and 3rd abdominal tergites almost smooth (with sparse punctures due to hair). Mesonotum with delicate but dense punctures, slightly lustrous, with dense appressed hair. Body dark brown; mesonotum, face and lower part of thorax reddish; mouthparts, scape and pedicel of antennae, tegulae, prothorax and legs dark brownish-yellowish. Body 7–8. Central Asia. . . **R. glaber** Tel.  
Lectotype: female, Turkmenia, Imam-baba, 16.III. –24.IV.1912 (Kozhanchikov).
- 17 (12). Oral cavity less wide, approximately 2 times as wide as its distance from eye; height of genae equals mandibular width at base (Fig. 39: 5). Antennae setiform, as long as body.
- 18 (19). Body black, legs dark brown, stigma yellowish. Body 7. Southeast; Western Europe . . . . . **R. morio** Reinh.
- 19 (18). Head and thorax black; legs, abdomen, sometimes thorax above dark brownish red, stigma dark black-dark brownish. Body 8–10. North (Arkhangelsk); Kazakhstan, Siberia (cf. also couplet 35) . . . . . **R. sibiricus** Kok.  
Lectotype: Female, Irkutsk (Yakovlev). Paralectotypes: 4 females, 1 male, other details same.
- 20 (11). Abdominal tergites with coarse sculpture, base of 2nd or 3rd tergite with longitudinal folds. More frequently oral cavity somewhat wider than its distance from eye, height of genae  $1/2$ – $1/3$  longitudinal diameter of eye.

- 21 (24). Length of 1st abdominal tergite 1.5 times its width at apex, 2nd tergite square (Fig. 39: 6). Oral cavity large, genae weakly developed.
- 22 (23). Oral cavity 3 times as wide as its distance from eye. Third abdominal tergite basally rugose-punctate, longitudinally striate, smooth in apical half. Ocelli (male) larger than ocellocular distance. Nervulus branched before middle of discoidal cell. Mesonotum and sides of mesothorax with sparse punctures, lustrous. Body black, mesonotum posteriorly and scutellum, 1st abdominal tergite and legs red. Body 7. Nakhichevan ASSR ..... **R. quadrum** Tobias
- 23 (22). Oral cavity 5–6 times as wide as its distance from eye. Third abdominal tergite entirely with large punctures, without wrinkles. Diameter of ocelli much less than ocellocular distance. Nervulus originating from middle of discoidal cell. Mesonotum and sides of mesothorax densely punctate, slightly lustrous. Body black. 1st and 2nd abdominal tergites, fore- and middle legs red, hind legs dark brown. Fig. 38: 1. Body 8–10. West, center, east, south .....  
 ..... **R. krulikowskii** Kok.  
 Lectotype: Female, Kirovsk Region, Malmyzh (L. Krulikovskii). Paralectotype: Female, Kharkov, 13.VI.1886 (Collection of Kokuev).
- 24 (21). Length of 1st abdominal tergite not more than 1.3 times its width at apex, 2nd tergite transverse.
- 25 (30). Eyes very large, genae very narrow, face square (Fig. 39: 7); if eyes less developed (height of genae  $1/4$ – $1/5$  their longitudinal diameter), then ocelli very large, their diameter much more than ocellocular distance. Antennae setiform, as long as body.
- 26 (29). Ocelli very large, posterior ocellus almost touching eyes.
- 78 27 (28). Radial cell of hind wing relatively slightly expanded starting from its middle. Basal flagellar segments square. Third abdominal tergite basally rugose. Body black, sides of thorax, its lower part, scutellum, sometimes mesonotum, and legs reddish dark brown, basal half of hind tibiae yellow, their apices and hind tarsi black. Body 6–7.5. Parasite of *Acronicta psi* L., *A. aceris* L., *A. leporina* L., *A. tridens* Den. and Schiff., *A. rumicis* L. (Noctuidae), *Orgyia gonostigma* F., *Euproctis chrysorrhoea* L., *E. similis* Fuessly (Lymantriidae), *Odontosia*

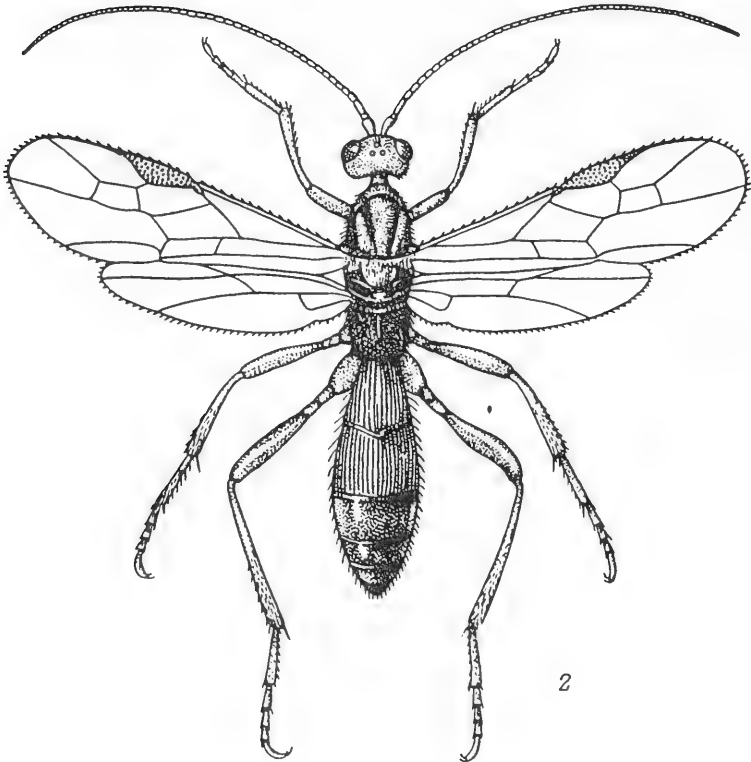
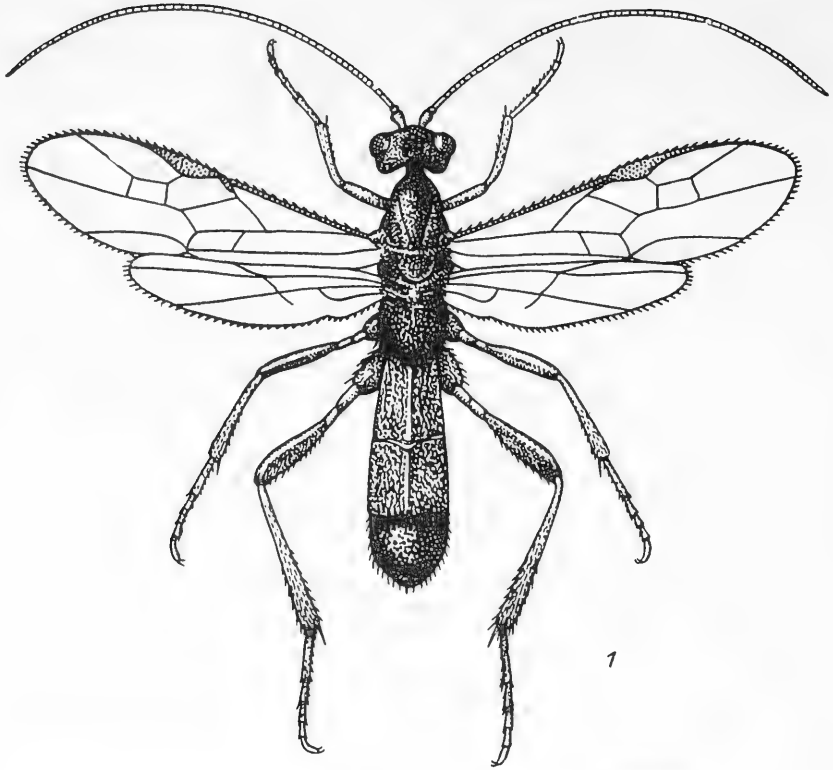


Fig. 38. Rogadinae (original).

1—*Rogas krulikowskii* Kok.; 2—*R. unipunctator* Thunb.



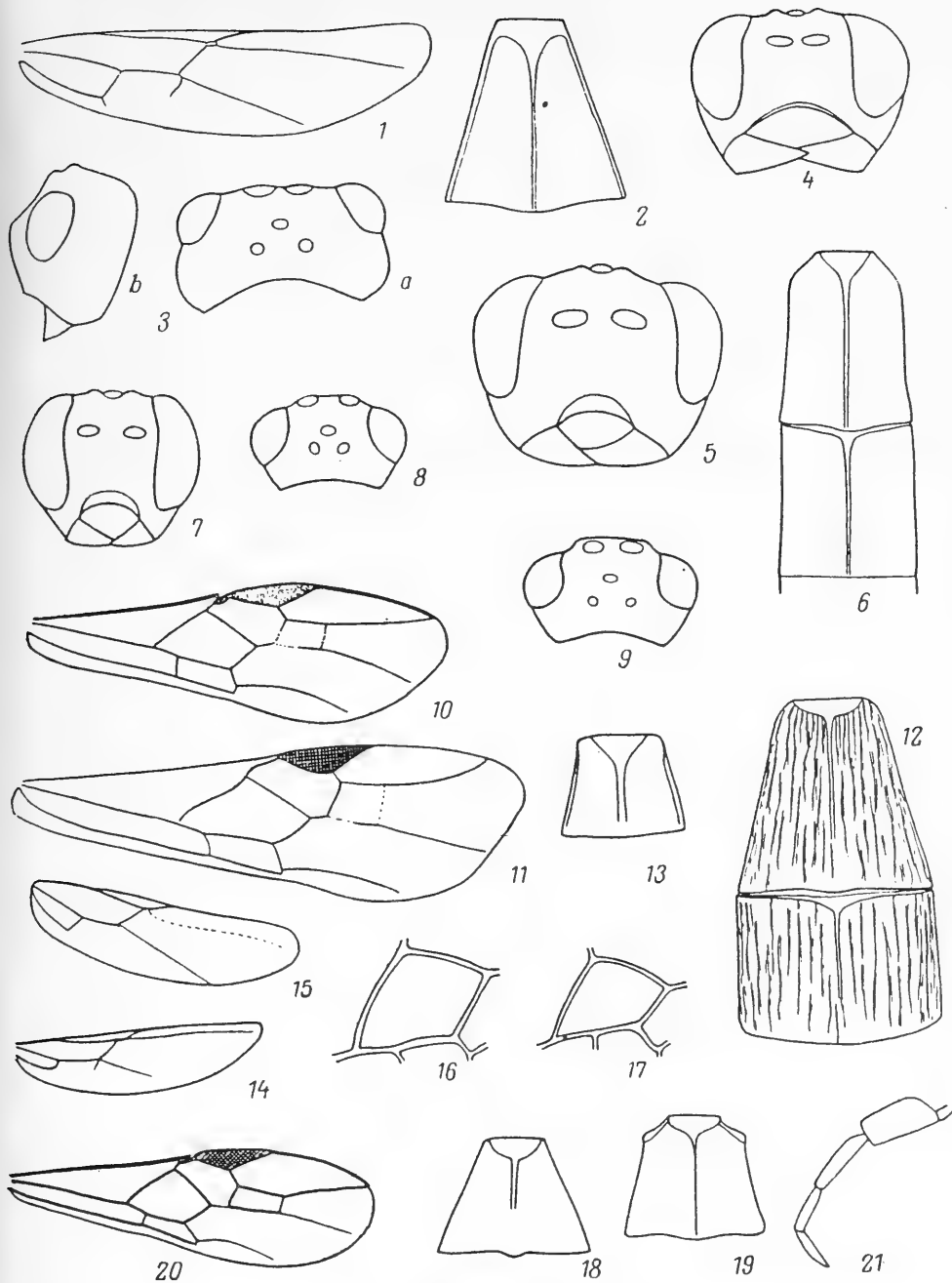


Fig. 39. Rogadinae (from Tobias).

1—*Rogas dimidiatus*, hind wing; 2—*R. dissector*, 1st abdominal tergite; 3—*R. ruficeps*, head (a—dorsal view, b—lateral view); 4—5—head, front view: 4—*R. agilis*, 5—*R. sibiricus*; 6—*R. quadrum*, 1st and 2nd abdominal tergites; 7—9—head: 7—*R. unipunctator*, 8—*R. schirjaewi*, 9—*R. ductor*, 10—11—forewing: 10—*R. gasterator*, 11—*R. dimidiatus*; 12—*R. dimidiatus*; 1st and 2nd abdominal tergites; 13—*R. grandis*, 1st abdominal tergite; 14, 15—hind wing: 14—*R. rossicus*, 15—*R. bicolor*, 16, 17—discoidal cell with nervulus: 16—*R. procerus*, 17—*R. esenbecki* 18, 19—1st abdominal tergite: 18—*R. rossicus*, 19—*R. bicolor*; 20—*R. kuslitzkyi*, forewing; 21—*R. testaceus*, maxillary palp.

- ziczac* L. (Notodontidae), *Cheimophila salicella* Hb. (Oecophoridae). Northwest, center, south; Central Ural; Kazakhstan; Western Europe ..... **R. pulchripes** Wesm.
- 28 (27). Radial cell of hind wing sharply expanded from apical third. Basal flagellar segments distinctly transverse. Third abdominal tergite basally not rugose, only with punctures. Body brownish yellow, only antennae, hind tarsi and apices of hind tibiae black. Body 8–9. Parasite of *Laothoe populi* L., *Smerinthus ocellatus* L., *Sphinx pinastri* L., *Dilina tiliae* L. (Sphingidae), *Euproctis chrysorrhoea* L. (Lymantriidae). Southeast (Volgograd), Krasnodar Territory (Novorossiisk); Western Europe; Korean Peninsula; Japan ..... **R. praetor** Wesm.
- 29 (26). Ocelli small, ocellar diameter equals ocellocular distance. Third abdominal tergite entirely smooth. Body black; 1st and 2nd abdominal tergites, scutellum and legs yellowish dark brown; apices of hind tibiae darkened without contrast, hind tarsi dark brown. Figs. 38: 2; 42: 1. Body 6–8. Parasite of *Apamea sordens* Hfn., *A. unanimitis* Hb., *Mythimna comma* L. (Noctuidae). Center, east, south (Kupyansk); Siberia (Tomsk, Irkutsk); Western Europe ..... **R. unipunctator** Thunb.
- 30 (25). Eyes less developed, genae well developed, their height not less than 1/6 longitudinal diameter of eye; height of face less than its width, ocelli small, 3rd abdominal tergite somewhat rugose.
- 31 (38). Height of face (including clypeus) half its width; oral cavity much wider than its distance from eye; temples somewhat bulged; height of genae 1/2–1/3 longitudinal diameter of eye; ocellar diameter less than ocellocular distance.
- 32 (33). Antennae much shorter than body, basally thickened. Greater part of thorax and apex of abdomen starting from 3rd tergite black; base of antennae, head, mesonotum and scutellum, legs, anterior half of abdomen dark brown-reddish; greater part of antennae dark brown. Body 6. Azerbaidzhan ..... **R. arnoldii** Tobias
- 33 (32). Antennae as long as body, setiform. Color different.
- 34 (37). Oral cavity 1.5 times as wide as its distance from eye.
- 35 (36). Nervulus removed from basal vein by not more than its length. Head 2 times as wide as long; temples distinctly rounded. Head densely sculptured, matte; mesonotum and sides of mesothorax fairly densely punctate, slightly lustrous.

- Head and thorax usually black. Antennal segments transverse or square (cf. also couplet 19) ..... **R. sibiricus** Kok.
- 36 (35). Nervulus removed from basal vein by 2 times its length. Head 1.5 times as wide as long, temples almost straight. Head dorsally, mesonotum and sides of mesothorax with sparse punctures, lustrous. Body brownish or reddish yellow with black ventral side of thorax, propodeum, anterior half of 1st tergite, apices of femora, tibiae and tarsi of all legs. Antennal segments slightly longer than wide. Body 8. Kazakhstan, Central Asia. .... **R. venustus** Kok. (*robustus* Tel., syn. n.)
- 37 (34). Oral cavity 3 times as wide as its distance from eye. Body yellowish dark brown; propodeum and sides of thorax usually darkened. Fig. 40: 1. Body 7–10. Parasite of *Heleiothis peltigera* Den. and Schiff., *Autographa gamma* L. (Noctuidae). South; Caucasus, Central Asia; southeastern part of Mediterranean ..... **R. aestuosus** Reinh.
- 38 (31). Height of face usually not less than 1/3 its width; width of oral cavity approximately equals its distance from eye; if wider then combination of other characters different.
- 39 (48). Height of genae 1/4–1/6 longitudinal diameter of eye; ocellar diameter equal to or more than ocellocular distance.
- 40 (45). Width of oral cavity equals its distance from eye; height of genae 1/4 longitudinal diameter of eye. Ocellar diameter not more or slightly more than ocellocular distance. Nervulus originating anterior to mid-point of discoidal cell.
- 41 (42). Hind tarsi thickened, much shorter than tibiae (4 : 5); longer spur of hind tibiae almost equals halflength of 1st tarsal segment. Segments of antennal flagellum transverse and square. Body usually black; legs dark brownish red, apices of hind tibiae and hind tarsi black; sometimes abdomen, rarely also propodeum, sides and ventral side of thorax brownish red. Body 7–9. Parasite of rustic moths *Acrionicta euphorbiae* Den. and Schiff., *A. cinerea* Hfn., *Orthosia miniosa* Den. and Schiff., *Oxicesta geographica* F., *Simyra albovenosa* Goeze. Northwest, center, south; Kazakhstan, Eastern Siberia (Irkutsk), Pacific Coastal Region; Western Europe .....  
..... **R. rugulosus** Nees
- 42 (41). Hind tarsi not thickened, as long as hind tibiae or slightly shorter; larger spur of hind tibiae shorter than halflength of 1st tarsal segment. Antennal segments square or their length more than width. Body black.

- 43 (44). Mesonotum and vertex delicately and relatively not so densely punctate, lustrous; 3rd abdominal tergite sparsely punctate, lustrous. Abdomen, except apex, and legs brownish yellow; hind tibiae darkened basally and apically, yellowish in middle. Body 7–8. South (Khar'kov Region); Caucasus (Georgia); Central Europe; Finland .....  
 ..... **R. pallidicornis** H.-Sch.
- 44 (43). Mesonotum and vertex with relatively dense micropunctures, matte; 3rd abdominal tergite in basal half rugose, longitudinally striate. Abdomen, except apex, and legs brownish red; hind tibiae apically darkened, in basal half yellowish without contrast. Fig. 40: 2. Body 7–8. Parasite of *Euxoa islandica* Str., *Apamea anceps* Den. and Schiff. (Noctuidae). Center, east, southeast, northern Caucasus, Kazakhstan, Central Asia, Siberia up to Far East; Spain; Mongolia .....  
 ..... **R. eurinus** Tel.
- Lectotype: Female, Kazakhstan, Borovoe ("Borovoe Forestry Polytechnic"), 1.VII.1932 (Popov). Paralectotypes: 1 male, Saratov, 7.VI.1911 (Katkov); 1 male, Southern Ural, Irgizla, 4.VII.1899 (J. Schmidt); 1 female, 1 male, Orenburg Region, Spasskoe, 11.VI.1930 (Rysakov); 1 female, Chernovaya on Bukhtarma River, 6.VIII.1897 (Silantev); 1 male, Kemerovo Region, Krasnoe, 17.VII.1928 (A. Karpov); 1 female, Irkutsk Region, Mel'nikovo, 11.VII.1910 (Prorokov); 1 male, Fergana, Sary-bel', 11.VII.1928 (Kuznetsov); Mongolia: 1 female, "valley of Sel'duan-gol River, 28–29.VII.1899 (expedition of Potanin)"; 1 male, "Sangin, Urga, 25.VII.1905 (Kozlov)."
- 45 (40). Width of oral cavity 2 times its distance from eye; height of genae 1/6 longitudinal diameter of eye.
- 46 (47). Ocellar diameter 2 times ocellocular distance. Nervulus originating from mid-point of posterior side of discoidal cell. Hind tarsi shorter than hind tibiae, larger spur of hind tibiae almost as long as half length of 1st tarsal segment. Mesonotum slightly punctate, lustrous. Flagellar segments transverse or square. Body black; mesonotum, often except its light colored anterior part, scutellum and 1st abdominal tergite sometimes 2nd and 3rd tergites and legs brownish red. Body 8–9. Parasite of *Hadena rivularis* F. (Noctuidae), *Orgyia ericae* Germ. (Lymantriidae). West, northwest, center, south (Khar'kov Region); Caucasus, Western Siberia (Omsk); Western Europe ..... **R. cruentus** Nees

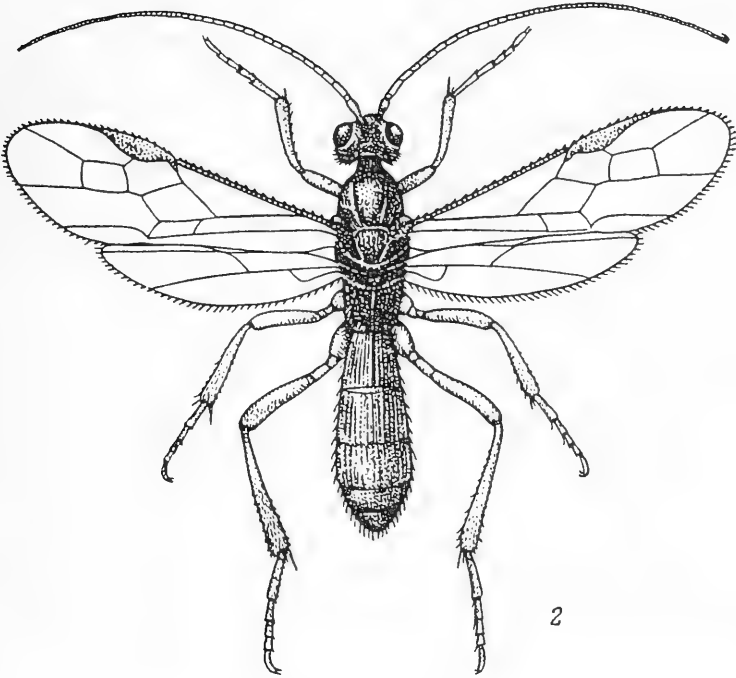
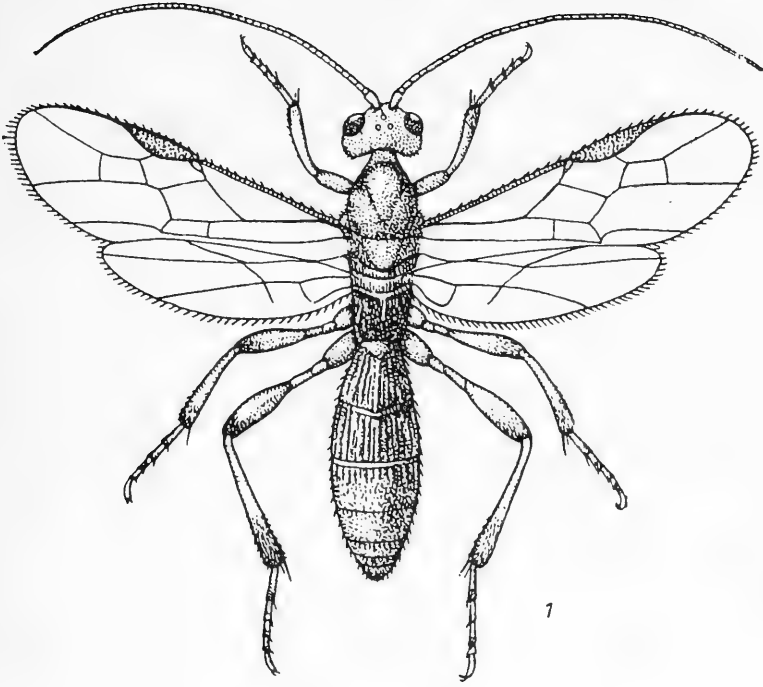


Fig. 40. Rogadinae (original).

1—*Rogas aestuosus* Reinh.; 2—*R. curinus* Tel.

- 47 (46). Ocellar diameter equals ocellocular distance. Nervulus originating from basal third of discoidal cell. Hind tarsi as long as tibiae, larger spur of tibiae much shorter than half length of 1st tarsal segment. Mesonotum with denser punctures, slightly lustrous. Flagellar segments square or their length more than width. Body yellowish red, head and apex of abdomen black. Body 6–9. Kazakhstan, Central Asia.....  
..... **R. ferrugileti** Shenef. (*ferrugineus* Tel.)  
Lectotype: Female, Kazakhstan, Dzhulek, 17.VII.1910 (Kozhanchikov). Paralectotypes: 11 females, 1 male, same place, 2 and 17.VII.1910 (Kozhanchikov); 3 females, Kizyl-Kum sands, 27.VII.1907 (Zarudnyi); "Ak-Bike, Aral", 11.VII.1914 (Zarudnyi); 1 female, Turkmenia, Bairam-Ali, 24.VII.1932 (Bogush).<sup>1</sup>
- 48 (39). Height of genae  $1/2$ – $1/3$  longitudinal diameter of eye; ocellar diameter less than ocellocular distance.
- 49 (54). Nervulus originating from middle of posterior side of discoidal cell. Third abdominal tergite for greater part smooth, only basally longitudinally rugose. Length of segments in middle part of antennae more than their width, apical segments square.
- 50 (51). Head behind ocelli distinctly narrowed rectilinearly (Fig. 39: 8). Head, propodeum, sides of mesothorax and metathorax, apex of abdomen from 3rd tergite, apices of middle and hind femora, tibiae and tarsi (often also forefemora and foretarsi) black; greater part of thorax and legs, basal half of abdomen brownish red; antennae dark brown. Body 5.5–7. South; Caucasus, Kazakhstan, southern Siberia to Far East ..... **R. schirjaewi** Kok.
- 51 (50). Head behind ocelli slightly narrowed, roundish (Fig. 39: 9). Thorax entirely black or only prothorax brownish yellow.
- 52 (53). Mesonotum almost smooth, lustrous. Body black; abdomen, except apex, and legs except apices of hind femora, apical half of hind tibiae and hind tarsi brownish red; middle and foretarsi and antennae brownish. Body 5.5–7. Parasite of *Mamestra brassicae* L., *Autographa gamma* L., *Discestra*

<sup>1</sup> Specimens from Mongolia—var. *mongolei* Shenef. (var. *mongolicus* Tel.)—have not been included among lectotypes since, probably, they are an independent species. Both names (*ferrugineus* Tel. and var. *mongolicus* Tel.) are replaced (Shenefelt. 1975. *Hymenopt. Catalog. Pars.* 12) as being nomina preoccupied.

- trifolii* Hfn. (Noctuidae), *Philudoria potatoaria* L. (Lasiocampidae). Center, south; Caucasus, Kazakhstan, Central Asia, southern Siberia to Far East; Western Europe; northern Africa; Israel; Iran ..... **R. ductor** Thunb.
- 53 (52). Mesonotum with dense punctures, matte. Body black; prothorax, abdomen except its apex, legs except apices of hind femora, tibiae and tarsi brownish yellow; antennae yellowish. Body 5–6. Northwest, center; Siberia (Irkutsk); Western Europe ..... **R. medianus** Thoms.
- 54 (49). Nervulus originating considerably before middle of posterior side of discoidal cell. Third abdominal tergite rugose-punctate, only in apical part somewhat smooth.
- 55 (62). Sides of mesothorax weakly punctate, lustrous. Length of 2nd radiomedial cell much greater than its width (Fig. 39: 10). Hind tibiae black in apical half, brownish yellow in basal half.
- 56 (57). Antennae thickened, shorter than body, yellow in basal half of flagellum. Body black; 1st and 2nd abdominal tergites and legs brownish red, apices of hind femora darkened, hind tarsi yellowish brown, tegulae yellowish. Body 6.5. Center (Yaroslav Region); Western Europe ..... **R. rufipes** Thoms. (*jaroslawnensis* Kok.)
- 57 (56). Antennae slender, not shorter than body, darker colored.
- 58 (59). Antennae about 40-segmented, basal part of flagellum light colored, apex black. Color variable: in female greater part of thorax and basal half of abdomen usually with brownish red pattern, male often black; legs brownish red, apices of hind femora black. Body 4.6–6. Krasnodar Territory (Sochi) ..... **R. caucasicus** Tobias
- 59 (58). Antennae not less than 50-segmented, flagellum entirely black. Body black.
- 60 (61). Legs except apices of hind femora, hind tibiae, hind tarsi and tegulae reddish yellow; 1st abdominal tergite apically reddish. Body 6–7. Center; Western Europe. .... **R. periscelis** Reinh.
- 61 (60). Legs, except brownish red hind coxae and basal half of hind femora and tegulae dark brown or only fore- and middle coxae dark brown; 1st and 2nd abdominal tergites reddish brown. Fig. 39: 10. Body 6–8. Parasite of *Autographa gamma* L. (Noctuidae), *Euproctis chryorrhoea* L. (Lymantriidae). Center, south; Caucasus, Siberia to Far East; Western Europe; Mongolia ..... **R. gasterator** Jur.

- 62 (55). Sides of mesothorax fairly densely and coarsely punctate, matte or slightly lustrous. Second radiomedial cell almost square (Fig. 39: 11). Hind tibiae entirely reddish brown. Body black.
- 63 (64). Third and following abdominal tergites uniformly and fairly densely punctate, 3rd tergite slightly, others distinctly lustrous. Median field of 1st abdominal tergite gradually narrowed apically (Fig. 39: 13). Fore- and middle femora, tibiae and tarsi except apical segments, and hind femora except their apices reddish brown. Body 6–10. Parasite of *Amphipyra pyramidea* L. (Noctuidae). Northwest, south; Western Europe ..... **R. grandis** Giraud
- 64 (63). Third abdominal tergite basally rugose-punctate, longitudinally striate, posteriorly and following tergites almost smooth, lustrous. Median field of 1st abdominal tergite sharply narrowed at apex (Fig. 39: 12). Abdomen except apex, legs except apices of hind femora and tarsi, sometimes also coxae and basal part of antennae reddish brown. Body 5–8. Parasite of *Agrothis segetum* Den. and Schiff., *A. vestigialis* Hfn., *A. clavis* Hfn., *A. exclamationis* L., *Euxoa tritici* L., *E. temera* Hb., *Helicoverpa armigera* Hb., *Cosmia subtilis* Stgr., *Haplodrina alsines* Brahm, *H. blanda* Den. and Schiff., *Caradrina morpheus* Hfn., *Apamea anceps* Den. and Schiff., *Cerapteryx graminis* L. (Noctuidae), *Arctia caja* L., *Diacrisia sannio* L., *Phragmatobia rupicola* Gr.-Grschm. (Arctiidae), *Philudoria potatoaria* L., *Lasiocampa quercus* L., *Macrothylacia rubi* L. (Lasiocampidae), *Orgyia antiqua* L., *O. dubia* Tausch. (Lymantriidae), *Thaumatopoea processionea* L. (Thaumatopoeidae). Entire Palearctic..... **R. dimidiatus** Spin.
- 65 ( 2). Radial cell of hind wing not broadened apically (Fig. 39: 14). Larger spur of hind tibiae shorter than 1/3 length of 1st tarsal segment. Sides of mesothorax, hind coxae and apical abdominal tergites with granulate sculpture, matte or slightly lustrous. Color usually yellowish brown with dark brown.
- 66 (75). Ocelli very large, their diameter much more than ocellular distance; if sometimes almost equal then body large (about 10 mm) and antennae over 60-segmented.
- 67 (70). Antennae more than 60-segmented. Body large: 9–12. Length of 1st abdominal tergite 1.5 times its width at apex. Eyes reniform.
- 68 (69). Height of genae less than longitudinal diameter of eye, temples 1/2–2/5 transverse diameter of eye. Nervulus originating



- anterior to middle of discoidal cell (Fig. 39: 16). Body yellowish dark brown, thorax somewhat darkened. Center, Far East; Western Europe; Japan ..... **R. procerus** Wesm.
- 69 (68). Height of genae  $1/5-1/6$  longitudinal diameter of eye, temples  $1/3-1/4$  transverse diameter of eye. Nervulus originating from middle of discoidal cell (Fig. 39: 17). Body entirely brownish yellow. Parasite of *Dendrolimus pini* L. (Lasiocampidae), *Endromis versicolora* L. (Endromididae). West, northwest; Western Europe ..... **R. esenbecki** Htg.
- 70 (67). Antennae usually not more than 50-segmented. Body small: 5-8. Length of 1st abdominal tergite not more or slightly more than its width at apex. Nervulus branching anterior to middle of discoidal cell. Hind tarsi as long as tibiae.
- 71 (74). Body brownish yellow or yellowish dark brown.
- 72 (73). Fifth segment of hind tarsi much shorter than 2nd. Second abdominal tergite square or transverse. Parasite of *Leucoma salicis* L., *Lymantria dispar* L., *Euproctis chryorrhoea* L. (Lymantriidae), *Cyclophora quercimontaria* Bast., *C. punctaria* L., *C. pendularia* Cl., *Hylaea fasciaria* L., *Bupalus piniarius* L., *Dyscia conspersaria* Den. and Schiff. (Geometridae), *Anarsia lineatella* Z. (Gelechiidae), *Cosmotriche lunigera* Esp. (Lasiocampidae), *Psyche viciella* Den. and Schiff. (Psychidae), *Apotomis sororculana* Zett. (Tortricidae), *Spodoptera exiqua* Hb., *Agrotis segetum* Den. and Schiff. (Noctuidae). Center, south, east; Caucasus, Central Asia, Siberia (Irkutsk), Pacific Coastal Region; Western Europe; Afghanistan; Mongolia.....
- ..... **R. pallidator** Thunb. (*pellucens* Tel., syn. n.)
- 73 (72). Fifth segment of hind tarsi as long as 2nd. Second abdominal tergite transverse. Parasite of *Helicoverpa armigera* Hb. (Noctuidae), *Porthesia cargalica* Moore (Lymantriidae), Kazakhstan; Central Asia; Iran .....

82

Lectotype: Female, Bairam-Ali, 27.IV.1931 (Bogush) (not 24.VI. as mentioned in first description). Paralectotypes: 10 females with features of holotype; 1 female, Imambaba, 1-5.IV.1912 (Kozhanchikov); 1 female Uch-Adzhi, 8.IV.1900 (Germs); 1 female, Ashkhabad, 3.III.1909; 1 female, Molla-Kara, 23.VI.1889 (A. Semenov); 1 male, Kizyl-Kum, 22.VII.1907 (Zarudnyi); 1 male, Repetek, 29.VI.1930 (Luppova); 1 male, Margelan-Fergana, 18.V.1900 (Germs); 1 female, Farab, 25.III.1911 (? Hol'bek), 1 male, same place, 6.VII.1928 (V. Gussakovskii).

- 74 (71). Body black; legs except dark hind tarsi and apices of hind tibiae brownish yellow, sometimes sides of thorax and scutellum reddish dark brown. Second abdominal tergite distinctly transverse. Body 5–6. Northwest, center, south, east. Western Europe ..... **R. heterogaster** Wesm.
- 75 (66). Ocelli small, their diameter not more than ocellular distance (in male sometimes slightly more).
- 76 (77). Antennae black, with whitish segment in middle of flagellum. Second abdominal tergite square. Body black or yellowish dark brown, legs yellowish dark brown or abdomen somewhat darkened. Body 4.5–5. Center, Central Ural .....  
..... **R. jakowlewi** Kok.
- 77 (76). Antennae lacking whitish segment in middle of flagellum.
- 78 (87). First abdominal tergite gradually and fairly distinctly narrowed basally, its length usually more than width at apex (Fig. 39: 18). Second radiomedial cell equal to brachial.
- 79 (86). Sides of mesothorax densely punctate, matte.
- 80 (81). Second abdominal tergite square or weakly transverse. Antennae setiform, as long as body or slightly longer. Height of genae approximately  $2/5$ – $3/7$  longitudinal diameter of eye. Head and thorax light colored or with dark pattern and then lower part of thorax usually brownish red (in female thorax often light colored); abdominal tergites often dark. Fig. 41. Body 5–7. Parasite of *Bupalus piniarius* L., *Hylaea fasciaria* L. (Geometridae), *Dioryctria abietella* Den. and Schiff. (Tortricidae), *Mythimna unipuncta* HW., *Mamestra brassicae* L., *Lithomoia sclidaginis* Hb., *Apamea crenata* Hfn., *Orthosia incerta* Hfn., *O. gracilis* Den. and Schiff. (Noctuidae), *Atolmis rubricollis* L. (Lithosiidae). Throughout European part of the USSR; Caucasus, Kazakhstan, Siberia to Far East; Western Europe ..... **R. circumscriptus** Nees (? *nigricornis* Wesm.)<sup>1</sup>
- 83 81 (80). Second abdominal tergite distinctly transverse (width 1.3–1.5 times length). If head and thorax with weak dark pattern, then lower part of thorax black or angle between recurrent vein and section of cubitus vein bordering brachial cell on outside acute.
- 82 (83). Angle between recurrent vein and section of cubitus bordering brachial cell on outside acute (Fig. 39: 20). Head and

<sup>1</sup>The list of hosts of *R. circumscriptus* is quite extensive according to published sources. However, this species has been variously interpreted by different authors and, possibly, hosts attributed to it relate to other species.

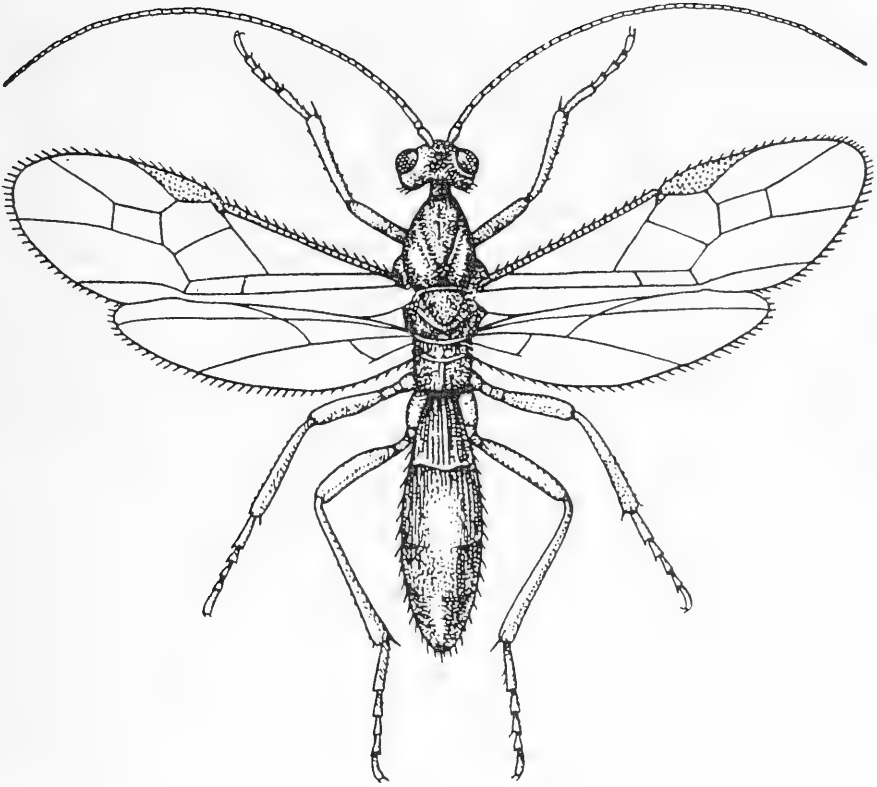


Fig. 41. Rogadinae (original).

*Rogus circumscriptus* Nees.

lower side of thorax brownish yellow, upper side of thorax (rarely head) with dark pattern, abdomen yellow with contrasting dark 1st tergite and spots on sides of 2nd, 3rd and middle of the 4th and following tergites. Antennae setiform, as long as body. Ocellar diameter equals ocellocular distance. Body 4.5–5. West; Caucasus ..... **R. kuslitzkyi** Tobias

- 83 (82). Angle between recurrent vein and section of cubitus bordering brachial cell on outside obtuse or right. Body usually with less developed dark pattern or in any case with different pattern.
- 84 (85). Ovipositor valves long, their outward projection dark as long as 1st abdominal tergite. Height of genae  $\frac{1}{6}$  longitudinal diameter of eye. Body 5–6. Center, east; Western Siberia; Finland; Czechoslovakia ..... **R. caudalis** Hellén

- 85 (84). Ovipositor valves short, their dark outward projection much shorter, usually half 1st abdominal tergite. Height of genae  $1/2-1/3$  longitudinal diameter of eye. Body usually light colored, rarely with development of dark pattern. Fig. 39: 14, 18. Body 4.5–6. Parasite of *Cerura Vinula* L. (under the skin of one caterpillar somewhat dense, almost vertical cocoons of parasite), *Harpyia hermelina* Goeze (Notodontidae), *Cilix glaucata* Scop. (Drepanidae), *Ostrinia nubilalis* Hb., *Pyrausta sambucalis* Den. and Schiff. (Pyraustidae), *Eupithecia sobrinata* Hb., *Semiothisa dathrata* L., *Tephрина arenacearia* Den. and Schiff., *Chlorochystis coronata* Hb., *Erannis defoliaria* Cl., *E. jacobsoni* Djak., *Hylaea fasciaria* L., *Lycia hirtarius* Cl., *L. pomonarius* Hb., *Operophtera brumata* L., *Apocheima hispidaria* Den. and Schiff. (Geometridae), *Malacosoma neustria* L. (Lasiocampidae), *Archips rosana* L., *Lobesia botrana* Den. and Schiff. (Tortricidae), *Euproctis similis* Fuessly, *E. Chrysorrhoea* L., *Leucoma salicis* L. (Lymantriidae), *Autographa gamma* L., *Spodoptera exigua* Hb., *Helicoverpa armigera* Hb., *Euclidimera ni* Cl. (Noctuidae) and other lepidopterans. Entire Palearctic; India; Burma ..  
..... **R. rossius** Kok. (*testaceus* auct.)
- 86 (79). Sides of mesothorax smooth. Body black with somewhat developed reddish pattern on head, thorax and abdomen, 5. Parasite of *Semiothisa liturata* Cl., *Sterrrha aureolaria* Den. and Schiff., *Eupithecia pimpinellata* Hb., *E. absinthiata* Cl., *E. lariciata* Freyer, *E. nanata* Hb., *E. exigua* Hb. (Geometridae), *Witlesia murana* Curt. (Pyraustidae), *Macrothylacia rubi* L. (Lasiocampidae). Center, south; Caucasus, Siberia (Baikal Region); Western Europe ..... **R. modestus** Reinh.
- 87 (78). First abdominal tergite weakly narrowed from apex to base, strongly narrowed at base (Fig. 39: 19), its length not more than or slightly more than width at apex. Second radiomedial cell usually much shorter than brachial.
- 88 (87). First abdominal tergite transverse, its length much less than width at apex. Abdominal tergites from 5th backward concealed. Body black, sometimes with reddish pattern on thorax, 4–5. North, northwest, center (Voronezh); northern Europe..... **R. arcticus** Hellén
- 89 (88). First abdominal tergite not transverse, length not less than width at apex. Apical abdominal tergites not concealed.
- 90 (91). Second abdominal tergite yellow at least in basal part; stigma uniformly colored, yellow; head black with yellowish

red pattern around eyes or yellowish red with dark pattern along middle; below and sides of thorax, pronotum and mesonotum yellowish red; abdomen trichromatic—yellowish red with black apex, large dark spot at base of 1st tergite and yellow in middle (except 2nd tergite, sometimes apex of 1st tergite and base of 3rd tergite yellow); legs and palps yellowish dark brown; antennae dark brown, basally yellowish red. Second radiomedial cell square or only slightly longer than wide. Antennae 45–50-segmented, somewhat longer than body (male!). Body 5.5–6. Moldavia .....

..... **R. moldavicus** Tobias, sp. n.

Holotype: Male, Kotovskoe mt., slopes, forest, 4.VI.1967. (Talitskii). Paratypes: 2 males, details same as for holotype; 3 males, same place, forest grade, 4.VI.1967 (Tobias).

- 91 (90). Abdomen not yellow, monochromatic or bichromatic; stigma usually dark brown, basally lighter in color, rarely yellow. Second radiomedial cell longer, usually much longer, rarely slightly longer than wide.
- 92 (93). Head and thorax entirely black or rarely with yellowish red pattern; abdominal apex black, its basal tergites except spot on 1st yellowish dark brown. Antennae 46–54-segmented. Body 5–7. Parasite of *Philudoria potatoria* L. (Lasiocampidae), *Orgyia antiqua* L., *O. gonostigma* L., *Gynaephora sclenitica* Esp., *Euproctis chrysoorrhoea* L., *E. similis* Fuessly (Lymantriidae), *Arctia caja* L., *A. villica* L., *Ocnogyna boeticum* Rbr., *Coscinia cribrum* L. (Arctiidae), *Spilonota ocellana* F. (Tortricidae), *Autographa gamma* L., *Noctua fimbriata* Schreb., *N. pronuba* L., *Acronicta psi* L. (Noctuidae), *Thaumetopoea processionea* L., *T. pityocampa* Den. and Schiff. (Thaumetopoeidae) and other lepidopterans. Center, south; Caucasus, Kazakhstan, Central Asia, Siberia, Yakutia; Western Europe; Mongolia ..... **R. geniculator** Nees
- 93 (92). Color highly variable, often head and thorax mostly yellowish dark brown; if black then abdomen entirely black. Antennae 37–45-segmented. Fig. 39: 15, 19. Body 3.5–6. Parasite of *Apamea sordens* Hfn. (Noctuidae), *Zygaena filipendulae* L., *Z. meliloti* Esp., *Procris pruni* Den. and Schiff. (Zygaenidae), *Hyphonephele jurtina* L. (Satyridae), *Dasychira albondentata* Brem. (Lymantriidae), *Polyommatus icarus* Rott., *P. eros* Ochs. (Lycaenidae), *Pterophorus monodactylus* L., *Leioptilus tephradactylus* Hb. (Pterophoridae), *Archiearis parthenias* L. (Geometridae), *Nymphalis urticae* L. (Nymphalidae). Entire

- Palearctic ..... **R. bicolor** Spin.  
 (*tener* Kok., *incertus* Kok., *tristis* Wesm., *basalis* Costa, *esseni*  
 Hellén, *coxator* Tel., syn. n., *incertoides* Tel., syn. n.).
- 94 ( 1). Third segment of maxillary palp enlarged, broader in basal  
 third (Fig. 39: 21). Propodeum rugose or almost smooth,  
 with fields, without longitudinal ridge. Abdomen enlarged  
 posteriorly, broadest in apical third. Eyes reniform.
- 95 (96). Occipital ridge uniformly developed throughout its length;  
 ocellar field distinctly raised, level of posterior ocellus  
 almost vertical to plane of vertex. 3rd segment of max-  
 illary palp sharply enlarged at base and gradually nar-  
 rowed toward apex, 3 times as long as maximum width.  
 Body yellowish dark brown, sometimes with blended dark-  
 ened propodeum and abdominal tergites, stigma yellow.  
 Propodeum rugose. Body 6–10. Parasite of *Iphiclidus po-*  
*dalirius* L., *Papilio machaon* L. (Papilionidae), *Hylaea fas-*  
*ciaria* L., *Thera firmata* Hb., *T. variata* Den. and Schiff.  
 (Geometridae), *Cochlidion limacodes* Hfn. (Limacodidae).  
 Ukraine (Kharkov Region), Moldavia, Caucasus; Western  
 Europe; Japan ..... **R. testaceus** F. (*luteus* Nees)
- 85 96 (95). Occipital ridge smooth in middle, ocellar field slightly raised,  
 plane of posterior ocellus slightly inclined to plane of ver-  
 tex; 3rd segment of maxillary palp more gradually and less  
 distinctly enlarged, 4 times as long as wide. Body usually  
 with well developed black pattern, dark spots on abdomen  
 contrasting with yellow border of tergites and lower side of  
 abdomen; stigma dark brown. Propodeum weakly sculptured.  
 Body 2.5–5. Parasite of *Cochlidion limacodes* Hfn. (Limaco-  
 didae). Moldavia; Armenia; Western Europe .....  
 ..... **R. tricolor** Wesm.

53. **Heterogamus** Wesmael, 1838 (*Hyperstemma* Shest.)—About  
 10 to 12 species, 4 to 5 in the Palearctic. From among the fauna of the  
 USSR we have not included here the Far Eastern species *H. chloroti-*  
*cus* Shest.

- 1 (4). Ocelli weakly developed, their diameter much less than ocel-  
 locular distance; height of genae approximately 1/2 longitudi-  
 nal diameter of eye; length of temples about 1/2 transverse  
 diameter of eye. Antennae with contrasting light colored,  
 whitish segment in middle. Body sculpture relatively coarse,

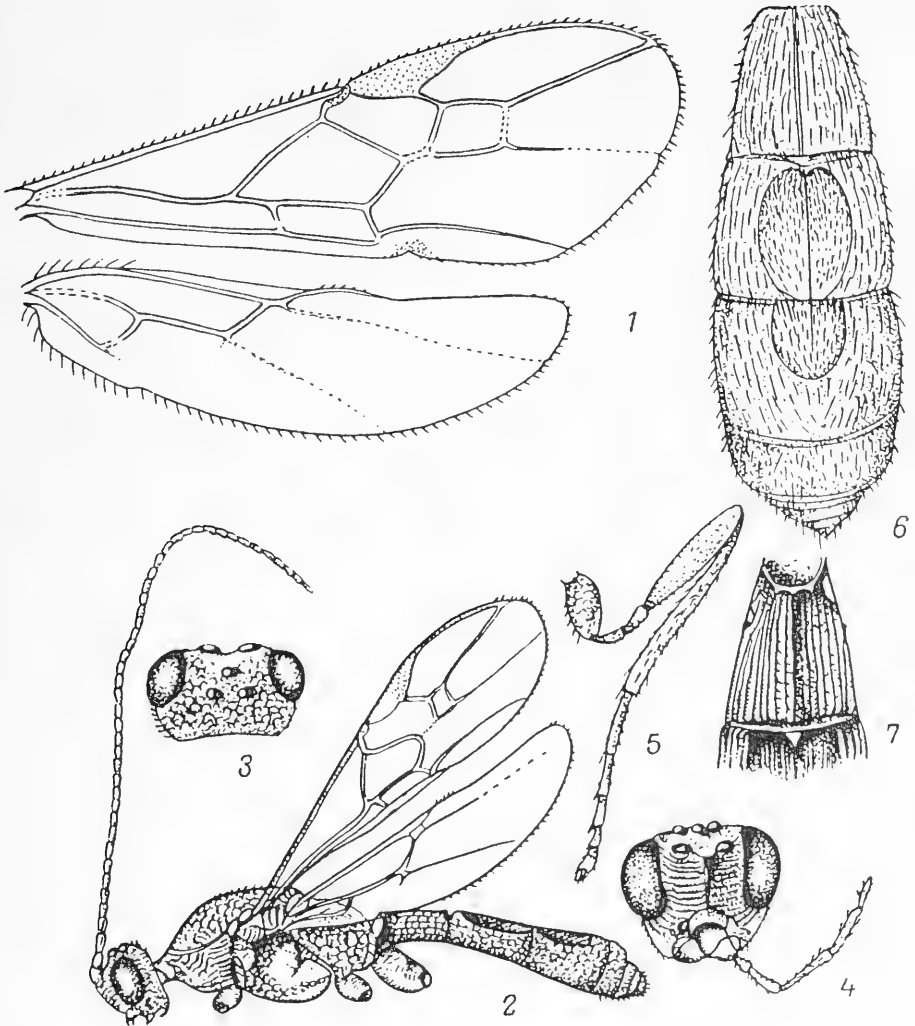


Fig. 42. Rogadinae (from Achterberg and Stary).

1—*Rogas unipunctator*, wings; 2–7—*Heterogamus excavatus*, male: 2—general appearance, 3—head, dorsal view, 4—head, frontal view, 5—hind leg, 6—abdomen, 7—1st and base of 2nd abdominal tergite.

occiput and temples with distinct wrinkles, matte. Wings somewhat darkened.

2 (3). Second and 3rd abdominal tergites of male with densely pilose depression. First abdominal tergite slightly longer than

its width at apex; 2nd tergite slightly transverse. Body yellowish dark brown. Fig. 42: 2–7. Body 5.5–6. Northwest, center; Kazakhstan, Caucasus, ?Far East; Czechoslovakia; Yugoslavia; Italy..... **H. excavatus** Tel. (*farmakena* Maláč.? *tatianae* Tel.)

Lectotype: Female, Kazakhstan, Borovoe, 10.VII.1932 (V. Popov).

- 3 (2). Second and 3rd abdominal tergites of male without depression. First abdominal tergite 1.5 times as long as wide at apex; 2nd tergite square or longer than wide. Body yellowish dark brown, 4.5–5. North (Arkhangel'sk), center; Caucasus (Sochi, Batumi); Western Europe; Japan..... **H. dispar** Curt.

- 4 (1). Ocelli large, their diameter equaling ocellocular distance or slightly less; height of genae approximately 1/4 longitudinal diameter of eye; temples 1/3–1/4 transverse diameter of eye. Antennae lacking whitish segment in middle. Body sculpture much less coarse, occiput and temples without distinct wrinkles, lustrous. Wings light colored. Body 3.5–4. South-east; Central Asia..... **H. testaceus** Tel.

Lectotype: Female, Astrakhan, 24.VII.1911. Paralectotypes: 3 females, same place, from [caterpillar] Geometridae, 24.VII.1911; 1 female (greatly damaged), Turkmenia, Bairam-Ali, 29.VII.1931. (Bogush).

54. **Petalodes** Wesmael, 1838.—Four species, 1 in the Palearctic.

- 1 (1). Body entirely, delicately and densely with granulose sculpture, matte, greenish dark brown, 4.5–7. Parasite of *Clostera pigra* Hfn., *C. anachoreta* Den. and Schiff. (Notodontidae), *Colchidion limacodes* Hfn. (Limacodidae), *Apocheima hispidaria* Den. and Schiff., *Hydriomena furcata* Thunb. (Geometridae), *Nycteola revayana* Scop. (Noctuidae), *Acleris hastiana* L. (Tortricidae), *Leucoma salicis* L. (Lymantriidae). West, center; Caucasus (Georgia), Siberia (Novokuzhetsk Irkutsk); Western Europe..... **P. unicolor** Wesm.

### 3. Subfamily Gnaptodontinae<sup>1</sup>

This subfamily was established relatively recently (van Achterberg, 1983. *Tijdschr. Entomol.*, 126, 2: 25–57). In addition to the earlier described genus *Gnaptodon* and close to it *Pseudognaptodon* (known

<sup>1</sup> Treatment by V.I. Tobias.



from North and South America) which form an independent tribe whose position is a subject of debate (however, the presence of the oral cavity and parasitism on lepidopteran miners more readily confirms its affinity with Doryctinae than with Opiinae where this tribe is sometimes traditionally placed), Achterberg included under this subfamily the tribe Gnaptogastrini with a single genus *Gnaptogaster* which when described was placed under subfamily (Tobias, 1976. Nasek. Mongolii [Insects of Mongolia], 4: 315–321) primarily based on the absence of the oral cavity and the presence of the prescutellar pit. Genera *Gnaptodon* and *Gnaptogaster* do have many important synapomorphic(?) characters (primarily the absence of basal prominence on the 2nd abdominal tergite, the absence of the occipital ridge, 3-segmented labial palp and general appearance) and it may be assumed that Achterberg is correct in placing them near each other. However, their true proximity can be judged only after data on hosts of the genus *Gnaptogaster* are published. Delineation of their characters is also very important (cf. above and key to tribes and genera) so that at least within the subfamily two independent tribes can be retained.

*Key to Tribes and Genera*

- 1 (2). Clypeus on anterior margin somewhat incised; between it and mandible distinct oral cavity developed (Fig. 43: 3). Maxillary palps 6-segmented. Mesonotum lacking prescutellar pit (Fig. 43: 4). First abdominal tergite basally with 2 longitudinal ridges (Fig. 43: 6, 9). Antennal apex with short spinule (Figs. 47: 7; 48: 5). Radial cell longer, maximum length of metacarpus many times its width (Fig. 43: 5, 8). Basal ring in copulatory apparatus of male closed, extended proximally, triangular (Tribe Gnaptodontini) ..... 55. **Gnaptodon**
- 86
- 2 (1). Clypeus on anterior margin not incised, oral cavity absent between it and mandibles. Maxillary palps 5-segmented. Mesonotum with prescutellar pit (Fig. 49: 3) or with shallow depression in region of this pit. First abdominal tergite basally without longitudinal ridges (Fig. 49: 5). Antennal apex without spinule (Fig. 49: 2). Radial cell very short, maximum metacarpus length equal or almost equal to its width (Fig. 49: 4). Basal ring in copulatory apparatus of male open, proximally not stretched, distinctly transverse (Fig. 49: 6). (Tribe Gnaptogastrini) .....  
 87 ..... 56. **Gnaptogaster**

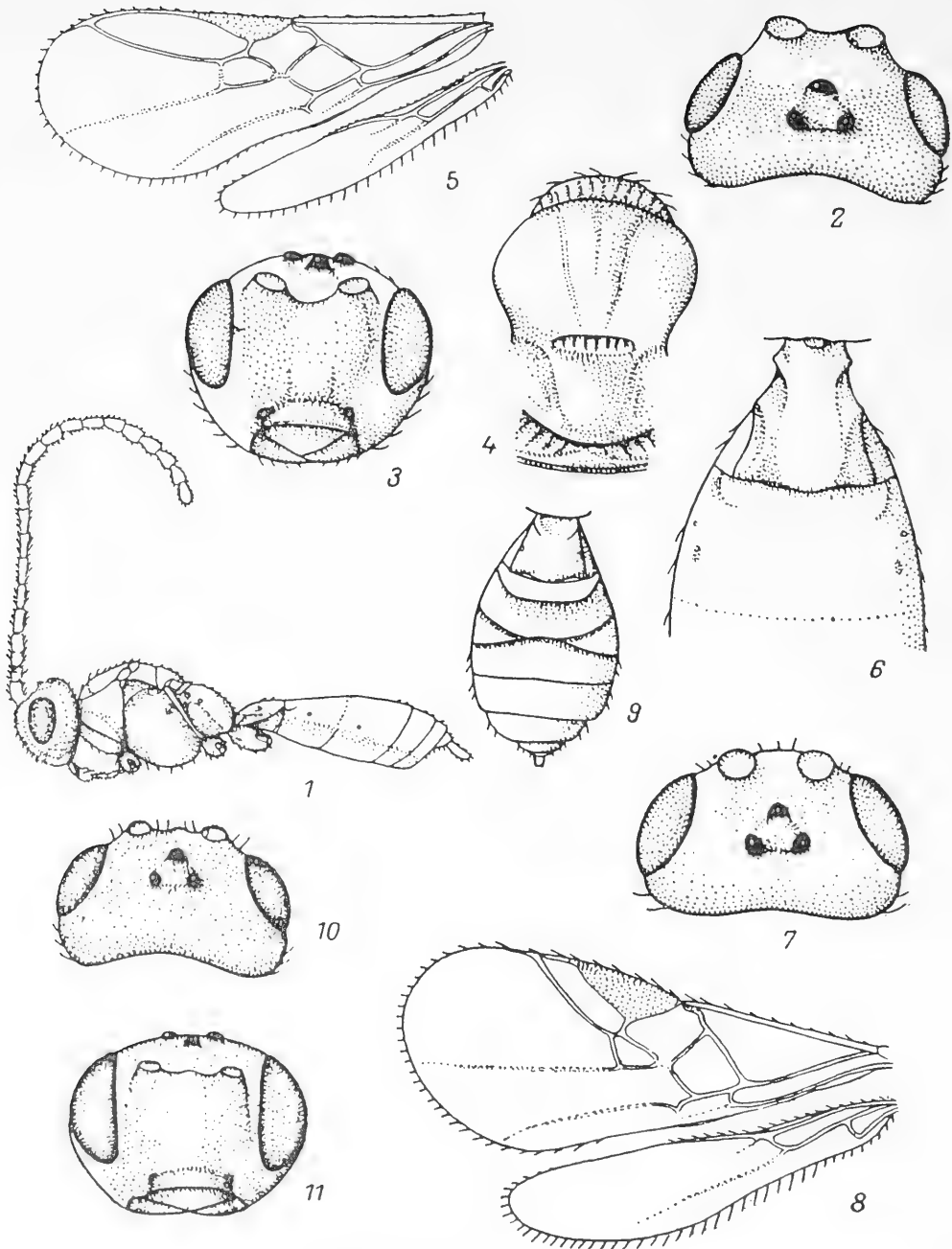


Fig. 43. Gnaptodontinae (from Achterberg).

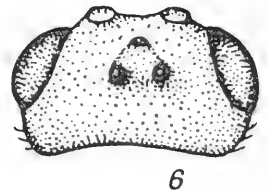
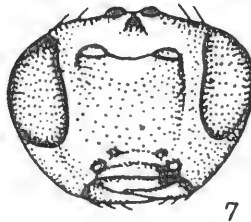
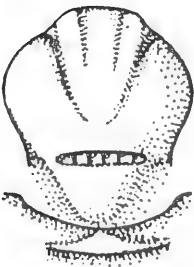
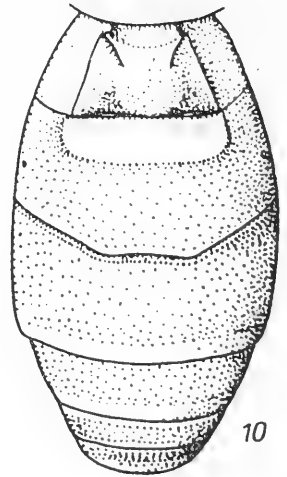
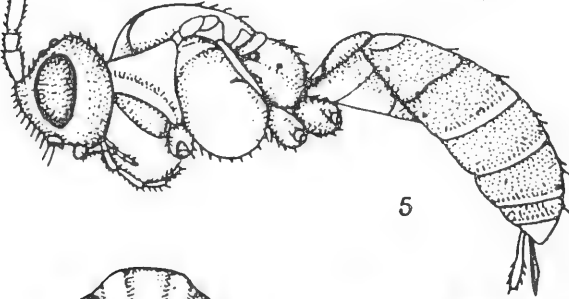
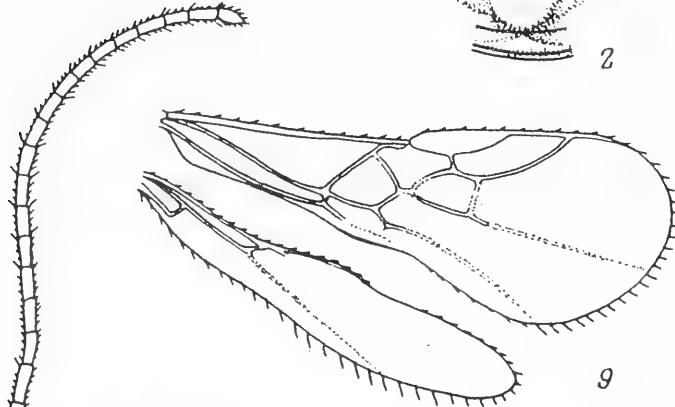
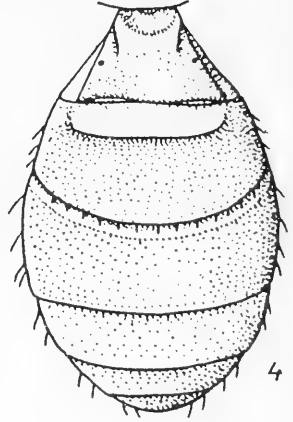
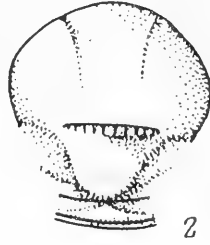
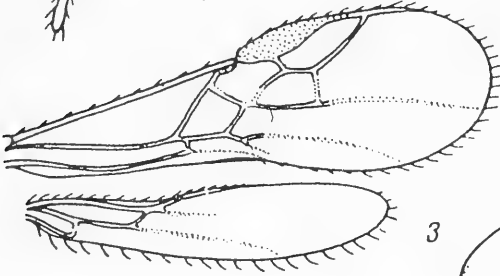
1-6—*Gnaptodon aphaeles*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—mesonotum, 5—wings, 6—1st and 2nd abdominal tergites; 7-9—*G. breviradialis*: 7—head, 8—wings, 9—abdomen; 10, 11—*G. brevis*: 10—head, dorsal view, 11—head, frontal view.

*Key to Species of Genera*

55. **Gnaptodon** Haliday, 1837<sup>1</sup>.—Twenty-four species, 13 species (one Himalayan from Nepal, others European) in the Palearctic. Parasites of miner caterpillars of family Nepticulidae. The majority of species of this genus are marked by high variability of color, sculpture on the abdomen and the size of the radial cell on the forewing. In these characters there is no distinct boundary between species and it has been suggested that known European species be treated as variants of a single highly variable species [Tobias, 1970. VII Mezhdunar. Simp. po Entomofaune Sr. Evropy Materialy (VII International Symposium on Entomofauna of Central Europe, Papers): 237–240]. However, based on investigations of a large amount of material separated from different hosts, it was established that wing venation within a species is less extensively variable and with other (including earlier, not considered) characters could be used in the systematics of the genus (van Achterberg, 1983: cf. footnote). We note, however, that the variability of the more common and extensively distributed species in Europe *G. pumilio* (which was confirmed by Achterberg's studies) is quite wide; the same is characteristic of the species *G. decoris* and *G. georginae* common in south. It is not always possible to precisely distinguish the latter from each other as well as from *G. breviradialis* and *G. erasmi*.

- 1 ( 2). Suture between 2nd and 3rd abdominal tergites very smooth, nearly in middle like posterior margin of basal prominence of 2nd tergite. Radial cell on forewing relatively long. Vertex and face laterally with weak finely granulose sculpture, frons smooth, face and frons lustrous. Middle part of mesonotum with weak longitudinal depression. Thorax 1.5 times longer than high. Flagellum and hind femora dark. Fig. 43: 1–6. Body 1.6. South; Tyrol (1900–2200 m) ... *G. apheles* Acht.
- 2 ( 1). Suture between 2nd and 3rd abdominal tergites distinct, usually deep; posterior margin of basal prominence of 2nd tergite usually distinct. Legs usually light colored.
- 3 (18). Radial cell on forewing  $2/3$ – $1/3$  distance from it to wing apex,  $2/3$ – $1/3$  of stigma (Figs. 43: 8; 44: 9; 45: 6; 46: 8; 47: 3, 5).
- 4 ( 5). First section of radial vein not shorter, often longer than its 2nd section. Lateral angles of 3rd abdominal tergite separated by distinct furrow. Vertex smooth. Antennae

<sup>1</sup> Van Achterberg. 1983. *Tijdschr. Entomol.*, 126, 1: 25–27.



17–19-segmented. Fig. 43: 7–9. Parasite of miners damaging leaves of trees, *Loranthus europaeus* Jacq., *Nepticula ulmivora* Fologne, *N. amygdali* Klim., *Ectoedemia mahalebella* Klim. Moldavia; France; Hungary; Greece .....

..... **G. breviradialis** Fi.

- 5 ( 4). First section of radial vein shorter than 2nd. Usually lateral angles of 3rd abdominal tergite not separated by distinct furrow. Vertex with microgranulose sculpture, number of antennal segments often more.
- 6 ( 9). Abdomen entirely yellow. Radial cell narrow, almost of same width as 2nd radiomedial cell (Fig. 44: 3, 9). Head and abdomen with microgranulose sculpture. Thorax short, mesonotum without longitudinal furrow. Second abdominal tergite much longer than 3rd.
- 7 ( 8). Ocelli small, diameter of posterior ocelli  $2/5$ – $1/3$  interocellar distance. Anterior margin of radial cell  $1/3$  of distance from it to wing apex. Suture between 2nd and 3rd abdominal tergites uniformly curved. Pit in middle of posterior margin of sides of mesothorax deep. Mesonotum without longitudinal depression in middle. Face almost smooth in middle. Head dark brown. Figs. 43: 10, 11; 44: 1–4. Body 1.4. Parasite of *Ectoedemia hexapetalae* Szöcs on *Filipendula vulgaris*. Hungary .....
- ..... **G. brevis** Acht.
- 8 ( 7). Ocelli larger, diameter of posterior ocellus about  $1/2$  of interocellar distance. Anterior margin of radial cell  $1/2$  of distance between it and wing apex. Suture between 2nd and 3rd abdominal tergites angular. Pit in middle of posterior margin of sides of mesothorax weak. Mesonotum in middle with longitudinal depression. Face entirely with granulose sculpture. Head yellowish dark brown. Fig. 44: 5–10. Body 1.6. Parasite of *Trifurcula dorycniella* Suire on *Dorycnium germanicum*. Hungary .....
- ..... **G. ruficeps** Acht.
- 9 ( 6). Abdomen entirely or in apical half dark. Radial cell usually broader. Ocelli usually larger than in *G. brevis*, their diameter 2 times interocellar distance.

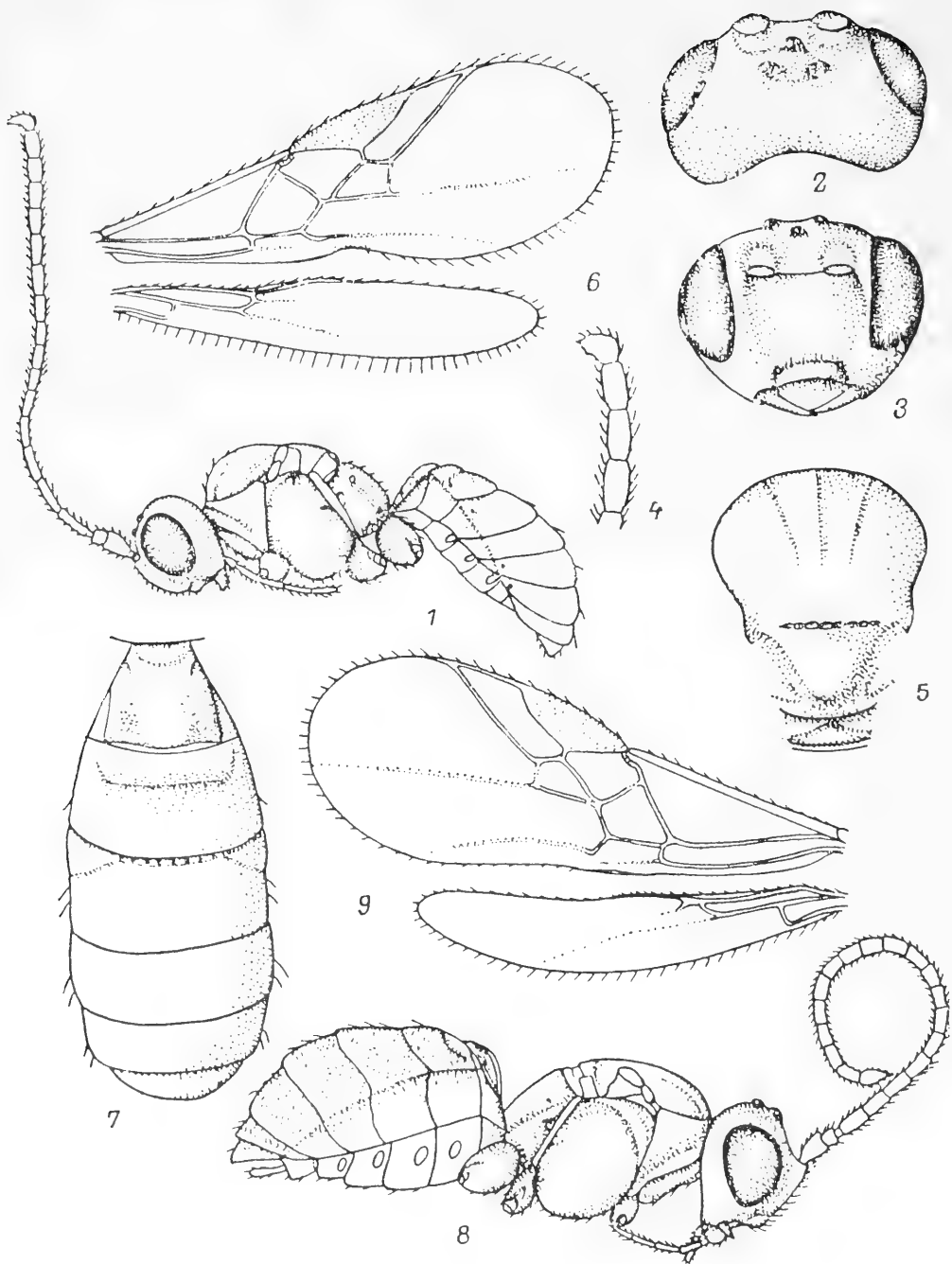


Fig. 45. Gnaptodontinae (from Achterberg).

1-7—*Gnaptodon vlugi*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—antennal apex, 5—mesonotum, 6—wings, 7—abdomen. 8-9—*G. pilosus*: 8—body, 9—wings.

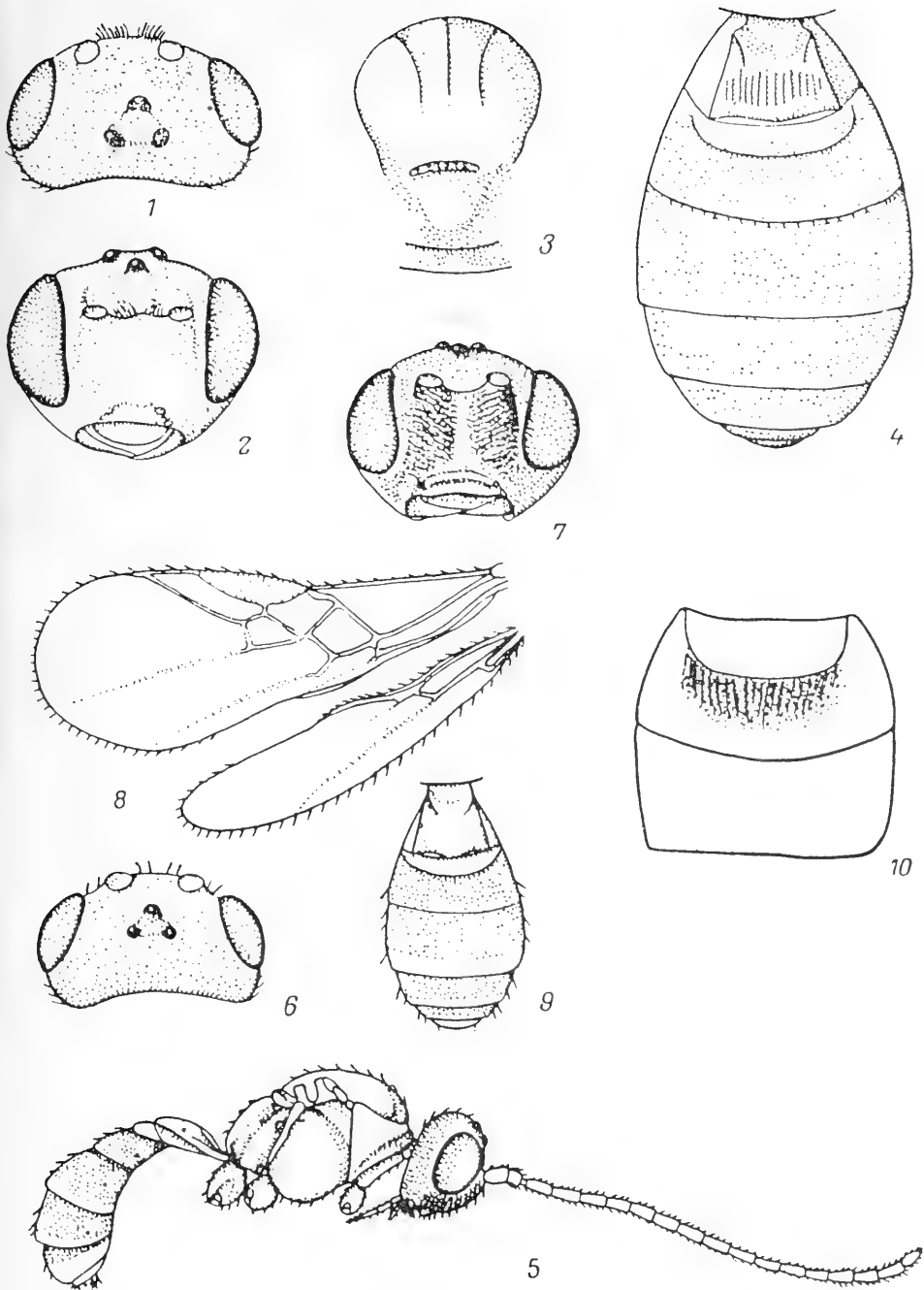


Fig. 46. Gnaptodontinae (from Achterberg and original).

1-4—*Gnaptodon pilosus*: 1—head, dorsal view, 2—head, frontal view, 3—mesonotum, 4—abdomen; 5-9—*G. nieukerkeni*: 5—body, 6—head, dorsal view, 7—head, frontal view, 8—wings, 9—abdomen; 10—*G. boreus* sp. n., 2nd and 3rd abdominal tergites.

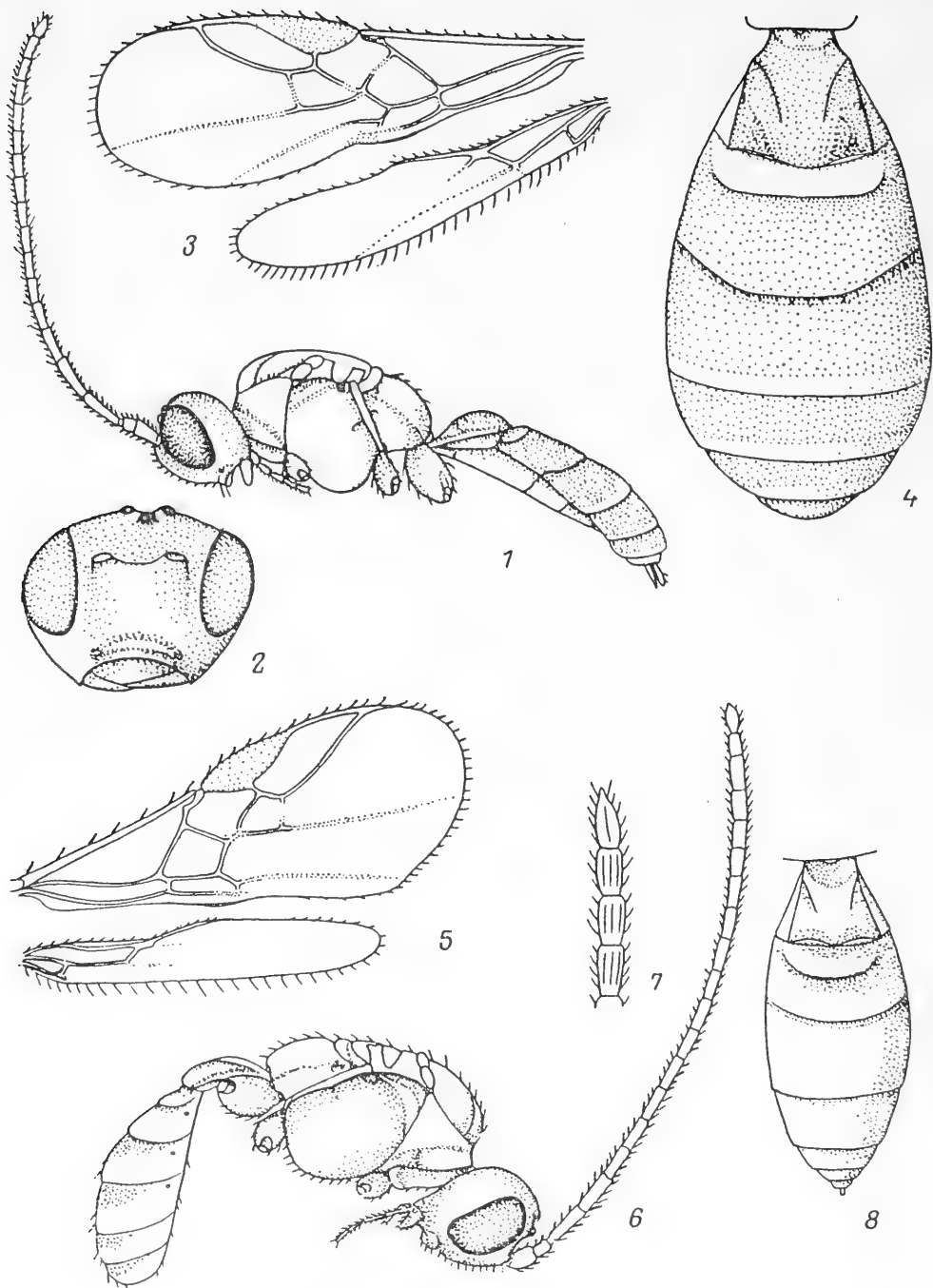


Fig. 47. Gnaptodontinae (from Achterberg).

1—4—*Gnaptodon erasmi*: 1—body, 2—head, 3—wings, 4—abdomen; 5—*G. decoris*, wings; 6—8—*G. georginae*: 6—body, 7—antennal apex, 8—abdomen.



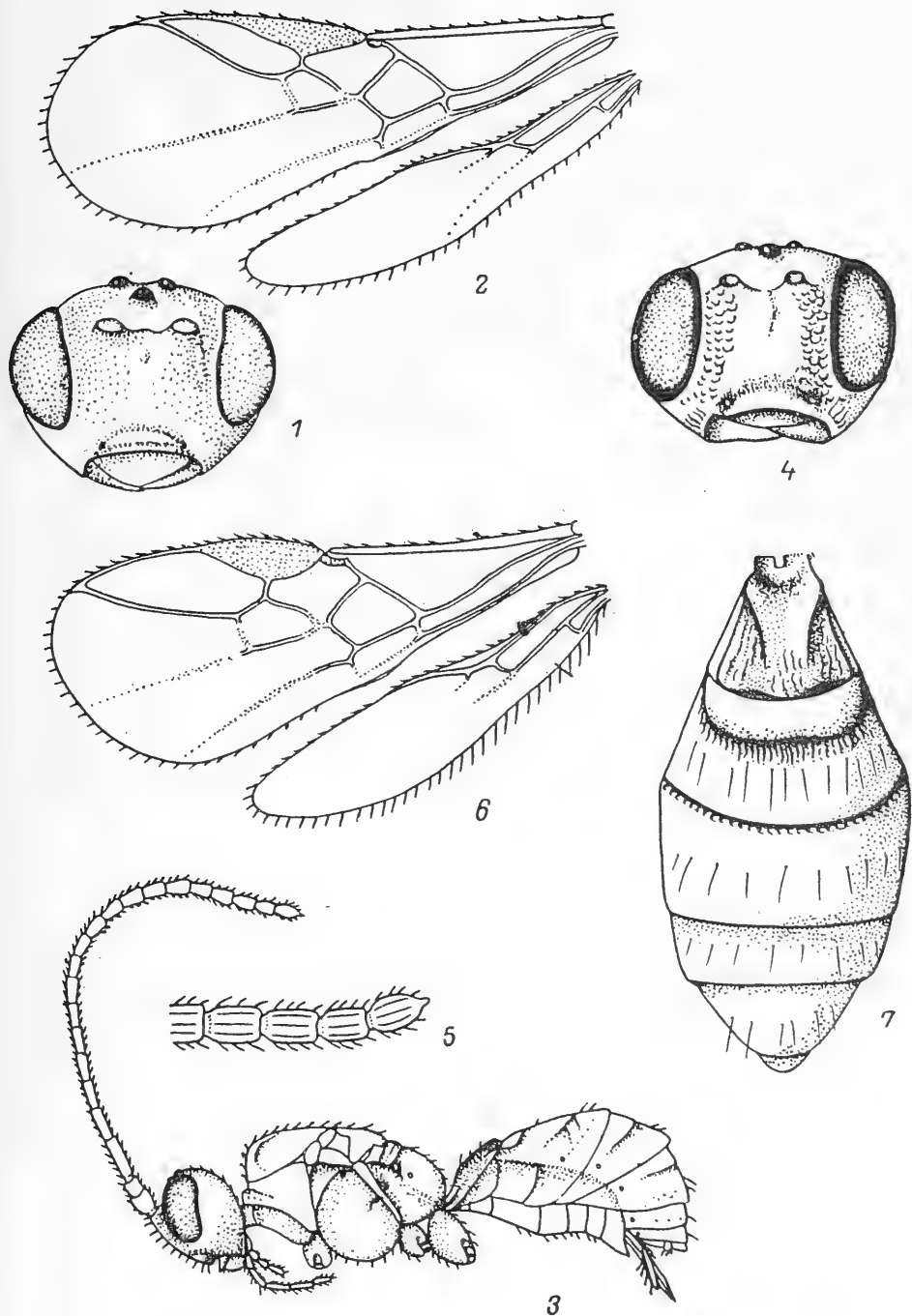
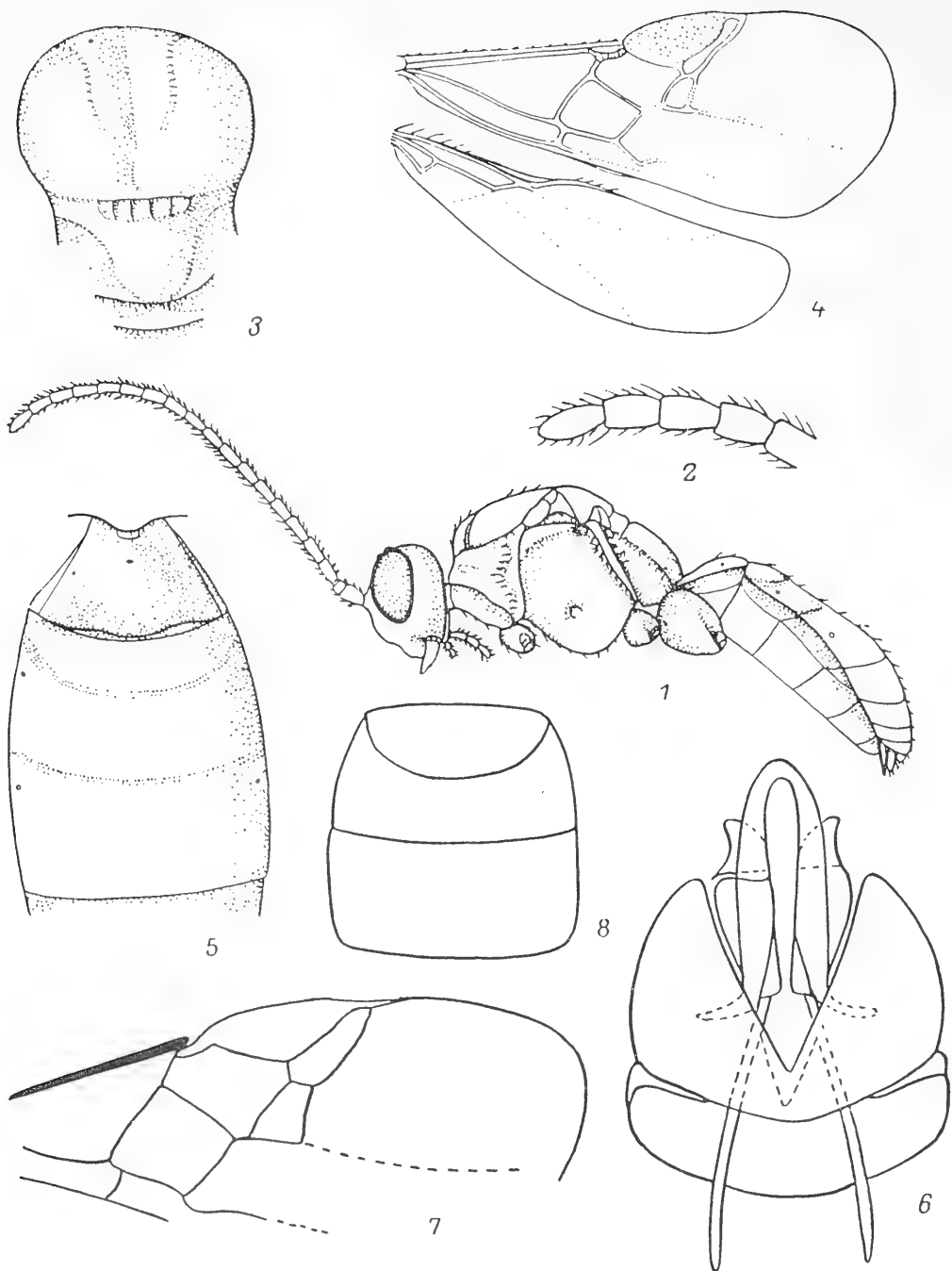


Fig. 48. Gnaptodontinae (from Achterberg).

1-2—*Gnaptodon georginae*: 1—head, 2—wings; 3-7—*G. punilio*: 3—body, 4—head, 5—antennal apex, 6—wings, 7—abdomen.



1—6—*Gnaptogaster mongolicus*: 1—body, 2—antennal apex, 3—mesonotum, 4—wings, 5—1st to 3rd abdominal tergites, 6—genitalia, male; 7—8—*G. levipleuris*: 7—part of forewing, 8—2nd and 3rd abdominal tergites.

- 10 (11). Vertex smooth. Third abdominal tergite with fine smooth furrows separating its posterolateral angles. These angles, 1st and 2nd abdominal tergites, and hind tarsi whitish yellow. Suture between 2nd and 3rd abdominal tergites crenulate. Third section of radial vein almost straight. Mesonotum with weak but distinct longitudinal furrow. Thorax short. Face almost smooth. Fig. 45: 1–7. Body 1.2. Sweden . . . . . **G. vlugi** Acht.
- 11 (10). Vertex with somewhat distinct granulose sculpture. Third abdominal tergite lacking oblique furrows. Color variable, usually without whitish tinge.
- 12 (13). Dense pubescence of long hair between antennal tubercles. Mesonotum in anterior half with longitudinal furrow in middle, usually as deep as notaulices. Second and 3rd abdominal tergites equal in length. Thorax short. Third section of radial vein slightly bent. Figs. 45: 8, 9; 46: 1–4. Body 1.4. Parasite of *Nepticula eberhardi* Joh. on *Quercus pubescens*. Moldavia; Hungary . . . . . **G. pilosus** Acht.
- 89 13 (12). At best, sparse hair between antennal tubercles. Longitudinal furrow on mesonotum weak or not developed.
- 14 (17). Hind coxae dark. Mesonotum lacking median longitudinal furrow. Antennae and abdomen dark.
- 90 15 (16). Face with dense granulose sculpture, transversely rugose. Radial cell relatively narrow. Anterolateral angles of 3rd abdominal tergite lacking transverse furrows; 3rd abdominal tergite 1.1 to 1.3 times as long as 2nd, posterior to basal prominence of 2nd tergite and following tergites with granulose sculpture. Antennae 17–20-segmented. Fig. 46: 5–9. Body 1.4. Parasite of *Nepticula* sp. on *Rhamnus saxatilis*, N. ? *diffinis* Wck., N. ? *occultella* Hein. Poland; Greece (2000 m) . . . . .  
. . . . . **G. nieukerkeni** Acht.
- 16 (15). Face only laterally with soft granulose sculpture, almost smooth in middle, lustrous, without transverse wrinkles. Radial cell broader, as in *G. pilosus* (cf. Fig. 45: 8). Anterolateral angles of 3rd abdominal tergite with short transverse furrow not reaching its lateral margin and separating only inner angles of lateral fields; 2nd abdominal tergite much longer than 3rd, like all subsequent tergites smooth but posterior to basal prominence with granulose sculpture and usually (particularly in holotype) with longitudinal wrinkles (Fig. 46: 10). Antennae 21–22-segmented; 1st flagellar segment 3 times as
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long as preapical, 2 times as long as wide. Body 2–2.3. Kola Peninsula ..... **G. boreus** Tobias, sp. n.

Holotype: Female, Polar (“Aleksandrovsk, Arkhangelsk”). 26.VIII.1923 (Fridolin). Paratypes: 2 females, 1 male, same place (“Aleksandrovsk, Murman.”), 24–30.VIII.1923 (V. Kuznetsov).

- 94 17 (14). Hind coxae light, dark brownish yellow or yellow. Face smooth only laterally with granulose sculpture. Antennae 17–18-segmented. Thorax  $\frac{2}{3}$  as long as high, mesonotum without median longitudinal furrow. Anterior margin of radial cell half distance from it to wing apex. Second abdominal tergite longer than 3rd, all tergites with soft granulose sculpture. Antennal bases and basal half of abdomen light colored. Fig. 47: 1–4. Body 1.3 to 1.6. Moldavia; Italy; Greece ..... **G. erasmi** Acht.
- 18 ( 3). Anterior margin of radial cell at best  $\frac{7}{10}$ , often longer than, distance from radial cell to wing apex; not less than half of stigma, often longer.
- 19 (22). Anterior margin of radial cell at best slightly (not more than 1.3 times) longer, often shorter, than distance from radial cell to wing apex; 3rd section of radial vein with somewhat distinct S-shaped bend (Figs. 47: 5; 48: 2).
- 20 (21). Basal segments of antennae dark rarely slightly yellowish. Mesonotum often with median longitudinal furrow. Antennae 20–23-segmented. Basal abdominal tergites usually dark. Fig. 47: 5. Body 1.2–1.5. Parasite of miners on grasses and low bushes: *Trifurcula cryptella* Stt., *Nepticula fragariella* Heyd., *N. geminella* Frey, *N. splendidissima* H.-S., *N. poterii* Stt., *N. occultella* Hein., *N. plagicolella* Stt., *N. setulicola nanivora* Petersen, *N. prunetorum* Stt.<sup>1</sup>, *N. agrimoniae* Frey. South, center, Central Ural; Caucasus, Kirgizia; Western Europe .....  
..... **G. decoris** Först. (*bachmaieri* Fi., *klemensiewiczii* Niez.)
- 21 (20). At least 4 basal segments of antennae dark brownish yellow. Mesonotum usually without longitudinal furrow. Antennae 19–21-segmented (in male 20–23). Basal abdominal tergites usually light. Thorax 1.3 times as long as high. Face and abdominal tergites with weak soft granulose sculpture.

<sup>1</sup> Material in the collection of ZIN Acad. Sci. USSR from Crimea, separated from this host, was earlier identified as *G. breviradialis* Fi. (Tobias, 1976. Braconidy Kavkaza [Braconids of Caucasus]: 287).

- Figs. 47: 6–8; 48: 1–2. Body 1.5. Parasite of miners on trees: *Nepticula hybnereella* Hb., *N. malella* Stt., *N. ruficapitella* Hw., *N. tityrella* Stt., *N. marginicolella* Stt. South; Poland; Switzerland; Bulgaria; Algeria ..... **G. georginae** Acht.
- 22 (19). Anterior margin of radial cell 2–4 times as long as distance from this cell to wing apex. Third section of radial vein straight or slightly bent, without distinct S-shaped bend. Sculpture and color of antennae and abdomen highly variable. Fig. 48: 3–7. Parasite of miners mostly on trees: *Nepticula luteella* Stt., *N. betulicola* Stt., *N. confusella* Wood, *N. continuella* Stt., *N. salicis* Stt., *N. tiliae* Frey, *N. ulmivora* Fologne, *N. carpinella* Nein., *N. magdalenae* Klim., *N. sorbi* Stt., *N. malella* Stt., *N. pomella* Vaughan, *N. rhamnella* H.-S., *N. ruficapitella* Nw., *N. speciosa* Frey, *N. aeneofasciella* H.-S., *N. caradjai* Hering, *Ectoedemia erythrogenella* de Joannis. Northwest, center, south; Western Europe ..... **G. pumilio** Nees

56. **Gnaptogaster** Tobias, 1976.—Two species, one from Mongolia, another from Kazakhstan.

- 1 (2). Pronotum posteriorly with transverse rugose furrow; lower part of sides of mesothorax with pit, their posterior margin with crenulate furrow. Mesonotum with prescutellar pit. Third section of radial vein curved inside radial cell (Fig. 49: 4). Basal prominence of 2nd abdominal tergite shorter than half length of tergite (Fig. 49: 5). Abdomen smooth, dark brownish yellow. Stigma dark brown. Fig. 49: 1–6. Body 2.1. Mongolia ..... **G. mongolicus** Tobias
- 2 (1). Pronotum posteriorly lacking transverse furrow, entirely smooth; lower part of sides of mesothorax lacking pit, only with weak depression, their posterior margin with smooth furrow. Mesonotum lacking prescutellar pit, only with very shallow and broad depression anterior to scutellum. Third section of radial vein bent outward (Fig. 49: 7). Basal prominence of 2nd abdominal tergite longer than half length of tergite. (Fig. 49: 8). Abdominal tergites with soft granulose sculpture; dark brown (thorax only slightly lighter, resinous black in color). Stigma yellow. Antennae 19-segmented. Body 1.7–1.9. Kazakhstan. .. **G. levipleuris** Tobias, sp. n.  
 Holotype: Male, Taskum sands, eastern Zaisan, 25.V.1961 (Tobias). Paratype: 1 male, details as above.

#### 4. Subfamily Braconinae<sup>1</sup>

This is the largest subfamily of braconids, supposedly comprising hundreds of genera and about 2500 species, mostly in the tropics. (Many names of genera and species would probably be synonymized; however, many species, it is presumed, have not yet been described.) This subfamily includes the largest braconids: in the tropics up to 25–27 mm, in the USSR up to 15 mm; in some of the large forms the ovipositor is many times as long as the body. The wing venation is fairly complete but anal cross-veins in the forewing and the recurrent vein in the hind wing are missing. Occipital and prepectal ridges, sternauli and often notaulices are not developed. The first abdominal tergite has a median field (Fig. 56: 18). The ovipositor is usually rather long. The body is smooth, rarely with granulose sculpture, rugose mostly on the abdomen. All members of the subfamily are ectoparasites usually of cryptic larvae of Lepidoptera, Coleoptera, rarely Diptera and Hymenoptera. Their hosts most commonly occur on stems and fruits of herbage, rarely under the bark of trees.

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#### Key To Tribes and Genera

- 1 ( 2). Pedicel as long as 1st flagellar segment; 1st and 2nd flagellar segments smaller than middle segments, sinuate (Fig. 53: 1–4). Longitudinal veins reaching apex of wing; 3rd section of radial vein straight; 2nd radiomedial cell small (Fig. 53: 6). (Tribe Coeloidini) ..... 57. **Coeloides**
- 2 ( 1). Pedicel much shorter than 1st flagellar segment; 1st and 2nd flagellar segments larger than middle segments, somewhat cylindrical (Fig. 56: 12). Longitudinal veins of forewing not reaching apex; if reaching, then 3rd section of radial vein bent and 2nd radiomedial cell large and long (Fig. 56: 13).
- 3 ( 4). Face with scaly outgrowths (Fig. 51: 6, 7). Antennae as long as head and thorax together, with transverse flagellar segments, distal segments compressed, apical segment obtuse (cf. Fig. 52: 7). Wings with basal vein gently sloping to nervulus, 2nd radiomedial cell apically not broadened, radial cell greatly reduced (Fig. 51: 5). Second tergite with narrow central field noticeable only laterally, deeply furrowed and with long, highly proximate oblique furrows. Basal segment of antennae as in *Atanecolus*. Abdomen smooth. Ovipositor as

<sup>1</sup> Treatment by V.I. Tobias.

- long as body (Tribe Victoroviellini trib. n.) ..... 58. **Victoroviella**
- 4 ( 3). Face without scaly outgrowths. Combination of other characters different.
- 5 ( 8). Basal vein distinctly sloping to nervulus, forming with it a clearly curved line; 2nd radiomedial cell greatly enlarged outward, its inner and outer sides (radiomedial vein) parallel (Fig. 51: 1). Apical segment of antennae blunt, compressed (Fig. 52: 6, 7). Antennae multi-segmented, segments transverse (Fig. 52: 6). Abdominal tergites basally with lateral fields. Body distinctly elongate. Ovipositor usually not shorter than body (Tribe Glyptomorphini).
- 6 ( 7). Third and 4th segments of hind tarsi with process on inner side (Fig. 52: 14) ..... 59. **Teraturus**
- 7 ( 6). Third and 4th segments of hind tarsi without process on inner side ..... 60. **Glyptomorpha**
- 8 ( 5). Basal vein slightly sloping to nervulus forming with it slightly curved or straight line; 2nd radiomedial cell not broadened outside, its inner and outer sides not parallel (Fig. 51: 3). Apical segment of antennae conical, not compressed.
- 96 9 (10). Nervulus antefurcal; brachial cell very large, oval (Fig. 51: 2). Eyes very large; height of face with clypeus much greater than its width. Antennae as in *Atanycolus*. Abdomen with triangular central field. Ovipositor shorter than abdomen (Tribe Aphrastobraconini) ..... 61. **Aphrastobracon**
- 10 ( 9). Nervulus interstitial, brachial cell with parallel anterior and posterior sides; if sometimes nervulus slightly antefurcal (*Fuscala*), then other characters different.
- 11 (26). Second abdominal tergite with central, usually triangular, field or with lateral field. Third section of radial vein with somewhat distinct S-shaped bend and 2nd section usually somewhat curved inside 2nd radiomedial cell (Tribe Iphiaulacini).
- 12 (13). Antennae setiform, longer than body, 50–100—segmented; flagellar segments transverse or square (Fig. 52: 2, 3). Abdominal tergites with lateral fields in anterior part and usually with wide, coarsely crenulate suture between 2nd and 3rd tergites (Fig. 50). Body often cherry red with black tinge ..... 62. **Iphiaulax**
- 97 13 (12). Antennae filiform or weakly setiform, not longer or slightly longer than body, usually with fewer segments; flagellar segments usually longer than wide, rarely square or transverse.

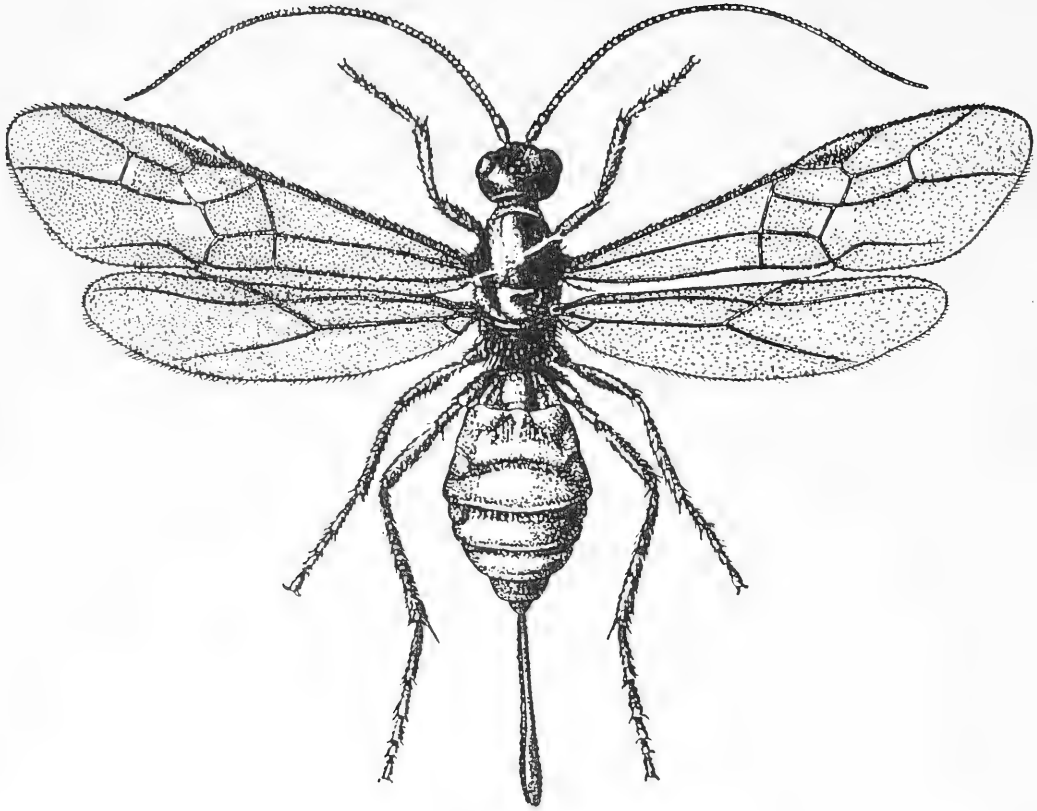


Fig. 50. Braconinae (original).

*Iphiaulax impostor* Scopoli.

- 14 (21). Second abdominal tergite with triangular or oval field (Fig. 56: 19).
- 15 (20). Clypeus lacking tuft of hair. Radial cell on forewing not shortened, reaching wing apex (Fig. 51: 4).
- 16 (19). Basal segment of antennae weak and gradually broadening apically, lacking sharp constriction and border basally; pedicel short, slightly exerted from base.
- 17 (18). Abdomen distinctly compressed (Fig. 58: 1, 8). First abdominal tergite very long, 2nd with oval basal field in middle (Fig. 58: 8). Notaulices not developed (Fig. 58: 5)
- ..... 63. **Fuscula**



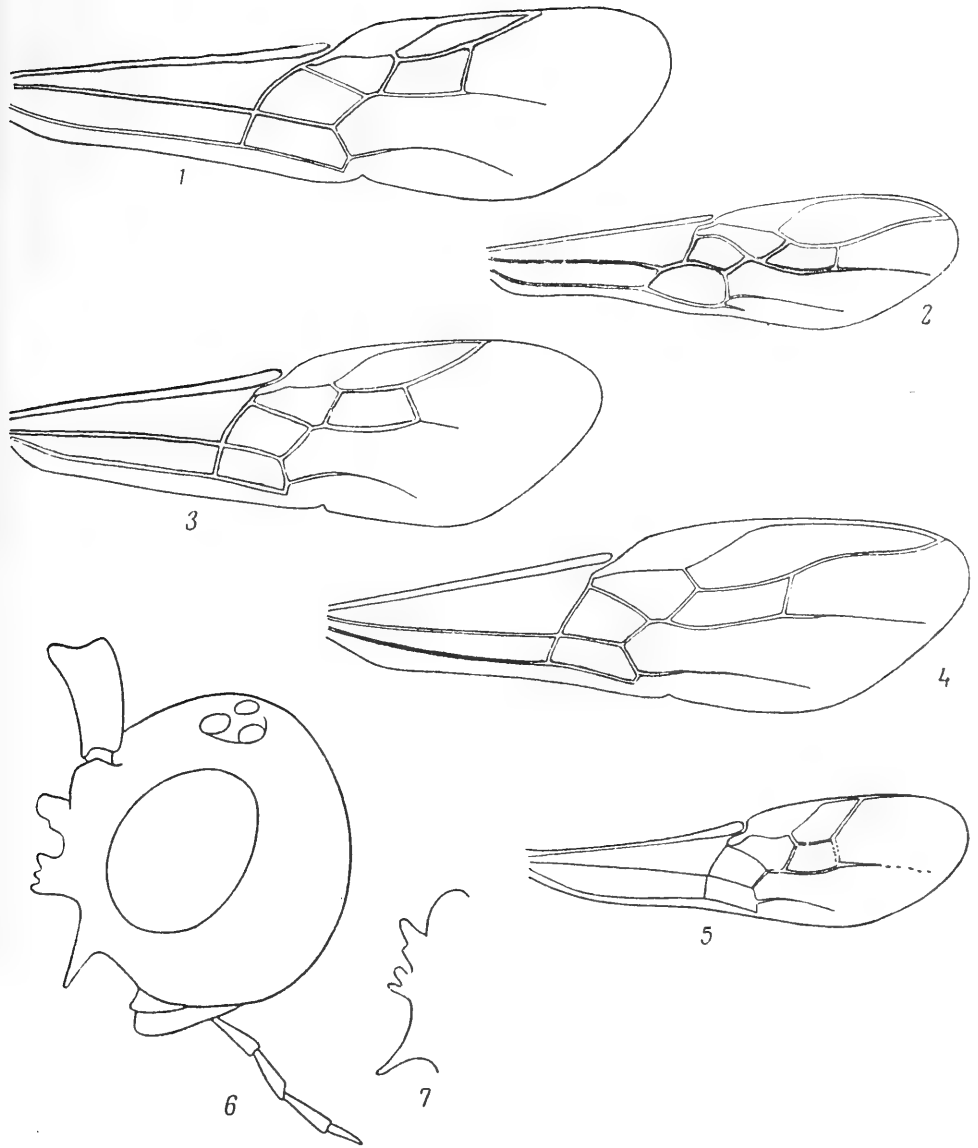


Fig. 51. Braconinae (from Tobias).

1-4—forewing: 1—*Glyptomorpha pectoralis*, 2—*Aphrastobracon jacobsoni*, 3—*Zavipio terrefactor*, 4—*Atanycolus genalis*; 5-7—*Victoroviella deserticola*: 5—forewing, 6—head, 7—variations of facial outgrowths.

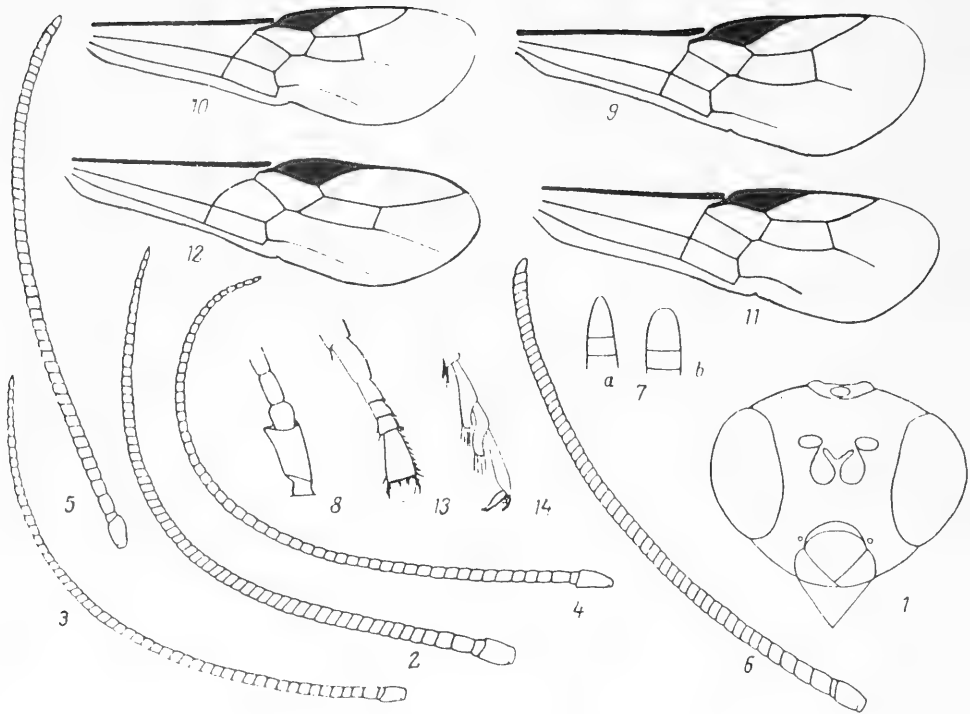


Fig. 52. Braconinae (from Tobias).

1—*Ceratobracon stshegolevi*, head; 2—6—antenna: 2—*Iphiaulax mactator*, 3—*I. umbraculator*, 4—*Cyanopterus flavator*. 5—*Zavipio intermedius*, 6—*Glyptomorpha pectoralis*: 7—*G. pectoralis*, antennal apex (a—front view, b—side view); 8—*Atanycolus genalis*, antennal base; 9—12—forewing: 9—*Iphiaulax umbraculator*, 10—*Zavipio intermedius*, 11—*Pseudovipio inscriptor*, 12—*Baryproctus barypus*; 13—*B. barypus*, hind tarsus; 14—*Teraurus semerowi*, apex of hind tarsus.

- 18 (17). Abdomen depressed or at best slightly compressed. First abdominal tergite much shorter, 2nd with triangular field in middle ..... 64. **IpoBracon**
- 19 (16). Scape parallel-sided, with distinct constriction at base, above constriction with border, apically with projecting margin; pedicel projecting far from base, spherical (Fig. 52: 8). Ovipositor long ..... 65. **Atanycolus**
- 20 (15) Clypeus with two tufts of long hair. Radial cell of forewing distinctly shortened (Fig. 51: 3) ..... 66. **Zavipio**
- 21 (14) Second abdominal tergite lacking distinct triangular or oval field.

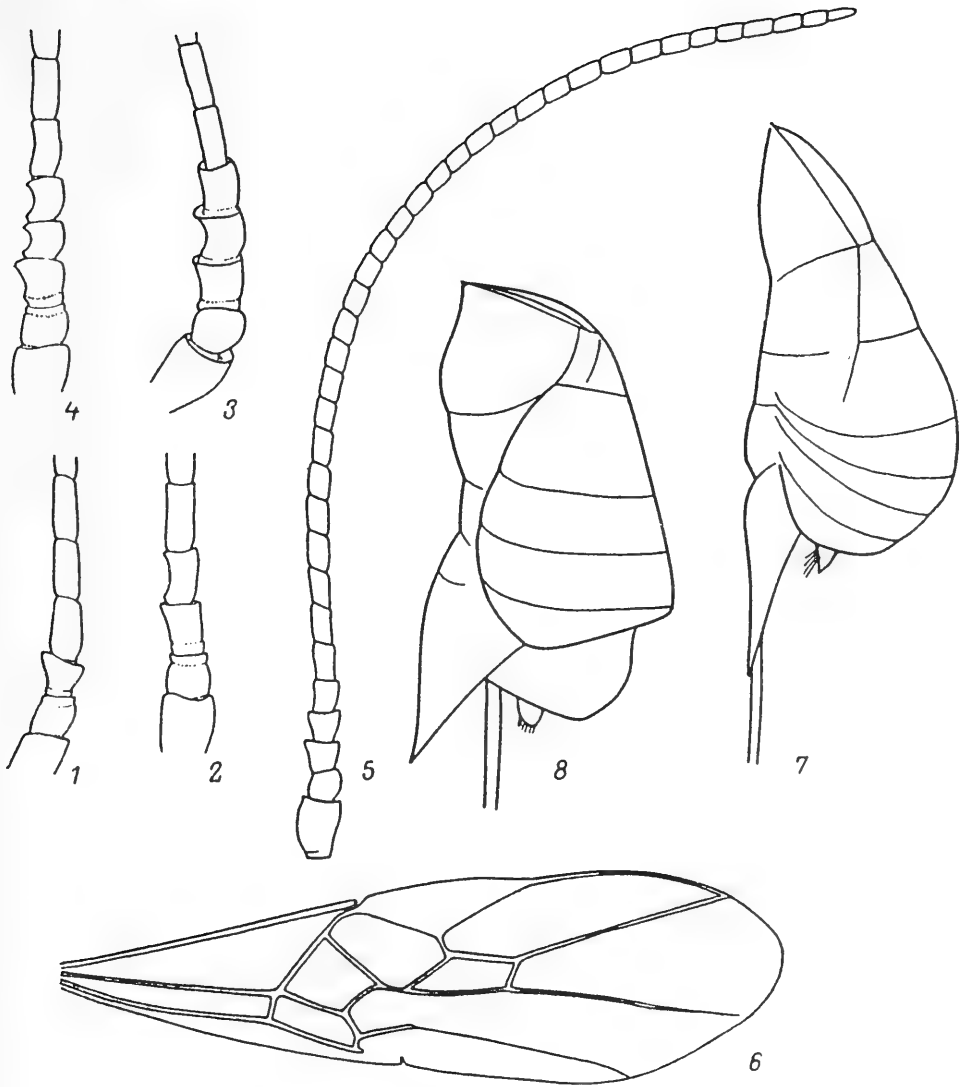


Fig. 53. Braconinae (from Tobias).

1—4—antennal base: 1—*Coeloides filiformis*, 2—*C. foersteri*, 3—*C. abdominalis*, 4—*C. unguularis*; 5—*C. scolyticida*, antenna; 6—*C. abdominalis*, forewing; 7—8—abdomen: 7—*C. filiformis*; 8—*C. scolyticida*.

22 (23). Radial cell of forewing slightly shortened. Second abdominal tergite with oblique furrows originating from middle of its

- base (Fig. 61). Abdomen smooth, 3rd tergite with weak lateral fields. Legs with dark erect hair. Wings distinctly smoky ..... 67. **Cyanopterus**
- 23 (22). Radial cell shortened (Fig. 62). Oblique furrows on 2nd abdominal tergite not close, lateral fields on 3rd tergite slightly less than on 2nd. Abdomen usually sculptured. Legs with light colored hair. Wings light colored or slightly smoky.
- 24 (25). Second and 3rd abdominal tergites lacking light colored Y-shaped pattern. Body usually with yellow spots. Abdomen rugose or smooth ..... 68. **Pseudovipio**
- 25 (24). Second and 3rd abdominal tergites with light colored Y-shaped pattern. Body lacking yellow spots. Abdominal tergites 1 to 4 rugose ..... 69. **Vipiomorpha**
- 98 26 (11). Second abdominal tergite lacking middle and lateral fields, other tergites lacking lateral fields; if at times small fields noticeable then 2nd and 3rd sections of radial vein straight and radial cell not shortened (Tribe Braconini).
- 27 (28). Second radiomedial vein not developed, radial cell very short. Small rudiment of 2nd recurrent vein present on medial vein of forewing. Abdomen smooth; 2nd tergite laterally with oblique depressions. Ovipositor half as long as abdomen ... ..... 70. **Chivinia**
- 28 (27). Second radiomedial vein developed.
- 29 (36). Head and thorax not flattened (if thorax more or less flattened, then not more than 1/3 as high as long). Antennal sockets far removed from clypeus, tubercle between them absent.
- 30 (31). Face in upper part, between antennal tubercles with apically furcate keel (Fig. 52: 1) ..... 71. **Ceratobracon**
- 31 (30). Face in upper part, between antennal tubercles lacking furcate keel.
- 32 (33). Apical segment of tarsi distinctly enlarged, as long as preceding three segments (Fig. 52: 13). Notaulices deep. Sixth abdominal sternite not reaching abdominal apex ..... 72. **Baryproctus**
- 33 (32). Apical segment of tarsi not enlarged (Fig. 68: 2, 4); if appreciably enlarged (subgenus *Orthobracon*—Fig. 75: 8), then longer than preceding two segments together and notaulices weaker.
- 34 (35). First abdominal tergite distinctly transverse, in basal third with projecting lateral angles (spiracular tubercles) from there to apex narrowed ..... 73. **Kulczynskia**

- 35 (34). First abdominal tergite not transverse; if slightly transverse, then laterally parallel-sided or slightly enlarged apically ...  
..... 74. **Bracon**
- 36 (29). Head and thorax distinctly flattened (Fig. 90: 1). Upper margin of clypeus at level of lower margin of antennal sockets, tubercle between them distinct (Fig. 90: 2, 3). Second abdominal tergite in middle with pair of slightly divergent rugose furrows (Fig. 90: 8) ..... 75. **Chartobracon**

*Key to Species in Genera of Subfamily Braconinae*

57. **Coeloides** Wesmael, 1838. (*Syntomomelus* Kok.)<sup>1</sup>.—Ten species (possibly 15) in the Palearctic and seven in the Nearctic. The key below does not include the Far Eastern subspecies *C. abdominalis orientalis* Haes. and *C. unguaris watanabei* Haes. from the fauna of the USSR.

- 1 ( 4). Fourth antennal segment long, 2 times or more as long as 3rd (Fig. 53: 1). Sixth abdominal sternite acicular, projecting far beyond abdominal apex (Fig. 53: 7). Recurrent vein almost interstitial.
- 2 ( 3). Ovipositor longer than body. Abdomen apically distinctly compressed, 1st abdominal tergite 2 times as long as its width at apex, 2nd approximately as long as its width at base (Fig. 55: 4). Abdomen of male very long, approximately 2 times as long as head and thorax together (Fig. 55: 10). Third section of radial vein 3 to 4 times as long as 2nd. Body 2.5–5. Parasite of *Hylesinus fraxini* Panz., *H. crenulatus* F. (Scolytidae). Ukraine, Voronezh Region, northern Caucasus; Western Europe ..... **C. filiformis** Ratz.
- 3 ( 2). Ovipositor shorter than body. Abdomen apically slightly compressed, 1st abdominal tergite not more than 1.5 times as long as its width at apex, 2nd tergite 1/2–2/5 as long as its width at base (Fig. 55: 5). Abdomen in male somewhat longer than thorax. Third section of radial vein 2 to 3 times as long as 2nd. Body 2–4. Parasite of *Hylesinus fraxini* Panz. (Scolytidae). Ukraine, Voronezh Region; Transcaucasia; Western Europe ..... **C. melanotus** Wesm.
- 4 ( 1). Fourth antennal segment short, as long as 2nd or slightly longer (Fig. 53: 2–5). Sixth abdominal sternite of usual

<sup>1</sup>Haeselbarth. 1967. *Mitt. Münch. Entomol. Ges.*, 57: 20–53.

- shape, not acicular but projecting or slightly projecting beyond abdominal apex (Fig. 53: 8). Recurrent vein ante-furcal.
- 5 (16). Abdominal tergites 1 to 3 smooth or only lateral margins of 1st and 2nd somewhat sculptured.
- 6 ( 9). Ovipositor shorter than thorax and abdomen together; 2nd abdominal tergite as long as 3rd, lacking oblique furrows, often somewhat rugose (Fig. 55: 6). Stigma in outer half noticeably more sclerotized than in inner, especially in male (where there is dense granulose sculpture). Body black, abdomen yellowish dark brown.
- 7 ( 8). Legs yellowish or reddish dark brown. Body 2.5–5. Parasite of *Ips typographus* L., *Blastophagus minor* Htg., *B. piniperda* L., *Pityogenes quadridens* Htg., *Orthotomicus proximus* Eichh., *Carphoborus minimus* F. (Scolytidae). *Pissodes notatus* F., *P. validirostris* Gyll. (Curculionidae), *Phaenops cyanea* F. (Buprestidae). North, west, northwest, center, east; Western Siberia, Eastern Siberia (Olekma River); Western Europe ..... *C. sordidator* Ratz. (*melanostigma* Strand, *stigmaticus* Hellén)
- 8 ( 7). Legs black. Body 4.5–6.8. Parasite of *Ips typographus* L. (Scolytidae), *Pissodes piceae* Ill., *P. piniphilus* Hbst., *P. pini* L., *P. harcyniae* Hbst. (Curculionidae). Caucasus (Teberda Preserve, Borzhomi); Central Europe. .... *C. foersteri* Haes.
- 9 ( 6). Ovipositor longer than thorax and abdomen. Second abdominal tergite much shorter than 3rd, with oblique furrows (Fig. 55: 7–9), smooth. Stigma in both sexes weak and uniformly sclerotized.
- 99 10 (15). Second abdominal tergite smooth, oblique furrows on it reaching its posterior margin; tubercles on its posterior part not developed or weak. Furrows on sides of middle field of 1st tergite smooth or weakly sculptured. Body black with contrasting yellowish dark brown or yellowish dark brown with contrasting black.
- 11 (12). First abdominal tergite posteriorly distinctly broadened (Fig. 55: 7). Only 2nd flagellar segment concave below, 3rd only in larger individuals barely concave (Fig. 53: 3). Head, thorax and legs, sometimes head below and around eyes reddish (Fig. 55: 1), abdomen yellowish dark brown. Body 3–7. Parasite of *Pissodes notatus* F. (Curculionidae), *Blastophagus minor* Htg., *B. piniperda* L., *Ips sexdentatus* Börn., *I. subelongatus* Motsch. (Scolytidae), *Phaenops*

- cyanea* F. (Buprestidae). North, northwest, center, east; Caucasus (Armenia), entire southern Siberia; Western Europe; Turkey ..... **C. abdominalis** Zett.
- 12 (11). First abdominal tergite parallel-sided or very slightly broadened posteriorly (Fig. 55: 8). Second and 3rd flagellar segments concave below (Fig. 53: 4).
- 13 (14). First abdominal tergite dark brownish yellow, like entire abdomen and greater part of head; geneae at mandibular bases contrastingly darkened. Figs. 53: 5, 8; 55: 2. Body 3–5.5. Parasite of *Scolytus scolytus* F., *S. multistriatus* Marsh., *S. pygmaeus* F., *Hylesinus fraxini* Panz, (Scolytidae). South (in the north up to Voronezh); Caucasus (Armenia; Georgia); Western Europe ..... **C. scolyticida** Wesm.
100. 14 (13). First abdominal tergite black or dark brown, darker than remaining parts of abdomen; body, except usually yellowish dark brown abdomen, black; geneae uniformly colored, usually black or dark brown, rarely yellowish (Fig. 55: 3). Body 3. 5–7. Parasite of *Scolytus ratzeburgi* Jans., *Ips typographus* L. (Scolytidae). Northwest, center, east; Western Siberia, Baltic Region; Western Europe ..... **C. unguularis** Thoms.
- 15 (10). Second abdominal tergite usually sculptured, oblique furrows on it relatively weaker, not reaching posterior margin and terminating in roundish tubercle. Furrow along margins of middle field of 1st tergite sculptured (Fig. 55: 9). Only 2nd flagellar segment notched below. Body dark brown with various light colored patterns on abdomen and head, sometimes head yellowish. Body 2.5–5. Parasite of *Ips typographus* L., *I. duplicatus* Sahlb., *I. subelongatus* Motsch., *Cryphalus piceae* Ratz. (Scolytidae). North, northwest, center, east; Western Siberia, Tuva Autonomous Region; Western Europe; Mongolia ..... **C. bostrichorum** Giraud
- 16 ( 5). Abdominal tergites 1 to 3 with rugose sculpture. Second and 3rd flagellar segments notched below. Body black; legs reddish dark brown, hind tibiae and tarsi dark brownish. Fig. 54. Body 5–10. Parasite of horntail *Xiphydria camelus* L. (Xiphydriidae). Northwest, center Ukraine (Kiev, Kharkov); Western Siberia (Tomsk), Transbaikal, Amur Region; northern and central parts of Western Europe ..... **C. rossicus** Kok.
- 102      58. **Victoroviella** Tobias, 1975.—One light colored Central Asian species—*V. deserticola* Tobias (Fig. 51: 5–7).

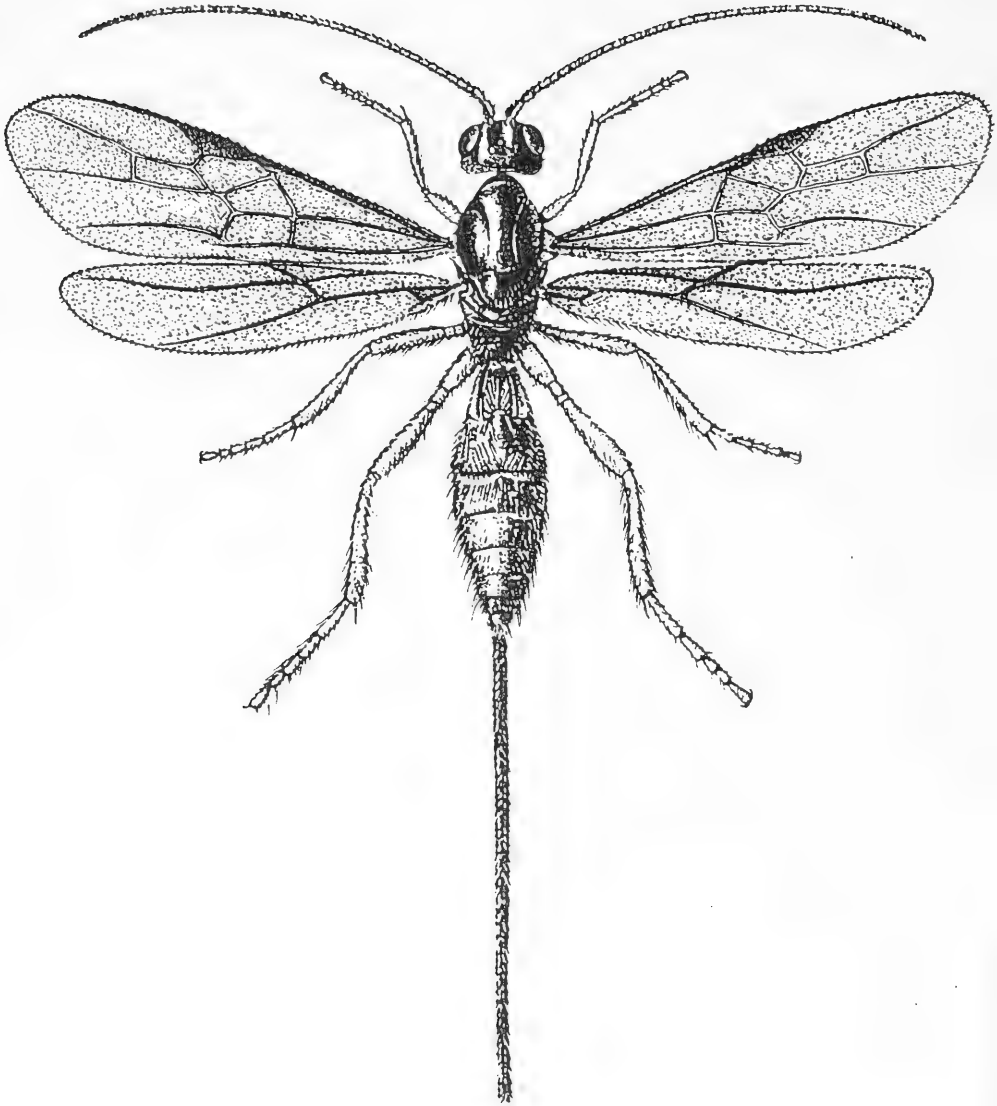


Fig. 54. Braconinae (original).

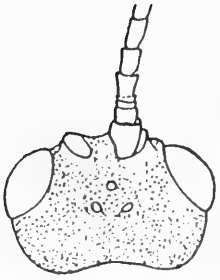
*Coeloides rossicus* Kok.

59. **Teraturus** Kokujev, 1898.—Three Palearctic species distributed in Armenia (*T. shelkovnikovi* Tel.), Central Asia (*T. roborowskii* Kok; *T. semenowi* Kok.) and Mongolia (*T. roborowskii*).

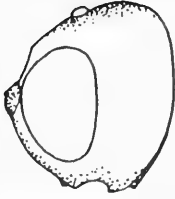


60. *Glyptomorpha* Holmgren, 1868.—Hundreds of species, mostly in the tropics. In the fauna of the USSR there are 13 species, mostly in the southern part of Central Asia and Transcaucasia. In the European part, the only species found are the ones listed below. In all species included in the key below the ovipositor is longer than the body, the abdominal tergites (usually up to the 4th) are coarsely rugose. The wings are distinctly smoky.

- 1 ( 8). Ovipositor 2 times as long as body or slightly shorter.
- 2 ( 3). Proboscis long, equaling height of head or slightly shorter (Fig. 56: 1). Furrows at base of 3rd abdominal tergite wide set (Fig. 56: 2), abdominal tergites 1 to 4 rugose. Stigma with yellow spot at base. Body dark brownish red, coxae and trochanters black, femora red. Antennae of male and female not different. Body 7–13. Northwest (Luga), center, south; Caucasus, Kazakhstan, Central Asia ..... *G. discolor* Thunb.
- 3 ( 2). Proboscis short, not longer than height of head (Fig. 56: 3).
- 4 ( 5). Second abdominal tergite square, furrows at its base proximate (Figs. 1: 1; 56: 4). Stigma with yellow spot at base. Body yellowish dark brown; color of legs variable from entirely yellowish dark brown to entirely black (usually, when entirely black, hind coxae and hind femora with profuse dark pattern). Usually abdominal tergites 1 to 4, rarely only 1 to 3, rugose. Antennae as in Figs. 5, 6, 7, in male same as in female. Body 8–14. Parasite of *Sphenoptera laticollis* Ol., *S. gossypii* Kerr., *S. montana* Jak., *Chrysobothris affinis* F. (Buprestidae), *Plagionotus arcuatus* L., *Schinocerus speciosus* Ad. (Cerambycidae). South (in the north up to southern Voronezh Region); Caucasus, Kazakhstan, Central Asia; southern part of Western Europe; Africa; Asia Minor; Mongolia; China; Pakistan; India ..... *G. pectoralis* Brullé (*desectus* Bradley, *desertor* auct.)
- 5 ( 4). Second abdominal tergite transverse, furrows at its base wide set (Fig. 56: 5, 6). Stigma monochromatic. Middle and hind legs black.
- 6 ( 7). Ovipositor 1.5 times as long as body. Antennae of male and female similar. Stigma dark brownish yellow. Body 7–8. Hungary ..... *G. gracilis* Szépl.



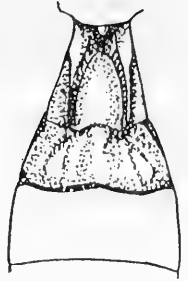
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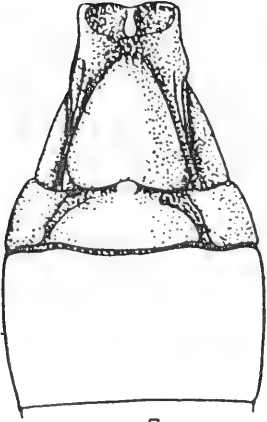
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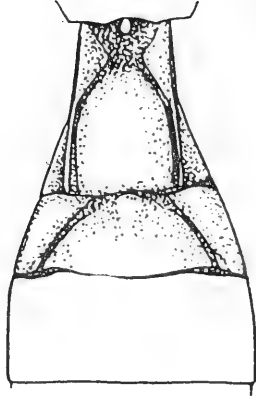
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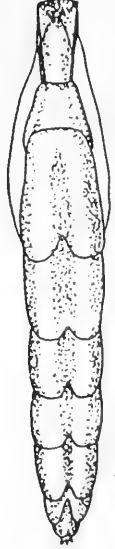
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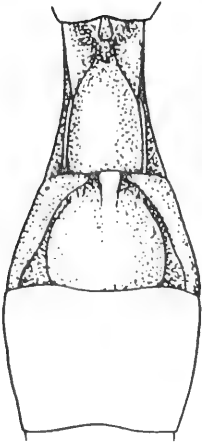
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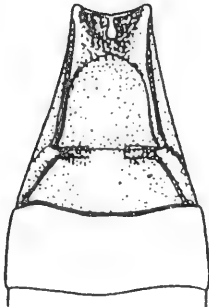
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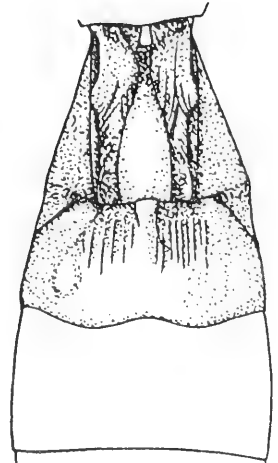
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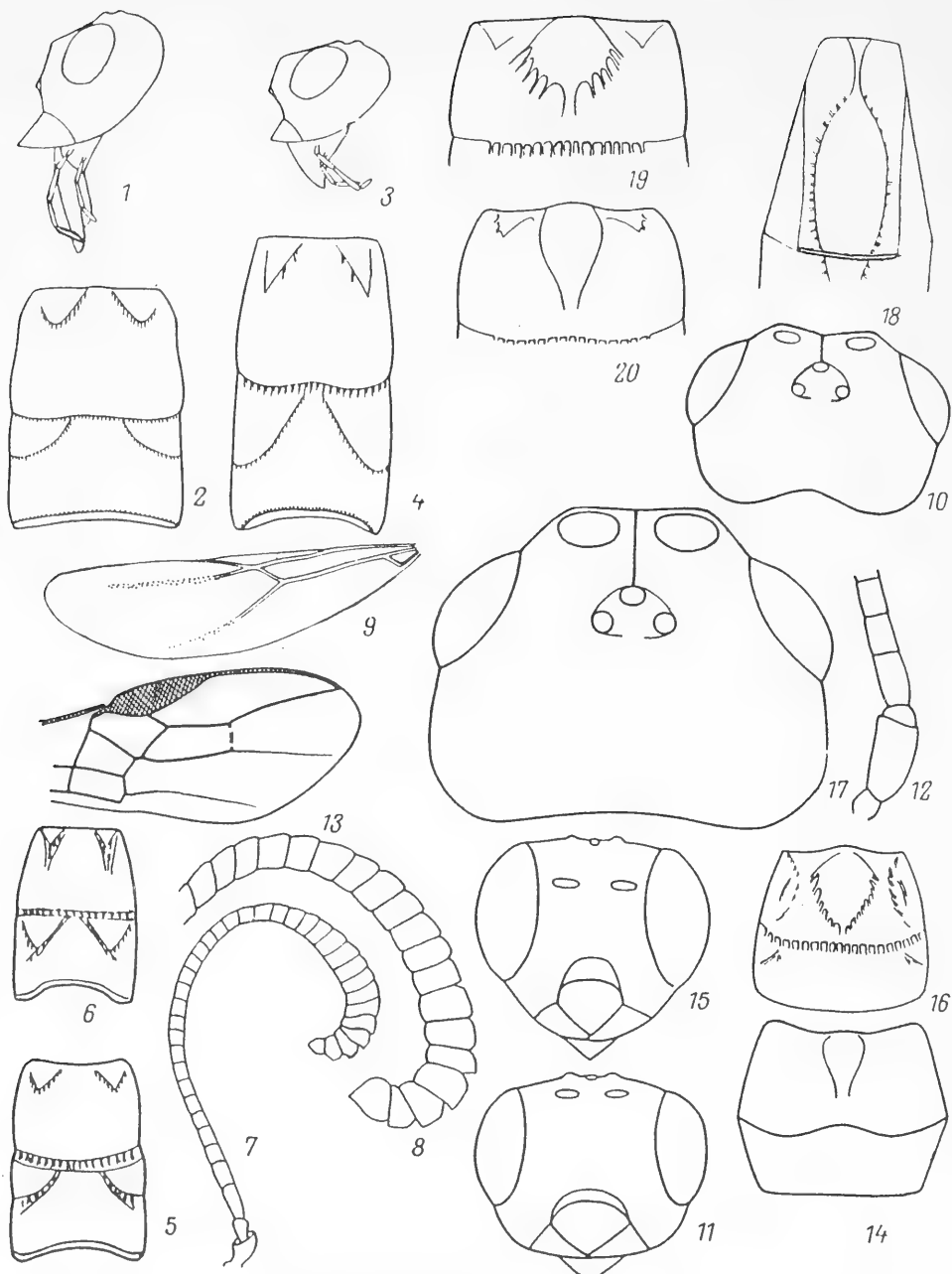


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- 7 ( 6). Ovipositor 2 times as long as body or slightly shorter. Antennae of male in apical third compressed (Fig. 56: 7, 8) (flagellum compressed right from base)<sup>1</sup>. Stigma dark brown. First abdominal tergite square or (in Volgograd specimen) distinctly transverse. Propodeum in middle with a few longitudinal wrinkles, with scattered large punctures (weakly developed and superficial in smaller specimens). Body dark brownish red or (males and females from Volgograd) yellowish darks brown; on head above large posteriorly narrowed black spot, palps also black, partly proboscis, three spots on mesonotum, scutellum, lower side of thorax and propodeum, sometimes two spots on 5th tergite. Body 5.5–8.5. South ..... **G. dispar** Tobias, sp. n.  
 Holotype: Male, Chernomorsk Preserve, sandy steppe with cracks, 15.V.1975 (Tobias). Paratypes: 3 females, 1 male, details same as above; 1 female, Volgograd ("Sarepta"), Besker (identified by Telenga as *G. gracilis* Szépl.).
- 8 ( 1). Ovipositor as long as body or longer.
- 9 (10). Fourth abdominal tergite apically lacking transverse furrow, with sculpture gradually becoming smooth to its apex. Proboscis as long as longitudinal diameter of eye, which is 1.5 times transverse diameter. Body yellowish dark brown, lacking black pattern, wings in basal part with yellowish tinge. Furrows on 2nd abdominal tergite wide set. Body 10–12. Armenia ..... **G. rugosa** Tel.
- 10 ( 9). Fourth abdominal tergite apically with transverse furrow, smooth posterior to furrow, uniformly and densely rugose, punctate anterior to it. Proboscis much shorter than longitudinal diameter of eye which is not more than 1/3 transverse diameter. Body reddish dark brown, with black pattern, wings in basal part lacking yellowish tinge.

1—*Coeloides abdominalis*, head, dorsal view; 2, 3—head, lateral view: *C. scolyticida*, 3—*C. unguularis*; 4–9—abdominal tergites 1st–3rd: 4—*C. filiformis*, 5—*C. melanotus*, 6—*C. foersteri*, 7—*C. abdominalis*, 8—*C. scolyticida*, 9—*C. bostrichorum*; 10—*C. filiformis*, male, abdomen.

<sup>1</sup>Flattening of antennal segments reflects the characteristic tendency of the tribe—apical segment compressed in a modified form.



1, 2—*Glyptomorpha discolor*: 1—head, lateral view, 2—abdominal tergites 2nd and 3rd; 3—*G. pectoralis*, head, lateral view; 4—6—abdominal tergites 2nd and 3rd: 4—*G. pectoralis*, 5—*G. kasparyani*, 6—*G. nachishevianica*; 7, 8—*G. dispar* sp. n.: 7—antenna, male, 8—antennal apex; 9—*Iphiaulax impostor*, hind wing; 10—14—*Ipobracon nigrator*: 10—head, dorsal view, 11—head, frontal view, 12—antennal base, 13—forewing, 14—abdominal tergites 2nd and 3rd; 15, 16—*I. tricolor*: 15—head, frontal view, 16—abdominal tergites 2nd and 3rd; 17—*I. curvatus*, head, dorsal view; 18—*Atanycolus genalis*, 1st abdominal tergite; 19—20—2nd abdominal tergite: 19—*A. initiator*, 20—*A. fulviceps*.

- 11 (12). Ovipositor slightly longer than body (10 : 12). Furrows on 2nd abdominal tergite wide set (Fig. 56: 5). Middle and hind legs black, stigma black. Body 7.5–10. Caucasus (Azerbaijan) ..... **G. kasparyani** Tobias
- 12 (11). Ovipositor as long as body. Furrows on 2nd abdominal tergite proximate (but to a lesser extent than in *G. pectoralis*—Fig. 56: 6). Middle and hind legs yellowish dark brown, stigma basally with yellow spot. Body 8–9. Caucasus (Nakhichevan ASSR) ..... **G. nachitshevanica** Tobias

61. **Aphrastobracon** Ashmead, 1896.—More than 30 species, mostly from the tropics of the Old World. Three species in the Palearctic—one (African) reported in Yugoslavia (*A. antefurcalis* Szépl.), one from Central Asia (*A. jacobsoni* Tobias) and one from Japan (*A. tibialis* Ashm.).

104 62. **Iphiaulax** Förster, 1862 (*Aniphiaulax* Kok., *Euglyptobracon* Tel.).—Over 450 (mostly in the tropics) species, about 10 in the Palearctic (not counting several North African).

- 1 (12). Anterior margin of radial cell appreciably longer than stigma (Fig. 50). Height of genae not more than 1/3 longitudinal diameter of eye. Antennal segments distinctly transverse (Fig. 52: 2). Body usually bright red with black pattern, sometimes occupying entire thorax and head. Suture between 2nd and 3rd tergites coarsely crenulate (sometimes like these tergites absolutely smooth). Ovipositor as long as abdomen or slightly shorter. Stigma black or bichromatic (Subgenus *Iphiaulax* s. str.).
- 2 (11). Ovipositor slightly bent, its valves parallel-sided.
- 3 (10). Abdomen rugose at least in middle of 2nd tergite or in extreme case suture between 2nd and 3rd tergites crenulate. Wings uniformly smoky.
- 4 ( 5). Only suture between 2nd and 3rd abdominal tergites sculptured, sometimes 2nd tergite with rare wrinkles in middle. Body red or orange, above eyes and below thorax black, legs black, rarely partially or entirely yellowish dark brown; when legs dark, hind coxae often light colored. Parasite of cerambycid beetle *Clerochytus semenovi* Jak. Central Asia; Mongolia, China ..... **I. (I.) pontanini** Kok.  
Lectotype: Female, China, Khansy, valley of River Ecsingol "Charassuchai" 29.VII.1896 (G. Potanin). Paralectotypes:

1 female, same place, "Lu-ja-Tun" (G. Potanin); 1 male, same place, "Tu-fun" (G. Potanin); 2 females, China, Inner Mongolia, "Dochodortu" (G. Potanin).

5 ( 4). At least middle of 2nd abdominal tergite, usually second and third, sculptured.

6 ( 9). Costal vein dark brownish, stigma dark brown or basally yellow.

7 ( 8). At most abdominal tergites 1 to 3 rugose (sometimes only middle of 2nd). Color varies from entirely red (but legs, as a rule, black) to entirely black on head and thorax; wings smoky, stigma dark brown or with yellowish spot basally. Body 5–12. Parasite of cerambycid beetles *Rhagium inquisitor* L., *Monochamus sutor* L., *Saperda populnea* L., *Psapharochrus clavipes* Schr., *Plagionotus arcuatus* L., *Acanthocinus aedilis* L., *Oberea linearis* L., *Apriona germari* Hope, *Icosium tomentosum* Luc., *Leiopus nebulosus* L., metallic woodborers *Anthaxia morio* F., carpenter moth *Zeuzera leuconotum* Btl. Entire Palearctic except its northern part (in European part in north up to Estonia—Arkhangelsk Region); western Africa ..... I. (I.) **impostor** Scopoli (*parvulus* Shest., *carissimus* Shest., *pulchellus* Tel., syn. n.)

8 ( 7). Abdominal tergites 1 to 5 rugose (wrinkles less distinct on 5th tergite). Body red; head above, lower side of thorax and legs black. Wings smoky, stigma dark brown, basally with small, light colored spot. (Possibly this is only a variety of the preceding species.) Central Asia ..... I. (I.) **impostor** Scopoli

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9 ( 6). Costal vein and stigma bright red. Abdominal tergites 1 to 3 rugose. Body red, wings smoky, basally yellowish. Body 8–12. Mediterranean Region; ? Central Europe; entire Africa ... I. (I.) **impostor** Scopoli

10 ( 3). Abdomen absolutely smooth. Wings light colored, with somewhat contrasting dark spots or darkening with light colored spots. Body red or yellowish dark brown, antennae black, stigma yellow with dark apex. Body 8–10. Kazakhstan (south); China ..... I. (I.) **impostor** Scopoli

Lectotype: Female, China, Inner Mongolia "Dochodortu" (G. Potanin). Paralectotypes: 3 males, China, Gansu, "Lu-ja-Tun" (1 male) and "Nan-pin" (G. Potanin).

- 11 ( 2). Ovipositor apically uniform, apices of ovipositor valves dilated, steeply curved. Body red; head, legs and some of the numerous spots on thorax black; wings smoky, stigma dark brown, sometimes basally with indistinct yellow spot. Body 7–12. Parasite of cerambycid beetle *Acanthocinus aedilis* L. Center, south; Caucasus, Kazakhstan, Transbaikal Region; Southern and Central Europe, Iran, Mongolia ..... I. (I.) **mactator** Klug
- 12 ( 1). Anterior margin of radial cell as long as stigma (Fig. 57). Genae  $1/2$  or less than  $1/2$  of longitudinal diameter of eye. Antennal segments square or slightly transverse (Fig. 52: 3). Body dark brown or yellowish, often with yellow spots on thorax and head, in middle not entirely black. Suture between 2nd and 3rd abdominal tergites (always somewhat sculptured) cranulate. Ovipositor quite short, sometimes  $1/3$  as long as abdomen (Subgenus *Euglyptobracon* Tal.).
- 13 (14). Body dark brown, lacking yellowish spots. Abdomen entirely densely rugose-punctate. Ovipositor half as long as abdomen. Stigma entirely dark brown, legs black. Body 4.5–8. South (Crimea), east (western Kazakhstan); Transcaucasia. .... I. (E.) **tauricus** Shest.  
Lectotype: Female, Crimea, Kerch; (O.A. Kirichenko).
- 14 (13). Body with yellowish spots on head and thorax. Posterior abdominal tergites with smooth sculpture, lustrous.
- 15 (16). Abdomen smooth, only 2nd tergite often somewhat sculptured, rarely also 3rd with weak sculpture. Body 3–7. South; Caucasus, Kazakhstan, Central Asia, southern part of Western Siberia; Czechoslovakia ..... I. (E.) **impeditor** Kok.
- 16 (15). Abdominal tergites sometimes, except apical ones, sculptured. Figs. 52: 9, 57. Body 3.5–7. Center, south; Caucasus, Kazakhstan, Central Asia; southern and Central Europe. .... I. (E.) **umbraculator** Nees

63. **Fuscala** van Achterberg, 1983.—One species.

- 1 (1). Head slightly transverse. Antennae segments square. Nervulus slightly antefurcal. Hind femora rather short. Ovipositor curved, 1.7 times as long as forewing. Body smooth in greater part, black; legs dark brown-yellowish. Fig. 58. Body 8.5. France ..... F. **compressiventris** Acht.

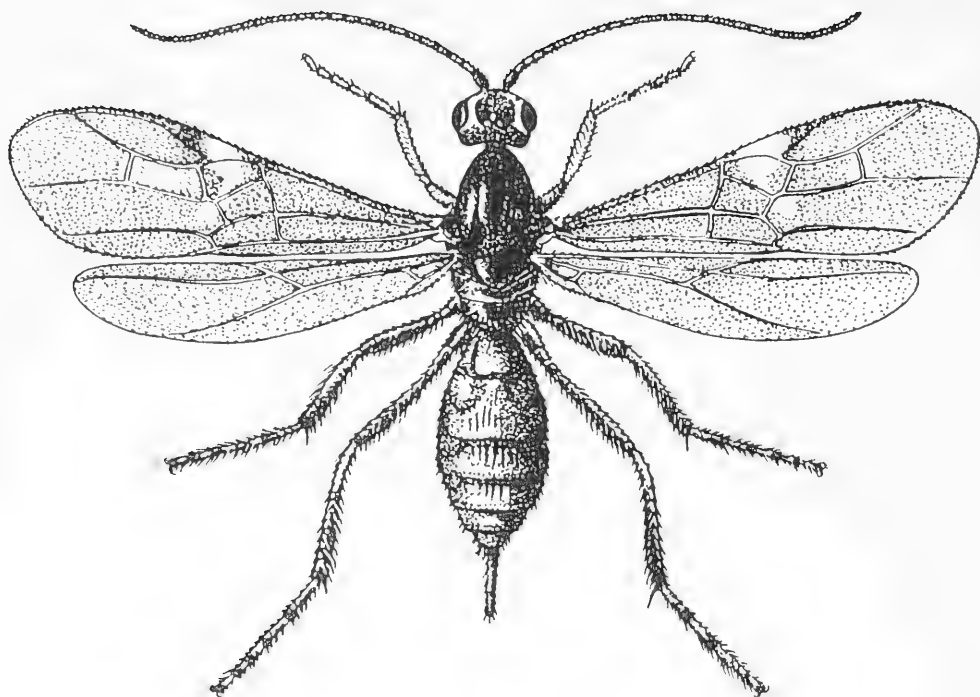


Fig. 57. Braconinae (original).

*Iphiaulax umbraculator* Nees.

64. *Ipobracon* Thomson, 1892<sup>1</sup>.—About 280 species, mostly in the tropics, 15 species in the Palearctic. From among the fauna of the USSR, the key below does not include three species known from Siberia and the Far East: *I. anuphrievi* Tobias, *I. curvatus* Tel., and *I. jakuticus* Tobias.

- 1 (15). Radial cell on forewing not reduced, reaching wing apex. Ovipositor not shorter or only slightly shorter than abdomen.
- 2 (12). Second abdominal tergite basally with distinctly separated lateral fields (Fig. 56: 15). Legs black.

<sup>1</sup>Tobias and Abdinbekova, 1973. *Entomol. obozrenie*, 52, 2: 430–439.



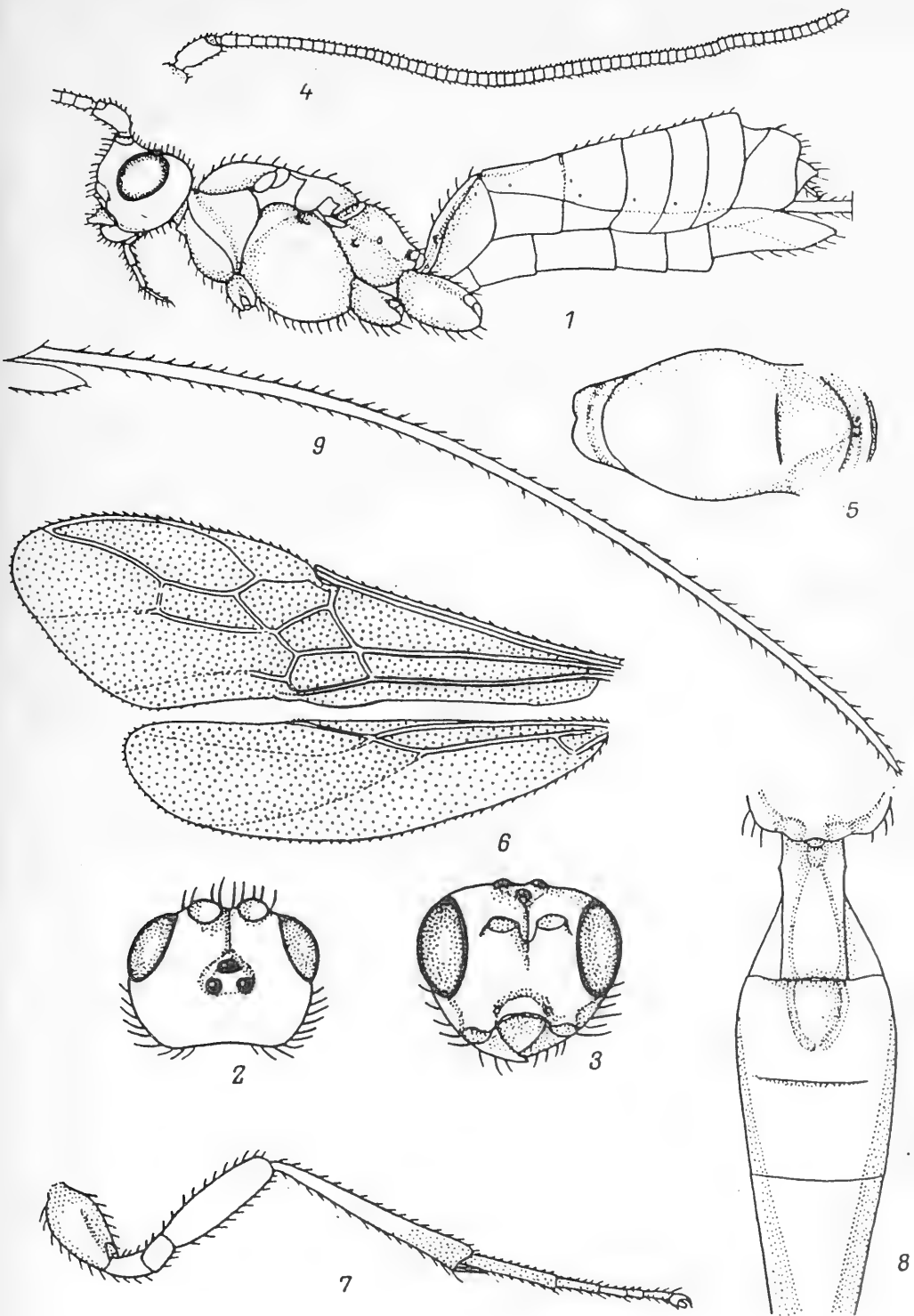


Fig. 58. Braconinae (from Achterberg).

1—9—*Fuscala compressiventris*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—antenna, 5—abdomen, upper part, 6—wings, 7—hind leg, 8—abdomen, 9—ovipositor.

- 3 ( 4). Abdomen black; head, usually also mesonotum, yellowish dark brown, abdomen below sometimes yellow. Ovipositor slightly shorter than abdomen. Abdominal tergites before apical margin lacking furrows. Figs. 56: 15, 16; 59. Body 4–5. Volga Region (Ul'yanovsk), south (Kharkov Region); Western Siberia ..... *I. tricolor* Ivanov
- 4 ( 3). Abdomen entirely or partially yellowish red, head and thorax black.
- 5 (11). Suture between 2nd and 3rd abdominal tergites crenulate.
- 6 ( 7). Broadened part of 1st abdominal tergite somewhat transverse, 4th and 5th abdominal tergites before posterior margin with transverse furrow. Oblique furrows on 4th and 5th tergites not deeply sculptured. Abdomen entirely dark

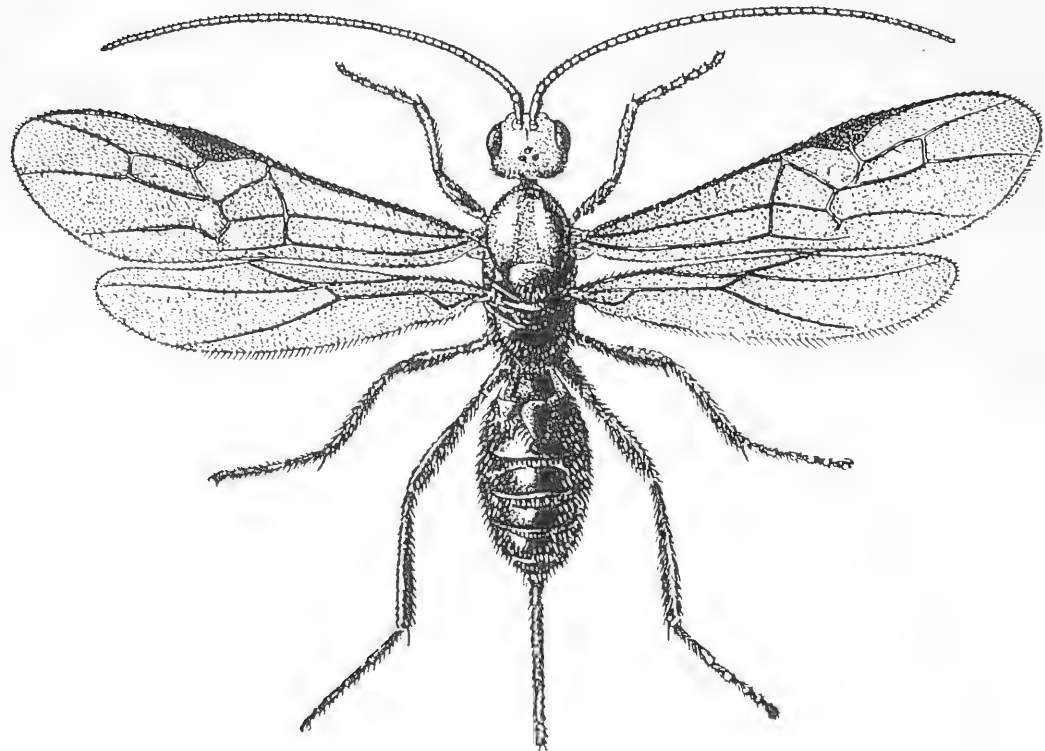


Fig. 59. Braconinae (original).

*Ipobracon tricolor* Ivanov.

- brownish yellow. Ovipositor much shorter than abdomen. Body 7.5. Volga Region (Kuibyshev); Krasnodar Region (Sochi), Azerbaidzhan ..... **I. kusarensis** Abdinb.
- 7 ( 8)\* Broadened part of 1st abdominal tergite square; 4th and 5th abdominal tergites lacking furrow before posterior margin.
- 9 (10). Furrow separating lateral fields at base of 4th and 5th tergites crenulate. Abdomen with profuse black coloration. Body 4.3 (male!). Azerbaidzhan. Hungary ..... **I. samedovi** Abdinb.
- 10 ( 9). Furrows separating lateral fields at base of 4th and 5th tergites smooth or weakly crenulate. Head behind eyes hardly narrowed, face broad. Abdomen dark brownish yellow, apically black. Ovipositor somewhat shorter than abdomen. Body 4. Parasite of beetles *Rhamnusium bicolor* Schr., *Monochamus* sp. (Cerambycidae), *Pissodes notatus* F. (Curculionidae), moth *Laspeyresia pactolana* Z. (Tortricidae). West, center, east, south; Caucasus (Krasnodar Region, Georgia); Western Europe ..... **I. rector** Thunb.
- 107 11 ( 5). Suture between 2nd and 3rd abdominal tergites smooth. Head behind eyes roundly narrowed, face square. Oblique furrows at base of 2nd and 4th abdominal tergites separating lateral fields, smooth. Ovipositor shorter than abdomen. Abdomen entirely dark brownish yellow, legs black. Body 4–5. Parasite of beetles *Pogonocherus fasciculatus* Deg., *P. perroudi* Muls., *Rhopalopus macropus* Germ. (Cerambycidae), *Pissodes notatus* F. (Curculionidae), *Orthotomicus suturalis* Gyll. (Scolytidae), moth *Paranthrene tabaniformis* Rott. (Sesiidae). Northwest, south (Kharkov Region); Krasnodar Region (Sochi), Georgia; Western Europe; Mongolia ..... **I. extricator** Nees
- 12 ( 2). Second abdominal tergite lacking distinctly separated lateral fields, with individual distinct oblique furrows; sometimes on sides basally with weak depressions (Fig. 56: 14).
- 13 (14). Head behind eyes roundly narrowed, temples as long as eyes (Fig. 56: 10). Antennae about 40-segmented. Face transverse, width of oral cavity more than its distance from eye (Fig. 56: 11). Broadened part of 1st abdominal tergite much

\* [sic]; in the Russian original there is some confusion in numbering or couplet. Actually couplet 7(8) should read 7(6). However, couplets 8(16) and 16(8) have been omitted from the original.—General Editor.

longer than wide. Ovipositor usually much longer than abdomen. Body 4–7. Parasite of *Agrilus ater* L. (Buprestidae). North, center, east, southeast (Orenburg Region); Kazakhstan, Eastern Siberia, Pacific Coastal Region; Western Europe ..... **I. nigrator** Zett. (? *konovii* Marsh., *borealis* Hellén, syn. n.)

14 (13). Head massive, usually not narrowed but appreciably broadened behind eyes, temples 1.5 times as long as eyes (Fig. 57: 17). Antennae about 50-segmented. Ovipositor 1.5 times as long as abdomen. Body 8. Orenburg Region, Pacific Coastal Region ..... **I. curvatus** Tel.

15 ( 1). Radial cell on forewing reduced, its anterior margin almost as long as stigma. Ovipositor 1/3 as long as abdomen. Second abdominal tergite densely rugose with small triangular field posteromedially and with smooth lateral fields; 3rd and sometimes 4th tergites more softly rugose-punctate. Body black; with dark brownish yellow pattern on greater part of head, in anterior part of thorax and greater part of middle abdomen. Body 4.5–6. Ciscaucasia ..... **I. bicolor** Tel., comb. n.

Lectotype: Female, Dagestan, "Paraboch Forestry Farm, Kizlyar", 19.VII.1927 (Kirichenko). (The species was described as *Euglyptobracon*.)

65. **Atanycolus** Förster, 1862.—Sixty species; 10 to 12 in the Palearctic. From the fauna of the USSR the Key does not include three species from Eastern Siberia and the Pacific Coastal Region (*A. crenulatus* Tel., *A. lindemain* Tobias, and *A. nigriventris* Voin.—Kr.).

108 1 ( 2). Abdominal tergites 2 to 4 rugose, transverse sculptured furrows on posterior margin of 3rd and 4th tergites. Notaulices slight. Head black, only stripe along inner margin of eyes yellowish red. Middle field of 2nd abdominal tergite broad (cf. Fig. 56: 19). Body 5–9. Parasite of *Lampra mirifica* Muls., *Melanophila picta* Pall., *M. decastigma* F. (Buprestidae). Center, south; Caucasus, Central Asia ..... **A. ivanovi** Kok. (*signatus* Szépl.,? *sculpturatus* Thoms.)

2 ( 1). Abdominal tergites 2 to 4 smooth, only furrows on 2nd suture between 2nd and 3rd tergites rugose. (If sometimes in males abdominal tergites 2 to 4 rugose, then notaulices distinct and head yellowish dark brown below.)

- 3 ( 6). Head yellowish dark brown, only ocellar field often black.
- 4 ( 5). Second abdominal tergite with broad middle field, surrounded by broad depressions with coarse transverse wrinkles around it and between 2nd and 3rd tergites (Fig. 56: 19). Body 5–11. Center, south (Kharkov Region); Caucasus; Czechoslovakia; Hungary. ....  
 ..... **A. initiator** F. (*flaviceps* Ivanov)
- 5 ( 4). Second abdominal tergite with narrow middle field, depressions separating it and suture between 2nd and 3rd abdominal tergites narrow, weakly crenulate (Fig. 56: 20). Body 6.5–9. Parasite of *Lampra mirifica* Muls. (Buprestidae). Ukraine; Central Europe; Asia Minor .....  
 ..... **A. fulviceps** Kriechb.
- 6 ( 3). Head entirely black or only above, sometimes with large posteriorly cuneately narrowed spot on vertex.
- 7 ( 8). Head black only in upper part (sometimes besides genae, in which case stripes along inner margin of eye not developed) or with large cuneate black spot on vertex. Wings as in Fig. 51: 4. In male abdominal tergites 2 to 4 sometimes distinctly sculptured and middle field on 2nd tergite narrow, many times as long as wide. Figs. 52, 8; 56: 18. Body 4–12. Parasite of cerambycid beetles *Rhagium inquisitor* L., *R. bifasciatum* F., *Acanthocinus aedilis* L., *Cerambyx scopoli* Fuessly, *Arhopalus rusticus* L., *Callidium abdominale* Bon., *Callidiellum rufipenne* Motsch., *Monochamus sutor* L., *M. galloprovincialis* Ol., *Asemum striatum* L., *Stenostola ferrea* Schr., *Tetropium fuscum* F., *T. graciliforme* Rtt., *Phymatodes pusillus* L., bark beetles *Blastophagus piniperda* L., *Hylesinus crenatus* F., *Ips subelongatus* Motsch., metallic woodborers *Lampra mirifica* Muls., *Phaenops cyanea* F., *P. guttulata* Gebl., Clearwing moths *Aegeria flaviventris* Stgr., *A. vespiformis* L. Entire forest belt of Palearctic; India .....  
 ..... **A. genalis** Thoms. (*initiator* auct.)
- 8 ( 7). Head black, only stripes on inner margin of eyes yellowish red.
- 9 (10). Furrows around middle field on 2nd abdominal tergite deep, narrow. First abdominal tergite often with black spot or entirely black. Body 5–9. Parasite of cerambycid beetles *Rhagium mordax* Deg., *R. inquisitor* L., *Acanthocinus aedilis* L., *Tetropium fuscum* F., *T. gabrieli* Weise, *Saperda populnea* L., metallic woodborers *Anthaxia morio* F., *Chrysobothris chrysostigma* L., *Lampra rutilans* F., *Poecilnota*

- variolosa* Payk. Northwest, center, south; Kazakhstan, Siberia up to Pacific Coastal Region; Western Europe; Mongolia ..  
..... **A. denigrator** L. (*albiscutis* Tel.)
- 10 ( 9). Furrows around middle field on 2nd abdominal tergite weak, 1st abdominal tergite lacking black coloration. Body 4–11. Parasite of *Saperda carcharias* L., *Acanthocinus aedilis* L., *Tetropium gabrieli* Weise, *T. fuscum* F., *Pyrrhidium sanguineum* L., *Plagionotus arcuatus* L., *Arhopalus rusticus* L., *Leptura maculata* Poda, *Rhagium inquisitor* L., *Mesosa nebulosa* Ol. (Cerambycidae), *Poecilonota variolosa* Payk., *P. conspersa* Gyll., *Lampira rutilans* F., *Phaenops cyanea* F., *Agrilus viridis* L., *A. biguttatus* F. (Buprestidae), *Cryptorrhynchus lapathi* L. (Curculionidae), *Aegeria vespiformis* L. (Sesiidae). Throughout; Caucasus (Dagestan, Krasnodar Region). ....  
..... **A. neesii** Marsh.

66. **Zavipio** Viereck, 1919 (*Vipio* auct.).—About 25 species in the Palearctic, mostly in its southern areas. Species so far found only in Central Asia and Transcaucasia, possibly also in western Kazakhstan and Dagestan. All species names under this genus, except *Z. marshalli* Schm. (type species), are new combinations (comb. n.).

- 1 ( 6). Ovipositor as long as abdomen. Propodeum sculptured. Body yellowish dark brown, sometimes with black spots, hind tibiae dark.
- 2 ( 5). Third and, as a rule, 4th abdominal tergite basally rugose-punctate.
- 3 ( 4). Propodeum punctate, with a few short irregular wrinkles (mostly medially). Hind coxae and femora (latter often only in lower half) black. Body 5.5–8. Parasite of *Agrilus coeruleus* Rossi (Buprestidae). Center, south; Caucasus, Kazakhstan, Central Asia; southern and central part of Western Europe; northern Africa ..... **Z. tentator** Rossi
- 4 ( 3). Propodeum with coarse long wrinkles spreading fanwise above, with slightly noticeable punctation, hind coxae reddish dark brown. Body 7. Transcaucasia (Azerbaijan), Central Asia ..... **Z. striolatus** Tel.
- 5 ( 2). Abdominal tergites 3 and 4 smooth. Propodeum rugose-punctate, with a few large, somewhat fanwise spreading folds. Hind coxae black, hind femora yellowish dark brown. Body 6–7.5. Transcaucasia (Azerbaijan, Georgia), Central Asia ..... **Z. mlkoszewiczii** Kok.

- 109 6 ( 1). Ovipositor not shorter than body. Body yellowish dark brown, often with black spots.
- 7 ( 8). Second abdominal tergite smooth, occasional wrinkles around middle field. Hind femora with dark stripe below. Propodeum smooth. Ovipositor 1.5 times as long as body. Body 4–10. Northwest (Luga), center, east (in the northern part of distribution area very rare), south; Kazakhstan, Central Asia, southern part of Siberia up to Far East; Mongolia; China ...  
..... **Z. sareptanus** Kawall (*schewyrewi* Kok.)  
Type of *Z. sareptanus* apparently lost. Lectotype of *Z. schewyrewi*: Female, Kirovsk Region, “Malmyzh” (Kulikovskii). Paralectotype: Female, Odessa “(Coll. Kokuiev)”.
- 8 ( 7). Second abdominal tergite at least around middle field rugose. Hind femora light colored, lacking black stripe below, rarely basally slightly darkened.
- 9 (12). Abdominal tergites 1 to 3 usually and 4th basally rugose, 3rd tergite before posterior margin with row of punctures, separating its rugose part from narrow smooth part. Second abdominal tergite square. Ovipositor 2–2.5 times as long as body. Propodeum rugose in middle.
- 10 (11). Thorax black, only pronotum dark brownish yellow; stigma monochromatic dark brown. Body 8–12. Moldavia, Crimea; Hungary ..... **Z. frivaldskyi** Szépl.
- 11 (10). Thorax above, like pronotum, dark brownish yellow or mesonotum with three black spots (but in male thorax, except pronotum, black), stigma with yellow basal spot. Female: 7–11; male: 4.5–8. South (Khar’kov); Transcaucasia; southern part of Western Europe; northern Africa; Asia Minor ..... **Z. marshalli** Schm.
- 12 ( 9). Third abdominal tergite smooth or only basally rugose, 4th tergite smooth or weakly rugose; if rugose, then 2nd tergite transverse and ovipositor not more than 1.5 times as long as body.
- 13 (16). Third abdominal tergite rugose at least in basal half. Propodeum black.
- 14 (15). Ovipositor as long as body. Fourth abdominal tergite basally rugose. Hind coxae dark brownish red, stigma basally with large yellow spot. Body 7–10. Azerbaidzhan; Iran .....  
..... **Z. nomioides** Shest.  
Holotype: Female, Iran, Shah Rud (A. Kirpichenko).

- 15 (14). Ovipositor 1.5 times as long as body. Fourth abdominal tergite smooth (in male basally rugose). Hind coxae black, stigma dark brown or basally with small, light colored spot. Body 5–9. Parasite of *Acanthocinus griseus* F. (Cerambycidae), *Elateroides dermestoides* L., *Lymexylon navale* L. (Lymexylonidae). Center, east (Bashkiria), south; Caucasus, Kazakhstan, Central Asia, Altai; Western Europe; northern Africa; Mongolia ..... **Z. nominator** F.
- 16 (13). Third abdominal tergite smooth; if basally rugose, then combination of characters different than in couplets 18, 19 and 20.
- 17 (20). Hind coxae at least partly black, stigma dark brown or pale yellowish at base. Thorax black with light colored pattern. Propodeum in middle somewhat rugose.
- 18 (19). Ovipositor as long as body. Abdomen posterior to 2nd tergite light colored. Body 4.5–8. South (in north up to Khar'kov); Caucasus, Kazakhstan, Central Asia, Transbaikal; Western Europe ..... **Z. contractor** Nees
- 19 (18). Ovipositor 1.5 times as long as body. Apical abdominal tergites from 4th backward and lateral margins of 3rd tergite black. Body 5. Hungary; Yugoslavia ..... **Z. filicaudis** Szépl.
- 20 (17). Hind coxae lacking black coloration, stigma basally usually with yellow spot.
- 21 (32). Body not more than 10, yellowish red, usually with isolated black spots on thorax. Ovipositor not more than 1.5 times as long as body.
- 22 (25). Propodeum rugose in middle, lacking black pattern. Ovipositor as long as body.
- 23 (24). Second abdominal tergite square. Body with black spots, 6–10. Center, south; Kazakhstan; Czechoslovakia ..... **Z. insectator** Kok.  
Lectotype: Female, Voronezh Region ("Bobrovsk District). Shevyrev. Paralectotype: Female, Kharkov, 1–17.VI.1896 (Yaroshevskii).
- 24 (23). Second abdominal tergite transverse,  $\frac{2}{3}$  as long as its width at apex. Body dark brownish yellow, lacking black spots or darkened, weakly developed (in lower part of mesothorax and on mesonotum). Body 5.5–7. Central Asia ..... **Z. shestakovi** Tel.



Lectotype: Female, Turkmenia ("Tartugai"), 3–15.VI.1923 (Shestakov). Paralectotypes: 11 females, details same; 1 female, Ashkhabad, 16–20.IV.1929 (Shestakov).

25 (22). Propodeum smooth and (or) black.

26 (27). Propodeum rugose in middle. Spots on 1st and 2nd tergites and on abdominal apex black, proboscis yellowish dark brown. Ovipositor as long as body. Body 7. Ciscaucasia; Kazakhstan ..... **Z. simulator** Kok.

Holotype: Female, Stavropol' Region ("Ivanovskoe, B. Ergoligk"). 3.VII.1886 (Fausek).

27 (26). Propodeum smooth, only in lower part sometimes with radially divergent wrinkles. Usually propodeum and proboscis black and abdomen lacking black spots or all these body parts uniformly light colored.

28 (29). Propodeum and proboscis black. Ovipositor as long as body. Second abdominal tergite somewhat transverse. Wings and antennae as in Fig. 52: 5, 10. Body 6–10. South (in north up to Khar'kov); Caucasus, Kazakhstan, Central Asia; southern part of Western Europe (in north up to Czechoslovakia); northern Africa; Asia Minor; Mongolia; China ..... **Z. intermedius** Szépl.

29 (28). Propodeum and usually proboscis yellowish dark brown.

30 (31). Ovipositor quite long, usually 1.5 times as long as body. Second abdominal tergite square. Body 4–10. Parasite of *Chrysobothris affinis* F. (Buprestidae). Northwest (Luga), center (Valdai), south; Caucasus, Western Siberia; Western Europe; Mongolia; China ..... **Z. appellator** Nees

31 (30). Ovipositor approximately as long as body. Second abdominal tergite transverse, apically broadened, 2/3 as long as its width at apex. Body 5.5–7. Central Asia ..... **Z. nomas** Kok.

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Holotype: Female, Turkmenia ("Arman-Saad-Kizyl-Arvat"), 1896 (Ahnger).

32 (21). Body larger (usually 12 to 15), with black spots in lower and posterior parts of thorax, always with black spots on mesonotum. Ovipositor 2 times as long as body. Wings (Figs. 51: 3; 60) very distinctly darkened, almost black. Northwest (Luga), south; Caucasus; southern part of Western Europe; Asia Minor; Iran; China ..... **Z. terrefactor** Villers

67. *Cyanopterus* Haliday. 1836.—Over 30 species, mostly in the tropics; one species (excluding one in North Africa) in the Palearctic.

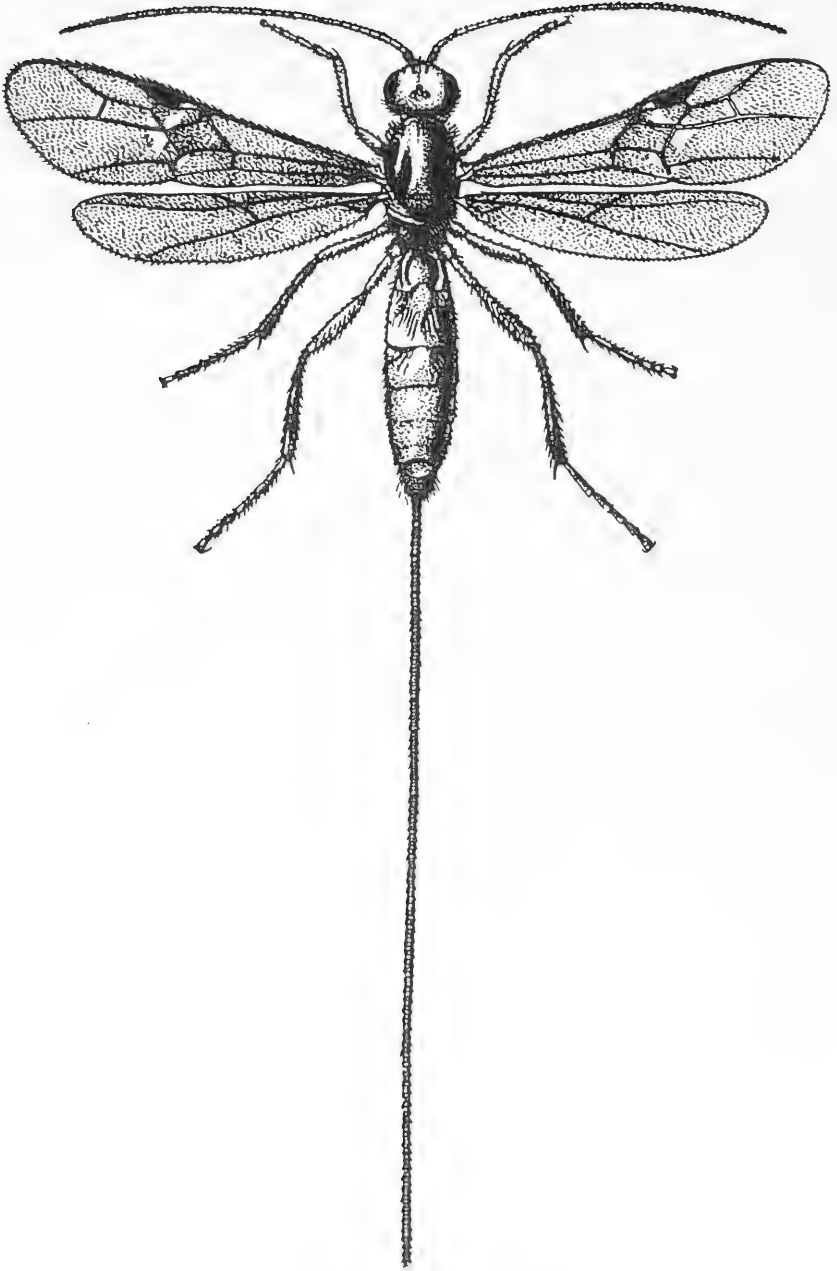


Fig. 60. Braconinae (original).

*Zavipio terrefactor* Villers.

- 111 1 (1). Antennae 55–77-segmented (Fig. 52: 4). Body black, abdomen yellowish dark brown. Fig. 61. Body 6–10. Parasite of *Saperda scalaris* L., *Rhagium inquisitor* L., *Monochamus rosenmuelleri* Ceder., *Pogonocherus fasciculatus* Deg., *P. hispidus* L., *Acanthocinus griseus* F., *Trichoferus pallidus* Ol. (Cerambycidae), *Bostrychus capucinus* L. (Bostrychidae). North, northwest, east; Kazakhstan (Chelkar), southern part of Eastern and Western Siberia (up to Pacific Coastal Region); Western Europe; northern Africa; Japan .....  
..... C. flavator F.

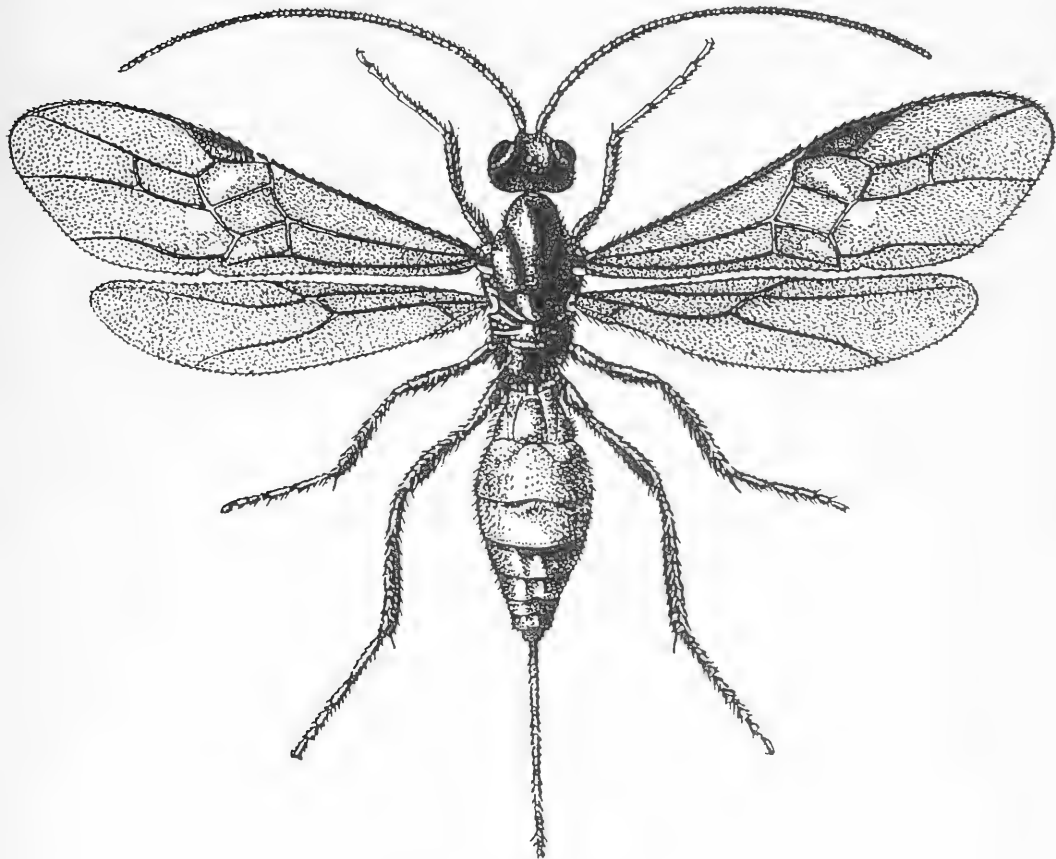


Fig. 61. Braconinae (original).

*Cyanopterus flavator* F.

68. **Pseudovipio Szépligeti, 1896** (*Glyptomorpha* auct., part.; *Pseudoglyptomorpha* Tobias, *Glabriolum* Shest.)—About 11 or 12 species in the Palearctic; some are reported only in Central Asia (rare species), but also along desert habitats and possibly could enter the southeastern part of the European USSR.

- 1 (18). Abdomen somewhat sculptured.
- 2 (13). Ovipositor shorter than body. Sixth sternite projecting beyond abdominal apex.
- 3 ( 4). Abdominal tergites 1 to 4 rugose-punctate. Ovipositor somewhat longer than body. Third abdominal tergite often with black spots on lateral fields, thorax with yellow spots. Radial cell on anterior margin as long as stigma (Fig. 52: 11). Body 4–9. Parasite of *Ostrinia nubilalis* Hb. (Pyraustidae). Center, south; Caucasus, Kazakhstan, Central Asia; Western Europe; Mongolia ..... **P. inscriptor** Nees
- 4 ( 3). Only 1st and 2nd or also 3rd abdominal tergite sculptured.
- 5 ( 6). Radial cell much shorter than stigma. Thorax lacking yellow spots. Ovipositor somewhat longer than body. Abdominal tergites 1 to 3 sculptured. Body 4–4.5. South (including Ciscaucasia); Kazakhstan; southern part of Western Europe (in north up to Czechoslovakia) ..... **P. minutus** Tel., comb. n.  
Lectotype: Female. Stavropol' Territory ("Starogladovskaya, Kizlyar district") 14.VII.1927 (Kirichenko). Paratype: Female, Voroshilovgrad ("Luganskaya village") 27.IX.1928 (Talitskii).
- 6 ( 5). Radial cell on its anterior margin as long as stigma. Thorax with yellow spots. Ovipositor 1.5 times as long as body or slightly shorter.
- 7 (12). Stigma basally with large yellow spot, legs lacking black pattern or (sometimes in *P. biroï*) only hind coxae and bases and apices of femora black; abdomen, as a rule, lacking black spots on lateral fields of 3rd and 4th tergites.
- 112 8 ( 9). Third abdominal tergite smooth or with very weak punctation. Head above and thorax with black spots. Body 6–8. South (north to Khar'kov); Kazakhstan; Hungary .....  
..... **P. biroï** Szépl.
- 9 ( 8). Third abdominal tergite punctate, with short wrinkles. Body lacking black spots, entirely dark brownish yellow.
- 10 (11). Head as wide as thorax, with temples slightly projecting above. Body 5.5–9 ..... **P. deserticola** Tel., comb. n.

Lectotype: Female, Tadzhikistan, Dusti ("Kabadian"), 22.VI.1918 (Golbeck). Paratype: Female, Turkmenia, Khiva, 20.VI.1927 (Zimin).

- 11 (10). Head much wider than thorax, with temples distinctly projecting above. Body 4.5. Central Asia .....  
 ..... **P. transcaspicus** Kok.
- 12 ( 7). Stigma basally lacking white spot, dark brown; hind coxae and femora with abundant black pattern; abdomen with black spots on lateral fields of 3rd and 4th tergites. Third abdominal tergite smooth. Head and thorax with black spots. Body 5.5–6. Parasite of *Oberea erythrocephala* Schr. (Cerambycidae), *Cneorrhinus plagiatus* Schall (Curculionidae). Northwest; northern part of Western Europe (south to Czechoslovakia) .....  
 ..... **P. variegatus** Boheman
- 13 ( 2). Ovipositor not longer than abdomen. Sixth sternite not projecting beyond abdominal apex.
- 14 (15). Hind femora black (cf. genus *Iphiaulax*).
- 15 (14). Hind femora dark brownish yellow; if with black pattern, then antennae not longer than body, stigma 1.5 times as long as wide, basally with yellow spot.
- 16 (17). Hind femora apically with black spot. Body 4–9 as in Fig. 62. Parasite of *Chrysobothris affinis* F., *Buprestis* sp. (Buprestidae), *Lixus junci* Boh. (Curculionidae), *Plagionotus arcuatus* L. (Cerambycidae), *Gortyna xentheres* Germ. (Noctuidae). South (north to Kharkov Region); Caucasus, Kazakhstan, Central Asia; Southern and Central Europe; northern Africa; Asia Minor; Mongolia ..... **P. castrator** F.
- 17 (16). Hind femora apically lacking black spot, sometimes basally with black spot or almost entirely black, except apices. Body 2.5–7. Parasite of *Lixus incanescens* Boh. (Curculionidae). South; Caucasus, Kazakhstan, Central Asia; Iran; Mongolia ..... **P. tataricus** Kok. (*Glyptomorpha pusilla* Shest.)
- 18 ( 1). Abdomen entirely smooth. Body dark brownish yellow. Ovipositor as long as abdomen. Desert species.
- 19 (20). Antennae very short, not longer than head and thorax together; 1st flagellar segment barely longer than wide, 2nd segment square, middle segments transverse. Radial cell terminating beyond middle of the distance from wing apex. Body 6. Southeast; Central Asia .....  
 ..... **P. Kirgisorum** Shest., comb. n.

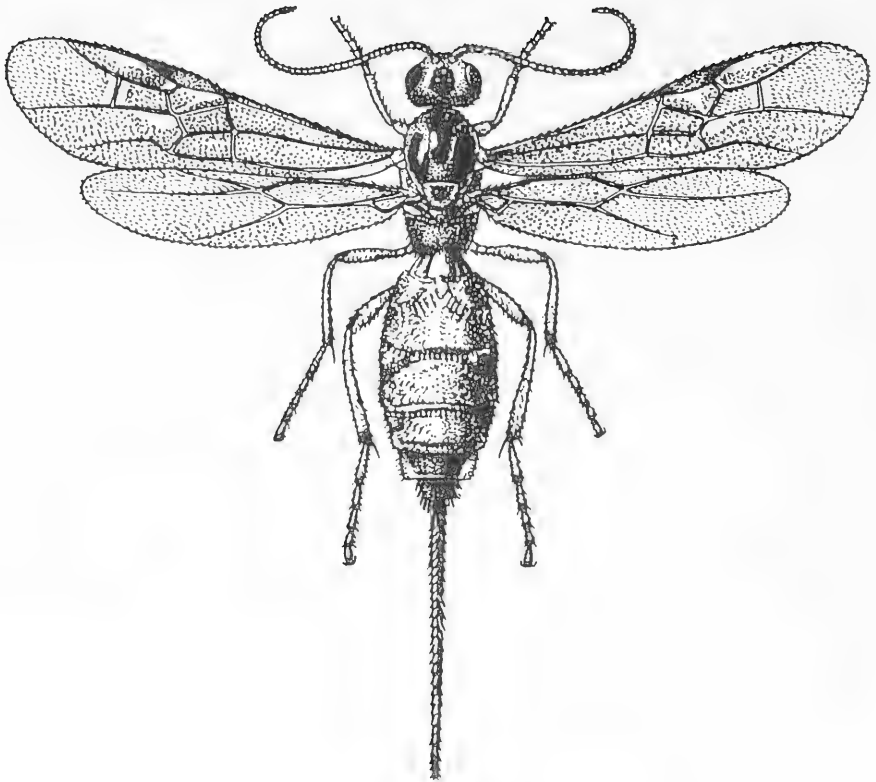


Fig. 62. Braconinae (original).

*Pseudovipio castrator* F.

Holotype: Female, Karatan Mts. near Dzhulek, "Balamurun", 18.V.1913 (Kozhanchikov).

20 (19). Antennae longer than head and thorax together. First flagellar segment 1.5 times and 2nd almost as long as wide, middle segments square. Radial cell terminating at middle of distance from stigma to wing apex.

21 (22). Middle field on 1st abdominal tergite longer than its width at apex; furrows on 2nd tergite forming acute angle. Head behind eyes slightly narrowed, temples slightly shorter than eyes. Head and thorax lacking yellowish white spots. Body 5. Central Asia ..... *P. barchanicus* Tel., comb. n.

Lectotype: Female, Turkmenia, Uch-adzhi, 1-3.V.1929 (A. Shestakov).

- 22 (21). Middle field on 1st abdominal tergite shorter than its width at apex; furrows on 2nd tergite forming obtuse angle. Head behind eyes distinctly narrowed, temples 2/3 as long as eyes. Head above near eyes and spot on thorax yellowish white. Body 6—6.5. Central Asia ..... **P. deserti** Tel., comb. n.  
Lectotype: Female, Turkmenia, Uch-adzhi, 1—3.V.1929 (A. Shestakov). Paralectotype: Female, details same as above.

69. **Vipiomorpha** Tobias, 1962.—One species: *V. ypsilon* Tobias from the Pacific Coastal Region.

70. **Chivinia** Shestakov, 1932.—One species: *C. zimini* Shest. from Central Asia.

71. **Ceratobracon** Telenga, 1936.—One species.

- 1 (1). Antennae shorter than body, 24—28-segmented. Second abdominal tergite shorter than 3rd. Ovipositor approximately half as long as abdomen. Body, including abdomen, entirely smooth. Body black, lower part of abdomen and legs partially yellowish dark brown; sometimes abdomen entirely dark brownish yellow. Fig. 52: 1. Body 2.5—5.5. Parasite of sawfly *Cephus pygmaeus* L. (Cephidae). Center, south; Caucasus, Central Asia; Mongolia ..... **C. stshegolevi** Tel.  
Lectotype: Female, Krasnodar Region, Verblynd village, barley, 12.VII.1931 (O. Moroshkina). Paratypes: 1 female, 1 male, Rostov, 21.V.1927 (Shegolev); 1 female, 2 males, Uzbekistan, Guzar, V.1929.

114 72. **Baryproctus** Ashmead, 1900.—Four species. In addition to the species described below, the fauna of the USSR includes one species each from Central Asia and the Far East.

- 1 (1). Forewings as in Fig. 52: 12. Color variable: thorax either entirely black or with dark brownish red mesonotum; abdomen dark brownish red or basally and apically black. Propodeum either rugose-punctate in apical half and with weakly granulose sculpture in basal half, lustrous or almost entirely with soft granulose (shagreen) punctation, lustrous; always with longitudinal ridge. Figs. 52: 13; 63. Body 4—7. South; Caucasus; Western Europe ..... **B. barypus** Marsh. (*hungaricus* Szépl., *caucasicus* Tel.).

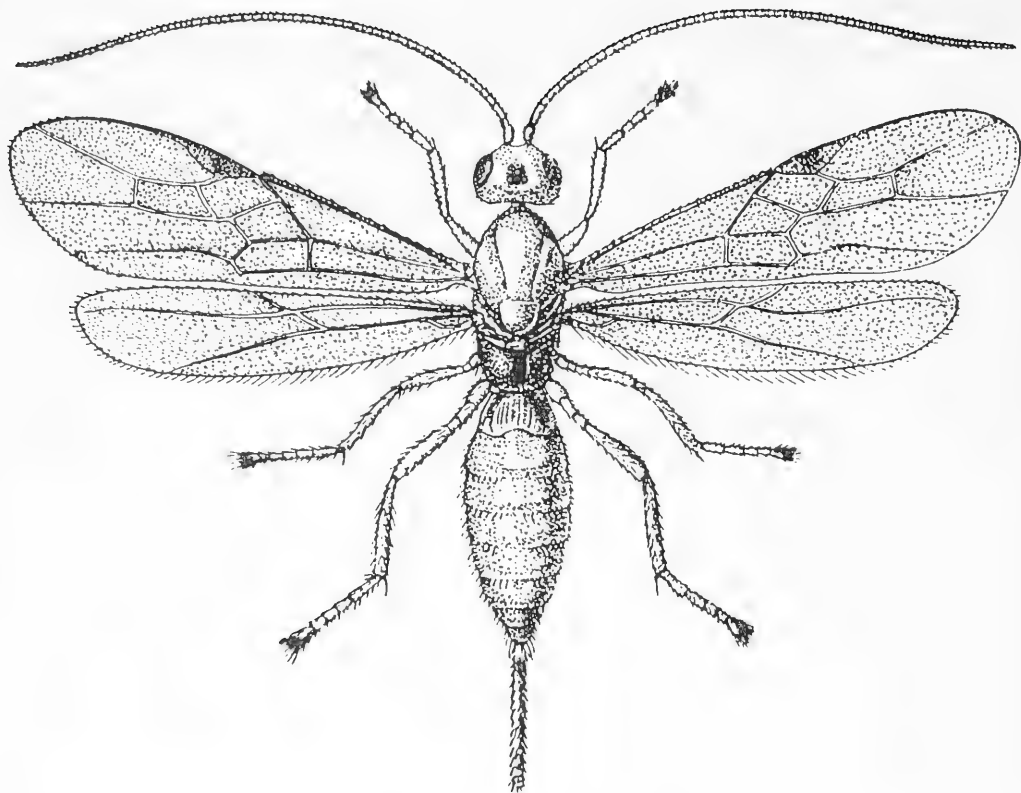


Fig. 63. Braconinae (original).

*Baryproctus barypus* Marsh.

73. *Kulczynskia* Niezabitowski, 1910.—One species from Poland, so far known only from first description.

74. *Bracon* Fabricius, 1804<sup>1</sup>.—One of the largest genera of braconids. About 800 species have been described; of these over 300 are from the Palearctic (not counting the already established synonyms,

<sup>1</sup>Tobias, 1957. *Entomol. Obozrenie*, 36, 2: 476–500; 1958, *Tr. Vsesoyuzn. Entomol. ob-va*, 46: 68–103; 1961, *Ibid.*, 48:129–180; 1959, *Entomol. Obozrenie*, 38, 4: 885–897; 1961, *Ibid.*, 40; 3: 559–668. Papp, 1965. *Acta zool. Acad. sci. hung.*, 11, 3–4: 403–416; 1966, *Ann. Hist.-Nat. Mus. Hung., Pars Zool.*, 58: 373–394; 1968, *Ibid.*, 60: 192–211; 1969, *Ibid.*, 61: 317–335; 1971, *Reichenbachia*, 13, 31: 275–292; 1974, *Ann. Naturhistor. Mus. Wein*, 78: 415–435.



which often are purely subjective in nature and are not always recognized by all authors). Many more names certainly will be included in synonymy (particularly those species included in the Key below) because of the extremely variable taxonomic characters, such as color, sculpture, wing venation, length of ovipositor, number and length of antennal segments and so on. At the same time, there are species in which even the color is hardly variable and hence the constancy of variability of the character for each species should be based on a study of a wide selection of material. However, even the overlapping of characters due to their wide variability does not always justify synonymization of species names because even such morphologically unique groups as *B. antracinus*—*atrator*—*mongolicus* could be related through transitional variants to other species, sometimes of another subgenus. The characters of the above-noted group transgress not only with characters of a series of species of the subgenus *Glabrobracon* (*B. variator*, *B. fumipennis*, *B. pineti*) but with characters of *B. intercessor* from the subgenus *Bracon* s. str. through *B. mongolicus* in which the abdominal tergites are often sculptured. This could be the result of phenotypic proximity of genotypically differing forms and, possibly, the result of hybridization, particularly because of exceptionally small differences in the structure of the genitalia (both male and female) of many species. Such a situation does not always make clear the species boundaries nor the boundaries of subgenera at the species level (for example, *B. erraticus* from subgenus *Leucobracon* in a series from one place is not always distinctly separable in the length of the radial cell on the forewings and sculpture on the abdomen, or *B. intercessor* from subgenus *Bracon* s. str. in the sculpture on the propodeum from *B. Orthobracon fulvipes* which in turn adjoins in the sculpture on the propodeum and length of the ovipositor with *B. (O.) longicollis* in a series of hundreds of specimens collected during several hours from a single site in the overgrown river banks of the Dnestr in the Chernyi [Black] Irtysch floodplains). To some extent, for this reason, the interpretation of subgenera by different authors (for instance, Papp and Tobias) is not identical. Some species have to be included somewhat arbitrarily under one of the three rather large subgenera (*Bracon* s. str., *Leucobracon* and *Glabrobracon*). Here these subgenera are recognized as an association of species having fairly well developed tendencies for: 1) reduction of the radial cell on the forewing, increase in the size of the oral cavity and reduction and thickening of antennae with smooth or basally sculptured abdomen (often we find thin antennae and a small oral cavity—*Orthobracon*); 2) retention of sculpture on the abdominal tergites, as a rule with a long radial cell,

a small oral cavity, thin antennae and often a large apical segment of the hind tarsi—*Bracon* s. str. (the series *Orthobracon*, earlier considered as a separate subgenus, is merged with it, since the characters distinguishing it are especially transgressive—cf. couplets 57, 82, and 83); 3) loss of sculpture on the abdomen (but the basal tergites are sometimes sculptured) with a usually long radial cell, small oral cavity and apical segment of hind tarsi and thin antennae—*Glabrobracon*.

There is wide variability of many species of the genus. Therefore, we could not include in the key below many species which have been described from the variable characters of common species (however, it is premature to assume their identity with these species).

From among the fauna of the USSR, the key does not include the Siberian *B. jakuticus* Tobias, *B. camellatus* Tel., *B. ductor* Tel., *B. irkuttensis* Tel., *B. transbaicalicus* Tel.; the Far Eastern *B. dahuricus* Tel., *B. saltator* Tel.; and *B. zonulatus* Fahr. described from Uralsk.

- 1 ( 36). Thorax with granulose sculpture, matte, if lustrous, then weak, soft granulose sculpture always noticeable on sides of mesothorax and, as a rule, on mesonotum. Abdomen always with granulose sculpture, sometimes weaker. Body often with yellow spots. Second radiomedial cell often short, on anterior margin (2nd section of radial vein) rarely longer than width of cell (Figs. 64: 4–7; 65: 1, 2).
- 2 ( 35). Second abdominal tergite basally with small triangular field (bordered by weak ridge) and lacking distinct lateral depressions, often with smooth sculpture and yellow spots.
- 3 ( 30). Eyes not large, genae well developed, their height not less or slightly less than basal width of mandibles (Fig. 64: 1, 2). Width of ocellar triangle usually not more than ocell-ocular distance (Subgenus *Habrobracon* Ashm.).
- 4 ( 5). Oral cavity very wide, three times its distance from eye; face 3 times as wide as high with clypeus (Fig. 64: 2). Radial cell short, not longer than stigma. Ovipositor much shorter than abdomen. Antennae thin, shorter than body, 20–21-segmented. Body almost entirely with granulose sculpture, matte; in middle part of mesonotum with two smooth stripes. Body black, 2.5–2.8. Southeast; Kazakhstan. Mongolia ..... **B. (H.) excisus** Tobias
- 5 ( 4). Oral cavity as wide as its distance from eye or slightly wider; face usually not more than 2 times as wide as its height with clypeus (Fig. 64: 1).

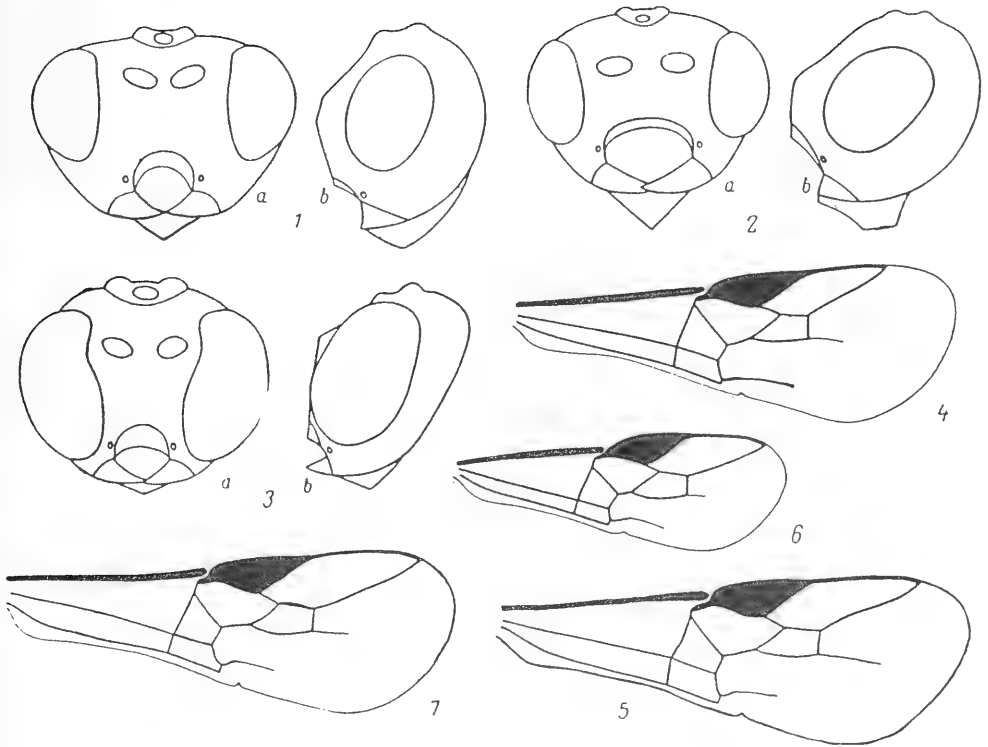


Fig. 64. Braconinae (from Tobias).

1—3—head (a—frontal view, b—lateral view): 1—*Bracon stabilis*, 2—*B. excisus*, 3—*B. ophthalmicus*; 4—7—forewings: 4—*B. kopetdagi*, 5—*B. stabilis*, 6—*B. viktorovi*, 7—*B. telengai*.

6 ( 19). Thorax granulosely punctate, matte, sometimes lower part of sides of mesothorax or part of mesonotum smooth.

7 ( 8). Body entirely reddish yellow, rarely thorax black below; antennae light brown, stigma bichromatic, basally yellow. Radial cell as long as stigma or slightly longer. Ovipositor much shorter than abdomen. Body 2.3—2.6. Parasite of caterpillars of *Spilonota ocellana* F., *Gypsonoma minutana* Hb., *Pandemis chondrillana* H.-S. (Tortricidae), *Pexicopia malvella* Hb. (Gelechiidae) and larvae of bark beetles in shoots of apple, cherry and almond. Southeast; Caucasus, Kazakhstan, Central Asia.....  
..... **B. (H.) telengai** Muljarskaya

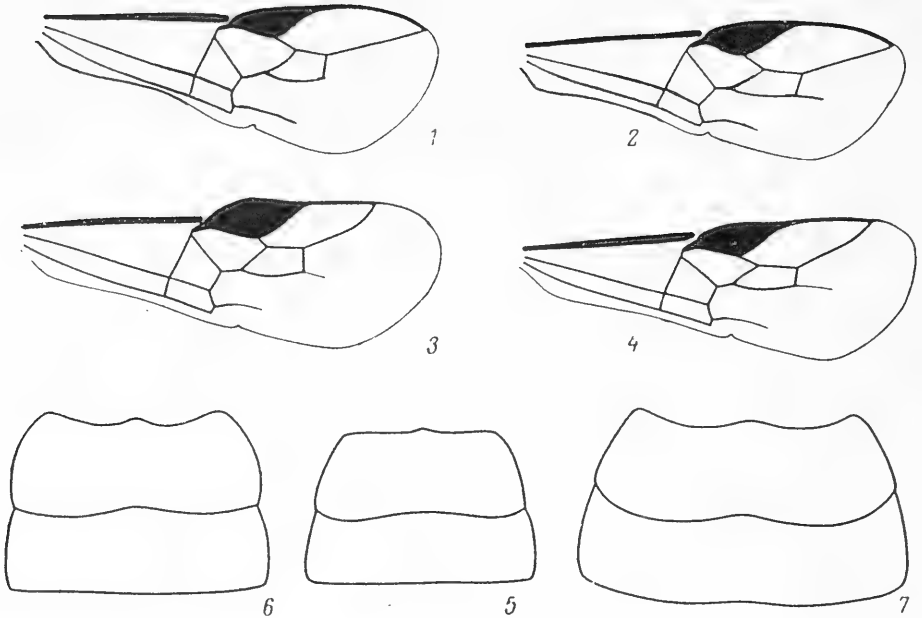


Fig. 65. Braconinae (from Tobias).

1—4—forewings: 1—*Bracon hebetor*, 2—*B. simonovi*, 3—*B. breviradiatus*, 4—*B. variegator*; 5—7—abdominal tergites 2nd—3rd: 5—*B. hebetor*, 6—*B. variegator*, 7—*B. ophthalmicus*.

- 8 ( 7). Greater part of body black; antennae black, rarely basally dark brown; stigma unichromatic, dark brown, rarely with basal yellow spot.
- 9 ( 14). Radial cell on forewing short, at anterior margin not longer than stigma (Figs. 65: 3; 66: 1). Stigma unichromatic, dark brown.
- 10 ( 13). Ovipositor valves much shorter than abdomen. First abdominal tergite at most 2/6 as long as its width at apex.
- 11 ( 12). Middle part of mesonotum uniformly granulosely punctate, abdominal tergites softly punctate, slightly distinguished by sculpture. Veins often thickened (Fig. 66: 1). Body 1.7—3.3. Parasite of diamond back moth *Plutella maculipennis* Curt. South; Kazakhstan, Central Asia; Austria, Mongolia. .... **B. (H.) radialis** Tel.

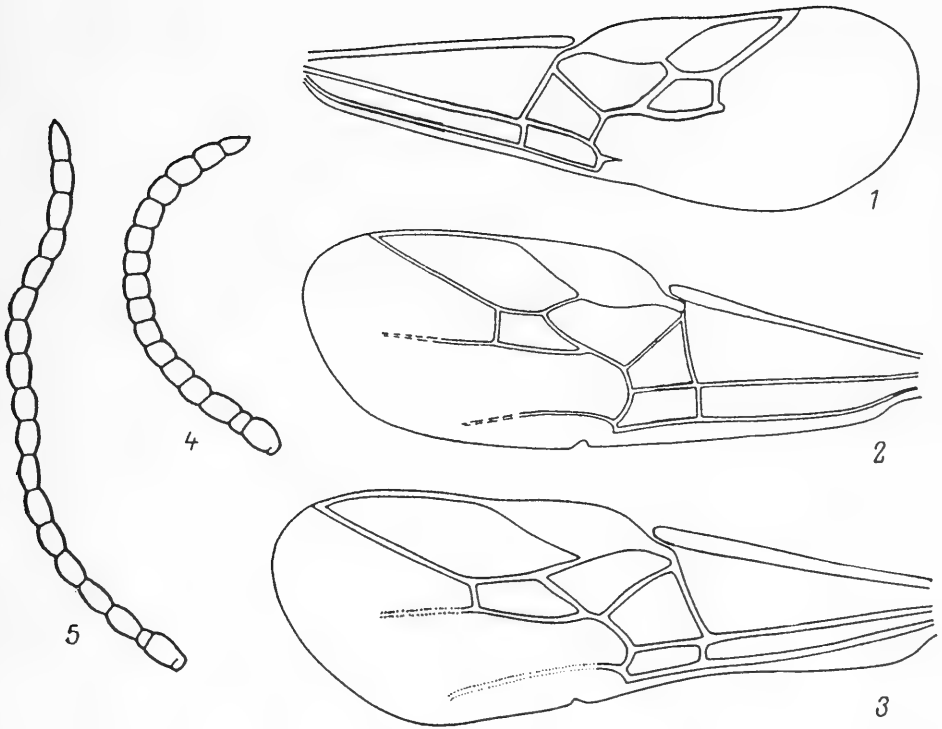


Fig. 66. Braconinae (from Tobias).

1-3—forewing: 1—*Bracon radialis*, 2—*B. nigricans*, 3—*B. ophthalmicus*; 4, 5—antennae:  
4—*B. hebetor*, 5—*B. viktorovi*.

Lectotype: Female, Kzyl-Orda ("Perovsk"), 15.V.1928 (Popov, Olenev).

- 12 ( 11). Middle part of mesonotum with two smooth, parallel-sided, longitudinal stripes. Second abdominal tergite sculptured noticeably more coarsely than following tergites. Veins not thickened, (Fig. 64: 4). Body 2.3-3. Parasite of *Anthaxia plaviltschikovi* Obenb. (Buprestidae), *Anarsia lineatella* Z. (Gelechiidae). Caucasus, Kazakhstan, Central Asia. .... **B. (H.) kopetdagi** Tobias
- 13 ( 10). Ovipositor valves as long as abdomen or slightly longer. First abdominal tergite distinctly transverse, broad-triangular, half as long as its width at apex (Fig. 67: 2, 3). Temples 2/3 as long as eyes. Antennae 21-25-segmented,

middle flagellar segments slightly longer than wide, in apical third almost square. Hind femora almost 5 times as long as wide. Abdomen almost flat, much wider than thorax. Second abdominal tergite almost 2 times as long as 3rd, in middle, like 3rd tergite, raised along median line. Mesonotum in middle with two almost smooth, raised stripes. Sculpture on abdomen fairly coarse, with dense punctation and distinct wrinkles on 2nd tergite. Body black, lower side of abdomen with reddish or dark brownish yellow pattern, mandibles yellowish red, anterior margin of clypeus and hind tibiae in basal half reddish dark brown; wings darkened. Female 3.2, male 2.5–3. Moldavia, Crimea, Krasnodar Region. ....

..... **B. (H.) ponticus** Tobias, sp. n.

Holotype: Female, Kishinev, 9.I.1961, reared in laboratory (Talitskii). Paratypes: 2 females, 6 males, Kishinev, acacia, 8.VII.1960, 19.VI, 14.VII.1961, 25.IX.1967 (Talitskii). One female, Crimea, Karadag, 14.V.1972 (Tobias), 1 female, Krasnodar, 20.VII.1978 (L. Anufriev).

- 14 ( 9). Radial cell longer than stigma (Figs. 64: 5; 65: 2). Ovipositor shorter than abdomen.
- 15 ( 16). Stigma basally with large yellow spot. Thorax black. Central Asia. .... **B. (H.) flavosignatus** Tobias
- 16 ( 15). Stigma unichromatic, dark brown; if with somewhat distinct basal yellow spot, then mesonotum with reddish yellow pattern.
- 17 ( 18). Middle part of mesonotum uniformly and with densely granulate sculpture, lacking smooth longitudinal stripes. Second abdominal tergite in sculpture almost indistinguishable from subsequent tergites. Stigma unichromatic. Fig. 66: 2. Body 2–3. Parasite of lepidopterans *Etiella zinckenella* Tr. (Phycitidae), *Pexicopia melvella* Hb. (Gelechiidae), *Pyrausta sticticalis* L. (Pyraustidae), *Cnephasia sedana* Const. (Tortricidae). Northwest, center, south; Caucasus, Kazakhstan, Central Asia, Pacific Coastal Region; Hungary, Mongolia, China. ....
- ..... **B. (H.) nigricans** Szépl.
- 18 ( 17). Middle part of mesonotum with two smooth, sometimes slightly noticeable longitudinal stripes. Second abdominal tergite in sculpture differing from subsequent tergites, somewhat rugose. Stigma unichromatic, rarely with basal yellow spot. Fig. 64: 1, 5. Body 2.5–3. Parasite of beetles

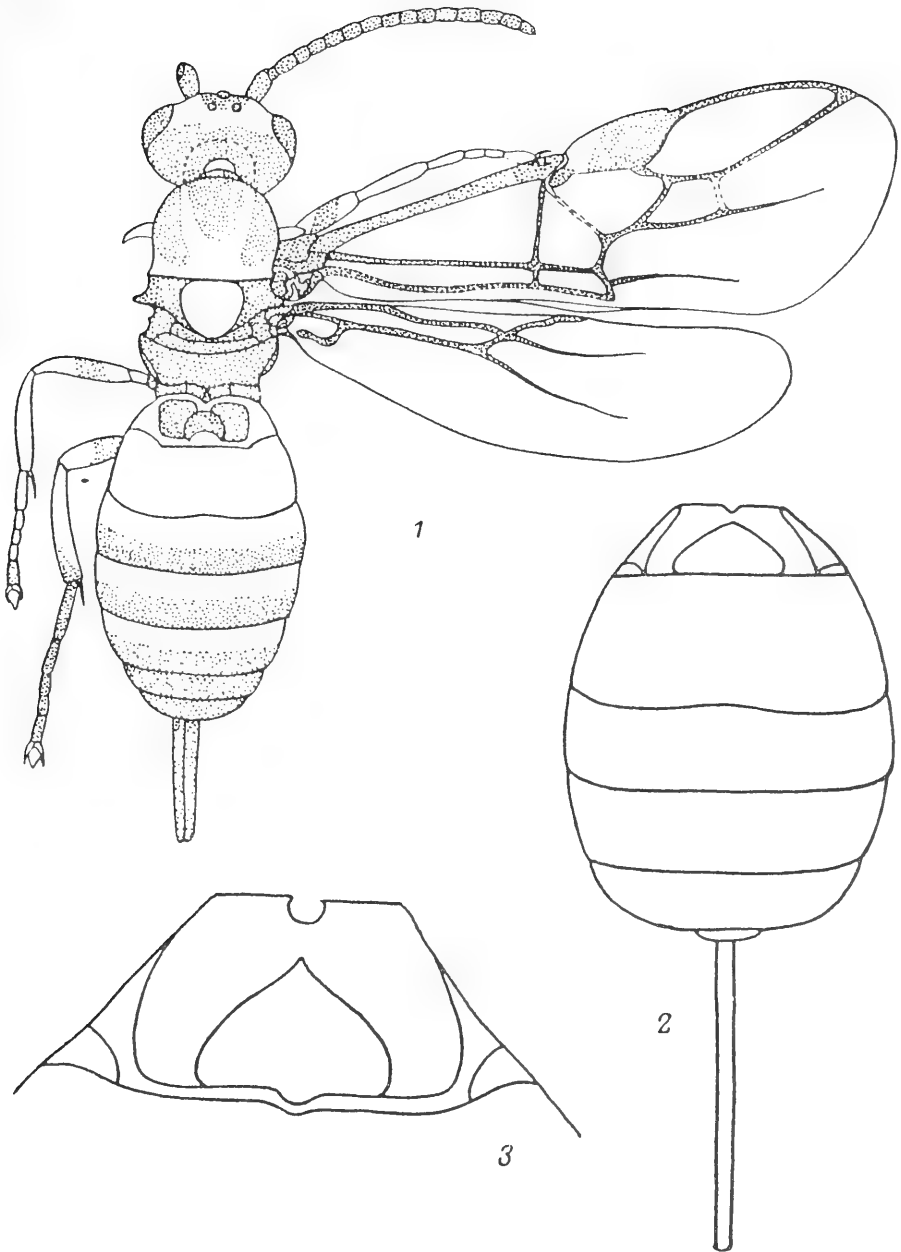


Fig. 67. Braconinae (from Goidanichu and original).

1—*Bracon hebetor*, general appearance; 2, 3—*B. ponticus* sp. n.: 2—abdomen, 3—1st abdominal tergite.

- Hylesinus crenatus* F., *H. fraxini* Pz., *Ips typographe* L. (Scolytidae), *Ernobius kiesenwetteri* Schilsky (Anobiidae), *Attagenus pello* L. (Dermestidae), lepidopterans *Laspayresia strobilella* L., *Archips rosana* L., *Zeiraphera griseana* Hb., *Choristoneura murinana* Hb., *Rhyacionia buoliana* Den. and Schiff., *R. pinivorana* Z., *Hastulla hyerana* Mill., *Cnephasia longana* Hw., *C. chrysantheana* Dup., *Epinotia nigricana* H.-S., *Tortrix viridana* L. (Tortricidae), *Agonopterix subpropinquella* Stt. (Oecophoridae), *Anarsia spartiella* Schr., *Caryocilum marmoreum* Hw., *Exoteleia dodecella* L., *Gnorimoschema brahmiella* Heyd. (Gelechiidae), *Yponomeuta malinellus* Z. (Yponomeutidae), *Coleophora laricella* Hb., (Coleophoridae); flies *Noeeta pupillata* Fall., *Chaetostomella cylindrica* R.-D. (Tephritidae). Cosmopolitan. . . . . **B. (H.) stabilis** Wesm.
- 19 ( 6). Thorax smooth, mesonotum or sometimes part of it or only upper part of sides of mesothorax with granulose (sometimes weaker) sculpture. Ovipositor shorter than abdomen.
- 20 ( 21). Propodeum with longitudinal ridge and herring bone pattern, wrinkles on sides from it; sides of mesothorax somewhat punctate. Body black; head anteriorly reddish yellow, antennae light brown, legs reddish, stigma dark brown. Body 4—4.5. Parasite of caterpillars *Euproctis chryso-rhoea* L. (Lymantriidae), *Malacosoma neustria* L. (Lasiocampidae). South; Armenia. . . . . **B. (H.) nygmiae** Tel.  
Lectotype: Female, Kharkov Region, 13.VII.1922, from browntail moth (Kamyshnyi). Paralectotypes: 2 females, details same; 1 male, Taganrog, 23.VI.1922 (Ahnger).
- 21 ( 20). Propodeum lacking ridge, sides of mesothorax smooth.
- 22 ( 29). Second radiomedial cell short, 2nd section of radial vein shorter than 1st radiomedial vein (Fig. 65: 1, 2). Abdominal tergites finely, granulosely punctate, somewhat lustrous.
- 23 ( 24). Antennae short, not longer or slightly longer than thorax, thickened, 14—18-segmented; flagellar segments square. Color highly variable: body entirely dark brownish yellow or almost entirely black. Figs. 65: 1, 5; 66: 4; 67: 1. In storehouses parasite of *Ephestia*, *Plodia*, *Galleria* species; in fields parasitizes many hosts, mostly lepidopterans of different families—*Ostrinia nubilalis* Hb., *Pexicopia malvella* Hb., *Etiella zinckenella* Tr., *Helicoverpa armigera* Hb., *Heliothis peltigera* Den. and Schiff., and others.



- Cosmopolitan species; in the European part often in fields, mostly in the south. ....  
 ..... **B. (H.) Hebetor** Say (*brevicornis* Wesm., *juglandis* Ashm., *vernalis* Szépl., *flavus* Tel., *turestanicus* Tel.)
- 24 ( 23). Antennae much longer than head and thorax together, usually with many segments, flagellar segments longer than wide (Fig. 66: 5).
- 25 ( 28). Radial cell on forewing long and wide, much wider than 2nd radiomedial cell, terminating near wing apex (Figs. 64: 6; 65: 2). Stigma unichromatic.
- 118 26 ( 27). Body reddish yellow, antennae dark brown. Interocellar distance equals ocellar diameter or slightly more. Fig. 65: 2. Body 1.5–2.5. Parasite of owl moths *Helicoverpa armigera* Hb., *Spodoptera exigua* Hb., *Earias roseipes* Fil. Central Asia..... **B. (H.) simonovi** Kok.
- 27 ( 26). Body black with yellow spots or diffused reddish pattern, antennae black. Interocellar distance 2 times ocellar diameter. Body 1.5–1.8. Southeast. .... **B. (H.) viktorovi** Tobias
- 28 ( 25). Radial cell short and narrow, slightly wider than 2nd radiomedial cell, terminating much before wing apex (Fig. 65: 3). Body dark brownish yellow, sometimes with dark spots, stigma with large yellow basal spot. Body 2–2.5. Central Asia. .... **B. (H.) breviradiatus** Tobias
- 119 29 ( 22). Second radiomedial cell longer, 2nd section of radial vein longer than 1st radiomedial vein (Fig. 65: 4). Abdominal tergites usually more coarsely sculptured, matte or slightly lustrous. Color highly variable: from reddish yellow to almost entirely black; wings light colored or smoky. Fig. 65: 6. Body 2–3. Parasite of *Tortrix viridana* L., *Laspoypesia strobilella* L., *Archips rosana* L. (Tortricidae), *Recurvaria nanella* Den. and Schiff., *Anarsia lineatella* Z., *Teleia modesta* Danil. (Gelechiidae), *Endrosis sarcitrella* L., *Agonopterix propinquella* Tr. (Oecophoridae), *Acrobasis obtusella ottomana* Car., *Hyphantidium terebellum* Zk. (Phycitidae), *Coleophora ibipennella* Z. (Coleophoridae), *Lithocolletis mespilella* Hb., *L. kleemanella* F. (Gracillariidae), *Yponomeuta padellus* L. (Yponomeutidae), and the beetle *Ernobius abietis* F. (Anobiidae). Entire Palearctic, introduced in New Zealand. ....  
 ..... **B. (H.) variegator** Spin. (*nanulus* Szépl.)
- 30 ( 3). Eyes distinctly enlarged, almost touching bases of mandibles. Face as wide as its height with clypeus. Width of

- ocellar triangle more than its distance from eye (Fig. 64: 3) (Subgenus *Ophthalmobracon* Tobias).
- 31 ( 32). Radial cell on forewing reaching its apex (Fig. 66: 3). Ovipositor as long as abdomen. Body distinctly granulosely punctate, dark brownish yellow. Fig. 65: 7. Body 3–7.3. Parasite of lepidopterans *Pexicopsis malvella* Hb., *Recurvaria pistaciicola* Danil., *Amblypalpis tamaricella* Danil. (Gelechiidae). Transcaucasia, Central Asia; Israel. ....  
..... **B. (O.) ophthalmicus** Tel.  
Lectotype: Male, Bukhara (locality cited from first description since the label does not contain geographic information), 1.V.1927 (Yakhontov). Paralectotype: Female (without abdomen!), lower reaches of Ili River, 15.VI.1914 (T.E.S.)
- 32 ( 31). Radial cell on forewing reduced, falling far short of wing apex. Ovipositor much shorter than abdomen.
- 33 ( 34). Mesonotum and scutellum with granulose sculpture, matte or slightly lustrous. Ocellar triangle 2–3 times as wide as its distance from eye. Body 1.8–3.5. Central Asia. ....  
..... **B. (O.) nocturnus** Tobias
- 34 ( 33). Mesonotum and scutellum absolutely smooth, lustrous. Ocellar triangle approximately as wide as (in male ocellar diameter greater) its distance from eye. Body 2.5. Central Asia. .... **B. (O.) lissothorax** Tobias
- 35 ( 2). Second abdominal tergite basally with small triangular field bordered by weak ridge, laterally with rather deep depressions bordering inner side with thin ridge (ridges posteriorly convergent). Thorax entirely with granulose sculpture. Oral cavity slightly wider than its distance from eye. Antennae as long as body, 32–38-segmented, middle flagellar segments somewhat longer than wide. Radial cell terminating before wing apex, 2nd radiomedial cell much longer than wide. (Subgenus *Asiabracon* Tobias).  
Body dark brownish yellow with black spots on mesonotum and on lower part of mesothorax, on propodeum, sometimes on 1st and in middle of 2nd abdominal tergite, with pair of dark spots on other tergites (often only on 3rd and 4th). Body 3.5–4.5. Parasite of cotton bollworm *Helicoverpa armigera* Hb. Azerbaidzhan, Central Asia. ..  
..... **B. (A.) quadrimaculatus** Tel.  
Lectotype: Female, Turkmenia, Bairam Ali, 14.VI.1932 (Bogush).

- 36 ( 1). Thorax lacking granulose sculpture, smooth, lustrous, only sometimes pronotum with somewhat noticeable granulose sculpture (in that case abdominal tergites in apical half smooth); if rarely thorax with granulose sculpture (subgenus *Leucobracon*), then radial cell strongly reduced, body lacking yellow spots and abdomen beyond 2nd tergite smooth. Abdomen often entirely smooth or only in apical half. Second radiomedial cell, with rare exceptions, much longer than wide.
- 37 ( 38). Abdomen entirely with reticulate sculpture, in middle of 2nd tergite slightly raised longitudinal ridge with smooth sculpture. Ovipositor very short, slightly projecting above abdominal apex. Scutellum with punctate depression. Oral cavity as wide as its distance from eye. Antennae shorter than body, with slightly moniliform, almost square, flagellar segments, antennae about 25-segmented. Radial cell on forewing long, terminating at wing apex. Fig. 68: 1, 2. (Subgenus *Sculptobracon* Tobias). Center; Siberia. ....  
..... **B. (S.) burjaticus** Tobias
- 38 ( 37). Abdomen either entirely smooth or only in apical half; if all tergites sculptured, sculpture coarse, not reticulate, usually noticeably smooth on apices of tergites. Ovipositor, as a rule, projecting greatly beyond abdominal apex, most often not or only slightly shorter than abdomen. Scutellum lacking punctate depression (rare exception: some individuals of *B. (Foveobracon) bimpressus* Tel.).
- 39 ( 40). Abdominal tergites 3 to 5 in male with dense tuft of semi-appressed short hair (Fig. 68: 5), densely punctate, tergites at base and apex of abdomen contrastingly smooth, all lacking hair. (In female, abdomen smooth and weakly pubescent, with medially deep and laterally weak suture between 2nd and 3rd tergites.) Radial cell on forewing very short, on anterior margin as long as stigma, much shorter than its distance from wing apex; 2nd radiomedial vein small, its front side (2nd section of radial vein) shorter than inner (1st radiomedial vein). Fig. 68: 3, 4. (Subgenus *Pilibracon* Tobias with one dark colored species—*B. (P.) disparilis* Tobias from Pamir).
- 40 ( 39). Abdomen in both male and female similarly pubescent and sculptured, sometimes not distinctly pubescent and sculptured on middle tergites compared to basal and apical tergites. Radial cell rarely reduced slightly; if distinctly

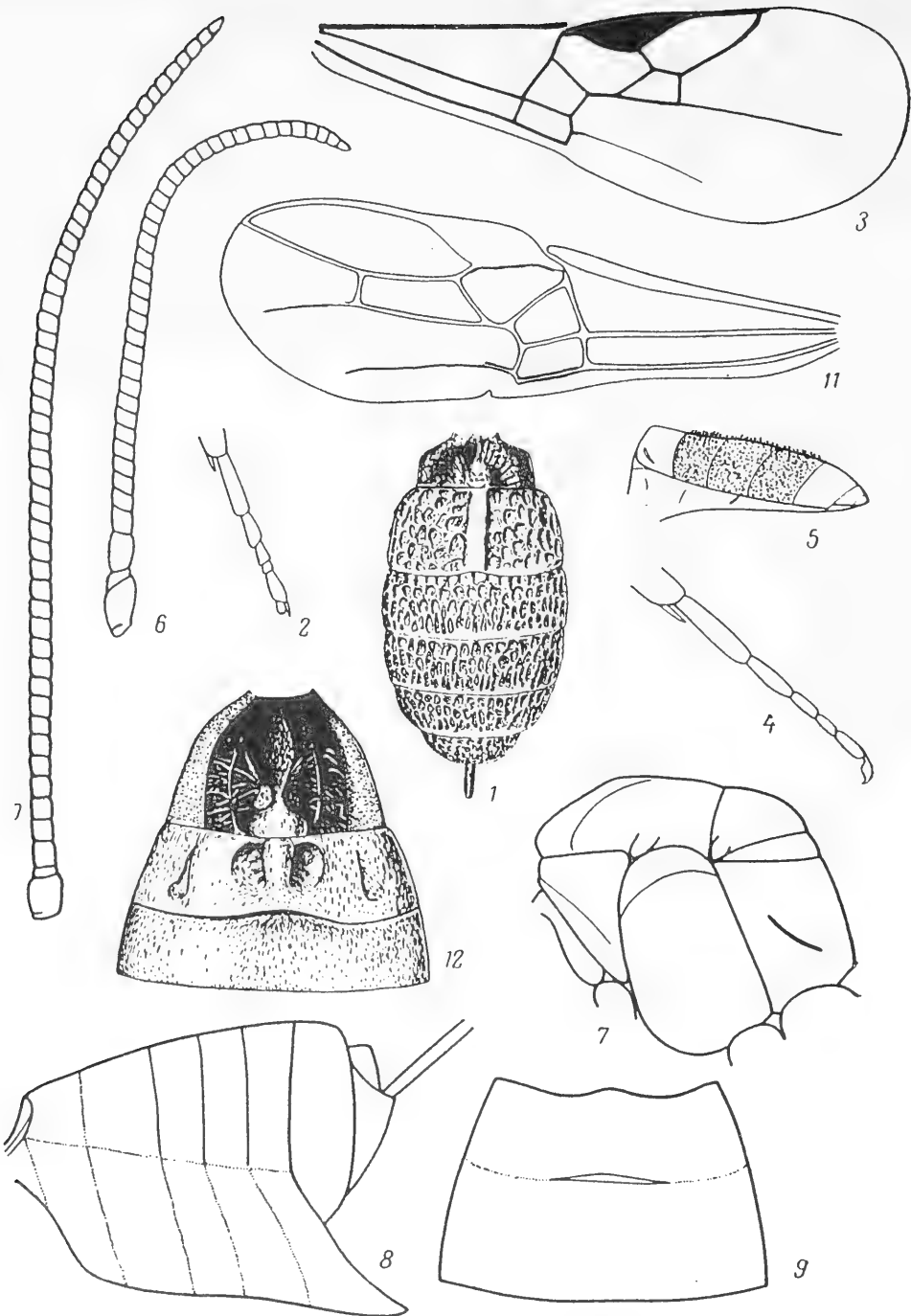


Fig. 68. Braconinae (from Tobias).

1, 2—*Bracon burjaticus*: 1—abdomen, 2—hind tarsus; 3—5—*B. disparilis*: 3—forewing, 4—hind tarsus, 5—abdomen; 6—8—*B. urinator*: 6—antenna, 7—thorax, 8—abdomen; 9—*B. fallax*, 2nd–3rd abdominal tergites; 10—*B. sabulosus*, antenna; 11, 12—*B. bimpressus*: 11—forewing, 12—abdominal tergites 1st–3rd.

reduced, then abdomen, as a rule, with sculpture on basal tergites.

- 41 ( 42). Proboscis greatly elongate, usually as long as height of face with clypeus; eyes oblong, their longitudinal diameter 2 times as much as transverse (Fig. 69: 1). Ocellar triangle obtuse angled. Mesonotum (seen laterally) with small umbo (Fig. 68: 7). (Subgenus *Rostrobracon* Tobias). Suture between 2nd and 3rd abdominal tergites compressed (Fig. 68: 8), smooth; ovipositor slightly longer than abdomen. Antennae 28–40-segmented, flagellar segments square (Fig. 68: 6). Body with numerous erect hair. Color highly variable. Wings as in Fig. 70: 2. Body 3–7.5. Parasite of beetles *Rhinocyllus conicus* Fröl., *R. latirostris* F., *Larinus sturnus* Schall., *L. saussureae* Marsh. (Curculionidae), flies *Tephritis pulchra* Lw. (Tephritidae) and obviously other larvae in capitula of Compositae. In north to Leningrad; Caucasus, Kazakhstan, Central Asia, southern Siberia; Western Europe; northern Africa; Asia Minor; Iran; Mongolia; China; India. . . . . **B. (R.) urinator** F.
- 42 ( 41). Visible part of proboscis much shorter than height of face; longitudinal diameter of eye less than 2 times as long as transverse. Ocelli inequilateral or barely transverse triangle. Mesonotum without trace of umbo (Figs. 72: 1; 76: 2–5).
- 43 ( 54). Antennae setiform, 40–70-segmented, flagellar segments transverse (Fig. 68: 10). Body with long, dark erect hair. Abdomen severely compressed smooth, suture between 2nd and 3rd tergites weaker on edges, fairly deep in middle (Fig. 68: 9); 6th abdominal sternite much shorter, not reaching abdominal apex. Wings distinctly smoky. (Subgenus *Cyanopteroobracon* Tobias).
- 44 ( 45). Legs dark brownish red; often coxae and bases of fore- and middle femora black. Notaulices slighter. Ovipositor half as long as abdomen or slightly longer. Body dark brownish red; head and lower side of thorax (in male, usually even sides) black. Figs. 68: 9; 69: 2; 70: 3. Body 3.4–6. South; Kazakhstan; Hungary. . . . .  
. . . . . **B. (C.) fallax** Szépl. (*falsus* Kok., *olgae* Tel.)
- 45 ( 44). Legs black.
- 46 ( 49). Thorax entirely black. Ovipositor two-thirds as long as abdomen.

- 47 ( 48). Eyes sharply projecting on sides of head, height of genae slightly less than longitudinal diameter of eye (Fig. 69: 3). Notaulices fairly deep. Abdomen entirely yellowish dark brown. Body 5.7–6. Azerbaidzhan; southern part of Western Europe; northern Africa. ....  
 ..... **B. (C.) mauritanicus** Schm.
- 48 ( 47). Eyes not sharply projecting, height of genae almost half of longitudinal diameter of eye (Fig. 70: 1). Notaulices fairly deep. Abdomen yellowish dark brown. Body 4–8. Parasite of *Larinus turbinatus* Gyll. (Curculionidae). South; Caucasus, Central Asia, Altai; southern and central part of Western Europe ..... **B. (C.) illyricus** Marsh.
- 49 ( 46). Thorax with dark brownish red mesonotum. Eyes rather weakly projecting on sides of head.
- 50 ( 53). Ovipositor much shorter than abdomen.
- 51 ( 52). Notaulices deep. Seventh abdominal tergite black, abdomen reddish dark brown. Figs. 2: 2; 68: 10; 69: 4; 70: 4. Body 4–8. Found in capitula of Compositae (*Carduus*)

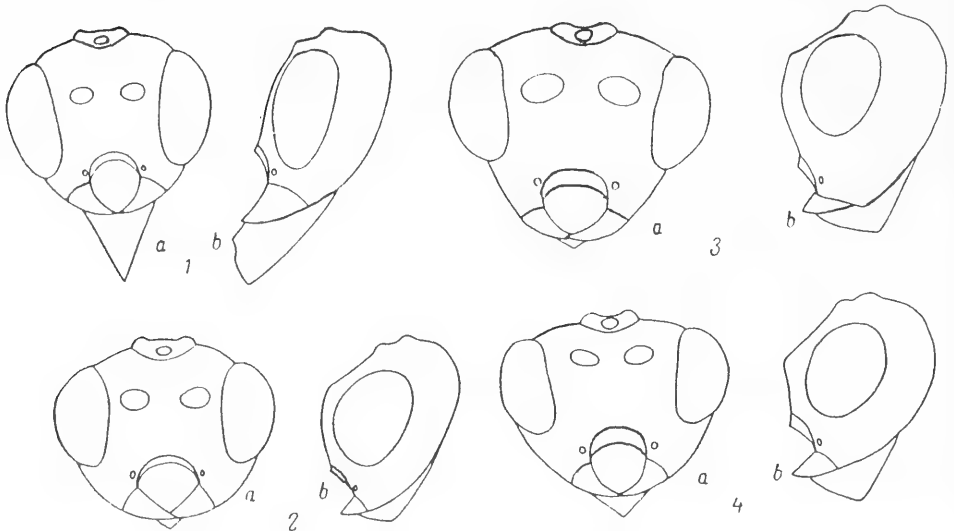


Fig. 69. Braconinae (from Tobias).

1–4—head (a—frontal view, b—lateral view): 1—*Bracon urinator*, 2—*B. fallax*, 3—*B. mauritanicus*, 4—*B. sabulosus*.

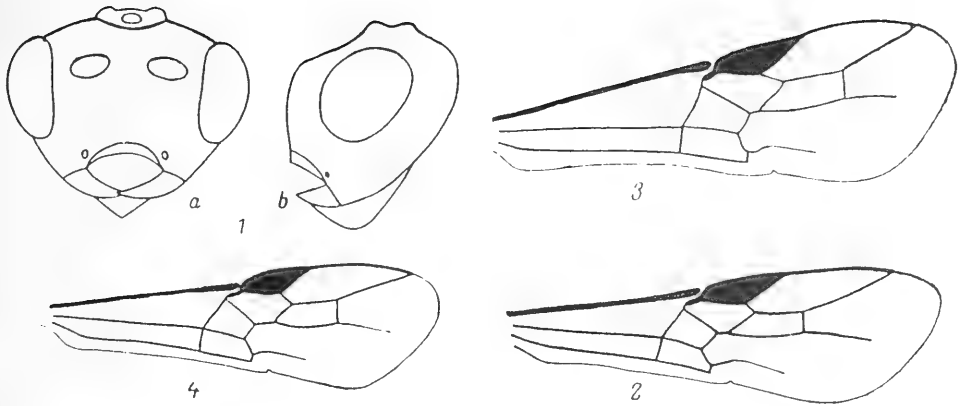


Fig. 70. Braconinae (from Tobias).

1—*Bracon illyricus*, head (a—frontal view, b—lateral view); 2—4—forewings: 2—*B. urinator*, 3—*B. fallax*, 4—*B. sabulosus*.

- infested by larvae of fruitflies (Tephritidae). South; Caucasus, Kazakhstan, Central Asia; Hungary; Yugoslavia; Romania; Iran..... **B. (C.) sabulosus** Szépl.
- 122 52 ( 51). Notaulices weak, superficial. Seventh abdominal tergite and entire abdomen yellowish dark brown. Body 4.5—6.5. Caucasus (Georgia), Kazakhstan, Central Asia ..... **B. (C.) spectabilis** Tel.  
 Lectotype: Female, Kodzori near Tbilisi, 11.VI.1916 (Andrievskii).
- 53 ( 50). Ovipositor as long as abdomen with propodeum. Notaulices not developed, Seventh abdominal tergite slightly darkened; abdomen yellowish dark brown. Body 7. Turkey ..... **B. (C.) armeniacus** Tel.  
 Lectotype: Female, village Gunya, Turkish Armenia, 24.VII.1916 (P. Kuchinskii).
- 54 ( 43). Antennae filiform or weakly setiform, usually not less than 40-segmented, flagellar segments often longer than wide, rarely square, in that case usually moniliform (Fig. 78: 1). Body with relatively short, light colored, usually appressed and not erect hair. Combination of other characters different.

- 55 ( 56). First abdominal tergite coarsely rugose, its middle field smooth with rugose depressions on sides of narrow median prominence; 2nd abdominal tergite with deep sculptured depressions on sides of raised small middle field, with lateral longitudinal furrows (Fig. 68: 12), remaining tergites smooth. Scutellum anteriorly often with distinct puncture-like depression. (Subgenus *Foveobracon* Tobias)<sup>1</sup>.

Ovipositor half as long as abdomen. Body black; wings smoky. Body 4. Parasite of larvae of *Polyploca ridens* F., *Achlya flavicornis* L. (Tetheidae). Southwest, east, Altai; Czechoslovakia ..... **B. (F.) biimpressus** Tel.

Lectotype: Female, Bashkirian ASSR, Belebei, 18.VI.1907 (A. Grigor'ev).

- 56 ( 55). First abdominal tergite uniformly bulged, smooth or with somewhat sculptured middle field; 2nd tergite lacking distinct depressions on sides of median prominence (if latter present then not marked as field and lateral depressions weak). Scutellum lacking puncture-like depression.
- 57 ( 82). Abdominal tergites entirely sculptured. Ovipositor not or only slightly shorter than abdomen. Last segment of hind tarsi not larger than 2nd. Antennae shorter than body, not thickened. Radial cell on forewing reaching its apex or slightly reduced. Oral cavity not or only slightly wider than its distance from eye. (Subgenus *Bracon* s. str.).

<sup>1</sup> The species described below is arbitrarily included under the subgenus *Foveobracon* (by the presence of the puncture-like depression on the scutellum and a similarity of sculpture on the 1st and 2nd abdominal tergites). However, the characters of the subgenus, in this species, are manifest less distinctly, particularly the puncture-like depression on the scutellum which may be absent, as seen in the material from Moldavia reported below but not included under paratypes. In all specimens the 1st abdominal tergite apically lacks distinct depressions on the sides from the middle but has coarse punctures. The frons is smooth. The ovipositor is more than half as long as the abdomen. The body is black; the abdomen in the middle has broad darkening, the lateral margins of the tergites and the lower side of the abdomen and legs are dark brown-yellowish. Body 2-2.5. Parasite of ? *Silonota ocellana* F. (Tortricidae). Moldavia ..... **B. (F.) plugarui** Tobias, sp. n.

Holotype: Female, village Kalfa, orchard, 6.VI.1967 (S. Plugaru). Paratypes: 2 females with the same label. Another material: 2 females, Karakushani, 2.VIII.1967 (S. Plugaru); 1 female, Kotov village, apple, 9.VIII.1967; 1 female, plum, 28.VII.1967, 2 males, 24.V.1968 (Talitskii).



- 58 ( 75). Ovipositor as long as body, slightly shorter or longer.
- 59 ( 62). Radial cell on forewing terminating before wing apex. Abdominal tergites uniformly and densely punctate. Ovipositor as long as thorax and abdomen together. Body and stigma yellow.
- 60 ( 61). Second radiomedial cell short, 2nd section of radial vein 1/3 as long as 3rd, not longer than 1st radiomedial vein. Wings hyaline—light colored. Body 3—3.4. Central Asia ..  
..... **B. (B.) breviareolatus** Tobias
- 23 61 ( 60). Second radiomedial cell very long, 2nd section of radial vein slightly shorter than 3rd and 1.5 times as long as 1st radiomedial vein. Wings slightly but noticeably darkened. Body 2.7. Central Asia ..... **B. (B.) chivensis** Tel.  
Lectotype: Female, Khiva, 4.VIII.1927 (Zimin).
- 62 ( 59). Radial cell terminating at wing apex.
- 63 ( 72). Abdominal tergites with fairly coarse deep punctures, lacking dense granulate sculpture or it is weakly developed. Ovipositor as long as body or slightly shorter, rarely slightly longer. Sixth sternite not projecting beyond abdominal apex.
- 64 ( 67). Abdominal tergites 3 to 6 with transverse furrows in front of posterior smooth margin. Ovipositor as long as body.
- 65 ( 66). Second abdominal tergite equal to 3rd (Fig. 71: 5). Longitudinal diameter of eye 4 to 5 times as long as genae (Fig. 71: 1). Body usually black, rarely mesonotum with reddish pattern; legs usually entirely black, rarely hind femora dark brownish red, rarely legs light colored but coxae always black. Wings as in Fig. 71: 3. Body 2.3—4.9. Parasite of *Metzneria lappella* L. (Gelechiidae) in heads of agrimony. West, northwest, center, south; Caucasus, Kazakhstan, Central Asia (Kopet-Dag); Western Europe.....  
..... **B. (B.) trucidator** Marsh. (*tauricus* Tel.)
- 66 ( 65). Second abdominal tergite much larger than 3rd (Fig. 71: 6). Longitudinal diameter of eye 2.5—3 times as long as height of genae (Fig. 71: 2). Body usually yellowish dark brown; if head and thorax mostly black, then legs entirely black, often dark brown, or black only on inner side. Figs. 71: 4; 72: 6. Body 2.5—5. Associated with Compositae (*Centaurea*, *Oirsium*, *Carduus*), in their heads infecting larvae of *Metzneria aestivella* Z., *M. lappella* L. (Gelechiidae), and larvae

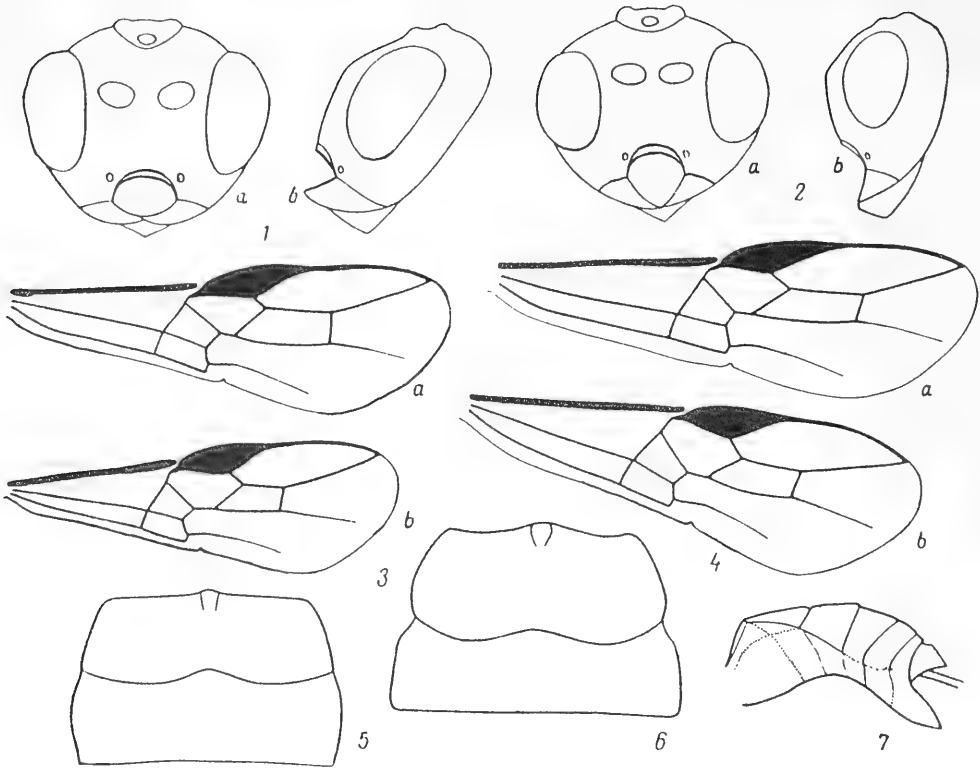


Fig. 71. Braconinae (from Tobias and original).

1, 2—head (a—frontal view, b—lateral view): 1—*Bracon trucidator*, 2—*B. luteator*; 3, 4—forewings (a—radiomedial cell long; b—radiomedial cell short): 3—*B. trucidator*, 4—*B. luteator*; 5, 6—abdominal tergites 2nd–3rd: 5—*B. trucidator*, 6—*B. luteator*; 7—*B. leptus*, abdomen.

of fruitflies, particularly *Urophora solstitialis* L. West, center, south; Caucasus, Kazakhstan, Central Asia; Western Europe; Israel. ....

..... **B. (B.) luteator** Spin. (*nigripedator* Nees)

67 ( 64). Abdominal tergites lacking transverse furrows in front of posterior smooth margin; if furrows developed, then posterior margin of tergites not smooth. Ovipositor usually longer than abdomen and thorax together.

68 ( 69). Abdomen with very delicate and superficial soft granulate sculpture, lustrous, with coarse scattered deep punctures. Head, thorax, middle and hind coxae, 1st abdominal tergite

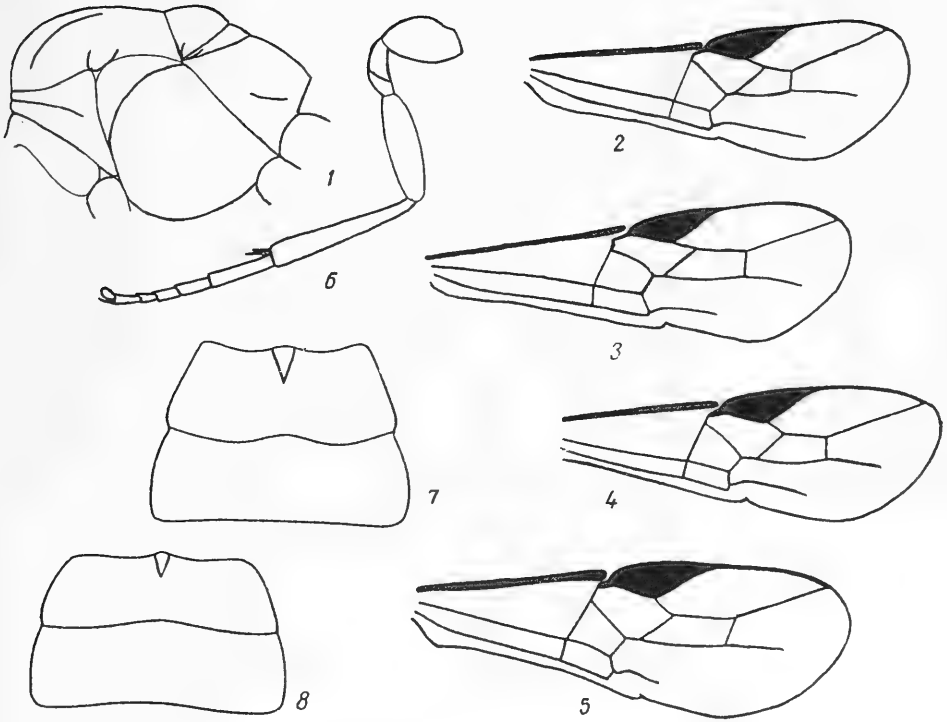


Fig. 72. Braconinae (from Tobias and original).

1—*Bracon subglaber*, thorax; 2—5—forewings: 2—*B. breviareolatus*, 3—*B. intercessor*, 4—*B. pectoralis*, 5—*B. subglaber*; 6—*B. luteator*, hind leg; 7—8—abdominal tergite 2nd—3rd: 7—*B. lepus*, 8—*B. mariae*.

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and spot on middle of 2nd tergite black; palps, abdomen and legs dark brownish yellow, apices of hind tibiae and tarsi darkened; tegulae yellow; wings darkened, stigma dark brown. Head 2 times as wide as long, temples half as long as eyes. Antennae 33-segmented, as long as head and thorax with half of abdomen, weakly setiform, with cylindrical, non-moniliform flagellar segments, their length greater than width. Radial vein originating anterior to middle of stigma, its 2nd section twice as long as 1st, half as long as 3rd, equal to 1st radiomedial vein. Hind femora 4.5 times as long as wide. Body 3.5. Gorky Region.....  
 ..... **B. (B.) querceus** Tobias, sp. n.

Holotype: Female, galls on oak, 1935 (Esterberg).  
Paratypes: 2 females, details same.

- 69 ( 68). Abdomen with much coarser sculpture, usually matte, large punctures not prominent against background of finer sculpture. Body light colored or if black, then abdomen and legs with abundant dark pattern.
- 70 ( 71). Abdomen uniformly punctate, 2nd tergite hardly distinguishable from others in sculpture. Body yellowish dark brown, wings slightly darkened. Thorax short, slightly longer than high (at most 1.5 times). Fig. 72: 4. Body 2.3–5. South; Caucasus, Kazakhstan, Central Asia; Western Europe ..... **B. (B.) pectoralis** Wesm<sup>1</sup>
- 71 ( 70). Second abdominal tergite noticeably more coarsely sculptured than other tergites. Apical abdominal tergites transversely striate, often in middle with longitudinal stripe with smooth sculpture, sometimes almost smooth. Body usually black, wings smoky. Fig. 72: 1, 5. Body 3–4.6. Parasite of lepidopterans *Paranthrene tabaniformis* Rott., *Penisetia hylaeiformis* Lasp. (Sesiidae), *Epichnopterix sieboldi* Rott. (Psychidae), *Aethes williana* Br. (Tortricidae), *Metzneria lappella* L. (Gelechiidae), dipterans *Urophora cardui* L., *U. solstitialis* L., *U. quadrifasciata* Mg., *Terellia serratulae* L., *Tephritis leontodontis* Deg., *Noeta pupillata* Fall. (Tephritidae), and beetles *Ceutorhynchus fairmairei* Ch. Bris. (Curculionidae). West, northwest, center, south; Caucasus, Kazakhstan, Central Asia; Western Europe ...  
... **B. (B.) subglaber** Szépl. (*minutator* auct., *tauricus* Tel.)
- 72 ( 63). Abdominal tergites softly punctate, with dense granulose sculpture. Ovipositor slightly longer than body. Sixth sternite projecting beyond abdominal apex (Fig. 71: 7).
- 73 ( 74). Stigma unichromatic, yellow or dark brown. Second abdominal tergite 1.5–2.5 times as long as its basal width.
- 125 Color varies from black with yellowish dark brown spots to yellowish dark brown with black lower side of abdomen. Body 3.3–5.5. Parasite of *Metzneria lappella* L. (Gelechiidae), in heads of agrimony. Center, south; Caucasus,

<sup>1</sup> According to the key compiled by Papp (1968), the material from the USSR, always characterized by relatively short thorax, should be included under *B. (B.) sulphurator* Szépl. since in the west European *B. pectoralis* the thorax is longer. The variability of this character needs further investigation.

Kazakhstan, Central Asia, Eastern Siberia (Krasnoyarsk), Far East; Western Europe..... **B. (B.) leptus** Marsh.

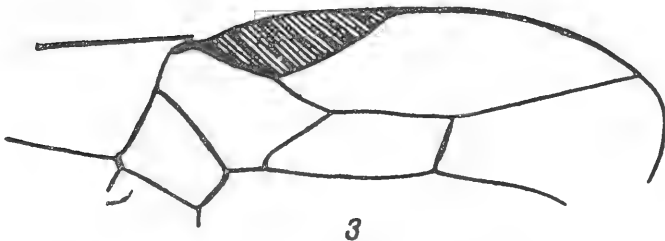
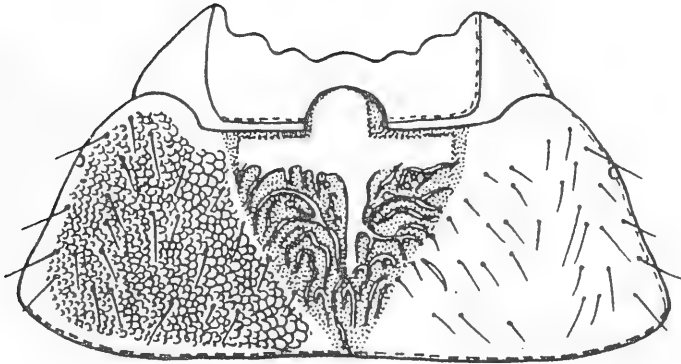
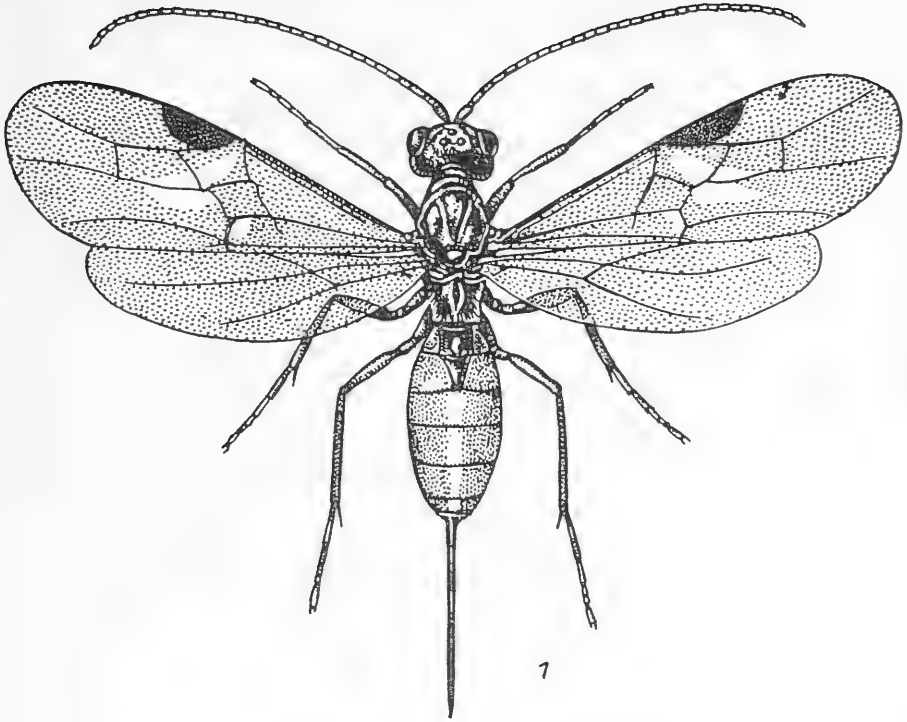
(*rufipalpis* Szépl., *obscuricornis* Szépl.)<sup>1</sup>

- 74 ( 73). Stigma in basal part yellow, in apical part dark brown. Second abdominal tergite 2 to 3 times as long as its basal width (Fig. 72: 8). Body yellowish dark brown, in dark brown specimens lower side of thorax and three spots on mesonotum black. Body 3—4.2. South; Caucasus, Kazakhstan, Central Asia; Western Europe; northern Africa .....  
..... **B. (B.) mariae** D.-T. (*semiflavus* Thoms.)
- 75 ( 58). Ovipositor as long as abdomen, somewhat longer or slightly shorter.
- 76 ( 77). Second abdominal tergite much shorter than 3rd and much less sculptured. Thorax slightly longer than high. Radial cell reaching wing apex. Body dark colored or dark brownish yellow, wings light colored. Body 2—2.5. Parasite of *Smicronyx tartaricus* Faust (Curculionidae). South; Azerbaijan, Kazakhstan, Central Asia.....  
... **B. (B.) murgabensis** Tobias (*praestans* Tobias, syn. n.)
- 77 ( 76). Second abdominal tergite as long as 3rd.
- 78 ( 81). Radial vein originating from middle of stigma; 2nd abdominal tergite uniformly but weakly sculptured, usually more distinctly than 3rd tergite. Ovipositor not shorter than abdomen.
- 79 ( 80). Radial cell on forewing reaching wing apex. Sculpture on abdomen distinctly variable, from coarse to weak (corresponding to large and small body size). Color highly variable: body including abdominal tergites may be entirely dark brownish yellow and entirely black, stigma yellow or dark brown; wings light colored or smoky, as in Fig. 72: 3. Body 2—6. Parasite of beetles *Rhynchites bacchus* L. (Attelabidae), *Microlarinus typriformis* Woll.,

<sup>1</sup> Papp (1974) considered that *B. obscuricornis* Szépl. and *B. rufipalpis* Szépl. are independent species. However, according to his key, the differences between them are not clear. *B. leptus* can be considered closer to *B. xyletini* Hedqv. described from Sweden; it is marked by unique features: a longitudinally rugose furrow in the middle of the propodeum (Fig. 74: 1), as well as coarse sculpture on the 1st abdominal tergite (Fig. 74: 2). The head and thorax of this species and the prothorax and sides of the mesothorax are black; the light colored part of the thorax, 2nd and 3rd abdominal tergites and the greater part of the legs are dark brownish yellow. Body 3.7. Parasite of *Xyletinus hanseni* A. Jas. (Anobiidae).

- M. lareyniei* Jacq., *Anthonomus pomorum* L., *A. pedicularis* L., *A. sorbi* Germ., *Apion opeticum* Bach., *Lixus junci* Boh., *L. incanescens* Boh., *L. brevirostris* Boh., *L. scabricollis* Boh. (Curculionidae), lepidopterans *Parametriotes theae* Kuzn. (Momphidae), *Augasma atraphaxidellum* Kuzn., *Sparganothis pilleriana* Den. and Schiff. (Tortricidae), hymenopterans *Tetramesa hyalipennis* Walk., *T. rossica* R.-K. (Eurytomidae). Entire Palearctic . . . . . **B. (B.) intercessor** Nees (*erythrostickus* Marsh., *bisinuatus* Szépl., *fallaciosus* Szépl., *fumigatus* Szépl., *nitidiusculus* Szépl., *suspectus* Szépl., *kacheticus* Tel., *maslovskii* Tel., *segregatus* Tel., *rhynchiti* Grese; *adjectus* Szépl., syn. n.; ? *vigilax* Kok., syn. n.; *fulvus* Szépl., syn. n.; *hemirugosus* Szépl., syn. n.; *mixtus* Szépl., syn. n.; *rufiscapus* Szépl., syn. n.)<sup>1</sup>.
- 80 ( 79). Radial vein on forewing reduced (cf. Fig. 72: 2). Abdominal tergites finely punctate, with transverse furrows in front of posterior margin. Body 3. Central Asia . . . . . **B. (B.) mesasiaticus** Tobias
- 81 ( 78). Radial vein originating from basal third of stigma (Fig. 73: 3). Second abdominal tergite laterally slightly sculptured, overall much less sculptured than 3rd to 5th tergites, in middle coarsely rugose. Ovipositor noticeably shorter than abdomen. Head 2 times as wide as long, temples half as long as eyes. Antennae as long as body, 24–26-segmented. Flagellar segments 1.3 times as long as wide. Thorax 1.5 times as long as high, notaulices distinct. Second radiomedial cell long, 2nd section of radial vein 1.5–2 times as long as 1st radiomedial vein. Hind femora 4 times as long as wide. Suture between 2nd and 3rd abdominal tergites very deep, finely sculptured, curved; 2nd tergite with distinct lateral longitudinal depressions; 4th and 5th tergites preapically with distinct transverse furrow. Head and thorax black or dark brown, sometimes with light colored pattern on anterior and lower parts of head, on pronotum, along notaulices and on sides of metathorax; legs and abdomen dark brownish or reddish

<sup>1</sup> Possibly synonyms of this species are also *B. corruptor* Szépl. described from Hungary and differing by weakly sculptured apices of abdominal tergites and bright yellow spots on sides of tergites, and the Central Asian *B. braviareolatus* Tobias with distinctly reduced 2nd radiomedial cell (Fig. 72: 2). Possibly *B. triangularis* Nees sensu Goidanich (Fig. 73: 1, 2) is also its synonym—see also couplet 280.



yellow; 1st abdominal tergite, sometimes also middle of 2nd, dark (in male abdominal apex and spot on 3rd tergite also dark); wings darkened, stigma dark brown. Body 2–2.5. Moldavia ..... **B. (B.) kuslitzkyi** Tobias, sp. n.

Holotype: Female, Onitskany, Kriulyansk District, leaf roller on apple, 30.V.1979 (Kuslitskii). Paratypes: 5 females, 1 male, Panasheshty, Starshensk district, same host, 1.VI.1979 (Kuslitskii); 1 female, Karmanovo, 27.VIII.1963 (Talitskii).

- 82 ( 57). Abdomen entirely smooth or only apical tergites smooth. If apical tergites also somewhat sculptured, then propodeum sculptured along middle (sometimes entirely and often with longitudinal ridge) and ovipositor noticeably shorter than abdomen (*Orthobracon*), or radial cell on forewing reduced, terminating preapically, antennae somewhat thickened with square and transverse segments (*Leucobracon*) or maxillary palps very long, longer than height of head (*B. (Glabrobracon) mongolicus* Tel.).

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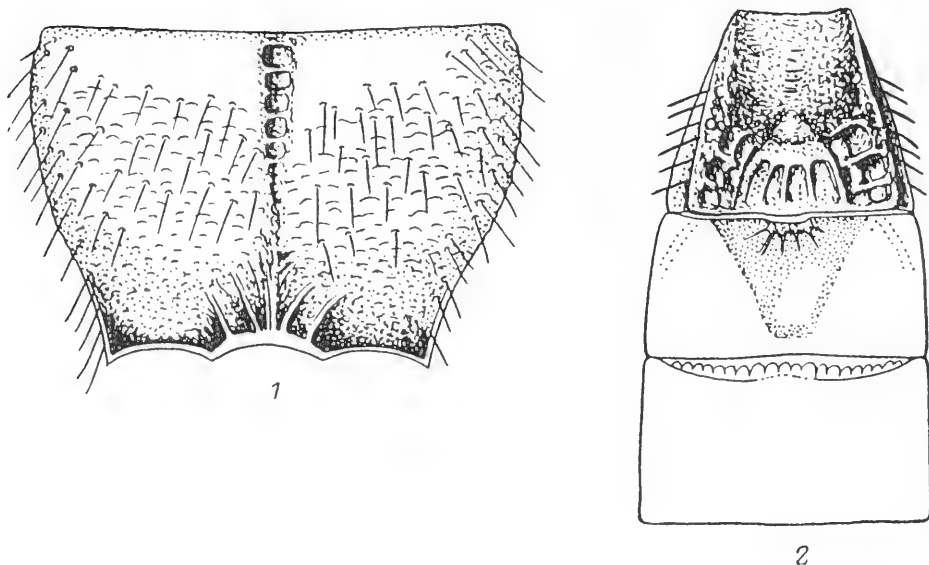


Fig. 74. Braconinae (from Hedqvist).

1, 2—*Bracon xyletini*: 1—propodeum, 2—1st–3rd abdominal tergites.



- 83 (118). Radial cell on forewing large, terminating at wing apex. Oral cavity small, at most slightly wider than its distance from eye. Apical segment of hind tarsi noticeably enlarged, not less than 2nd, usually larger. Ovipositor usually shorter than abdomen. Propodeum often sculptured entirely or along middle. Abdominal tergites usually sculptured in basal half but sometimes also apical with smooth sculpture; rarely (*B. terebella*) abdomen smooth. Antennae usually as long as body. Suture between 2nd and 3rd tergites well developed, usually curved. Hind femora short, usually 4 times, sometimes 3 times, as long as wide (section *Orthobracon* Fahr.).
- 84 ( 95). Ovipositor as long as abdomen or slightly shorter (in doubtful cases propodeum entirely rugose).
- 85 ( 86). Only 1st to 3rd abdominal tergites rugose, others smooth. Thorax 1.5 times as long as high. Head half as long as wide, temples as long as eye. Body reddish dark brown, legs yellow. Second abdominal tergite with yellow spot on each side. Body 2.4. Sweden . . . . **B. (B.) filicornis** Thoms.
- 86 ( 85). Tergites in apical half of abdomen sculptured.
- 87 ( 90). Propodeum entirely sculptured or only on sides with smooth sculpture, longitudinal ridge on it weakly developed and usually noticeable only in lower half. Body usually, including legs, yellowish dark brown, apical segments of abdomen light colored, and wings (in any case with dark spots on body) darkened. Ovipositor often noticeably shorter than abdomen.
- 88 ( 89). Propodeum and abdominal tergites with black pattern. Fig. 75: 1—3. Body 3—4.5. Parasite of beetles *Mononychus punctum-album* Hbst., *Curculio villosus* F., *Apion cyanescens* Gyll., *A. minimum* Hbst. (Curculionidae), lepidopterans *Paranthrene tabaniformis* Rott. (Sesiidae), *Coleophora coronillae* Z. (Coleophoridae), hymenopterans *Tetramesa hyalipennis* Walk., *T. brevicollis* Walk. (Eurytomidae). Center, south; Caucasus, Kazakhstan, Central Asia, southern Siberia to Far East . . . . .  
 . . . . . **B. (B.) fulvipes** Nees (*kiritschenkoi* Tel.)
- 89 ( 88). Body absolutely lacking dark pattern; 3—3.5. Azerbaidzhan, Central Asia; Iran . . . . . **B. (B.) schmidti** Kok.  
 Lectotype: Female, Azerbaidzhan, Geoktepe, "on electric arc light," 15.VII.1901 (R. Schmidt).
- 90 ( 87). Propodeum sculptured only along its middle.

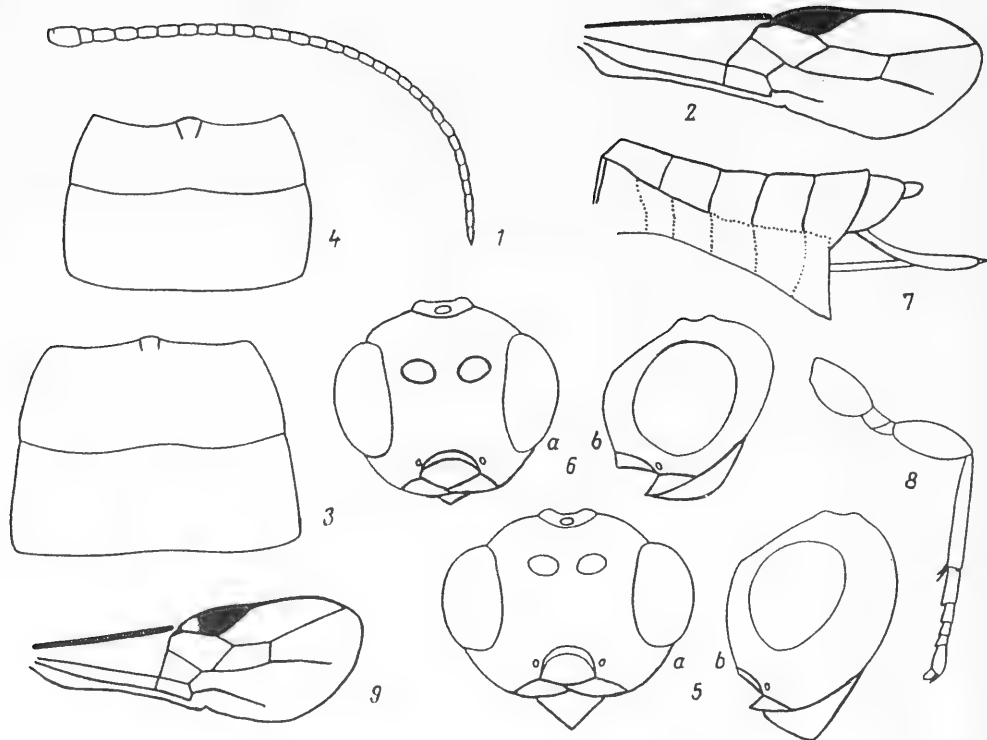


Fig. 75. Braconinae (from Tobias).

1—3—*Bracon fulvipes*: 1—antenna, 2—forewing, 3—2nd—3rd abdominal tergites; 4—*B. minuator*, 2nd—3rd abdominal tergites; 5, 6—head (a—frontal view, b—lateral view); 5—*B. longigenis*, 6—*B. gusaricus*; 7—*B. gusaricus*, abdomen; 8—*B. longicollis*, hind leg; 9—*B. hamiflavus*, forewing.

- 91 ( 92). Propodeum with narrow sculptured stripe along sharply marked ridge throughout its length, smooth in greater part. Head 2 times as wide as long. Hind femora 5 times as long as wide. Ovipositor not shorter than abdomen. Apical abdominal segments smooth. Head, thorax and abdominal apex black, middle of abdomen contrastingly dark brownish yellow, legs yellowish but coxae black; wings light colored. Body 3—3.5. Siberia (Irkustsk); Western Europe ...  
 ..... **B. (B.) fuscicoxis** Wesm.

- 92 ( 91). Propodeum with broader median stripe of sculpture and weakly developed longitudinal ridge (Fig. 81: 2, 4).
- 128 93 ( 94). Head slightly transverse (Fig. 81: 1). Hind femora not thickened. Second abdominal tergite sculptured only in middle, its sides and remaining tergites smooth (Fig. 81: 2). Wings as in Fig. 82: 1. Head and thorax dark brownish, abdomen reddish yellow with dark spots on tergites. Body 4. Sweden; Finland; Austria..... **B. (B.) crassiceps** Thoms.
- 94 ( 93). Head transverse, almost half as long as wide. Hind femora thickened, 3 times as long as wide. Second abdominal tergite densely sculptured, subsequent tergites with progressively weaker sculpture toward abdominal apex. Head and thorax black, abdomen above black basally and apically, 2nd and 3rd tergites and lateral margins of 4th dark brownish yellow; tegulae and legs, except middle and hind coxae, dark brownish yellow, hind femora reddish. Body 3.8. Southeast, (Ural River) (cf. also couplet 291) .....  
..... **B. (B.) shestakoviellus** Tobias
- 95 ( 84). Ovipositor distinctly shorter than abdomen, usually not longer than half.
- 96 ( 97). Abdomen short, as long as thorax, entirely sculptured. Ovipositor approximately one-third as long as abdomen. Body black; usually legs, except coxae, lateral margins of abdominal tergites and lower part of abdomen yellowish dark brown, or legs darkened. Body 2–3. Parasite of lepidopterans *Grapholitha compositella* F. (Tortricidae), *Coleophora millefolii* Z. (Coleophoridae), *Zygaena achilleae* Esp. (Zygaenidae) and fly *Chaetostomella cylindrica* R.-D. (Tephritidae). North, center; Western Siberia; Western Europe..... **B. (B.) nigratus** Wesm.
- 97 ( 96). Abdomen longer than thorax. Apical abdominal tergites smooth or ovipositor more than one-third as long as abdomen.
- 98 (101). Abdomen almost entirely smooth, only 2nd tergite with weak soft granulate sculpture (rarely also 3rd and 4th tergites). Abdomen usually much broader than thorax. Ovipositor approximately half as long as abdomen. Head and thorax black.
- 99 (100). Genae 1/3–2/7 as high as longitudinal diameter of eye. Legs and abdomen black, often lateral margins of tergites (sometimes 2nd and 3rd entirely) and sternites or entire abdomen, except its base and apex, yellowish dark brown.

- Fig. 81: 3. Body 2–4. Parasite of *Miarus campanulae* L. (Curculionidae), *Cephus pygmaeus* L., *Trachelus tabidus* F. (Cephidae). Northwest, center, south; Caucasus, including Ciscaucasia, Central Asia; Western Europe; northern Africa; introduced into North America .....  
 ..... **B. (B.) terebella** Wesm. (*curticaudis* Szépl.)
- 100 ( 99). Genae 1/4–1/5 as high as longitudinal diameter of eye. Entire abdomen and legs dark brownish red. Fig. 75: 4.
- 129 Body 3.2–5.5. Parasite of lepidopterans *Rhyacionia buoliana* Den. and Schiff., *Leguminivora glycinivorella* Mats., *Cochylis posterana* Z. (Tortricidae), *Pennisetia hylaeiformis* Lasp. (Sesiidae), *Caloptilia syringella* F. (Gracillariidae), *Mesapamea secalis* L., *Oria musculosa* Hb., *Sesamia nonagrioides* Led. (Noctuidae), beetle *Anthonomus pomorum* L. (Curculionidae), fly *Lipara lucens* Mg. (Chloropidae), sawfly *Cephus pygmaeus* L. (Cephidae). Center, south; Caucasus, Kazakhstan, Central Asia, Eastern Siberia; Western Europe, northern Africa, southern Asia .....  
 ... **B. (B.) minutator** F. (*abscissor* Nees, *rufigaster* Szépl.)
- 101 ( 98). Abdominal tergites (often except apical) distinctly sculptured; if tergites from 3rd back smooth, then 2nd tergite coarsely rugose, its folds longitudinal. Abdomen usually not wider or only slightly wider than thorax.
- 102 (103). Usually only 2nd abdominal tergite rugose, folds longitudinal. Ovipositor half as long as abdomen or shorter. Thorax 2 times as long as high. Body black; lower side of abdomen anteriorly, sometimes lateral margins of 2nd and 3rd tergites and often legs yellowish dark brown. Body 2.3–3.6. Parasite of moth *Acleris rhombana* f. *ciliana* Hb. (Tortricidae), beetle *Apion hookeri* Kby. (Curculionidae), fly *Amaurosoma* sp. (Scatophagidae). North, northwest, center, south; Kazakhstan, Eastern Siberia; Western Europe. ....  
 ..... **B. (B.) exhilarator** Nees
- 103 (102). Usually 2nd to 4th abdominal tergites sculptured, at least sometimes and weakly.
- 104 (105). Genae distinctly developed, their height only 1/2 longitudinal diameter of eye (Fig. 75: 5). Propodeum rugose along middle, below with short longitudinal ridge. Ovipositor slightly shorter than halflength of abdomen. Body black, lateral margins of tergites and lower side of abdomen, forelegs, except coxae, apices of middle and hind femora and tibiae of these legs except their apices yellowish dark

- brown. Body 2.6–3. South (Crimea); Krasnodar Region (Sochi) ..... **B. (B.) longigenis** Tobias
- 105 (104). Genae very weakly developed, 1/3–1/5 as high as longitudinal diameter of eye (Fig. 75: 6).
- 106 (107). Propodeum entirely with granulose sculpture, with weak longitudinal ridge. Ovipositor half as long as abdomen. Body dark brownish yellow, only 1st abdominal tergite and middle of 2nd dark brown. Body 2.8–3.4. Kazakhstan ...  
..... **B. (B.) longiantennatus** Tobias
- 107 (106). Propodeum at most sculptured in middle.
- 108 (117). Ovipositor about half as long as abdomen.
- 109 (112). Propodeum sculptured in middle, often with longitudinal ridge. Thorax 2 times as long as high.
- 110 (111). Antennae as long as body. Suture between 2nd and 3rd tergite bent. Abdomen posterior to 2nd tergite somewhat sculptured, 2nd tergite usually entirely sculptured. Color highly variable, body black, abdomen on lateral margins of tergites and below and greater part of legs yellowish dark brown, or body entirely yellowish dark brown; stigma dark brown or yellowish. Body 2–4. Northwest, center, south; Caucasus, Kazakhstan, Central Asia, southern part of Western Siberia; Western Europe; Iran; Mongolia ...  
..... **B. (B.) longicollis** Wesm.  
(*alutecus* Szépl., *rugulosus* Szépl., *depressiusculus* Szépl.,  
*crassicauda* Thoms., ? *subcylindricus* Wesm<sup>1</sup>).
- 111 (110). Antennae as long as thorax and abdomen together. Suture between 2nd and 3rd abdominal tergites straight. Second abdominal tergite sculptured usually in middle, its sides and succeeding tergites smooth. Head and thorax very dark brown, abdomen and legs with abundant light coloration. Body 2.5. Western Europe ..... **B. (B.) titubans** Wesm.
- 112 (109). Propodeum smooth, only below sometimes with short median ridge and wrinkles on sides from it.
- 113 (114). Thorax 2 times as long as high. Body black; lateral margins of tergites, lower side of abdomen and legs yellowish dark brown. Body 2–2.8. Parasite of *Phloeotribus scarabaeoides* Bern. (Scolytidae). South; Caucasus, Kazakhstan, Western Siberia; Western Europe ..... **B. (B.) tenuicornis** Wesm.

<sup>1</sup> Possibly *B. (L.) procerus* Papp (Fig. 89: 1–3) is a synonym of *B. (L.) longicollis* Wesm.

- 114 (113). Thorax usually 1.5 times as long as high. Body with distinctly developed reddish dark brown or yellowish dark brown pattern.
- 115 (116). Head with distinctly developed black pattern (even if thorax darkened below) or entirely black. Fig. 75: 6, 7. Body 2.5–3.5. Central Asia; Bulgaria .....  
 ... **B. (B.) gusaricus** Tel. (*pulcherrimus* Tel., *depressus* Tel.)  
 Lectotype: Female, Uzbekistan, Guzar, 19.IV.1929.  
 Paratype: Female, same place, 26.V.1929.
- 116 (115). Head entirely with yellowish dark brown (even if thorax above with black) spots. Body 2.5–3. Moldavia, Ciscaucasia, Central Asia .....  
 ... **B. (B.) kozak** Tel. (*shestakovi* Tel., *ovoides* Tel., syn. n.)  
 Lectotype: Female, Stavropol' Territory, Sharakhalsun, 18.V.1926 (V. Belizin).
- 117 (108). Ovipositor somewhat shorter than abdomen. Head transverse. Antennae as long as body, 25–31-segmented. Propodeum along middle with more or less developed sculpture. Apical half of abdomen smoother, weakly sculptured, basal half (2nd tergite always, 3rd not always) sculptured. Head and thorax black, abdominal tergites very dark brown, often with yellowish lateral margins; tegulae, abdominal sternites and legs (often except hind and middle coxae) dark brownish yellow. Body 3–4.5. North, northwest, center, Ukraine (Kiev); Western Europe .....  
 ... **B. (B.) immutator** Nees
- 118 (83). Radial cell on forewing reduced, terminating preapically and (or) oral cavity very large, its width much more than its distance from eye, or entire abdomen (rarely except basal tergite) smooth.
- 130 119 (214). Oral cavity small, as wide as its distance from eye or slightly more. Radial cell usually not reduced, terminating at wing apex. Antennae not reduced, usually as long as body, flagellar segments, as a rule, longer than wide. Abdomen usually absolutely smooth, granulose sculpture on pronotum and basal abdominal tergites, as a rule, absent. Ovipositor rarely shorter than abdomen, usually as long as or longer. (Subgenus *Glabrobracon* Fahr.).
- 120 (123). Abdomen strongly compressed, 6th sternite falling much short of abdominal apex. Suture between 2nd and 3rd abdominal tergites deep in middle, weak on sides. Notaulices deep. Radial cell terminating before wing apex.

- Ovipositor as long as abdomen (similar to species of the subgenus *CyanopteroBracon* but body size much smaller).
- 121 (122). Border between face and frons and between antennal bases deeply notched, with dense long hair (Fig. 79: 1). Similar dense pubescence below scape and pedicel. Body black, abdomen dark brownish yellow with black 1st tergite, spot in middle of 2nd and abdominal apex, greater part of legs dark colored, stigma yellowish. Body 3.6. Central Asia ..  
..... **B. (G.) densipilosus** Tobias
- 122 (121). Only weak notch with sparse hair between antennal bases. Pubescence of scape and pedicel sparse and uniform. Antennae setiform, about 35-segmented. Body black; lateral margins of tergites, except apical, lower side of abdomen (often except apical sternites) yellowish dark brown; hind femora reddish dark brown or black. Body 3.6–3.8. Southwest (Moldavia); Transcaucasia, Central Asia .....  
..... **B. (G.) angustiventris** Tobias
- 123 (120). Abdomen not compressed or compressed only at apex, 6th sternite terminating closer to abdominal apex. Antennae usually filiform, less than 35-segmented (in any case with body size less than 4 mm). Suture between 2nd and 3rd abdominal tergites along margin less distinct than in middle. Usually notaulices weak and radial cell terminating at wing apex.
- 124 (129). Maxillary palps very well developed, longer than height of head, their 4th segment 2 times as long as 3rd and noticeably longer than 5th (Fig. 76: 1).
- 125 (126). Ovipositor as long as abdomen or somewhat shorter. Greater part of head dark brownish yellow, stigma usually yellow. Abdomen sometimes with sculptured tergites. Body 2.1–2.8. Southwest, southeast, Ciscaucasia, Kazakhstan; Mongolia; China ..... **B. (G.) mongolicus** Tel<sup>1</sup>.  
Lectotype: Female, Sachzhou oasis, Hatyn Gobi, 28.VII.1895 (Roborovskii, Kozlov)". Paralectotypes: 1 female, details same (both specimens lacking abdomen).
- 126 (125). Ovipositor larger than abdomen. Body black, stigma dark brown. Abdomen always entirely black.

<sup>1</sup> *H. mongolicus* Tel. has been described (Telenga, 1936) in the genus *Habrobracon*, considered here only as a subgenus of genus *Bracon*. However, since that name has been included under synonyms of *B. (H.) nigricans* Szépl., the name published under genus *Bracon* is preferred as the valid name.

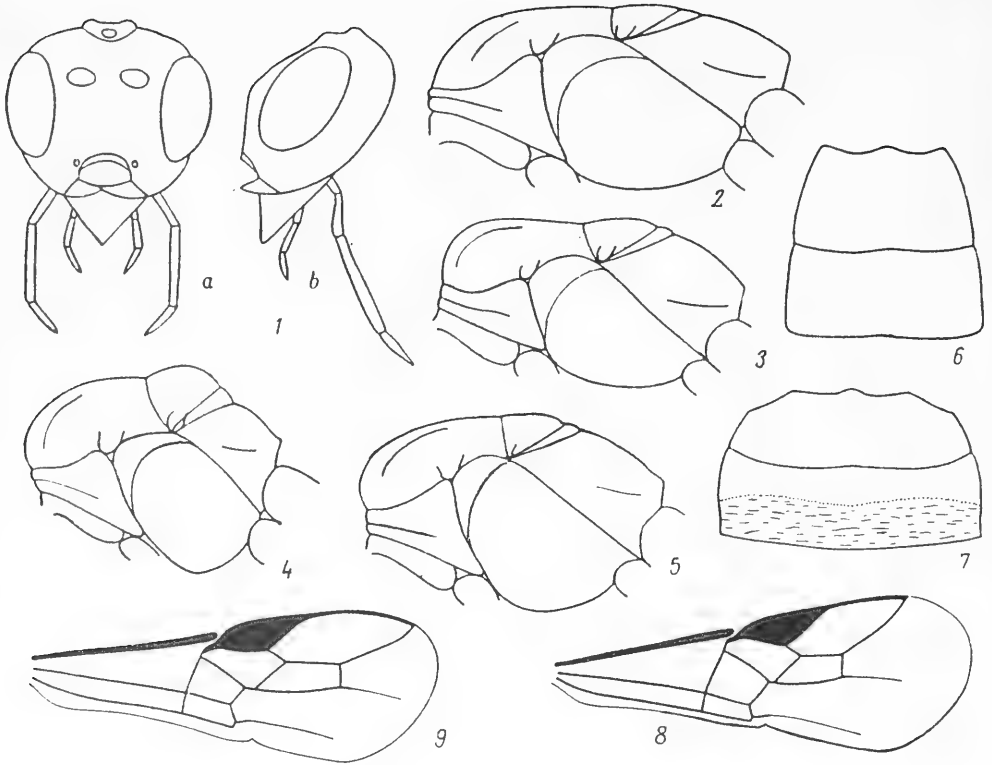


Fig. 76. Braconinae (from Tobias).

1—*Bracon anthracinus*, head (a—frontal view, b—lateral view); 2–5—thorax: 2—*B. planinotus*, 3—*B. kirgisorum*, 4—*B. popovi*, 5—*B. variator*; 6, 7—2nd–3rd abdominal tergites: 6—*B. kirgisorum*, 7—*B. osculator*, 8, 9—forewings: 8—*B. ciscaucasicus*, 9—*B. osculator*.

- 127 (128). Ovipositor not longer than abdomen and thorax together. Lower side of abdomen, sometimes also lateral margins of tergites yellowish dark brown. Body 1.7–2.6. Parasite of beetles *Miarus campanulae* L., *Hylobius piceus* Deg. (Curculionidae), moth *Laspeyresia strobilella* L. (Tortricidae), fly *Urophora cuspidata* Mg. (Tephritidae). Northwest, center, south; Caucasus, Kazakhstan; Western Europe; Mongolia; China ..... **B. (G.) anthracinus** Nees
- 128 (127). Ovipositor as long as body or slightly longer. Abdomen almost entirely black, its lower side usually dark brown.



- Body 1.7–2.3. Parasite of beetles *Gymnetron villosulum* Gyll., *Apion buddebergi* Bed. (Curculionidae), flies *Tephritis separata* Rd., *T. conura* Lw. (Tephritidae), *Phytobia flavifrons* Mg. (Agromyzidae), Lepidopteran *Coleophora corollae* Z. (Coleophoridae). Northwest, center, south; Caucasus, Kazakhstan, Central Asia; Western Europe .....
- ..... **B. (G.) atrator** Nees
- 129 (124). Maxillary palps normal, not longer than height of head.
- 130 (189). Abdomen uniformly sclerotized, lacking coriaceous areas and absolutely smooth including 2nd tergite.
- 131 (184). Suture between 2nd and 3rd tergites well developed, usually bent, rarely straight.
- 132 (145). Ovipositor as long as body, barely shorter or longer. Wings darkened.
- 133 (144). Thorax not more than 1.5 times as long as high, mesonotum fairly steeply inclined toward pronotum and greatly raised above it (Fig. 76: 5). Hind tibiae not more than 1.5 times as long as femora.
- 134 (137). Ovipositor very long, 1.5–2 times as long as body. Body 4–4.5.
- 135 (136). Ovipositor 2 times as long as body. Spiracles on 1st abdominal segment not projecting. Head 2 times as wide as long; oral cavity 2 times as wide as distance from eye; temples half as long as eyes. Antennae slightly longer than thorax and head together, 22-segmented, flagellar segments slightly longer than wide. Second abdominal tergite slightly shorter than 3rd. Body very dark brown; border of eyes, lateral margins of abdominal tergites and sternites, sometimes pattern on thorax dark brownish yellow. Hungary; Romania .....
- ..... **B. (G.) esikii** Szépl.
- 136 (135). Ovipositor 1.5 times as long as body. Spiracles on 1st abdominal segment projecting. Body including legs and upper part of abdomen black; abdominal sternites and basal third of hind tibiae yellowish. France; Hungary .....
- ..... **B. (G.) dolichurus** Marsh.
- 131 137 (134). Ovipositor not longer or very slightly longer than body; if much longer, then body small (about 3 mm) and body hair dark.
- 138 (143). Head and thorax black or very dark brown, abdomen above dark colored.
- 139 (140). Body hair dark, on hind tibiae long, as long as width of tibiae in its basal third, erect. Antennae 19-segmented,

- flagellar segments moniliform. Legs dark colored. Body 3. Southeast (cf. also couplet 246) ..... **B. (G.) nigripilosus** Tobias
- 140 (139). Body hair light colored, on hind tibiae short, much shorter than width of tibiae in basal third.
- 141 (142). Wings smoky; lateral margins of abdominal tergites yellowish dark brown, lower side of abdomen yellowish. Body 2.8–4.4. Parasite of moth *Laspeyresia strobilella* L. (Tortricidae) and beetles *Ernobius abietis* F., *E. abietinus* Gyll., *E. nigrinus* Sturm., *E. longicornis* Sturm. (Anobiidae). North, northwest, west, center, south; Caucasus, Kazakhstan, Central Asia, Eastern Siberia; Western Europe ..... **B. (G.) pineti** Thoms.
- 142 (141). Wings slightly darkened, usually only lower side of abdomen somewhat light colored. Body 1.7–2.8. Parasite of fruitflies *Tephritis pulchra* LW., *Chaetostomella cylindrica* R.-D., *C. onotrophes* LW. throughout the European part; Transpalearctic ..... **B. (G.) fumipennis** Thoms<sup>1</sup>.
- 143 (138). Body yellowish dark brown; stigma dark brown or yellow. Ovipositor slightly shorter than body. Body 4. Krasnodar Region (Sochi); Armenia ..... **B. (G.) lividus** Tel.
- 144 (133). Thorax 2 times as long as high; mesonotum gently sloping to pronotum and slightly raised above it (Fig. 76: 2). Hind tibiae 1.5 times as long as femora. Antennae thin, 18–20-segmented, as long as thorax and abdomen together. Hind femora 4.5 times as long as wide. Body black, abdomen sometimes light colored. Body 1.9–2.8. Southeast; Krasnodar Region (Sochi), Kazakhstan ..... **B. (G.) planinotus** Tobias
- 145 (132). Ovipositor as long as abdomen, slightly longer or shorter; if much longer, then wings light colored.
- 132 146 (183). Thorax not more than 1.5 times as long as high. Second abdominal tergite not longer than 3rd (except in *B. ahngerii*).
- 147 (164). Wings light colored, absolutely lacking smoky tinge or with very slight tinge.

<sup>1</sup> Papp (1966) held that *B. fumipennis* Thoms. is only a variant of *B. obscurator* Nees. Actually, the only character separating them—length of the ovipositor—is highly variable. However, in local series this character is more stable; this point needs to be investigated further.

- 148 (149). Second abdominal tergite longer than 3rd. Radial vein originating from basal third of stigma and terminating short of wing apex. Ovipositor half as long as abdomen. Antennae 20-segmented. Fifth segment of hind tarsi as long as 2nd. Body yellowish dark brown; 1st, 2nd and base of 3rd abdominal tergites yellow; remaining tergites dark brown. Body 2. South ..... **B. (G.) ahngeri** Tel.  
Lectotype: Female, Taganrog, 28.VI.1921. ("C. Ahnger").
- 149 (148). Second abdominal tergite not longer than 3rd. Radial vein usually originating from middle of stigma.
- 150 (153). Face approximately twice as wide as its height with clypeus (Fig. 77: 1). Second abdominal tergite as long as 3rd. Ovipositor as long as abdomen or just slightly longer.
- 151 (152). Radial cell reaching wing apex (Fig. 77: 3). Body usually dark brownish yellow, rarely thorax with somewhat developed dark pattern; stigma always yellow or with dark apex (with widespread dark coloration on body). Body 1.9–3.4. South (in north to Ul'yanovsk); Azerbaidzhan, Kazakhstan, Central Asia .....  
..... **B. (G.) tschitscherini** Kok. (*ochrostigma* Tel.)
- 152 (151). Radial cell reduced (Fig. 79: 4). Body yellowish dark brown with yellow spots. Body 1.8–2.8. Central Asia .....  
..... **B. (G.) karakumicus** Tobias
- 153 (150). Face approximately 1.5 times as wide as height with clypeus (Fig. 77: 2).
- 154 (157). Second abdominal tergite as long as 3rd. Ovipositor noticeably longer than abdomen. Thorax 1.5 times as long as high.
- 155 (156). Body dark brownish yellow. Radial cell on forewing noticeably reduced. Body 3. Central Asia .....  
..... **B. (G.) delusorius** Tel.  
Lectotype: Female, Ashkhabad, 16–20.IV.1929 (A. Shestakov).
- 156 (155). Body, including abdomen, black; legs yellowish dark brown, except black coxae, greater part of hind and basal half of middle femora. Radial cell terminating at wing apex. Body 2.8–3.3. Center; Azerbaidzhan .....  
..... **B. (G.) jaroslavensis** Tel.  
Lectotype: Female, Yaroslav Region, Zhadenovo, 3.VII.1918 (Shestakov). Paratype: Female, same place, 12.VI.1918 [not 1910!] (Shestakov).

- 157 (154). Second abdominal tergite shorter than 3rd. Ovipositor not longer than abdomen; if longer, then body stout, thorax not more than 1/3 longer than its height.
- 158 (159). Larger spur on hind tibiae weakly developed, 1/5 or less length of 1st tarsal segment. Genae 2/5–1/3 as high as longitudinal diameter of eye. Radial cell just falling short of wing apex. Body and legs black, lateral margins of 2nd tergite and posterior margins of remaining tergites yellow. Body 2. Kazakhstan, Central Asia. .... **B. (G.) brevicaratus** Tobias
- 133 159 (158). Larger spur of hind tibiae 1/3–1/4 length of 1st tarsal segment. Genae 1/3–1/4 as high as longitudinal diameter of eye.

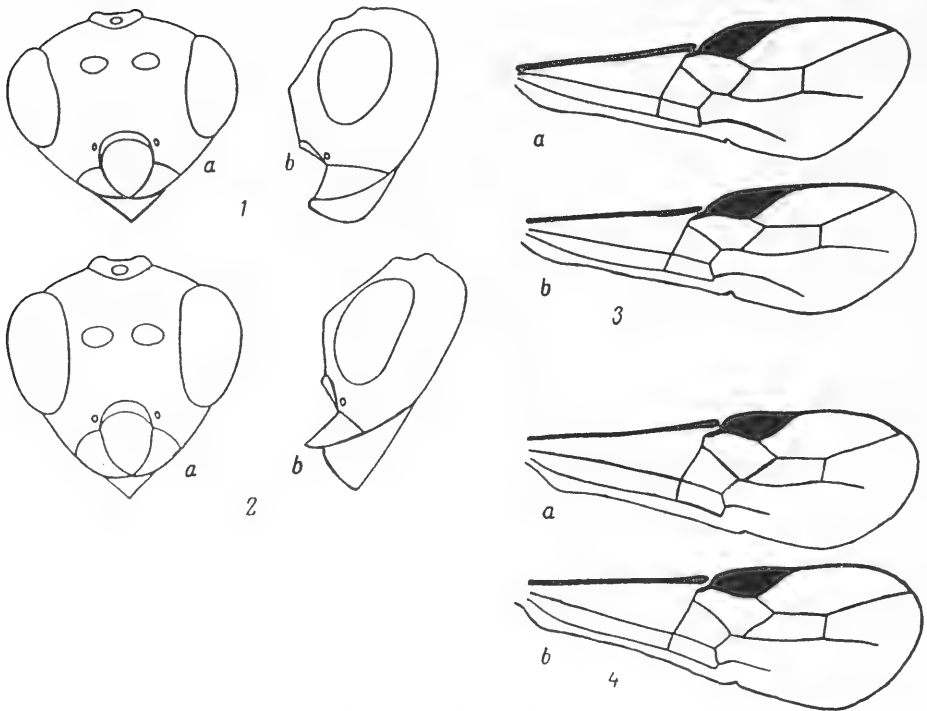


Fig. 77. Braconinae (from Tobias and original).

- 1, 2—head (a—frontal view, b—lateral view): 1—*Bracon tschischerini*, 2—*B. variator*;  
 3, 4—forewings (a—with short, b—with long 2nd radiomedial cell): 3—*B. tschischerini*,  
 4—*B. variator*.

- 160 (161). Ovipositor usually noticeably longer than abdomen. Body short, stout (Fig. 76: 4). Color of body varying from dark brownish yellow to almost entirely black, except yellow lower side of abdomen and in part legs; stigma usually yellow, rarely dark brown. Body 1.9–2.8. South (in north to Voronezh); Caucasus, Kazakhstan, Central Asia .....  
 ..... **B. (G.) popovi** Tel.  
 Lectotype: Female, northern Kazakhstan, Borovoe, 22.VII.1932 (V. Popov).
- 161 (160). Ovipositor not longer, often shorter than abdomen. Body more elongate (Fig. 76: 5), black, stigma dark brown or yellowish (in latter case ovipositor much shorter than abdomen).
- 162 (163). Ovipositor half as long as abdomen. Stigma yellowish dark brown. Body 2–2.2. Kazakhstan; Hungary. ....  
 ..... **B. (G.) parvicornis** Thoms. (*carbonarius* Szépl.)
- 163 (162). Ovipositor as long as abdomen. Stigma dark brown. Body 1.7–2.4. Parasite of lepidopterans *Homoeosoma sinuelum* F. (Phycitidae), *Epermenia fulviguttella* Z. (Epermeniidae), *Coleophora caespitiella* Z. (Coleophoridae) and beetles *Trachys pumila* Ill., *T. troglodytes* Gyll. (Buprestidae), *Orthotomicus suturalis* Gyll., *Hylesinus fraxini* Panz., *Ips typographus* L. (Scolytidae). West, northwest, center, south; Caucasus, Kazakhstan, Western Siberia (Barnaul), Central Asia. Western Europe .....  
 ..... **B. (G.) obscurator** Nees (*marshalli* Szépl.)
- 164 (147). Wings darkened.
- 165 (166). Second abdominal tergite much shorter than 3rd. Body yellowish dark brown, stigma yellow with dark apex. Ovipositor as long as abdomen. Body 3–3.5. Southeast .....  
 ..... **B. (G.) helleni** Tel.  
 Lectotype: Female, Ural'sk, 9.VII.1927 (A. Pobedimov).  
 Paralectotype: 1 specimen (lacking abdomen), details same.
- 166 (165). Second abdominal tergite as long as 3rd (Fig. 78: 3).
- 167 (168). Wings slightly darkened, absolutely light colored in basal half. Ovipositor as long as abdomen. Antennae 30–33-segmented. Body black with yellowish dark brown pattern, stigma yellow. Body 4. South .....  
 ..... **B. (G.) chrysostigma** Grese  
 Lectotype: Female, Kiev, 27.VI.1927 (only date entered on the label) (Grese). Paralectotype: Female, 8.VII.1926.

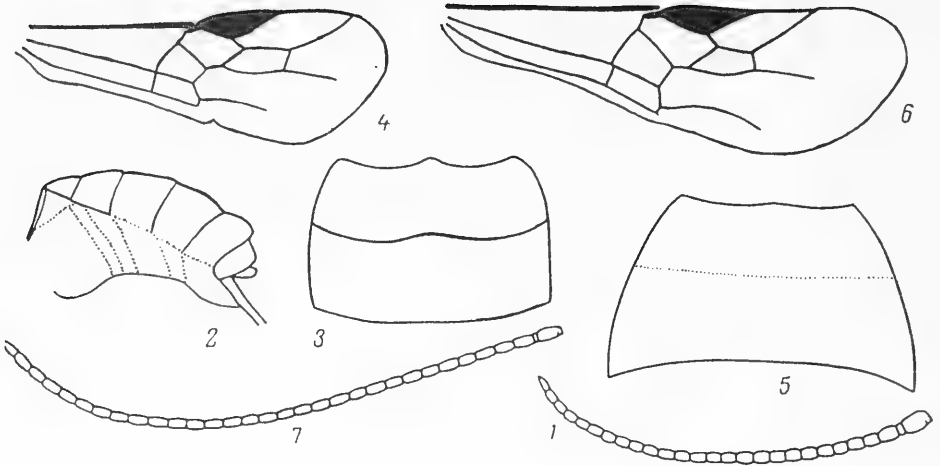


Fig. 78. Braconinae (from Tobias and original).

1-3—*Bracon variator*: 1—antenna, 2—abdomen, 3—2nd-3rd abdominal tergites; 4, 5—*B. tekkensis*: 4—forewing, 5—2nd-3rd abdominal tergites; 6—*B. repetekiensis*, forewing; 7—*B. picticornis*, antenna.

- 168 (167). Wings very dark, basally darker than in apical half.
- 169 (170). Stigma bichromatic: basally yellow, apically dark brown. Body black with yellowish dark brown pattern, sometimes almost entirely yellowish dark brown. Wings as in Fig. 75: 9. Body 2.5-3. South; Caucasus, Kazakhstan, Central Asia; Hungary .....  
.....**B. (G.) hemiflavus** Szépl. (*turemenus* Tel.)
- 170 (169). Stigma unichromatic, usually dark brown.
- 171 (182). Body with somewhat developed (at least in lower part of thorax and on legs) dark coloration.
- 172 (175). Head and thorax black, legs dark brownish yellow or only coxae black.
- 173 (174). Ovipositor noticeably longer than abdomen. Abdomen dark brownish yellow or with dark pattern in middle. Body 2.4-3.5. Parasite of *Anthonomus pomorum* L. (Curculionidae). Center, south; Caucasus; north Europe .....  
..... **B. (G.) macrurus** Thoms. (*pumilionis* auct.)
- 134 174 (173). Ovipositor much shorter than abdomen (usually half as long as abdomen). Antennae about 30-segmented. Body 4. Hungary ..... **B. (G.) tener** Szépl.

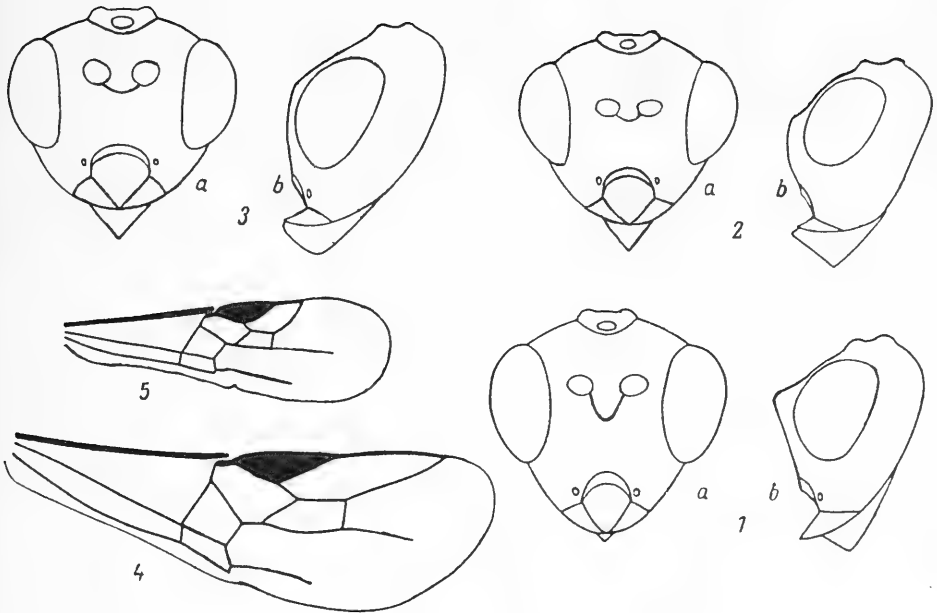


Fig. 79. Braconinae (from Tobias).

1-3—head (a—frontal view, b—lateral view): 1—*Bracon densipilosus*; 2—*B. tekkensis*,  
3—*B. frater*; 4, 5—forewings: 4—*B. karakumicus*, 5—*B. parviradialis*.

175 (172). Body color highly variable (thorax entirely yellowish dark brown to entirely black) but with black thorax and head, greater part of legs black. Ovipositor as long as abdomen, very slightly longer/shorter.

176 (179). Hind legs lighter colored than middle and forelegs; when fore- and middle femora black, hind legs often entirely or partially dark brownish yellow; if all femora dark brownish yellow then hind coxae lighter colored than fore- and middle coxae; if fore- and middle legs entirely black, then bases of hind tibiae yellowish, rarely hind legs entirely black.

177 (178). Head slightly transverse. Body 2.6–4.2. Parasite of lepidopterans *Etiella zinckenella* Tr. (Phycitidae), *Cochylis epilina* Dup., *Cnephasia longana* Hw. (Tortricidae). South, east, Caucasus, Kazakhstan; Western Europe ....

..... **B. (G.) piger** Wesm.

- 178 (177). Head distinctly transverse (Fig. 77: 2)—Figs. 76: 5; 77: 4; 78: 1–3; 80: 1. Body 2–4.2. Parasite of lepidopterans *Platyedra subcinerea* Hw., *Pexicopia malvella* Hb., *Mesophleps corsicellus* H.-S. (Gelechiidae), *Hadena bicurris* Hfn. (Noctuidae). *Lithocolletis mespilella* Hb. (Gracillariidae), *Aegeria andrenaeformis* Lasp. (Sesiidae), *Coleophora medelichennis* Krone, *C. coronillae* Z. (Coleophoridae), *Grapholitha funebrana* Tr., *G. dorsana* F., *Barbara herichiana* Obr., *Pandemis cerasana* Hb., *Petrova resinella* L., *Laspeyresia strobilella* L., *Eucosma cana* Hw. (Tortricidae), *Etiella zinckenella* Tr., *Dioryctria abietella* Den. and Schiff., *Myelois cribrella* Hb. (Phycitidae), beetles *Ernobius nigrinus* Sturm. (Anobiidae), *Larinus turbinatus* Gyll., *L. jaceae* F., *Anthonomus pomorum* L., *Sibinia viscaria* L., *Pissodes validirostris* Gyll., *Baris cupirostris* F., *B. laticollis* Marsh., *B. chlorisans* Germ., *Magdalis rufa* Germ., *Gymnetron tetrum* L., *G. asellus* Grav., *Miarus campanulae* L., *Sitona longulus* Gyll., *Ceutorhynchus punctiger* Gyll. (Curculionidae), *Bruchus laticollis* Boh., *B. lentis* Fröl., *B. viciae* Ol., *B. atomarius* L., *Bruchidius lividimanus* Gyll., *B. poupillieri* All. (Bruchidae), flies *Pegohylemyia seneciella* Meade (Anthomyiidae), *Noeeta pupillata* Fall., *Chaetostomella cylindrica* R.-D., *Tephritis leontodontis* Deg., *Sphenella marginata* Fall. (Tephritidae); *Hoplocampa brevis* Klug, *H. flava* L. (Tenthredinidae). Cosmopolitan ..... **B. (G.) variator** Nees (*explorator* Szépl., *breviventris* Szépl., *ornatulus* Tel., *praecox* Wesm., *bipartitus* Wesm., *maculiger* Wesm., ? *dichromus* Wesm., *collaris* Tel., syn. n., *pumilionis* Roman, syn. n.<sup>1</sup>)
- 179 (176). Hind and middle legs darker than forelegs; if femora yellowish dark brown, then hind and middle coxae darker than forecoxae; when middle and hind femora entirely black, apices of forefemora usually light colored; bases of tibiae yellowish dark brown, foretibiae light colored.
- 180 (181). Head slightly transverse. Thorax dark colored but palps lighter in color; stigma dark brown. Body 3.2. Sweden; Finland ..... **B. (G.) flavipalpis** Thoms.

<sup>1</sup> Synonymy of *B. pumilionis* established from comparison with *B. variator* syntype (female) from the collections of ZIN Akad. Nauk SSSR ("Vanaja Hukkinen", *Bracon pumilionis* A. Roman det., cotypi) designated as lectotype.



- 181 (180). Head noticeably more transverse (Fig. 77: 2). When thorax dark colored palps dark; stigma usually dark brown, sometimes yellow. Body 2–4..... **B. (G.) variator f. maculiger** Wesm.
- 182 (171). Body including legs entirely yellowish dark brown, only antennae and pulvilli of tarsi black. Body 3–3.5. Azerbaidzhan, Central Asia..... **B. (G.) variator var. collaris** Tel.
- 183 (146). Thorax almost 2 times as long as high (Fig. 76: 3). Second abdominal tergite usually slightly longer than 3rd (Fig. 76: 6). Antennae 25–29-segmented. Ovipositor slightly shorter than abdomen or equal to it. Head and thorax black; abdomen black with dark brown or yellowish lower side and lateral margins of basal tergites; legs usually dark colored, sometimes yellowish dark brown, wings slightly darkened, stigma dark brown. Body 1.7–4. Center, south; Caucasus, Kirgizia ..... **B. (G.) kirgisorum** Tel<sup>1</sup>.  
Lectotype: Female, "Kirgizistan, Syrabulak", 5.VII.1927 (Shtamberg).
- 184 (131). Suture between 2nd and 3rd abdominal tergites weak, straight (Fig. 78: 5). Radial cell on forewing somewhat reduced, not reaching wing apex.
- 185 (186). Radial cell on forewing strongly reduced (Fig. 79: 5). Notaulices weak. Antennae thin, slightly longer than body, 23-segmented. Hind femora 4.5 times as long as wide. Ovipositor slightly more than half as long as abdomen. Body and legs black; sternites at abdominal base yellow; wings light colored, stigma dark brown. Body 1.7. Kazakhstan ..... **B. (G.) parviradialis** Tobias
- 186 (185). Radial cell much less reduced. Notaulices deep. Body black; abdomen on sides and below light colored.
- 187 (188). Abdomen from base compressed. Ovipositor as long as abdomen or slightly shorter. Wings (Fig. 78: 4) slightly darkened, stigma dark brown. Genae half as high as longitudinal diameter of eye (Fig. 79: 2). Body 2.3–3.2. Central Asia..... **B. (G.) tekkensis** Tel.

<sup>1</sup>This species was identified (Tobias, 1959, *Entomol. Obozrenie*, 38, 4: 895) with *B. discoideus* Wesmael, 1838. However, it is clear from the redescription of *B. discoideus* (Papp, 1966) that the latter is a different species, possibly only a variant of *B. variator* Nees.

- Lectotype: Female, "Bagir (Ashkhabad)", 21–23.IV.1929 (A. Shestakov). Paratype: 1 female, "Bagir", 20–21.IV.1929 (A. Shestakov).
- 188 (187). Abdomen not compressed. Ovipositor half as long as abdomen, or slightly longer. Wings light colored, basally yellow, stigma yellow or yellowish dark brown. Genae 1/3–1/4 as high as longitudinal diameter of eye (Fig. 79: 3). Antennae 25–28-segmented. Body 2–3.8. Central Asia . . . . .  
 . . . . . **B. (G.) frater** Tobias
- 189 (130). Body at abdominal base (2nd tergite always sculptured or with coriaceous areas (when abdomen smooth, 3rd tergite always coriaceous in apical part).
- 190 (199). Third and often subsequent abdominal tergites posteriorly coriaceous; usually yellowish coriaceous part sharply differing in color from darker anterior part of tergites (Figs. 76: 7; 80: 2, 3). Wings light colored.
- 191 (194). Radial cell on forewing anteriorly shorter than stigma (Fig. 80: 4).
- 192 (193). Wings hyaline-light colored, bristles on them not pigmented. Body yellowish dark brown, with yellow spots. Figs. 78: 6; 80: 2. Body 1.8–2.5. Central Asia . . . . .  
 . . . . . **B. (G.) repetekiensis** Tobias
- 193 (192). Wings slightly but distinctly darkened, with pigmented bristles. Body black; legs dark brown, hind legs darker; face, genae, tegulae, lower and coriaceous parts of abdomen yellow (in male coriaceous parts of abdomen dark). Fig. 80: 3, 4. Body 1.8–2.2. Kazakhstan . . . . .  
 . . . . . **B. (G.) pelliger** Tobias
- 194 (191). Radial cell not shorter than stigma. Wings noticeably darkened, with pigmented bristles.
- 195 (196). Anterior margin of radial cell as long as stigma (Fig. 76: 8). Ovipositor one-third or one-half as long as abdomen. Body coloration variable: yellowish dark brown or black, legs light or dark, lower side of abdomen always with yellow coloration. Body 2. Crimea, Ciscaucasia; Azerbaidzhan, Kazakhstan, Kirgizia . . . . . **B. (G.) ciscaucasicus** Tel.  
 Lectotype: Female (without head), Ciscaucasia, "Prikumsk Agricultural School", 6.VI. [not 10.VII] 1926 (Novitskii).
- 196 (195). Anterior margin of radial cell much longer than stigma (Fig. 76: 9). Ovipositor half as long as abdomen, sometimes slightly shorter than it.

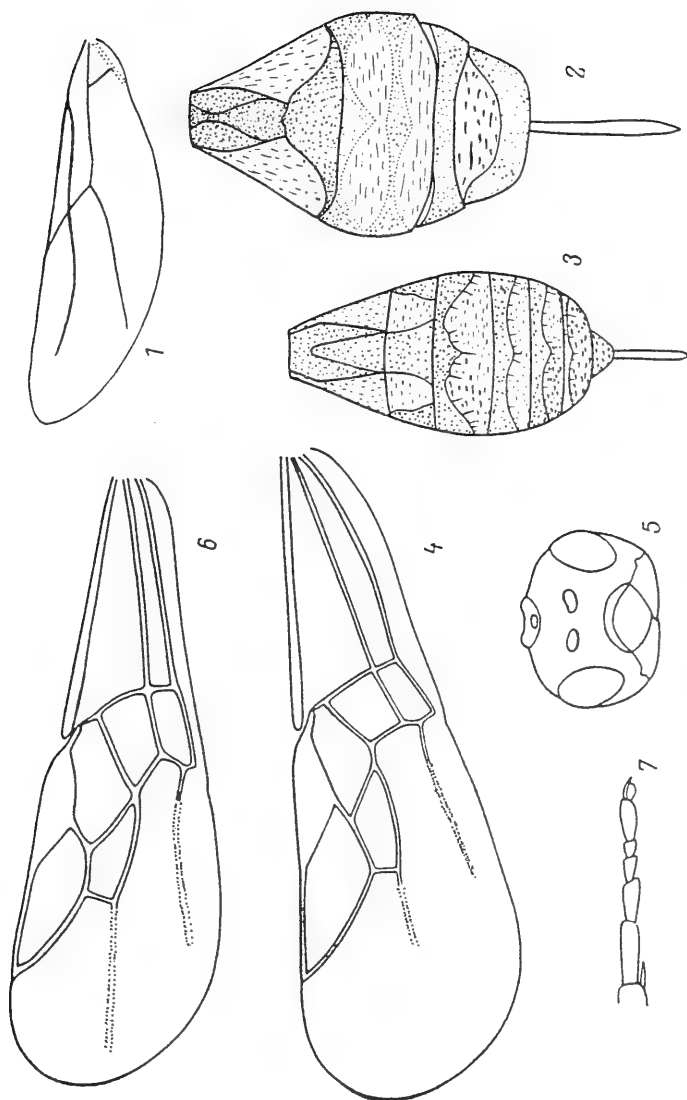


Fig. 80. Braconinae (from Tobias).

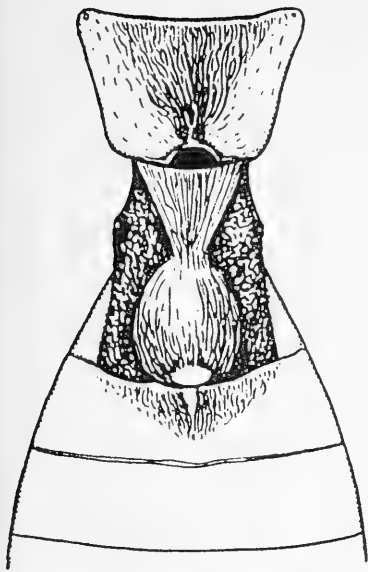
1—*Bracon variator*, hind wing; 2—*B. repetekiensis*, abdomen; 3, 4—*B. pelliger*: 3—abdomen, 4—forewing;  
5—7—*B. stepposus*: 5—head, 6—forewing, 7—hind tarsus.

- 197 (198). Sclerotized part of 1st abdominal tergite 2 times as long as wide. Second abdominal tergite laterally with large coriaceous areas such that middle part almost triangular on 3rd and 4th tergites, coriaceous areas covering greater part of tergites. Body black; coriaceous parts and lower side of abdomen yellowish; stigma yellowish. Body 2. Center, Moldavia, Krasnodar Region; Hungary.....  
..... **B. (G.) cingulator** Szépl.
- 198 (197). Sclerotized part of 1st abdominal tergite less narrow, usually 1.5 times as long as wide. Sclerotized part of 2nd tergite broadly trapezoid, coriaceous parts on 3rd and 4th tergites weakly developed (Fig. 76: 7). Sometimes abdominal tergites with soft granulose sculpture. Color highly variable: body either yellowish dark brown or black (except usually light colored coriaceous parts of tergites and lower side of abdomen). Body 1.9–2.5. Parasite of species of the genus *Coleophora* (Coleophoridae). Entire Palearctic.....  
.... **B. (G.) osculator** Nees (*temporalis* Tel., *venustus* Tel.)
- 136 199 (190). Abdominal tergites lacking coriaceous areas. Second abdominal tergite with somewhat developed sculpture, rugose or soft granulose punctures; weak sculpture sometimes even on subsequent tergites.
- 200 (205). Ovipositor as long as body or somewhat longer. Wings darkened.
- 201 (204). Hind femora 5 times as long as wide. Abdomen entirely yellowish dark brown.
- 202 (203). Legs, including coxae, yellowish dark brown. Body 4.3–4.9. South; Azerbaidzhan..... **B. (G.) jaroshevskyi** Tobias
- 203 (202). Legs black. Body 5. Center; Western Europe.....  
..... **B. (G.) peroculatus** Wesm.
- 204 (201). Hind femora 4 times as long as wide. Color variable: thorax dark, abdomen with profuse dark pattern on tergites. Body 3–4. Northwest, south; northern and Central Europe....  
..... **B. (G.) facialis** Thoms. (*quinquemaculatus* auct.)
- 205 (200). Ovipositor as long as abdomen, somewhat longer or shorter.
- 206 (209). Antennae very thin, flagellar segments 1.5–2 times as long as wide (Fig. 78: 7).
- 207 (208). Larger spur of hind tibiae slightly shorter than 1/3 length of 1st tarsal segment. Color variable: body black with yellowish dark brown pattern on head, thorax and abdomen and dark brownish yellow legs, or body dark brownish yellow

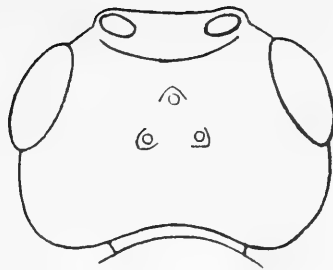
- with dark pattern on lower and posterior parts of thorax and abdomen; flagellum always black, tegulae dark brown, stigma dark brown or yellowish. Body 2–4. Parasite of sawflies in galls on willows: *Pontania viminalis* L., *P. vesicator* Bremi, *P. proxima* Lep., *P. pedunculi* Htg., *Nematus bipartitus* Lep., *N. salicis* L. (Tenthredinidae), as well as beetles *Plagionotus arcuatus* L., *Chytus* sp. (Cerambycidae), leaf roller *Cochylis pallidana dolosana* Kenn. (Tortricidae). Northwest, center, south; Caucasus, Kazakhstan, Central Asia, Far East, Western Europe.....
- ..... **B. (G.) picticornis** Wesm.
- 208 (207) Larger spur of hind tibiae 1/5 as long as 1st tarsal segment. Body black; flagella, legs, lateral margins of tergites and lower side of abdomen yellow; veins dull brownish yellow, stigma dark brown. Body 3.7. Central Asia .....
- ..... **B. (G.) negativus** Tobias
- 209 (206). Antennae less thin, flagellar segments not more than 1.5 times as long as wide. Larger spur of hind tibiae 1/3 as long as 1st tarsal segment or longer.
- 210 (211). Abdomen (above) broad, oval; 2nd abdominal tergite distinctly transverse, 2/7–2/9 as long as wide at base, 1/4–1/6 width at apex. Body black; spots on head, partially legs, lower side of abdomen and lateral margins of tergites dark brownish-yellow; stigma usually yellow or yellowish. Body 2–4. Center, south; Kazakhstan, Far East; Western Europe.....
- ..... **B. (G.) larvicida** Wesm.
- 137 211 (210). Abdomen elongate, 2nd abdominal tergite 1/2–2/5 as long as its width at base and 2/5–1/4 as long as its width at apex.
- 212 (213). Body and greater part of legs black. Body 2.1–3.5. Parasite of lepidopterans *Cochylis posterans* Z., *C. roseana* Hw. (Tortricidae), *Nepticula hannoverella* Glitz. (Nepticulidae), *Aristotelia brizella* Tr. (Gelechiidae), fly *Noeeta pupillata* Fall. (Tephritidae), hymenopterans *Biorhiza pallida* Ol. (Cynipidae), *Caphus pygmaeus* L. (Cephidae), beetles *Orthotomicus proximus* Eichh., *O. laricis* F., *O. suturalis* Gyll. (Scolytidae). Northwest, center, south; Caucasus, Kazakhstan, southern Siberia; Western Europe.....
- ..... **B. (G.) praetermissus** Marsh.
- 213 (212). Body including thorax with somewhat (usually considerably) developed light colored pattern; rarely black but greater part of legs including hind femora dark brownish yellow. Body 2.6–3.7. Parasite of *Iteomyia Capreae* Winn.

- (Cecidomyiidae), *Agromyza flaviceps* Fall. (Agromyzidae), *Cryptorrhynchus lapathi* L. (Curculionidae). Northwest, center, south; Caucasus, Kazakhstan, Baikal Region; Western Europe .....
- B. (G.) epitriptus** Marsh. (*maculifer* Szépl., *novus* Szépl.)
- 214 (119). Oral cavity large, much wider than its distance from eye. (Fig. 84: 1, 3, 4, 6) and/or radial cell on forewing reduced, terminating preapically (Figs. 85: 4–8; 88: 1–5). Antennae often thickened, with square and transverse flagellar segments (Fig. 87: 9, 10). Abdomen usually sculptured in middle of 2nd tergite, rarely smooth or sculptured, except 2nd, 3rd and 4th tergites (Subgenus *Leucobracon* Fahr.).
- 215 (218). Thorax with distinctly developed granulose sculpture, particularly on sides of mesothorax. Wings shorter than body.
- 216 (217). Head transverse (Fig. 81: 6, 7), vertex and temples like face and frons with granulose sculpture; 2nd abdominal tergite and mesonotum smooth. Suture between 2nd and 3rd abdominal tergite weak, straight (Fig. 81: 9). Anterior margin of radial cell as long as stigma (Fig. 81: 8). Legs of usual structure with normal femora. Ovipositor more than half as long as abdomen. Body black; only apices of forefemora, tibiae and tarsi reddish. Body 3. Hungary ...
- ..... **B. (L.) semifusus** Papp
- 217 (216). Head slightly transverse, vertex and temples smooth; 2nd abdominal tergite and mesonotum along line of notaulices with dense granulose sculpture. Suture between 2nd and 3rd abdominal tergites deep, distinctly curved in middle. Anterior margin of radial cell shorter than stigma (Fig. 88: 1). Legs short, hind femora thickened, 2.5 times as long as wide. Ovipositor less than half as long as abdomen. Body black; forelegs, except bases of femora, trochanters of middle and hind legs, hind tarsi reddish

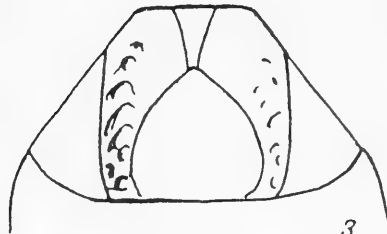
1, 2—*Bracon crassiceps*: 1—head, 2—propodeum and 1st–3rd abdominal tergites; 3—*B. terebella*, 1st abdominal tergite; 4–5—*B. hades* Papp: 4—propodeum, 5—abdomen; 6–9—*B. semifusus*: 6—head and thorax, dorsal view, 7—same, lateral view, 8—forewing, 9—abdomen; 10–11—*B. abbreviator*: 10—part of forewing, 11—1st–3rd abdominal tergites.



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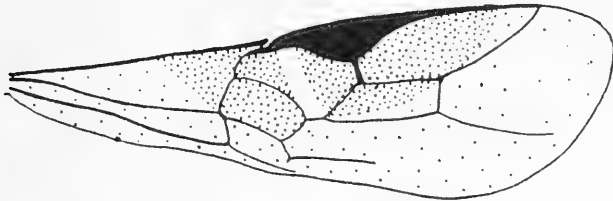
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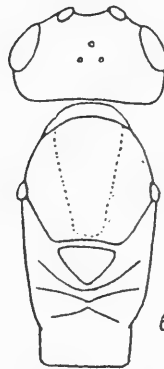
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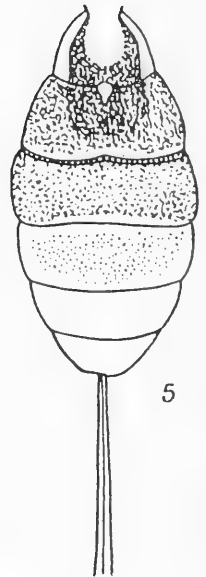
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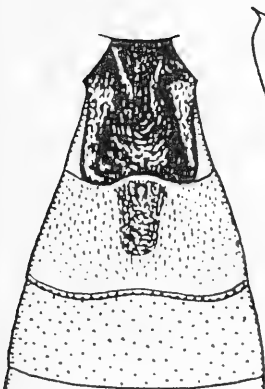
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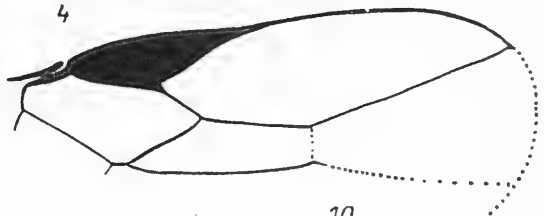
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4



10

- dark brown; palps, hind tarsi and hind tibiae yellow. Body 2.3. Kazakhstan ..... **B. (L.) punctithorax** Tobias
- 218 (215). Thorax at most with sculpture on pronotum, sides of metathorax and propodeum; sides of mesothorax always smooth.
- 219 (228). Body highly elongate; thorax 2.5–3 times as long as high (Fig. 86: 1).
- 220 (225). Wings as long as body. Abdomen as long as thorax, with transverse 2nd and 3rd tergites (Fig. 81: 11).
- 221 (222). Radial cell on forewing not reduced (Fig. 81: 10). Head 2 times as wide as long. Antennae 30-segmented, as long as head and thorax together. Ovipositor half as long as abdomen, 1st and 2nd abdominal tergites longitudinally rugose. Body black; palps, legs and greater part of abdomen dark brownish yellow, wings light colored. Body 3.7–3.8. Central Europe..... **B. (L.) abbreviator** Nees
- 222 (221). Radial cell on forewing noticeably reduced. Head slightly transverse.
- 223 (224). Ovipositor 1.5 times as long as body. Antennae 20-segmented. Abdomen smooth. Body black, legs dark brownish. Fig. 83: 1, 2. Body 2.4. Sweden; Finland ..... **B. (L.) longulus** Thoms.
- 224 (223). Ovipositor shorter than abdomen, 2nd abdominal tergite sculpted in middle (Fig. 83: 5). Thorax and wings as in Fig. 83: 3, 4. Body reddish yellow with black spots on thorax, 1st and middle of 2nd abdominal tergites. Body 3.5. Hungary ..... **B. (L.) moczari** Papp
- 225 (220). Wings half as long as body. Abdomen (Fig. 86: 4) 1.5 times as long as thorax; 2nd and 3rd abdominal tergites square or slightly transverse (Fig. 86: 5). Radial cell on forewing reduced (Fig. 85: 4).
- 226 (227). Ovipositor as long as body or somewhat shorter. Second section of radial vein usually 2/3 as long as 3rd (Fig. 85: 4). Head and antennae as in Figs. 84: 1; 87: 9. Body dark brownish yellow with black spots, wings slightly darkened. Body 3.7–4.7. Center, south; Caucasus, Kazakhstan; Hungary; Mongolia ..... **B. (L.) hungaricus** Szépl. (*xanthostigma* Kok.)
- 227 (226). Ovipositor as long as abdomen. Second section of radial vein half as long as 3rd (Fig. 85: 5). Color as in previous species. Body 2.8–3.6. Azerbaidzhan, Kazakhstan; Mongolia ..... **B. (L.) brachypterus** Tobias



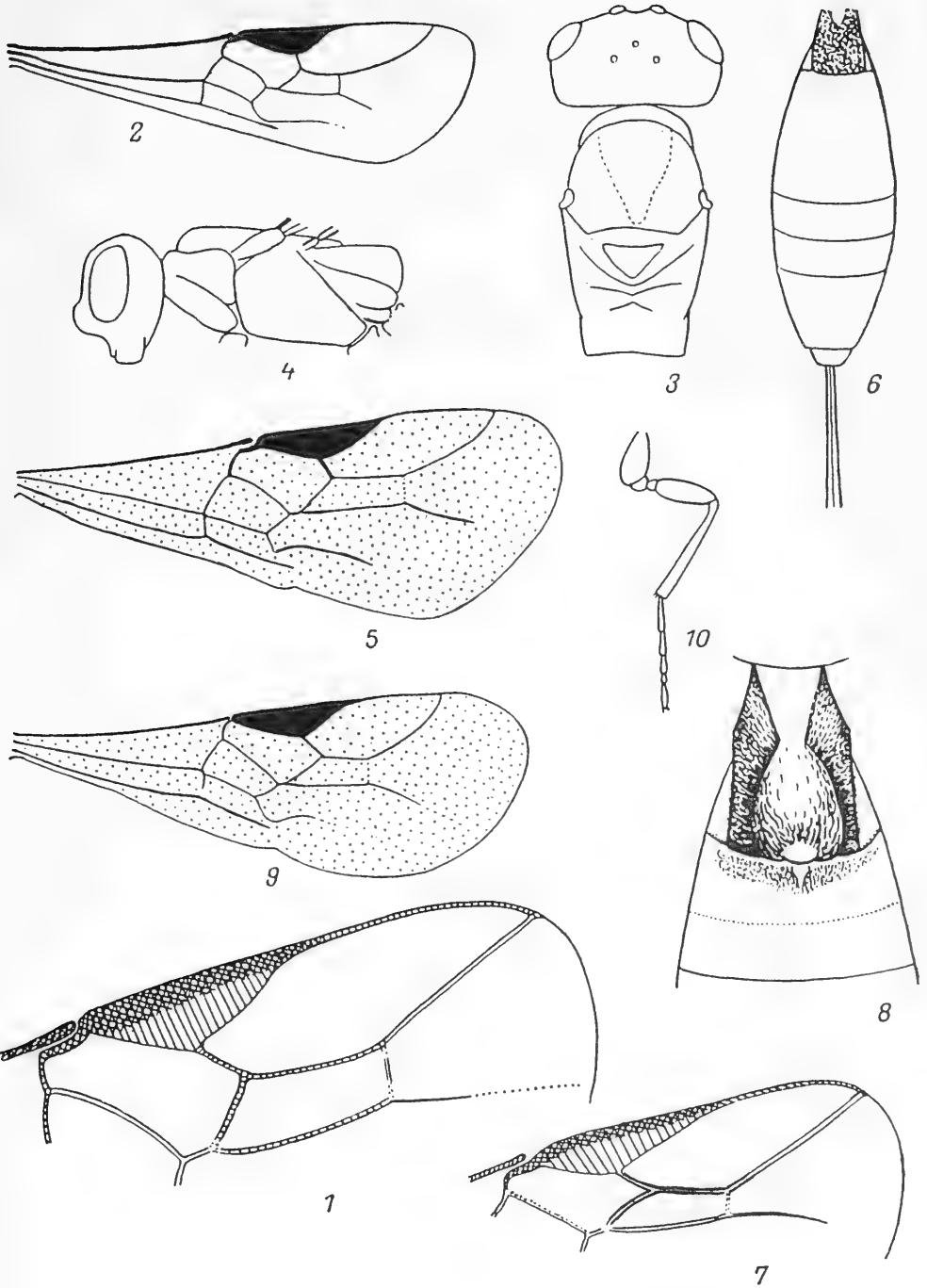


Fig. 82. Braconinae (from Papp).

1—*Bracon crassiceps*, part of forewing; 2—*B. fuscoflavus*, forewing, 3—6—*B. brachycerus*: 3—head and thorax dorsal view, 4—same, lateral view, 5—forewing, 6—abdomen; 7—8—*B. crassungula*: 7—part of forewing, 8—1st-3rd abdominal tergites; 9—10—*B. tobiasi*: 9—forewing, 10—hind leg.

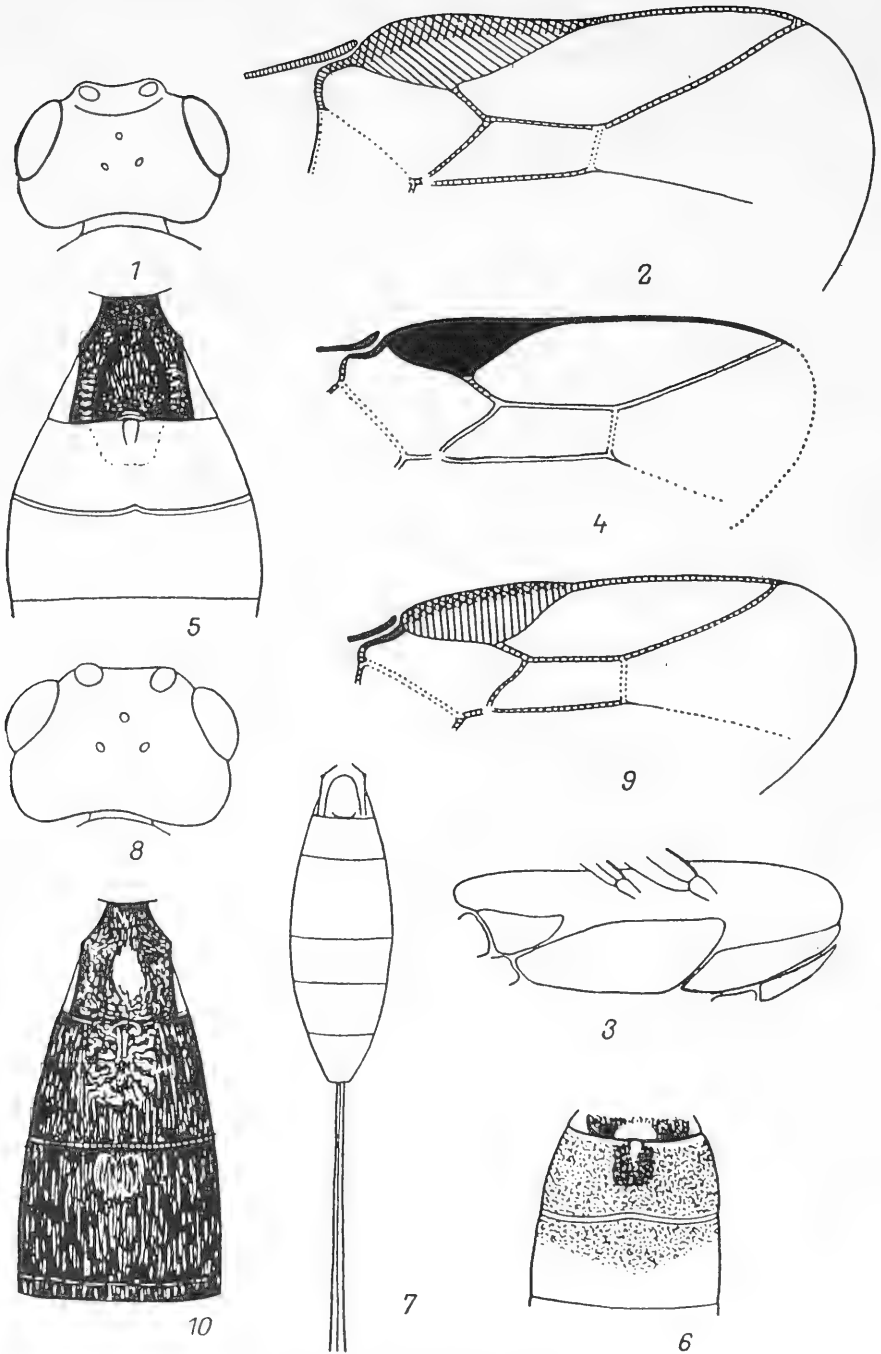


Fig. 83. Braconinae (from Papp).

1, 2—*Bracon longulus*: 1—head, 2—part of forewing; 3—5—*B. moczari*: 3—thorax, 4—part of forewing, 5—1st–3rd abdominal tergites; 6—*B. ochraceus*, 2nd–3rd abdominal tergites; 7—*B. fuscoflavus*, abdomen; 8–10—*B. thuringiacus*: 8—head, 9—part of forewing, 10—1st–3rd abdominal tergites.

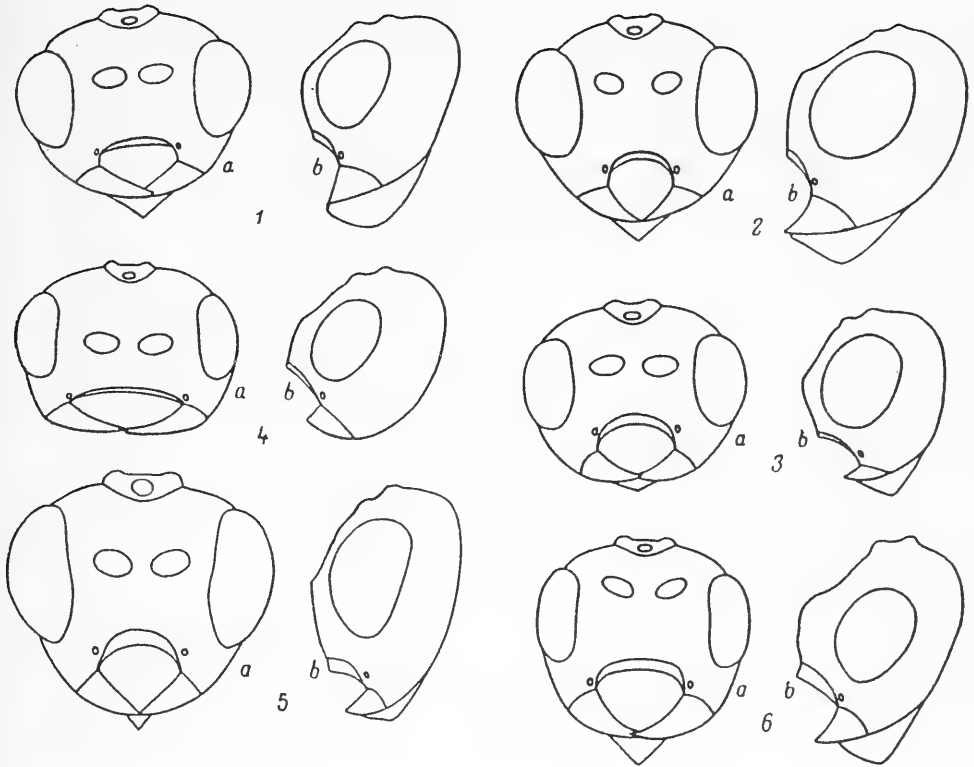


Fig. 84. Braconinae (from Tobias).

1—6—head (a—frontal view, b—lateral view): 1—*Bracon hungaricus*, 2—*B. miroides*, 3—*B. nomas*, 4—*B. infernalis*, 5—*B. hedwigae*, 6—*B. guttiger*.

228 (219). Body less elongate; thorax usually not more than 2 times as long as high, rarely 2.5 times. Wings usually slightly but sometimes much shorter than body. Abdomen not longer or slightly longer than thorax. Second and 3rd abdominal tergites transverse.

229 (248). Ovipositor as long as body, slightly shorter or longer.

230 (231). Ovipositor almost 2 times as long as body. Abdominal tergites 1 to 3 with soft granulate punctation, propodeum smooth. Antennae slightly longer than head and thorax together. Radial cell on forewing terminating preapically. Thorax and legs black, head and abdomen yellowish red with black pattern; wings smoky. Body 4.3. Azerbaidzhan ..... *B. (L.) talyshicus* Tobias

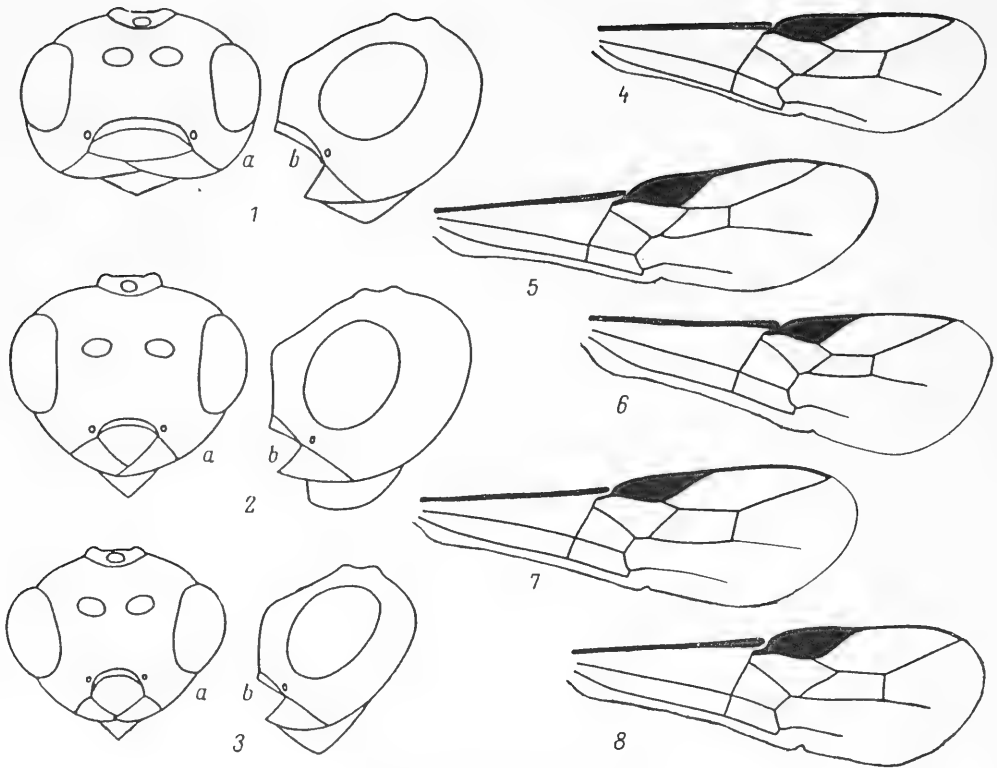


Fig. 85. Braconinae (from Tobias).

1—3—head (a—frontal view, b—lateral view): 1—*Bracon suchorukovi*, 2—*B. nigriventris*,  
3—*B. erraticus*; 4—8—forewing: 4—*B. hungaricus*, 5—*B. brachypterus*, 6—*B. hedwigae*,  
7—*B. suchorukovi*, 8—*B. erraticus*.

- 231 (230). Ovipositor not as long as or only slightly longer than body.
- 141 232 (241). First three abdominal tergites with granulose sculpture; propodeum in middle part rugose. Flagellar segments longer than wide. Radial cell on forewing terminating preapically.
- 233 (238). Oral cavity relatively small, 1.5 times as wide as its distance from eye (Fig. 84: 2). Ovipositor as long as body. Abdominal tergites 1 to 3 or 1 to 4 with granulose sculpture, only 2nd in middle weakly rugose.
- 234 (235). Abdominal tergites 1 to 4 with granulose sculpture, propodeum rugose in middle with transversely rugose-longitudinal furrow. Body yellowish red with black spots

- on thorax, at base and apex of abdomen. Body 3. Adzhar ASSR..... **B. (L.) miroides** Tobias
- 235 (234). Only abdominal tergites 1 to 3 with granulose sculpture.
- 236 (237). Propodeum uniformly not coarsely rugose-punctate, lacking longitudinal furrow. Body reddish yellow; three spots on mesonotum, lower side of pronotum, prosternum, sides of mesothorax, except their upper part, scutellum, metathorax, propodeum, 1st abdominal tergite, spot on 2nd, 4th and subsequent tergites black. Body 3. Hungary..... **B. (L.) mirus** Szépl.
- 237 (236). Propodeum smooth, only along median line with soft wrinkles. Body black; palps, tibiae, basal abdominal sternites dark brownish yellow. Fig. 89: 4–7. Body 3–4. Sweden; Finland..... **B. (L.) punctifer** Thoms.
- 238 (233). Oral cavity 2 times as wide as its distance from eye (Fig. 84: 3).
- 239 (240). Ovipositor as long as thorax and abdomen together. Abdominal tergites 2 and 3 with soft densely granulose sculpture, lacking coarse longitudinal folds (Fig 83: 6). Body reddish yellow with few dark spots, 2.8–3. Hungary.....  
..... **B. (L.) ochraceus** Szépl. (*gracilis* Szépl.)
- 240 (239). Ovipositor slightly longer than body. Abdominal tergites 2 and 3 with coarse longitudinal folds against background of granulose sculpture. Body yellowish red with black spots on head, thorax and abdominal base. Body 3.8–4.5. Southeast; Kazakhstan..... **B. (L.) nomas** Tobias
- 241 (232). First three abdominal tergites usually and propodeum lacking granulose sculpture. Second abdominal tergite somewhat rugose; propodeum smooth or only apically with weak wrinkles.
- 242 (245). Wings light colored. Suture between 2nd and 3rd abdominal tergites straight (Fig. 86: 6). Ovipositor as long as body. Body and legs black.
- 142 243 (244). Antennae distinctly shorter than body, 29–34-segmented. Head almost 2 times as wide as long. Body 2–4.5. Center, south; Kazakhstan, Yakutia; Mongolia.....  
..... **B. (L.) meyeri** Tel.  
Lectotype: Female, Yakutia, Bestyakh, 29.V.1912 (Naumov). Paralectotypes: 1 female, 1 male, same place, 30 and 29.V.1912 (Naumov).

- 244 (243). Antennae slightly shorter than body, 25-segmented. Head 1.5 times as wide as long. Body 2.7. Hungary .....  
 ..... **B. (L.) kaszabi** Papp
- 245 (242). Wings darkened in any case with dark colored body. Suture between 2nd and 3rd abdominal tergites curved.
- 246 (247). Thorax 1/3 longer than high. Wings smoky in basal half. Ovipositor as long as body. Body with dark hair, black (cf. also couplet 139) .....  
 ..... **B. (Glabrobracon) nigripilosus** Tobias
- 247 (246). Thorax almost 2 times as long as high. Wings slightly darkened. Ovipositor as long as thorax and abdomen together. Body with light colored hair. Color variable from dark brownish yellow to black; stigma yellow or dark brown. Body 2.3–3.5. South; Caucasus; Hungary. ....  
 ..... **B. (L.) fumatus** Szépl. (*brunnipennis* Szépl.)
- 248 (229). Ovipositor as long as abdomen, slightly longer or shorter.
- 249 (262). Suture between 2nd and 3rd abdominal tergites very weak, straight, sometimes indistinct (Figs. 82: 6; 86: 7, 8).
- 250 (251). Body with long erect gray hair. Oral cavity very large, as wide as longitudinal diameter of eye; face 3 to 4 times as wide as high (Fig. 84: 4). Notaulices weak. Body entirely smooth, black, 3.6–3.8. Southeast; Caucasus, Kazakhstan. ....  
 ..... **B. (L.) infernalis** Tel.  
 Lectotype: Female, Makhach-Kala ("Petrovsk"), 22.V.1926 (Ryabov). Paralectotype: Female, Kazakhstan, M. Barsuki, 19.VI.1931 (Lushova).
- 251 (250). Body with short semiappressed hair. Oral cavity small.
- 252 (259). Propodeum sculptured.
- 253 (258). Radial cell short, its anterior margin as long as stigma.
- 254 (257). Width of oral cavity slightly less than longitudinal diameter of eye, face 3 times as long as wide. Notaulices deep. Hind femora short, 2.5–3 times as long as wide. Ovipositor as long as abdomen. Lower side of pronotum and prosternum with dense granulose sculpture, top and sides of thorax smooth; propodeum with longitudinal furrow in middle. Apical segments of antennae moniliform.
- 143 255 (256). Face, except median tubercle, densely punctate, matte. Body black. Fig. 87: 1. Body 3–3.4. South; Caucasus. ....  
 ..... **B. (L.) pliginskii** Tel.  
 Lectotype: Female, Crimea ("Tauria, Belbek Station, 1.VI.1914. V. Pliginski").

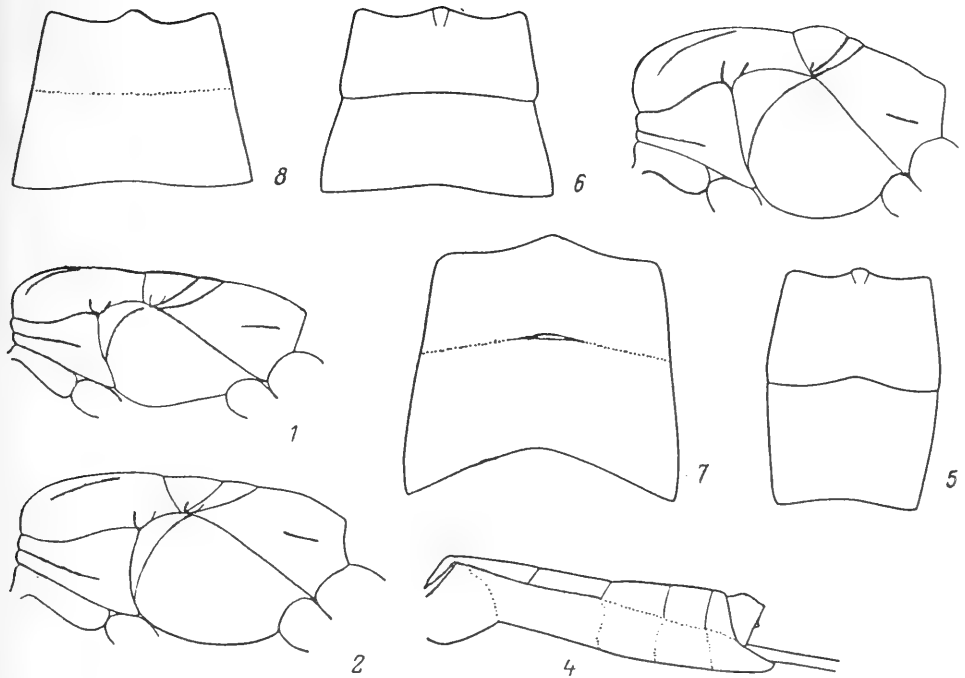


Fig. 86. Braconinae (from Tobias).

1—3—thorax: 1—*Bracon hungaricus*, 2—*B. suchorukovi*, 3—*B. erraticus*; 4—*B. hungaricus* abdomen; 5—8—2nd—3rd abdominal tergites: 5—*B. hungaricus*, 6—*B. meveri*, 7—*B. infemalis*, 8—*B. hedwigae*.

- 256 (255). Face weakly sculptured, lustrous, yellow like pronotum and propodeum. Figs. 82: 2; 83: 7. Body 2.2. Hungary. ....  
 ..... **B. (L.) fuscoflavus** Papp
- 257 (254). Oral cavity and face less broad. Notaulices weak. Hind femora elongate. Ovipositor half as long as abdomen. Prothorax smooth in greater part; propodeum in middle with longitudinal ridge. Second abdominal tergite with granulo-seulpture. Body very dark brown; 2nd and 3rd abdominal tergites and legs yellow. Fig. 82: 3—6. Body 3—3.5. Western Europe. ....  
 ..... **B. (L.) brachycerus** Thoms. (*kudsiricus* Papp)
- 258 (253). Radial cell less reduced, its anterior margin longer than stigma (Fig. 85: 6). Antennal segments very firmly attached

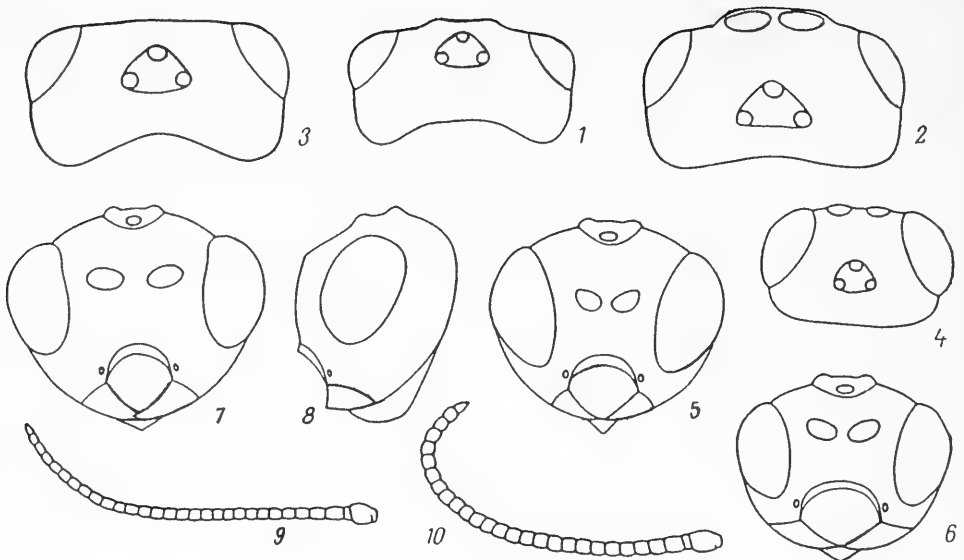


Fig. 87. Braconinae (from Tobias and original).

1-4—head, dorsal view: 1—*Bracon pliginskii*, 2—*B. guttiger*, 3—*B. concavus*, 4—*B. brevitemporis*; 5-7—head, frontal view: 5—*B. kasachstanicus*, 6—*B. akmolensis*, 7—*B. concavus*; 8—*B. concavus*, head, lateral view; 9, 10—antennae: 9—*B. hungaricus*, 10—*B. suchonukovi*.

- to each other. Oral cavity almost half as wide as longitudinal diameter of eye; face 1.5 times as wide as high (Fig. 84: 5). Notaulices weak. Prothorax lacking granulose sculpture. Mesonotum and abdomen yellowish red. Body 3.2-5. Caucasus, Central Asia; southern part of Western Europe; northern Africa. ....  
 ..... **B. (L.) hedwigae** Schm. (*carinatus* Tel.)  
 259 (252). Propodeum smooth, only apically with longitudinal ridge and wrinkles near it. Notaulices deep.  
 260 (261). Oral cavity small, head transverse. Radial cell weakly reduced, 2nd radiomedial cell small but long (Fig. 82: 7). Second abdominal tergite basally sculptured, suture between 2nd and 3rd tergites very weak, absolutely straight (Fig. 82: 8). Ovipositor noticeably shorter than abdomen. Body very dark brown; 2nd and 3rd abdominal tergites yellowish laterally; palps, legs, abdominal sternites yellow;



- wings light colored, stigma yellowish dark brown. Body 3.1. Sweden..... **B. (L.) crassungula** Thoms.
- 261 (260). Oral cavity large, broad, much wider than its distance from eye. Head cubical, almost as long as wide. Radial cell large. Second abdominal tergite in middle of base longitudinally rugose, suture between 2nd and 3rd tergites narrow but distinctly deep, slightly curved in middle. Ovipositor slightly larger than abdomen. Body and legs very dark brown; forefemora and bases of tibiae yellowish; wings darkened, dark brown. Body 3.7. Western Europe. ....  
..... **B. (L.) grandiceps** Thoms.
- 262 (249). Suture between 2nd and 3rd abdominal tergites deep and usually somewhat curved (Fig. 88: 9, 10).
- 144 263 (272). Radial cell very distinctly reduced, its anterior margin shorter than stigma (Fig. 88: 2, 3). Ovipositor not longer than half length of abdomen. Thorax 2–2.5 times as long as high. Hind femora very short.
- 264 (265). Oral cavity as wide as its distance from eye (Fig. 87: 5). Antennae much longer than head and thorax together, about 30-segmented. Second abdominal tergite as long as 3rd, suture between them slightly curved (Fig. 88: 9). Hind femora 3.5 times as long as wide. Flagellar segments longer than wide. Ovipositor 1/3 as long as abdomen. Propodeum rugose-punctate with small longitudinal ridge; 2nd abdominal tergite basally rugose. Body black; apices of forefemora and bases of all tibiae reddish dark brown; wings slightly smoky, stigma dark brown. Body 3.2. Kazakhstan. .... **B. (L.) kasachstanicus** Tobias
- 265 (264). Oral cavity 2 times as wide as its distance from eye (Fig. 87: 6). Antennae barely longer than head and thorax together. Second abdominal tergite shorter than 3rd, suture between them distinctly curved (Fig. 88: 10).
- 266 (267). Hind femora 3.5–4 times as long as wide (Fig. 88: 7); larger spur on hind tibiae, slightly larger than 1/3 length of 1st tarsal segment. Discoidal cell almost 2 times as wide as brachial cell (Fig. 88: 2). Ovipositor as long as abdomen. Propodeum laterally with small longitudinal ridge and middle of 1st abdominal tergite rugose. Body black; tarsi dark brown, wings slightly smoky, stigma dark brown. Body 2.3. Kazakhstan. .... **B. (L.) akmolensis** Tobias
- 267 (266). Hind femora 2.5–3 times as long as wide (Fig. 88: 8); larger spur on hind tibiae longer than half, rarely as long

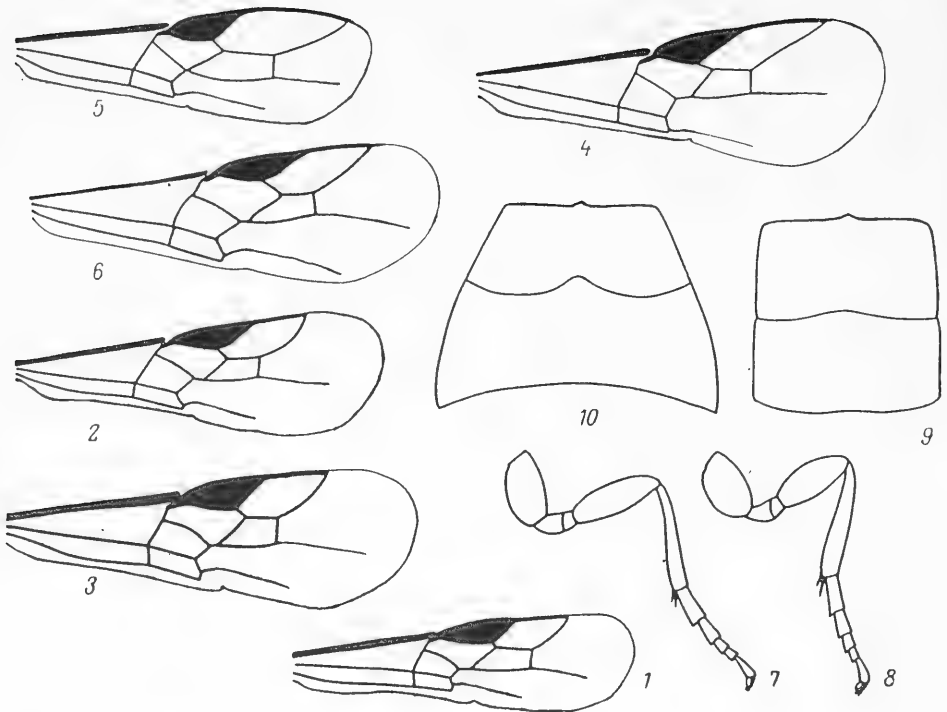


Fig. 88. Braconinae (from Tobias).

1—6—forewings: 1—*Bracon punctithorax*, 2—*B. akmolensis*, 3—*B. brevifemur*, 4—*B. radiaius*, 5—*B. brevitemporis*, 6—*B. stepposus*; 7—8—hind legs: 7—*B. akmolensis*, 8—*B. brevifemur*, 9, 10—2nd—3rd abdominal tergites: 9—*B. kasachstanicus*, 10—*B. akmolensis*.

as halflength of 1st tarsal segment. Discoidal cell slightly broader than brachial (Fig. 88: 3). Antennae 23—28-segmented, flagellar segments as long as wide. Second abdominal tergite with wrinkles.

268 (271). Second abdominal tergite at most  $\frac{2}{3}$  as long as 3rd. Ovipositor approximately  $\frac{1}{3}$  as long as abdomen. Propodeum fairly coarsely, rarely weakly sculptured, sometimes with weak longitudinal ridge. Body black; apices of femora (forefemora entirely), tibiae and tarsi reddish dark brown.

269 (270). Discoidal cell 1.5 times as wide as brachial, radial vein originating from middle of stigma or slightly beyond its

- middle. Abdomen black, wings darkened. Figs. 80: 5–7; 88: 6. Body 3.6–4. Kazakhstan. .... **B. (L.) stepposus** Tobias
- 270 (269). Discoidal cell very slightly broader than brachial, radial vein originating far beyond middle of stigma. Second and 3rd abdominal tergites often yellowish, wings darkened or light colored. Body 2.8–3.2 (male 1.9–2.8). Kazakhstan. .... **B. (L.) brevifemur** Tobias
- 271 (268). Second abdominal tergite half as long as 3rd. Ovipositor slightly shorter than halflength of abdomen. Propodeum only along median line rugose. Body black; legs yellowish dark brown. Hind legs and wings as in Fig. 82: 9, 10. Body 2.1–2.2. Hungary. .... **B. (L.) tobiasi** Papp
- 272 (263). Radial cell less distinctly reduced or not reduced. Ovipositor usually longer, but thorax shorter.
- 145 273 (274). Temples very short, 1/3 as long as eyes (Fig. 87: 4). Oral cavity 3 times as wide as its distance from eye. Antennae basely longer than head and thorax together, 20-segmented; flagellar segments almost square. Hind femora 3.5 times as long as wide. Wings as in Fig. 88: 5. Ovipositor somewhat longer than halflength of abdomen. Body smooth; 2nd abdominal tergite longitudinally striate. Body black; forelegs, apices of middle and hind femora, bases of tibiae and tarsi of middle and hind legs, 2nd abdominal tergite, except its middle, and lateral margins of 1st and 3rd tergites, bases of abdominal sternites yellowish red; wings slightly darkened. Body 1.9. Kazakhstan. .... **B. (L.) brevitemporis** Tobias
- 274 (273). Temples very long, not shorter than halflength of eyes (from above).
- 275 (276). Ovipositor short, about 1/3 as long as abdomen. Oral cavity as wide as longitudinal diameter of eye (Fig. 84: 6). Antennae fairly thin, flagellar segments in apical third longer than wide. Radial cell terminating at wing apex. Body and legs black. Body 2. Parasite of beetles *Phaedon cochleariae* F., *Gastroidea viridula* Deg., *Phyllotreta nemorum* L. (Chrysomelidae) and lepidopterans *Coleophora laricella* Hb., *C. lutipennella* Z. (Coleophoridae). Northwest, center; Western Europe. .... **B. (L.) guttiger** Wesm.
- 276 (275). Ovipositor not or only slightly shorter than abdomen.
- 277 (288). Radial cell terminating at wing apex.

- 278 (279). Color highly variable, such that body may be entirely black (in north) and almost entirely dark brownish yellow (usually in south); when light colored clearly developed abdomen and thorax also with somewhat well developed light coloration (cf. also couplet 304). .....  
 ..... **B. (L.) erraticus** Wesm.
- 279 (278). Color relatively slightly variable. Body black, abdomen light colored in middle with contrasting black apex or with black triangular spot on 2nd tergite. Second or 3rd and 4th tergites at least sometimes entirely with soft, granulose sculpture.
- 280 (281). Abdomen light colored, only 1st tergite and triangular spot in middle of 2nd tergite black (in region of this spot 2nd tergite contrastingly rugose); legs black. Ovipositor as long as abdomen. Fig. 73: 1, 2. Body 3–5. Parasite of *Aegeria tipuliformis* Cl. (Sesiidae). Western Europe .....  
 ..... **B. (L.) triangularis** Nees
- 281 (280). Abdomen with developed dark coloration at least at apex, lacking triangular contrasting spot in middle of 2nd tergite (its sculpture in middle almost same as on remaining surface); legs light colored.
- 282 (285). Ovipositor as long as abdomen with propodeum.
- 283 (284). Two weak but distinctly noticeable parallel furrows on mesonotum between notaulices. Granulose sculpture on 2nd to 4th tergites. Light color on abdomen always well developed. Body 3–6. Parasite of clearwing moths *Aegeria culiciformis* L., *A. spheciformis* Den. and Schiff., *Pennisetia hylaeiformis* Lasp., *Sesia bembeciformis* Hb. (Sesiidae). West, center, Krasnodar Region; Western Europe .....  
 ..... **B. (L.) mediator** Nees
- 284 (283). Mesonotum between notaulices lacking longitudinal furrow. Weak granulose sculpture only on 2nd abdominal tergite. Legs, middle, sometimes base of abdomen, sometimes also mesonotum light colored. Body 3–4.5. Black Sea coast of Caucasus ..... **B. (L.) humidus** Tobias
- 285 (282). Ovipositor as long as abdomen. Mesonotum between notaulices lacking furrows. Usually only 2nd, rarely also 3rd abdominal tergite with granulose sculpture. Abdomen usually dark colored, sometimes only 2nd tergite light colored.
- 147 286 (287). Abdominal tergites 1 to 3 with densely granulose sculpture, matte (3rd tergite laterally lustrous due to smooth sculpture), remaining tergites absolutely smooth. Propodeum

and sides of metathorax coarsely rugose-punctate, with longitudinal furrow in middle. Antennae almost as long as body, slightly thickened, 29-segmented, flagellar segments slightly longer than wide. Body black; tegulae, palps, legs, 2nd abdominal tergite except spot in middle, 3rd tergite and basal abdominal sternites dark brownish yellow; wings slightly but distinctly darkened, stigma and veins dark brown. Body 2.9. Moldavia .....

..... **B. (L.) subhylobii** Tobias, sp. n.

Holotype: Female, Bendery, forest, 15.V.1967 (Talitskii).

- 287 (286). As a rule only 2nd abdominal tergite sculptured, that too, weakly, rarely also 3rd tergite very weakly sculptured. Propodeum weakly rugose, lustrous. Antennae thickened, much shorter than body, middle segments usually not longer than wide. In upper part of abdomen only 2nd tergite often light colored; legs often somewhat darkened. Body 3—4. Parasite of bark beetles *Hylobius abietis* L., *H. piceus* Deg., *Pissodes pini* L., *P. notatus* F., *P. harcyniae* Hbst., *P. piceae* Ill. (Curculionidae), *Polygraphus polygraphus* L. (Scolytidae). Northwest, northwest, center; Western Siberia, Yakutia, Transbaikal Region; Western Europe .....
- 288 (277). Radial cell terminating preapically (Fig. 88: 2, 5). Combination of body coloration different than in couplets 278 and 279. .... **B. (L.) hylobii** Ratz.
- 289 (290). Propodeum with longitudinal ridge. Ovipositor shorter than abdomen. Abdominal tergites 1 to 3 with dense granulose punctation. Body entirely black, 2.8—3. Armenia. . . . . **B. (L.) byurakanicus** Tobias
- 290 (289). Propodeum lacking longitudinal ridge.
- 291 (292). Hind femora thickened, 3 times as long as wide. Ovipositor as long as abdomen and propodeum together. Body black, legs yellowish red, middle and hind coxae black. Body 3.8. (cf. also couplet 94) .....
- 292 (291). Hind femora not thickened, 4—4.5 times as long as wide.
- 293 (302). Head slightly transverse (Fig 83: 8). Thorax 2—2.5 times as long as high, often noticeably depressed (Fig. 86: 2).
- 294 (295). Second and 3rd abdominal tergites slightly transverse, basally sculptured in middle. Ovipositor slightly longer than half length of abdomen. Body black; head around

- eyes and partially legs yellowish dark brown. Fig. 83: 8–10. Body 4. East Germany ..... **B. (L.) thuringiacus** Schm.
- 295 (294). Second and 3rd abdominal tergites considerably more transverse.
- 296 (297). Abdomen smooth. Second radiomedial cell half as narrow as radial cell (Fig. 89: 9). Oral cavity as wide as its distance from eye. Antennae 26–27-segmented, thickened. Second abdominal tergite as long as 3rd,  $1/2$ – $2/5$  as long as its width at base. Ovipositor slightly shorter than abdomen. Body with diffused yellowish red pattern on head, thorax and abdomen; wings darkened, stigma basally yellow. Fig. 89: 8, 9. Body 3. Hungary; Yugoslavia; Romania ..... **B. (L.) fumarius** Szépl.
- 297 (296). Second abdominal tergite sculptured. Radial cell narrower. Oral cavity broad. Ovipositor as long as abdomen. Coloration variable; thorax black or yellowish dark brown with black pattern.
- 298 (299). Oral cavity very wide, 3 times its distance from eye, almost equals longitudinal diameter of eye. Figs. 85: 1, 7; 86: 2. Body 2.4–2.7. Northwest, west, center, south; Caucasus, Kazakhstan, Western Siberia (Tomsk); Austria ..... **B. (L.) suchorukovi** Tel. (*dobrovolskii* Tel.)  
Lectotype: Female, Kazakhstan, Kustanai, "Veselyi Kut" 25.VII.1931 (Molchanov). Paralectotype: 1 female, details same.
- 299 (298). Oral cavity narrower, not more than 2 times its distance from eye, longitudinal diameter of eye 2 times its width (Fig. 85: 2).
- 300 (301). Propodeum smooth, only apically sometimes weakly rugose. Antennae thickened, much shorter than body, 25–30-segmented, flagellar segments square. Color highly variable. Body 2–4. Parasite of *Pissodes pini* L., *Hylobius piceus* Deg. (Curculionidae), *Plagionotus floralis* Pall. (Cerambycidae). South; Caucasus, Kazakhstan, Central Asia; Western Europe; Mongolia ..... **B. (L.) nigriventris** Wesm. (*indubius* Szépl., *fumigidus* Szépl., *sphaerocephalus* Szépl., *lautus* Szépl., *laticeps* Tel., *lencoranus* Tel., *persimilis* Tel.)
- 301 (300). Propodeum softly rugose in middle. Antennae as long as body, 22–24-segmented, middle flagellar segments 1.5 times as long as wide. Body black; legs dark brown; margins of 1st and 2nd abdominal tergites and abdominal

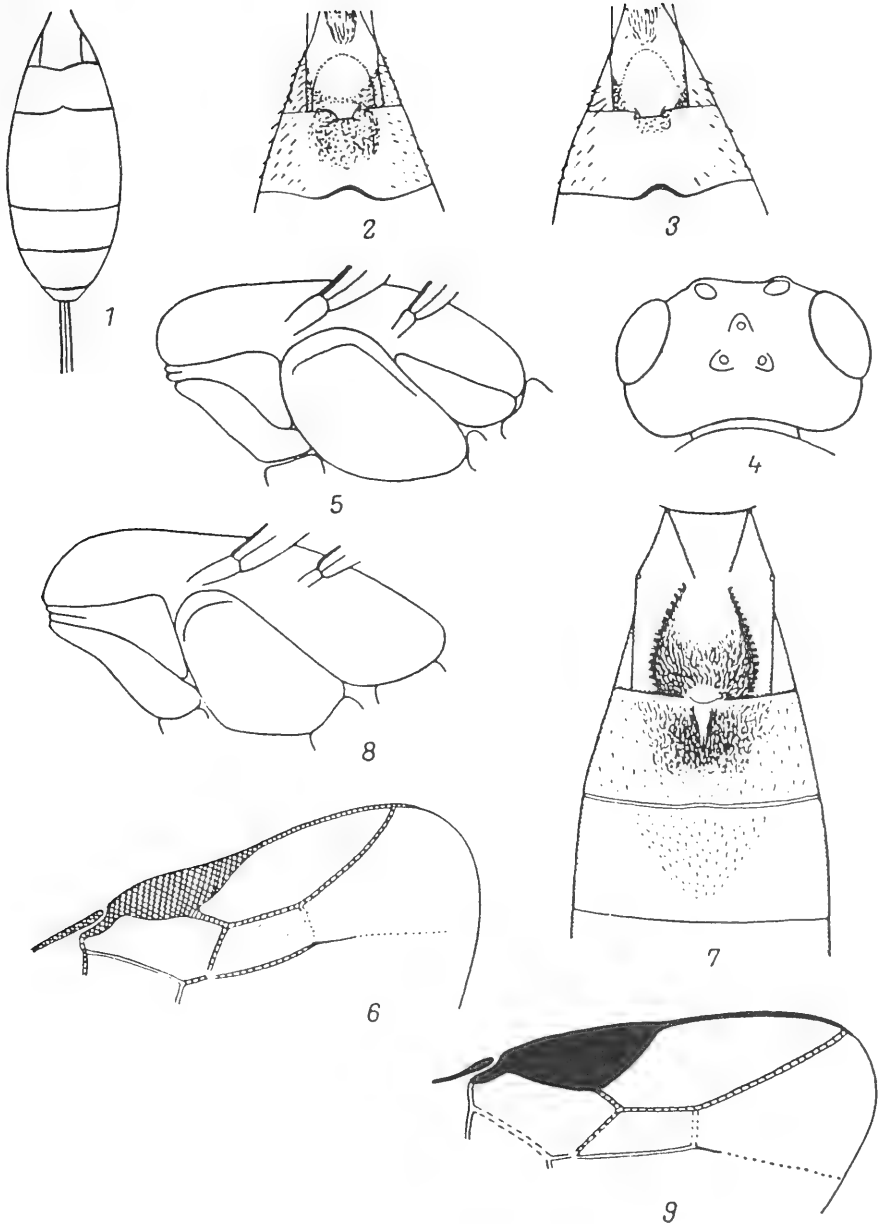


Fig. 89. Braconinae (from Papp).

1—3—*Bracon procerus*: 1—abdomen, 2—1st and 2nd abdominal tergites, 3—same, variation; 4—7—*B. punctifer*: 4—head, 5—thorax, 6—part of forewing, 7—1st—3rd abdominal tergites; 8, 9—*B. fumarius*: 8—thorax, 9—part of forewing.

- sternites yellowish dark brown. Body 2–2.5. Hungary ...  
 ..... **B. (L.) paucus** Papp
- 302 (293). Head transverse. Thorax 1.3–1.8 times as long as high, not depressed (Fig. 86: 3).
- 303 (306). Propodeum smooth or just apically rugose. Ovipositor as long as abdomen or slightly shorter.
- 304 (305). Radial cell slightly reduced, terminating preapically. Sculpture on abdomen highly variable: from weak, only on 1st and 2nd tergites, to fairly distinct on 2nd to 4th tergites (as in Fig. 81: 5). Sometimes propodeum in middle with fairly distinct sculpture (as in Fig. 81: 4). Body coloration variable from entirely yellowish dark brown to almost entirely black (usually in northern part of distribution area). Figs. 85: 3; 86: 3. Body 2–4.5. Parasite of *Pennisetia hylaeiformis* Lasp. (Sesiidae), *Acleris rhombana* Den. and Schiff. (Tortricidae), *Metzneria lappella* L. (Gelechiidae), *Chaetostomella cylindrica* R.-D., *Urophora eriolepidis* LW., *Terellia serratulae* L. (Tephritidae). Cosmopolitan; Caucasus, Kazakhstan, Central Asia; Western Europe (cf. also couplet 278) .....  
 ..... **B. (L.) erraticus** Wesm. (*confinis* Szépl., *talitzkii* Tel., *transcaspicus* Tel., *planiceps* Tel., *lagodechianus* Tel.)
- 305 (304). Radial cell distinctly reduced, its anterior margin as long as stigma (Fig. 88: 4). Second and 3rd abdominal tergites with granulate sculpture (weaker on 3rd). Body yellowish dark brown, antennae black; stigma yellow in basal half, dark brownish in apical half. Body 2.8. Central Asia ....  
 ..... **B. (L.) radiatus** Tobias
- 306 (303). Propodeum entirely with finely granulate sculpture and 1st to 3rd abdominal tergites (on 3rd less than on 2nd). Ovipositor half as long as abdomen. Radial cell less reduced. Temples half as long as eyes. Middle antennal segments longer than wide.
- 307 (308). Occiput slightly notched. Body reddish dark brown; head dark brown, yellow around eyes; wings light colored, stigma yellowish dark brown. Body 3.3. Central Asia .....  
 ..... **B. (L.) jacobsoni** Tel.  
 Lectotype: Female, Golodnaya Steppe village, 17.V.1903 (G. jacobson).
- 308 (307). Occiput deeply notched. Body black; spot around eyes and on genae, apices of forefemora, fore- and middle tibiae and hind tibiae except their apices dark brownish yellow;



margins of 1st tergite and lower side of abdominal sternites yellow. Fig. 87: 3, 7, 8. Body 3.6. Central Asia.....  
 ..... **B. (L.) concavus** Tobias

75. **Chartobracon** van Achterberg, 1983.—One species.

- 1 (1). Mesonotum lacking notaulices. Radial vein originating anterior to middle of stigma. Hind femora fairly thick. Body smooth, black; legs very dark brown or black with yellowish trochanters. Fig. 90. Body 2.7. Sweden..... **C. huggerti** Acht.

### 5. Subfamily Telengainae

The subfamily has one genus.

76. **Telengaia** Tobias, 1962.—One dark colored species with hyaline-light colored wings—*T. ventralis* Tobias (Fig. 91).

### 6. Subfamily Helconinae

Medium (3–5 mm) and large (up to 14.5 mm) insects, usually dark colored. As a rule, their ovipositor is somewhat long. The wing venation is complete (the second anal cross-vein may be reduced on the forewing), the radial and radiomedial cells are relatively short. The frons is often notched. The occipital, prepectal and longitudinal ridges of the 1st abdominal tergite are developed. The prescutellar depression is broad with a longitudinal keel. Notaulices and sternauli are deep. The abdomen is articulated above the level of the hind coxae. The body usually has somewhat developed coarse sculpture with extensive, almost smooth surfaces.

There are about 35 genera and over 200 species in the world fauna; all are widely distributed for the most part in the tropics. Almost all helconins are endoparasites of beetle larvae. Their hosts lead a concealed life usually under the bark of trees. In the subfamily, three tribes are distinguished according to specialization for the host: the larger Helconini are parasites of cerambycid beetles; Diospilini and Cenocoeliini have a much wider host range while *Dyscoletes* from Diospilini are adapted to genus *Boreus* of the order Mecoptera (presumably the only known hymenopteran parasite of this ancient order of insects). The tribe Cenocoeliini because of the extremely high articulation of the abdomen with the propodeum were earlier separated in an independent subfamily Cenocoeliinae.

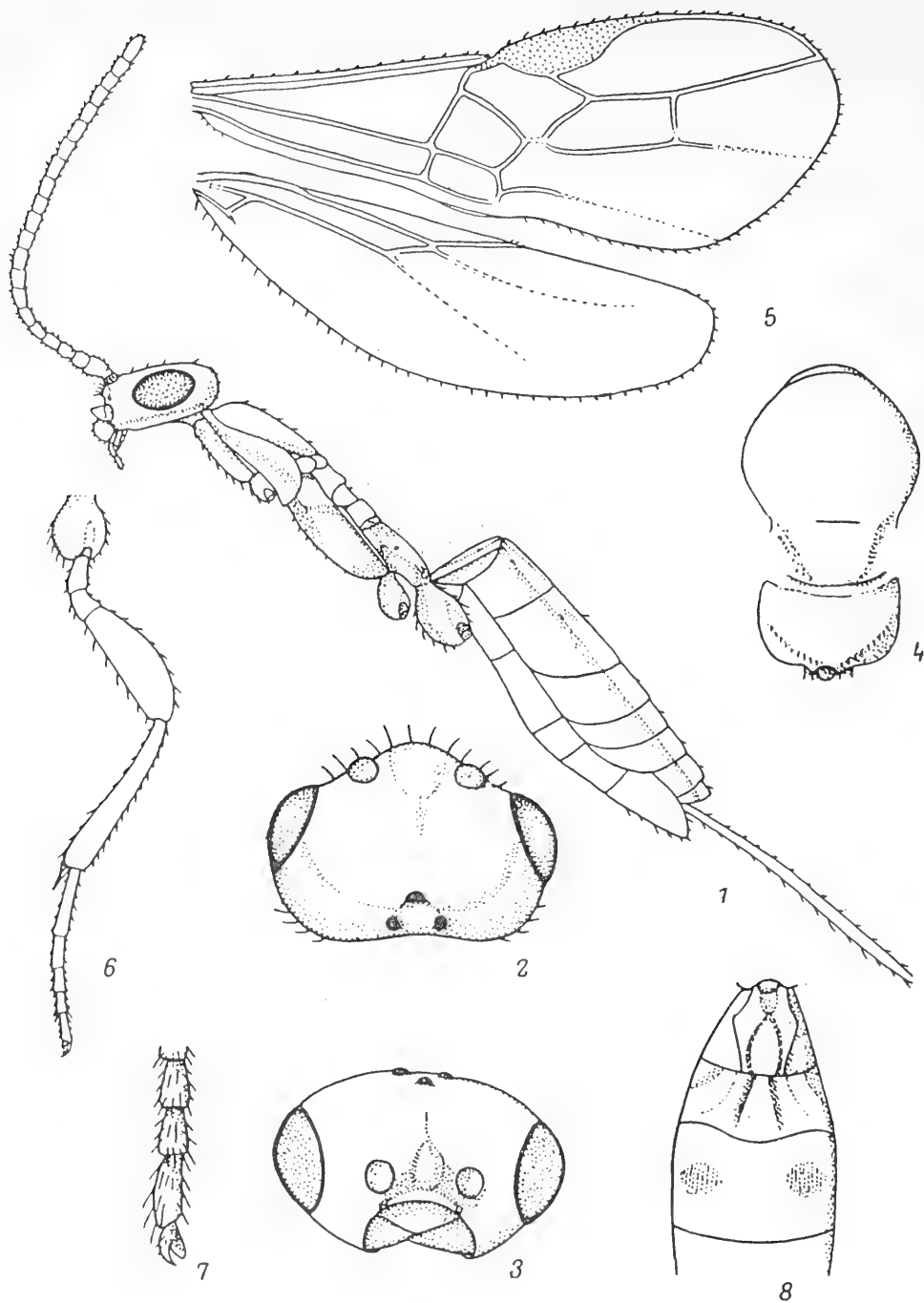


Fig. 90. Braconinae (from Achterberg).

1-8—*Chartobracon huggerii*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—thorax, 5—wings, 6—hind leg, 7—apex of hind tarsus, 8—1st-3rd abdominal tergites.

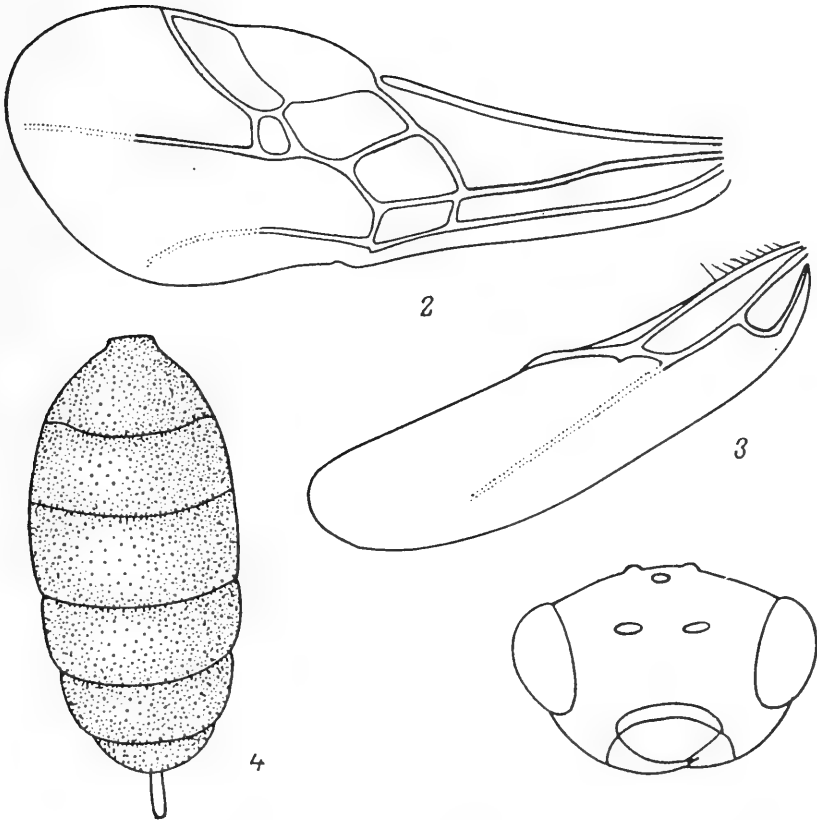
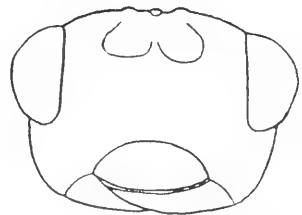
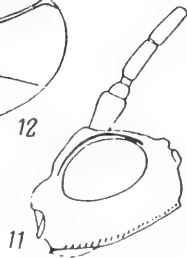
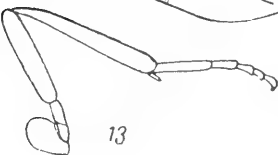
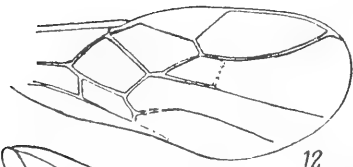
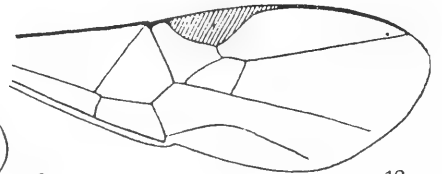
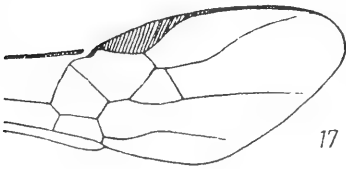
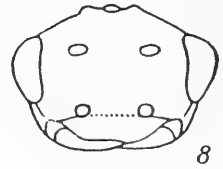
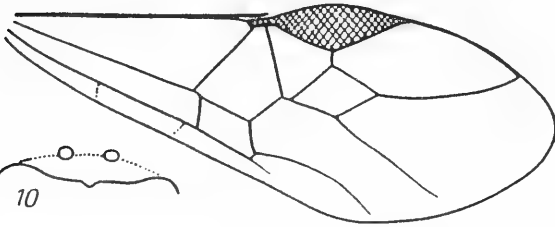
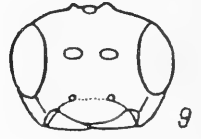
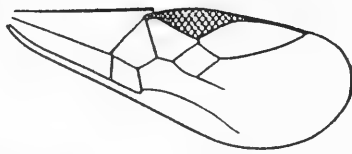
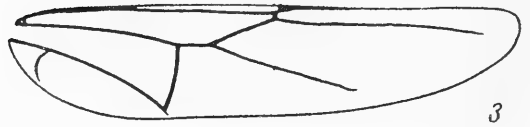
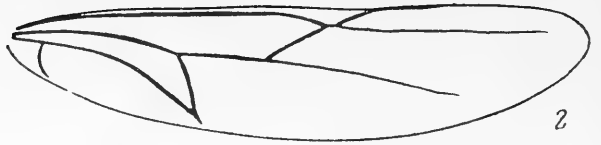
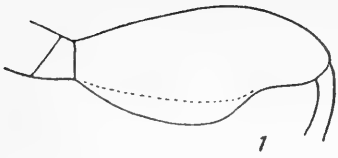


Fig. 91. Telengainae (from Tobias).

1—4—*Telengaiia ventralis*: 1—head, 2—forewing, 3—hind wing, 4—abdomen.

### Key to Tribes and Genera

- 1 ( 8). Abdomen articulated with propodeum above level of hind coxae
- 2 ( 3). Abdomen articulated high above level of hind coxae. Hind coxae very small; almost half as long as height of propodeum (Figs. 92: 14; 95: 4). Genae very strongly developed, their height almost equaling longitudinal diameter of eye. (Tribe *Cenocoeliini*) ..... 77. *Cenocoelius*



- 3 ( 2). Abdomen not articulated high above level of hind coxae. Hind coxae large, slightly shorter than height of propodeum. Genae weakly developed. Body well proportioned abdomen usually much longer than thorax. Insects usually large, 7–14. (Tribe Helconini).
- 4 ( 5). Hind femora below with preapical denticle (Fig. 92: 4, 5). Anal cross-veins two. Frons deeply depressed ..... 78. **Wroughtonia**
- 5 ( 4). Hind femora lacking denticle.
- 6 ( 7). Forewing with 2 anal cross-veins (Fig. 92: 16). Frons deeply depressed (Figs. 93: 1, 3; 95: 1)..... 79. **Helcon**
- 7 ( 6). Forewing with only 1 anal cross-vein, 2nd generally entirely reduced (Fig. 94: 3). Frons relatively weakly depressed (Fig. 94: 1, 6) ..... 80. **Aspicolpus**
- 8 ( 1). Abdomen articulated with propodeum at same level as hind coxae. Body stout, abdomen not longer than thorax. Body small. (Tribe Diospilini).
- 9 (16). Medial vein on forewing originating together with basal directly from parastigma. Sternauli developed.
- 10 (13). Clypeus on outer margin angularly pointed.
- 11 (12). Second segment of maxillary palp distinctly broadened so that articulation of 3rd segment appears not apical. Antennae in male apically thickened ..... 81. **Aspigonus**
- 12 (11). Maxillary palps of usual shape. Antennae in male not thickened..... 82. **Baeacis**
- 13 (10). Outer margin of clypeus straight or uniformly rounded, rarely with weak median tubercle.
- 14 (15). Second radiomedial cell trapezoid, anteriorly narrowed. (Fig. 92: 18). Second abdominal tergite separated from laterotergites by sharp bend. Abdomen usually not shorter than thorax..... 83. **Taphaeus**

1—*Cenocoelius femorator*, forefemur; 2, 3—hind wings: 2—*Wroughtonia dentator*, 3—*W. ruspator*; 4, 5—hind femora: 4—*W. dentator*, 5—*W. ruspator*; 6, 7—forewings: 6—*Diospilus morosus*, 7—*D. rufipes*; 8, 9—head: 8—*D. rufipes*, 9—*D. capito*; 10—*D. tuberculatus*, clypeus; 11–13—*Hellenius semiruber*: 11—head, 12—forewing, 13—hind leg; 14—*Cenocoelius* sp., body; 15—*Aspicolpus carinator*, head; 16–19—forewings: 16—*Helcon redactor*, 17—*Wroughtonia miroshnikovi* sp. n., 18—*Taphaeus hiator*, 19—*Diospilus capito*.

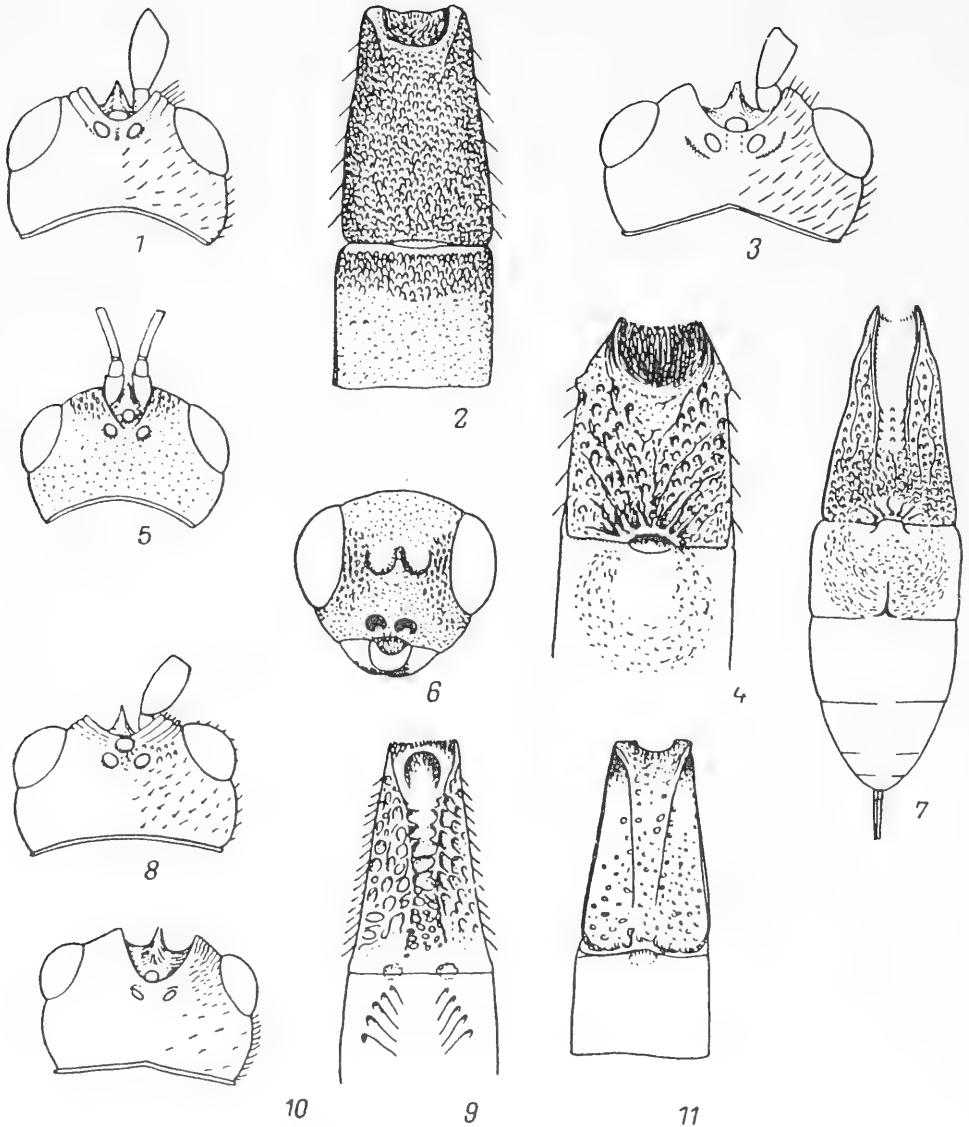


Fig. 93. Helconinae (from Hedqvist).

1—2—*Helcon redactor*: 1—head, 2—1st—2nd abdominal tergites; 3, 4—*H. tardator*: 3—head, 4—1st—2nd abdominal tergites; 5—7—*H. claviventris*: 5—head, dorsal view, 6—head, frontal view, 7—abdomen; 8, 9—*Wroughionia ruspator*: 8—head, 9—1st—2nd abdominal tergites; 10, 11—*W. spinator*: 10—head, 11—1st—2nd—abdominal tergites.

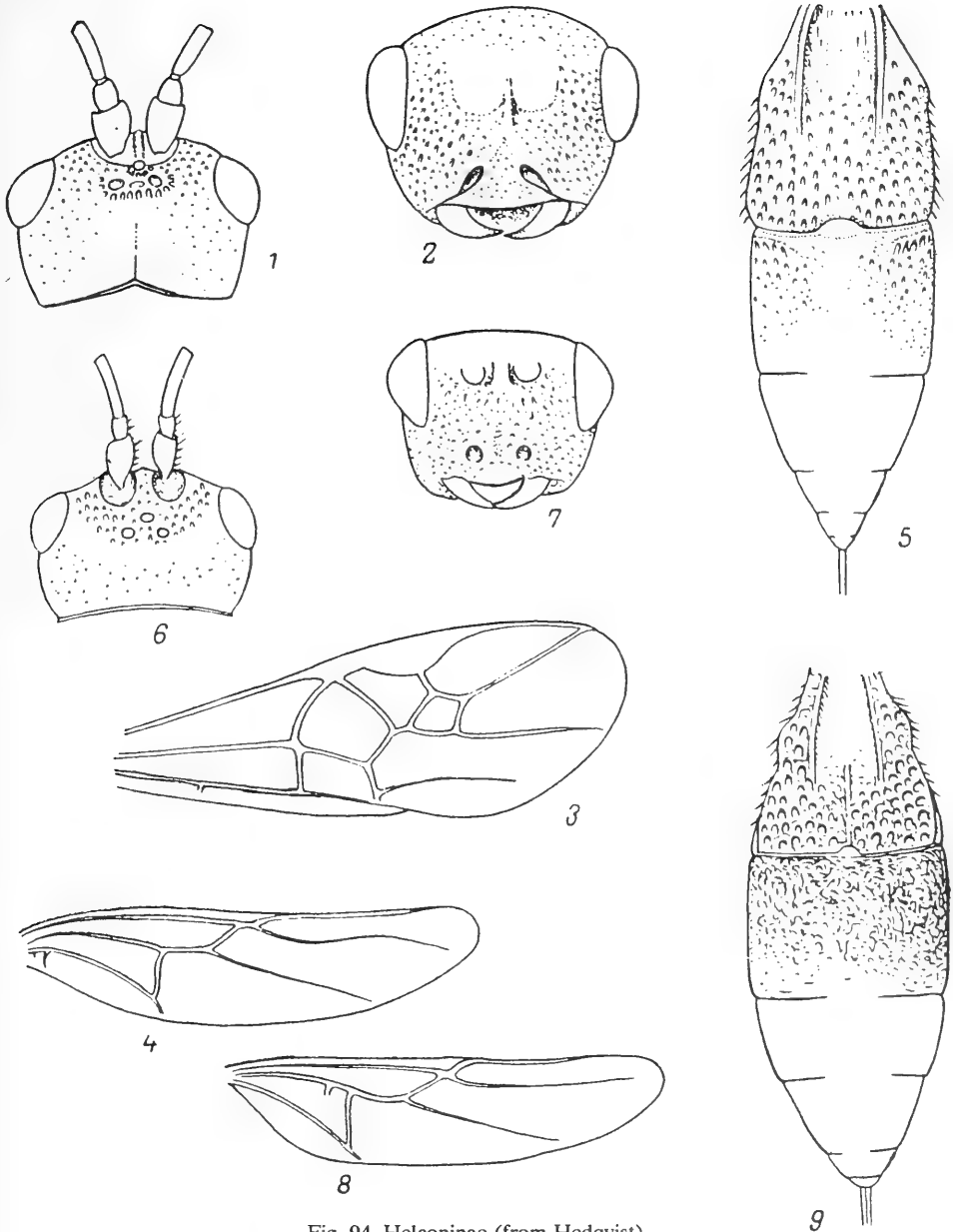


Fig. 94. Helconinae (from Hedqvist).

1-5—*Aspicolpus carinator*: 1—head, dorsal view, 2—head, frontal view, 3—forewing, 4—hind wing, 5—abdomen; 6-9—*A. borealis*: 6—head, dorsal view, 7—head, frontal view, 8—hind wing; 9—abdomen.

- 15 (14). Second radiomedial cell square or anteriorly broadened (Fig. 92: 6, 7, 19). Bend between upper part of 2nd abdominal tergite and its basal part (not forming distinctly separated laterotergites) uniformly rounded. Abdomen shorter than thorax ..... 84. **Diospilus**
- 16 (9). Medial vein on forewing originating from basal vein at some distance from parastigma. Sternauli not developed.
- 17 (18). Recurrent vein on forewing postfurcal, brachial cell in posterior outer corner open; stigma narrow, radial vein originating far from its middle (Fig. 95: 9). Propodeum with fields (with median cell originating from it anteriorly with longitudinal ridge and with transverse ridges on its sides). Hind tibiae thin, as long as hind tarsi. Frons lacking keel along inner margin of eye ..... 85. **Dyscoletes**
- 18 (17). Recurrent vein on forewing antefurcal, brachial cell closed, stigma broad, radial vein originating from its middle (Fig. 92: 12). Propodeum with 2 parallel ridges in middle, lacking transverse ridges. Hind tibiae noticeably thickened, apically broader than femora, longer than hind tarsi (Fig. 92: 13). Frons with distinct keel along inner margin of eye (Fig. 92: 11) ..... 86. **Hellenius**

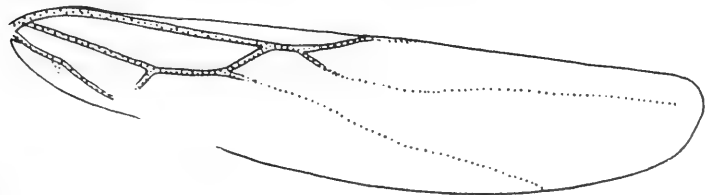
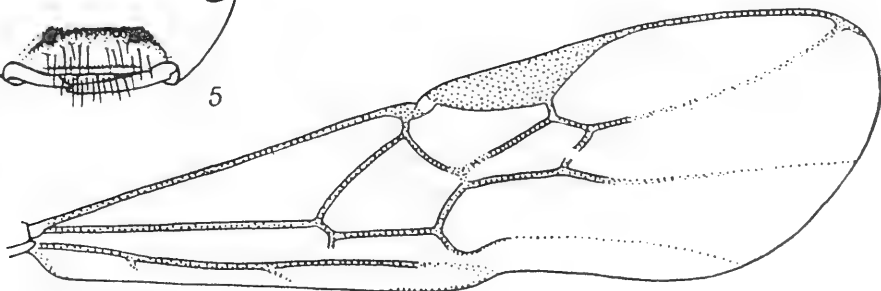
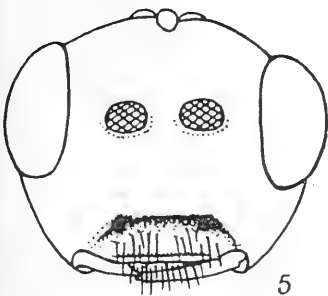
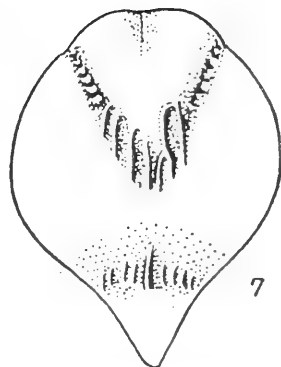
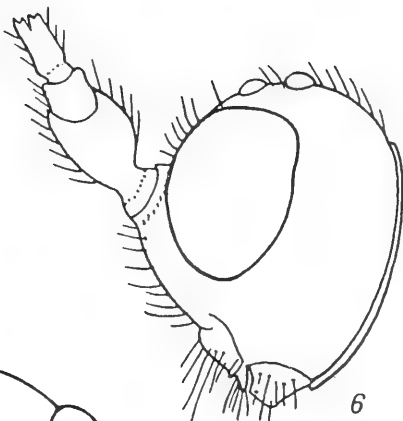
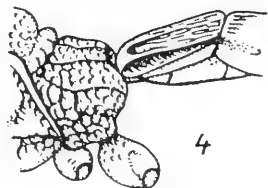
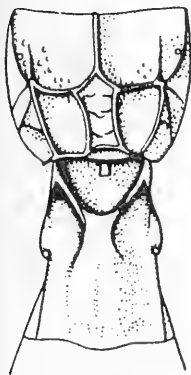
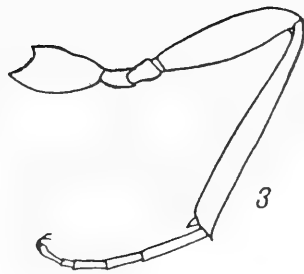
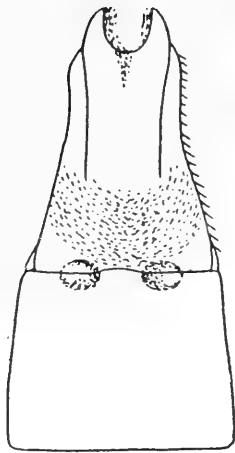
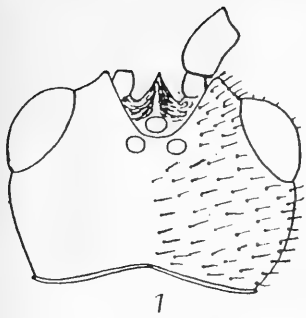
*Key to Species of Genera of Subfamily Helconinae*

77. **Cenocoelius** Westwood, 1840.—Over 40 species, in the Palearctic 5 to 6. From the fauna of the USSR the key does not include *C. kunashiri* Tobias from the Kuril Islands.

- 151 1 (2). Forefemora below with broad lamellar projection (Fig. 92: 1). Antennae 31–32-segmented. Ovipositor slightly longer than abdomen. Body including legs black, head of female, except ocellar field and mouthparts, dark brownish red, in male head black. Body 4–5. West, northwest; Caucasus (Teberda) ..... **C. femorator** Tobias
- 2 (1). Forefemora of normal shape, lacking lamellar projection.

1, 2—*Wroughnonia dentator*: 1—head, 2—1st and 2nd abdominal tergites; 3—*Helcon* sp., hind leg; 4—*Cenocoelius analis*, propodeum and 1st abdominal tergite; 5–8—*Dyscoletes lancifer*: 5—head, frontal view, 6—head, lateral view; 7—mesonotum, 8—propodeum and 1st abdominal tergite; 9—*D. canadensis* Mason, wings.





- 3 (4). Antennae 25–26-segmented. Body black; legs, except coxae and trochanters, dark brownish yellow; color of head and thorax in male and female varying from black to dark brownish yellow. Fig. 95: 4. Body 3–4. Parasite of beetles *Magdalis armigera* Geoffr., *M. ruficornis* L. (Curculionidae), *Scolytus rugulosus* Ratz. (Scolytidae), *Tetrops praeusta* L. (Cerambycidae). Center, south; Caucasus (Sochi, Azerbaidzhan), Western Europe.....  
..... **C. analis** Nees
- 4 (3). Antennae 30–34-segmented. Thorax and greater part of abdomen black.
- 5 (6). Ovipositor almost as long as body. First abdominal tergite with deep longitudinal folds, lustrous. Head black, greater part of legs yellowish dark brown. Body 3.5–4. Center; Hungary.....  
..... **C. hungaricus** Zilahi-Kiss
- 6 (5). Ovipositor much shorter than body. First abdominal tergite weakly sculptured, often almost smooth. Head of female dark brownish red, in male black; legs black. Body 4–5. Parasite of *Magdalis violacea* L., *M. nitida* Gyll., *M. rufa* Germ., *M. ruficornis* L., *Pissodes validirostris* Gyll. (Curculionidae), *Pogonocherus fasciculatus* Deg., *P. hispidus* L., *P. bidentatus* Thoms., *P. taygetanus* Pic. (Cerambycidae), *Ips typographus* L. (Scolytidae). Pacific Coastal Region; Western Europe.....  
..... **C. secalis** L. (*agricolorator* L.)

78. **Wroughtonia** Cameron, 1899 (Helconidea Vier.)<sup>1</sup>.—More than 20 species; 10 in the Palearctic, mainly in the Far East. Mostly parasites of Cerambycid beetles.

- 1 (6). Antennae and tarsi lacking whitish segments.
- 2 (3). On hind wing nervellus forming acute angle with anal vein. Hind femora not thickened. Ovipositor longer than body. Body black, legs yellowish dark brown, tibiae and tarsi darkened. Figs. 92: 2, 4; 95: 1, 2. Body 7.5–12.5. Parasite of *Plagionotus arcuatus* L., *Tetropium castaneum* L., *T. fuscum* F., *T. gabrieli* Weise, *Monochamus sartor* F., *M. urussovi* Fisch., *Callidium violaceum* L., *C. aeneum* Deg. North, northwest, center, east; Caucasus (Georgia), Western Siberia; Western Europe.....  
..... **W. dentator** L. (*aequator* Nees)

<sup>1</sup> Fahringer. 1934. *Zischr. angew. Entomol.*, 20: 307–323; Tobias. 1967. *Tr. Zool. in-ta AN SSSR*, 41: 232–238; Hedqvist. 1967. *Entomol. Tidskr.*, 88, 3–4: 133–143.

- 3 (2). On hind wing nervellus forming almost right angle with anal vein (Fig. 92: 3). Hind femora thickened (Fig. 92: 5). Ovipositor as long as body, rarely very slightly longer. Body black; legs reddish yellow, coxae, at least hind coxae, black or dark brownish; palps dark brownish yellow.
- 4 (5). Second radiomedial cell very short, almost triangular, distinctly narrowed anteriorly, 2nd section of radial vein much shorter than 1st (Fig. 92: 17). Propodeum and sides of metathorax entirely softly rugose-punctate. Antennae 34-segmented. Body 4. Parasite of *Rhopalopus clavipes* F. Krasnodar Region .....  
..... **W. miroshnikovi** Tobias, sp. n.  
Holotype: Female, Krasnodar, Dubki, parasite of *R. clavipes*, 4.VI.1973 (Miroshnikov).
- 5 (4). Second radiomedial cell much longer, trapezoid, 2nd section of radial vein much longer than 1st (cf. Fig. 92: 16). Propodeum and sides of metathorax with coarse reticulate sculpture, base of propodeum with smooth transverse field. Figs. 92: 3, 5; 93: 8, 9. Body 8–12. Parasite of *Strangalia quadrifasciata* L., *Acanthocinus aedilis* L., *Monochamus sutor* L., *Leptura dubia* Scop. Northwest, center, south (Kharkov Region); Caucasus; Western Europe ..... **W. ruspator** L.
- 6 (1). Antennae black, in female 12th to 16th segments whitish; middle and hind tarsi whitish, legs yellowish red, hind tibiae dark brown. Nervellus forming almost right angle with anal vein. Fig. 93: 10, 11. Body 7–10. Western Europe .... **W. spinator** L.

79. **Helcon** Nees, 1814<sup>1</sup>.—Seventeen species; 7 in the Palearctic, of these 4 in the Far East. Parasites of cerambycid beetles.

- 1 (4). On hind wing radial vein not curved, radial cell not constricted in middle. Ovipositor as long as abdomen and thorax together, or slightly shorter.
- 2 (3). Longitudinal ridges on 1st abdominal tergite absent or weakly developed, usually like 2nd tergite densely rugose-punctate; 3rd tergite delicately punctate, rarely smooth. Body black; legs yellowish dark brown, often apical half of hind femora, sometimes hind femora entirely, hind tibiae and hind tarsi darkened. First abdominal tergite gradually and slightly narrowed toward base. Figs. 92: 16; 93: 1, 2. Body 8–13. Parasite

<sup>1</sup> Literature same as for the previous species.

of *Rhopalopus clavipes* F., *R. macropus* Germ; *Callidium variabile* L., *C. violaceum* L., *Phymatodes pusillus* L., *Pyrrhidium sanguineum* L. North, northwest, west, center, south; Caucasus (Teberda, Novorossiisk), Far East; Western Europe; Mongolia ..... **H. redactor** Thumb.

- 153 3 (2). First abdominal tergite with 2 longitudinal ridges reaching beyond its middle; only 1st and basal half of 2nd tergite rugose, usually rather coarsely; remaining tergites smooth. Body black; legs yellowish dark brown, only hind tarsi and hind tibiae darkened. First abdominal tergite parallel-sided, sharply narrowed in basal third. Fig. 93: 3, 4. Body 10–14.5. Parasite of *Callidium violaceum* L., *C. variabile* L., *C. aeneum* Deg., *Pyrrhidium sanguineum* L., *Phymatodes testaceus* L., *Xylotrechus rusticus* L., *Plagionotus arcuatus* L., *Hoplosia fennica* Pk., *Clytus arietis* L. Center, south (Kharkov Region); Caucasus; Western Europe ..... **H. tardator** L.
- 4 (1). On hind wing radial vein curved so that radial cell narrowed in middle. Ovipositor as long as body. First abdominal tergite with weak ridges. Antennae 30-segmented. First abdominal tergite smooth, hind femora entirely yellowish dark brown. Fig. 93: 5–7. Body 5–8. Parasite of *Melandrya serrata* F., *M. caraboides* F. (Melandryidae). ? Ukraine; Western Europe ..... **H. claviventris** Wesm.

80. **Aspicolpus** Wesmael, 1838. (*Aspidocolpus* auct.)<sup>1</sup>.—About 20 species, 11–13 in the Palearctic, mainly in the Far East.

- 154 1 (2). Abdomen yellowish dark brown. Second abdominal tergite almost smooth. Ovipositor slightly longer than abdomen. Antennae lacking whitish segments, basal half of flagellum dark brown; legs including coxae yellowish dark brown; body black, 8.5. Central Asia ..... **A. erythrogaster** Tobias
- 2 (1). Abdomen (and entire body) black. Second abdominal tergite sculptured. Antennae black. Ovipositor as long as or longer than abdomen.
- 3 (6). Notch on frons in middle with denticle (Fig. 94: 2).
- 4 (5). Legs, including coxae, yellowish dark brown. Figs. 92: 15; 94, 1–5. Body 8–10. Parasite of *Xylotrechus arvicola* Ol., *Phymatodes testaceus* L., *Plagionotus arcuatus* L., *Hoplosia fennica* Pk.,

<sup>1</sup> Literature same as for *Wroughtonia* and *Helcon*.

- 155 *Callidium violaceum* L., *C. aeneum* Deg., *C. variabile* L. (Cerambycidae), *Xyloniates retusus* Ol. (Bostrychidae), *Scolytus intricatus* Ratz. (Scolytidae). South; Far East; Western Europe .....  
 ..... **A. carinator** Nees
- 5 (4). Legs yellowish dark brown but coxae, at least hind coxae, black. Body 6–8. Yakutia, Far East; Hungary .... **A. maximus** Szépl.
- 6 (3). Notch on frons lacking denticle (Fig. 94: 7). Legs and antennae dark; antennal bases, tegulae reddish dark brown, fore and middle tibiae and tarsi yellowish (Fig. 94: 6–9). Body 8. Kamchatka; Sweden ..... **A. borealis** Thoms.

81. **Aspigonus** Wesmael, 1835 (*Aspidogonus* auct.).—Two to three species, only one species reliably reported from the Palearctic.

- 1 (1). Radial cell on forewing not reaching its apex, 3rd section of radial vein straight. First abdominal tergite rugose with 2 longitudinal ridges. Ovipositor slightly shorter than body. Antennae about 30-segmented. Body black; legs yellowish dark brown. Body 5.5–7. Parasite of *Melandrya caraboides* F. (Melandryidae), *Elateroides dermestoides* L., *Lymexylon nodale* L. (Lymexylonidae), *Mycetochara linearis* Ill. (Alleculidae), *Cylus arietis* L., *Callidium violaceum* L. (Cerambycidae). Caucasus (Georgia); Far East (Khabarovsk). Western Europe .....  
 ..... **A. diversicornis** Wesm.

82. **Baeacis** Förster, 1878.—Fifteen species; 3 to 4 species in Europe, others in Madagascar.

- 1 (2). Second abdominal tergite sculptured; 1st rugose with 2 longitudinal ridges. Ovipositor slightly longer than abdomen. Body black, legs reddish dark brown. Body 7–8. Parasite of *Callidium abdominale* Bon., *C. violaceum* L., *Tetropium castaneum* L. (Cerambycidae). Western Europe ..... **B. dissimilis** Nees
- 2 (1). Second abdominal tergite smooth.
- 3 (4). Hind tibiae dark brownish red. Ridges on 1st abdominal tergite weak. Ovipositor slightly longer than body. Antennae 25–26-segmented. Body 3.5–4. Parasite of *Ernobius abietis* F. and *E. angusticollis* Ratz. (Anobiidae). Northwest, west, Ukraine; Western Europe ..... **B. abietis** Ratz.
- 4 (3). Hind tibiae dark brownish, basally with whitish annulus. Parasite of *Exocentrus punctipennis* Muls. (Cerambycidae). Western Europe ..... **B. intermedia** Först.

83. *Taphaeus* Wesmael, 1835.—About 10 species, 5 in the Palearctic.

- 1 (2). Body including head, yellowish dark brown, only propodeum, sides of metathorax, sides of mesonotum and abdominal apex black or dark brown. Antennae about 30-segmented. Ovipositor as long as or slightly shorter than body. First abdominal tergite basally with projecting spiracular tubercle, slightly longer than its width at base. Notaulices rugose, posteriorly broad; sternauli broad and rugose. Body 3—3.5. Altai .....  
 ..... *T. rufcephalus* Tel., comb. n.  
 Lectotype: Female, "Kuznetsk district, Bogaty, 25.VI.1928 (A. Karpov)". Paralectotype: 1 male, details same.
- 2 (1). Body or at least head black.
- 3 (4). Thorax cylindrical, mesonotum at same level with top of posteriorly steeply sloping propodeum, scutellum not rising above level of mesonotum, thorax 2 times as long as high. Second radiomedial cell relatively slightly narrowed anteriorly, often parallel-sided. Head behind eyes slightly narrowed, temples shorter than eyes. Clypeus small, slightly wider than height of face, in middle on anterior margin with weak tubercle; tentorial pits roundish, intertentorial line half tentorio-ocular line. First flagellar segment 1.5 times as long as 2nd, segments in apical third transverse. Face slightly lustrous. Body black; palps and legs dark brownish yellow (cf. also genus *Diospilus*) .....  
 ..... *T. molorchicola* Fi.
- 4 (3). Thorax not cylindrical, mesonotum appreciably raised above level of posteriorly uniformly rounded propodeum, scutellum raised above level of mesonotum, thorax 1.5 times as long as high. Second radiomedial cell anteriorly greatly narrowed (Fig. 82\*: 18). Head behind eyes distinctly narrowed, temples somewhat longer than eyes, clypeus large, broad, 2 times as broad as height of face, in middle on anterior margin lacking tubercle; tentorial pits transverse, intertentorial line roughly equals tentorio-ocular line. First flagellar segment equal to 2nd, segments in apical third square. Face usually distinctly punctate, in any case always more punctate than almost smooth clypeus. Color variable, usually body black with reddish dark brown pronotum, often thorax entirely black, rarely mesonotum

\* [sic.]: an obvious printing error; should read Fig. 92: 18.—General Editor.

as well as 2nd and 3rd abdominal tergites reddish or yellowish dark brown. Body 2.5–4. Parasite of *Orchesia micans* Panz. (Melandryidae). Northwest, center, south; Caucasus (Dagestan, Sochi), Transurals, north Kazakhstan, Baikal Region; Western Europe ..... *T. hiator* Thunb. (*speculator* Hal.)

84. *Diospilus* Haliday, 1833.—About 30 species, of which about 20 are in the Palearctic.

- 157 1 ( 2). Thorax long, 2 times as long as high. Head  $\frac{2}{3}$  as long as wide. Antennae as long as body; first flagellar segment 2 times as long as wide, segments in apical third square, antennae about 30-segmented. Radial cell on forewing more than 1.5 times as long as stigma, not reaching apex. Larger spur of hind tibia  $\frac{1}{3}$ – $\frac{1}{4}$  as long as 1st tarsal segment. First abdominal segment as long as its width at apex or slightly longer. Ovipositor as long as thorax and abdomen together. Upper sides of mesothorax with coarse and deep punctation. Sternauli longer and almost straight. Propodeum and 1st abdominal tergite uniformly and densely rugose, punctate. Body black, legs dark brownish yellow; abdomen somewhat dark brownish. Body 3–4. Parasite of *Molorchus umbellatarum* Schreb. (Cerambycidae), *Agrilus roscidus* Ksw. (Buprestidae). Southeast; Caucasus (Krasnodar Region, Tbilisi); Austria (cf. also genus *Taphaeus*) ..... *D. molorchicola* Fi.
- 2 ( 1). Thorax short, not more than 1.5 times as long as high.
- 3 (18). Thorax entirely black.
- 4 ( 5). First abdominal tergite shorter than its width at apex. Anterior margin of radial cell longer than stigma. Ovipositor very slightly longer than abdomen. Propodeum and 1st abdominal tergite rugose-punctate. Antennae 23-segmented. Legs, except coxae, yellowish dark brown, palps darkened. Body 2.5. Ciscaucasia; Western Europe ..... *D. ovatus* Marsh.
- 5 ( 4). First abdominal tergite not shorter than its width at apex.
- 6 ( 7). Radial cell short, its anterior margin not longer than stigma (Fig. 92: 6). Ovipositor slightly longer than abdomen. Antennae 20–22-segmented. Propodeum with fields like 1st abdominal tergite, slightly sculptured. Palps and legs darkened. Body 2–2.5. Parasite of *Phyllostreta nemorum* L., *Psylliodes chrysocephala* L. (Chrysomelidae), *Ceutorhynchus assimilis* Pk. (Curculionidae). West, northwest, center, south; Kazakhstan; Western Europe ..... *D. morosus* Reinh.

- 7 ( 6). Anterior margin of radial cell longer than stigma (Fig. 92: 7, 19). Abdomen black.
- 8 (15). Anterior margin of clypeus lacking tubercle in middle.
- 9 (10). First abdominal tergite longitudinally rugose. Anterior margin of clypeus rectilinearly broadly incised. Face fairly densely and coarsely punctate. Ovipositor as long as body. Antennae about 30-segmented. Second radiomedial cell anteriorly broadened. Palps and legs dark brownish yellow. Fig. 92: 7, 8. Body 3–5. Parasite of *Xestobium plumbeum* Ill. (Anobiidae), *Byctiscus populi* L. (Attelabidae), *Rhynchaenus salicis* L. (Curculionidae). Center, south; Caucasus; Western Europe ..... **D. rufipes** Reinh.
- 10 ( 9). First abdominal tergite softly sculptured, often smooth in middle. Anterior margin of clypeus broadly rounded. Face almost smooth, lustrous. Antennae 21–25-segmented.
- 11 (12). Ovipositor distinctly shorter than body (but usually longer than abdomen). Palps and legs dark brownish yellow or somewhat darkened. Second radiomedial cell parallel-sided or slightly broadened anteriorly, Fig. 92: 9, 19. Body 2.5–3. Parasite of *Byctiscus betulae* L. (Attelabidae), *Anobium punctatum* Deg., *A. pertinax* L. (Anobiidae), *Ceutorhynchus rapae* Gyll., *C. assimilis* Pk., *C. leprieri* Bris., *C. sulcicollis* Pk., *C. napi* Gyll., *C. contractus* Marsh., *C. pictitarsis* Gyll., *C. pleurostigma* Marsh., *Hypurus bertrandi* Perr., *Magdalis ruficornis* L. (Curculionidae), *Meligethes aeneus* F., *M. viridescens* F. (Nitidulidae), *Psylliodes chrysocephala* L. (Chrysomelidae). North, west, northwest, center, south; Caucasus, Kazakhstan, Central Asia; Western Europe ..... **D. capito** Nees (*oleraceus* Hal.)
- 12 (11). Ovipositor longer than body.
- 13 (14). First abdominal tergite and propodeum smooth, lustrous. First abdominal tergite slightly longer than its width at apex. Body black; palps dark colored; legs yellowish dark brown but hind femora dark. Body 2. England; Yugoslavia ..... **D. productus** Marsh.
- 14 (13). First abdominal tergite and propodeum uniformly and finely rugose-punctate, matte. First abdominal tergite 1.5 times as long as its width at apex. Head transverse, roundedly narrowed behind eyes, half as long as wide, temples shorter than eyes. Antennae 25–27-segmented, in apical part segments moniliform, square, 1st flagellar segment as long as 2nd, 3 times as long as wide. Second and subsequent abdominal



tergites smooth; 2nd and 3rd tergites often dark brown. Fig. 96: 4, 5. Body 2.7–3.5. Southwest; Kazakhstan ..... *D. longicauda* Tobias, sp. n.

Holotype: Female, Lesnoe, west of Odessa 13.VI. 1974 (Kasparyan). Paratypes: female, same place, 12–14.VI.1974 (Kasparyan); 1 female, Moldavia, Kotovskoe, forest edge, 4.VI.1967 (Tobias); 1 female, Kazakhstan, Tarbagatai, southern slope of Zhalaula mountains, northwest of Makanchi, 2.VII.1962 (Tobias).

- 15 ( 8). Anterior margin of clypeus with small tubercle in middle (Fig. 92: 10). Ovipositor as long as abdomen and thorax up to tegulae.
- 16 (17). Head  $2/3$  as long wide, temples longer than eyes. First abdominal tergite rugose-punctate, matte, face densely punctate in middle, matte. Legs and palps dark brownish yellow. Body 4.5. Azerbaidzhan ..... *D. tuberculatus* Abdinb.
- 17 (16). Head half as long as wide, temples shorter than eyes (cf. also couplet 22) ..... *D. kokujevi* Tobias, sp. n.
- 18 ( 3). Thorax with yellowish dark brown pattern at least on pronotum.
- 19 (22). Clypeus in middle of anterior margin lacking distinct tubercle. Second radiomedial cell parallel-sided. Legs and palps dark brownish yellow.

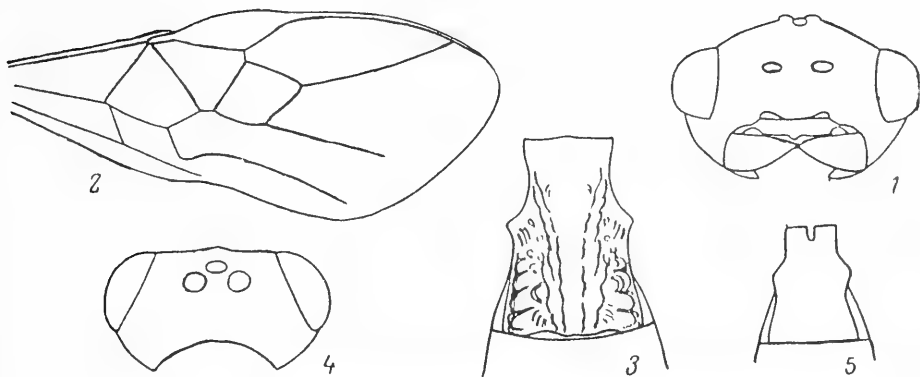


Fig. 96. Helconinae (original).

1–3—*Diospilus kokujevi* sp. n.: 1—head, frontal view, 2—forewing, 3—1st abdominal tergite; 4, 5.—*D. longicauda* sp. n.: 4—head, dorsal view, 5—1st abdominal tergite.

- 20 (21). Ovipositor as long as body. Face weakly sculptured. Mesonotum, pronotum and 2nd and 3rd abdominal tergites yellowish dark brown. Antennae 27–28-segmented. Body 3.5. Parasite of *Diaperis boleti* L. (Tenebrionidae), *Dorcatoma dresdensis* Hbst., *D. chrysomelina* Sturm, *D. setosella* Muls. and Rey., *D. serra* Pz. (Anobiidae) in tinder fungus. Western Europe  
..... **D. ehippium** Nees
- 21 (20). Ovipositor as long as abdomen or slightly longer. Face sculptured. Body black, only pronotum yellowish dark brown. Body 3–3.5. Parasite of *Dorcatoma dresdensis* Hbst., *D. chrysomelina* Sturm (Anobiidae). Center; Western Europe  
..... **D. melanoscelus** Nees
- 158 22 (19). Clypeus in middle of anterior margin with distinct tubercle. Second radiomedial cell anteriorly broadened. Ovipositor as long as body. Antennae 30-segmented (in male 29-segmented) with moniliform, almost roundish segments in apical part; 1st flagellar segment equal to 2nd, both 2.5 times as long as wide. Face punctate in middle, densely or weakly; clypeus rugose-punctate. Notaulices very deep, sculptured. Propodeum rugose, coarse folds forming somewhat distinct undulate transverse ridge. First abdominal tergite with raised spiracular tubercles, 1.5 times as long as its width at apex, rugose-punctate (but sparser than propodeum); in basal third with longitudinal ridges on margins. Second abdominal tergite basally weakly sculptured, remaining tergites smooth. Body black; palps, tegulae, legs and abdomen, except 1st tergite (in male only 2nd and 3rd tergites) dark brownish yellow; pronotum reddish, yellowish below. Antennae yellowish dark brown, apically much darker (in male lighter than in female). Fig. 96: 1–3. Body 4.5 (male 3.7). Yaroslavl Region (cf. also couplet 17)..... **D. kokujevi** Tobias, sp. n.  
Holotype: Female, Yaroslavl'. 26.VI.1894 (Kokuev).  
Paratypes: 1 female, Berdishchino, 24.VI.1894; 1 male, Yaroslavl'. 26.VI.1894; 1 male IV. (? 1886) (Kokuev).

85. **Dyscoletes** Haliday, 1837 (*Microcentrus* Szépl., *Elachistocentrum* Schulz, syn. n.)<sup>1</sup>.—Two species. One European, other North

<sup>1</sup> Synonym of *Elachistocentrum* (= *Microcentrus*) *similis* Szépl. with *D. lancifer* Hal. established from a comparison of the description of the latter (Mason, 1976. *Canad. Entomol.*, 108: 855–858) with personal redescription (manuscript) of the type specimens of *E. similis* Szépl. being preserved in the Hungarian Natural History Museum, Budapest.

American. Both parasites of species of genus *Boreus* (Mecoptera, Boreidae).

- 1 (1). Head almost 1.5 times as wide as mesonotum; temples distinctly roundedly narrowed, as long as transverse diameter of eye. Antennae 26–28-segmented, apically thickened. Notaulices deep, sternauli not developed. Radial vein originating from apical part of stigma, its 1st section much shorter than 2nd. Second radiomedial cell short, distinctly narrowed anteriorly. Greater part of body smooth, black or dark brown, legs yellowish dark brown. Fig. 95: 5–8. Body 2.5–2.7. Parasite of *Boreus hyemalis* L. West (Lithuania); Western Europe .....  
 ..... **D. lancifer** Hal. (*similis* Szépl., syn. n.)

86. **Hellenius** Tobias, 1982.—One species.

- 1 (1). Antennae about 30-segmented. Greater part of body smooth, face with granulose sculpture and coarse transverse folds; notaulices rugose. Body black; mesonotum, abdomen beyond 1st tergite and legs dark brownish yellow. Fig. 92: 11–13. Body 4. Finland ..... **H. semiruber** Hellén

### 7. Subfamily Brachistinae (Calyptinae)

This subfamily is certainly close to Helconinae and is always considered as its tribe. However, in addition to the absence of the 2nd radiomedial vein on the forewing and significantly smaller body size (2–2.5 mm), it is distinguished by a clearly manifest tendency for the fusion of the first few abdominal tergites into a shield. We find a complete series showing this transition from the abdomen of *Eubazus* with completely visible apical tergites (subgenus *Eubazus* s. str.) or partially stretched tergites (subgenus *Brachistes*) to the abdomen with elongate segments but movable, articulated 1st and 2nd tergites (*Aliolus*, *Foersteria*, *Polydegmon*; moreover, in the two latter genera the 2nd and 3rd tergites are strongly enlarged), and finally to the abdomen with entirely fused 1st to 3rd tergites. In the latter case, the shield formed by the tergites with complete sutures (*Triaspis*) or often without sutures may be fairly diverse in shape—oval or ovate with different degrees of elongation, often with projections and denticles at the apex (*Schizoprymnus* and the Nearctic *Urosigalphus*). In members of the last two genera, the ovipositor is usually short; in others, as a rule, somewhat long. Unlike Helconinae, the species of the subfamily Brachistinae, as

far as we know, are egg-larval parasites, mostly of weevils and pulse beetles. There are 12 genera and over 300 species in the world fauna.

*Key to Tribes and Genera*

- 1 ( 8). First three abdominal tergites not forming shield; articulation between 1st and 2nd tergites movable (Fig. 97: 1–6). Sternauli usually smooth. (Tribe Brachistini).
- 2 ( 7). Hind coxae lacking denticle above. Lateral plates (laterotergites) of 2nd and 3rd abdominal segments smooth, obliquely directed inward.
- 3 ( 6). Hind femora of usual shape, lacking distinct border below and lacking keel above. Third abdominal tergite apically lacking transverse folds, less sculptured than 2nd or similar to it.
- 4 ( 5). Third abdominal tergite almost straight on posterior margin, its posterolateral angles nonuniformly roundish (Fig. 97: 1–2), 3rd tergite smooth. Ovipositor often longer than body .....87. **Eubazus**
- 5 ( 4). Third abdominal tergite on posterior margin noticeably rounded, sculptured (Fig. 97: 3). Ovipositor shorter than body ..... 88. **Aliolus**
- 6 ( 3). Hind femora below usually with translucent border and then their upper margin carinate. Third tergite apically with transverse folds (Fig. 98: 2), its sculpture coarser than on 2nd tergite .....89. **Foersteria**
- 7 ( 2). Hind coxae above with denticle. Laterotergites of abdominal segments 1 to 3 sculptured, usually directed vertically downward (Fig. 97: 4–6) .....90. **Polydegmon**
- 8 ( 1). First three abdominal tergites forming shield. Sternauli usually sculptured. (Tribe Triaspidini).
- 9 (10). Abdominal shield of three distinctly visible tergites separated by sutures; 3rd tergite posteriorly not bent under (Figs. 100, 101).
- 10 ( 9). Abdominal shield not divided on tergites, apically often bent forward; if sometimes sutures between tergites visible then only along sides of tergites ..... 92. **Schizoprymnus**

*Key to Species in Genera of Subfamily Brachistinae*

87. **Eubazus** Nees, 1814 (*Calyptus* Hal., *Brachistes* Wesm., *Eubadizon* auct., part.). About 80 species, in the Palearctic about 60. From the fauna of the USSR the key below does not include the Far Eastern

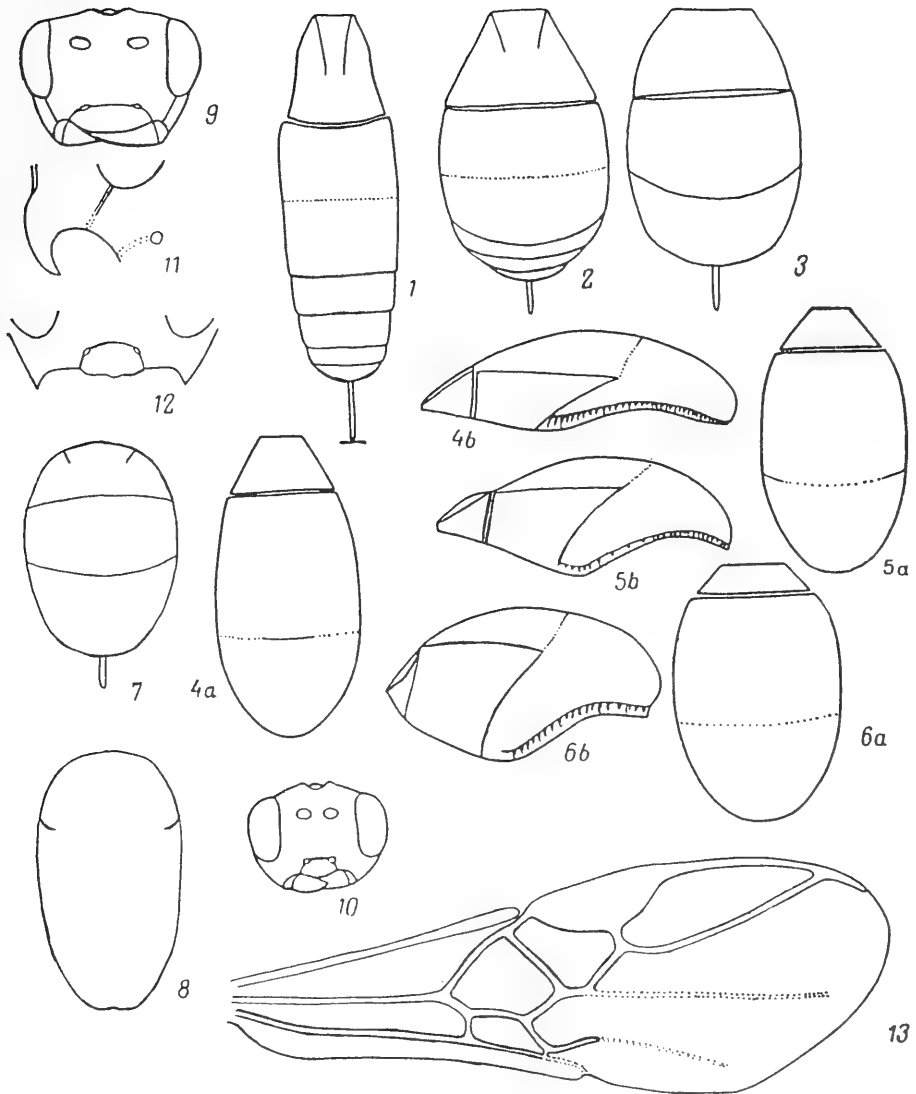


Fig. 97. Brachistinae (from Tobias).

1-8—abdomen (a—dorsal view, b—lateral view): 1—*Eubazus pallipes*, 2—*E. atricornis*, 3—*Aliolus lepidus*, 4—*Polydegnon sinuanus*, 5—*P. marshalli*, 6—*P. foveolatus*, 7—*Triaspis thoracicus*, 8—*Schizoprymnus opacus*; 9, 10—head: 9—*Eubazus tibialis*, 10—*E. vagus*; 11—*E. tibialis*, gena; 12—*E. atricornis*, lower part of head; 13—*Foersteria talitzkii*, forewing.

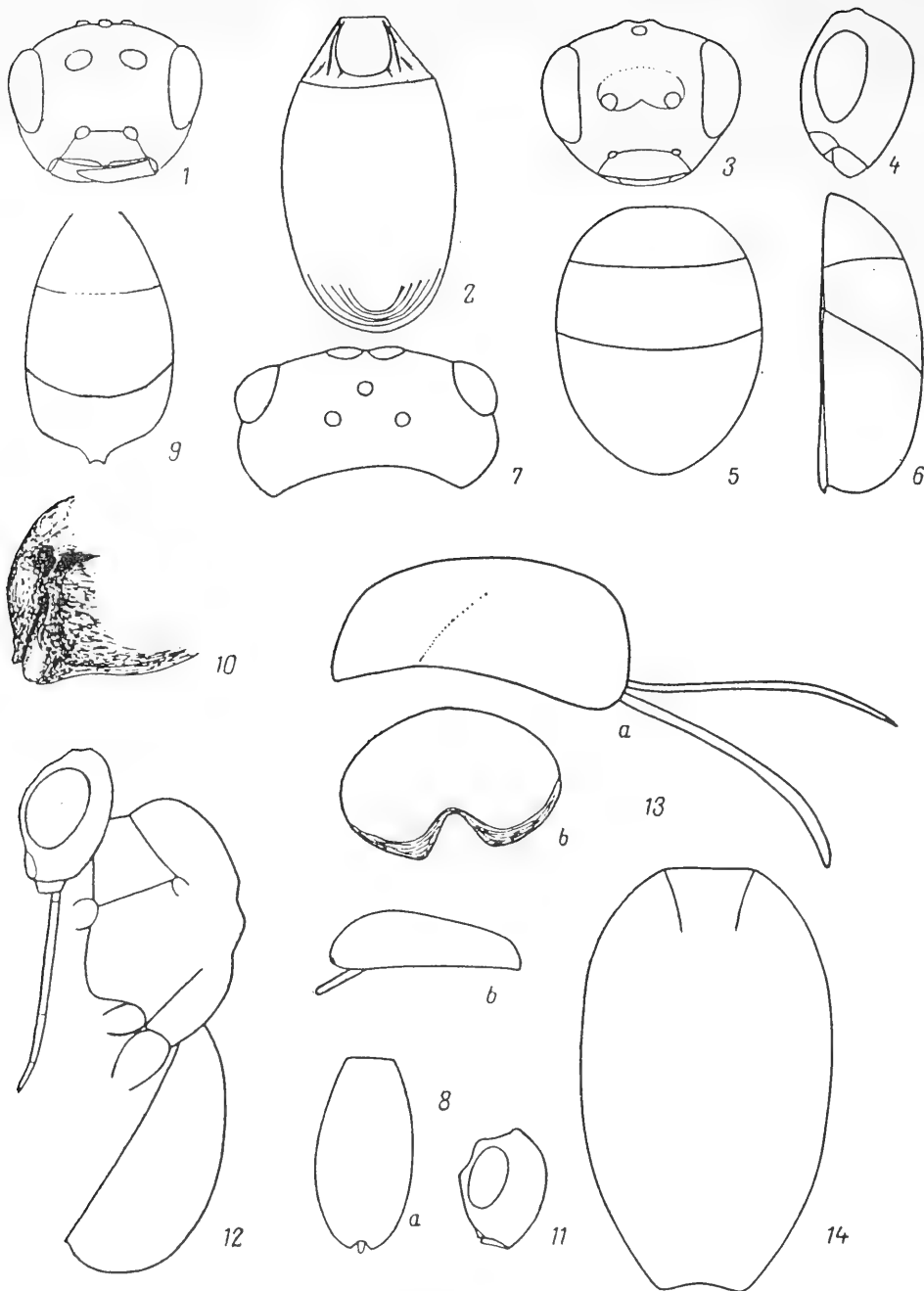


Fig. 98. Brachistinae (from Tobias).

1—*Eubazus talitzkii*, head; 2—*Foersteria talitzkii*, abdomen; 3–6—*Triaspis claripennis*: 3—head, frontal view, 4—head, lateral view, 5—abdomen, dorsal view, 6—abdomen, lateral view; 7—*Schizopyrnnus temporalis*, head; 8—*S. subangustatus*, abdomen (a—dorsal view, b—lateral view); 9, 10—*S. rimosus*: 9—abdomen, 10—abdominal apex; 11—*S. tuberosus*, head; 12—*S. palpator*, body; 13—*S. arcuanus*, abdomen (a—lateral view, b—posterior view); 14—*S. temporalis*, abdomen.

*E. striatus* Shest. and the inadequately described (types, apparently, lost) *E. testaceipes* Grese from Ukraine. These are parasites of beetle larvae; the investigated species are egg-larval parasites.

- 1 (94). Brachial cell on forewing closed (in posterior outer corner adjoining brachial vein). Sternauli usually developed.
- 2 (23). First abdominal tergite appreciably longer, usually more than 1.5 times as long as its width at apex. Abdomen elongate, usually with 6th and 7th tergites visible (Fig. 97: 1). Ovipositor longer than body, rarely slightly shorter. (Subgenus *Eubazus* s. str.).
- 3 (12). Only 1st abdominal tergite somewhat sculptured, remaining tergites smooth. Abdomen shorter than head and thorax together.
- 4 ( 5). Ovipositor shorter than body. First abdominal tergite lacking distinct spiracular tubercles. Antennae 27-segmented. Body black: mouthparts and legs reddish dark brown; coxae, tibiae and tarsi of hind legs darkened. Body 5. Central Europe ..... *E. (E.) aequator* H.-Sch.
- 5 ( 4). Ovipositor noticeably longer than body. First abdominal tergite with distinct spiracular tubercles. Propodeum with somewhat pentangular areola.
- 6 ( 7). Fore- and middle legs dark brownish red, hind legs distinctly darkened. Propodeum somewhat rugose-punctate. Body 2.6. Parasite of *Apion apricans* Hbst. (Curculionidae), *Abdera flexuosa* Pk. (Melandryidae), *Synchita speranda* Rtt. (Colydiidae), *Gracilia minuta* F. (Cerambycidae). Western Europe (cf. also couplet 13) .....  
..... *E. (E.) macrocephalus* Nees (*synchitae* Hedqvist)
- 7 ( 6). Legs yellowish dark brown, hind legs only slightly darker.
- 8 (11). Clypeus distinctly transverse, lacking tubercle in middle on anterior margin. First abdominal tergite 1.5 times as long as its width.
- 9 (10). Propodeum rugose-punctate. Antennae 26–29-segmented (in male 24–29-segmented). Body 3–3.2. Parasite of *Scolytus ratzeburgi* Jans. (Scolytidae). Western Europe .....  
..... *E. (E.) ratzeburgi* Fi.
- 10 ( 9). Propodeum almost smooth, with distinct ridges. Antennae 21–22-segmented. Body 2.3–3.3. Parasite of *Exocentrus punctipennis* Muls. (Cerambycidae). Northwest, center, south; Caucasus; Western Europe (cf. also couplet 95) ..  
..... *E. (E.) flavipes* Hal.

- 11 ( 8). Clypeus slightly transverse, with distinct tubercle in middle on anterior margin. First abdominal tergite less than 1.5 times as long as its width at apex. (cf. also couplet 71) ..  
..... E. (**Brachistes**) **longicaudis** Ratz.
- 12 ( 3). Except 1st and 2nd abdominal tergite with distinct sculpture.
- 160 13 (14). Anterior part of 2nd abdominal tergite smooth, striate only before posterior margin. Antennae 29–30-segmented. First abdominal tergite 2.5 times as long as its width at apex. Body 4. Sweden (cf. also couplet 6) .....  
..... E. (E.) **macrocephalus** Nees
- 14 (13). Second abdominal tergite entirely sculptured or smooth only on posterior margin.
- 15 (18). Females.
- 16 (17). Antennae 34-segmented. Body black; only tibiae, tarsi and forefemora somewhat reddish dark brown, wings darkened. Body 4. East Germany ..... E. (E.) **nigripennis** Dahl
- 17 (16). Antennae 21–24-segmented. Color lighter: legs almost entirely yellowish dark brown, wings light colored. Fig. 97: 1. Body 3–4. Parasite of *Lyctus linearis* Goeze, *L. brunneus* Steph., *L. planicollis* Leconte, *L. canaliculatus* F. (Lyctidae), *Pissodes harcyniae* Hbst. (Curculionidae). Center, east, south; Caucasus (Azerbaijan); Western Europe; North America (cf. also couplets 21 and 79) .....  
..... E. (E.) **pallipes** Nees
- 18 (15). Males.
- 19 (20). Spiracular tubercles on 1st abdominal tergite indistinct or absent. Coxae black. Parasite of *Rhynchaenus quercus* L. (Curculionidae). Italy ..... E. (E.) **orchestidis** Rondani
- 20 (19). Spiracular tubercles on 1st abdominal tergite distinct. Coxae somewhat reddish.
- 21 (22). Antennae 26–30-segmented. Spiracular tubercles distinctly developed. Second abdominal tergite laterally often and posteriorly smooth. Clypeus slightly transverse, with tubercle on anterior margin. Body 3.5–4. (cf. also couplets 17 and 79) ..... E. (E.) **pallipes** Nees
- 22 (21). Antennae 33-segmented. Spiracular tubercles weak. Second abdominal tergite entirely rugose. Body 5. Parasite of *Ernobius nigrimus* Sturm (Anobiidae). Western Europe ..  
..... E. (E.) **rufipes** H.-Sch.
- 23 ( 2). First abdominal tergite not longer or slightly longer than its width at apex. Abdomen usually short, with tergites



starting from 4th or 5th elongate and dorsally not noticeable (Fig. 97: 2). Ovipositor often much shorter than body. (Subgenus *Brachistes* Wesm.).

- 24 (25). Second abdominal tergite square. Ovipositor half as long as abdomen, falcate. Head 1.5 times as wide as mesonotum, behind eyes roundly narrowed; temples as long as transverse diameter of eye; clypeus on anterior margin slightly uniformly convex, half as high as wide; intertentorial line slightly longer than tentorio-ocular line. Antennae 27–28-segmented, with moniliform square segments in apical part; 1st flagellar segment 3 times as long as wide. Thorax half as high as long; sternauli weaker, smooth. Radial cell on forewing narrow, reduced. Hind femora 5 times as long as wide. Abdomen narrow, as long as thorax. Propodeum and 1st abdominal tergite uniformly, softly rugose-punctate; 2nd tergite entirely, more weakly sculptured. Face absolutely smooth, clypeus somewhat sculptured. Body black; palps and legs dark brownish yellow but coxae and tarsi somewhat darkened (in male legs darkened). Wings light colored. Fig. 105: 1, 2. Body 2.5–2.8. Crimea ..... E. (**E.**) **tauricus** Tobias, sp. n.  
 Holotype: Female, Karadag, near forest, 14.V.1972 (Tobias). Paratypes: 2 females, same place, 15.V.1972; 1 male, 11.V.1972, herbage steppe (Tobias).
- 25 (24). Second abdominal tergite transverse; if square, then ovipositor much longer than abdomen, always straight or slightly curved.
- 26 (69). Clypeus broad, not less than 2 times as wide as high; intertentorial line usually much longer than tentorio-ocular line (Figs. 97: 9; 98: 1).
- 27 (28). Sternauli sculptured. Second abdominal tergite smooth. Legs yellowish dark brown (male).
- 27a (27b). Antennae 30-segmented. Propodeum with 3 distinct ridges in lower part. Body 4. Western Europe ..... E. (**B.**) **nasutus** Wesm.
- 27b (27a). Antennae 25-segmented. Propodeum lacking distinct ridges in lower part. Body 3–3.3. Western Europe ..... E. (**B.**) **semicastaneus** Marsh.
- 28 (27). Sternauli smooth.
- 29 (30). Body yellowish dark brown, propodeum and 1st abdominal tergite dark brown, pronotum yellowish; fore- and middle legs and hind femora dark brownish yellow. Genae

- posteriorly with small triangular projection. Radial cell on forewing almost reaching its apex. Face softly punctate, clypeus smooth; propodeum softly rugose-punctate, with transverse ridge; sides of mesothorax, 2nd and subsequent tergites smooth. Body 3.5. Yugoslavia.....
- ..... E. (B.) **bicolor** Szépl.
- 30 (29). Body black or very dark brown, only sometimes abdomen, rarely pronotum with light colored pattern or only thorax light colored and abdomen black; head always black.
- 31 (32). Thorax reddish dark brown; mandibles, lower side of scape and legs similarly colored; head and abdomen (except dark brown base of 1st tergite) black; antennae very dark brown, apically black. Head half as long as wide. Temples longer than eyes. Radial cell reduced, its anterior margin somewhat shorter than stigma. Ovipositor half as long as abdomen. Face weakly punctate, basally with 2 almost smooth semi-circular fields. Body 4.5. Azerbaidzhan .....
- ..... E. (E.) **rufithorax** Abdinb.
- 32 (31). Thorax black, at most pronotum light colored.
- 33 (42). Genae below with uncate projection (Fig. 97: 11). Second abdominal tergite (except in *E. puber*) slightly transverse or square. Ovipositor as long as body or somewhat shorter. Legs yellowish dark brown, coxae somewhat darkened. Antennae about 30-segmented.
- 161 34 (39). Abdomen black.
- 35 (38). Second abdominal tergite smooth, rarely weakly punctate, sometimes lacking longitudinal wrinkles.
- 36 (37). Second abdominal tergite slightly transverse, 3rd tergite smooth. Hind coxae above with longitudinal keel. Fig. 97: 9, 11. Body 3—4.5. Parasite of *Byctiscus betulae* L., *B. populi* L. (Attelabidae). North, west, northwest, center, south; Caucasus, eastern Siberia; Western Europe .....
- ..... E. (B.) **tibialis** Hal.<sup>1</sup>

<sup>1</sup> *E. (B.) tibialis*, in the shape of the abdomen and the presence of the keel along the upper side of the hind coxae, resembles species of the genus *Foersteria* (in them this keel is somewhat masked by the surrounding sculpture) and was considered closer to it and even included under this genus (Mason, 1974. *Proc. Entomol. Soc. Washington*, 76, 3: 235—246). However, it does not show, typical for the genus *Foersteria*, lamellar keels along the lower part of the hind femora and transverse wrinkles at the apex of the 3rd abdominal tergite. For these reasons it has been retained in the genus *Eubazus*.

- 37 (36). Second abdominal tergite distinctly transverse, half as long as wide, 3rd abdominal tergite rugose at apex (male). Body 3.5. Western Europe ..... E. (B.) **puber** Hal.
- 162 38 (35). Second abdominal tergite, often also 3rd, distinctly rugose punctate. Body 3.5–4.5. Northwest, center; Eastern Siberia; Western Europe..... E. (B.) **opacus** Reinh.
- 39 (34). Abdomen with somewhat developed dark brownish yellow pattern at least on sides of 2nd and apex of 3rd tergite.
- 40 (41). Second abdominal tergite in middle with dense and on sides with sparse punctures, in middle sometimes rugose. Ovipositor as long as abdomen and halflength of thorax. Body 3.5. Moldavia; Hungary .... E. (B.) **cingulatus** Szépl.
- 41 (40). Second abdominal tergite smooth or with weak punctation. Ovipositor usually as long as abdomen and thorax together, Body 2.5–3.6. Caucasus ..... E. (B.) **rufiventris** Abdinb.
- 42 (33). Genae lacking uncate projection, sometimes projecting angularly.
- 43 (44). Abdomen, except black 1st tergite, reddish dark brown. Antennae 30-segmented. Ovipositor  $\frac{2}{3}$  as long as abdomen. Second abdominal tergite smooth or with slight sculpture. Body 4. Southwest (Moldavia); Western Europe..... E. (B.) **cruentatus** Ruthe
- 44 (43). Abdomen entirely black.
- 45 (56). Legs, including coxae, yellowish or reddish dark brown.
- 46 (47). Ovipositor shorter than abdomen. Second abdominal tergite smooth. Propodeum weakly sculptured, lustrous with distinctly outlined fields. Abdomen shorter than thorax. Antennae 24–28-segmented. Body 1.8–2.5. Parasite of *Pityogenes bidentatus* Hbst. (Scolytidae). Center, south; Krasnodar Region (Sochi); Western Europe ..... E. (B.) **claviventris** Ruthe
- 47 (46). Ovipositor longer than abdomen; if shorter, then 2nd abdominal tergite rugose.
- 48 (49). Ridges delimiting fields sharp (cf. also couplet 85) ..... E. (B.) **sochiensis** Tobias
- 49 (48). Ridges delimiting fields usually not sharp or barely noticeable.
- 50 (51). Legs dark brownish red. Second abdominal tergite smooth. Ovipositor as long as abdomen and thorax together. Antennae 27–30-segmented. Body 3–4.5. Parasite of *Byctiscus populi* L. (Atellabidae). Center, south (Dnepropetrovsk);

- Kazakhstan, Transbaikal Region, Pacific Coastal Region;  
Western Europe..... E. (B.) **ruficoxis** Wesm.
- 51 (50). Legs with yellowish tinge.
- 52 (55). Second abdominal tergite smooth. Ovipositor not shorter than abdomen.
- 53 (54). Ovipositor as long as body or somewhat shorter. Antennae 20–22-segmented. Body 1.5–2.3. Parasite of *Rhynchaenus ulni* Müll., *R. fagi* L., *R. quercus* L. (Curculionidae). South; Azerbaidzhan; Western Europe .... E. (B.) **minutus** Ratz.
- 54 (53). Ovipositor somewhat longer than abdomen. Antennae 25–29-segmented. Body 2.5–3. Center, south; Caucasus, Kazakhstan; Western Europe (cf. also couplet 59) .....  
..... E. (B.) **nigricoxis** Wesm.
- 55 (52). Second abdominal tergite rugose-punctate. Ovipositor 1/3 as long as abdomen. Abdomen shorter than thorax. Antennae 23-segmented. Body 2. Parasite of *Meligethes aeneus* F. (Nitidulidae). Western Europe .....  
..... E. (B.) **sigalphoides** Marsh.
- 56 (45). At least coxae black.
- 57 (60). Palps pale yellow. Second and subsequent abdominal tergites smooth.
- 58 (59). Ovipositor slightly shorter than abdomen. Antennae 20-segmented. Body 2. Western Europe .....  
..... E. (B.) **fasciatus** Nees
- 59 (58). Ovipositor approximately 1.5 times as long as abdomen. Antennae 25–29-segmented (cf. also couplet 54) .....  
..... E. (B.) **nigricoxis** Wesm.
- 60 (57). Palps somewhat darkened.
- 61 (66). Second abdominal tergite smooth.
- 62 (63). Ovipositor as long as abdomen or shorter. Antennae 20–24-segmented (in male 22–25-segmented). Tentorial pits wide set; intertentorial line much longer than tentoric-ocular line. Femora yellowish dark brown. Body 2–2.5. Center, south; Caucasus (Sochi), Kazakhstan, Central Asia (Kopetdag), Baikar Region; Western Europe ..  
..... E. (B.) **fuscipalpis** Wesm.
- 63 (62). Ovipositor somewhat shorter than body. Femora usually darkened.
- 64 (65). Tentorial pits very deep and broad, close set, intertentorial line shorter than tentorio-ocular line. Antennae 26-segmented, their segments in apical third transverse. Body 3.5–4. Center; Western Europe.... E. (B.) **gallicus** Reinh.

- 65 (64). Tentorial pits small, intertentorial line slightly longer than tentorio-ocular line. Antennae 21-segmented, their segments in apical third square or slightly longer than wide. Body 3. Kola Peninsula; Sweden Finland ..... **E. (B.) lapponicus** Thoms.
- 66 (61). Second abdominal tergite sculptured.
- 67 (68). Ovipositor half as long as abdomen. Femora dark brownish yellow, only basally darkened. Antennae 24–25-segmented. Body 2–3.3. Southwest, Kazakhstan; Central Europe .... **E. (B.) parvulus** Ruthe
- 68 (67). Ovipositor as long as abdomen or slightly longer. Femora of all legs in basal half sometimes entirely darkened. Antennae 24–25-segmented (in male 26-segmented), in female shorter than body, their segments in apical half transverse. Fig. 98: 1. Body 2.6–3.3. Moldavia; Caucasus, Central Asia (western Kopetdag) ..... **E. (B.) talitzkii** Tobias
- 69 (26). Clypeus narrower, usually much less than 2 times as wide as high; intertentorial line approximately as long as tentorio-ocular line.
- 70 (77). Sides of mesothorax punctate.
- 71 (72). Second abdominal tergite smooth. Ovipositor almost 1.5 times as long as body. Antennae 27–29-segmented. Legs yellowish dark brown. Body 2.5–3.5. Parasite of *Scolytus mali* Bechst., *S. rugulosus* Ratz. (Scolytidae), *Byctiscus populi* L. (Attelabidae), *Pissodes notatus* F., *Magdalis ruficornis* L. (Curculionidae). Center, south; Western Europe (cf. also couplet 11) ..... **E. (B.) longicaudis** Ratz.
- 72 (71). Second abdominal tergite sculptured. Ovipositor not longer than abdomen. Legs yellowish dark brown, hind coxae darkened.
- 73 (74). Middle cell on propodeum very sharply delimited. Antennae 29-segmented. Body 2.7. Western Europe ..... **E. (B.) corrugatus** Ruthe
- 74 (73). Middle cell on propodeum weakly delimited by ridges.
- 75 (76). Propodeum laterally with obtuse denticles. Antennae 31–32-segmented. Body 3–4. Parasite of *Pissodes notatus* F., *Magdalis frontalis* Gyll. (Curculionidae). Northwest, center; Western Europe ..... **E. (B.) robustus** Ratz.
- 76 (75). Propodeum laterally lacking denticles. Body 2.5–3. Parasite of *Magdalis violacea* L. Western Europe. .... **E. (B.) rugosus** Ratz.
- 77 (70). Sides of mesothorax smooth.

- 78 (87). Second abdominal tergite at least basally sculptured. Legs yellowish dark brown.
- 79 (80). Ovipositor longer than body. Clypeus slightly transverse with tubercle in middle of anterior margin (cf. also couplets 17 and 21) ..... E. (B.) **pallipes** Nees
- 80 (79). Ovipositor not longer than body; if slightly longer, then clypeus distinctly transverse and lacking tubercles in middle on anterior margin.
- 81 (82). Clypeus slightly transverse with distinct tubercle in middle on anterior margin. Antennae 31–34-segmented. Ovipositor slightly shorter than abdomen. Fig. 97: 2, 12. Body 3.5–5.5. Parasite of *Pissodes notatus* F., *P. pini* L., *P. piceae* Ill., *P. harcyniae* Hbst., *P. validirostris* Gyll. (Curculionidae), *Ips sexdentatus* Börn, *Blastophagus piniperda* L. (Scolytidae). Entire forest zone ..... E. (B.) **atricornis** Ratz<sup>1</sup>.
- 82 (81). Clypeus more transverse, lacking tubercle in middle on anterior margin (Fig. 97: 10). Ovipositor as long as abdomen and thorax together or slightly shorter.
- 83 (86). Second abdominal tergite sculptured only in basal half. Apical abdominal segments projecting after 3rd tergite. Ovipositor slightly shorter than body. Body large: 3–3.5.
- 84 (85). Anterior margin of radial cell longer than stigma. Propodeum densely rugose-punctate (except upper part where sculpture smooth), coarse folds on it slightly raised against background of surrounding sculpture. Antennae about 25-segmented. Center; Kazakhstan; Central Europe ..... E. (B.) **vagus** Ruthe
- 85 (84). Anterior margin of radial cell as long as stigma. Propodeum with coarse longitudinal folds behind sharply transverse ridge, between folds with smooth sculpture. Antennae 21-segmented. Krasnodar District (Sochi) (cf. also couplet 48) ..... E. (B.) **sochiensis** Tobias
- 86 (83). Second abdominal tergite entirely rugose-punctate, sharply contrasting with smooth (shorter) 3rd tergite. Apical abdominal segments concealed under 3rd tergite (abdomen very short; much shorter than thorax). Ovipositor as long as abdomen and halflength of thorax. Head 1.5 times as

<sup>1</sup> In the shape of the clypeus and other features, *E. atricornis* is undoubtedly closer to *Aliolus semirugosus* Nees, differing only by the smooth 3rd abdominal tergite with unseparated laterotergites (cf. note to the genus *Aliolus*).

wide as mesonotum, almost  $1/2$  as long as wide, temples roundly narrowed, noticeably shorter than eyes; face half as high as wide, intertentorial line equal to tentorio-ocular line; clypeus with straight anterior margin,  $3/9$ th as high as wide. Antennae 22-segmented, 13th to 16th segments shortest and transverse, apical segments longer than wide; 1st flagellar segment 4 times as long as wide, segments in apical half moniliform. Thorax 1.5 times as long as high. Anterior margin of radial cell slightly longer than stigma (Fig. 105: 3). Hind femora 4 times as long as wide, hind tibiae much thicker, of same width as middle femora. Body black; palps pale yellow, first 2 antennal segments and legs yellowish dark brown. Body 2.2. Krasnodar Region .....

..... E. (B.) *subvagus* Tobias, sp. n.

Holotype: Female, Sochi (Lazarevskoe), terraced slopes, forest, 5.VII.1974 (V. Tobias).

- 87 (78). Second abdominal tergite smooth.
- 88 (89). Ovipositor 1.5 times as long as body. Tentorial pits deep. Antennae 30-segmented. Body 5. Yugoslavia .....
- ..... E. (B.) *gigas* Fahr.
- 89 (88). Ovipositor not longer than abdomen.
- 90 (93). Legs including coxae yellowish dark brown, hind tibiae and tarsi dark brown. Ovipositor as long as abdomen. Antennae 26–28-segmented.
- 91 (92). Clypeus below middle with transverse furrow, above furrow with deep puncture, smooth below; frons laterally from antennal bases with deep pit. Propodeum with very sharp, uniformly arcuate transverse ridge. Hind femora 3.5 times as long as wide, reddish; yellow bases of hind tibiae distinctly differing from femora in color and contrasting with dark color of greater part of hind tibiae. Head behind eyes distinctly narrowed, temples as long as eyes. Anterior margin of radial cell slightly longer than stigma. Body 4.—Krasnodar Region .....
- E. (B.) *clypealis* Tobias, sp. n.
- Holotype: Female, Sochi (Lazarevskoe), forest along a stream, 18.VI.1979 (Tobias). Paratype: 1 male, details same.
- 165 92 (91). Clypeus lacking transverse furrow, uniformly and coarsely punctate; frons laterally from antennal bases with deep depressions. Propodeum with indistinct undulate transverse ridge. Hind femora 4 times as long as wide, yellowish. Body 2.5–3.5. Parasite of *Scolytus pygmaeus* F., *S.* ? *intricatus*

- Ratz. (Scolytidae), *Exocentrus punctipennis* Muls. (Cerambycidae). Center; Far East; Western Europe .....  
 ..... E. (B.) **angustinus** Ruthe.
- 93 (90). Coxae black, femora yellowish dark brown, hind tibiae darkened. Ovipositor half as long as abdomen. Antennae 30-segmented. Body 3.3–4. Western Europe.....  
 ..... E. (B.) **exsertor** Reinh.
- 94 ( 1). Brachial cell open (brachial vein not developed). Sternauli only as smooth broad depressions. Body elongate. Ovipositor almost 1.5 times as long as body.
- 95 (96). First abdominal tergite smooth or slightly longitudinally striate, 2 times as long as its width at apex. Propodeum sculptured with fields, latter sometimes indistinct. Body black; legs yellowish dark brown (cf. also couplet 10) ...  
 ..... E. (Eubazus) **flavipes** Hal.
- 96 (95). First abdominal tergite densely rugose-punctate, matte, only in middle of apex strongly smooth, lustrous, sculpture, but on sides with thin longitudinal wrinkles; first tergite 1.3 times as long as its width at apex. Propodeum softly rugose-punctate, with somewhat distinctly smooth sculpture in apical half and in middle of posterior half with indistinct transverse ridge. Temples behind eyes distinctly roundly narrowed, half as long as eyes; height of face 1/3 its width; clypeus distinctly transverse, distance between intertentorial line somewhat longer than tentorio-ocular line. Antennae 25-segmented (in small individuals), its apical segments square; first flagellar segment 3.5–4 times as long as wide. Body black; legs dark brownish yellow with light brown hind tibiae and tarsi and very dark brown hind coxae; wings light colored, veins pale brown, stigma dark brown. Fig. 105: 4. Body 2.4–2.8. Voronezh Region .....  
 ..... E. (Eubazus) **xiphydriae** Tobias, sp. n.  
 Holotype: Female, Khopersk preserve, from larvae of *Xiphydria camelus* L., on alder, 12.VI.1971 (V. Tobias).  
 Paratype: Female, details same.

88. **Aliolus** Say, 1836 (*Allodorus* Förster, 1962 Syn. n.)<sup>1</sup>—Forty

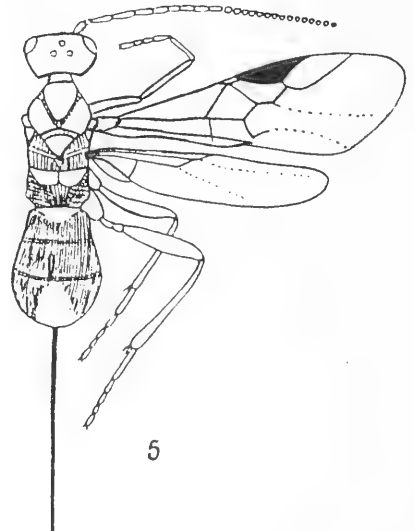
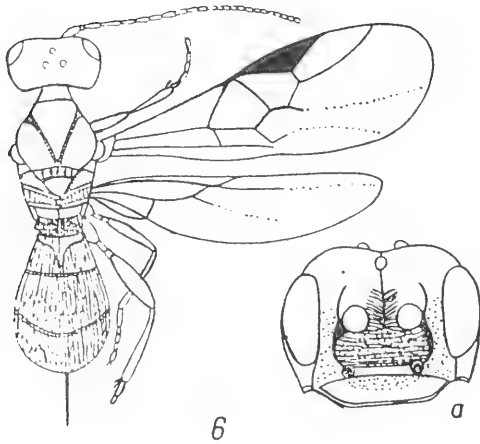
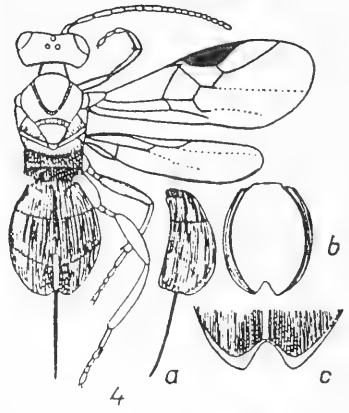
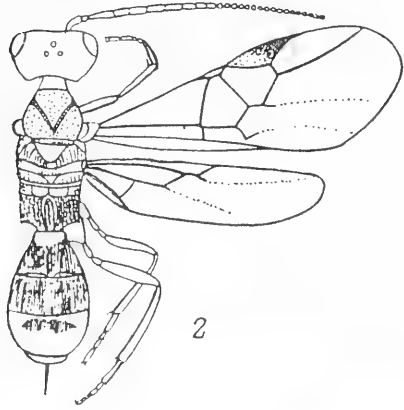
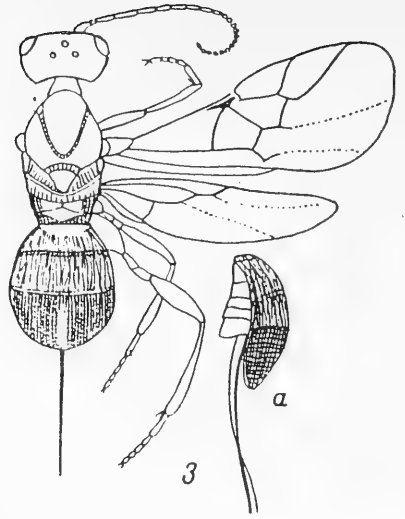
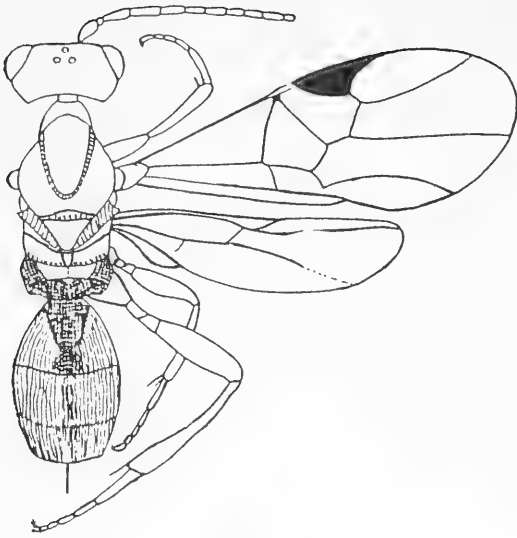
<sup>1</sup>In literature (Mason. 1974. *Proc. Entomol. Soc. Washington*, 76, 3: 235–246), the extreme closeness of *Allodorus* Först with *Aliolus* Say has been reported, in particular its



to 45 species; 12 in the Palearctic, all rare (all given here in new combinations).

- 1 (22). First abdominal tergite uniformly rectilinearly or roundly narrowed toward base, much shorter than width at apex. Clypeus usually distinctly transverse, uniformly rounded on anterior margin (except in *A. semirugosus*), sculptured.
- 2 (19). Thorax (sometimes except pronotum) black; if ventrally light colored (*A. glypturus*), then 3rd tergite apically with transverse furrow.
- 3 ( 4). Face and pronotum in female dark brownish yellow. Ovipositor half as long as abdomen or shorter. Antennae 33-segmented. Fig. 99: 1. (male not known). Body 3–4. Pacific Coastal Region; Czechoslovakia ..... **A. hofferi** Snofl.
- 4 ( 3). Face and pronotum black; if dark brownish yellow, then in male, not in female.
- 5 ( 6). Ovipositor very short, 1/3 as long as abdomen. Third abdominal tergite almost smooth. Antennae 26-segmented. Palps and legs dark brownish yellow. Fig. 99: 2. Body 3–3.5. Czechoslovakia ..... **A. breviseta** Snofl.
- 6 ( 5). Ovipositor long. Third abdominal tergite entirely rugose (if greater part smooth, then clypeus slightly transverse).
- 7 ( 8). Second and third abdominal tergites in middle with longitudinal keel. Ovipositor half as long as abdomen. Antennae 34-segmented. Legs dark brownish red, coxae and trochanter yellowish. Body 4–5: Central Europe .....  
..... **A. carinatus** Nees
- 8 ( 7). Second and third abdominal tergites lacking longitudinal keel.

affinity with the last series of European (not mentioned precisely) species of *Allodorus*. The only difference accepted as a diagnostic character of *Allodorus* (based on the type species *A. semirugosus* Nees) lies in (Mason, 1974) indistinct separation in it, unlike in *Aliolus*, of the apical part of the laterotergite from the dorsal part of the 3rd tergite. This is because of the relatively much weaker sclerotization of the posterior half of the 3rd tergite due to the absence of sculpture on it. However, even in *A. semirugosus* the entire upper part of the 3rd tergite could be sculptured, and then the laterotergites could be separated as sharply as in the American members of *Aliolus* and almost all European species of *Allodorus*. On this is based their synonymization here. *A. semirugosus* is intermediate between genera *Aliolus* (*Allodorus*) and *Eubazus*, differing from *E. atricornis* Ratz. by the somewhat sculptured 3rd abdominal tergite.



- 9 (10). Third abdominal tergite before posterior margin with furrows; posterior margin of 2nd tergite straight. Antennae 22-segmented (in male 28-segmented). Ovipositor half as long as abdomen; in male head, prothorax and lower part of mesothorax dark brownish yellow. Body 5 (male 2.5). Parasite of *Pissodes pini* L. (Curculionidae). Sweden .....  
 ..... **A. glypturus** Thoms.
- 10 ( 9). Third abdominal tergite before posterior margin lacking furrows; posterior margin of 2nd tergite broadly arcuate. Antennae 27–31-segmented. Ovipositor slightly shorter than abdomen or as long as it.
- 11 (12). First abdominal tergite almost smooth between long and straight ridges almost reaching up to its apex, ridges almost smooth; abdominal tergites not punctate, with coarse longitudinal folds. Legs dark brownish yellow, hind femora darkened. Body 4. Czechoslovakia ..... **A. sudeticus** Šnofl.
- 12 (11). First abdominal tergite sculptured between usually shorter and curved ridges.
- 13 (18). Clypeus more than 2 times as wide as high, its anterior margin uniformly convex. Second and third abdominal tergites distinctly sculptured.
- 14 (15). Basal keel of 1st abdominal tergite extending far beyond its middle. Head behind eyes distinctly narrowed. Hind tibiae red. In male as well as female head black. Body 3.5. Finland ..... **A. novatibialis** Shenef. (*tibialis* Hellén)
- 15 (14). Basal keel of 1st abdominal tergite reaching only up to its middle. Head behind eyes not narrowed. Hind tibiae dark brown with yellowish bases.
- 16 (17). Posterior margin of 3rd abdominal tergite in female without notch in middle. In female face and pronotum black, in male yellow. Abdomen as in Fig. 97: 3. Body 3.5–5. Parasite of *Pissodes harcyniae* Hbst. (Curculionidae). West, center, east,

1—*Aliolus hofferi*; 2—*A. breviseta*; 3—*Triaspis lugubris* (a—abdomen, lateral view);  
 4—*T. excisus* (a, b —abdomen, lateral view and ventral view, c—apex); 5—*T. semillissus*;  
 6—*T. devinensis* (a—head).

- south (Ciscaucasia); Georgia, Pacific Coastal Region; Western Europe ..... **A. lepidus** Hal.
- 17 (16). Posterior margin of 3rd abdominal tergite in female notched in middle. Face and pronotum in both male and female black. Body 4.8. West; Czechoslovakia ..... **A. obtusus** Šnofl.
- 18 (13). Clypeus slightly wider, than high, anterior margin with a denticle or tubercle in middle. Third abdominal tergite entirely or only basally sculptured. In female face and pronotum black (male not known). Body 2–3.5. Parasite of *Rhynchaenus quercus* L., *Pissodes notatus* F., *P. harcyniae* Hbst. (Curculionidae). West, north, center, east, south; Caucasus; Western Europe ..... **A. semirugosus** Nees
- 19 ( 2). Thorax with abundant light colored pattern.
- 20 (21). Head, basal half of antennae, sides and legs yellowish dark brown, apical half of antennae, upper part of thorax and abdomen dark brown. Antennae 27-segmented. Second and third abdominal tergites entirely sculptured. Clypeus transverse, uniformly convex on anterior margin, 2.5 times as wide as high. Head behind eyes less distinctly roundly narrowed; temples as long as eyes. Hind tibiae 0.77 as thick as femora (male). Body 3. Azerbaidzhan ..... **A. kusarensis** Abdinb.
- 21 (20). Head black above, dark brownish red in front and below; antennae yellowish dark brown in basal half; thorax yellowish red, only lateral parts almost black; abdomen very dark brown, 1st tergite reddish; legs dark brownish yellow, hind tibiae dark brown. Antennae 24-segmented, in apical third with almost rounded segments. Second and third abdominal tergites rugose-punctate, 2nd tergite with longitudinal folds, 3rd with folds forming concentric semioval, smooth on posterior margin, lustrous. Clypeus slightly wider than high. Head behind eyes more distinctly roundly narrowed, sometimes almost 1/2 of eyes. Hind tibiae half as thin as femora (female). Body 2.8. Krasnodar Region ..... **A. rufithorax** Tobias, sp. n.  
 Holotype: Female, Sochi (Lazarevskoe), forest along stream, 21.VI.1979 (Tobias).
- 22 ( 1). First abdominal tergite basally up to projecting spiracular tubercles weakly narrowed. Clypeus slightly transverse, with denticle on anterior margin, smooth. Head behind eyes distinctly roundly narrowed, temples as long as eyes. Antennae 24-segmented, setiform; segments in apical half longer than wide, 1st flagellar segment 4 times as long as wide.

Radial cell terminating much before wing apex, its anterior margin as long as stigma. Hind femora 5 times as long as wide. First abdominal tergite basally with two distinct close-set ridges reaching up to its middle, 1st tergite noticeably longer than 2nd; suture between 2nd and 3rd tergite almost straight, 2nd and 3rd tergites entirely sculptured; propodeum with coarsely rugose sculpture, laterally with small obtuse denticle on each side. Body black; antennal bases, tegulae and legs dark brownish yellow; apices of hind tibiae and hind tarsi dark brown; palps pale yellow. Body 2.5. Moldavia. ...  
 ..... **A. denticlypealis** Tobias, sp. n.  
 Holotype: Male, Kotovskoe, hawthorn, 28.V.1968 (Talitskii).

89. *Foersteria* Szépligeti, 1896.—Four Palearctic species.

- 1 (2). Abdomen densely rugose-punctate. Ovipositor slightly longer than body. Hind femora elongate, below and above with translucent border. Body black; legs, usually sides and lower part, and base of abdomen yellowish dark brown. Body 3.2–4.2. Center (Voronezh); Kazakhstan; Hungary; Poland .....  
 ..... **F. flavipes** Szépl.
- 2 (1). Abdomen much weakly sculptured, lustrous. Ovipositor not longer than body. Hind femora slightly flattened, lacking translucent border above and below.
- 3 (6). Second abdominal tergite with distinct sculpture.
- 4 (5). Ovipositor shorter than body, 2nd and 3rd abdominal tergites forming abdominal plate with uniform punctation, punctation at apex of 3rd tergite much denser than on 2nd, apex of 2nd tergite with much sparser and weaker punctation. Body black; legs yellowish dark brown, lateral plates of abdominal shield often yellowish, wings distinctly darkened. Figs. 97: 13; 98: 2. Body 2.6–4. Northwest, center, south; Central Ural; Kazakhstan, Transbaikal ..... **F. talitzkii** Tobias
- 5 (4). Ovipositor as long as body. Second and third abdominal tergites with soft punctation. Body including entire abdomen and greater part of legs black; wings hyaline-transparent. Body 3–3.8. Transcaucasus ..... **F. vardzia** Eulikidze
- 6 (3). Second abdominal tergite smooth. Radiomedial vein on forewing with inward directed process of 1st radiomedial cell (obviously aberrant character). Body 4. Hungary; Yugoslavia ..... **F. laeviuscula** Szépl.

167 90. *Polydegmon* Förster, 1862.—Three Palearctic species, distributed in steppes.

- 1 (2). Antennae 30–34-segmented. Lateral plates of 2nd abdominal segment weakly pubescent below (Figs. 97: 4; 106: 11). Ovipositor as long as body. Hind femora not elongate, below with weak keel. Body 2.5–4.7. South; Caucasus, Kazakhstan, Uzbekistan, southern part of Western Siberia; Central Europe .....  
..... *P. sinuatus* Szépl.
- 2 (1). Antennae 24–27-segmented. Lateral plates of 2nd abdominal segment strongly pubescent below (Fig. 97: 5, 6).
- 3 (4). Abdomen as long as head and thorax together, elongateoval (Fig. 97: 5). Ovipositor as long as body. Hind femora not flattened, below with weak keel. Lateral plates of abdominal shield usually weakly sculptured, lustrous. Body 3.2–3.5. South, including Ciscaucasia; Hungary, Yugoslavia .....  
..... *P. marshalli* Szépl.
- 4 (3). Abdomen as long as thorax, short oval (Fig. 97: 6). Ovipositor much shorter than body. Hind femora clearly flattened, below with sharp keel. Lateral plates of 2nd abdominal segment strongly sculptured, matte or slightly lustrous. Body 3.4–3.6. South, east (south of Bashkiria); Kazakhstan, Uzbekistan; Central Europe.....  
..... *P. foveolatus* H.-Sch. (*intermedius* Szépl.)

91. *Triaspis* Haliday, 1835.—More than 80 species, about 40 in the Palearctic.

- 1 (2). Wings darkened. Abdomen fairly distinctly convex, short oval, entirely rugose-punctate, except usually smooth in middle 3rd tergite. First and 2nd tergites with sharp longitudinal folds. Legs darkened. Fig. 99: 3. Body 1.8–3. Central Ural, Kazakhstan, south of Western and Eastern Siberia; Czechoslovakia ..... *T. lugubris* Šnofl.
- 2 (1). Wings light colored.
- 3 (10). Abdomen with light colored pattern, sometimes body entirely red.
- 4 (5). Thorax barely longer than high, mesonotum sharply raised above pronotum. Abdomen short oval (Fig. 97: 7), rugose-punctate. First and 2nd abdominal tergites somewhat longitudinally striate. Ovipositor as long as abdomen or very slightly longer. Body with diffused reddish pattern, rarely

- almost entirely black. Body 2–3.3. Parasite of *Bruchus pisorum* L., *B. lentis* Fröl., *B. rufimanus* Boh., *B. viciae* Ol., *Bruchidius seminarius* L., *B. lividimanus* Gyll., *B. villosus* F. and other species of these genera, *Acanthoscelides obsoletus* Say (Bruchidae). South, Caucasus; Western Europe, introduced in North and South America and Australia .....  
 ..... **T. thoracicus** Curt.
- 5 ( 4). Thorax 1.3–1.5 times as long as high or much longer, mesonotum less sharply sloping toward pronotum. Abdomen longer.
- 6 ( 9). Ovipositor longer than abdomen.
- 7 ( 8). Ovipositor as long as abdomen and propodeum. Color more contrasting: anterior half of thorax and head dark brownish red, remaining part of thorax and abdomen black. Body 3.5. Parasite of *Bruchus pisorum* L., *B. lentis* Fröl., *Bruchidium cisti* Pk. (Bruchidae). Moldavia; Czechoslovakia; Hungary (cf. also couplet 41) .....  
 ..... **T. rugosus** Szépl. (*gibberosus* Szépl., syn. n.)<sup>1</sup>
- 8 ( 7). Ovipositor as long as body. Color less contrasting: head, except dark apex, yellowish dark brown, thorax reddish dark brown, propodeum very dark brown, abdomen black. Body 2.8. Armenia ..... **T. armeniacus** Tobias
- 9 ( 6). Ovipositor as long as abdomen. Abdomen softly punctate. Body black, pronotum and mesonotum up to scutellum red. Body 3. Sweden ..... **T. collaris** Thoms.
- 10 ( 3). Thorax entirely black or dark brownish.
- 11 (12). Abdomen apically with deep notch (Fig. 99: 4), short oval, entirely rugose-punctate, longitudinally striate, with anastomosing folds. Legs yellowish dark brown. Body 2–3.3. South; Kazakhstan; Czechoslovakia ..... **T. excisus** Šnofl.
- 12 (11). Abdomen lacking apical notch or sometimes weakly notched.

<sup>1</sup> *T. gibberosus* Szépl. differs from *T. rugosus* Szépl. only in darker color. Their conspecificity is confirmed by the affinity of type specimen of *T. gibberosus* to the same series isolated from *Bruchus pisorum* L. as for *T. rugosus* (this entire material is preserved in the Hungarian Natural History National Museum, Budapest). In turn, *T. rugosus* differs from *T. thoracicus* Curt. only by longer thorax (usually both parasitize the same host), whose color also varies, sometimes to entirely black, and possibly it is only a variant of the latter.

- 13 (14). Frons very deeply sunken, with sharply raised lateral margins of frontal depression. Radial cell almost reaching wing apex, much longer than stigma. In male face yellow. Legs, palps, and tegulae yellowish dark brown. Fig. 100. Body 3.5–4. West (Lithuania), east (Kirovsk Region); Czechoslovakia ..... *T. cavifrons* Šnofl<sup>1</sup>.
- 14 (13). Frons less sunken, lateral margins of frontal depression not raised. Radial cell falling much short of wing apex, not longer than stigma. In male face black.
- 169 15 (16). Clypeus very broad, intertentorial line more than 2 times as long as tentorio-ocular line. Abdomen with large folds, short oval. Hind tarsi 2/3 as long as tibiae. Legs almost entirely and palps reddish yellow. Fig. 99: 6. Body 3–3.5. Southwest; Dagestan; Czechoslovakia .....  
..... *T. devinensis* Šnofl.
- 16 (15). Clypeus less broad, intertentorial line less than 2 times as long as tentorio-ocular line.
- 17 (36). Ovipositor much longer than abdomen; as a rule, not shorter than abdomen and thorax together.
- 18 (19). Ovipositor 1.5 times as long as body. First abdominal tergite with somewhat projecting spiracular tubercles. Head 1.3 times as wide as mesonotum, distinctly roundly narrowed behind eyes, temples as long as eye. Antennae 19–21-segmented (in male 21–23-segmented), segments in apical part slightly longer than wide. Thorax 1.5 times longer than high, notaulices and sternauli deeper, sculptured; sternauli very long, posteriorly meeting middle coxae. Metacarpal section posterior to radial cell short, 1/3–1/4 as long as anterior margin of radial cell. Hind femora 5 times as long as wide. Abdomen oblong-oval, apically with broad translucent yellowish border. Propodeum uniformly and densely rugose-punctate, on sides with obtuse denticles. Abdominal tergites densely punctate; 1st tergite with longitudinal folds, on 2nd tergite folds much weaker, sinuate, branched, 3rd tergite only basally on sides with weakly developed longitudinal folds.
- 170

<sup>1</sup>van Achterberg (1980. *Entomol. Ber.*, 40, 5: 72–80) separated this species in a special monotypic genus *Dicyrtapsis*. However, the unusual structure of the frons alone is hardly sufficient for this purpose, more so as this character is manifest in a much less distinct form than, for example, in *Dendrospter* and in the closely related genus *Schizopyrnus* there is a species (*S. tuberosus* Tel.) with a similar structure of the frons.



Palps and legs dark brownish yellow, antennae in basal third yellowish, tegulae almost dark brown; wings light colored

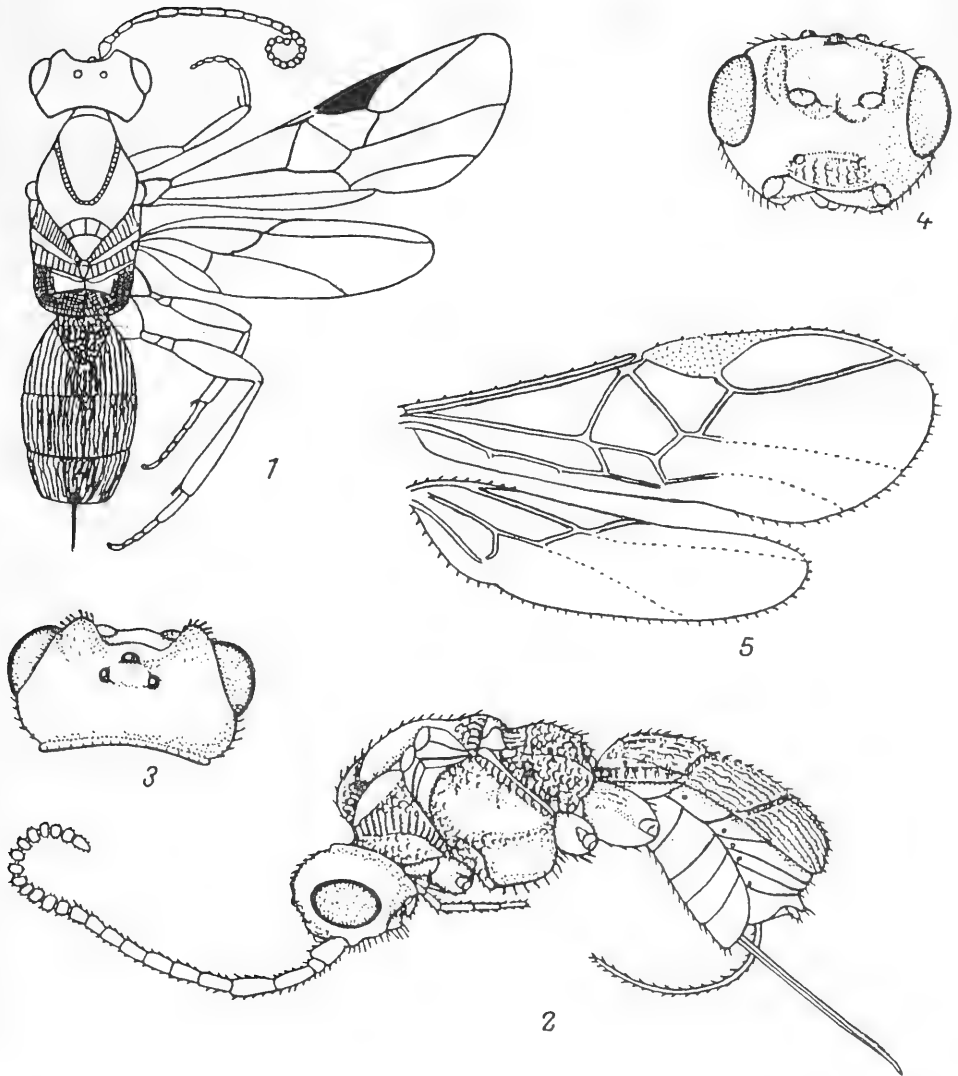


Fig. 100. Brachistinae (from Šnoflak and Achterberg).

1—5—*Triaspis cavifrons*: 1—general appearance, 2—body, lateral view, 3—head, dorsal view, 4—head, frontal view, 5—wings.

Fig. 105: 7–9. Body 2.8–3.8. Western Kazakhstan .....  
 ..... **T. elaeagni** Tobias, sp. n.

Holotype: Female, Ural, from Bostrychidae and *Tetrops* hosts on oleaster, 22.V.1954 (Zakharchenko). Paratypes: 1 female, 4 males, details same; 19 females, 8 males, Dzhanybek, from dry narrow leaved oleaster branches from larva of *Tetrops elaeagni* Plav., 4.X.1975, “hatched in laboratory, winter 1975–76” (G. Lindeman); 8 females, 10 males, Dzhanybek, oleaster, on *T. elaeagni*, VIII.1972 (G. Lindeman).

19 (18). Ovipositor short. First abdominal tergite lacking raised spiracular tubercles.

20 (21). Abdomen very short, almost round. Ovipositor as long as abdomen and thorax together. Antennae 21–24-segmented. Abdomen rugose-punctate, longitudinally striate, 3rd abdominal tergite sometimes almost smooth. Legs and palps dark brownish yellow. Body 1.8–2.5. Parasite of *Bruchus atomarius* L., *B. affinis* Fröl. (Bruchidae), *Rhynchaenus fagi* L., *R. quercus* L., *R. alni* Müll., *R. testaceus* Müll., *Gymnetron tetrum* L., *G. antirrhini* Pk., *Apion aeneum* F., *Anthonomus pomorum* L., *Ceutorhynchus pleurostigma* Marsh. (Curculionidae). Center, south, west (Orenburg); Caucasus, Azerbaidzhan; Western Europe; China .... **T. pallipes** Nees

21 (20). Abdomen longer, oval.

22 (31). Ovipositor as long as body or longer.

23 (24). Ovipositor usually noticeably longer than body. Legs darkened, in greater part dark brown. Abdomen with longitudinal folds, 3rd tergite almost smooth. Antennae 19–22-segmented. Fig. 101: 1. Body 1.4–2.4. Parasite of *Thamnurgus euphorbiae* Küst. (Scolytidae), *Byctiscus populi* L., *B. betulae* L., *Apion assimile* Kby., *A. apricans* Hbst., *A. aestivum* Germ., *Rhynchaenus fagi* L., *R. quercus* L., *Pissodes notatus* F. (Curculionidae), *Bruchidius fasciatus* Ol. (Bruchidae) (in literature reports are available about lepidopterans and dipterans as hosts for this species; apparently, these are erroneous). West, northwest, center, south; Caucasus, Kazakhstan; Western Europe.....  
 ..... **T. caudatus** Nees

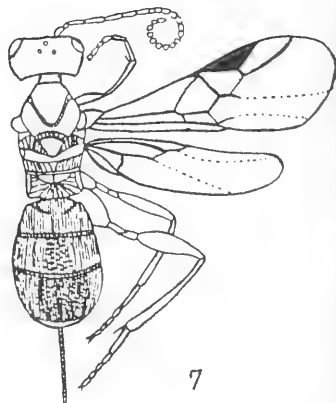
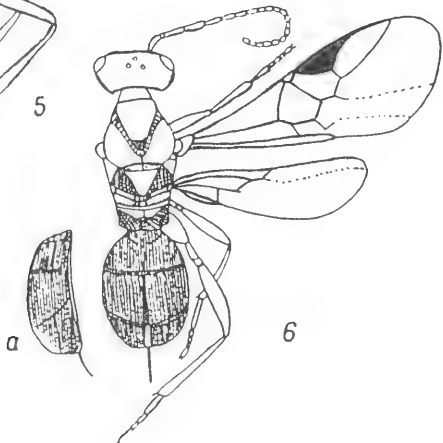
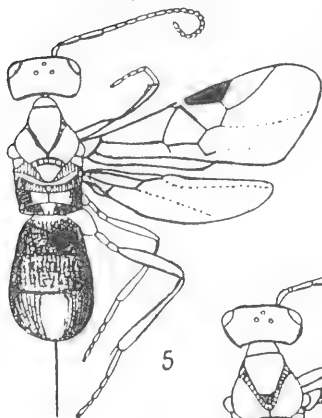
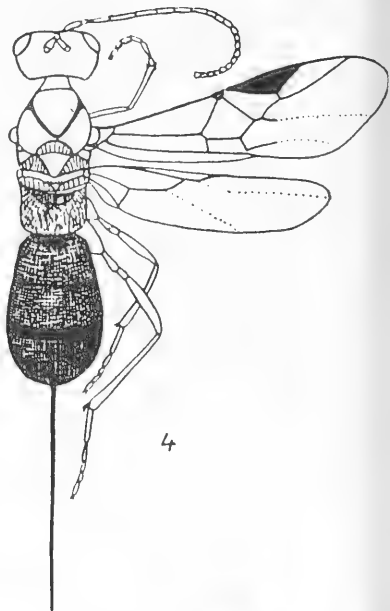
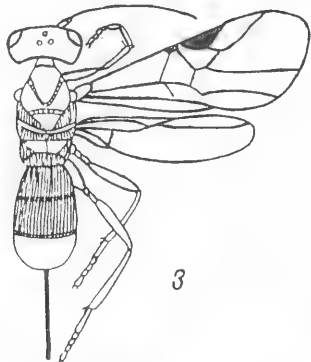
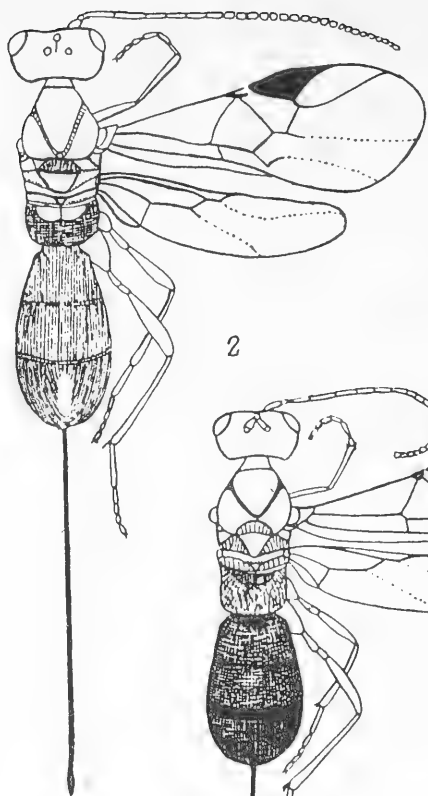
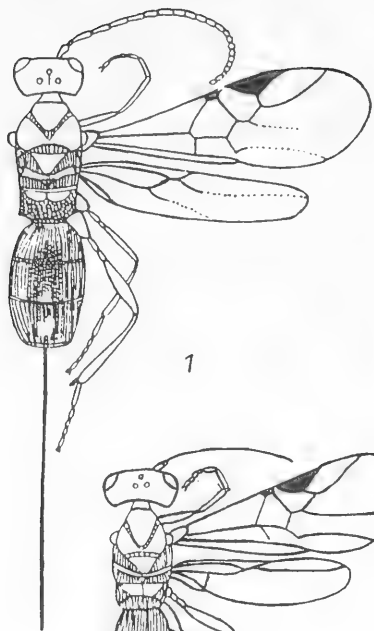
24 (23). Ovipositor as long as body.

25 (30). Third abdominal tergite entirely sculptured.

26 (29). Greater part of legs yellowish dark brown. Abdomen entirely rugose-punctate, with soft longitudinal striation.

- 27 (28). Sternauli deep, sculptured. Antennae 21–29-segmented. Fig. 101: 2. Body 2–3. Parasite of *Pissodes notatus* Hbst., *Magdalis nitida* Gyll., *Apion aeneum* F. (Curculionidae), *Bruchus atomarius* L., *B. rufipes* Hbst., *B. pallidicornis* Schönh., *B. signaticornis* Schönh. (Bruchidae), *Phloeosinus cedri* Bris. (Scolytidae). Northwest, center; Caucasus; Western Europe..... **T. striatulus** Nees
- 28 (27). Sternauli weak, smooth. Body 2. Sweden.....  
..... **T. breviventris** Thoms.
- 29 (26). Legs somewhat darkened. Abdomen uniformly punctate, longitudinal folds weakly developed. Antennae 21–24-segmented. Body 2–2.7. Azerbaidzhan .....  
..... **T. caucasicus** Abdinb.
- 30 (25). Third abdominal tergite only basally softly striate, on greater part smooth. Sternauli broad, densely rugose-punctate. Legs dark brownish with lighter apices of femora and black coxae. Body 2. Finland ..... **T. arcticus** Hellén  
Lectotype: Female, Utsioki, 799 (Hellén).
- 31 (22). Ovipositor shorter than body, usually as long as abdomen and thorax together or slightly shorter.
- 32 (35). Abdomen with longitudinal folds.
- 33 (34). Abdomen with very fine folds, in middle of 3rd tergite smooth, broadest beyond middle, along margin of 3rd tergite with broad translucent yellowish border. Palps dark brown, legs dark brownish yellow. Fig. 99: 5. Armenia; Czechoslovakia ..... **T. semillissus** Šnofl.<sup>1</sup>
- 34 (33). Abdomen with less fine folds, with slightly smooth sculpture in middle of 3rd tergite, broadest in middle, with narrow dark border. Antennae 36-segmented. Body 2.3–3.5. Czechoslovakia ..... **T. sekerai** Šnofl.
- 35 (32). Abdomen nonuniformly softly rugose. Legs, palps and tegulae somewhat darkened. Antennae 21–24-segmented. Fig. 101: 4. Body 3.8. Czechoslovakia .... **T. conjugens** Šnofl.
- 36 (17). Ovipositor at most slightly longer than abdomen, usually as long as or shorter than it.
- 37 (38). First and 2nd abdominal tergite with almost parallel longitudinal folds, punctuation between them very soft, 3rd tergite almost smooth. Antennae 21–22-segmented.

<sup>1</sup> Earlier materials from Armenia ("parasite of maple stamping beetle") (Tobias, 1976. Brakonidy Kavkaza) were included under *T. sekerai* Šnofl.



- Legs yellowish dark brown, palps darkened. Fig. 101: 3. Body 1.8–2.6. Parasite of *Apion rufirostre* F., *A. loti* Kby., *A. longirostre* Ol., *Ceutorhynchus pleurostigma* Marsh., *C. sulcicollis* Pk., *C. sulcatus* Bris. (Curculionidae). Center, Krasnodar Territory (Sochi), Transural; Western Europe, northern Africa ..... *T. floricola* Wesm.
- 38 (37). First and 2nd abdominal tergites with branching and anastomosing folds or punctures between them of same size as folds; sculpture on 3rd tergite less contrasting compared to two preceding tergites.
- 39 (42). Head broadened behind eyes.
- 40 (41). Radial cell long, on anterior margin usually longer than stigma. Abdomen slightly bulged with very narrow dark border, tergites entirely sinuous rugose, only in middle with softer and distinct folds. Intertentorial line not longer than tentorio-ocular line. Face and mesonotum moderately bulged. Tegulae, palps and legs yellowish dark brown. Body 5. Northern and Central Europe ..... *T. thomsoni* Fahr. (*striatulus* Thoms.)
- 41 (40). Radial cell much shorter, on anterior margin not longer than stigma. Abdomen more bulged, with translucent yellowish border along margin of 3rd tergite; tergites softly longitudinally rugose, with smooth sculpture in middle of 3rd tergite. Intertentorial line longer than tentorio-ocular line. Face and mesonotum distinctly bulged. Body black; palps yellowish, legs dark red with darkened coxae and somewhat darkened apices of hind tibiae. Body 3.8 (cf. also couplet 7.) ..... *T. rugosus* var. *gibberosus* Szépl.
- 42 (39). Head behind eyes not broadened.
- 43 (44). Radial cell very short, on anterior margin half as long as stigma. Wings hyaline, light colored, with unpigmented bristles. Antennae 18–20-segmented. Flagellar segments larger than wide in apical part. Abdomen short oval with uniformly rugose-punctate tergites. Thorax short. Palps, basal third of antennae, tegulae and legs dark brownish yellow.

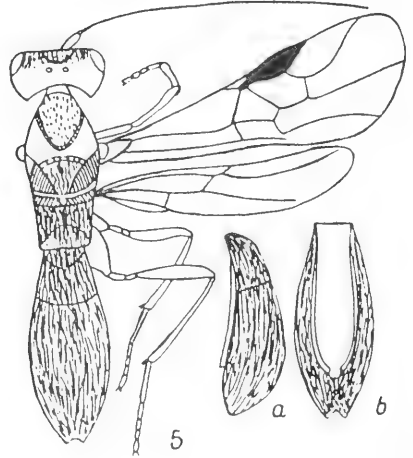
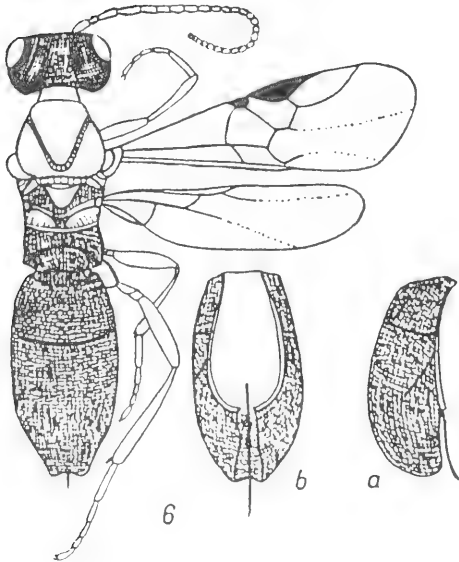
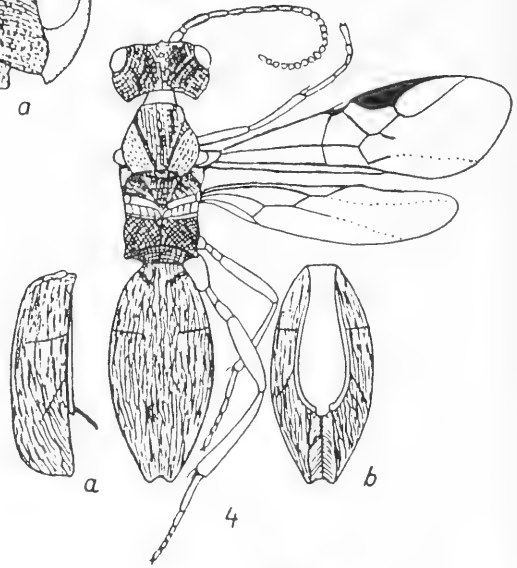
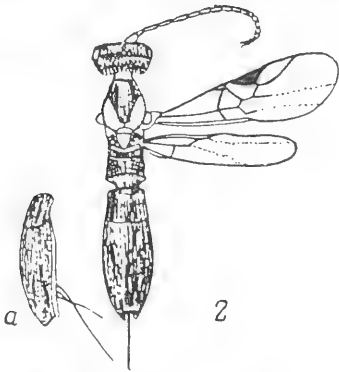
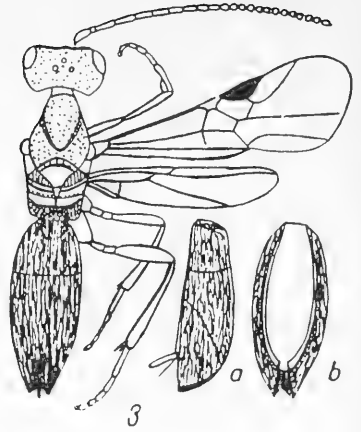
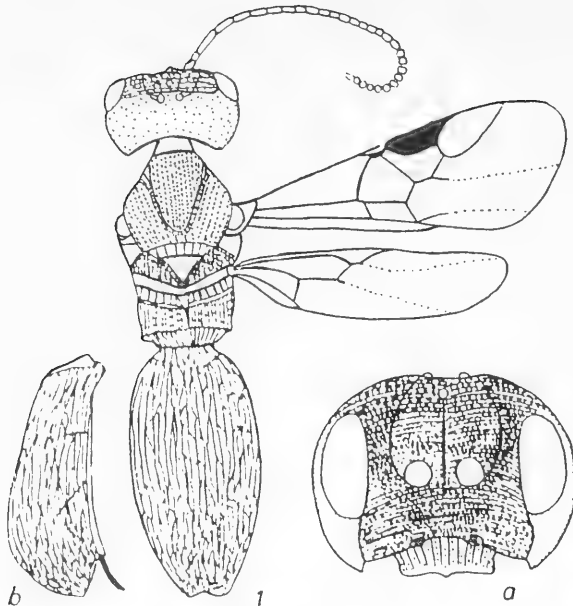
- Fig. 98: 3–6. Body 2.3–2.9. Central Asia .....  
 ..... **T. claripennis** Tobias
- 44 (43). Radial cell much longer, on anterior margin equals stigma or very slightly shorter. Wings usually slightly but distinctly darkened, with somewhat pigmented bristles. Antennae 20–23-segmented, segments in apical third square.
- 45 (46). Section of metacarpus posterior to radial cell very long, almost as long as anterior margin of radial cell. Abdomen elongate oval. Ovipositor as long as abdomen and propodeum together. Body dark brown, propodeum and sides of mesonotum reddish. Head 1.3 times as broad as thorax; temples as long as transverse diameter of eye; clypeus small with small tubercle in middle of anterior margin, 1.5 times as wide as high; intertentorial line very slightly longer than tentorio-ocular line. Apical antennal segments moniliform, transverse. Thorax 1.3 times as wide as high; notaulices and sternauli deep, sculptured. Propodeum softly rugose-punctate, above with two smooth fields separated by longitudinal ridge, abdomen rugose-punctate with longitudinal folds, weakly developed only in middle part of 3rd tergite. Palps, basal third of antennae, tegulae and legs dark brownish yellow. Fig. 105: 5, 6 Body 2.1. Moldavia.....  
 ..... **T. metacarpalis** Tobias, sp. n.  
 Holotype: Female, Dubossary, orchard in the flood-plain, 28.VII.1958 (V. Talitskii).
- 46 (45). Section of metacarpus posterior to radial cell guide short, usually half as long as anterior margin of radial cell. Abdomen short oval (Fig. 101: 5). Ovipositor as long as abdomen or slightly shorter. Body usually black, rarely dark brownish.
- 47 (48). Thorax short, as high as long. Abdomen fairly short and bulged. Antennae 21–23-segmented. Legs reddish dark brown. Fig. 101: 5. Body 3. Parasite of *Anobium rufipes* F., *Ochina pinoides* Marsh. (Anobiidae), *Gymnetron villosulum* Gyll., *Stenocarus fuliginosus* Marsh. *Ceutorhynchus maculata* Hbst. (Curculionidae). Southwest; Western Europe ...  
 ..... **T. aciculatus** Ratz.
- 48 (47). Thorax usually longer, height much less than length.
- 49 (50). Ovipositor one-third or half as long as abdomen. Antennae 20–21-segmented. Legs and palps pale yellow. Fig. 101: 6. Body 2–3. South (Kharkov Region); Czechoslovakia .....  
 ..... **T. flavipes** Ivanov

- 50 (49). Ovipositor more than half as long as abdomen.
- 51 (52). Sternauli deep, sculptured. Ovipositor as long as abdomen, or shorter. Legs and palps yellowish red or somewhat darkened. Antennae 19–23-segmented. Fig. 101: 7. Body 1.5–2.5. Parasite of *Bruchus lentis* Fröl., *B. rufimanus* Boh. (Bruchidae), *Gymnetron antirrhini* Pk., *Ceutorhynchus pictarsis* Gyll., *C. contractus* Marsh., *C. pleurostoma* Marsh., *C. assimilis* Pk., *C. sulcicollis* Pk., *Apion craccae* L., *A. carduorum* Kby., *A. semivittatum* Germ. (Curculionidae). Northwest, center, south; Caucasus, Kazakhstan, Central Asia, Yakutia; Western Europe ..... **T. obscurellus** Nees (*similis* Szépl., syn. n.; ? *flavipalpis* Wesm.)
- 52 (51). Sternauli weak, smooth. Ovipositor longer than abdomen. Legs and palps yellowish red or somewhat darkened. Body 3. Parasite of *Bruchus lentis* Fröl., *B. affinis* Fröl., *B. rufimanus* Boh., *Bruchidius lividimanus* Gyll., *B. villosus* F. (Bruchidae), *Ochina pinooides* Marsh. (Anobiidae), *Hylesinus fraxini* Pz. (Scolytidae). South (Voroshilovgrad). cited from Telenga (1941); Western Europe ..... **T. luteipes** Thoms.

92. **Schizoprymnus** Förster, 1862<sup>1</sup>.—More than 40 species; in the Palearctic more than 35; from the fauna of the USSR the key below does not include the East Siberian *S. dauricus* Tel. The body, as a rule, is black.

- 1 (74). Palps normally developed, not longer than height of head.
- 2 ( 7). Head behind eyes broadened, temples longer than eyes (Fig. 98: 7). Depression on frons reaching behind anterior ocellus. Wings in basal half yellowish. Abdominal shield at apex shifted below by 1/5–1/6 its length (Fig. 102: 1).
- 3 ( 6). Temples, vertex and mesonotum sparsely punctate, lustrous.
- 74 4 ( 5). Temples 1.5 times as long as eyes. Antennae about 30-segmented. Notch on abdominal apex narrow. Femoral apices (of forelegs in apical half) and tibial bases reddish yellow or hind femora entirely black. Fig. 102: 1. Body 4–5. Center, southeast; Caucasus (Armenia), Kazakhstan, Eastern Siberia; Central Europe ..... **S. pallidipennis** Nees

<sup>1</sup> Snoflak. 1952. *Acta entomol. Mus. Nat. Pragae*, 25, 417: 285–395.



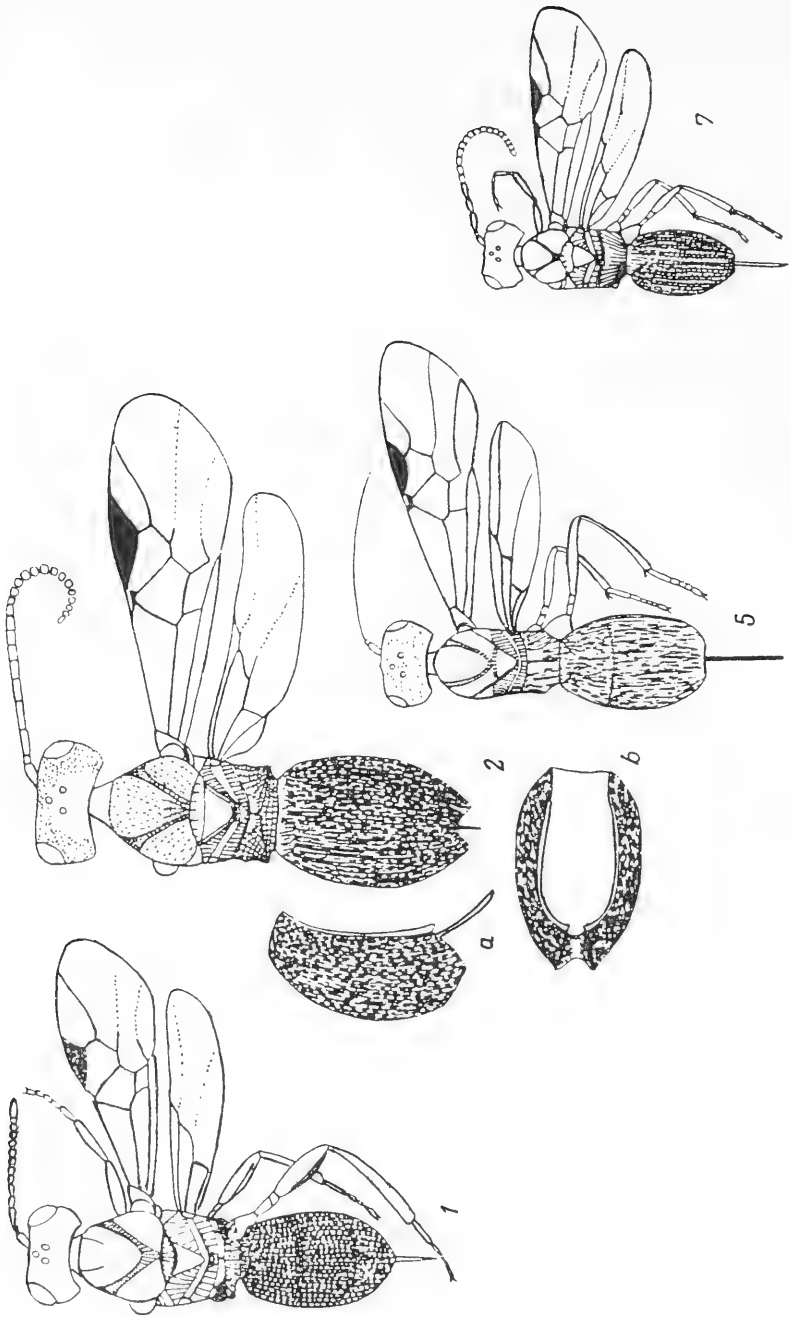


- 5 ( 4). Temples slightly longer than eye (Fig. 98: 7). Antennae about 20-segmented. Notch on abdominal apex wider (Fig. 98: 14). Hind femora entirely, middle femora almost entirely black. Body 3.5. Central Asia .....  
 ..... **S. temporalis** Tobias
- 6 ( 3). Temples, vertex and mesonotum densely punctate, slightly lustrous. Legs usually darkened but often, except coxae, dark brownish yellow. Body 3.8–4.1. Center; Caucasus (Azerbaijan), Kazakhstan (Dzhungarian Alatau); Northern and Central Europe, Mongolia .....  
 ..... **S. crassiceps** Thoms.
- 7 ( 2). Head behind eyes somewhat roundly narrowed, temples usually not longer than eye (if longer, head behind eyes broadened, then margins of frons tuberculately raised: *S. tuberosus*).
- 8 (11). Body well proportioned, abdominal shield apically slightly bent below (Fig. 102: 2). Legs dark colored.
- 9 (10). Ovipositor greatly exerted behind abdominal apex. Head above densely punctate, matte or weakly punctate, lustrous. Fig. 102: 2. Body 2–3. Southwest; Caucasus, Transural, Kazakhstan, Central Asia; Czechoslovakia .....  
 ..... **S. angustissimus** Šnofl.
- 10 ( 9). Ovipositor slightly exerted behind abdominal apex. Head above densely punctate, matte. Body 2–3. West; Caucasus (Azerbaijan), Kazakhstan (Dzhungarian Alatau); Hungary ..... **S. elongatus** Szépl.
- 11 ( 8). Body less well proportioned or abdominal shield posteriorly considerably bent under and extending forward usually by 1/3–1/4 its length.
- 12 (23). Abdominal shield at apex bent under and extending forward by 1/4–1/3 rarely 1/5 its length, apically with a notch between denticulate projections (Figs. 97: 8; 98: 8; 102: 3). Abdomen elongate.
- 13 (16). Abdomen 2.5 times as long as its width in middle, shield posteriorly bent under and extending forward by 1/5 its

1—*Schizoprymnus pallidipennis* (a—head, frontal view, b—abdomen, lateral view);  
 2—*S. angustissimus* (a—abdomen, lateral view); 3—*S. angustatus* (a, b—abdomen, lateral  
 view and ventral view); 4—*S. opacus* (a, b—same as above); 5—*S. nigripes* (a, b—same  
 as above); 6—*S. cataphractus* (a, b—same as above).

- length. Temples weakly punctate, lustrous. Legs, except coxae, in greater part reddish or yellowish dark brown.
- 14 (15). Abdomen toward apex roundly narrowed, widest in apical third (Fig. 98: 8), more softly sculptured, lustrous. Body 2.5. Azerbaidzhan ..... **S. subangustatus** Tobias
- 15 (14). Abdomen toward apex rather sharply narrowed, in apical third narrower than in middle, more coarsely and densely sculptured, matte. Fig. 102: 3. Body 2.5–3.5. Center, southeast; Caucasus (Sochi, Azerbaidzhan), Kazakhstan; Western Europe ..... **S. angustatus** H.-Sch.
- 16 (13). Abdomen shorter, distinctly bent forward. Sculpture on abdomen nonuniform, fairly dense, lacking sharp longitudinal folds.
- 17 (18). Abdominal shield with short folds, appearing sharply striate (in male with clear smooth sculpture), lustrous, bent under by 1/3 its length (in male by 1/5). Temples and vertex almost smooth, lustrous. Femora, except apices of forefemora, black. Fig. 104: 1. Body 3.1. Czechoslovakia ..... **S. cylindricus** Šnofl.
- 18 (17). Abdominal shield with denser and less uniform sculpture, not appearing sharply striate, matte.
- 19 (20). Head and thorax densely punctate, matte (lateral parts of mesonotum sometimes with smooth sculpture). Legs in greater part black or dark brown, apices of femora (forefemora sometimes entirely) dark brownish yellow. Abdomen bent under by 1/3 its length. Figs 97: 8; 102: 4. Body 3.1–4.5. Center, south; Caucasus, Kazakhstan, Western Siberia, Pacific Coastal Region; Western Europe; Mongolia ..... **S. opacus** Thoms.
- 20 (19). Vertex, temples, lateral parts of mesonotum weakly punctate, lustrous.
- 21 (22). Legs dark, only apices of femora somewhat dark brownish yellow. Abdominal shield slightly bent under. Fig. 102: 5. Body 3–4. Center, south; northern Caucasus, Kazakhstan; Western Europe ..... **S. nigripes** Thoms.
- 22 (21). Legs, except coxae, dark brownish or yellowish red. Abdominal shield distinctly bent under. Fig. 102: 6. Body 3.5–4.5. Southeast; Caucasus (Chechen-Ingush ASSR), central Kazakhstan, Central Asia (western Kopetdag); Czechoslovakia ..... **S. cataphractus** Šnofl.

- 23 (12). Abdominal shield at apex not bent under or slightly bent under.
- 24 (25). Radial cell much shorter than stigma. Antennae 14–18-segmented. Abdominal shield not bent under at apex. Suture between 1st and 2nd abdominal tergites, and on sides of shield suture between 2nd and 3rd tergites usually distinct. Ovipositor valves about as long as abdomen. Legs dark. Body 2.2–3.5. Parasite of *Corimalia komaroffi* Fst. (Curculionidae). Center, southeast; Kazakhstan .....  
..... **S. telengai** Tobias
- 25 (24). Radial cell not shorter than stigma.
- 176 26 (27). Abdominal shield apically with lamellar projections as arcs or wide slit with uneven margins (Fig. 98: 9, 10). Antennae 20-segmented with square segments in apical third. Thorax slightly longer than high. Propodeum uniformly rugose-punctate with longitudinal ridge and obtuse denticles on sides; abdomen rugose-punctate, wrinkles forming fine cells, somewhat roundish in the middle part of shield. Legs dark brownish yellow with black coxae and darkened bases of femora (in male, femora with abundant dark coloration, hind femora just apically light colored); wings hyaline-light colored with weakly pigmented veins in basal and middle part of wing. Female 2.8, male 3.5. Central Asia ..... **S. rimosus** Tobias
- 27 (26). Abdominal shield apically lacking lamellar projections.
- 28 (29). Antennae in female very short, 14-segmented; in male 18-segmented. Abdominal shield slightly bent in with weak notch and translucent border at apex, sutures of shield indistinct. Clypeus fairly wide, somewhat narrower than width of face. Abdomen rugose-punctate, wrinkles nonuniform, short. Body very dark brown, legs dark brown. Fig. 103: 1. Body 3.5–4. Spain; Central Europe .....  
..... **S. brevicornis** H.-Sch.
- 29 (28). Antennae longer with greater number of segments (usually 22–23-segmented).
- 30 (35). Clypeus very large and broad, occupying almost entire width of face, uniformly bulged on anterior margin, 2/5–1/4 as high as wide; intertentorial line at least 2 times as long as tentorio-ocular line.
- 31 (32). Pronotum and mesonotum except its posterior part, yellowish red. Clypeus 2.5 times as wide as high. Antennae



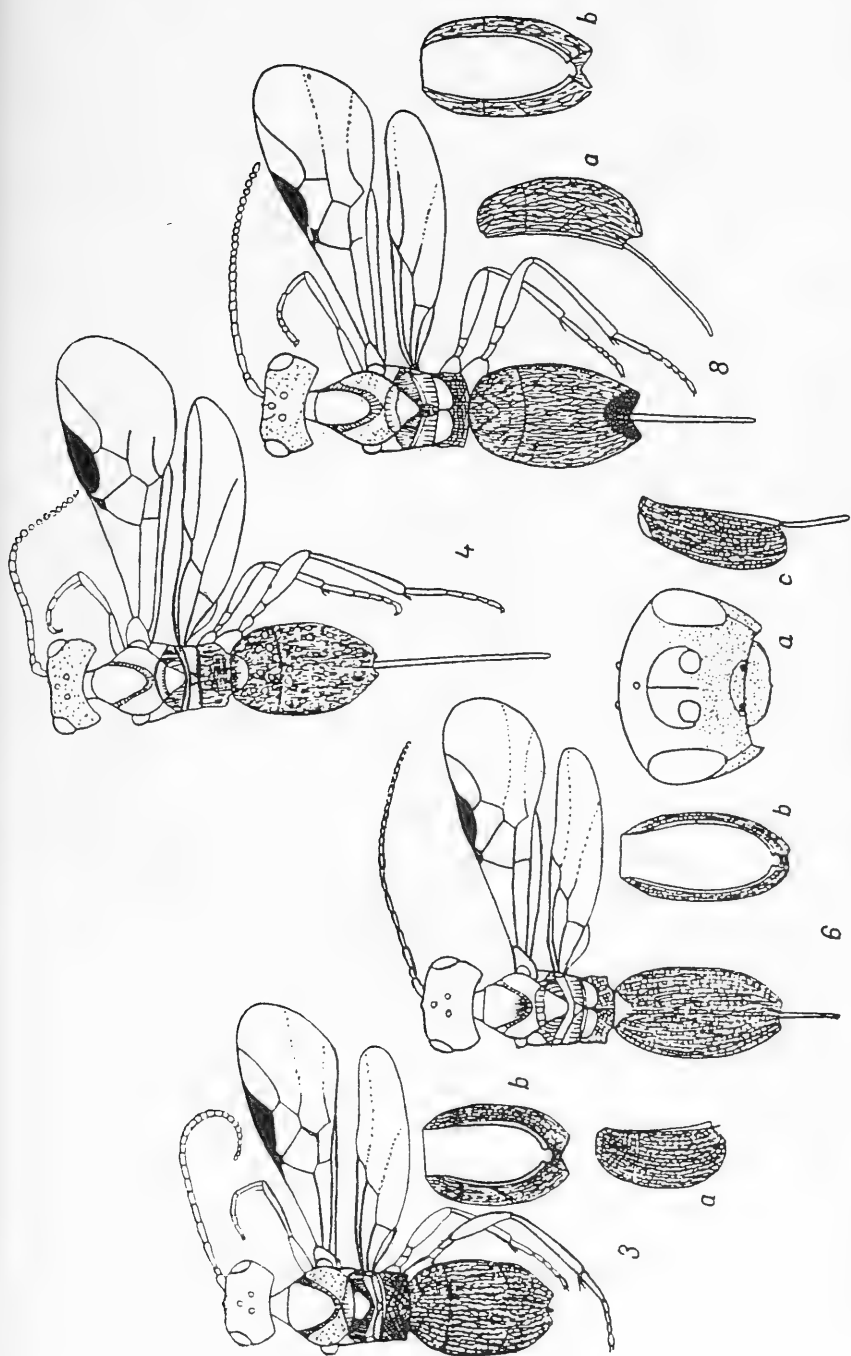
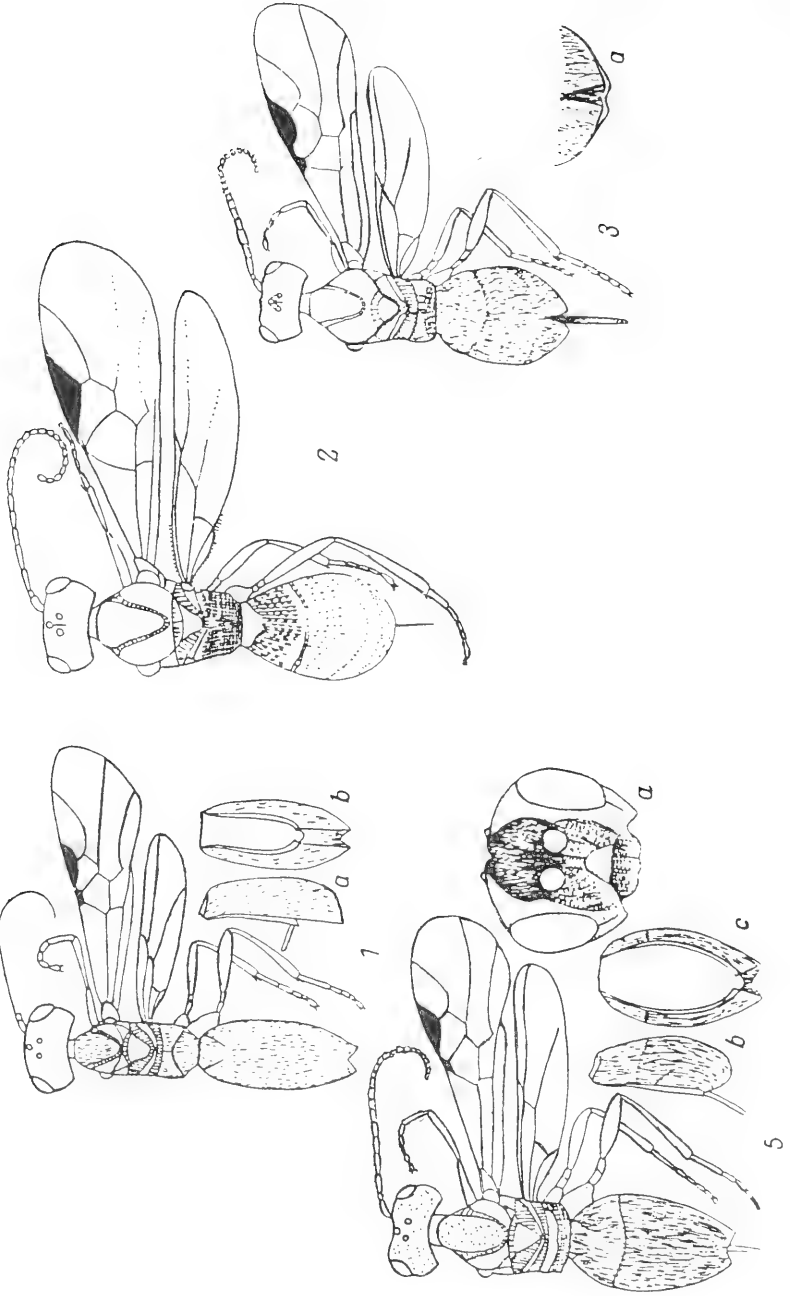


Fig. 103. Brachistinae (from Šnoflák).

1—*Schizopygmyus brevicornis*; 2—*S. bidentatus* (a, b—abdomen lateral view and ventral view); 3—*S. ambiguus* (a, b—same as above); 4—*S. hilaris*; 5—*S. rufipes* (a—head, frontal view, b and c—abdomen, ventral view and lateral view); 6—*S. parvus*; 7—*S. emerignatus* (a, b—abdomen, lateral view and ventral view); 8—*S. emerignatus* (a, b—abdomen, lateral view and ventral view).



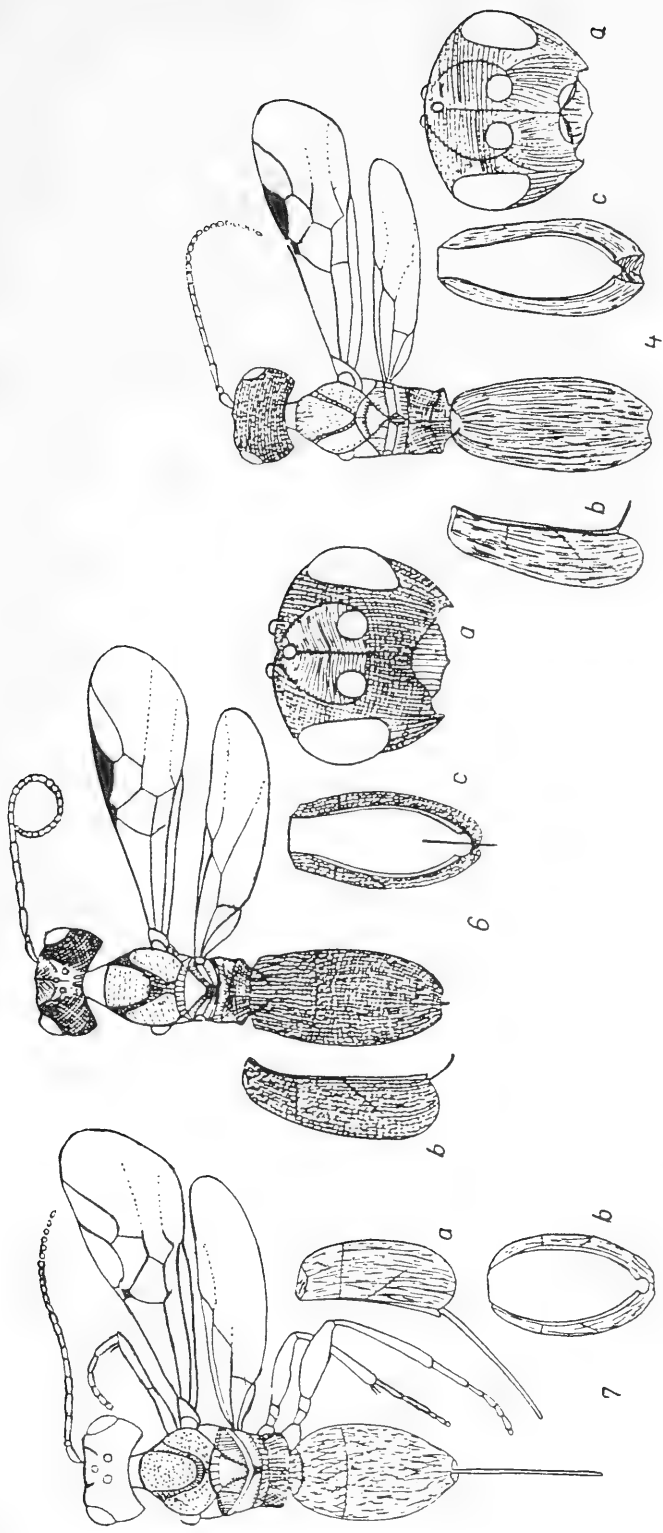


Fig. 104. Brachistinae (from Šnoflák).

1—*Schizopygmyx cylindricus* (a, b—abdomen, lateral and ventral views); 2—*S. glaberrimus*; 3—*S. eurygaster* (a—abdominal apex); 4—*S. luteipalpis* (a—head, frontal view, b and c—abdomen, lateral and ventral views); 5—*S. gregori* (a, b, c—same as above); 6—*S. acataphractus* (a, b, c—same as above); 7—*S. stenopygus* (a, b—abdomen, lateral and ventral views).

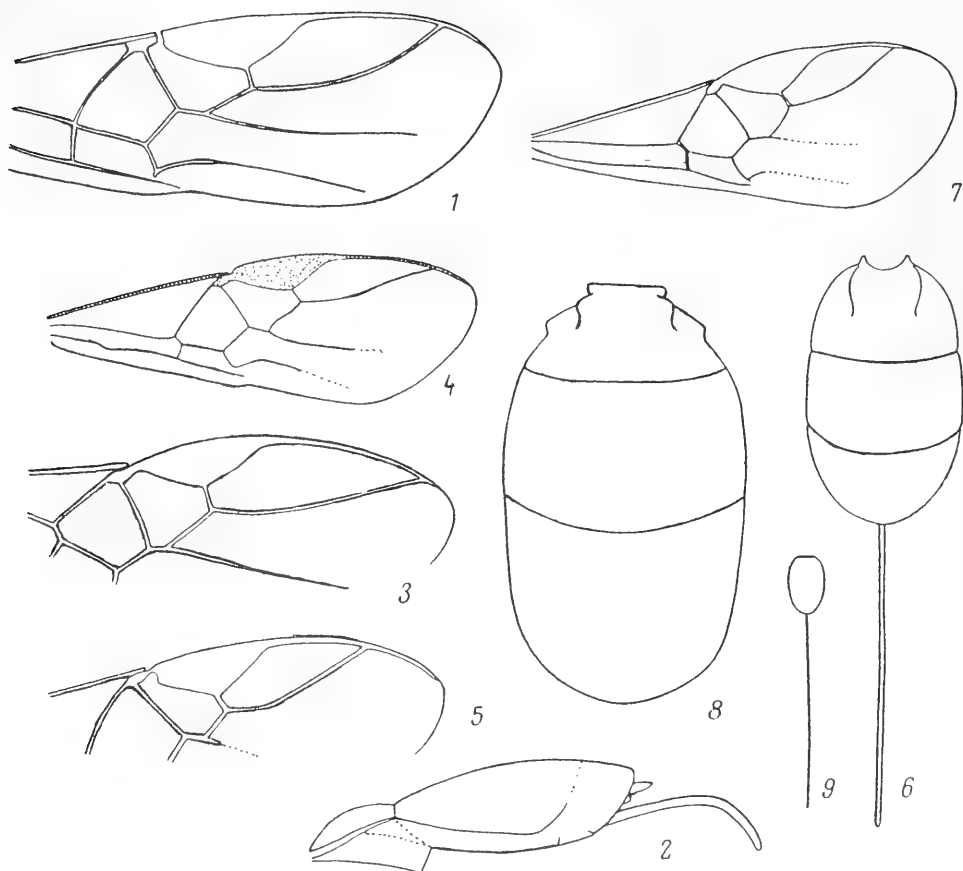


Fig. 105. Brachistinae (original).

1, 2—*Eubazus tauricus* sp. n.: 1—forewing, 2—abdomen, lateral view; 3—*E. subvagus* sp. n., part of forewing; 4—*E. xiphydriae* sp. n., forewing; 5, 6—*Triaspis metacarpalis* sp. n.: 5—part of forewing, 6—abdomen, dorsal view; 7—9—*T. elaeagni* sp. n.: 7—forewing, 8—abdomen, dorsal view, 9—abdomen with ovipositor.

setiform, 30-segmented; segments in apical half moniliform, in middle part of flagellum transverse, in apical third slightly longer than wide. Abdomen with indistinct sutures, apically with small notch. Ovipositor as long as abdomen with propodeum. Face and clypeus fairly coarsely rugose-punctate; propodeum rugose-punctate with arcuate transverse ridge and obtuse denticles on sides; abdomen



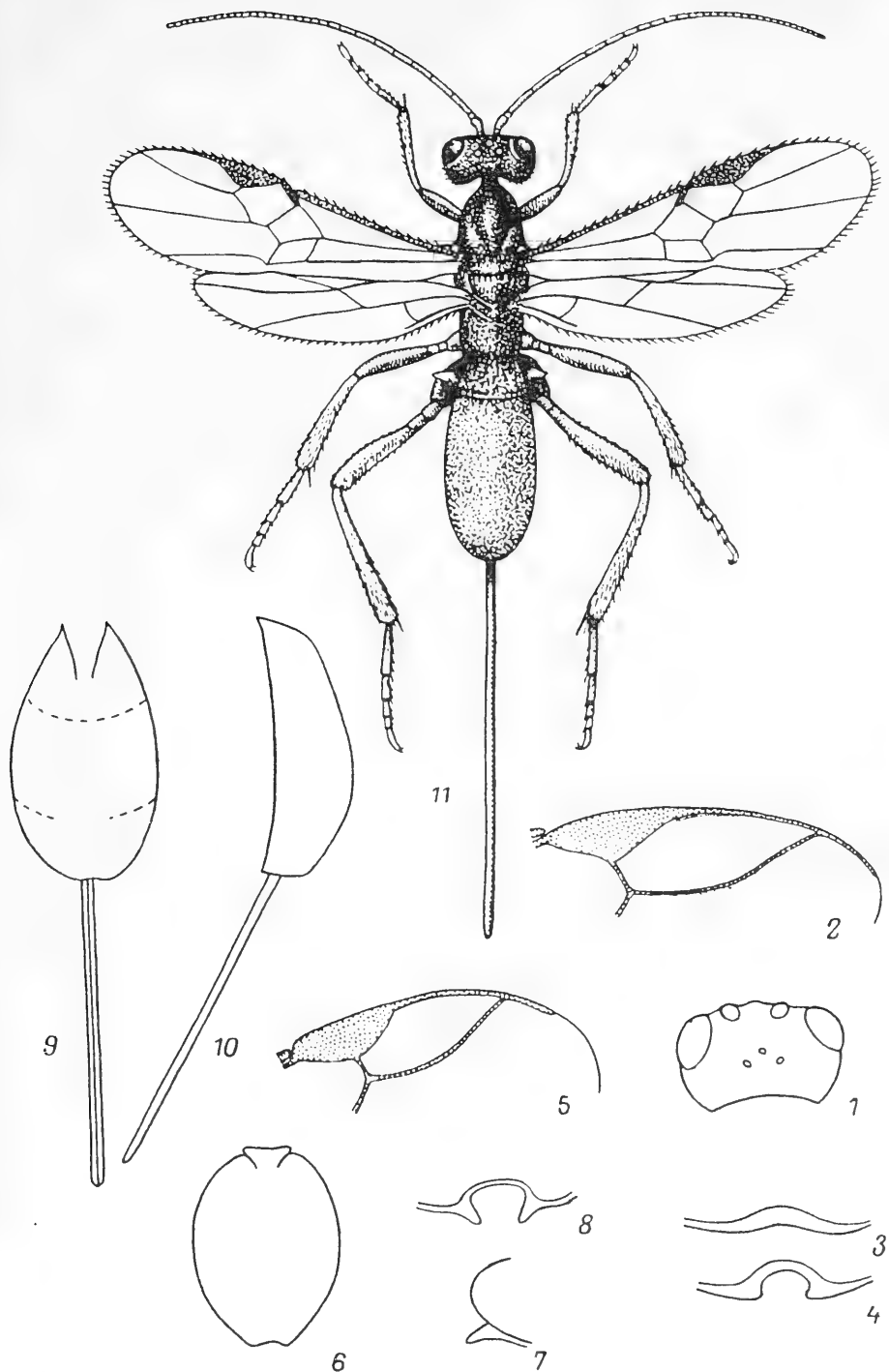


Fig. 106. Brachistinae (from Papp, Jakimavičius and original).

1-3—*Schizopyrmnus distortquatus*: 1—head, 2—part of forewing, 3—apical margin of abdomen; 4—*S. rufipes*, same; 5-8—*S. tantalus*: 5—part of forewing, 6—abdomen, dorsal view, 7—abdominal apex, lateral view, 8—apical margin of abdomen; 9, 10—*S. rubens*: 9—abdomen, dorsal view, 10—abdomen, lateral view; 11—*Polydegnon sinuatus*.

- rugose-punctate with weak sinuate longitudinal folds. Fig. 106: 9, 10. Body 3. Lithuania ..... *S. rubens* Jakim.
- 32 (31). Thorax entirely black.
- 33 (34). Abdomen weakly sculptured, lustrous; face smooth. Tentorial pits very close to eyes. Antennae 25-segmented (in male 27-segmented). Palps dark brown, legs dark brownish yellow, hind femora and tibiae darkened. Fig. 104: 2. Body 3.8 (male 4.3). Center; Czechoslovakia .....  
.....*S. glaberrimus* Šnofl., comb. n.
- 34 (33). Abdomen densely rugose-punctate, face sculptured. Tentorial pits less wideset, intertentorial line only 2 times as long as tentorio-ocular line. Antennae 27–31-segmented (male!). Palps and legs reddish yellow, middle and hind femora dark brownish. Body 3.5. Czechoslovakia .....  
.....*S. sculpturatus* Šnofl.
- 35 (30). Clypeus large, much narrower than width of face, not more than 1/2 as high as wide, tentorial pits wide set, intertentorial line slightly (1.5 times at most) longer than tentorio-ocular line (or roughly equal).
- 36 (45). Body short, abdominal shield short oval, distinctly convex (Fig. 103: 2).
- 37 (38). Abdominal shield apically with 2 large obtuse denticles; denticles on propodeum fairly acute. Between wrinkles on abdominal shield large punctures. Legs in greater part black, apices of femora yellowish dark brown. Fig. 103: 2. Body 3–4.5. Center; Caucasus, Kazakhstan; Hungary ....  
.....*S. bidentulus* Szépl.
- 38 (37). If abdominal apex with projections, then latter more roundish, not denticulate; denticles on propodeum obtuse. Punctures on abdominal shield not distinct.
- 39 (40). Abdominal shield absolutely not bent in, with deep arcuate notch at apex, smooth above notch.
- 39a (39b). Distance between posterior ocelli equals ocellocular distance and almost 2 times that between anterior and posterior ocelli. Face in middle and ocellar field rugose. Notch in posterior part of abdomen somewhat semicircular, below with denticles (Fig. 106: 8), abdomen above it sculptured, matte. Ovipositor valves barely shorter than abdomen. Legs for greater part dark. Antennae 17–19-segmented. Fig. 106: 5–8. Body 1.9–2.2. Hungary, Greece, Turkey ..... *S. tentalus* Papp

- 39b (39a). Distance between posterior ocelli much less than ocellular distance and slightly more than that between anterior and posterior ocelli. Face and ocellar field almost smooth. Notch in posterior part of abdomen semi-oval, below lacking denticles, abdomen above it almost smooth. Eyes elongate, 2 times as long as wide; height of genae very slightly exceeding width of mandible at base. Antennae 19-segmented. Head smooth, face and mesonotum weakly punctate. Ovipositor valves noticeably longer than abdomen. Legs, except coxae, yellowish dark brown. Fig. 98: 13. Body 2–2.5. Center, south; Armenia ..  
 ..... **S. arcuatus** Tobias
- 40 (39). Abdominal shield apically noticeably bent under, with somewhat distinct longitudinal depression or furrow, entirely sculptured. Eyes shorter, their longitudinal diameter 1.5–1.8 times transverse diameter, height of genae not less than 1.5 times width of mandible at base.
- 178 41 (42). Ovipositor short, its valves half as long as abdomen, usually lightly exerted beyond its apex. Legs dark colored in greater part.
- 41a (41b). Antennae 20–22-segmented, 3 times as long as height of head. Fig. 103: 3. Body 2–3.2. West, center, south; Caucasus (Azerbaijan), Kazakhstan (Zaisan), Central Asia (western Tien Shan); Western Europe .....  
 ..... **S. ambiguus** Nees
- 41b (41a). Antennae 17-segmented (in male 17–18-segmented), 2–2.5 times as long as height of head.—Moldavia .....  
 ..... **S. moldavicus** Tobias, sp. n.  
 Holotype: Female, Kotovskoe, 21.VII.1967 (Talitskii). Paratypes: 1 female, Kishinev, 20.VII.1960; 1 male, Plot, 20.VII.1960; 1 male, Kotovskoe, 29.VI.1960; 1 male, Kishinev, 2.VIII.1960 (Talitskii).
- 42 (41). Ovipositor valves almost as long as abdomen, projecting far beyond its apex.
- 43 (44). Abdominal shield at apex noticeably bent under and extending forward ventrally, with broad depression. Legs dark colored or greater part of femora dark brownish red. Center, south; Caucasus, Kazakhstan, Central Asia (western Tien Shan); Central Europe, Iran .....  
 ..... **S. globosus** Szépl.

- 44 (43). Abdominal shield at apex hardly bent under ventrally, with narrow depression. Palps and legs dark. Fig. 104: 3. Body 3–8. Czechoslovakia ..... **S. eurygaster** Šnofl.
- 45 (36). Body longer, abdominal shield longer, less convex.
- 46 (49). Ovipositor valves much longer than abdomen.
- 47 (48). Ovipositor valves as long as abdomen and propodeum together. Antennae 18–25-segmented. Legs dark colored. Fig. 103: 4. Body 2.3–3.3. South; Transcaucasia, Kazakhstan, Central Asia; Czechoslovakia .....  
..... **S. terebralis** Snofl.
- 48 (47). Ovipositor valves longer than body. Antennae 26-segmented. Legs yellowish red, femora and tarsi dark brown. Body 4.5. Central Europe .... **S. longiseta** H.-Sch.
- 49 (46). Ovipositor valves not longer than abdomen.
- 50 (63). Legs, often except coxae, and sometimes except bases of middle and hind femora, yellowish or reddish dark brown (apices of tibiae and tarsi somewhat darkened).
- 51 (52). Frons and sides of eyes with sharp tuberculate elevation (Fig. 98: 11). Abdominal shield posteriorly in lower part bent under with wide notch in middle, its length 2 times its width. Ovipositor slightly exerted beyond abdominal apex. Legs yellowish dark brown. Body 4. Center, south-east; Kazakhstan, Far East..... **S. tuberosus** Tel.
- 180 52 (51). Frons from eye slightly bulged on sides.
- 53 (54). Suture between 2nd and 3rd abdominal tergites distinct. Abdomen apically slightly bent under.
- 53a (53b). Abdomen apically with indistinct notch. Radial cell longer than stigma, metacarpus reaching wing apex. Head behind eyes distinctly roundly narrowed. Legs yellow. Fig. 106: 1–3. Body 3.7. Hungary .....  
..... **S. distortus** Papp
- 53b (53a). Abdomen apically deeply notched. Radial cell not longer than stigma. Legs reddish or dark brownish yellow with darkened coxae. Fig. 103: 5. Body 2.3–4. Parasite of *Bruchidius varius* Ol. (Bruchidae). Center, south; Kazakhstan, Central Asia, Western Europe .....  
..... **S. hilaris** H.-Sch.
- 54 (53). Suture between 2nd and 3rd abdominal tergites absent or indistinct. Head above weakly punctate, lustrous; notch on frons not reaching anterior ocellus (Fig. 103: 6a).
- 55 (62). Abdomen elongate-oval, not less than 2 times as long as wide.

- 56 (57). Propodeum on sides with acute short denticles, with transverse ridge and in middle anterior to it with short longitudinal ridge, sculpture below transverse ridge coarse rugose; temples densely punctate, mesonotum and scutellum coriaceous rugose, slightly lustrous. Abdomen rugose, lacking distinct longitudinal folds. Antennae 24-segmented, in apical part with square moniliform segments. Palps, 1st to 5th antennal segments, tegulae and legs red, coxae and apices of hind tibiae black. Body 4. Kazakhstan .....
- ..... **S. rufiscapus** Tel.<sup>1</sup>
- 57 (56). Denticles on sides of propodeum not developed or obtuse, transverse and longitudinal ridges not developed or weak; temples and mesonotum with distinct punctation, lustrous.
- 58 (59). Abdomen apically deeply notched. Head distinctly transverse. Antennae 21-segmented. Ovipositor not exerted beyond abdominal apex. Body and legs reddish. Body 5. Kazakhstan .....
- ..... **S. grandis** Tel.<sup>1</sup>
- 59 (58). Abdomen apically less deeply notched. Head less transverse. Antennae 24–25-segmented. Body black.
- 60 (61). Notch on frons reaching beyond anterior ocellus. Vertex and temples densely punctate. Palps reddish yellow. Abdomen noticeably broadened apically. Fig. 104: 4. Body 2.7. Czechoslovakia. ....
- ..... **S. luteipalpis** Šnofl.
- 61 (60). Notch on frons not reaching anterior ocellus. Vertex and temples weakly punctate, lustrous. Palps darkened. Abdomen apically not broadened. Figs. 103: 6; 106: 4. Body 2.3–3.3. Central belt, south; Kazakhstan, Central Asia, Far East; Central Europe .....
- ..... **S. rufipes** H.-Sch.
- 62 (55). Abdomen 1.5 times as long as wide, apically fairly deeply sunken. Fig. 103: 7. Body 2.7–4. Central belt; Kazakhstan, Central Asia, Western Siberia; Central and northern Europe .....
- ..... **S. parvus** Thoms.
- 63 (50). Greater part of legs black or very dark brown, femoral apices often light colored.
- 64 (67). Ovipositor barely exerted from abdominal apex. Notch on frons reaching beyond anterior ocellus.

<sup>1</sup>*S. rufiscapus* and *S. grandis* have been included in the key only from their descriptions. Materials of these species (including type specimens) are not available in the collection of ZIN Acad. Sci. of the USSR and possibly the type specimens have been lost.

- 65 (66). Abdominal shield distinctly bent under, with deeper apical depression (Fig. 104: 5c), its sculpture weak, at apex lustrous; vertex and temples weakly punctate. Fig. 104: 5. Body 3.3–3.6. Parasite of *Ceutorhynchus macula-alba* Hbst. and *Stenocarus fuliginosus* Marsh. (Curculionidae). Czechoslovakia ..... **S. gregori** Šnofl.
- 66 (65). Abdominal shield less bent under, apically with weaker depression, its sculpture coarser, at apex entirely matte; temples and vertex somewhat densely punctate.—Fig. 104: 6. Body 4. Czechoslovakia ..... **S. acataphractus** Šnofl.
- 67 (64). Ovipositor as long as or slightly shorter than abdomen.
- 68 (71). Notch on frons reaching beyond anterior ocellus. Body large, about 4.
- 69 (70). Abdominal shield less slightly bent under, lacking distinct projections. Fig. 104: 7. Czechoslovakia ..... **S. stenopygus** Šnofl.
- 70 (69). Abdominal shield posteriorly noticeably bent under, with distinct projections at apex. Fig. 103: 8. Southeast, Central Asia, Western Siberia (Omsk), Transbaikal; Czechoslovakia ..... **S. emerginatus** Šnofl.
- 71 (68). Notch on frons not reaching anterior ocellus. Body small, 2–3.
- 72 (73). Ovipositor valves projecting much less than length of abdomen. Abdominal shield at apex slightly bent under, with somewhat distinct depression. Parasite of *Ceutorhynchus picitarsis* Gyll., *C. sulcicollis* Pk. (Curculionidae). West, northwest, center, south; Caucasus, Kazakhstan, Central Asia, southern Siberia up to Far East; Western Europe, northern Africa, Mongolia ..... **S. obscurus** Nees
- 73 (72). Ovipositor valves projecting almost by length of abdomen. Abdominal shield with deep arcuate notch. Azerbaidzhan ..... **S. azerbaidzhanicus** Abdinb.
- 74 (1). Palps very long, much longer than height of head (Fig. 98: 12). Antennae much shorter than body, 17-segmented. Anterior margin of radial cell as long as stigma. Ovipositor valves  $\frac{2}{3}$  as long as abdomen. Head and thorax punctate, slightly lustrous. Abdominal shield at apex slightly bent under, with small depression in middle. Greater part of legs black, wings light colored. Body 1.8–2.3. Dagestan ..... **S. palpator** Tobias

### 8. Subfamily Euphorinae<sup>1,2</sup>

181 This highly polymorphic subfamily is characterized by only one character, obligatory practically for all its members: the open brachial cell. Insects are small to medium in size (1.5–6 mm), rarely large (9–10). The biology of this subfamily is substantially different from that of other subfamilies in the distinctly developed tendency for parasitization of adult insects (beetles, hymenopterans—bumble bees and ichneumon flies, neuropterans—goldeneyes) as well as of insects with incomplete metamorphosis (bugs and booklice). The morphology of this group exhibits a clearly developed tendency for reduction of wing venation, primarily loss of the 2nd radiomedial vein, disclerotization of the mediocubital vein on the forewing, shifting of venation of the middle part of the wing (short-radial and, if present, 2nd radiomedial cells), formation of the pedicel from the 1st abdominal segment, the appearance of modifications, unusual for other braconids, of antennae and ovipositor (the last three features are obviously associated with adaptation to hosts of diverse biology). There are about 45 genera and over 600 species in the world fauna.

#### *Key to the Tribes and Genera*

- 1 (58). Radial cell on forewing lacking accessory cell (if vein strongly desclerotized, then 2nd radiomedial cell not developed at all). Maxillary palps 4–6-segmented, labial palps always more than one segmented.
- 2 (57). Mandibles small, oral cavity between them and clypeus not developed; head small, much shorter than half length of thorax; antennae not articulated on special projections of frons.
- 3 ( 6). Forewing with 2 radiomedial veins (Fig. 108: 7). First segment of abdomen with somewhat narrow, almost parallel sided pedicel in basal half, broadening from middle to apex, not more than 3 times as long as its width at apex (Fig. 108: 8). Notaulices always distinct, usually deep. Second and 3rd abdominal tergites occupying approximately half (following 1st segment) wider part of abdomen. Median vein on forewing originating from basal (Fig. 108: 7). Parasites

<sup>1</sup> Treatment by V.I. Tobias.

<sup>2</sup> Tobias, 1965. *Entomol. Obozrenie*, 44, 4: 841–865; 1966, 45, 3: 612–633; Shaw, 1985. *Entomography*, 3: 277–370.

- of larvae of lepidopterans, rarely larvae of beetles. (Tribe Meteorini).
- 4 ( 5). Radial cell on hind wing not broadened outward, not divided by cross-vein, radial vein not broken (Fig. 109: 3, 4). Ovipositor usually longer than 1st abdominal tergite ..... 93. **Meteorus**
- 5 ( 4). Radial cell on hind wing broadened outward, often divided by cross-vein, radial vein broken (Figs. 114: 4; 116: 4). Ovipositor usually not longer than 1st abdominal tergite. First abdominal tergite always with longitudinal furrows before its broadened part. Antennae about 40-segmented. Recurrent vein originating from 1st radiomedial cell ..... 94. **Zele**
- 6 ( 3). Usually only one (1st) radiomedial vein developed. If sometimes 2nd radiomedial vein present, then 1st abdominal segment of different structure, uniformly and slightly broadened from base to apex, often very long and thin, combination of other characters different.
- 7 (26). First abdominal tergite lacking thin pedicel in basal half and broadening beyond it. Radial cell on forewing long, reaching wing apex or slightly reduced.
- 8 (15). First abdominal tergite relatively long, not less than 1.5 times (usually 2 to 3 times) as long as its width at apex (Fig. 117: 7), usually somewhat broadened toward apex or parallel-sided (Fig. 121: 9). Mediocubital vein distinctly sclerotized (like or almost like anal and basal veins). First section of medial vein and basal vein originating usually from same or different points of stigma (Fig. 117: 2, 6). Ovipositor thin, with acicular, slightly bent stylet. (Tribe Blacini).
- 9 (10). Forewing with 2 radiomedial veins (Fig. 117: 2, 4). Occipital ridge developed. Propodeum rugose. Brachial cell closed below by weak but distinct vein ..... 95. **Blacometeorus**
- 10 ( 9). Forewing with one radiomedial vein (Fig. 118: 2, 4).
- 11 (14). First radiomedial and discoidal cells divided by vein.
- 12 (13). Occiput and temples not bordered by ridge. Propodeum smooth, with distinctly delineated fields (Fig. 117: 7). Brachial cell on forewing below almost entirely open (Fig. 117: 6). Abdomen distinctly compressed ..... 96. **Ischnotron**
- 13 (12). Occiput and temples bordered by ridge. Propodeum, as a rule, somewhat sculptured, lacking fields or with weakly developed field. Brachial cell below delimited at least at



- base by distinct vein. Abdomen not compressed or slightly compressed .....97. **Blacus**
- 14 (11). First radiomedial and discoidal cells fused. Occiput bordered. Propodeum rugose .....98. **Neoblacus**
- 15 ( 8). First abdominal tergite short, usually not more than 1.5 times as long as its width at apex, either greatly broadened apically or massive and sharply narrowed basally. Mediocubital vein often strongly desclerotized (much weakly sclerotized than anal and basal veins). First segment of medial vein originating usually from basal vein (Fig. 134: 3). Ovipositor with massive stylet in form of curved keel or sabre and wide valves. Parasites of adult beetles. (Tribe Centistini).
- 16 (19). Mediocubital vein sclerotized like or almost like anal and basal veins (Fig. 132: 7).
- 17 (18). Discoidal and 1st radiomedial cells fused (Fig. 132: 5). First abdominal tergite apically broadened, lacking spiracular tubercles (Fig. 132: 7). Ovipositor valves thin (Fig. 132: 1). Tarsi short and thick (Fig. 132: 6) ..... 99. **Spathicopis**
- 18 (17). Discoidal and 1st radiomedial cells separate (Fig. 134: 3). First abdominal tergite behind distinctly projecting spiracular tubercles, not broadened (Fig. 134: 1). Ovipositor valves broad, sabre-like (Fig. 133: 3, 4). Tarsi thin and long (Fig. 133: 5) ..... 100. **Pygostolus**
- 19 (16). Mediocubital vein desclerotized, greatly differing in sclerotization from anal and basal veins. First abdominal tergite uniformly broadened apically, basally above lacking pits and on sides lacking spiracular tubercles. Ovipositor short, with somewhat acuminate stylet.
- 20 (25). Discoidal and radiomedial cells separated (Fig. 134: 3). Notaulices distinctly developed or not developed.
- 21 (22). Notaulices not developed at all. Mesonotum smooth and bulged .....101. **Centistes**
- 22 (21). Notaulices deep, sometimes smooth in middle.
- 23 (24). Hind coxae lacking denticles; claws not split ..... 102. **Ancylacentrus**
- 24 (23). Hind coxae ventrally with apical denticle, claws split ..... 103. **Allurus**
- 25 (20). Discoidal and radiomedial cells not separated. Notaulices not developed ..... 104. **Syrrhizus**
- 26 ( 7). First abdominal segment basally with long thin pedicel (Fig. 134: 19); if pedicel weakly developed, then entire 1st segment very long and thin (Figs. 134: 7; 136: 1). Radial cell

- on forewing often greatly reduced. Parasite of adult insects, sometimes (beetles, bugs) also their larvae.
- 27 (34). First abdominal segment very long and narrow (as long as hind tibia), apically not broadened, usually slightly but distinctly broadened in middle. Forewing often with 2 radiomedial veins, 2nd and 3rd abdominal tergites distinctly developed, concealing or almost concealing apical segments.
- 28 (31). Ovipositor exerted far beyond apex of 6th abdominal sternite. Thorax with fine punctation, lacking reticulate sculpture. Anterior margin of radial cell as long as stigma or slightly shorter. Femora thin. Notaulices distinct. Antennae about 18-segmented. (Tribe Wesmaeliini trib. n.).
- 29 (30). Forewing with 2 radiomedial veins (Fig. 134: 6). Parasites of adult neuropterans of genera *Chrysopa* (Chrysopidae) ..... 105. **Chrysopophthorus**
- 30 (29). Forewing with only one (1st) radiomedial vein. Parasites of bugs of genus *Nabis* (Nabidae) ..... 106. **Wesmaelia**
- 31 (28). Ovipositor short, concealed or barely exerted from apex of 6th abdominal sternite. Thorax with coarse reticulate sculpture. Anterior margin of radial cell distinctly shorter than stigma. Femora thickened. Notaulices not developed. Antennae 18-segmented (Tribe Helorimorphini).
- 32 (33). Forewings with 2 radiomedial veins, recurrent vein postfurcal ..... 107. **Aridelus**
- 33 (32). Forewing with one (1st) radiomedial vein, recurrent vein antefurcal (Fig. 134: 8) ..... 108. **Ussuraridelus**
- 34 (27). First abdominal segment much shorter, distinctly shorter than hind tibia, usually several times shorter than it; if relatively less short than hind tibia, then distinctly broadened apically. Forewing always with one radiomedial vein. Second and 3rd abdominal tergites most often less developed and not concealing apical tergites.
- 35 (36). Clypeus projecting far forward as vizor. Mandibles very long, intersecting, lacking developed denticles, apically obtuse, preapically incised in stepped manner (Fig. 134: 9) (Tribe Proclithrophorini trib. n.) ..... 109. **Proclithrophorus**
- 36 (35). Clypeus of usual shape, not projecting forward. Mandibles not long, touching, not intersecting, apically with 2 denticles.
- 37 (56). Eyes not projecting forward, head (in dorsal view) bulged. Abdomen not compressed. Legs of usual shape, sometimes femora thickened. Mesonotum at least partially or also other thoracic sclerites smooth.

- 38 (51). Mediocubital vein on forewing sclerotized like or almost like anal and basal veins. Ovipositor usually half as long as abdomen, almost straight, rarely reduced or bent under; ovipositor valves long and somewhat broader than stylet. Radial cell on forewing reduced.
- 39 (50). Eyes not pubescent. Venation posterior to basal vein, including recurrent vein normally developed; radiomedial vein originating from radial vein (Tribe Perilitini).
- 40 (45). Scape not enlarged or slightly enlarged, not longer than distance from antennal base to anterior ocellus.
- 41 (42). Head distinctly transverse (2 times as wide as long), behind eyes distinctly, almost rectilinearly narrowed; temples 1/3 as long as eyes (Fig. 137: 1). Scape as long as distance from it to anterior ocellus. Propodeum steeply sloping, its posterior vertical part much larger than anterior horizontal part (Fig. 137: 3). Discoidal cell small, approximately equaling brachial cell, recurrent vein antefurcal, separated from radiomedial vein by its length (Fig. 137: 4). Occiput punctate, scutellum rugose punctate. Parasites of adult beetles of family Coccinellidae ..... 110. **Dinocampus**
- 183 42 (41). Head less transverse, less distinctly narrowed behind eyes, temples long. Scape half as long as distance from it to anterior ocellus. Propodeum uniformly rounded or less steeply sloping, posterior vertical part approximately as much as anterior horizontal. Discoidal cell (if separated from radiomedial cell) almost 2 times as large as brachial; recurrent vein interstitial or weakly antefurcal (Fig. 137: 5, 9). Occiput and scutellum smooth.
- 43 (44). Discoidal and radiomedial cells separated by vein (Fig. 137: 5, 9) ..... 111. **Perilitus**
- 44 (43). Discoidal and radiomedial cells fused (Fig. 139) ..... 112. **Microctonus**
- 45 (40). Scape distinctly enlarged, much longer than distance from it to anterior ocellus.
- 46 (47). Discoidal and radiomedial cells separated by vein. Flagellum clavate, 8-segmented, as long as thorax, 1st and 2nd flagellar segments somewhat longer than wide (Fig. 134: 10). Parasites of adult bark beetles of family Scolytidae ..... 113. **Ropalophorus**
- 47 (46). Discoidal and radiomedial cells on forewing fused. Flagellum not clavate, with large number of small segments.

- 48 (49). Head, sides of thorax and scutellum fairly punctate. Face distinctly narrowed downward, its width in lower part equaling half height of face. Antennal bases not raised on tubercles. Notaulices indistinct. Ovipositor as long as abdomen, straight ..... 114. **Ecclitura**
- 49 (48). Head, sides of thorax and scutellum smooth. Face transverse, not narrowed downward. Antennal bases raised on tubercles. Notaulices deep. Ovipositor short, apically curved upward .. ..... 115. **Streblocera**
- 50 (39). Eyes pubescent. Posterior to basal vein only radial and medial veins normally developed in forewing, recurrent entirely and radiomedial vein partially reduced (Fig. 141: 5). Head slightly transverse, eyes distinctly converging below, maxillary palps 5-segmented, labial palps 2-segmented. Antennae articulated below middle of eyes, 12-segmented, as long as head, thorax and 1st abdominal tergite together. Second and 3rd abdominal tergites strongly developed, suture between them reduced (Fig. 141: 6). (Tribe Cryptoxilonini trib. n.) ..... 116. **Cryptoxilos**
- 51 (38). Mediocubital vein on forewing weakly sclerotized (more weakly than anal and basal veins). Ovipositor shorter than halflength of abdomen, often bent hooklike and with enlarged valves.
- 52 (53). Radial cell on forewing strongly reduced, its anterior margin usually shorter than stigma. First abdominal tergite not larger than hind coxae with trochanters, 2 or 3 times as long as apical width (if 4 to 5 times as long, then parallel-sided). Stylet of ovipositor thin, short, hooklike, ovipositor valves much broader than stylet. (Tribe Euphorini) ..... 117. **Leiophron**
- 53 (52). Radial cell on forewing not reduced or very weakly reduced. First abdominal tergite basally thin, gradually and fairly slightly broadened toward apex (Fig. 134: 13), much longer than hind coxa with trochanter. Stylet of ovipositor usually straight, its valves thin, elongate. (Tribe Syntretini).
- 54 (55). Ovipositor straight. Maxillary palps not longer than height of head. Inner spur of hind tibiae much shorter than halflength of 1st tarsal segment. Forefemora thin, not thinner than middle femur. Wings with short bristles differing in length from those on anterior margin of costal vein, throughout uniformly dense over wing membrane ..... 118. **Syntretus**

- 55 (54). Ovipositor falcate (Fig. 134: 15). Maxillary palps much longer than height of head. Inner spur on hind tibiae half as long as 1st tarsal segment. Forefemora thickened, thicker than middle femur. Wings with long bristles, same as on anterior margin of costal vein; bristles on median cell sparser than on basal vein. Body entirely smooth ..... 119. **Falcosyntretus**
- 56 (37). Eyes sharply projecting forward, head frontally arcuate (Fig. 134: 16). Abdomen compressed (Fig. 135: 7). Legs very thin and long (Fig. 135: 19, 20). Thorax entirely densely punctate, matte. (Tribe Loxocephalini) ..... 120. **Loxocephalus**
- 57 ( 2). Mandibles very large, geniculate on outer side, broad oral cavity developed between them and reduced clypeus (Fig. 134: 17); head massive, more than half as long as thorax. Antennae articulated on special projections on frons. Last section of cubital vein straight (Fig. 134: 18). Parasites of adult beetles of family Scolytidae. (Tribe Cosmophorini). .. 121. **Cosmophorus**
- 58 ( 1). Radial cell on forewing with accessory cell (Fig. 134: 20); sometimes vein dividing them not developed, in that case veins distinctly sclerotized but then 2nd radiomedial cell distinct (Fig. 147: 2). Maxillary palps 2–3-segmented, labial palps 1–2-segmented. Parasites of adult ants. (Tribe Neoneurini).
- 59 (64). Palps lacking spatulate segment.
- 60 (63). Antennae somewhat shorter than body; 16–18-segmented, basal segments of flagellum 2 to 3 times as long as wide.
- 61 (62). Antennae 16-segmented. Maxillary palps 2-segmented, labial palp 1-segmented. Radial cell on forewing with cross-vein, separating accessory cell (Fig. 134: 20). First abdominal tergite with raised spiracular tubercles. Mesonotum lacking coarse, deep punctures ..... 122. **Neoneurus**
- 182 62 (61). Antennae 18-segmented. Maxillary palps 3-segmented, labial palps 2-segmented. Radial cell on forewing lacking cross-vein (Fig. 147: 2). First abdominal tergite lacking spiracular tubercles. Mesonotum with coarse deep punctures ..... 123. **Euneoneurus**
- 63 (60). Antennae short, not longer than head and thorax together, 13-segmented in female, 14-segmented in male; basal segments of flagellum somewhat longer than wide ..... 124. **Elasmosoma**

- 64 (59). Palps with spatulate segments (Fig. 147: 16). Maxillary and labial palps 2-segmented. Antennae 15- or 22-segmented. Mesonotum with coarse deep punctures. Cross-vein not developed on radial cell (Fig. 147: 12) .....  
 ..... 125. **Parelasmosoma**

*Key to Species in Genera of Subfamily Euphorinae*

93. **Meteorus** Haliday, 1835<sup>1</sup>—About 200 species, of which 50 in the Palearctic. They are parasites of caterpillars of lepidopterans, rarely larvae of beetles concealed under tree bark (as a rule) or in fungi. From the fauna of the USSR the Key below does not include the East Siberian *M. baicalensis* Tel.

- 1 ( 10). Second abdominal tergite sculptured, 1st abdominal tergite in basal third with two deep pits.
- 2 ( 3). Head above up to occipital ridge and thorax, except smooth middle part of scutellum, with coarse and fairly dense punctation, weakly lustrous. Head behind eyes distinctly narrowed, temples somewhat shorter than eye, face half as high and wide. Antennae 30-segmented. Mesonotum in middle with longitudinal ridge. Recurrent vein slightly post-furcal. First abdominal tergite 1.8 times as long as its width at apex, dorsal pits located anterior to its middle. Ovipositor valves somewhat longer than half length of abdomen. Propodeum coarsely reticulate-rugose; 1st abdominal tergite longitudinally rugose, 2nd delicately longitudinally striate. Body dark brownish yellow with dark brownish lower side of thorax, propodeum and 1st abdominal tergite; stigma yellow. Body 7–8. Central Asia (cf. also couplet 118) .....  
 ..... **M. politutele** Shenef. (*politus* Tel.).  
 Lectotype: Male, Uzbekistan SSR, Guzar, V.1929 (species described also from female; obviously only male preserved).
- 3 ( 2). Head above and greater part of mesonotum smooth (sometimes mesonotum only with delicate punctation), lustrous. Stigma dark brown, light only basally or along anterior margin.

<sup>1</sup>Schmiedeknecht. 1897. *Ill. Wochenschr. Entomol.*, 2: 150–154, 173–175, 184–190, 204–207, 221–223, 298–302; Fischer, 1970. *Wiss. Arbeiten Bgld. Eisenstadt, Österreich*, 44: 254–300; Huddleston, 1980. *Bull. Brit. Mus. (Nat. Hist.)*, 41, 1: 1–58.

- 4 ( 9). Temples not shorter or somewhat shorter than transverse diameter of eye. First abdominal tergite massive, lacking distinctly separated pedicel, with deep furrows at base (Fig. 107: 5). Recurrent vein antefurcal. Ocelli small. Claw lacking basal prominence. Body black.
- 5 ( 8). Temples not shorter than eye, somewhat bulged (Fig. 107: 1, 3). Mandibles with distinctly upturned surface.
- 6 ( 7). Propodeum divided by sharp transverse ridge into horizontal upper and vertical posterior surface. Clypeus with longitudinal folds. Second radiomedial cell as long as wide (Fig. 107: 2). Antennae 39—41-segmented. Body 7—8. Parasite of *Monochamus galloprovincialis* Ol. (Cerambycidae). Center; Siberia (Krasnoyarsk), Altai, Far East; Western Europe ..... **M. corax** Marsh. (*monochami* Fi., *pospelovi* Tel.)
- 7 ( 6). Propodeum fairly flat, lacking sharply transverse ridge. Clypeus punctate, lustrous. Second radiomedial cell narrow (Fig. 107: 4). Antennae 31—36-segmented. Body 4. Parasite of *Semanotus undatus* L., *Pogonocherus dimidiatus* Bless., *Eutetrappa chrysochloris* Bat., *Phymatodes alni* L., *Molorchus umbellatarum* Schreb. (Cerambycidae). Krasnodar Territory (Khodyzhensk); Pacific Coastal Region; Western Europe ..... **M. sulcatus** Szépl. (*insignis* Mues., *molorchi* Fi.)
- 8 ( 5). Temples noticeably shorter than eye, not bulged (Fig. 107: 6). Mandibles wide, their apices in one plane with base (Fig. 107: 7). Antennae 43-segmented. Clypeus with sparse punctures. Austria .... **M. nixonii** Huddleston
- 9 ( 4). Temples half as long as eye (Fig. 108: 1). First abdominal tergite with distinct pedicel, above lacking furrows or furrows weak and located generally in middle (cf. also couplets 19 and 85) ..... **M. pulchricornis** Wesm.<sup>1</sup>
- 10 ( 1). Second abdominal tergite smooth, 1st tergite lacking dorsal pits or they are weakly developed and located usually in middle part of tergite.
- 11 ( 36). First abdominal tergite lacking two longitudinal furrows (sometimes weak depressions present, differing little from

<sup>1</sup> In addition to this species, the sculpture on the 2nd tergite may be found, rarely, in aberrant specimens of some other species.



Fig. 107. Euphorinae (from Huddleston and Tobias).

1, 2—*Meteorus corax*: 1—head, 2—2nd radiomedial cell; 3—5—*M. sulcatus*: 3—head, 4—2nd radiomedial cell, 5—1st abdominal tergite; 6, 7—*M. nixoni*: 6—head, 7—mandible; 8—*M. micropterus*, head (a—frontal view, b—lateral view); 9, 10—*M. versicolor*: 9—head, 10—1st abdominal segment (ventral view); 11—15—*M. lionotus*: 11—head, dorsal view, 12—head, frontal view, 13—mandible, 14—1st abdominal segment (ventral view), 15—2nd radiomedial cell.



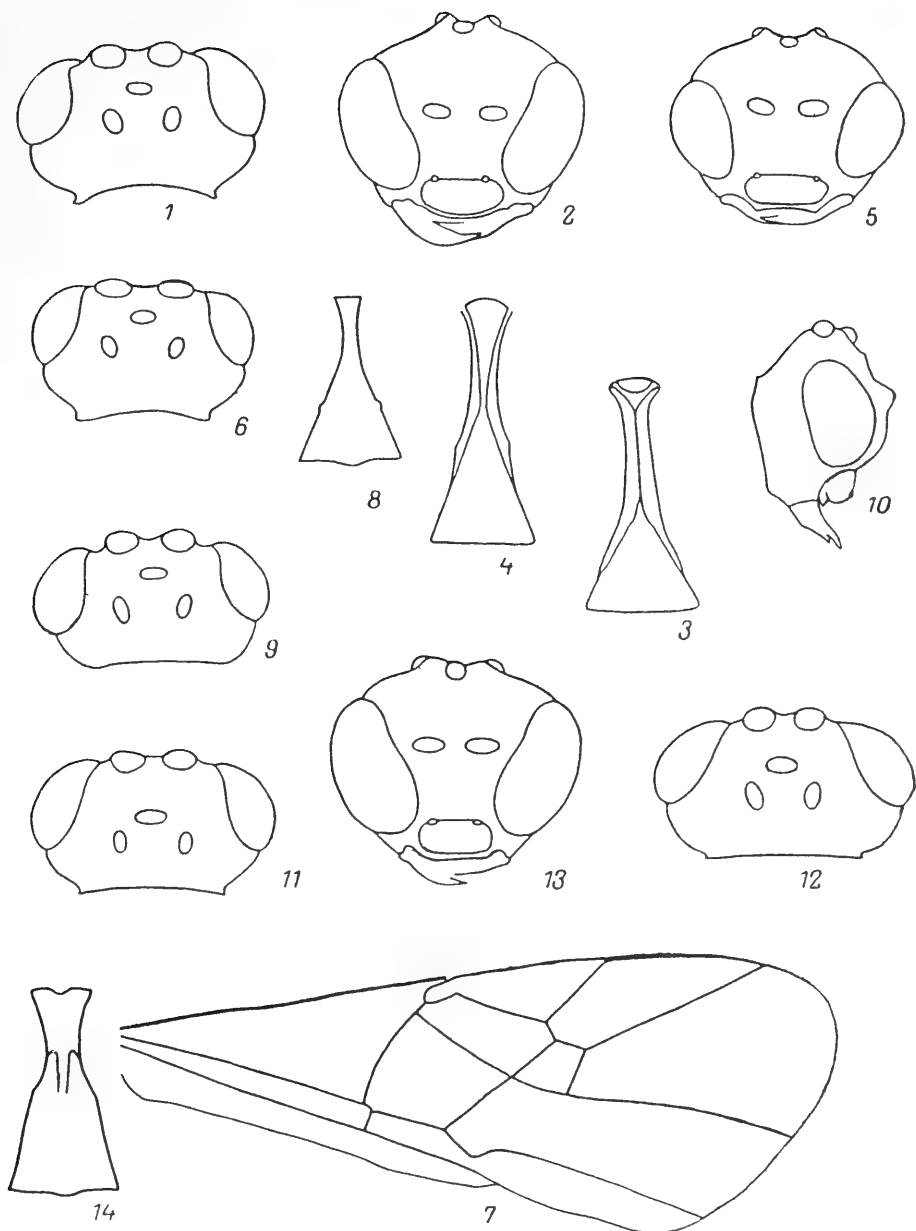


Fig. 108. Euphorinae (from Huddleston and Tobias).

1—*Meteorus pulchricornis*, head; 2, 3—*M. filator*: 2—head, 3—1st abdominal segment, ventral view; 4—*M. cinctellus*, same; 5—*M. eadyi*, head; 6—8—*M. rubens*: 6—head, 7—forewing, 8—1st abdominal tergite; 9, 10—*M. colon*: 9—head, dorsal view, 10—head, lateral view; 11—*M. tabidus*, head; 12, 13—*M. pallipes*: 12—head, dorsal view, 13—head, frontal view; 14—*M. ictericus*, 1st abdominal tergite.

depressions between longitudinal folds in middle of tergite) (Fig. 108: 8).

- 12 ( 13). Wings narrow, approximately as long as distance from their base to abdominal apex, darkened. Antennae very slightly longer than head and thorax together, thickened, 23–27-segmented, flagellar segments moniliform, except first segment not longer than wide (in male antennae shorter than body). Face distinctly bulged, very broad, genae strongly developed (Fig. 107: 8). Body black, 3–5. Parasite of *Hepialus humuli* L., *Korscheltellus fusconebulosus* Deg. (Hepialidae). Kola Peninsula; British Isles; northern Europe ..... **M. micropterus** Hal.
- 13 ( 12). Wings normally developed, not narrow, longer than distance from their base to abdominal apex, light 185 colored or very weakly darkened. Antennae distinctly longer than head and thorax together, segments in basal half longer than wide. Face less bulged but more narrow, genae usually less developed.
- 14 ( 15). Base of 1st abdominal tergite yellow or whitish, contrasting with darker broader part of tergite. Recurrent vein antefurcal or interstitial. Eyes and ocelli large. Antennae 29–33-segmented. Ovipositor 1.5–2 times as long as 1st abdominal tergite. Propodeum rugose-punctate. Color variable, usually body light colored. Fig. 107: 9, 10. Body 3.5–5.5. Parasite of *Malacosoma neustria* L., *Eriogaster lanestris* L., *Dendrolimus pini* L., *Lasiocampa quercus* L., *Macrothylacia rubi* L. (Lasiocampidae), *Arctornis l-nigrum* Müll., *Leucoma salicis* L., *Lymantria monacha* L., *L. dispar* L., *Euproctis chrysorrhoea* L., *E. flava* Brem., *Orgyia antiqua* L., *O. gonostigma* F., *O. ericae* Germ., *Dasychira pudibunda* L., *Ocneria detrita* Esp. (Lymantriidae), *Archips oporana* L., *Pandemis cerasana* Hb. (Tortricidae), *Geometra papilionaria* L., *Eupithecia exigua* Hb., *Archiearis parthenias* L., *Operophtera brumata* L., *Ennomos erosaria* Den. and Schiff., *Ematurga atomaria* L., *Calospilos pantaria* L., *Eulithus testaria* L. (Geometridae), *Noctua pronuba* L., *Brachionycha sphinx* Hfn., *Diachrysis chrysitis* L., *Panolis flammea* Den and Schiff., *Agrotis exclamationis* L., *A. segetum* Den. and Schiff., *A. strigula* Thunb., *Amathes agathina* Dup., *Anatra myrtilli* L., *Lycophotia porphyrea* Den. and Schiff., *Nycteola asiatica* Krul. (Noctuidae), *Hyponephele jurtina* L. (Satyridae),

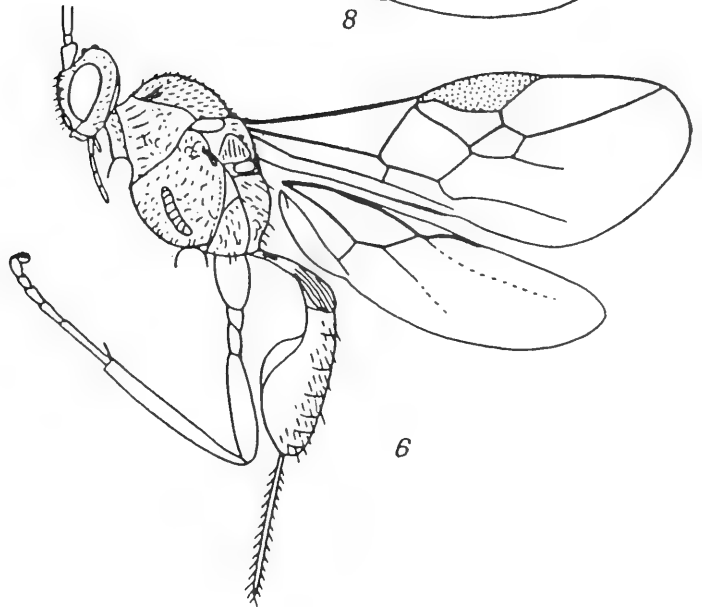
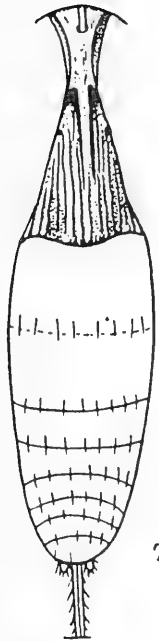
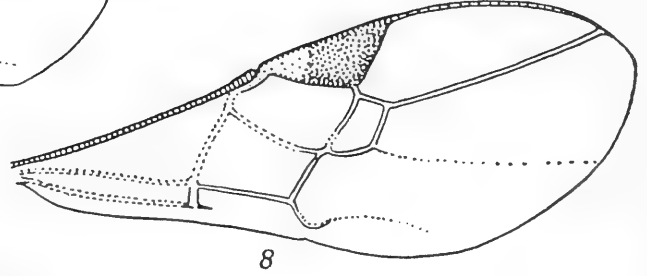
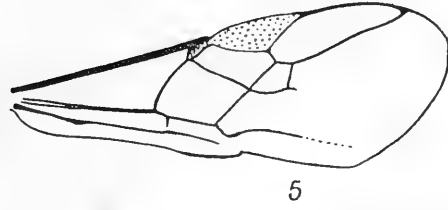
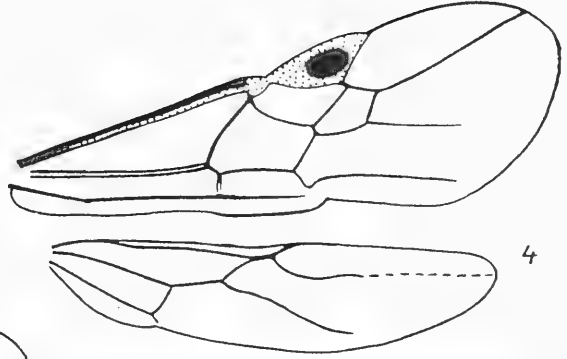
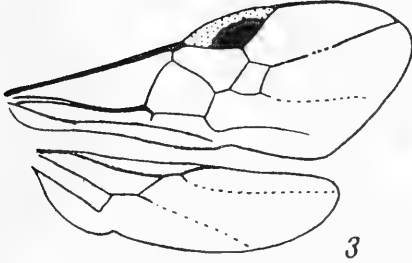
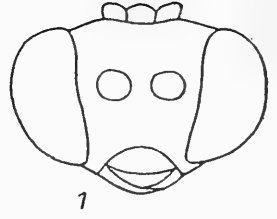
- Thaumetopoea processionea* L., *T. pictyocampa* Den. and Schiff. (Thaumetopoeidae), *Nola cucullatella* L. (Nolidae), *Hyphantria cunea* Drury (Arctiidae), *Argyresthia nitidella* F. (Argyresthiidae), *Eurrhyncha hortulata* L. (Pyraustidae). Entire Palearctic, Nearctic (cf. also couplet 35) .....
- ..... **M. versicolor** Wesm. (*decoloratus* Ruthe, *bimaculatus* Wesm., *brevicornis* Rätz., *rugator* Rätz., *camptolomae* Wat., *ikonomovi* Fi., *hartigi* Shenef.)
- 15 ( 14). First abdominal tergite uniformly colored, usually dark, rarely basally lighter colored than in broader part but not whitish and not contrastingly light colored.
- 16 ( 17). Stigma entirely dark brown, sometimes only slightly light colored basally. Body reddish dark brown, only head dorsally and posteriorly dark. Nervulus shifted from basal vein by twice its length. Antennae somewhat longer than body. Face narrow, eyes very large, diameter of posterior ocellus greatly exceeding ocellocular distance. Fig. 107: 11–15. Body 5. Parasite of *Thera obeliscata* Hb., *T. variata* Den. and Schiff., *Operophtera brumata* L. (Geometridae). Western Europe (cf. also couplet 104) .....
- ..... **M. lionotus** Thoms.
- 17 ( 16). Stigma yellow or if dark brown then basally with light colored spot or light color on entire anterior margin. Nervulus less shifted from basal vein.
- 18 ( 25). Stigma dark brown, basally or also on anterior margin light colored.
- 19 ( 20). Clypeus densely punctate, matte, distinctly bulged, with dense, light colored erect hair. Antennae 29–33-segmented, flagellar segments longer than wide. Face slightly less high than wide, head distinctly narrowed behind eyes, ocelli large. Claw with basal prominence. Ovipositor slightly shorter than abdomen. Sternauli broad, rugose; propodeum coarsely rugose, 1st abdominal tergite longitudinally rugose. Body light colored, stigma dark brown, light colored on anterior margin, sometimes only basally light colored. Figs. 108: 1, 109: 1, 2. Body 4.5–5. Parasite of *Lycophotia porphyrea* Den. and Schiff., *Eupsilia transversa* Hfn. (Noctuidae), *Lymantria dispar* L. (Lymantriidae), *Operophtera brumata* L., *Agriopsis leucophaearia* Den. and Schiff., *A. aurantiaria* Den. and Schiff., *Eupithecia nanata* Hb. (Geometridae), *Nola cucullatella* L. (Nolidae), *Poecilocampa populi*

- L. (Lasiocampidae), *Charaxes jasius* L. (Nymphalidae), *Hyphantria cunea* Drury (Arctiidae). Center, south; Transural, Caucasus; Western Europe; Turkey; Japan (cf. also couplets 9 and 85) .....
- .....**M. pulchricornis** Wesm. (*striatus* Thoms., *thomsoni* Marsh., *japonicus* Ashm., *nipponensis* Vier., *macedonicus* Fi., *graeffei* Fi., *tuberculifer* Fi.)
- 20 ( 19). Clypeus without somewhat sparse punctures, somewhat lustrous, sparsely hairy, usually weakly bulged.
- 21 ( 22). Genae very weakly developed, eyes large, protuberant, almost touching mandibular base. Ovipositor valves as long as abdomen. Ocelli small. Claw lacking basal prominence. First abdominal tergite very thin (2.5–3 times as long as its width at apex), below with touching margins. Figs. 108: 2, 3; 109: 3. Body 3.5–5. West, northwest, center; Caucasus, southern part of Western Siberia, Baikal Region; Western Europe; Mongolia .....
- ..... **M. filator** Hal. (*laticeps* Wesm., *hodisensis* Fi.)
- 22 ( 21). Genae well developed. Ovipositor valves shorter than abdomen.
- 23 ( 24). Temples half as long as eyes, face as wide as high. Antennae 24–29-segmented. Body usually dark colored with dark brownish yellow legs; often head anteriorly and mesonotum along notaulices with light colored pattern. Figs. 108: 4; 109: 4. Body 3.5–5. Parasite of *Tortrix viridana* L., *Hedia pruniana* Hb., *Acleris rhombana* Den. and Schiff., *A. hastiana* L., *Archips xylosteana* L., *Gypsonoma oppressana* Tr., *G. sociana* Hw., *Notocelia uddmanniana* L., *Pandemis heparana* Den. and Schiff. (Tortricidae), *Thera juniperata* L. (Geometridae). West, center, Ukraine, northern Caucasus; Western Europe .....
- .....**M. cinctellus** Nees (*tenellus* Marsh., *fuscipes* Wesm.)
- 24 ( 23). Temples as long as eye, face 1.5–2 times as wide as high. Ocelli small, diameter of posterior ocellus 2/5–1/3 ocellular distance (Fig. 108: ). Claw lacking basal prominence.

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Fig. 109. Euphorinae (from Fisher, Achterberg and Papp).

1, 2—*Meteorus pulchricornis*: 1—head, 2—forewing; 3, 4—wings: 3—*M. filator*, 4—*M. cinctellus*; 5—*M. obfuscatus*, forewing; 6—*M. obsoletus*, 7—*M. ictericus*, abdomen; 8—*M. obfuscatus*, forewing.



- Ovipositor 1.5 times as long as 1st abdominal tergite. Propodeum with 2 transverse and 3 longitudinal ridges (2 on each side), between them with relatively weaker sculpture. Body black; legs yellowish dark brown. Northwest; Armenia; Western Europe ..... **M. eadyi** Huddleston
- 25 ( 18). Stigma yellow.
- 26 ( 31). Antennae filiform, not as long as body, 24–28-segmented (in male setiform, but usually not more than 28-segmented).
- 27 ( 28). Temples slightly shorter than eye. Recurrent vein interstitial or almost interstitial. Face 2 times as wide as high; ocelli large, distance between posterior ocellus and eye approximately 1.5 times ocellar diameter. Propodeum rugose. Ovipositor 2 times as long as 1st abdominal tergite. Color of body distinctly variable: from entirely dark brownish yellow to black. Fig. 108: 6–8. Body 3.5–6. Parasite of *Euxoa tritici* L., *Noctua pronuba* L., *Mamestra brassicae* L., *Cerapteryx graminis* L., *Agrotis ypsilon* Hfn., *A. vestigialis* Hfn., *A. exclamationis* L., *A. obesa* Boisd., *Amathes c-nigrum* L., *Spodoptera exigua* Hb., *Discestra trifolii* Hfn., *Ochropleura fennica* Tausch., *Peridroma saucia* Hb. (Noctuidae), *Phthorimaea operculella* Z. (Gelechiidae), *Cynthia cardui* L. (Nymphalidae), *Sterrhia muricata* Hfn. (Geometridae), *Tortrix viridana* L., *Eupoecilia ambiguella* Hb., *Lobesia botrana* Den. and Schiff. (Tortricidae), *Orgyia antiqua* L. (Lymantriidae). Entire Palearctic .....  
..... **M. rubens** Nees (*leviventris* Wesm., *heteroneurus* Thoms., *medianus* Ruthe)
- 28 ( 27). Temples much shorter than eye. Recurrent vein postfurcal. Claw with basal prominence.
- 29 ( 30). Ovipositor valves much shorter than abdomen (Fig. 109: 6). Head behind eyes distinctly roundly narrowed, temples one-third as long as eye. Thorax black, pronotum and abdomen except 1st tergite dark brown or yellow; legs yellow. Body 4–5. Parasite of *Tortrix viridana* L., *Gypsonoma dealbana* Fröl., *Rhopobota ustomaculana* Curt. (Tortricidae). Moldavia; Western Europe; Turkey (cf. also couplet 34) .....  
..... **M. obsoletus** Wesm. (*viridanae* Johansson)
- 30 ( 29). Ovipositor valves as long as abdomen and propodeum together. Head less distinctly narrowed, temples half as long as eye. Body black; legs yellowish dark brown, middle and

hind coxae darkened. Face noticeably narrowed downward, its height equaling width in lower part, almost half of longitudinal diameter of eye; genae narrow; distance between posterior ocelli equaling one-third ocellar diameter, slightly less than ocellular distance; diameter of posterior ocellus  $2/5$  this distance. Thorax 1.6 times as long as high; notaulices deep, narrow, posteriorly weakly convergent; sternauli as narrow, long, rugose depressions. Radial cell on forewing almost reaching its apex (Fig. 110: 1). Hind femora 6 times as long as wide. First abdominal tergite 2 times as long as its width at apex. Face finely punctate, in middle weakly transversely striate; mesonotum in posterior part between notaulices coarsely rugose; propodeum finely reticulate-rugose, with longitudinal ridge in middle. First abdominal tergite softly longitudinally rugose. Head frontally dark brownish; tegulae and hind coxae dark brown; stigma dark brownish yellow, wings light colored. Body 3.5. North.....

..... **M. boreus** Tobias, sp. n.

Holotype: Female, Kola Peninsula. Lake Imandra, 3.IX.1929 (Cheburova). Paratypes: 2 females, details as above, 4.VIII. and 20.VIII.1929.

- 31 ( 26). Antennae setiform, usually longer than body, 28–34-segmented. Propodeum uniformly reticulate-rugose. Claw with basal prominence.
- 32 ( 35). Margins of 1st abdominal tergite below separated by slit-like recess or touching only in middle. Recurrent vein postfurcal (Fig. 109: 6). Face somewhat square.
- 33 ( 34). Head behind eyes distinctly narrowed, temples somewhat shorter than eye (Fig. 108: 9). Apical antennal segments about 2 times as long as wide; antennae 30–34-segmented. Frons with small tubercle in middle (Fig. 108: 10). Ocelli fairly large, diameter of posterior ocellus equaling half ocellular distance. Thorax above usually black, its sides and lower part dark brownish yellow. Body 4–5. Parasite of *Pseudoips bicolorana* Fuessly, *Bena fagana* F., *Cucullia argentea* Hfn., *Allophyes oxyacanthae* L., *Orthosia stabilis* Den. and Schiff., *Euxoa tritici* L., *Spodoptera exigua* Hb., *Diarsia brunnea* Den. and Schiff., *Polia nebulosa* Hfn., *Noctua fimbriata* Schreb. (Noctuidae), *Limenitis camilla* L. (Nymphalidae), *Eupithecia venosata* F., *Anticollix sparsata* Tr. (Geometridae),

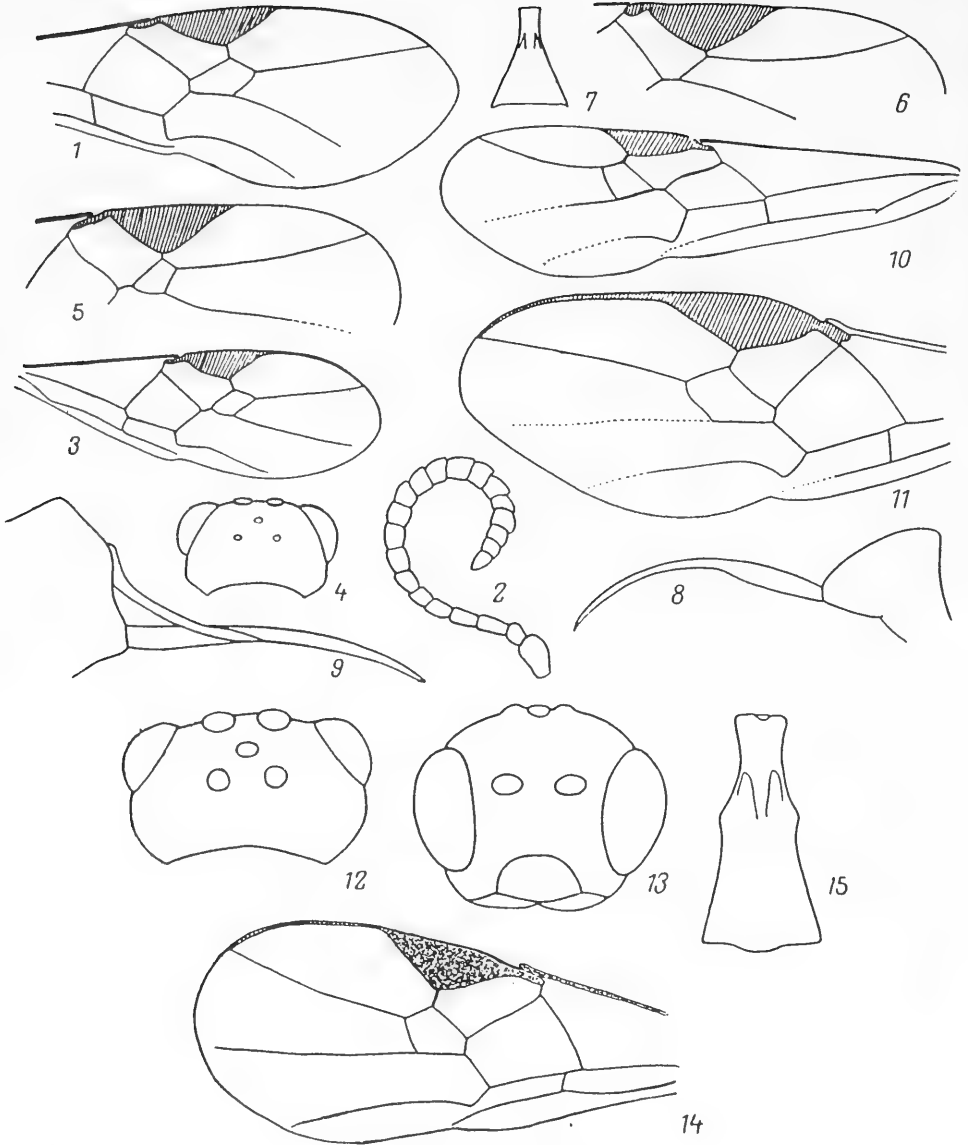


Fig. 110. Euphorinae (original).

1—*Meteorus boreus* sp. n., forewing; 2, 3—*M. breviantennatus* sp. n.: 2—antenna, 3—forewing; 4–8—*M. varinervis* sp. n.: 4—head, dorsal view, 5—part of forewing, 6—same, variation, 7—1st abdominal tergite, 8—abdominal apex; 9—*M. ipidivorus* sp. n., abdomen; 10, 11—forewing: 10—*M. radialis* sp. n., 11—*M. monachae* sp. n.; 12–15—*M. micropilosus* sp. n., 12—head, dorsal view, 13—head, frontal view, 14—forewing, 15—1st abdominal tergite.



- Acrobasis consociella* Hb. (Phycitidae), *Phalera bucephala* L. (Notodontidae), *Lithosia quadra* L. (Lithosiidae), *Leucoma salicis* L., *Lymantria monacha* L. (Lymantriidae), *Nola cucullatella* L. (Nolidae). Northwest, center, south; Caucasus (Georgia), Pacific Coastal Region; Western Europe ..... **M. colon** Hal.  
 (*fragilis* Hal., *luridus* Ruthe, *fasciatus* Ratz.)
- 34 ( 33). Head behind eyes slightly narrowed. Apical antennal segments approximately 1.5 times as long as wide; antennae 27–30-segmented. Frons lacking median tubercle. Body dark brownish black; pronotum, spot on mesonotum or thorax almost entirely and middle of abdomen light colored (cf. also couplet 29) ..... **M. obsoletus** Wesm.
- 35 ( 32). Margins of 1st abdominal tergite contiguous over longer distance below. Recurrent vein somewhat interstitial (cf. also couplet 14) ..... **M. versicolor** Wesm.
- 36 ( 11). First abdominal tergite with 2 distinct furrows, closed anteriorly and open posteriorly at border between pedicel and broadened part of tergite (Fig. 110: 7).
- 37 ( 96). Recurrent vein antefurcal (sometimes almost interstitial).
- 38 ( 45). Stigma yellow, sometimes slightly dark brownish, transparent.
- 39 ( 40). Face dark brown. Legs thin. Ovipositor valves as long as abdomen or very slightly shorter. Body black; 2nd abdominal tergite and legs dark brown. Antennae 28–32-segmented. Face almost square. First abdominal tergite 3 times as long as its width at apex. Sternauli wide, rugose. Hind coxae rugose, propodeum coarsely rugose. Fig. 108: 11. Body 4.5–5. Parasite of beetles *Saperda populnea* L., *S. scalaris* L., *Leiopus nebulosus* L. (Cerambycidae). Inchworms *Eupithecia assimolata* Dbld. have also been reported as hosts and (for synonym of *M. dubius*) *Laspeyresia strobilella* L. (Tortricidae), *Epichnopterix sieboldi* Reutti, *Fumea betulina* Z. (Psychidae), *Coleophora ledi* Stt. (Coleophoridae). Northwest, center, south; Western Europe (cf. also couplets 50 and 92) .....  
 ..... **M. tabidus** Wesm.  
 (*dubius* Ruthe, *facialis* Ruthe, *pentheri* Fi.)
- 40 ( 39). Face yellow or reddish yellow.

- 41 ( 42). Face narrowed below, height more than width in lower part. Ovipositor as long as abdomen. Body black; legs, often also head dark brownish yellow. Fig. 108: 12, 13. Body 5–6. Parasite of *Archips oporana* L., *A. rosana* L., *A. xylosteana* L., *Selenodes lediana* L., *Tortrix viridana* L., *Epinotia sordidana* Hb. (Tortricidae), *Hyphoraia aulica* L. (Arctiidae), *Operophtera brumata* L. (Geometridae). West; Armenia; Western Europe; China .....  
 ..... **M. pallipes** Wesm.
- 42 ( 41). Face not narrowed or slightly narrowed below, height less than width in lower part.
- 43 ( 44). Ovipositor valves as long as abdomen or very slightly longer. Antennae filiform, 26–33-segmented. Recurrent vein usually greatly shifted from 1st radiomedial vein. Ocelli large, projecting. Claw with basal prominence. Color variable. Figs. 108: 14; 109: 7; 111: 1–3. Body 4–6. Parasite of *Spilonota ocellana* F., *S. laricana* Hein., *Epinotia sordidana* Hb., *E. solandriana* L., *E. caprana* F., *Archips oporana* L., *A. xylosteana* L., *A. podana* Sc., *Grapholitha molesta* Busck., *Notocelia cynosbatella* L., *Cacoecimorpha pronubana* Hb., *Acleris hastiana* L., *A. variegana* Den. and Schiff., *Croesia bergmanniana* L., *Gravitarmata margarotana* Hein., *Gypsonoma minutana* Hb., *Clepsis celsona* Kenn., *Tortrix viridana* L., *Pandemis cerasana* Hb., *Adoxophyes orana* F.R., *Rhyacionia buoliana* Den. and Schiff. (Tortricidae), *Euproctis chrysorrhoea* L., *Leucoma salicis* (Lymantriidae), *Dendrolimus pini* L. (Lasiocampidae), *Gelechia costella* Westw. (Gelechiidae), *Operophtera brumata* L., *Eupithecia virgaureata* Doubl., *E. tripunctaria* H.-S., *Hemithea aestivaria* Hb., *Gnophos asperaria* Hb., (Geometridae), *Pyralis farinalis* L., *Mecyna asinalis* Hb. (Pyralidae), *Udea alpinalis* Den. and Schiff. (Pyraustidae), *Eupsilia transversa* Hfn., *Apamea remissa* Hb. (Noctuidae), *Mompha conturbatella* Hb., *Blastodacna atra* Haw. (Mompidae), *Yponomeuta plumbellus* Den. and Schiff., *Y. padellus* L. (Yponomeutidae), *Thaumetopoea processionea* L., *T. pityocampa* Den. and Schiff. (Thaumetopoeidae). Entire Palearctic (cf. also couplets 65 and 113) .....  
 .... **M. ictericus** Nees (*confinis* Ruthe, *fallax* Ruthe, *pleuralis* Ruthe, *liquis* Ruthe, *consors* Ruthe, *crassicus* Thoms., *lophyriphagus* Fahr., *adoxophyesi* Minamikava, ? *ruficeps* Nees)

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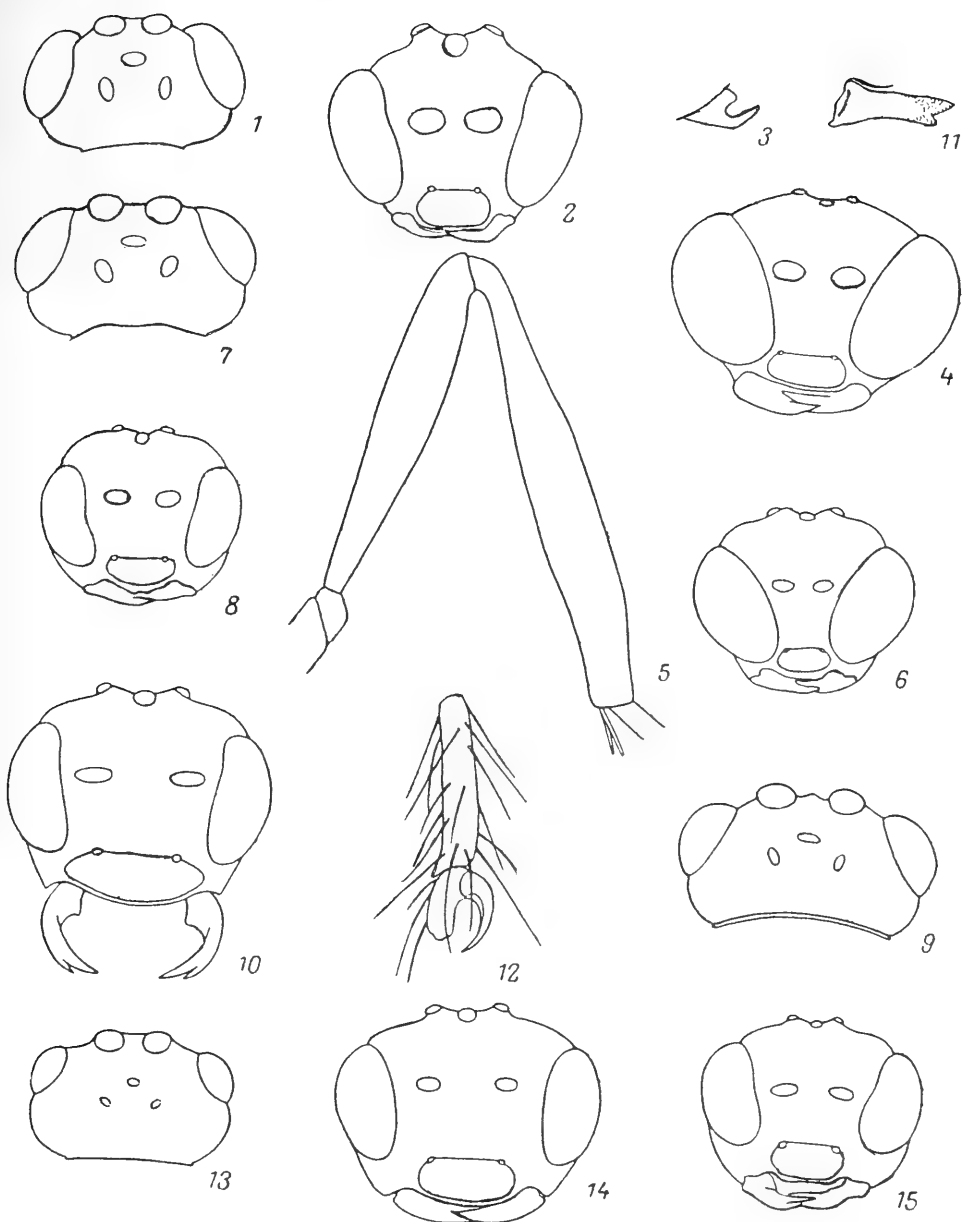


Fig. 111. Euphorinae (from Huddleston).

1-3—*Meteorus ictericus*: 1—head, dorsal view, 2—head, frontal view, 3—claw; 4, 5—*M. oculus*: 4—head, 5—hind femur and tibia, 6-8—head: 6—*M. vexator*, 7—*M. affinis*, 8—*M. profligator*; 9-12—*M. hirsutipes*: 9—head, dorsal view, 10—head, frontal view, 11—mandible, 12—apical segment of tarsus; 13-15—head: 13—*M. jaculator*, 14—*M. longicaudis*, 15—*M. punctifrons*.

- 192 44 ( 43). Ovipositor valves much shorter than abdomen. Antennae setiform. Recurrent vein almost interstitial. Sternauli wide, rugose (like upper part of sides of mesothorax). Notaulices fairly wide, rugose. Propodeum coarsely reticulate-rugose, with depression in middle, with ridge above. Face half as high as wide. Body dark brownish yellow. Body 4–5. Parasite of *Zygaena filipendulae* L. (*Zygaenidae*). Kharkov Region; Western Europe ..... **M. unicolor** Wesm.
- 45 ( 38). Stigma dark brown, with light colored spot at base, sometimes light colored on anterior margin.
- 46 ( 55). Legs dark brown, hind coxae and hind femora somewhat blackened.
- 47 ( 54). Radial cell on forewing broad, reaching or almost reaching wing apex; discoidal cell much larger than brachial cell (Fig. 110: 3).
- 48 ( 49). Antennae very short, not longer than head and thorax together: 20–21-segmented, their 15 terminal segments (except apical) square or transverse, moniliform (Fig. 110: 2). Ocelli small; face 1.3 times wider than high, height slightly more than that of clypeus; genae weakly developed. Notaulices deep, narrow, convergent anterior to scutellum; sternauli as fairly wide, long, rugose depressions. Radial cell on forewing broad (Fig. 110: 3). Hind femora 4–4.5 times as long as wide. Claw lacking basal prominence. First abdominal tergite 2 times as long as its width at apex. Ovipositor as long as abdomen or very slightly shorter, its stylet almost straight. Head dorsally and mesonotum (except notaulices) smooth; frons glossy; face softly sculptured, in middle with short obliquely transverse folds; propodeum densely and irregularly rugose-punctate; 1st abdominal tergite rugose, on sides in posterior half with longitudinal folds. Body black; clypeus, mandibles, tegulae yellowish; 2nd and 3rd abdominal tergites dark brownish or yellowish; palps pale yellow; wings light colored, veins pale brown. (In specimens from Krasnaya Rachka mesonotum in middle with deep symmetric depression—obviously a malformation.) Body 2.5–3. Parasite of *Ips acuminatus* Gyll. (*Scolytidae*). Central Volga Region; Transcaucasia, (cf. also couplet 82) .... **M. brevantennatus** Tobias, sp. n.
- Holotype: Female, Ulyanovsk Region, Dimitrovgrad (“Melekeess”), [tunnels] of *Blastophagus minor* Hart., *Ips acuminatus* Gyll., 10.VIII.1968. (Filippenkova).

Paratypes: 1 female, Ulyanovsk Region, Krasnaya Rechka, *Ips acuminatus* Gyll., 11.VIII.1968 (Filippenkova). Georgia, Tsagveri, *Pinus sosnowskyi* from *Ips acuminatus* Gyll., 8–12.IX.1976 (D. Zharkov).

- 49 ( 48). Antennae longer, much longer than head and thorax together, with larger number of segments.
- 50 ( 51). Fæe as high as wide, clypeus as wide as face. Antennae 35-segmented. Body 4.5 (cf. also couplets 39 and 92) ....  
..... **M. tabidus** Wesm.
- 51 ( 50). Face 2 times as wide as high, clypeus much narrower than face. Antennae 25–29-segmented. Head 1.5 times as wide as mesonotum, behind eyes slightly narrowed; temples slightly shorter than eye; ocelli small (Fig. 110: 4). Antennae filiform, as long as body; antennal segments in apical half longer than wide. First section of radial vein on forewing short, sometimes almost punctiform (Fig. 110: 5). Hind femora 6 times as long as wide. First abdominal tergite distinctly broadened apically, 1.5 times as long as width at apex (Fig. 110: 7). Ovipositor valves half as long as abdomen.
- 52 ( 53). Stylet of ovipositor distinctly, almost falcately curved (Fig. 110: 8). Antennae 25–27-segmented. Head dorsally with coarse scattered punctures, face delicately punctate; mesonotum fairly densely punctate, especially between notaulices, slightly lustrous; sides of mesothorax densely and coarsely punctate, with wrinkles above and in depression in area of weakly marked sternauli; propodeum densely and delicately punctate-rugose (sometimes with smooth sculpture), with weak lateral longitudinal ridges and weak median longitudinal ridge in its apical part and sometimes with weak transverse ridge at base (each of these ridges may be absent); 1st abdominal tergite softly sculptured, lacking distinct longitudinal folds. Body black or head and lower part of pronotum dark brown. Sometimes 2nd radiomedial cell not developed<sup>1</sup>. Body 2.3–2.6. North ...  
..... **M. varinervis** Tobias, sp. n.

<sup>1</sup> In one specimen (holotype!) the 2nd radiomedial vein was normally developed on the left wing and very weakly on the right. It was closest to the specimen lacking both 2nd radiomedial veins. Thereby *M. varinervis* sp. n. seemingly describes the phylogenetic pathway of genus *Perilitus* from *Meteorus*; the species of the latter genus persistently lack the 2nd radiomedial vein. The reduction of this vein could be associated with the

Holotype: Female, Arkhangelsk Region, spruce, from female of bark beetles *Pityogenes chalcographus* L. and *Pityophthorus micrographus* L., 6.VII.1964 (Pryakhina). Paratypes: 1 female, details same as above; 1 female, same place from tunnels of bark beetles and others, 3.VII.1964 (Pryakhina); 1 female, Arkhangelsk, M. Karely, from tunnels of *Pityogenes chalcographus*, spruce, 6.VII.1964 (? Pryakhina).

- 53 ( 52). Stylet of ovipositor slightly curved (Fig. 110: 9). Antennae 28–29-segmented. Head dorsally smooth, face very weakly punctate; mesonotum almost smooth, lustrous, only along notaulices rugose-punctate; sides of mesothorax mostly in lower part, in depressions in area of sternauli rugose-punctate, in greater part smooth; propodeum with very smooth sculpture, bordering above broad cell (longitudinal ridges in its upper horizontal part sharper but sometimes lateral ridges not developed); 1st abdominal tergite distinctly longitudinally rugose. Body black; head frontally and lower part of pronotum dark brownish-reddish. Body 3.3–3.5. Parasite of *Ips acuminatus* Gyll. (Scolytidae). Middle Volga Region; Western Siberia (cf. also couplet 111)..... **M. ipidivorus** Tobias, sp. n.

Holotype: Female, Novosibirsk Region, Togushinsk District, Kourak, in tunnel of *Ips acuminatus*, 6.IX.1965 (Tarasova). Paratypes: 1 female, details same, 8.VIII.1965; 1 female, Ulyanovsk Region, Dimitrograd ("Melekeess"), *Blastophagus minor*, *Ips acuminatus*, 10.VIII.1968 (Filippenkova); 1 female, (lacking abdomen and antennae), Kuibyshev Region, M. Malyshevka, *Ips acuminatus*, 18.VIII.1968 (Filippenkova).

- 54 ( 47). Radial cell on forewing narrow and short, discoidal cell as wide as brachial cell (Fig. 110: 10). Face 1.3 times as wide as high, clypeus as wide as face, 2.5–3 times as high as wide. Antennae shorter than body, 24–26-segmented. First abdominal tergite 2 times as long as

decrease of body size (moreover, in the closely related larger *M. abdominalator* the wings of the male sometimes also lack the 2nd radiomedial vein). Interestingly, the hosts of *M. varinervis* and of the closely related *M. ipidivorus* sp.n., are beetles which is unusual for the genus *Meteorus* while species of *Perilitus* are specially adapted to beetles. Consequently, *M. varinervis* copies not only morphologically but biologically a transition from *Meteorus* to *Perilitus*. (cf. also couplet 20 of genus *Perilitus*.)

width at apex. Ovipositor valves very slightly shorter than abdomen, its stylet slightly curved. Other morphological features as in 2 preceding species. Head smooth, above face densely rugose-punctate with transverse folds; notaulices coarsely rugose, mesonotum weakly but sometimes fairly densely punctate, lustrous; sides of mesothorax coarsely rugose-punctate with small smooth area above middle; propodeum coarsely reticulate-rugose; 1st abdominal tergite longitudinally rugose. Body black; clypeus and basal half of antennae dark brown, spot on inner upper margin of eye reddish. Body 4–4.8. North, center .....

..... **M. radialis** Tobias, sp. n.

Holotype: Female, Kola Peninsula, Khibiny, 19.VII.1928 (Cheburova). Paratypes: 1 female, Kola Peninsula, Polyarnyi ("Aleksandrovsk"), 30.VII.1923 (Fridolin); 1 female, Perevoz, 10 km west of Novozybkova, forest, 16–31.VII.1970 (Tobias).

- 55 ( 46). Legs dark brownish yellow or reddish, sometimes hind femora somewhat darkened; if legs dark brown, then hind coxae and femora not blackened.
- 56 ( 57). Hind tibiae distinctly thickened, thicker than femora, apically distinctly narrowed (Fig. 111: 5). Eyes very large, genae hardly developed, face narrowed below, its width below almost equaling height (Fig. 111: 4). Body black, 4–5. Center; Transural Region, Kirgizia; North and Central Europe (cf. also couplet 97) .....
- ..... **M. oculatus** Ruthe (*pachypus* Schm.)
- 57 ( 56). Hind tibiae not thickened or slightly thickened, thinner than femora.
- 58 ( 61). Eyes very large, face distinctly narrowed below, almost 2 times as high as wide in lower part (Fig. 111: 6). Propodeum with smooth sculpture, with fields. Ovipositor valves as long as abdomen. Body black.
- 59 ( 60). Diameter of posterior ocellus  $2/5$ – $1/3$  ocellocular distance. Claw lacking prominence. Thorax black, only prothorax often somewhat light colored. Radial vein originating from middle of very broad stigma. Antennae 19–24-segmented. Body 3–4. Parasite of beetles in fungi *Biphylus lunatus* F. (Erotylidae), *Mycetophagus* sp. (Mycetophagidae). North west, center; Caucasus; Western Europe .....
- ..... **M. vexator** Hal.

- 60 ( 59). Diameter of posterior ocellus  $2/3-1/2$  ocellocular distance. Claw with small basal prominence. Mesonotum often reddish dark brown. Radial vein originating from middle of stigma. Antennae 24–26-segmented. Fig. 112: 1, 2. Body 4. Parasite of *Infurcitinea argentimaculolla* Stt. (Tineidae), *Scoparia* sp. (Pyraustidae). Krasnodar Territory (Sochi), Armenia; Western Europe.....  
 .....**M. affinis** Wesm. (*voloscensis* Fi.)
- 61 ( 58). Eyes less developed, face broader. Propodeum usually rugose.
- 62 ( 93). Wings light colored or weakly darkened. Second radiomedial cell anteriorly not narrowed. Ovipositor most often not shorter than abdomen.
- 63 ( 74). Propodeum above with smooth sculpture. Frons smooth.
- 64 ( 69). Antennal segments in apical half longer than wide. Face almost as high as wide.
- 65 ( 66). Ocelli large, diameter of posterior ocellus equaling ocellocular distance or about  $2/3$  of it (Fig. 111: 1). Claw distinctly curved with large basal prominence (Fig. 111: 3). Eyes large, protuberant (Fig. 111: 1, 2). Antennae 26–33-segmented. Ovipositor 2.5 to 3 times as long as 1st abdominal tergite. First abdominal tergite longitudinally rugose. Color variable; often body dark colored, while head, pronotum and legs dark brownish yellow. (cf. also couplets 43 and 113)..... **M. ictericus** Nees
- 66 ( 65). Ocelli small, diameter of posterior ocellus  $1/2$  of ocellocular distance. Claw lacking basal prominence (Fig. 111: 12). Eyes slightly protuberant (Fig. 111: 8).
- 67 ( 68). Antennae 20–22-segmented. Ovipositor 2 times as long as 1st abdominal tergite. First abdominal tergite densely rugose-punctate, only on margins with longitudinal folds. Propodeum with weak ridges, entirely weakly rugose. Body black, basal half of antennae, mouthparts, legs and usually 2nd abdominal tergite reddish yellow. Fig. 111: 8. Body 3. Parasite of beetle *Cis boleti* Scop. (Cisidae). Western Europe ..... **M. profligator** Hal.
- 68 ( 67). Antennae 28–30-segmented. Ovipositor 2.5 times as long as 1st abdominal tergite. First abdominal tergite longitudinally rugose, apically longitudinal folds joining to form semicircles. Propodeum with well developed transverse and longitudinal keels, behind transverse keel with coarse, mostly vertical, folds. Tarsi with long hair. Mandibles



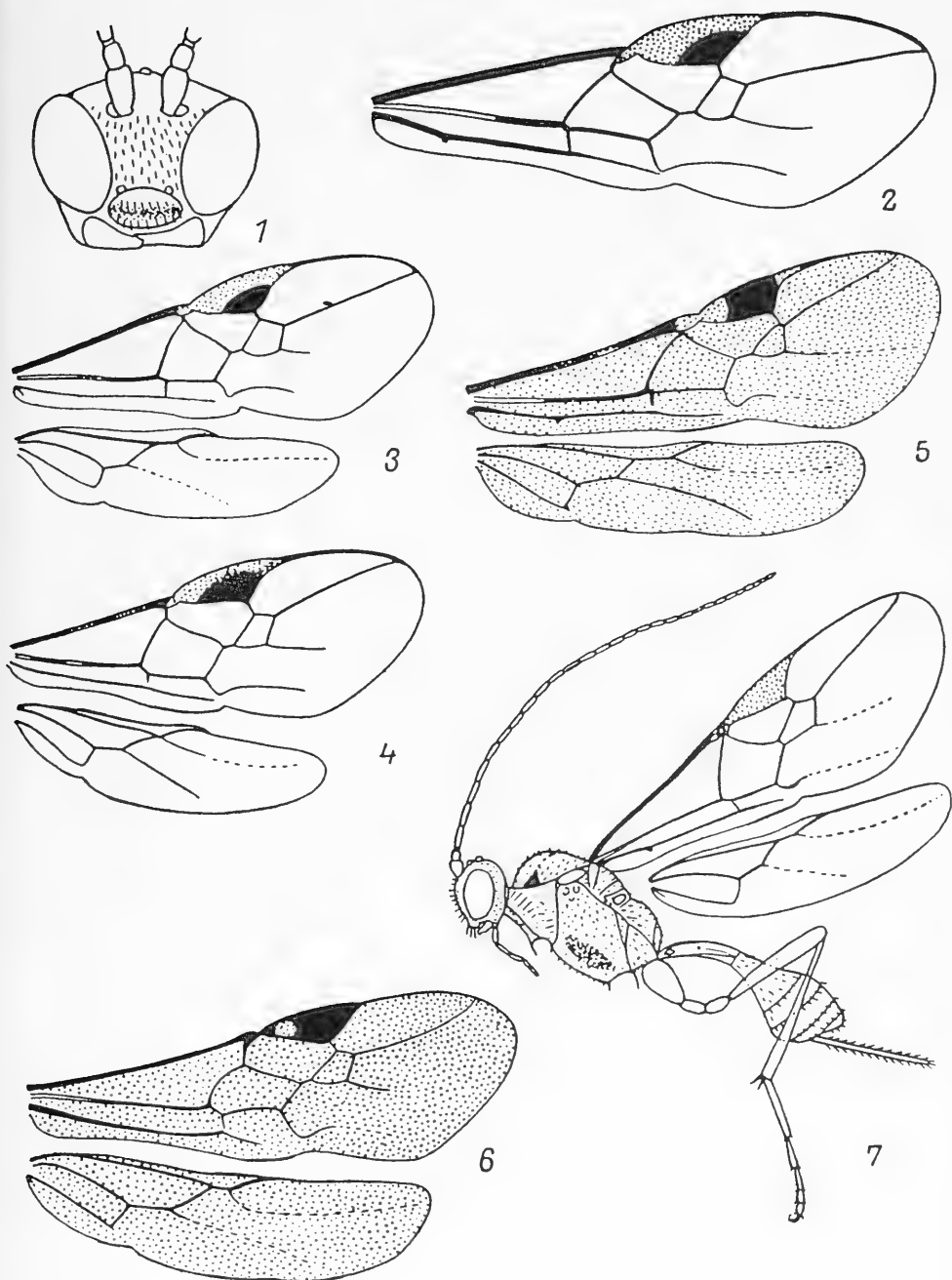


Fig. 112. Euphorinae (from Fisher).

1, 2—*Meteorus affinis*: 1—head, 2—forewing; 3—6—wing: 3—*M. jaculator*, 4—*M. abscissus*, 5—*M. consimilis*, 6—*M. abdominalator*; 7—*M. heliophilus*.

- large. Body black; pronotum and legs dark brownish yellow. Fig. 111: 9–12. Ireland, West Germany, Finland . . . . . **M. hirsutipes** Huddleston
- 69 ( 64). Apical antennal segments as long as wide or slightly smaller. Height of face much less than its width. Claw lacking basal prominence.
- 194 70 ( 71). Head behind eyes noticeably broadened. Face 2 times as wide as high, more than longitudinal diameter of eye. Ovipositor 3 to 4 times as long as 1st abdominal tergite. First abdominal tergite densely and nonuniformly rugose. Body very dark brown; face dark brown, legs yellow. Figs. 111: 13; 112: 3. Body 2.5–3. Western Europe . . . . . **M. jaculator** Hal.
- 71 ( 70). Head behind eyes roundly narrowed. Face 1.5 times as wide as high, less than longitudinal diameter of eye.
- 72 ( 73). Ovipositor 2 times as long as 1st abdominal tergite (cf. also couplet 88) . . . . . **M. obfuscatus** Nees
- 195 73 ( 72). Ovipositor 3.5 times as long as 1st abdominal tergite. Antennae 23-segmented. Temples somewhat shorter than eye; diameter of posterior ocellus 1/4 ocellocular distance. Sternauli densely rugose-punctate, wide. Propodeum softly rugose-punctate, behind middle with transverse ridge, below it reticulate-rugose; 1st abdominal tergite densely rugose-punctate, on sides longitudinally rugose. Body dark brown; tegulae, pronotum, mouthparts including clypeus, and legs dark brownish yellow on anterior margin. Body 3. Northwest; Altai . . . . . **M. subjaculator** Tobias, sp. n.  
(*jaculator* sensu Tobias, 1976)
- Holotype: Female, Altai, Uznezi on Katun, 9.VIII.1909 (Torchakovskii). Paratype: Female, Leningrad, Shuvalovo, 5.VIII.1897 (Jacobson).
- 74 ( 63). Propodeum entirely rugose; if above with smooth sculpture, then very short and frons punctate (*M. punctifrons*) or femora reduced (*M. brevicauda*).
- 75 ( 80). Eyes small, their longitudinal diameter less than width of face; genae fairly well developed, height not less than basal width of mandible (usually equal to it; Fig. 111: 14, 15). Ocelli small. Claw lacking basal prominence.
- 76 ( 77). Ovipositor almost as long as body. Face slightly bulged; frons smooth in middle. Antennae 29–32-segmented. Body black; head and legs dark brownish yellow.

- Fig. 111: 14. Body 5. Parasite of beetles *Orchesia micans* Pz.(Melandryiidae), *Eledenoprius armatus* Pz.(Tenebrionidae). Northern and Central Europe...  
 ..... **M. longicaudis** Ratz.
- 77 ( 76). Ovipositor not longer than abdomen.
- 78 ( 79). Frons between ocelli and eyes with large punctures. Head almost cubical, face relatively slightly bulged, occiput weakly notched. Propodeum short, posteriorly depressed, reticulate-rugose, above weakly rugose. Antennae 26–27-segmented. Ovipositor 1.5 times as long as 1st abdominal tergite. Body black; legs reddish yellow, sometimes hind coxae black. Fig. 111: 15. Body 4.5. Parasite of *Corticus longulus* Gyll. (Tenebrionidae); reared from cut wood infested by bark beetles (Scolytidae). Sweden; France.....  
 ..... **M. punctifrons** Thoms.
- 79 ( 78). Frons smooth. Face distinctly bulged, occiput deeply incised (Fig. 113: 1). Propodeum steeply rounded, coarsely reticulate rugose. Antennae 33–35-segmented. Ovipositor 2.5 times as long as 1st abdominal tergite. Body black, with light colored pattern on head, pronotum, sometimes also on upper part of thorax; legs reddish yellow. Body 4.8. Hungary; Austria; Bulgaria ..... **M. salicorniae** Schm.
- 80 ( 75). Eyes very well developed, their longitudinal diameter more than width of face; height of genae usually less than basal width of mandible.
- 81 ( 84). Hind femora short, thickened, 3.5–4 times as long as wide. Ovipositor shorter than abdomen.
- 82 ( 83). Antennae very short, not longer than head and thorax together, 20–21-segmented (cf. also couplet 48).....  
 ..... **M. breviantennatus** Tobias, sp. n.
- 83 ( 82). Antennae longer, 23–27-segmented. Propodeum above with smooth sculpture. Body black; pattern on pronotum and sometimes on mesonotum yellowish red. Ocelli small. Claw lacking basal prominence. Propodeum with 1 or 2 transverse ridges and 1 longitudinal ridge in middle. Fig. 113: 2–4. Body 3–3.5. Parasite of beetles *Orchesia micans* Pz. (Melandryidae), moth *Tineola biselliella* Hum. (Tineidae). West; Western Europe.....  
 ..... **M. brevicauda** Thoms.  
 (mongolicus Fahr., thuringiacus Schm.)
- 84 ( 81). Hind femora not thickened, approximately 6 times as long as wide.

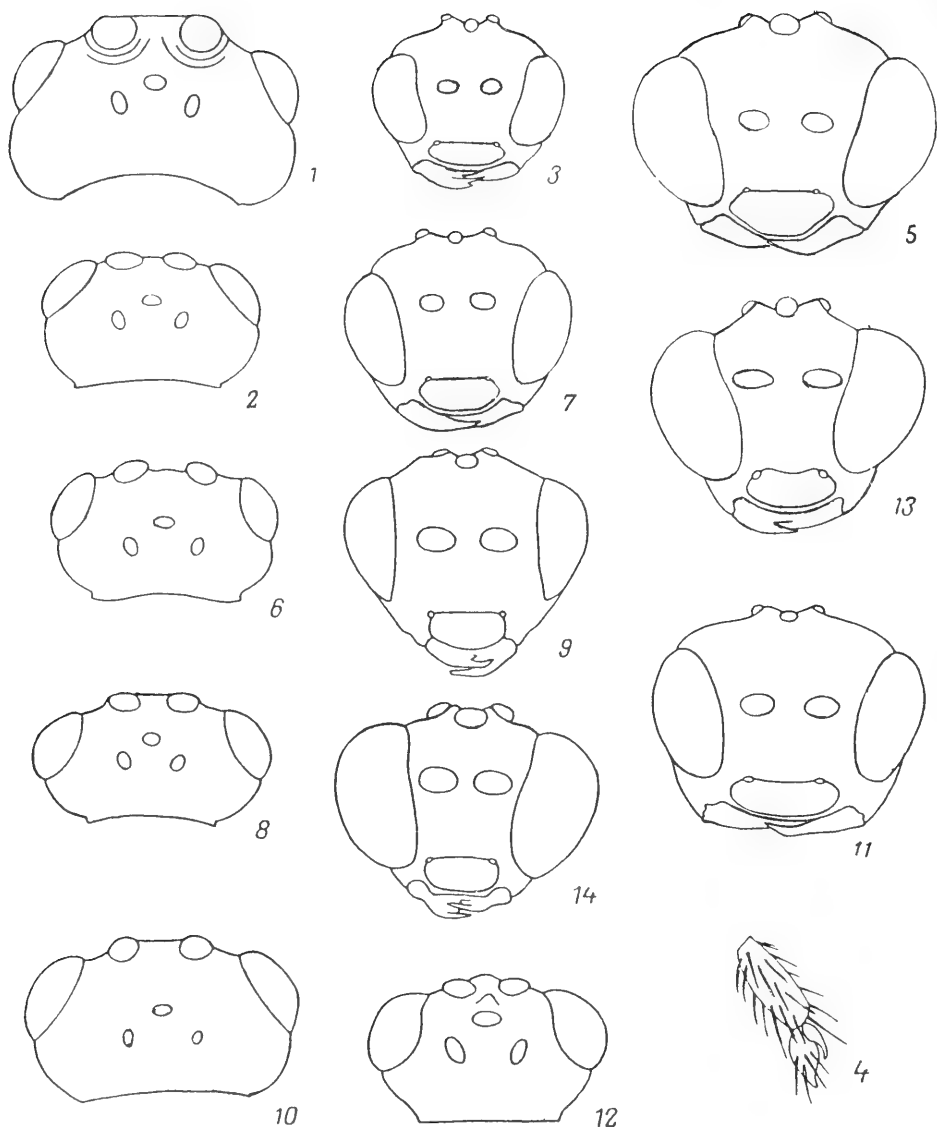


Fig. 113. Euphorinae (from Huddleston).

1—*Meteorus salicorniae*, head; 2—4—*M. brevicauda*: 2—head, dorsal view, 3—head, frontal view, 4—apical segment of tarsus; 5—*M. obfuscatus*, head; 6, 7—*M. cesoidator*: 6—head, dorsal view, 7—head, frontal view; 8, 9—*M. consimilis*: 8—head, dorsal view, 9—head, frontal view; 10, 11—*M. abdominalator*: 10—head, dorsal view, 11—head, frontal view; 12, 13—*M. melanostictus*: 12—head, dorsal view, 13—head, frontal view; 14—*M. heliophilus*, head, frontal view.

- 85 ( 86). Clypeus densely punctate, matte, with dense erect hair, distinctly and uniformly bulged. (cf. also couplets 9 and 19) ..  
 ..... **M. pulchricornis** Wesm.
- 86 ( 85). Clypeus sparsely punctate, lustrous, with sparse hair; if densely punctate and with dense hair (*M. abscissus*), then obliquely thickened.
- 87 ( 90). Ovipositor much shorter than abdomen. Face  $2/3-1/2$  as high as wide. Diameter of posterior ocellus  $1/2-2/5$  ocellular distance.
- 88 ( 89). Clypeus uniformly bulged, projecting, weakly punctate, with sparse hair. Head behind eyes fairly distinctly narrowed, temples somewhat shorter than eye (Fig. 113: 5). Antennae 23–29-segmented. Sternauli narrow, crenulate. Propodeum with somewhat noticeable fields posterior to transverse ridge. Claw with basal enlargement. Color variable: usually body black; head, mesonotum, scutellum, middle of abdomen and legs dark brownish yellow. Fig. 109: 8. Body 4–5. Parasite of beetles *Orchesia micans* Pz., *O. minor* Walk. (Melandryidae), *Triple russica* L., *Neotriplax lewisi* Grotch (Erotylidae). West; Krasnodar Territory (Sochi); Western Europe. (cf. also couplet 72) ..  
 ..... **M. obfuscatus** Nees (*fodori* Papp)
- 89 ( 88). Clypeus anteriorly flattened, densely punctate, with dense erect hair. Temples half as long as eye. Antennae 30–33-segmented. Sternauli broad, rugose. Propodeum uniformly reticulate-rugose. Claw basally with tooth-like process. Prepectal ridge distinct. Body reddish dark brown above head and thorax and 1st abdominal tergite dark colored. Fig. 112: 4. Body 3.8–4. Parasite of *Amathes agathina* Dup., *Orthosia stabilis* Den. and Schiff., *Agrotis strigula* Thunb., *Anaplectoides prasina* Den. and Schiff. (Noctuidae), *Oecophora geoffrella* L. (Oecophoridae), *Agriopsis leucophaearia* Den. and Schiff. *Alsophila aescularia* Den. and Schiff., *Operophtera brumata* L., *Oporinia dilutata* Den. and Schiff. (Geometridae), *Witlesia truncicolella* Stt. (Pyraustidae). Krasnodar Territory (Sochi); Northern and Central Europe..... **M. abscissus** Thoms.
- 196 90 ( 87). Ovipositor not shorter than abdomen.
- 91 ( 92). Face slightly narrowed downward, 2 times as wide as high; diameter of posterior ocellus  $2/5-1/3$  ocellular distance (Fig. 113: 6, 7). Ovipositor valves longer than abdomen. Claw basally slightly enlarged. Wings usually

almost hyaline-light colored, rarely weakly darkened. Parasite of moths *Tineola biselliella* Hum., *Nemapogon granellus* L., *N. personellus* P. and M., *N. cloacellus* Hw., *Trichophaga tapetzella* L. (Tineidae), beetles *Orchesia micans* Pz. (Melandryidae), reared from tunnel of *Rhagium bifasciatum* F. (Cerambycidae). North, northwest, center, east; Northern Caucasus, Western Siberia, Baikal Region; Western Europe, northern Africa, China. (cf. also couplet 99) .....

... **M. cespicator** Thunb. (*ambiguus* Ruthe, *similator* Nees)

- 92 ( 91). Face narrowed downward, its width in lower part equals height; diameter of posterior ocellus 1/2 ocellocular distance. Ovipositor valves usually as long as abdomen. Claw with basal prominence. Wings noticeably darkened. (cf. also couplets 39 and 50) ..... **M. tabidus** Wesm.
- 93 ( 62). Wings darkened with somewhat distinct light colored band under stigma. Second radiomedial cell anteriorly narrowed (Fig. 112: 5, 6). Ovipositor shorter than abdomen.
- 94 ( 95). Genae well developed, their height much greater than basal width of mandible (Fig. 113: 8, 9). Second radiomedial cell almost triangular or narrow trapezoidal (Fig. 112: 5). Face 2 times as wide as high. Antennae 32–36-segmented. Propodeum coarsely reticulate-rugose, posteriorly with depression. Claw distinctly curved, uniformly broadened toward base. Body black; legs dark brown, antennae usually dark brownish yellow (in male black). Body 3.6–4.3. Parasite of *Scolytus multistriatus* Marsh. (Scolytidae). Northwest; Central Asia (western Kopetdag); Western Europe .....
- ..... **M. consimilis** Nees (*flagellatus* Alexeev, syn. n.)
- 95 ( 94). Height of genae not exceeding basal width of mandible (Fig. 113: 10, 11). Second radiomedial cell broader, trapezoidal (Fig. 112: 6). Antennae 22–26-segmented, segments distinctly separated, length of 2 preapical segments slightly more than their width. Ovipositor 2–2.5 times as long as 1st abdominal tergite. Sternauli wide, rugose-punctate; propodeum coarsely non-uniformly reticulate-rugose; 1st abdominal tergite longitudinally rugose. Body black; legs yellowish or dark brownish red, tegulae and middle of abdomen above yellowish dark brown. Body 3.5–6. Parasite of *Xanthorhoe fluctuata* L., *Calostigia pectinataria* Knoch., *Operophtera brumata* L., *Eucoxia certata* F., *Eupithecia*

- sorbinata* Hb.(Geometridae), *Cucullia argentea* Hfn. (Noctuidae). North, west, northwest, center, Ukraine (Poltava), Moldavia; Caucasus, Kazakhstan, southern part of Siberia up to Far East, Kamchatka; entire Western Europe .....
- ..... **M. abdominalis** Nees (*brunnipes* Ruthe)
- 96 ( 37). Recurrent vein falling in 2nd radiomedial cell or interstitial.
- 97 ( 98). Hind tibiae thickened, thicker than femora (Fig. 111: 5). Face narrow, height not more than width in lower part. Antennae 30–33-segmented. Ovipositor as long as abdomen. Body black; legs reddish (cf. also couplet 56).....
- ..... **M. oculatus** Ruthe
- 98 ( 97). Hind tibiae thinner than femora.
- 99 (100). Ovipositor as long as abdomen and propodeum together. Antennae 25–29-segmented. Body 3–5. (cf. also couplet 91) .....
- ..... **M. cespicator** Thunb.
- 100 ( 99). Ovipositor not longer, usually shorter than abdomen.
- 101 (112). Stigma dark brown, often with light colored spot at base; sometimes light colored on anterior margin.
- 102 (105). Stigma monochromatic.
- 103 (104). Stigma almost black. Body very dark brown; head, pronotum, legs dark brownish yellow. Ovipositor 1.5 times as long as 1st abdominal tergite. Claw with basal prominence. Head distinctly narrowed behind eyes; ocelli large; frons with tubercle in middle; face square. Propodeum not coarsely sculptured with transverse ridge. Fig. 113: 12, 13. Body 5. Parasite of *Apeira syringaria* L., *Ennomos quercinaria* Hfn. (Geometridae). Western Europe .....
- ..... **M. melanostictus** Capron
- 104 (103). Stigma dark brown. Body yellowish dark brown; head posteriorly and dorsally black (cf. also couplet 16).....
- ..... **M. lionotus** Thoms.
- 105 (102). Stigma with yellow spot at base or light colored on anterior margin.
- 106 (111). Stylet of ovipositor more than half as long as abdomen, straight.
- 107 (108). Face half as high as wide (Fig. 110: 13). Antennae filiform, noticeably shorter than body, apical segments somewhat longer than wide. Ovipositor valves as long as abdomen. Head with numerous very short hair, on temples hair closer to eye, not reaching its margin, so that a distinct glabrous band forms between them and eye. Antennae

27-segmented. Radial cell on forewing very large (Fig. 110: 14). Hind femora 5 times as long as wide. First abdominal tergite sharply narrow from middle (Fig. 110: 15). Propodeum with distinct transverse ridges at base and beyond middle, almost smooth between them, with weak longitudinal middle ridge and more distinct lateral ridges, behind posterior transverse ridge with fairly coarse but sparse wrinkles, with large pentangular areola; 1st abdominal tergite entirely sculptured, on sides with longitudinal folds. Legs yellowish dark brown; tegulae and palps yellow. Body 4. Krasnodar territory .....

..... **M. micropilosus** Tobias, sp. n.

Holotype: Female, Sochi (Lazarevskoe), terraced slopes, forest, 8-9.V.1975 (V. Tobias).

108 (107). Face square.

109 (110). Second radiomedial cell not at all narrowed anteriorly, 1st and 2nd radiomedial veins parallel, nervulus distinctly postfurcal (Fig. 110: 11). Propodeum with sharp transverse, broad arcuate keel beyond middle, lacking longitudinal median ridge but from middle transverse keel with 2 small oblique divergent ridges, in upper half relatively weakly rugose-punctate with few longitudinal wrinkles; posterior to transverse keel with wide, almost pentangular areola, softly rugose-punctate; claws simple. Ovipositor valves equal to broadened part of abdomen. Antennae setiform, 27-segmented, preapical segments 1.5-2 times as long as wide. Body black; head except ocellar field and spot on it, prothorax including pronotum, and legs dark brownish yellow; stigma dark brown with light colored anterior margin. Body 4.5. Parasite of *Lymantria monacha* L. West .....

..... **M. monachae** Tobias, sp. n.

Holotype: Female, Minsk Region, Trepalovo, *L. monacha* L., VII.1979 (A. Tereshkin).

110 (109). Second radiomedial cell weak but distinctly narrowed anteriorly. First and 2nd radiomedial veins not parallel; nervulus slightly postfurcal. Propodeum with weakly developed transverse and distinct longitudinal ridges. Claw basally with wide denticle. Body with abundant light coloration, stigma on anterior margin light colored. Antennae setiform, about as long as body, apical segments larger than wide. Ovipositor valves much shorter than abdomen. Hair



- on head long (on temples closer to eye, reaching its margin) (cf. also couplet 117) ..... **M. gyrator** Thunb.
- 111 (106). Ovipositor stylet half as long as abdomen, curved (Fig. 110: 9). (cf. also couplet 53) .....  
 ..... **M. ipidivorus** Tobias, sp. n.
- 112 (101). Stigma pale yellow, sometimes dark brownish, transparent.
- 113 (114). Ovipositor valves as long as abdomen (cf. also couplets 43 and 65) ..... **M. ictericus** Nees
- 114 (113). Ovipositor valves much shorter than abdomen.
- 115 (118). Head dorsally and greater portion of upper part and sides of mesothorax smooth. Claw with basal prominence.
- 116 (117). Face with clypeus 1.5 times as high as wide. Distance between posterior ocelli slightly more than ocellar diameter. Propodeum in middle with weak but distinct pentangular areola and short longitudinal ridge anterior to it. Body reddish yellow. Figs. 112: 7; 113: 14. Body 4.5–4.8. Austria ..... **M. heliophilus** Fi.  
 (*luridus* sensu Tobias, 1976)
- 117 (116). Face with clypeus at most slightly higher than wide. Distance between posterior ocelli 1.5 times ocellar diameter. Propodeum with somewhat distinct longitudinal ridge against uniformly rugose background, lacking pentangular areola in middle. Body light colored; 1st abdominal tergite and often upper part of thorax somewhat dark. Body 4–6. Parasite of *Cosmia trapezina* L., *Hydraecia micacea* Esp., *Nycteola asiatica* Krul., *Noctua pronuba* L., *N. fimbriata* Schreb., *Mythimna unipuncta* Hw., *Amphipyra tragopogonis* Cl., *Spodoptera exigua* Hb., *Agrochola lota* Cl., *Eupsilia transversa* Hfn., *Amathes xanthographa* Den. and Schiff., *A. triangulum* Hfn., *Ipimorpha retusa* L., *I. subtusa* Den. and Schiff., *Cucullia argentea* Hfn., *Euxoa nigricans* L., *E. temera* Hb., *Panolis flammea* Den. and Schiff., *Orthosia stabilis* Den. and Schiff., *Chilodes maritima* Tausch. (Noctuidae), *Thera juniperata* L., *Agriopsis aurantiaria* Den. and Schiff., *Eupithecia vulgata* Haw., *E. exiguata* Hb., *Operophtera brumata* L., *Calospilos pantaria* L. (Geometridae), *Leucoma salicis* L., *Lymantria dispar* L., *L. monacha* L., *Orgyia gonostigma* F. (Lymantriidae), *Malacosoma neustria* L., *Odonestis pruni* L. (Lasiocampidae), *Choristoneura murinana* Hb., *Tortrix viridana* L. (Tortricidae), *Strymon w-album* Knoch (Lycaenidae). Entire Palearctic. (cf. also couplet 110) ..... **M. gyrator** Thunb. (*scutellator* Nees)

- 118 (115). Head dorsally (including behind ocelli up to transverse ridge) and entire mesothorax (except smooth middle of scutellum) with fairly coarse and dense punctation, slightly lustrous (cf. also couplet 2) ..... **M. politutele** Shenef.

94. **ZeZe** Curtis, 1832 (*Zemiotes* Först., *Meteorus* anct., part<sup>1</sup>)<sup>2</sup>. Of 11 species, 6 in the Palearctic. The key below does not include the Holarctic-oriental *Z. niveitarsis* Cresson from the fauna of the USSR, which is distributed in the Far East.

- 1 (4). Sternauli as narrow, noticeably curved crenulate furrows (their lower margin indistinct and somewhat sculptured). Fig. 114: 1, 7. Body dark colored. First abdominal tergite relatively short (Figs. 115: 2; 114: 6).
- 2 (3). Ovipositor valves almost as long as abdomen. Hind femora relatively thick, 4.5–5 times as long as wide. Fig. 114: 1–6. Body 4–4.5. Northern Palearctic (according to Achterberg) ..... **Z. annulicrus** Thoms.
- 3 (2). Ovipositor valves shorter than abdomen. Hind femora thin, 5.2–6.5 times as long as wide. Figs. 114: 7–10; 115: 1, 2. Body 4.5–5.5. Parasite of *Eupithecia indigata* Hb., *E. satyrata* Hb., *E. lariciata* Freyer and other species of this genus (Geometridae). Center; Baikal Region; Western Europe; North America ..... **Z. caligatus** Hal. (*neesii* Ruthe)
- 4 (1). Sternauli and wide-rugose depressions (Figs. 115: 3; 116: 1). Body usually light colored (male often black). First abdominal tergite longer and thinner (Figs. 115: 7; 116: 6). Hind femora thin (Fig. 116: 5).
- 5 (6). Ovipositor valves almost as long as abdomen. Nervulus ante-furcal, rarely almost interstitial. Tarsi yellowish. Fig. 115: 3–7. Body 7–7.5. Parasite of *Acrobasis consociella* Hb., *A. tallonella* Rag., ? *Salebria formosa* Haw., *Dioryctria abietella* Den. and Schiff. (Phycitidae), *Zygaena lonicerae* Scheken (Zygaenidae), *Pyrausta sticticalis* L. (Pyraustidae), *Tortrix viridana* L. (Tortricidae). West, center, south; Caucasus, Kazakhstan (Alma-Ata), Western Siberia, Baikal Region, Far East; Western Europe

<sup>1</sup>The characters of *ZeZe* (= *Zemiotes*), based on which most authors consider it a subgenus of *Meteorus*, are hardly sufficient to warrant its elevation as an independent genus. However, combining them in one genus would call for the replacement of the widely known name *Meteorus* to *ZeZe*; this is not desirable.

<sup>2</sup>van Achterberg. 1979. *Tijdschr. Entomol.*, 122, 7: 241–279.

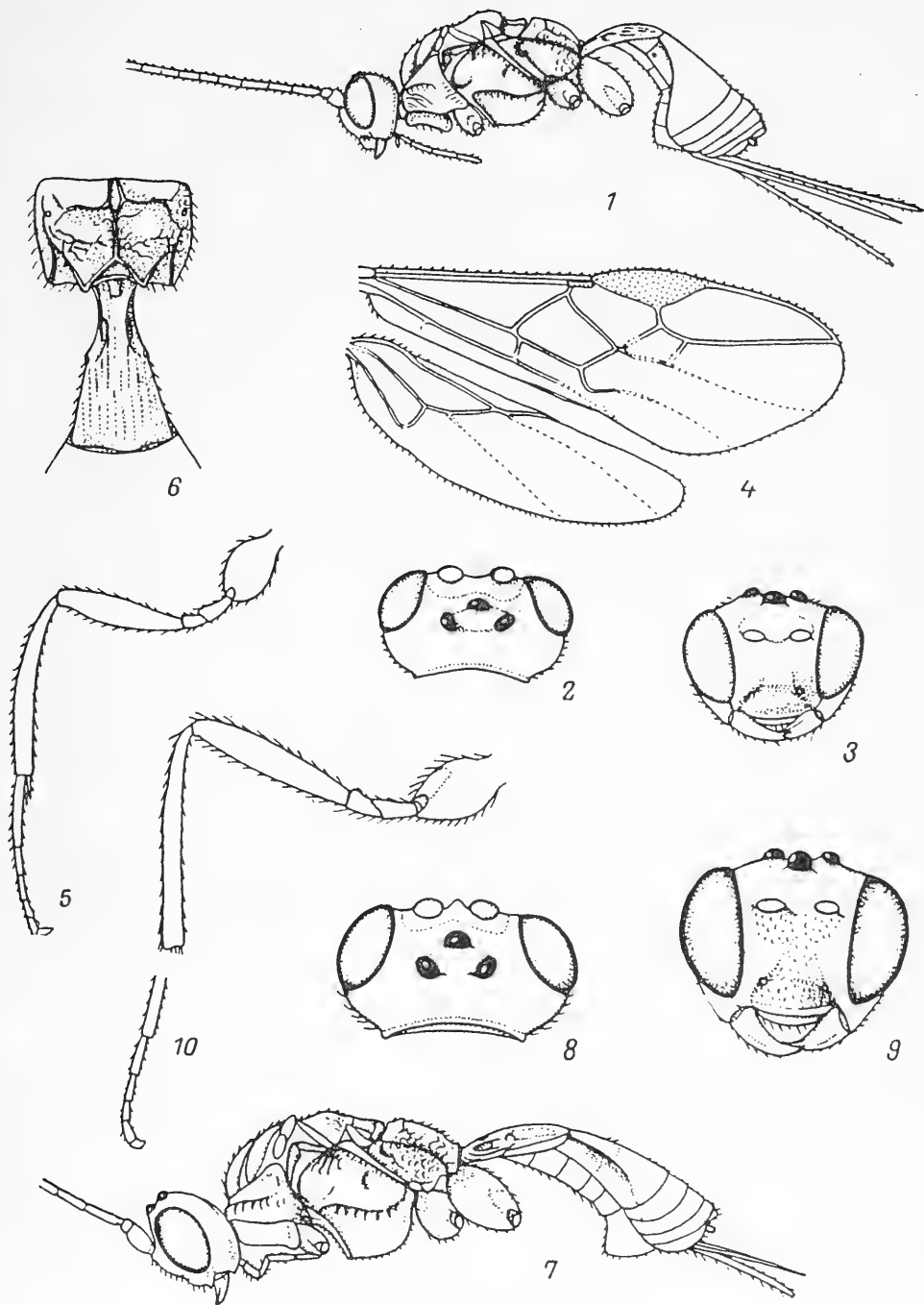


Fig. 114. Euphorinae (from Achterberg).

1-6—*Zela annulicrus*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—wings, 5—hind leg, 6—propodeum with 1st abdominal tergite; 7-10—*Z. caligaus*: 7—body, 8—head, dorsal view, 9—head, frontal view, 10—hind leg.

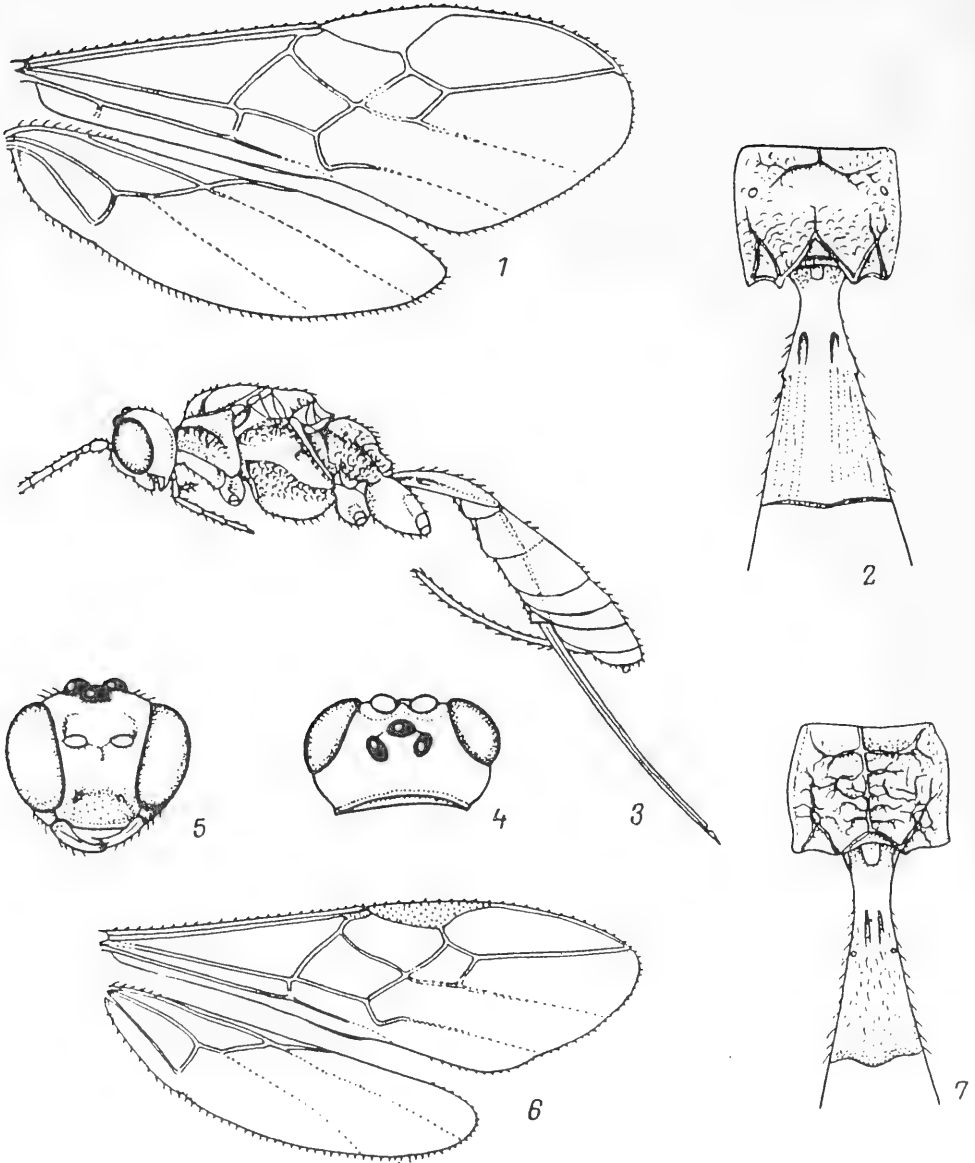


Fig. 115. Euphorinae (from Achterberg).

1-2—*Zele caligatus*: 1—wings, 2—propodeum with 1st abdominal tergite;  
 3-7—*Z. chlorophthalmus*: 3—body, 4—head, dorsal view, 5—head, frontal view,  
 6—wings, 7—propodeum with 1st abdominal tergite.

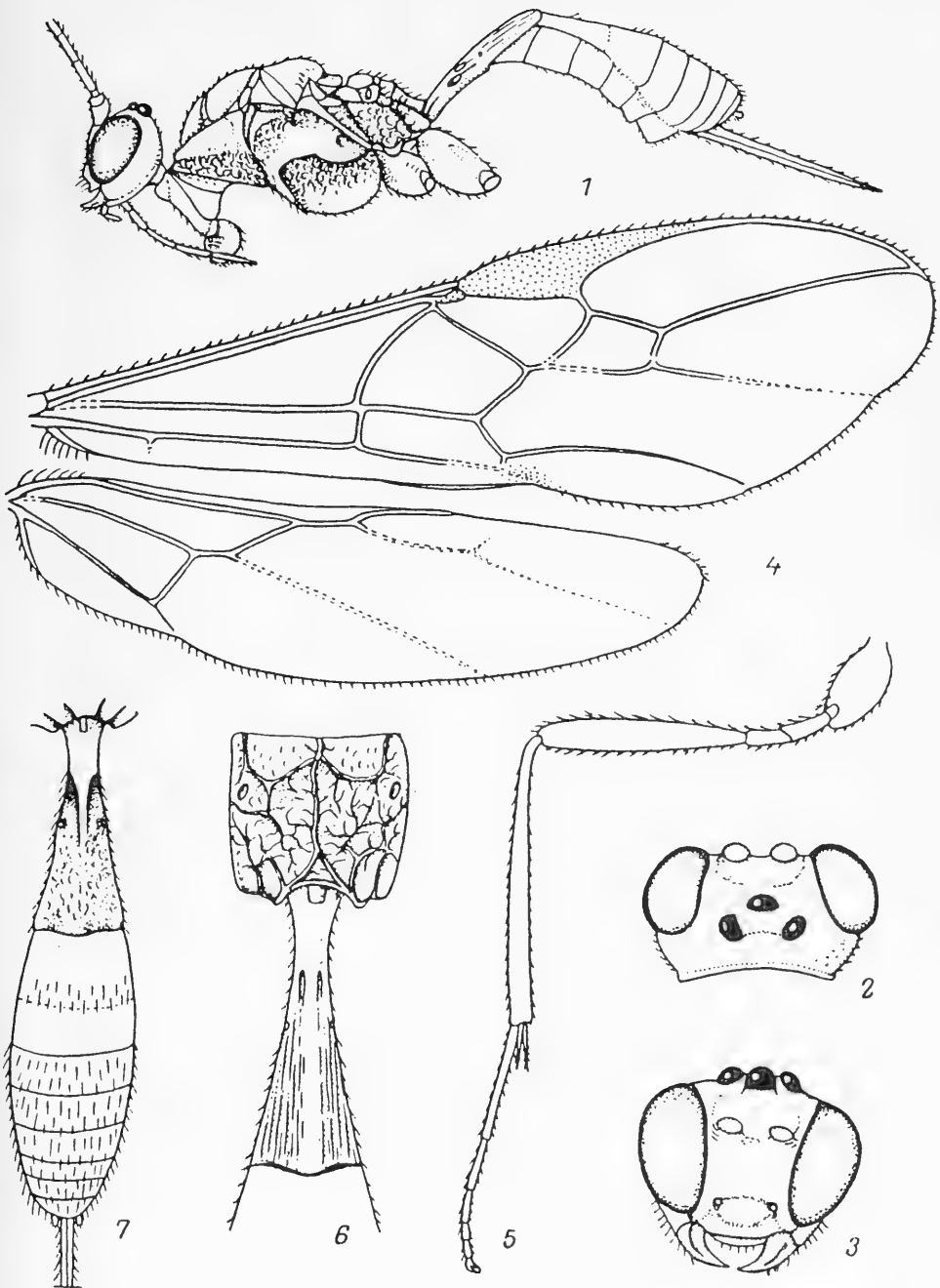


Fig. 116. Euphorinae (from Achterberg).

1—7—*Zele albiditarsus*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—wings, 5—hind leg, 6—propodeum with 1st abdominal tergite, 7—abdomen.

- ..... **Z. chlorophthalmus** Spin.  
 (*chrysophthalmus* Nees, *nigricollis* Thoms.)
- 6 (5). Ovipositor valves almost half as long as abdomen. Nervulus postfurcal. Tarsi often whitish (but sometimes dark colored f. *deceptor* Wesm.). Fig. 116. Body 7.5–10. Parasite of *Bupalus piniarius* L., *Hydriomena furcata* Thunb., *Rheumaptera hastata* L., *Semiothisa continuaria* Eversm., species from genera *Eupithecia*, *Nyctibia* (Geometridae), *Anarta myrtili* L. (Noctuidae), *Anthereaea palyphemus* Cramer (Attacidae), *Ostrinia nubilalis* Hb., *Pyrausta sticticalis* L. (Pyraustidae), *Acleris variana* Fennald (Tortricidae). Northwest, center, south; Caucasus, Kazakhstan, Siberia (up to Far East); Western Europe; North America ..... **Z. albiditarsus** Curt. (*testaceator* Curt., *deceptor* Wesm., *rufulus* Thoms., *separandus* Fi., *romani* Fahr.)

95. **Blacometeorus** Tobias, 1976<sup>1</sup>.—Three species.

- 1 (2). Pedicel of antennae elongate, slightly shorter than scape; flagellar segments gradually reducing from base to apex. Base of ocellar triangle slightly longer than its sides, as long as distance from posterior ocellus to eye. First abdominal tergite apically broadened, 2.5 times as long as its width at apex; abdomen compressed. Antennae 18-segmented. Fig. 117: 1, 2 (male). Caucasus (Lenkozan) ..... **B. intermedius** Tobias
- 201
- 202 2 (1). Pedicel of antennae spherical, half as long as scape; first 3 flagellar segments longer, 4th and 5th much shorter, 6th and subsequent larger than 4th and 5th. Ocelli in equilateral triangle with base shorter than distance from posterior ocellus to eye. Hind femora 5 to 6 times as long as wide (females).
- 3 (4). First flagellar segment 2.5 times as long as 2nd, 3rd almost 2 times as wide as they, 4th and 5th segments square, subsequent approximately 1.5 times as long as wide. First abdominal tergite apically broadened, 1.5 times as long as width at apex. Abdomen only apically compressed, shorter than thorax; ovipositor slightly shorter than abdomen (Fig. 117: 3). Antennae 17-segmented. Finland ..... **B. brevicauda** Hellén
- 4 (3). First flagellar segment 4 times, 2nd 3.5 times, 3rd 3 times, 4th and 5th 2 times, subsequent segments 2.5 times as long as wide. First abdominal tergite parallel-sided, 2 times as long as wide. Abdomen distinctly compressed, larger than thorax; ovipositor

<sup>1</sup> Tobias. 1982. *Entomol. Obozrenie*, 61, 3: 614–619.

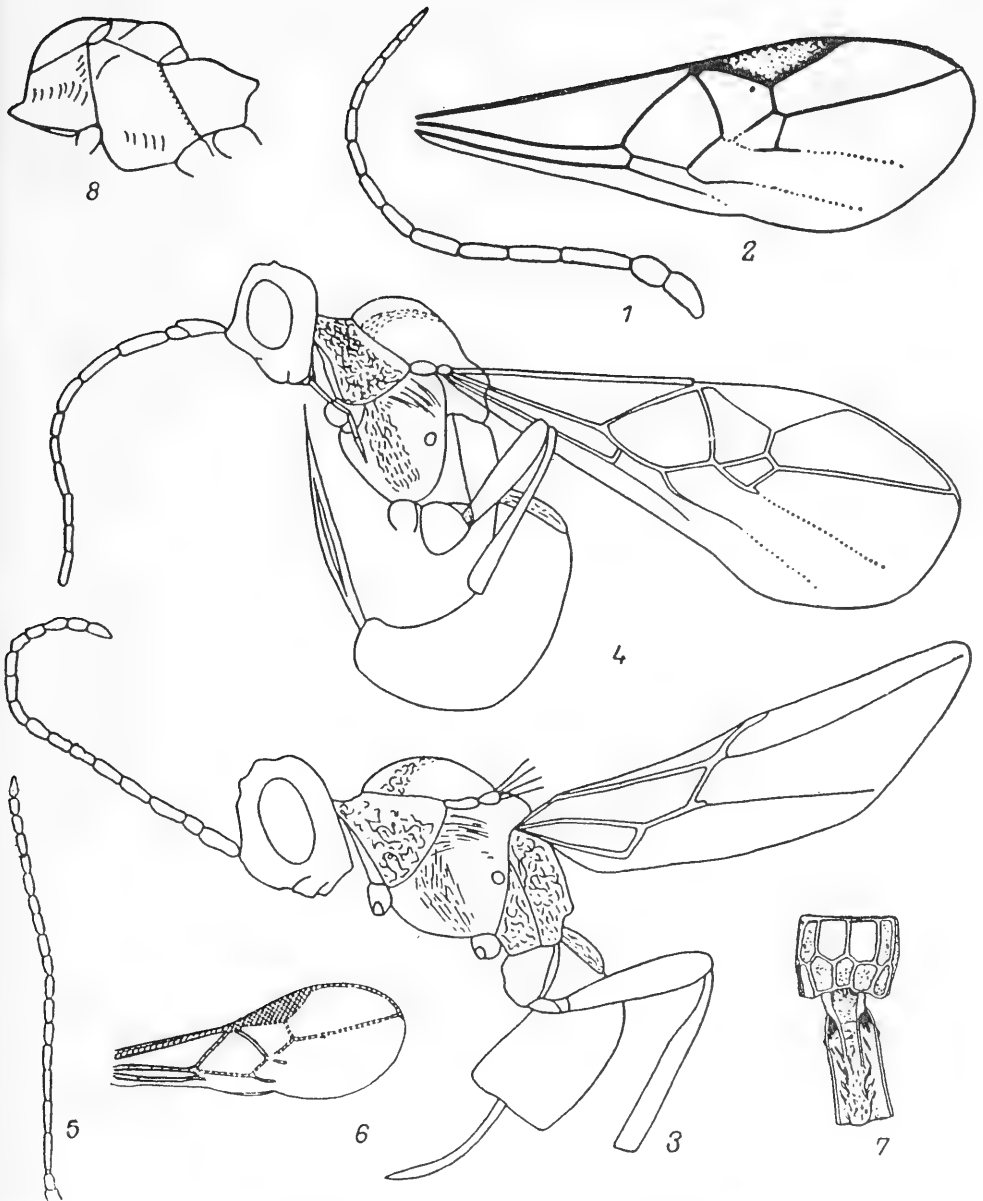


Fig. 117. Euphorinae, female (from Tobias and Haeselbarth).

1, 2—*Blacometeorus intermedius*: 1—antenna, 2—forewing; 3—*B. brevicauda*; 4—*B. pusillus*; 5–7—*Ischnotron achterbergi*: 5—antenna, 6—forewing, 7—propodeum with 1st abdominal tergite; 8—*Blacus instabilis*, thorax.

as long as abdomen (Fig. 117: 4). Finland .....  
 ..... **B. pusillus** Hellén

96. **Ischnotron** van Achterberg, 1975.—Four species, of which 1 in the Palearctic.

- 1 (1). Antennae 18–19-segmented, long and thin. Sternauli as short crenulate furrows. Palps, arcuately bordered. Ovipositor valves somewhat shorter than hind tibia. First section of radial vein as long as width of stigma. Legs thin, hind femora 6 times as long as wide, hind tarsi and tibiae of same length; foretarsi and tibiae short with somewhat distinct denticles. First abdominal tergite long, parallel-sided, softly rugose, 2nd basally sometimes coriaceous-rugose. Face, clypeus and scutellum smooth. Body very dark brown, legs yellowish dark brown. Fig. 117: 5–7. Wings 2 mm. Moldavia; Western Europe .....  
 ..... **I. achterbergi** Haes. (*gracilis* Haes.)

97. **Blacus** Nees, 1818<sup>1</sup>.—About 100 species, 50 in the Palearctic (besides those included in the Key below there are several species from Asia outside the USSR).

- 1 (84). Females.  
 2 ( 3). Propodeum smooth, uniformly rounded, with 5 distinct fields, scutellum sharply bordered. Antennae 17–18-segmented. Sternauli not developed. Ovipositor valves 2 times as long as hind tibia. Abdomen apically distinctly compressed, 1st abdominal tergite 2.5 times as long as wide, its upper part softly rugose, other tergites smooth. Body very dark brown to black; 1st and 2nd antennal segments yellowish dark brown. Fig. 118: 1, 2. Wings 2–2.5 mm. Central Europe. (Subgenus *Leioblacus* Acht.) ..... **B. (L.) fischeri** Haes.  
 3 ( 2). Propodeum somewhat steeply sloping, often on sides with obtuse projections or denticles, most often rugose and lacking fields or with weak fields; if smooth or only with weak sculpture and distinct fields, then only 4 fields on its upper surface: 2 each in front and behind transverse ridge.

<sup>1</sup>Haeselbarth. 1973. *Veröff. zool. St. Samml.* München, 16: 69–170; van Achterberg. 1976: *Tijdschr. Entomol.*, 118, 7: 159–322.



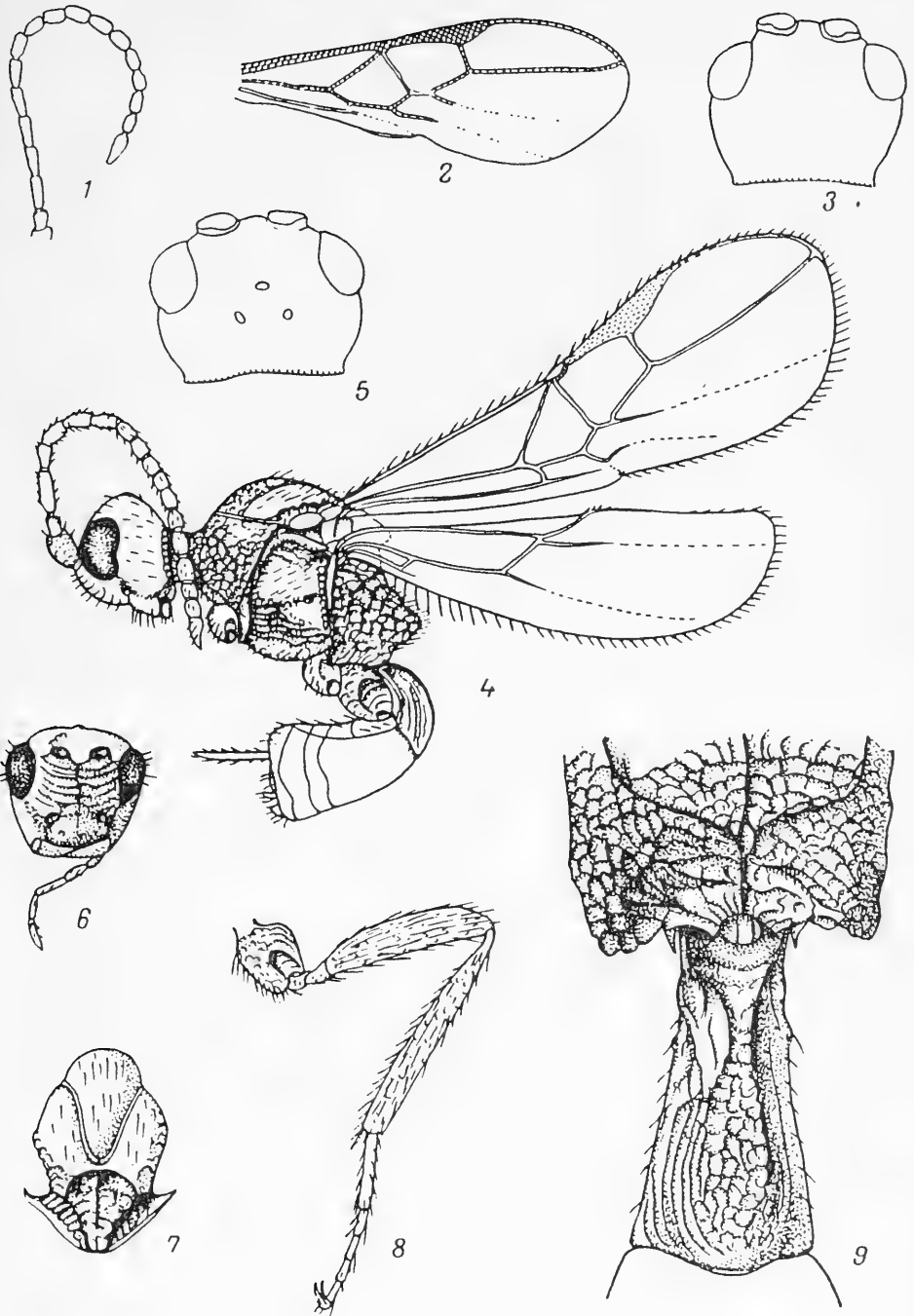


Fig. 118. Euphorinae, female (from Achterberg and Hacsclbarth).

1, 2—*Blacus fischeri*: 1—antenna, 2—forewing; 3—*B. mamillanus*, head; 4—9—*B. robustus*: 4—general appearance, 5—head, dorsal view, 6—head, frontal view, 7—mesonotum, 8—hind leg, 9—propodeum with 1st abdominal tergite.

- 4 (37). Claw of forelegs with black, unequally long projections (Fig. 121: 7). Scutellum sharply bordered, at apex border arcuate, sometimes as plate or raised denticle. Sternauli as wide obliquely rugose depressions. Antennae 15–26-segmented.
- 5 ( 8). Scutellum coarsely rugose. Propodeum on sides with large projections. Antennae 18-, rarely 19-segmented. Hind femora 5 times as long as wide. (Subgenus *Hysterobolus* Vier.).
- 6 ( 7). Head with very long temples (Fig. 118: 3). Thorax with reddish pattern. Wings often short and narrow. Ovipositor valves as long as 1st segment of hind tarsus. Propodeum with triangular denticles. Face transversely rugose. First abdominal tergite longitudinally rugose, 1.5 times as long as its width at apex. Antennae except bases and apices, tegulae and legs dark yellow, wings weakly darkened. Body 2–2.5. Southwest; Caucasus (Sochi); Western Europe ..... **B. (H.) mamillanus** Ruthe
- 7 ( 6). Temples not so long. Body entirely black or very dark brown. Wings not always reduced. Ovipositor valves slightly shorter than 1st abdominal tergite. Triangular denticles on propodeum weakly developed. Face delicately transversely striate. First abdominal tergite with dense longitudinal wrinkles, as its width at apex  $3/4$  of length. Color as in previous species. Fig. 118: 4–9. Wings 2.1–2.3. Kazakhstan; Central Europe ..... **B. (H.) robustus** Haes.
- 8 ( 5). Scutellum smooth or weakly sculptured. Propodeum on sides with small denticles or uniformly rounded. (Subgenus *Ganychorus* Hal.).
- 9 (10). Antennae 15-segmented (Fig. 119: 1). Ovipositor barely exerted from abdominal apex, slightly curved upward. Wing veins noticeably thickened (Fig. 119: 2). Hind femora 6 times as long as wide, 1st abdominal tergite apically 2 times as long as wide as at base, 1.8 times as long as width at apex. Face weakly rugose-punctate, scutellum smooth or weakly rugose; propodeum softly rugose, with indistinct fields, lacking denticles on sides; 1st abdominal tergite softly but densely longitudinally rugose, 2nd basally softly rugose. Body black; legs yellow with darkened hind femora; wings weakly darkened. Wings 1.9–2.1 mm. Northern part of Western Europe..... **B. (G.) strictus** Stelfox

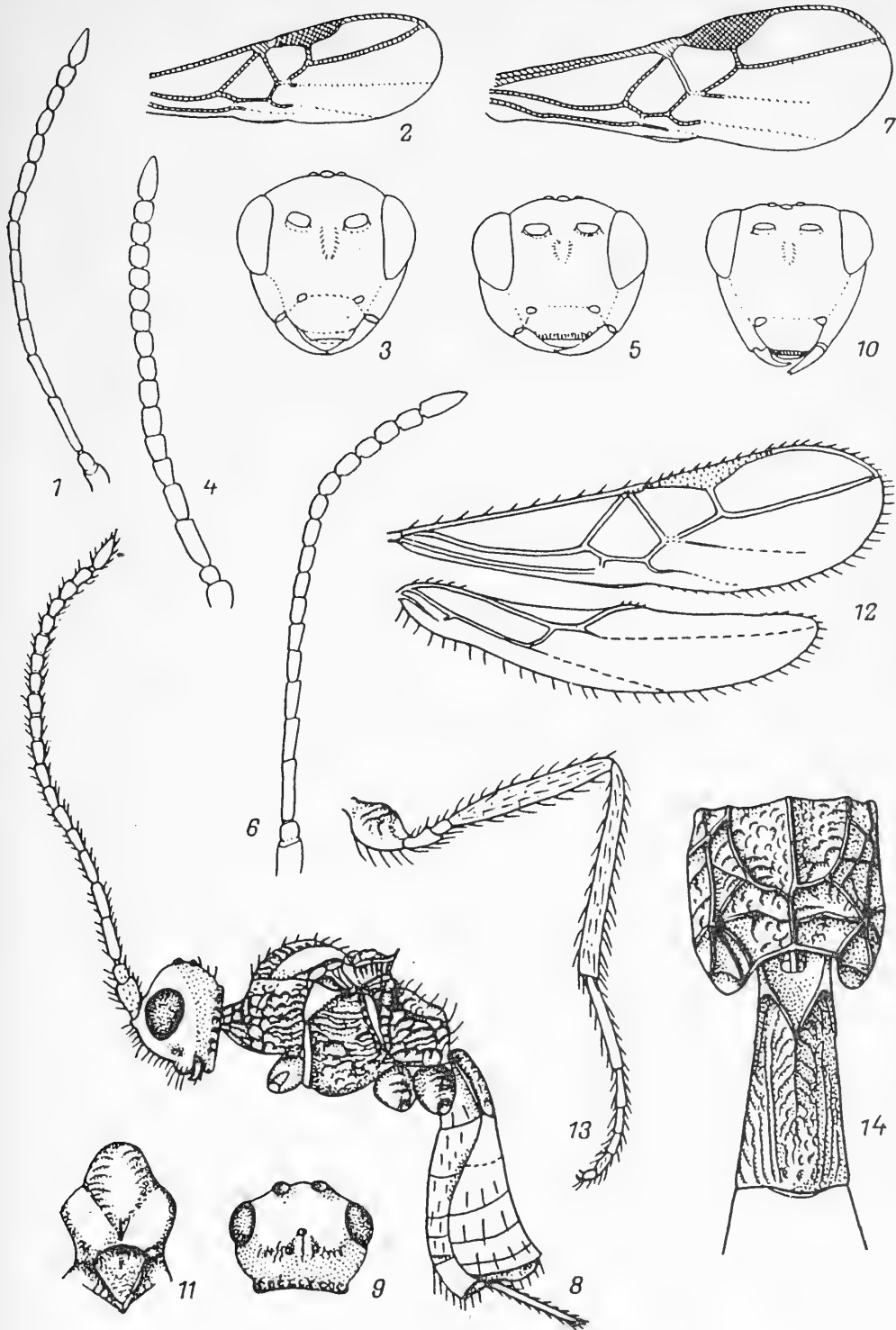


Fig. 119. Euphorinae, female (from Achterberg and Haeselbarth).

1, 2—*Blacus strictus*: 1—antenna, 2—forewing; 3, 4—*B. varius*: 3—head, 4—antenna; 5–7—*B. nixonii*: 5—head, 6—antenna, 7—forewing; 8–14—*B. armatulus*: 8—body, 9—head, dorsal view, 10—head, frontal view, 11—mesonotum, 12—wings, 13—hind leg; 14—propodeum with 1st abdominal tergite.

- 10 ( 9). Antennae not less than 17-segmented. Ovipositor exerted far from abdominal apex, noticeably curved downward.
- 11 (14). Propodeum with one denticle on both sides. Antennae 17–19—segmented. Long black projections only on claws of forelegs.
- 12 (13). Scutellum absolutely smooth. Flagellar segments shorter (antennae 17-segmented) (Fig. 119: 4). Genae 2 times as high as width of mandible at base (Fig. 119: 3). First section of radial vein longer than width of stigma. Hind femora 4.5 times as long as wide. Ovipositor valves somewhat longer than 1st abdominal tergite. Face softly transversely rugose; propodeum coarsely rugose, on sides with denticles (acute in profile). First abdominal tergite longitudinally rugose, 2 times as long as width at apex. Body reddish with abdomen, propodeum, lower part of thorax dark, 3 spots on mesonotum and ocellar field; wings light colored. Wings 2.2–2.5 mm. Northern Italy..... **B. (G.) varius** Haes.
- 204
- 13 (12). Scutellum weakly but distinctly rugose. Antennae with longer segments. Genae 1.5 times as high as width of mandible at base. First section of radial vein shorter than width of stigma. Hind femora 5–5.5 times as long as wide. Ovipositor valves 1.5 times as long as 1st abdominal tergite. Face indistinctly transversely rugose; propodeum rugose, on sides with obtuse projections (rectangularly truncate in profile). First abdominal tergite indistinctly longitudinally rugose, 1.8 times as long as width at apex. In color similar to previous species but dark spots on mesonotum often indistinct. Fig. 119: 5–7. Wings 2–2.5 mm. Cyprus; Bulgaria ..... **B. (G.) nixonii** Haes.
- 206
- 14 (11). Propodeum lacking denticles, rounded or angular on sides. Antennae not more than 19-segmented. Usually black projections developed besides forelegs on middle and sometimes even hind leg claws.
- 15 (18). First abdominal tergite almost parallel-sided. Antennae 19–20-segmented. Scutellum sharply bordered with spoon-shaped apex. Propodeum angular (posterior and upper surfaces forming an angle of about 110°).
- 16 (17). Scutellum coarsely rugose, with transverse folds. Antennae 20-segmented. Head with very long genae, genae 2.5–3 times as high as width of mandible. Wings narrow. Hind femora 6 times as long as wide. Discoidal cell broad, anteriorly pointed. Ovipositor somewhat shorter than 1st abdominal tergite, 1st abdominal tergite 2 times as long as wide. Face

- softly rugose. Propodeum rugose but at places with smooth sculpture and fairly distinct fields, 1st abdominal tergite longitudinally rugose. Body black; antennae and legs yellowish dark brown, hind femora apically darkened in dark brown. Fig. 119: 8–14. Wings 1.8–2 mm. Center (Voronezh), Moldavia, Transcarpathia; Caucasus, Kazakhstan; Western Europe ..... **B. (G.) armatulus** Ruthe
- 17 (16). Scutellum smooth. Antennae 19-segmented, rarely 20-segmented. Genae 2 times as high as width of mandible. Wings broad (Fig. 120: 1). Hind femora 7 times as long as wide. Ovipositor valves thin, somewhat curved, somewhat longer than 1st abdominal tergite, 1st abdominal tergite 2.5 times as long as wide. Discoidal cell very narrow, anteriorly with basal and medial veins apart (in male discoidal cell broadly sessile). Face weakly rugose; propodeum rugose with somewhat distinct fields. Body dark brown, at places black, palps and legs pale yellow; wings light colored, stigma yellow. Fig. 120: 1. Center; Caucasus (Georgia, Azerbaidzhan); Western Europe..... **B. (G.) tripudians** Hal.
- 18 (15). First abdominal tergite distinctly broadened apically. Apex of gena less strongly elevated. If sometimes 1st abdominal tergite slightly broadened and genae sharply bordered (*B. palipes*), then antennae 23–25-segmented.
- 19 (26). Hind femora apically with dark brown or black stripe or spot. Antennae 20-segmented.
- 20 (21). Second flagellar segment 1.5–2 times as long as wide. Propodeum steeply sloping almost at right angle (95–100°). Scutellum somewhat smooth; frons softly striate from median furrow obliquely backward. Body black; hind femora sometimes almost entirely or entirely black, 5 times as long as wide. Fore and middle legs with black projections, hind legs with slighter projections. Antennal segments slightly longer than wide. Forewings fairly narrow, 2–2.5 mm. First abdominal tergite 2 times as long as width at apex, somewhat shorter than ovipositor. Fig. 120: 2–4. North, west, northwest, center; Western Europe ..... **B. (G.) maculipes** Wesm.
- 21 (20). Second flagellar segment 2.5–3 times as long as wide. Propodeum less steeply sloping (105–120°).
- 22 (23). Claw of all legs with long, unequal black projections. Scutellum noticeably rugose. Apical antennal segments somewhat longer than wide. Forewings sometimes short and narrow—about 1.5 mm (*B. ambulans ambulans* Hal. from

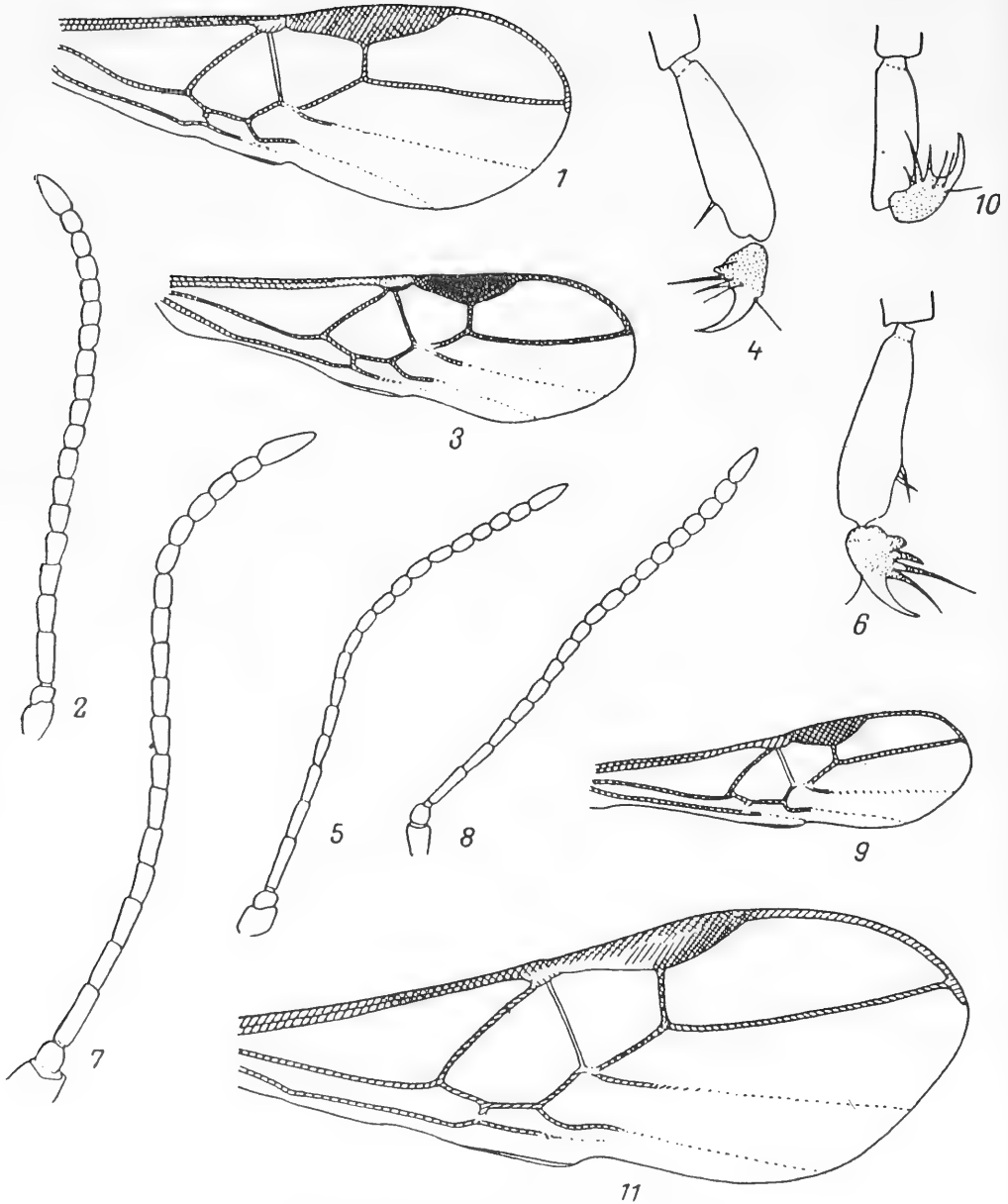


Fig. 120. Euphorinae, female (from Haeselbarth).

1—*Blacus tripudians*, forewing; 2—4—*B. maculipes*: 2—antenna, 3—forewing, 4—5th segment of hind tarsus; 5, 6—*B. ambulans*: 5—antenna, 6—5th segment of hind tarsus; 7—*B. koenigsmanni*, antenna; 8—10—*B. diversicornis*: 8—antenna, 9—forewing, 10—5th segment of hind tarsus; 11—*B. pallipes*, forewing.

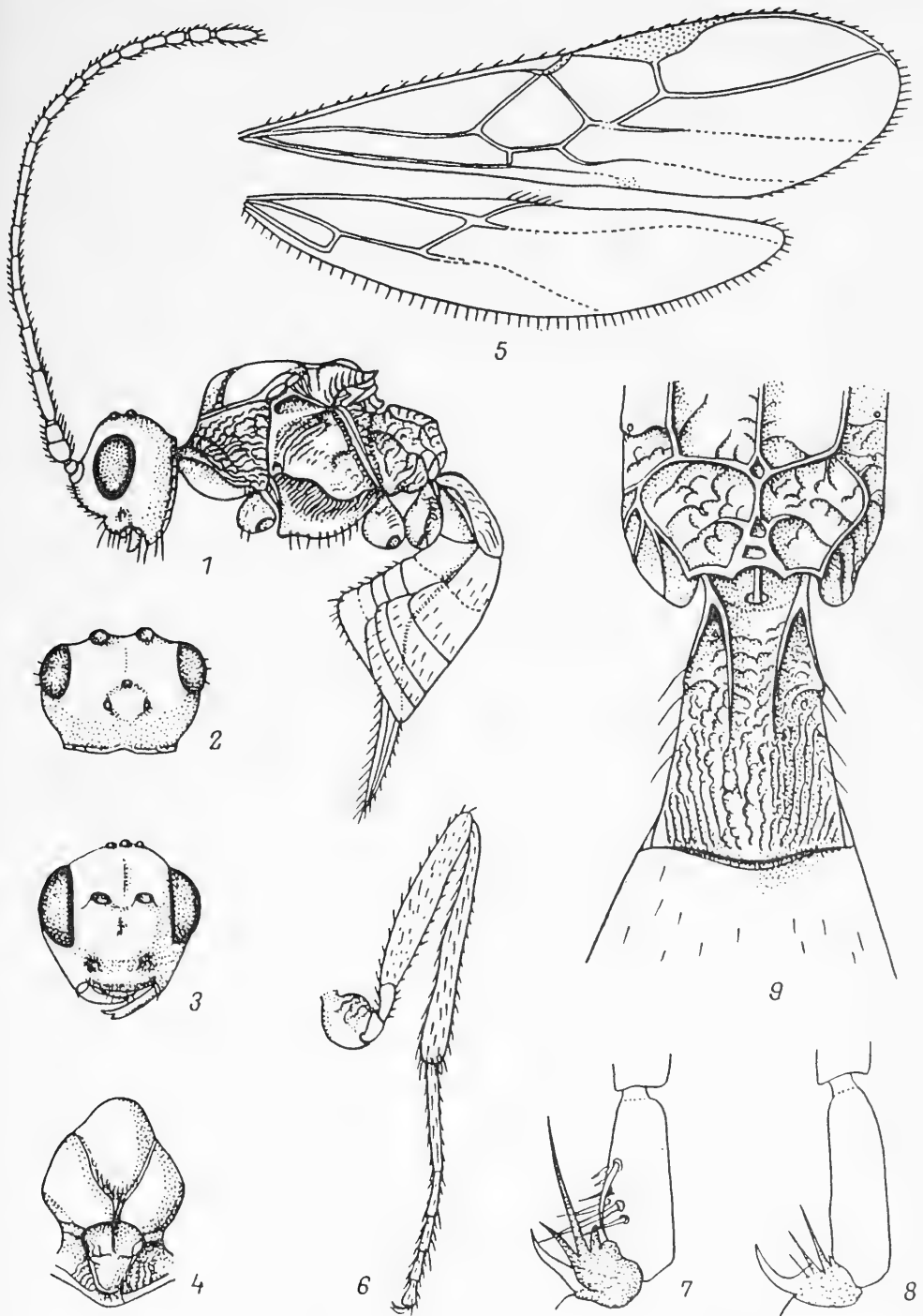


Fig. 121. Euphorinae, female (from Achterberg).

1—9—*Blacus ruficornis*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—mesonotum, 5—wings, 6—hind leg, 7—5th segment of foretarsus, 8—5th segment of hind tarsus, 9—propodeum with 1st abdominal tergite.

- Ireland) but usually wings as long as body (Fig. 120: 6) or slightly longer- 1.8–2.2 mm. Hind femora 7 times as long as wide. First abdominal tergite 1.6–1.7 times as long as its width at apex, somewhat shorter than ovipositor. Body black, upper part of pro- and mesothorax sometimes dark brown. Fig. 120: 5, 6. North, northwest, center; Western Europe...  
 ..... **B. (G.) ambulans macropterus** Haes.
- 23 (22). Only claws on fore- and middle legs with black projections, hind claw without them. Face softly rugose.
- 24 (25). Frons distinctly striate obliquely backward from median line; scutellum coarsely transversely rugose. Antennal segments in apical third longer than wide (Fig. 120: 7). Hind femora 6 times as long as wide. First abdominal tergite 2 times as long as its width at apex. Forewings 2.5–3 mm. Central Europe ..  
 ..... **B. (G.) koenigsmanni** Haes.
- 25 (24). Frons and scutellum smooth. Apical antennal segments shorter. Hind femora 5 times as long as wide. First abdominal tergite 1.5 times as long as its width at apex. Fig. 120: 8–10. Forewings 1.8–2.2 mm (in holopterous forms; sometimes wings greatly reduced). Northwest, center, southwest; Caucasus, Kazakhstan; Western Europe .....  
 ..... **B. (G.) diversicornis** Nees
- 26 (19). Hind femora entirely yellowish dark brown, lacking preapical darkened spot. Antennae 19–25-segmented.
- 27 (28). Antennae 23–25-segmented. Forewings 4–4.5 mm. Basal vein considerably, 1.5 times as long as 1st section of medial vein (Fig. 120: 11). Hind femora thin, 7 to 8 times as long as wide; claw on fore- and middle legs with long black projections. Horizontal and vertical parts of propodeum forming angle of about 130°. Body black or very dark brown; wings light colored. Northwest, center; Caucasus; Western Europe .....  
 ..... **B. (G.) pallipes** Hal. (*tuberculatus* Wesm., *?barynoti* Boudier)
- 28 (27). Antennae 19–20-segmented. Forewings seldom longer than 3 mm.
- 29 (34). Antennae 20-segmented (in *B. pectinatus* sometimes 19-segmented). Hind coxae light colored.
- 207 30 (31). Darker parts of body black. Basal vein approximately 1.5 times as long as 1st section of medial vein (Fig. 122: 2). Occipital ridge in middle distinctly interrupted anteriorly. Antennae thin (Fig. 122: 1). Only claws of forelegs with black



- projections. Horizontal and vertical surfaces of propodeum forming angle of about  $104^\circ$ . Hind femora 6 times as long as wide. Forewings 3–3.3 mm. Kola Peninsula; England, Sweden, Finland, Austria ..... **B. (G.) nitidus** Haes.
- 31 (30). Darker part of body very dark brown. Basal vein 1.2–1.4 times as long as 1st section of medial vein. Occipital ridge lacking distinct discontinuity. Besides forelegs, middle or hind legs also with black projections.
- 32 (33). Claws of all legs including hind legs (Fig. 122: 4) with black projections. Hind femora 5 times as long as wide. Wings darkened. Antennae thicker (Fig. 122: 3). Horizontal and vertical sloping parts of propodeum forming angle of about  $115\text{--}120^\circ$ . Forewings 2.1–2.4 mm. Finland; Czechoslovakia; Hungary; Austria ..... **B. (G.) pectinatus** Haes.
- 208
- 209 33 (32). Claws on hind legs lacking black projections. Hind femora 6 times as long as wide. Wings weakly darkened. Antennae thin. Propodeum roundish, angle between its horizontal and vertical parts about  $130^\circ$ . Figs. 121; 135: 1. Forewings 2.5–2.7 mm. Parasite of *Tachyporus obtusus* L. (Staphylinidae). Entire European part of the USSR; Caucasus, Kazakhstan, Central Asia, Siberia (Barnaul, Irkutsk); Western Europe, northern Africa ..... **B. (G.) ruficornis** Nees
- 34 (29). Antennae 19-segmented. Hind coxae at least above darkened.
- 35 (36). Discoidal cell near parastigma pointed (Fig. 122: 5). Upper side of thorax fairly strongly sculptured, sides of mesothorax in region of sternauli longitudinally rugose (anteriorly up to prepectal ridge). Frons with weak smooth furrow, distinct only anterior to ocellus. Scutellum weakly bulged. Forewings 2.2–2.5 mm. Western Europe, Turkey ..... **B. (G.) conformis** Wesm.
- 36 (35). Discoidal cell near parastigma obtuse. Sculpture of upper side of thorax relatively weaker as also longitudinal wrinkles in region of sternauli (they at most reach prepectal ridge). Frons with distinct smooth longitudinal furrow. Scutellum fairly distinctly bulged. Fig. 122: 6, 7. Forewings 2.6–2.8 mm. Moldavia; Czechoslovakia; Hungary; Austria; Yugoslavia; Romania ..... **B. (G.) capeki** Haes.
- 37 ( 4). Claw lacking black projections or only basally with weak projections but often with bristles. Scutellum less strongly bordered. Sternauli granulose-rugose, lacking longitudinal folds or with weak folds. Antennae 17-segmented. (Subgenus *Blaacus* s. str.)

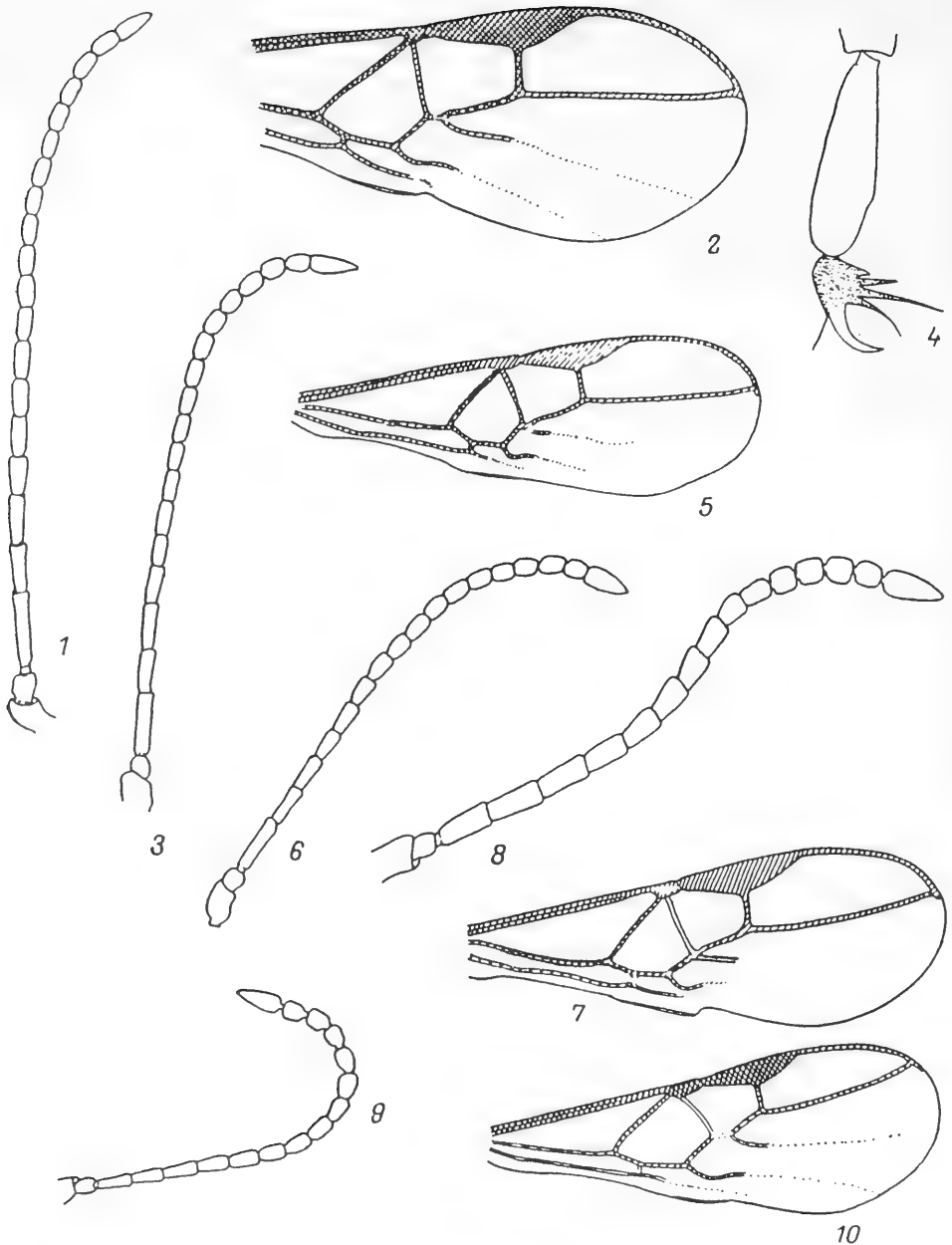


Fig. 122. Euphorinae, female (from Haeselbarth).

1, 2—*Blacus nitidus*: 1—antenna, 2—forewing; 3, 4—*B. pectinatus*: 3—antenna, 4—5th segment of hind tarsus; 5—*B. conformis*, forewing; 6, 7—*B. capeki*: 6—antenna, 7—forewing; 8—*B. rufescens*, antenna; 9, 10—*B. modestus*: 9—antenna, 10—forewing.

- 38 (39). Wings narrow, strongly reduced, barely reaching up to propodeum. Propodeum with two large denticles on sides. Ovipositor somewhat longer than hind tibia. Hind tarsi noticeably shorter than hind tibiae. Fig. 122: 8. Body 2–3. Moldavia; Western Europe. (*B. rufescens* group, part., cf. also couplets 72–74) .....  
 ..... **B. (B.) rufescens** Ruthe (*spinifer* Thoms.)
- 39 (38). Wings normally developed.
- 40 (51). Parastigma large, discoidal cell anteriorly somewhat widely obtuse (Figs. 122: 10; 123: 3, 8). (*B. humilis* group.)
- 41 (42). Propodeum roundish, only sometimes on sides with weak tubercles, softly coriaceous-rugose. Discoidal cell near parastigma relatively narrow, obtuse (Fig. 122: 10). Antennae slightly thickened apically (Fig. 122: 9). Hind femora 4 times as long as wide, hind tarsi as long as tibiae. First abdominal tergite 1.8 times as long as its width at apex. Ovipositor valves somewhat longer than hind tibia. Body black or very dark brown; legs light brown, stigma dark brown. Forewings 2.2–2.7 mm. Northwest; Western Europe.....  
 ..... **B. (B.) modestus** Haes.
- 42 (41). Propodeum on sides with obtuse and short but well developed denticles, usually strongly rugose. Discoidal cell anteriorly broadly sessile. First abdominal tergite 1.8–2 times as long as wide. Body black; legs yellow or dark brown, hind coxae above somewhat darkened.
- 43 (46). Prescutellar furrow besides middle keel also with longitudinal ribs. Ovipositor valves shorter than hind tibia.
- 44 (45). Antennae very short, middle flagellar segments as long as wide. Hind tarsi much shorter than hind tibiae. Ovipositor valves as long as hind femur. Hind femora 4 times as long as wide. Forewings 2.5–3.5 mm. Fig. 123: 1–4. Parasite of *Anthrophagus* sp. (Cryptophagidae). West, center, south; Caucasus (Sochi, Georgia); Western Europe.....  
 ..... **B. (B.) paganus** Hal. (*brevicornis* Ruthe)
- 45 (44). Antennae with noticeably longer middle segments of flagellum (Fig. 123: 5). Hind tarsi and tibiae approximately of same length. Ovipositor valves somewhat longer than hind femur. Hind femora 5 times as long as wide. Forewings 2.3 mm. Crimea; Kazakhstan; Mongolia; Nepal .....  
 ..... **N. (B.) radialis** Haes.

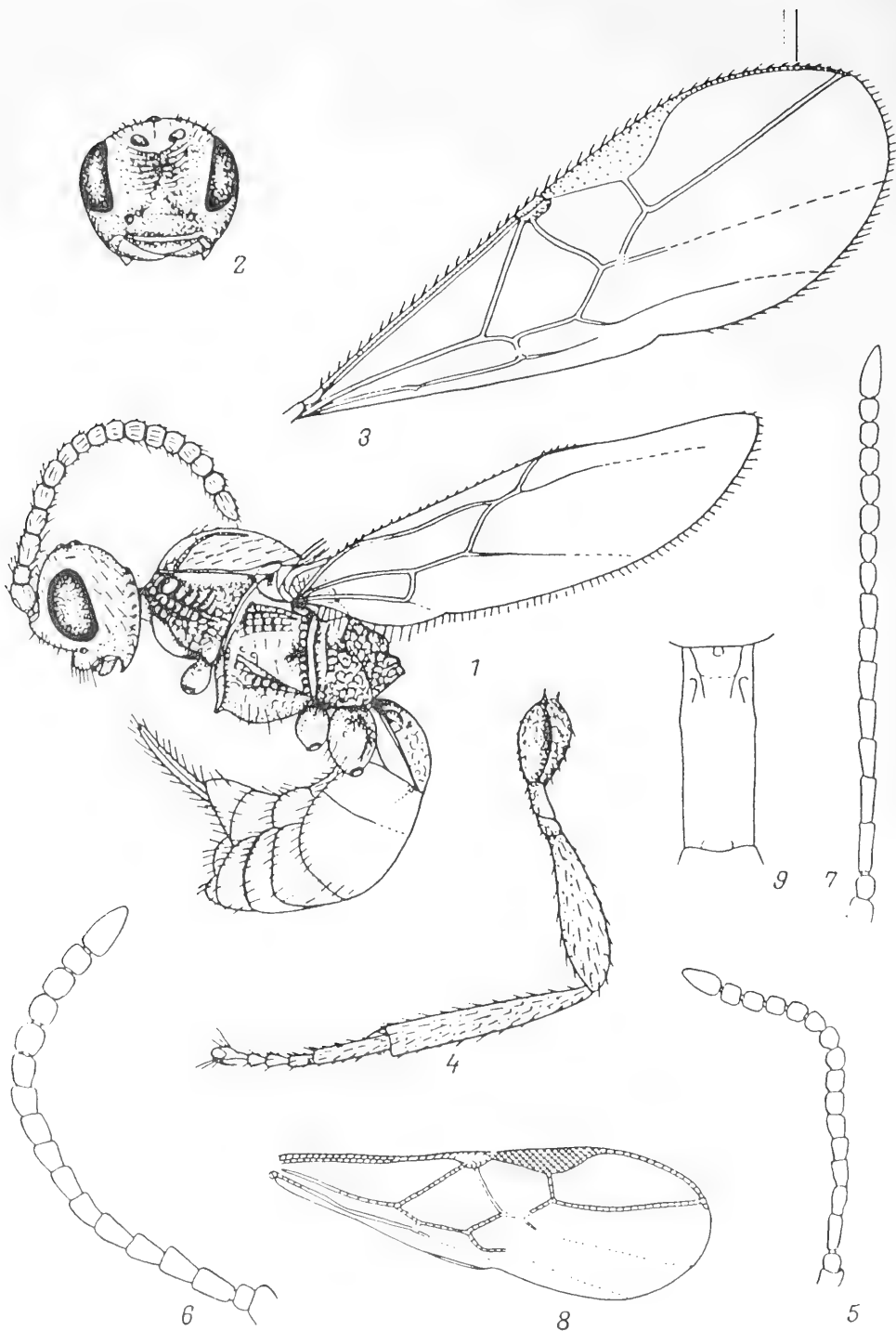


Fig. 123. Euphorinae, female (from Achterberg and Haeselbarth).

1-4—*Blacus paganus*: 1—body, 2—head, 3—forewing, 4—hind tarsus; 5—*B. radialis*, antenna; 6—*B. forficornis*, antenna; 7-9—*B. longipennis*: 7—antenna, 8—forewing, 9—1st abdominal tergite.

- 46 (43). Elevated tubercle on sides smooth from median keel or only very nonuniformly rugose. Ovipositor valves not shorter than hind tibiae.
- 47 (48). Antennae short and thick (Fig. 123: 6). Hind tarsi much shorter than tibiae. Longitudinal median furrow on frons smooth, deep. Head and thorax often dark brownish, abdomen black; legs yellow or darkened. Body 3–3.5. North, center; Caucasus (Sochi); England; Sweden; Hungary .....  
..... **B. (B.) forticornis** Haes.
- 48 (47). Antennae thinner (Fig. 123: 7). Hind tarsi and tibiae of approximately same length. Longitudinal median furrow on frons not developed or very weak. Body monochromatic, dark.
- 49 (50). First abdominal tergite very narrow, long, parallel-sided, 2.5 times as long as its width at apex. Antennae much longer than head and thorax together, segments thinner. First section of radial vein at least equal to width of stigma. Fig. 123: 7–9. Forewings 2.3–3.1 mm. Parasite of *Anobium* sp. (Anobiidae). Northwest; Krasnodar territory (Sochi), Kazakhstan; Western Europe ..... **B. (B.) longipennis** Grav. (*dubius* Ruthe)
- 50 (49). First abdominal tergite apically noticeably broadened, not less than twice as long as its width at apex. Antennae only slightly longer than head and thorax together. First section of radial vein usually shorter than width of stigma. Fig. 124: 1–3. Forewings 2–3 mm. Parasite of *Blastophagus piniperda* L. (Scolytidae), *Stegobium paniceum* L. (Anobiidae), *Cryptophagus lycoperdi* Hbst. (Cryptophagidae). West, northwest, center, Ciscaucasia; Western Europe; North America .....  
..... **B. (B.) humilis** Nees (*trivialis* Hal.)
- 210 51 (40). Parastigma small, discoidal cell anteriorly pointed or almost pointed (Fig. 124: 5, 7).
- 52 (53). Parallel vein forming straight or almost straight line with cubital. Scutellum weakly rugose; propodeum lacking denticles. Ovipositor valves as long as hind tibiae. Hind femora 5 times as long as wide, hind tarsi and tibiae of same length. First abdominal tergite 1.6–1.8 times as long as its width at apex. Body black; legs yellow. Fig. 124: 4, 5. Forewing 1.7–2.4 mm. Crimea; Western Europe; northern Africa; Afghanistan (*B. interstitialis* group).....  
..... **B. (B.) interstitialis** Ruthe (*oscinellae* Fi.)
- 53 (52). Parallel vein forming distinctly curved line with cubital vein.

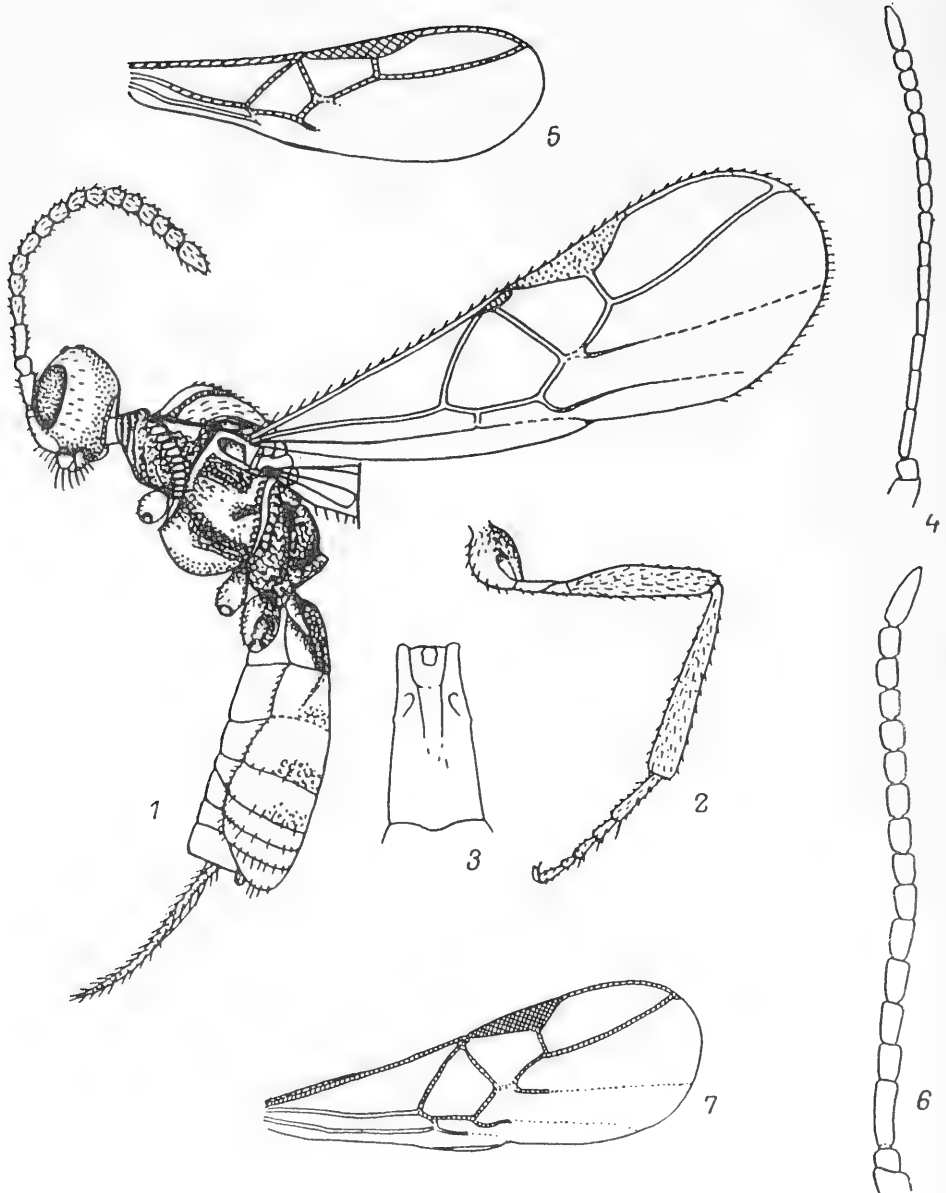


Fig. 124. Euphorinae, female (from Achterberg and Haeselbarth).

1—3—*Blacus humilis*: 1—general appearance, 2—hind leg, 3—1st abdominal tergite; 4, 5—*B. interstitialis*: 4—antenna, 5—forewing; 6, 7—*B. hastatus*: 6—antenna, 7—forewing.

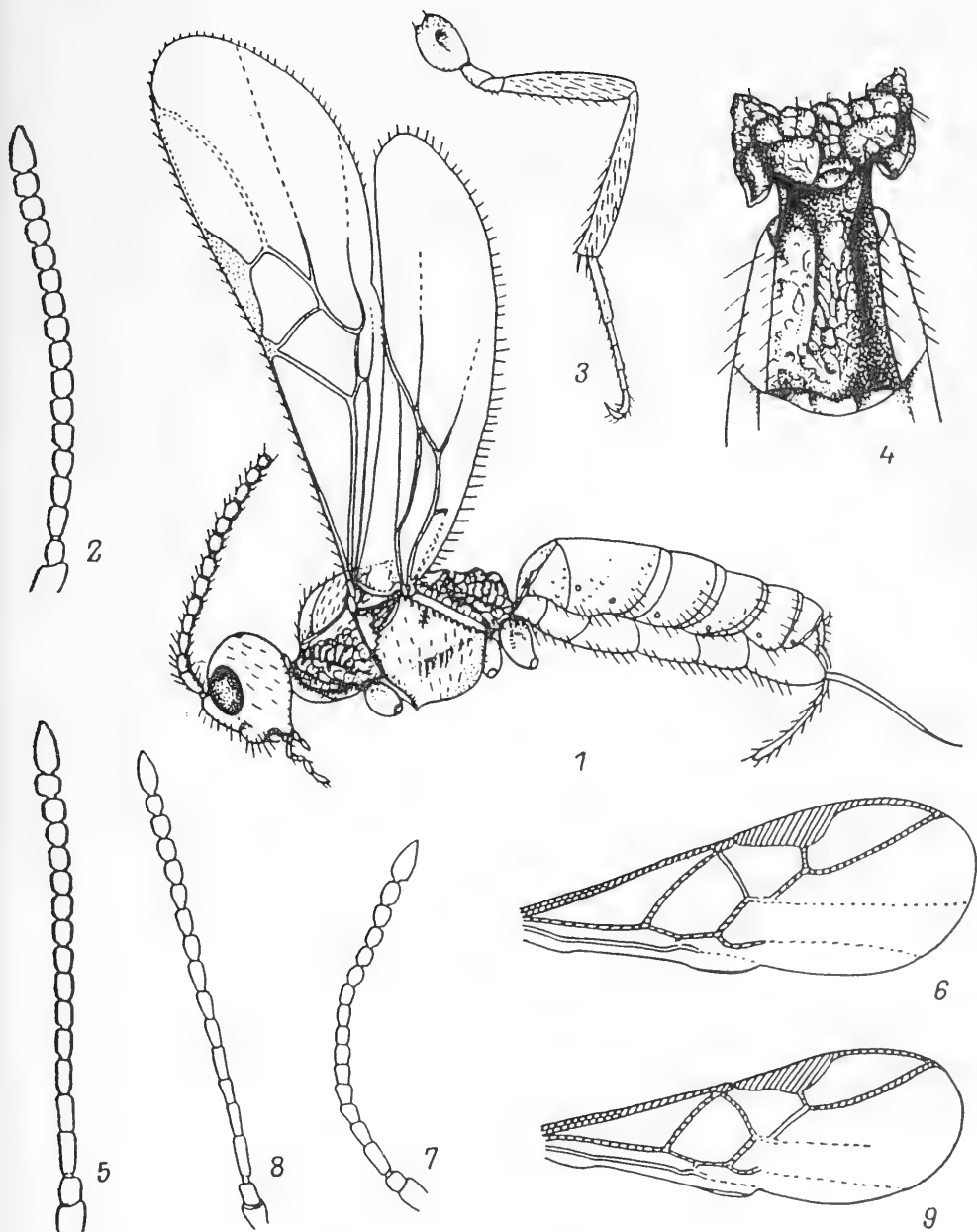


Fig. 125. Euphorinae, female (from Achterberg and Haeselbarth).

1—4—*Blacus maryi*: 1—general appearance, 2—antenna, 3—hind leg, 4—propodeum with 1st abdominal tergite; 5, 6—*B. instabilis*: 5—antenna; 6—forewing, 7—*B. tobiac*, antenna; 8, 9—*B. filicornis*: 8—antenna, 9—forewing

- 54 ( 55). Scutellum densely and distinctly rugose. Propodeum on each side with short, obtuse denticle. Abdomen somewhat shorter than thorax. Ovipositor thin and long, its valves as long as forewing. Hind femora 5 times as long as wide, hind tarsi much shorter than hind tibia. First abdominal tergite 1.8 times as long as its width at apex. Body black or dark brown, sometimes with lighter pronotum and propodeum; legs light brown, hind coxae somewhat darkened; wings darkened, dark brownish. Fig. 124: 6, 7. Wings 2–2.7. Center, Ukraine (Kanev), southwest; Caucasus (Sochi); Western Europe (*B. hastatus* group) ..... **B. (B.) hastatus** Hal.
- 212 55 ( 54). Scutellum smooth in middle, on sides bordered, apically distinctly rugose.
- 56 ( 67). Second section of radial vein weakly but uniformly curved, terminating before wing apex (only in *B. leptostigma* longer), metacarpus at most barely crossing apex of radial cell (Figs. 125: 1; 126: 2). Ovipositor valves not longer than hind tibia. Propodeum usually on each side with small tubercle. (*B. exilis* group).
- 57 ( 60). Ovipositor valves 1.5–2 times as long as 1st abdominal tergite, 1st abdominal tergite weakly rugose.
- 213 58 ( 59). Antennal segments short, 1st flagellar segment only 1.5 times as long as its width at apex. Hind femora 4 times as long as wide. Legs somewhat darkened. Fig. 125: 1–4. Forewings 1.9–2.6 mm. Finland; Switzerland; Austria; North America ..... **B. (B.) maryi** Hellén
- 59 ( 58). Basal segment of antennal flagellum much longer, 1st segment 2.5 to 3 times as long as width at apex. Hind femora 5 to 6 times as long as wide. Legs yellowish dark brown, hind coxae sometimes somewhat darkened. Fig. 125: 5, 6. Forewings 2.2–2.8 mm. West, northwest, center, Ukraine (Kiev); Caucasus (Talysh), Central Asia; Western Europe; Turkey (Ankara) ..... **B. (B.) instabilis** Ruthe
- 214 60 ( 57). Ovipositor valves at most 1.3 times as long as 1st abdominal tergite, latter fairly densely rugose.
- 61 ( 62). Propodeum steeply sloping, cubic, in profile its horizontal and vertical surfaces making 100–110° angle. Antennal flagellum barely narrowed toward base (Fig. 125: 7). Nervulus originating near middle of discoidal cell. Hind femora 4.5 times as long as wide. Ovipositor valves somewhat shorter than 1st abdominal tergite. Body black; legs yellowish dark



brown, hind coxae darkened. Forewings 2—2.1 mm. Moldavia; Kazakhstan, Central Asia ..... **B. (B.) tobiae** Haes.

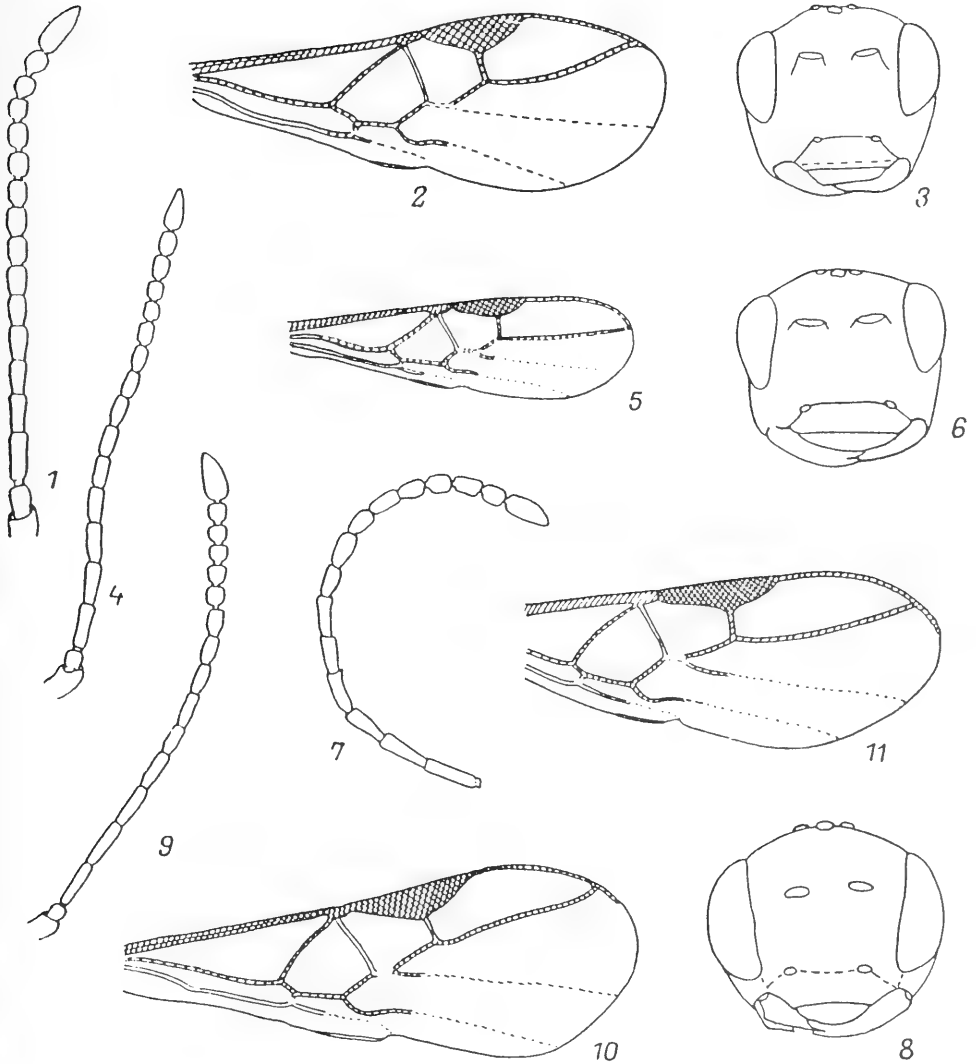


Fig. 126. Euphorinae, female (from Haeselbarth).

1, 2—*Blacus exilis*: 1—antenna, 2—forewing; 3, 5—*B. pappianus*: 3—head, 4—antenna, 5—forewing; 6, 7—*B. procerus*: 6—head, 7—antenna; 8—10—*B. nigricornis*: 8—head, 9—antenna, 10—forewing; 11—*B. bovistae*, forewing.

- 62 ( 61). Propodeum flatter and roundish, its vertical and horizontal surfaces making a more obtuse angle. Antennae somewhat distinctly narrowed toward base. Hind femora 5 to 6 times as long as wide.
- 63 ( 64). Stigma and radial cell narrow and long (Fig. 130: 13). First abdominal tergite 1.5 times as long as its width at apex, posteriorly 2 times as wide as at base. Ovipositor valves as long as 1st abdominal tergite. Forewings 1.9 mm. Southeast; Ireland, East Germany . . . **B. (B.) leptostigma** Ruthe
- 64 ( 63). Stigma and radial cell broader (Figs. 125: 9; 126: 2). First abdominal tergite slightly less than 2 times as long as its width at apex. Ovipositor valves slightly longer than 1st abdominal tergite.
- 65 ( 66). Antennae thin, flagellum greatly narrowed toward base, middle flagellar segments much longer than wide (Fig. 125: 8). Forewings 2 mm. West, center; Kazakhstan; Western Europe . . . . . **B. (B.) filicornis** Haes.
- 66 ( 65). Antennae less thin and with flagellum less narrowed toward base, antennal segments longer than wide. Fig. 126: 1, 2. Forewing 1.6–2.3 mm. Parasite of *Ips vorontzowi* Jacobs. (Scolytidae), *Magdalis armigera* Geoffr. (Gurculionidae). Throughout; Caucasus, Kazakhstan, Central Asia, eastern Siberia; Western Europe, Turkey, Israel, Mongolia, North America . . . . . **B. (B.) exilis** Nees
- 67 ( 56). Second section of radial vein straight or in any case nonuniformly curved, terminating at wing apex (Fig. 126: 5). If radial cell shorter and 2nd section of radial vein fairly uniformly curved, then metacarpus distinctly reaching beyond radial cell. Ovipositor long, its valves rarely shorter than hind tibiae.
- 68 ( 71). Ovipositor as long as body or somewhat longer.
- 69 ( 70). Radial cell terminating at wing apex. Lower part of sides of mesothorax with sculptured depression. Propodeum with small triangular denticles on sides. First flagellar segment 4 times, 2nd 3 times, 4th 2 times as long as wide, apical segments slightly longer than wide. Hind femora 6 times as long as wide. First abdominal tergite 2 times as long as its width at apex. Body 2.5. Caucasus (Armenia). (*B. longicaudatus*, nov. group.) . . . . **B. (B.) longicaudatus** Tobias
- 70 ( 69). Radial cell terminating subapically. Sides of mesothorax absolutely smooth. Propodeum lacking denticles on sides (cf. genus *Eubazus*) . . . . . **E. xiphydriae**, sp. n.

- 71 ( 68). Ovipositor much shorter than body.
- 72 ( 75). Propodeum with distinct, fairly sharp denticles on sides. Radial vein originating from apical third of stigma (Fig. 126: 5). Hind femora 5 times as long as wide, hind tarsi and tibiae of same length. Ovipositor valves somewhat longer than hind tibia. Body black; legs yellowish dark brown, hind legs sometimes somewhat darkened. (*B. rufescens* group.)
- 73 ( 74). Head anteriorly rounded, clypeus 2 times as wide as high; intertentorial distance 1.5 times tentorio-ocular distance. Antennal flagellum not narrowed toward base. Thorax about 1.5 times as long as high. First abdominal tergite 2 times as long as its width at apex. Fig. 126: 3–5. Forewing 1.9 mm. Center (Voronezh), southwest; Hungary, Italy ..... **B. (B.) pappianus** Haes.
- 74 ( 73). Head anteriorly quadrangular, clypeus 4 times as wide as high, intertentorial distance 2 times tentorio-ocular distance. Antennal flagellum slightly narrowed toward base. Thorax almost 2 times as long as high. First abdominal tergite almost 2.5 times as long as its width at apex. Fig. 126: 6, 7. Forewing 2.1 mm. Kazakhstan; Czechoslovakia ..... **B. (B.) procerus** Haes.
- 75 ( 72). Propodeum lacking denticles, at most with small tubercles on each side. (*B. errans* group.)
- 76 ( 79). Metacarpus greatly extending beyond apex of radial cell (Fig. 126: 10, 11). Ovipositor valves 1.5 times as long as hind tibia. Body black; legs yellowish dark brown, hind coxae darkened.
- 77 ( 78). First segment of antennal flagellum 2.5–3 times as long as subapical. Clypeus very wide; tentorial pits level with lower margin of eye, height of genae equaling half basal width of mandible. Propodeum lacking tubercles or obtuse denticles on sides. Hind femora 5 to 6 times as long as wide. First abdominal tergite 1.5 times as long as its width at apex. Fig. 126: 8–10. Forewing 2–2.5 mm. Parasite of *Meligethes aeneus* F. (Nitidulidae). West, southwest; Western Europe ..... **B. (B.) nigricornis** Haes.
- 78 ( 77). First segment of antennal flagellum 2 times as long as subapical. Clypeus narrower, tentorial pits below level of lower margin of eye, height of genae equaling basal width of mandible. Propodeum on sides with angular tubercle on each side. Hind femora 4.5 times as long as wide. First

- abdominal tergite 2 times as long as its width at apex. Forewing 2.7 mm (Fig. 126:11). Crimea; Central and southern Europe; northern Africa.....  
 ..... **B. (B.) bovista** Haes.
- 79 ( 76). Metacarpus not extending or barely extending from apex of radial cell. Ovipositor valves 1.3 times as long as hind tibia.
- 80 ( 81). First flagellar segment 2.5–3 times as long as subapical (Fig. 127:2). Clypeus very wide; tentorial pits level with lower margin of eye; genae with thin furrow between eye and base of mandible, lower than basal width of mandible. Scutellum indistinctly bordered. First abdominal tergite 1.8–2 times as long as its width at apex. Ovipositor valves 1.3 times as long as hind tibia. Body black; legs reddish or yellowish dark brown. Fig. 127:1–3. Forewing 2.5–3.2 mm. Parasite of *Dasytes* spp. (Melyridae). West; Caucasus (Sochi, Armenia); Western Europe.....  
 ..... **B. (B.) errans** Nees
- 81 ( 80). First segment of antennal flagellum 2 times as long as subapical (Fig. 127: 5, 7). First abdominal tergite 2–2.5 times as long as its width at apex. Body black.
- 82 ( 83). Tentorial pits somewhat below level of lower margin of eye, intertentorial distance 2 times tentorio-ocular distance. Genae with furrow, somewhat lower than basal width of mandible. Scutellum weakly bordered. First abdominal tergite 3 times as long as its width at apex. Ovipositor valves shorter than hind tibia. Legs light colored. Fig. 127: 4, 5. Forewing 2.7–3 mm. Central Europe.....  
 ..... **B. (B.) hostilis** Haes.
- 216 83 ( 82). Tentorial pits noticeably lower than lower margin of eye, intertentorial distance 1 to 7 times tentorio-ocular distance. Genae lacking furrow, absolutely smooth, higher than basal width of mandible. Scutellum hardly bordered. First abdominal tergite 2.5 times as long as its width at apex. Ovipositor valves somewhat longer than hind tibia. Legs yellowish dark brown, hind legs (especially coxae) brownish, darkened. Fig. 127: 6, 8. Forewing 2.1–2.6 mm. Southwest; Caucasus (Georgia), eastern Siberia (upper reaches of Tunguska); Western Europe, Mongolia .....  
 ..... **B. (B.) stelfoxi** Haes.
- 84 ( 1). Males.

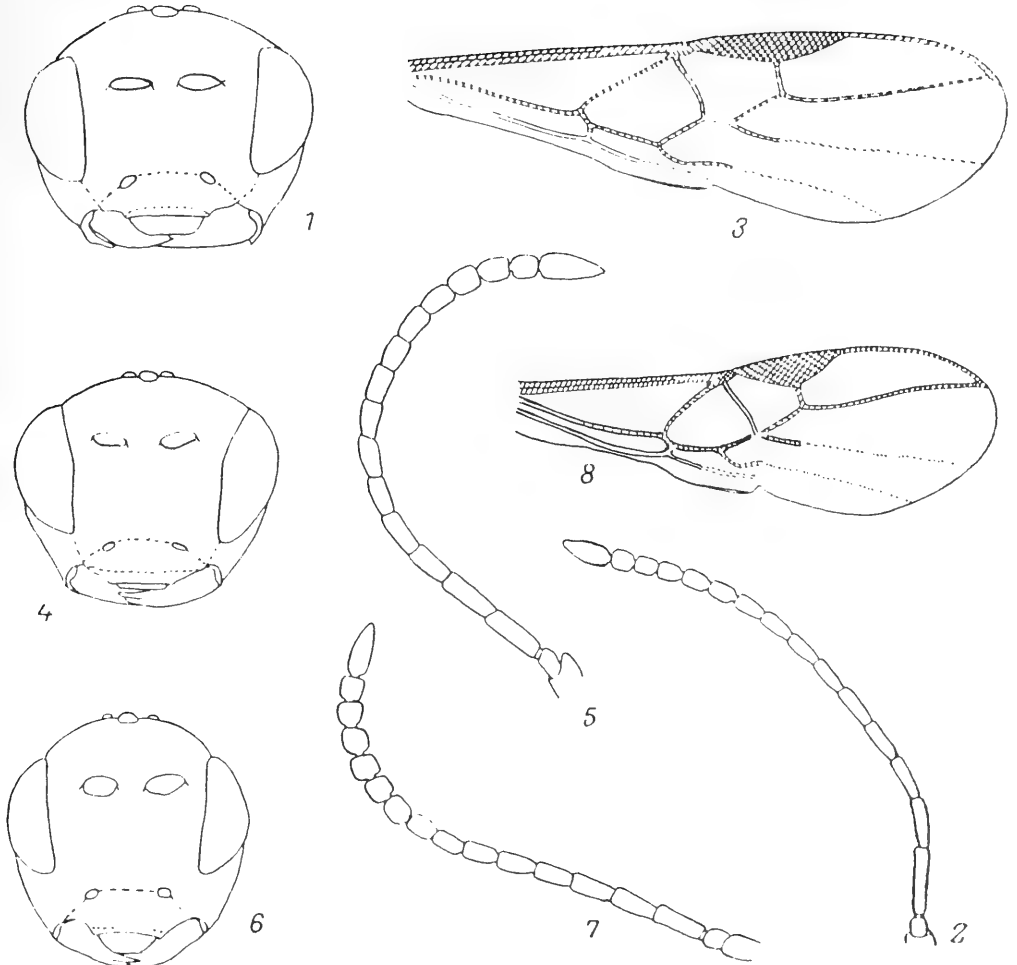


Fig. 127. Euphorinae, female (from Haeselbarth).

1-3—*Blacus errans*: 1—head, 2—antenna, 3—forewing; 4, 5—*B. hostilis*: 4—head, 5—antenna; 6-8—*B. stelfoxi*: 6—head, 7—antenna, 8—forewing.

85 ( 86). Propodeum smooth, lacking denticles, with distinct fields (usually 5—2 above and 3 below). Antennae 16-segmented, basally yellowish dark brown (but not contrastingly light colored). Fields on propodeum as distinct as in previous species. Radial cell reaching wing apex .....  
 ..... **B. (Lioblacus) fischeri** Haes.

- 86 ( 85). Propodeum sculptured, with denticles, if weakly sculptured and with fields, then 2 fields in lower part. Sternauli sculptured.
- 87 (116). Scutellum sharply bordered, border (especially in posterior part of scutellum) distinctly raised upward. Sternauli usually as wide oblique depressions with longitudinal wrinkles. Antennae 16–26-segmented.
- 88 ( 89). Scutellum distinctly rugose. Propodeum on sides with massive projections. First abdominal tergite apically distinctly broadened. Antennae 21-segmented (Fig. 128: 1) .....  
..... **B. (Hysterobolus) robustus** Haes.
- 217 89 ( 88). Upper surface of scutellum smooth or weakly and indistinctly rugose. (Subgenus *Ganychorus*).
- 90 ( 91). Antennae 16-segmented (Fig. 128: 2). Discoidal cell anteriorly pointed; veins on forewing relatively thick .....  
..... **B. (G.) strictus** Stelfox
- 91 ( 90). Antennae multiarticulate.
- 92 ( 99). Antennae 22–26-segmented.
- 93 ( 94). Antennae 25–26-segmented. Forewing 4–5 mm. Discoidal cell anteriorly obtuse, bisected by enlarged parastigma...  
..... **B. (G.) pallipes** Hal.
- 94 ( 93). Antennae 22–23-segmented. Forewing 2–3 mm. Discoidal cell anteriorly pointed, parastigma not enlarged.
- 218 95 ( 98). First abdominal tergite 2 times as long as its width at apex.
- 96 ( 97). Thorax black. Sides of mesothorax smooth with short crenulate sternaui. Propodeum lacking denticles, rugose.....**B. (G.) nitidus** Haes.
- 97 ( 96). Thorax reddish. Sides of mesothorax in region of sternaui longitudinally rugose. Propodeum on sides gibbously inflated. Fig. 128: 3, 4 ..... **B. (G.) varius** Haes.
- 98 ( 95). First abdominal tergite 3 times as long as its width at apex. Sternauli fairly long (about 1/3 length of sides of mesothorax), angularly curved, crenulate in upper part, smooth in horizontal; propodeum on sides with small angular projections, in upper part with smooth semioval field divided by longitudinal ridge, in posterior half with transverse folds. Fig. 128: 5, 6. Body 2.5. Krasnodar Territory (Sochi) ....  
..... **B. (G.) petiolatus** Tobias
- 99 ( 92). Antennae 20–21-segmented (rarely 22-segmented).
- 100 (113). Antennae 21-segmented.

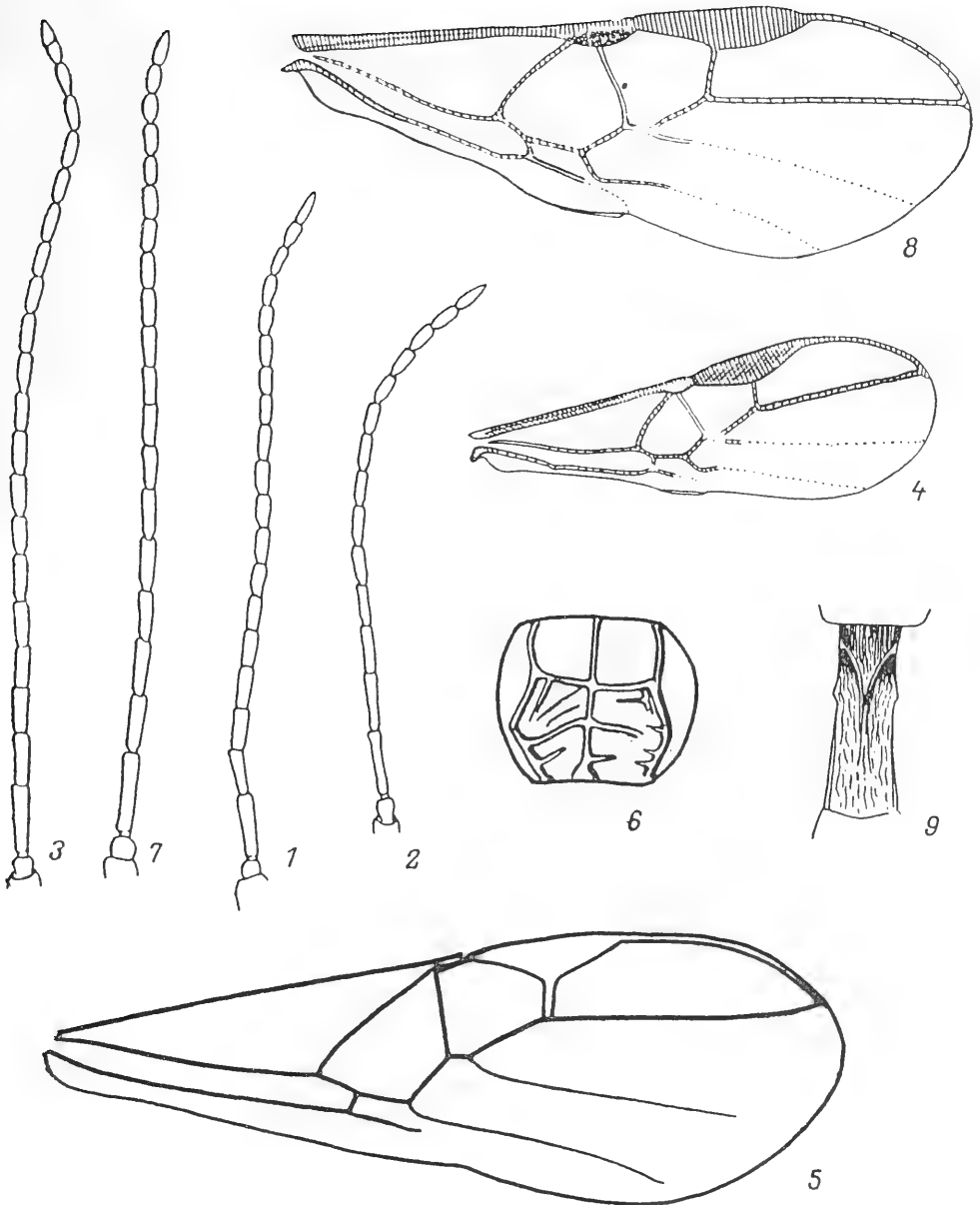


Fig. 128. Euphorinae, male (from Haeselbarth and Tobias).

1—*Blacus robustus*, antenna; 2—*B. strictus*, antenna; 3, 4—*B. varius*: 3—antenna, 4—forewing; 5, 6—*B. petiolatus*: 5—forewing, 6—propodeum; 7—9—*B. tripudians*: 7—antenna, 8—forewing, 9—1st abdominal tergite.

- 101 (106). Hind femora and coxae light colored, only sometimes coxae weakly darkened. Discoidal cell anteriorly broadly incised by enlarged parastigma.
- 102 (103). First abdominal tergite long and narrow, posteriorly not broadened or only slightly. Scutellum with upturned margins (but more weakly than in female), its raised apical margin thin. Discoidal cell fairly narrow. Fig. 128: 7–9 ..  
..... **B. (G.) tripudians** Hal.
- 103 (102). First abdominal tergite posteriorly noticeably broadened. Margins of scutellum weakly upturned, not thin. Discoidal cell broader.
- 104 (105). Upper surface of scutellum distinctly raised, its posterior margin pointedly projected. First segment of antennal flagellum 2.5 times as long as 17th segment, apical segments 2 times as long as wide. First abdominal tergite narrowest anterior to spiracles. Fig. 129: 1–3 .....  
..... **B. (G.) ruficornis** Nees
- 105 (104). Upper surface of scutellum fairly flat, its apex barely above sides. First segment of antennal flagellum 2 times as long as 17th segment; apical segments 3 times as long as wide. First abdominal tergite narrowest posterior to spiracles. Fig. 129: 4–6 ..... **B. (G.) pectinatus** Haes.
- 106 (101). Hind femora preapically with dark spot or stripe; hind coxae above somewhat distinctly darkened.
- 107 (110). Discoidal cell anteriorly pointed or slightly obtuse.
- 108 (109). Radial cell long and narrow, 2nd section of radial vein fairly straight; discoidal cell anteriorly pointed. Fig. 129: 7, 8 ..... **B. (G.) diversicornis** Nees
- 109 (108). Radial cell short, end section of radial vein noticeably curved; discoidal cell anteriorly slightly obtuse (known only from Ireland) ..... **B. ambulans ambulans** Hal.
- 110 (107). Discoidal cell anteriorly broadly incised by enlarged parastigma.
- 111 (112). Forewings 2.2–2.7 mm. Basal segments of antennal flagellum yellow, distal segments darkened. Scutellum usually indistinctly rugose. Stigma and parastigma as a rule light colored. First segment of antennal flagellum 2.2–2.3 times as long as 17th segment (Fig. 129: 9) .....  
..... **B. (G.) ambulans macropterus** Haes.
- 112 (111). Forewings 2.5–3 mm (usually 2.7–2.8 mm). Mostly antennae dark; if light colored, then as in distal part. Scutellum as a rule smooth. Stigma and parastigma almost always in



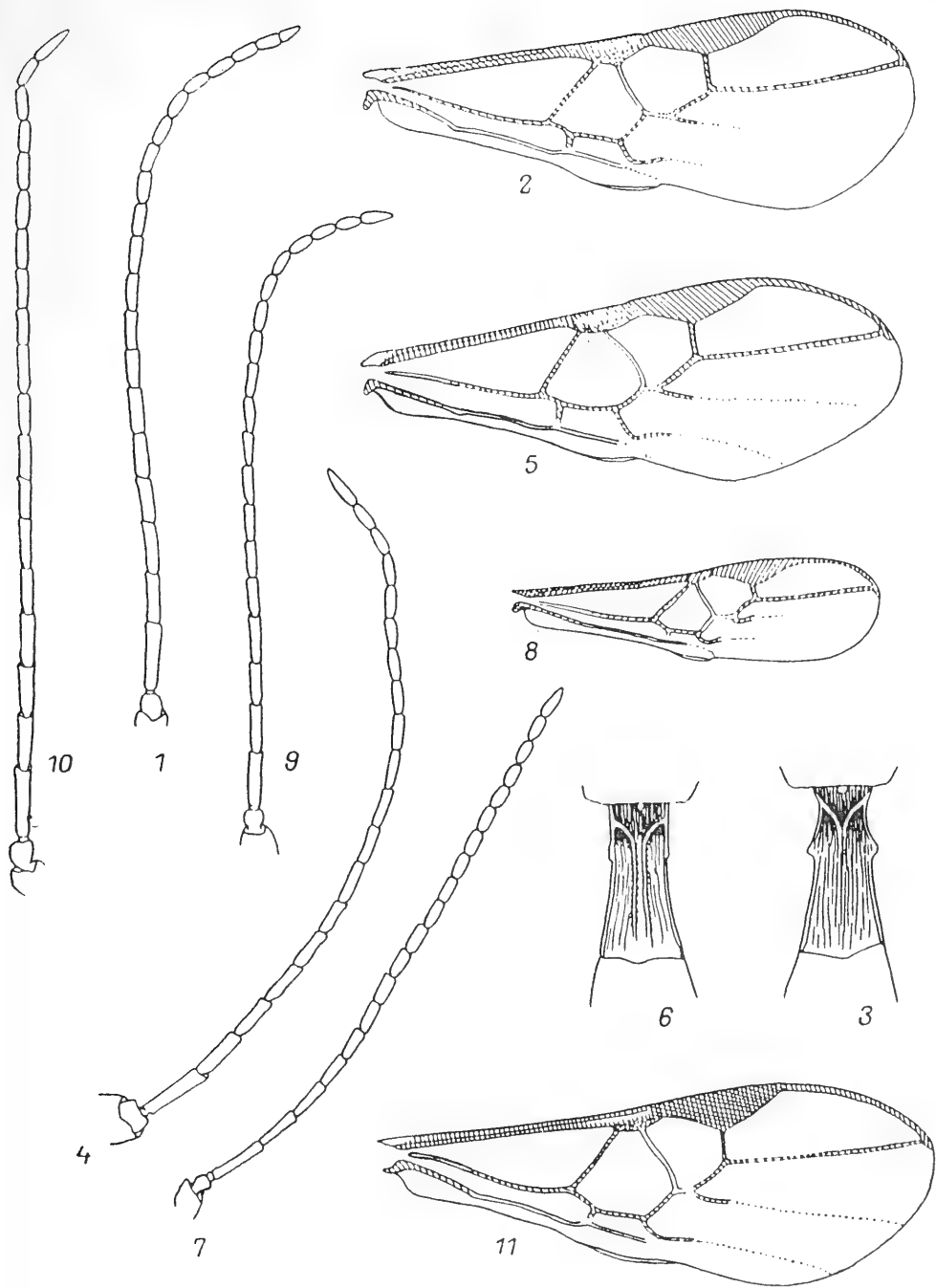


Fig. 129. Euphorinae. male (from Haeselbarth).

1-3—*Blacus ruficornis*: 1—antenna, 2—forewing, 3—1st abdominal tergite;  
 4-6—*B. pectinatus*: 4—antenna, 5—forewing, 6—1st abdominal tergite; 7, 8—*B. diversicornis*: 7—antenna, 8—forewing; 9—*B. ambulans*, antenna; 10, 11—*B. maculipes*:  
 10—antenna, 11—forewing.

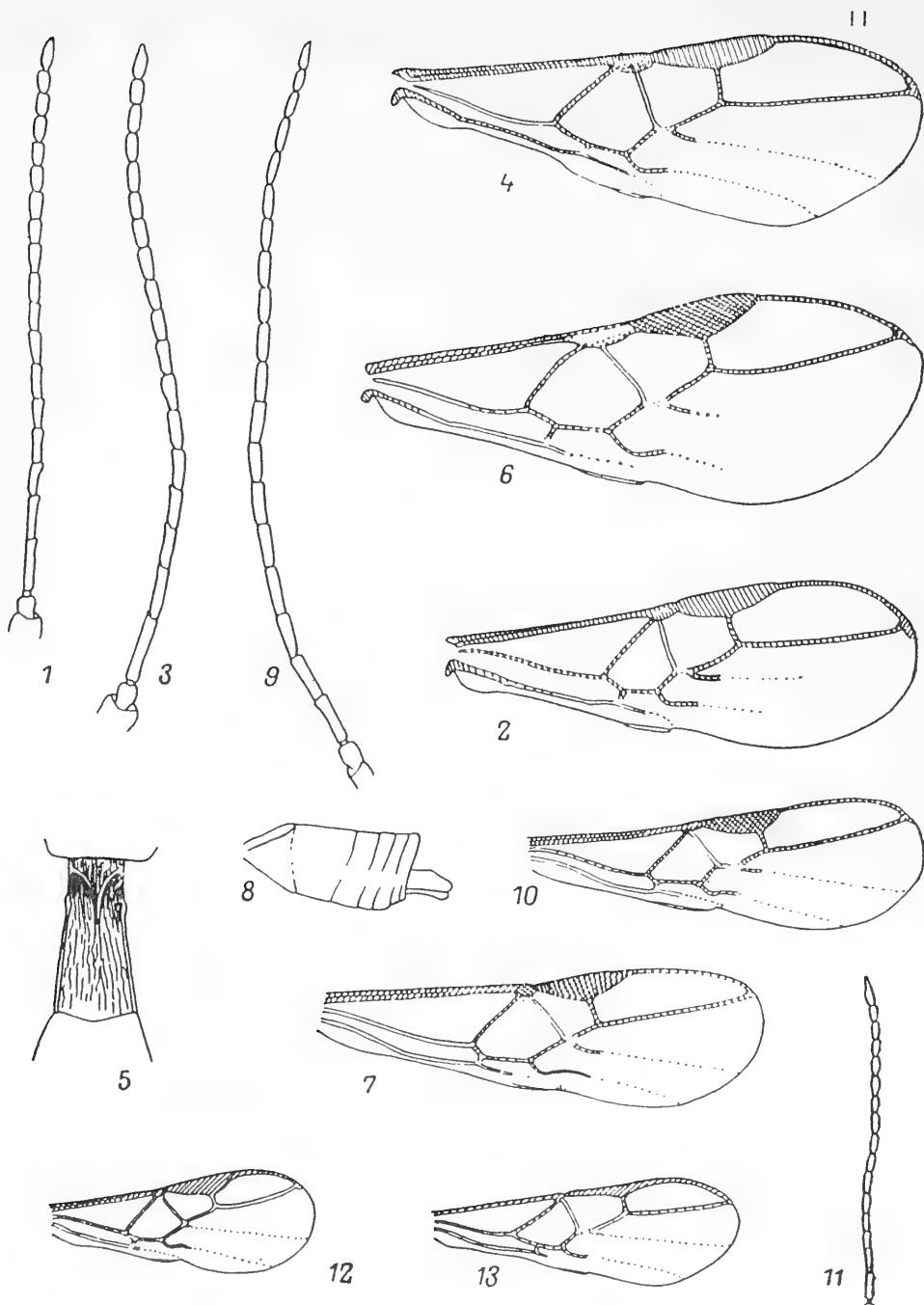


Fig. 130. Euphorinae, male (from Haeselbarth).

1, 2—*Blacus conformis*: 1—antenna, 2—forewing; 3–5—*B. capeki*: 3—antenna, 4—forewing, 5—1st abdominal tergite; 6—*B. paganus*, forewing; 7, 8—*B. rufescens*: 7—forewing, 8—abdomen; 9, 10—*B. pappianus*: 9—antenna, 10—forewing, 11, 12—*B. exilis*: 11—antenna, 12—forewing; 13—*B. leptostigma*, forewing.

- greater part dark. First segment of antennal flagellum 2 times as long as 17th segment. Fig. 129: 10, 11.....  
 ..... **B. (G.) maculipes** Wesm.
- 113 (100). Antennae 20-segmented. Discoidal cell relatively narrow (Fig. 130: 2, 4). Hind coxae darkened above.
- 114 (115). Discoidal cell anteriorly pointed (Fig. 130: 2). Sides of mesothorax fairly coarsely longitudinally rugose. Upper surface of scutellum fairly flat. Apical antennal segments shorter (Fig. 130: 1)..... **B. (G.) conformis** Wesm.
- 115 (114). Discoidal cell anteriorly broadly obtuse. Sides of mesothorax softly rugose along narrow sternaui, at places almost smooth. Scutellum distinctly inflated. Apical antennal segments longer. Fig. 130: 3-5 ..... **B. (G.) capeki** Haes.
- 116 ( 87). Scutellum not bordered or in any case less sharply bordered, its margins not raised above. Sides of mesothorax in region of sternaui granulosely sculptured; longitudinal wrinkles if present, weak and short. Antennae 17-23-segmented. (Subgenus *Blacus* s. str.).
- 117 (126). Parastigma large, somewhat broadly incising anterior margin of discoidal cell.
- 118 (121). Prescutellar furrow crenulate, that is, with several short longitudinal ribs (sometimes weak).
- 119 (120). Scutellum posteriorly broadly incised, trapezoidal, its smooth surface shorter than its anterior width. Mesonotum and face often with fairly dense and long light colored hair. Forewing (Fig. 130: 6) 3-3.8 mm .....  
 ..... **B. (B.) paganus** Hal.
- 120 (119). Scutellum posteriorly mostly rounded, its smooth surface almost as long as its anterior width. Mesonotum and face weakly pubescent. Forewings 2.6-3.2 mm .....  
 ..... **B. (B.) radialis** Haes.
- 121 (118). Prescutellar furrow on sides from middle keel smooth or only with indistinct wrinkles.
- 122 (123). First abdominal tergite narrow, parallel-sided, 2.5 times as long as wide. First segment of antennal flagellum more than 3 times as long as wide, usually at least basally yellow..... **B. (B.) longipennis** Grav.
- 219 123 (122). First abdominal tergite less narrow, apically distinctly broadened, 1.5-2 times as long as its width at base. First antennal segment at most 3 times as long as wide, dark colored.

- 124 (125). Scutellum broad, uniformly bulged, posteriorly broadly incised, its smooth surface shorter than its width at base ..  
 ..... **B. (B.) forticornis** Haes.
- 125 (124). Scutellum elongate-triangular, posteriorly narrowly rounded, more bulged, its smooth surface usually longer than width at base ..... **B. (B.) humilis** Nees
- 221 126 (117). Parastigma small, discoidal cell anteriorly pointed or almost pointed.
- 127 (128). Antennae 17-segmented. Parallel vein forming straight or almost straight line with last section of cubital vein. ....  
 ..... **B. (B.) interstitialis** Ruthe
- 128 (127). Antennae 18–25-segmented. Parallel vein forming distinctly curved line with last section of cubital vein.
- 129 (130). Scutellum rugose. Abdomen relatively small and narrow (shorter and narrower than abdomen) .....  
 ..... **B. (B.) hastatus** Hal.
- 130 (129). Scutellum smooth on upper surface, only on margins often rugose. Abdomen large.
- 131 (132). Second section of radial vein slightly but distinctly arcuate, terminating at anterior margin of wing before its apex, metacarpus slightly extending above apex of radial cell. Scutellum slightly bordered. Fig. 130: 11, 12 (In practice many species are differentiated exclusively from females; cf. also couplets 58–68.)
- 132 (131). Second section of radial vein straight or slightly curved, reaching wing apex (Fig. 130: 7, 10); if not reaching wing apex, then metacarpus distinctly extending beyond apex of radial cell.
- 133 (138). Genitalia very large, exerted (Fig. 130: 8). Propodeum lacking denticles on sides but with distinct tubercles in their place. Antennae 21–23-segmented.
- 134 (135). Clypeus 3.5 times as wide as high. First flagellar segment 4 times as long as wide. Radial vein originating from apical third of stigma; discoidal cell anteriorly pointed. Hind tibia and tarsus of equal length ..... **B. (B.) procerus** Haes.
- 135 (134). Clypeus 2.2–2.5 times as wide as high. First flagellar segment 3 times as long as wide.
- 136 (137). Radial vein originating not far from middle of stigma, discoidal cell anteriorly narrow, pointed. Hind tarsi somewhat shorter than hind tibia. Antennae 21–23-segmented. Fig. 130: 7, 8 ..... **B. (B.) rufescens** Ruthe

- 137 (136). Radial vein originating from apical third of stigma, discoidal cell anteriorly often pointed. Hind tarsi and tibiae of equal length. Antennae 21-segmented. Fig. 130: 9, 10 ..  
..... **B. (B.) pappianus** Haes.
- 138 (133). Genitalia smaller. Propodeum usually lacking tubercles on sides (except in *B. bovistae*). Antennae 18–21-segmented.
- 139 (142). Metacarpus noticeably extending beyond apex of radial cell.
- 140 (141). Antennae 21-segmented, rarely 20-segmented. Propodeum with tubercles on sides. Genae slightly lower than width of mandible at base ..... **B. (B.) bovistae** Haes.
- 141 (140). Antennae 18-segmented, rarely 19-segmented. Propodeum uniformly rounded. Height of genae slightly less than halfwidth of mandible at its base .....  
..... **B. (B.) nigricornis** Haes.
- 142 (139). Metacarpus not extending beyond apex of radial cell. Propodeum in profile uniformly flatly rounded.
- 143 (144). Antennae 18–19-segmented, rarely 20-segmented. Tentorial pits at level of lower margin of eye; temples narrowed below. Scutellum weakly bordered. First abdominal tergite two times as long as its width at apex.....  
..... **B. (B.) errans** Nees
- 144 (143). Antennae 20–21-segmented. Tentorial pits below level of eye, temples of uniform width throughout. Scutellum hardly bordered. First abdominal tergite 3 times as long as its width at apex..... **B. (B.) stelfoxi** Haes.

98. **Neoblacus** Ashmead, 1900.—One species.

- 1 (1). Antennae 17–18-segmented. Propodeum on sides with tubercular denticles. Hind femora 4 times as long as wide. Hind tarsi equal to tibia in length. First abdominal tergite more than 2 times as long as wide. Ovipositor valves as long as hind femur. Sides of mesothorax smooth, with weakly depressed rugose ster-nauli. Body black, almost very dark brown. Fig. 131. Forewing 1.5–2 mm. Parasite of *Scolytus koenigi* Schev. (Scolytidae). Eng-land; Austria; Czechoslovakia; North America .....  
..... **N. koenigi** Fi.

99. **Spathicopsis** van Achterberg, 1977.—One species.

- 1 (1). Head transverse. Antennae 25–26-segmented. Notaulices complete, deep. Ovipositor stylet apically cuneately pointed.

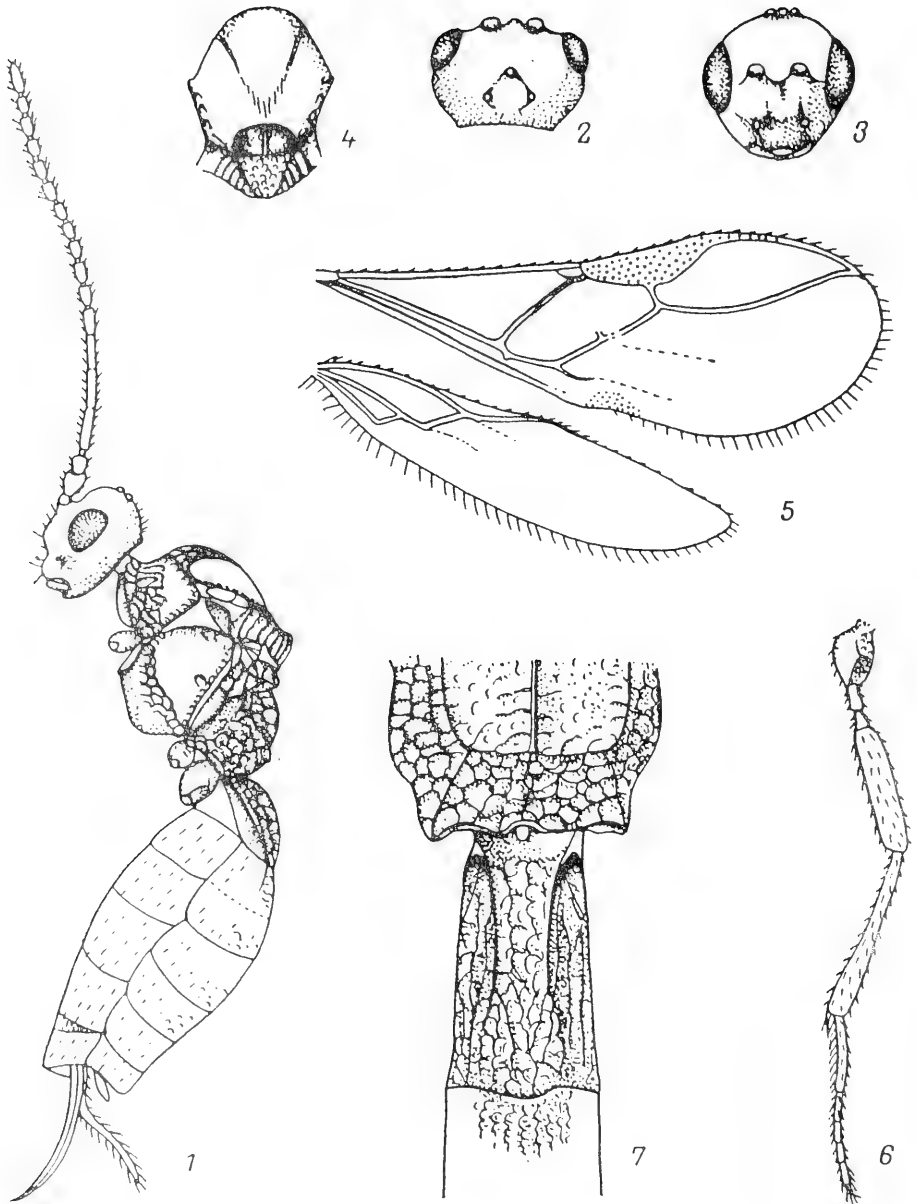


Fig. 131. Euphorinae (from Achterberg).

1—7—*Neoblacus koinigi*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—mesonotum, 5—wings, 6—hind leg, 7—propodeum with 1st abdominal tergite.

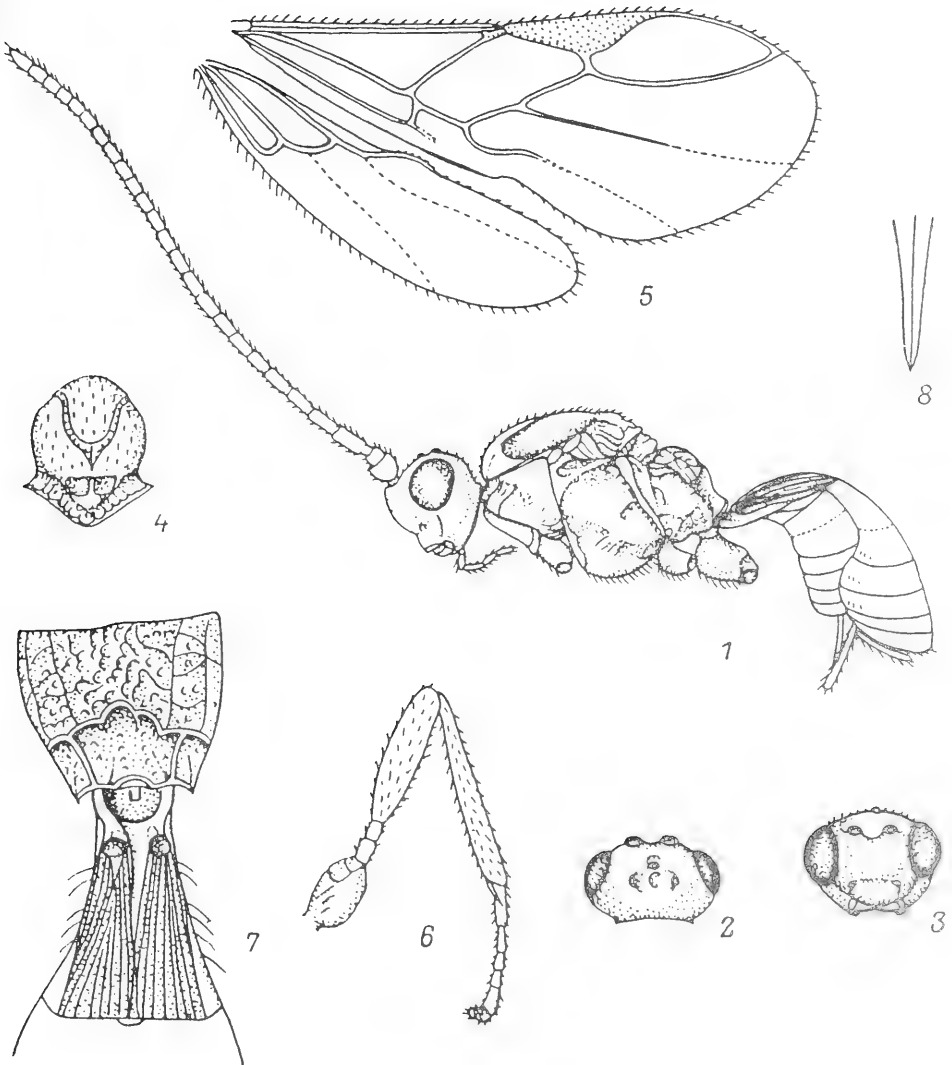


Fig. 132. Euphorinae (from Achterberg).

1-8—*Spathicopsis flavocephala*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—mesonotum, 5—wings, 6—hind leg, 7—propodeum with 1st abdominal tergite, 8—abdominal apex.

Body brown; head, basal antennal segment, tegulae, lower part of pronotum, prothorax, legs and lower part of abdomen

yellowish; palps whitish; stigma light brown. Fig. 132. Body 2.7. Netherlands; North America (Alaska) .....  
 , ..... **S. flavocephala** Acht.

100. **Pygostolus** Haliday, 1833<sup>1</sup>.—Five species, 4 in the Palearctic (one Far Eastern, known from Hokkaido Island).

- 222 1 (4). Ovipositor stylet curved, saber-like (Fig. 133: 1, 3), its valves longer than halflength of abdomen. Recurrent vein antefurcal or interstitial.
- 2 (3). Antennae longer than body, about 35-segmented. Head behind eyes distinctly narrowed. Fig. 133: 1. Body 5.7–8. Parasite of *Brachyderes incanus* L., *Otiorrhynchus niger* F., *O. laevigatus* F. (Curculionidae). West, northwest, southwest; Western Europe ..... **P. multiarticulatus** Ratz.
- 3 (2). Antennae as long as body, usually not more than 30-segmented. Head behind eyes slightly narrowed or just slightly broadened. Figs. 133: 2, 3; 134: 1; 135: 2. Body 2.5–5.5. Parasite of many species of beetles of genera *Sitona* as well as *Brachyderes incanus* L., *Polydrosus pilosulus* Chev., *Otiorrhynchus ovatus* L., *Strophosoma capitatum rufipes* Steph. (Curculionidae), *Cryptocephalus bipunctatus* L. (Chrysomelidae). West, northwest, center, south; Caucasus, Kazakhstan, Kirgizia, Siberia (Tomsk, Yakutia, Transbaikal Region), Sakhalin; Western Europe; Mongolia; introduced into North America .....  
 ..... **P. falcatus** Nees
- 223 4 (1). Ovipositor stylet straight, wide; its valves half as long as abdomen. Recurrent vein usually postfurcal. Antennae 33–34-segmented. Fig. 133: 4, 5. Body 5.5–7. Parasite of *Barynotus moeres* F., *Otiorrhynchus singularis* L., *O. laevigatus* F. (Curculionidae). (Mention is also made, possibly erroneously, of sandflies and lepidopterans as hosts.) West; Western Europe ..  
 ..... **P. sticticus** F.

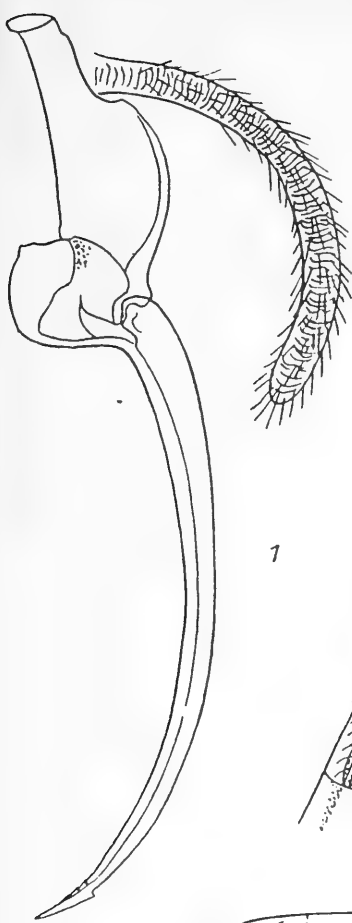
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Fig. 133. Euphorinae (from Haeselbarth and Achterberg).

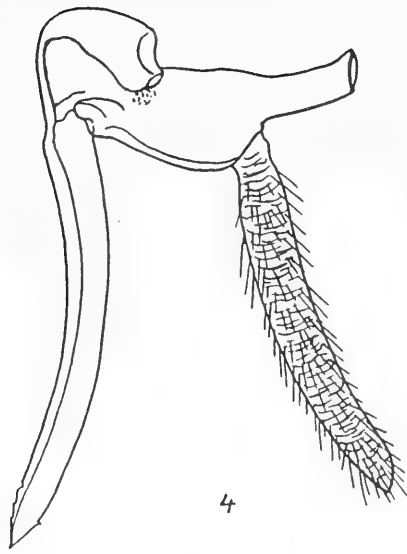
1—*Pygostolus multiarticulatus*, ovipositor; 2, 3—*P. falcatus*: 2—antennal apex, 3—ovipositor; 4, 5—*P. sticticus*: 4—ovipositor, 5—hind tarsus; 6—*Ancylocentrus excrucians*, abdomen; 7—*Allurus muricatus*, abdomen; 8—*Syrhizus delusorius*, 1st abdominal tergite.

<sup>1</sup>Haeselbarth. 1971. *Opuscula Zool.*, 112: 1–8.





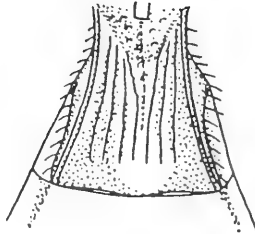
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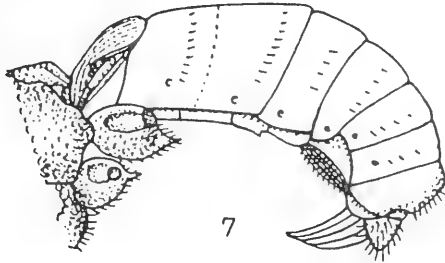
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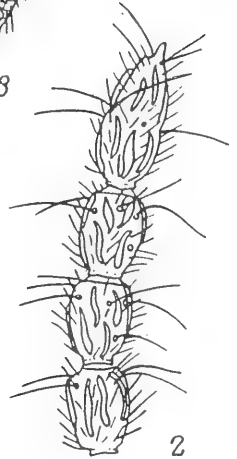
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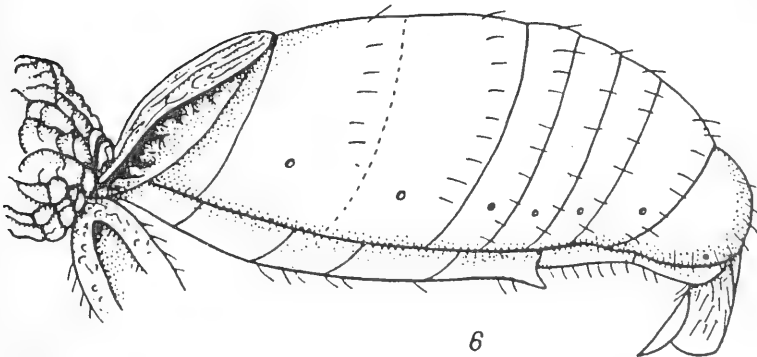
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101. *Centistes* Haliday, 1835.—About 10 species.

- 1 (4). Body black. Ovipositor longer than 1st abdominal segment.
- 2 (3). Antennae as long as body or slightly longer, 24-segmented. Legs dark brownish yellow. Fig. 135: 3, 4. Body 1.8—2.2. Parasite of adult beetles of genus *Tachyporus* (Staphylinidae). West, center, southwest, south (Kanev, Crimea); Caucasus, Kazakhstan, Kirgizia, Sakhalin; Western Europe.....  
..... *C. cuspidatus* Hal. (*lucidator* Nees)
- 3 (2). Antennae shorter than body, 19-segmented. Legs dark brown, coxae almost black. Body 2—2.2. Center, southwest; Caucasus; Western Europe ..... *C. fuscipes* Nees
- 4 (1). Head, pronotum, antennal bases and legs dark brownish black; sides of thorax and mesonotum yellowish dark brown or very dark brown. Ovipositor about half as long as abdomen, falcate, bent under abdomen. Antennae 22-segmented. Body 2. Parasite of *Scymnus impexus* Muls. (Coccinellidae). Center; Central Europe ..... *C. scymni* Ferrière

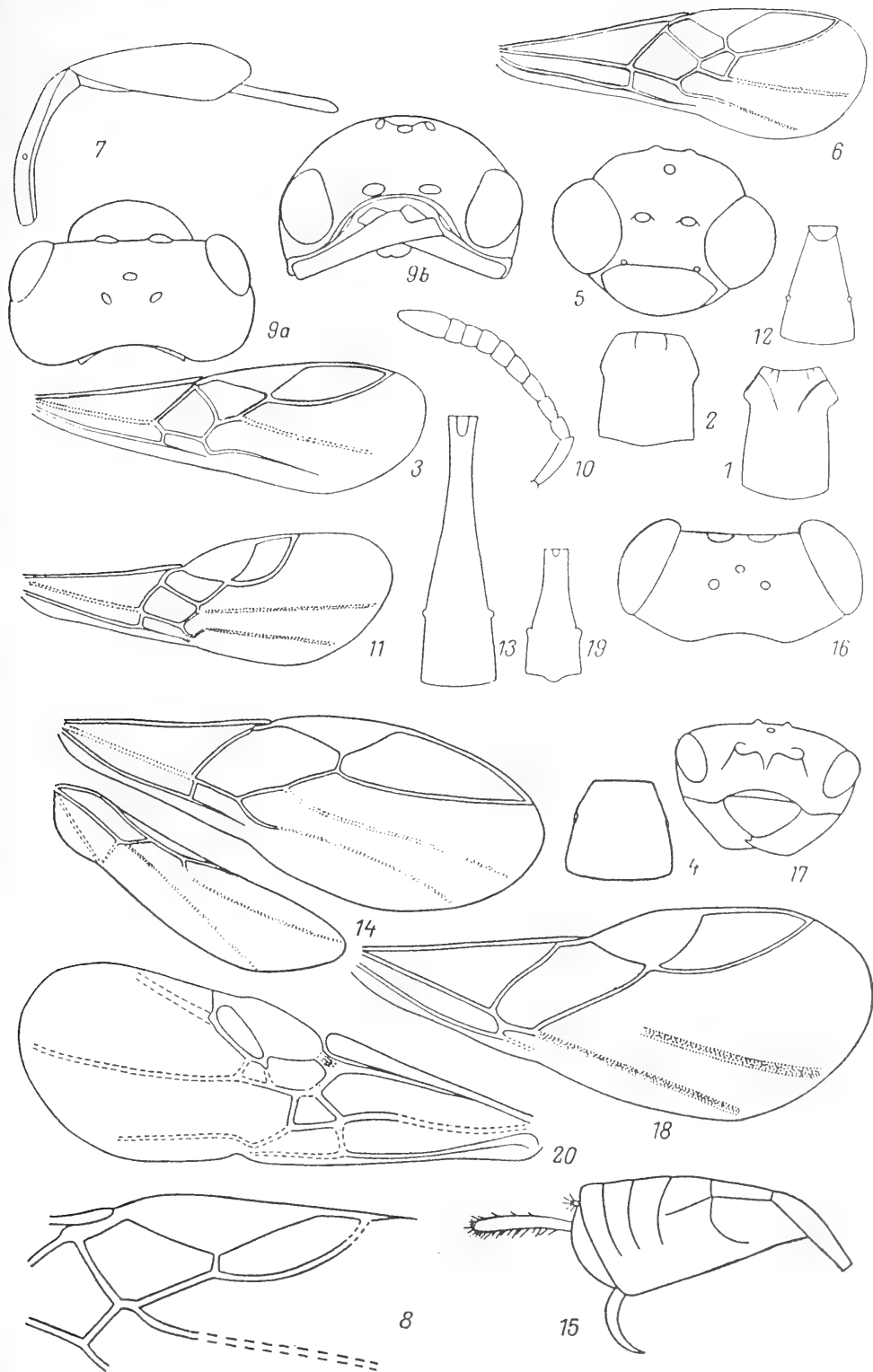
225 102. *Ancylocentrus* Förster, 1862. (*Leiophron* auct.)<sup>1</sup>.—Thirteen species, 10 in the Palearctic (2 from Japan).

- 1 (10). Abdominal sternites lacking denticles. Ovipositor valves conical, black.
- 2 ( 7). First abdominal tergite 1.5—2 times as long as its width at apex. Notaulices distinct only anteriorly, longitudinal furrow anterior to scutellum on mesonotum. Propodeum with transverse ridge.

Fig. 134. Euphorinae (from Tobias; Tobias and Balokobylskii).

1—*Pygostolus falcatus*, 1st abdominal tergite; 2, 3—*Allurus lituratus*: 2—1st abdominal tergite, 3—forewing; 4—*A. muricatus*, 1st abdominal tergite; 5—7—*Chrysopophthorus elegans*: 5—head, 6—forewing, 7—abdomen; 8—*Ussuraridelus niger*, part of forewing; 9—*Proclithrophorus mandibularis*, head (a—dorsal view, b—frontal view); 10—*Ropalophorus clavicornis*, antenna; 11, 12—*Leiophron orchesia*: 11—forewing, 12—1st abdominal tergite; 13, 14—*Syntretus elegans*: 13—1st abdominal tergite, 14—wings; 15—*Falcosyntretus falcifer*, abdomen; 16—*Loxocephalus boops*, head, dorsal view; 17, 18 —*Cosmophorus klugii*: 17—head, frontal view, 18—forewing; 19—*Microctonus aethiopes*, 1st abdominal tergite; 20—*Neoneurus auctus*, forewing.

<sup>1</sup> Hellén. 1958: *Fauna Fennica*, IV: 1—37.



- 3 ( 4). Thorax entirely black. First abdominal tergite 1.5 times as long as its width at apex, lacking raised spiracular tubercles, sculptured. Body 2.5. Northwest; Eastern Siberia (Vitim); Sweden ..... **A. subsulcatus** Thoms.
- 4 ( 3). At least prothorax including notum light colored. First abdominal tergite different.
- 5 ( 6). First abdominal tergite with raised spiracular tubercles, sculptured, 2 times as long as its width at apex. Prothorax and legs dark brownish yellow. Body 3.5. Northwest; Sweden; Yugoslavia ..... **A. collaris** Thoms.
- 6 ( 5). First abdominal tergite with slightly raised spiracular tubercles, sculptured only in basal half. Thorax with abundant dark brownish-yellowish or yellowish dark brown coloration. Body 2–2.3. Parasite of *Monolepta* sp., *Galerucella tenella* L. (Chrysomelidae). Northwest, center, Crimea.....  
..... **A. rufithorax** Tel., comb. n.  
Lectotype: Female, Yalta, 26.VII.1930 (not 26 VI. as mentioned in the description of the species) (N. Telenga). Paratypes: 2 females with the same label. 1 female, Moscow “district Savdorg” (obviously Savelovskaya Doroga and not “Savzdarg”; as mentioned in the description of the species), 1931, parasite of *Galerucella tenella* (strawberry leaf beetle) and not viburnum beetle as mentioned in the description of the species.
- 7 ( 2). First abdominal tergite not longer or only slightly longer than its width at apex. Notaulices distinct usually over entire length.
- 8 ( 9). Large-sized, body 5–6. Propodeum entirely coarsely rugose, with sharp folds; depression on sides of mesothorax rugose-punctate. Notaulices usually deep. Antennae about 30-segmented. South (Kharkov, Saratov); Caucasus, Kazakhstan, Eastern Siberia (Irkutsk, Selenga estuary); Western Europe; China (Valley of Middle Kunes He River; VIII, 1877. Przhhevskii) ..... **A. saxo** Reinh.
- 9 ( 8). Small-sized, body 2.5–3.5. Propodeum softly sculptured, lacking sharp folds; depression on sides of mesothorax punctate. Notaulices less deep, sometimes posteriorly smooth. Antennae 25–26-segmented. West, Center, southwest; Kazakhstan; Western Europe..... **A. edentulus** Hal.
- 10 ( 1). Abdomen in middle ventrally with two denticles. Ovipositor valves broad, apically broadened (Fig. 133: 6). Antennae 24–25-segmented. Notaulices deep. Body black, legs dark

brownish yellow. Body 2.5–3. West; Western Europe .....  
 .... **A. excrucians** Hal. (? *ater* Nees, *lativalvis* Jakim., syn.n.)

103. **Allurus** Förster, 1962\*.—Two species. Parasites of adult weevils of genus *Sitona*.

- 1 (2). Third abdominal sternite with 2 denticles. Denticles on hind coxae rather large. Second and third abdominal tergites dark brownish yellow. Figs. 133: 7; 134: 4; 135: 5. Body 2.5–3. Parasite of *Sitona lineatus* L., *S. hispidulus* F., *S. regensteiniensis* Habst., *S. sulcifrons* Thunb. Southwest; Caucasus, Kazakhstan; Western Europe..... **A. muricatus** Hal.
- 2 (1). Third abdominal sternite lacking denticles. Denticles on hind coxae small. Second and third abdominal tergites in middle dark. Fig. 134: 2, 3. Body 2–3.2. Parasite of *Sitona lineatus* L., *S. crinitus* Hbst., *S. inops* Schönh. West, southwest; Caucasus, Kazakhstan, Altai; Western Europe; North America.....  
 ..... **A. lituratus** Hal.

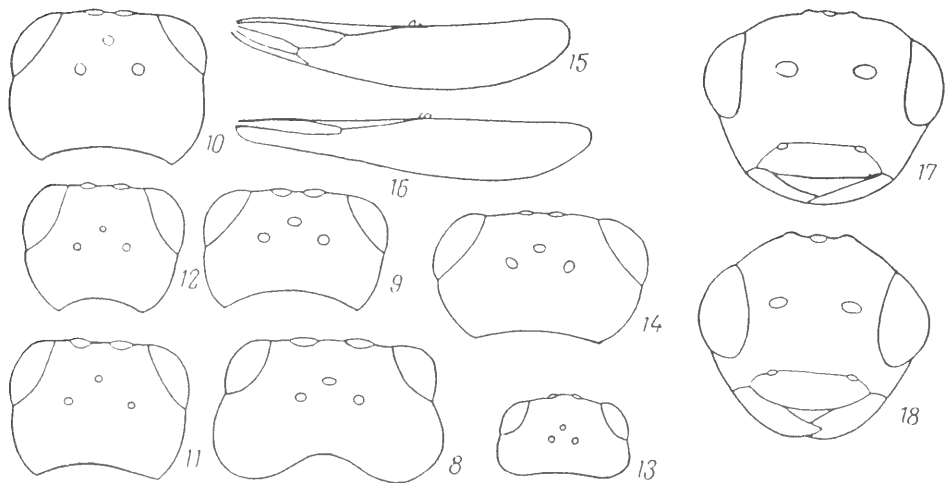
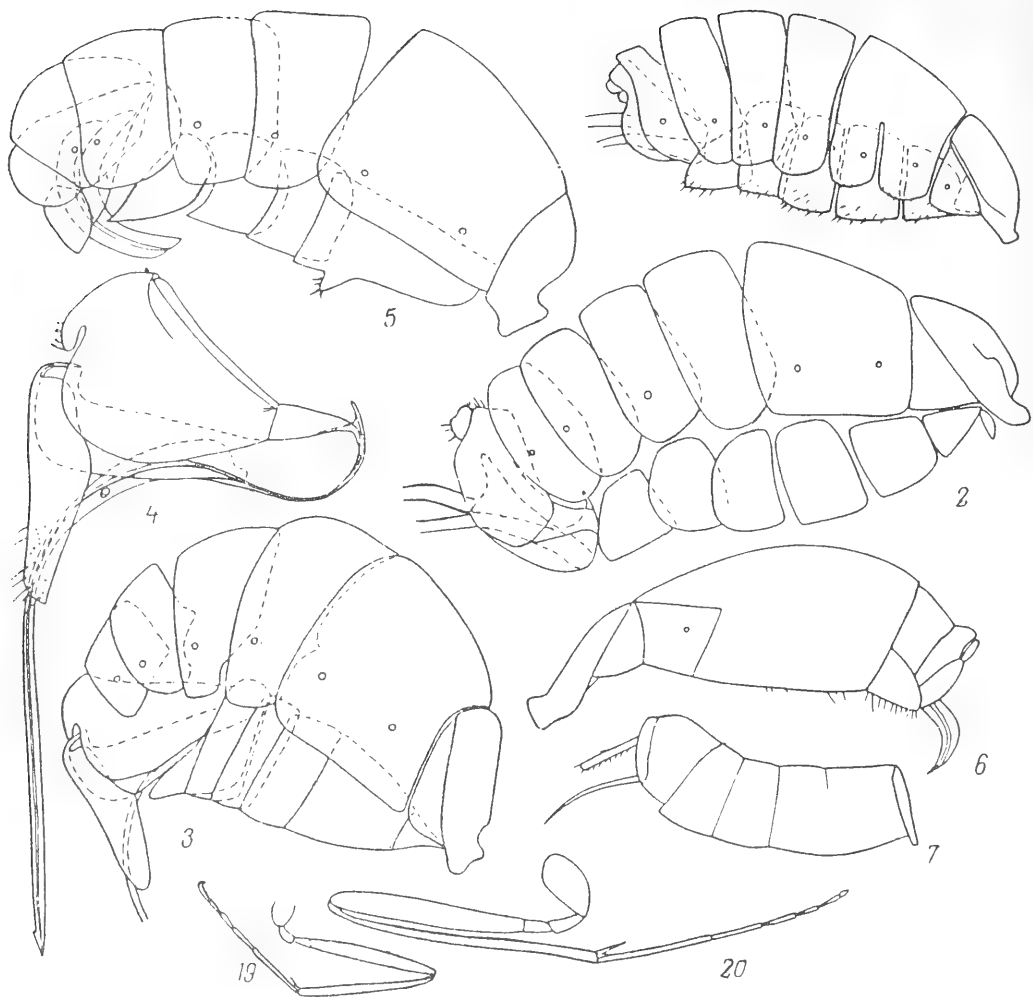
104. **Syrrhizus** Förster, 1862.—Four species, 2 in the Palearctic.

- 1 (1). Body black. Antennae 22-segmented; legs dark brownish yellow. Fig. 133: 8. Parasite of adult beetles *Anthonomus pomorum* L. (Curculionidae). Northwest; Western Europe .....  
 ..... **S. delusorius** Först

105. **Chrysopophthorus** Goidanich, 1948.—Seven species, 2 in the Palearctic.

- 1 (2). Anterior margin of clypeus uniformly convex. Flagellar segments 1 to 3 of female noticeably compressed, apically noticeably thinner than other segments (in male these segments cylindrical, slightly thinner than subsequent segments). Tentorio-ocular distance equaling ocular diameter. Body dark brownish yellow, legs and 1st abdominal segment pale yellow. Figs. 134: 5–7; 138: 2. Body 3.5–3.6. Parasite of *Chrysopa carnea* St. (Chrysophidae). South; Azerbaidzhan .....  
 ..... **C. elegans** Tobias
- 2 (1). Anterior margin of clypeus truncate in middle. Flagellar segments 1 to 3 of female cylindrical. Tentorial pits slightly

\* [sic]; an obvious printing error; should read 1862—Translator.



separated, shifted farther from eye. Figs. 136: 1, 2; 138: 1. Parasite of *Chrysopa flavifrons* Brauer, *C. ventralis* Curt., *C. camea* Steph. (Chrysopidae). Azerbaidzhan; Central and Southern Europe..... *C. hungaricus* Zilachi-Kuss (*chrysopimuginis* Goid.)

229 106. *Wesmaelia* Förster, 1862.—One species.

1 (1). Body yellow. Antennae 24–28-segmented. Parasite of *Nabis* spp. (Nabidae). Southwest; Caucasus (Azerbaidzhan), Central Asia; Western Europe; North America .....  
..... **W. pendula** Först. (*cremasta* Marsh., *asiatica* Shest.)

107. *Aridelus* Marshall, 1887<sup>1</sup>.—More than 20 species, of these 4 in the Palearctic (2 from the Far East).

1 (2). Face not densely punctate, lustrous. Body black; scape and legs dark brownish yellow; wings light colored. Body 4. Parasite of *Eurygaster maura* L., *E. austriaca* Schr. (Scutellariidae), *Palomena prasina* L., *Dolycoris baccarum* L., *Eurydema ornata* L., *Holcotethus vernalis* Wolff, *Aelia acuminata* L., *A. cognata* Fieb. (Pentatomidae), *Coptosoma scutellatum* Geoffr., *C. mucronatum* Seid. (Plataspidae). Ukraine, Krasnodar territory (Sochi), Azerbaidzhan, Far East; Western Europe .....  
..... **A. egregius** Schm.

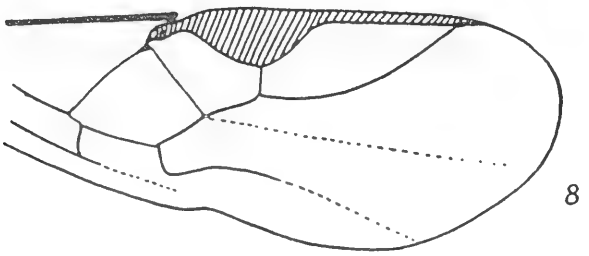
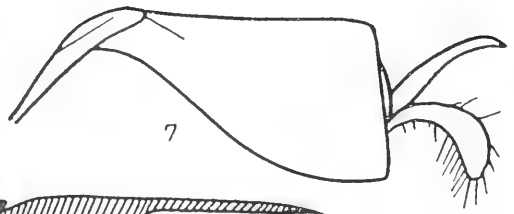
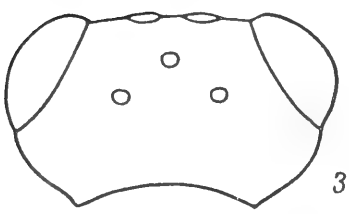
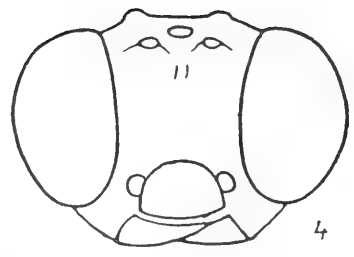
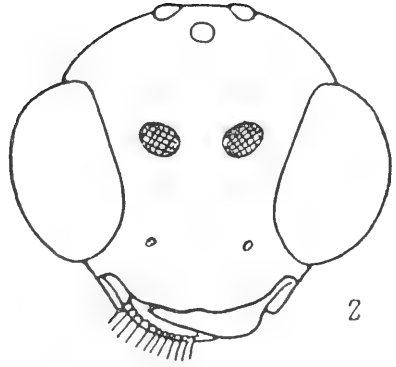
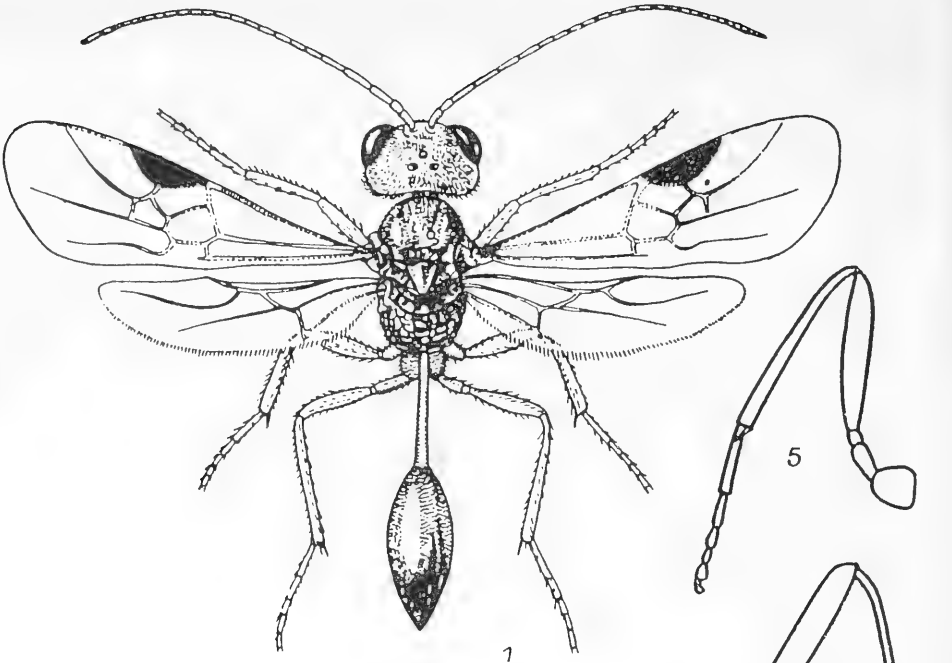
2 (1). Face very densely punctate, matte. Body yellowish red; ocellar field, thorax except pronotum and sides of mesonotum or also sides of metathorax black or very dark brown; antennal apices, hind tibiae, sometimes hind femora dark brownish;

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Fig. 135. Euphorinae (from Tobias and original).

1–3—Abdomen: 1—*Blacus ruficornis*, 2—*Pygostolus falcaus*, 3—*Centistes cuspidatus*; 4—*C. cuspidatus*, ovipositor; 5–7—abdomen: 5—*Allurus murcaus*, 6—*Leiophron rubricollis*, 7—*Loxocephalus boops*; 8–14—head, dorsal view: 8—*Leiophron rubricollis*, male, 9—*L. pallipes*, male, 10—*L. grandiceps*, female, 11—*L. rubricollis*, female, 12—*L. pallipes*, female, 13—*Syntreus testaceus*, 14—*S. vernalis*; 15, 16—hind wing: 15—*L. deficiens*, 16—*L. apicalis*; 17, 18—head, frontal view: 17—*Syntreus elegans*, 18—*S. klugii*; 19–20—*Loxocephalus boops*: 19—foreleg, 20—hind leg.

<sup>1</sup>Belokobylskii. 1981. In book: Pereponchatokrylye Dalnego Vostoka (Hymenoptera of the Far East). Vladivostok: 41–47.





wings slightly darkened. Body 4.5. Caucasus .....  
 .....**A. rufotestaceus** Tobias, sp. n.  
 Holotype: Female, Sochi (Lazarevskoe), forest along  
 rivulet, 14.IX.1981 (V. Tobias). Paratype: 1 female, Lidzava,  
 Pishchunda, ravine with alder, ferns, 21.IX.1982 (Kasparyan).

108. **Ussuraridelus** Tobias and Belokobylskij, 1981.—One Far  
 Eastern species (*U. niger* Tobias and Belok.). Fig. 134: 8.

109. **Proclithrophorus** Tobias and Belokobylskij, 1981.—One Far  
 Eastern species (*P. mandibularis* Tobias and Belok.). Fig. 134: 9.

110. **Dinocampus** Förster, 1862.—One species.

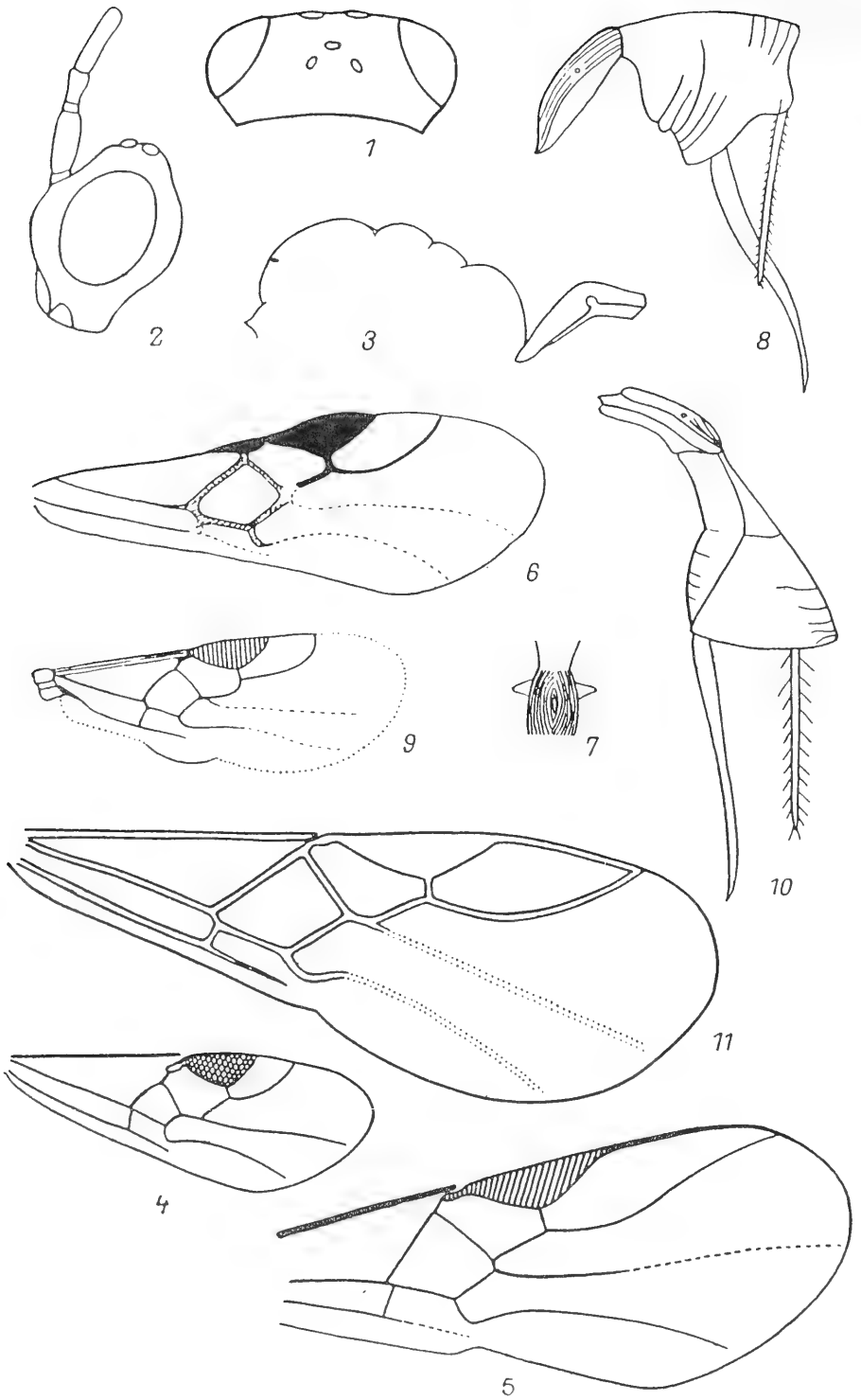
1 (1). Body black, head, abdominal apex and partly legs dark brownish  
 yellow. Ovipositor shorter than abdomen. Fig. 137: 1–4. Body  
 3–4. Parasite of adult beetles, rarely larvae of beetles of family  
 Coccinellidae (Fig. 138: 11). Throughout, almost cosmopolitan  
 species ..... **D. coccinellae** Schrank (*terminatus* Nees)

111. **Perilitus** Nees<sup>1</sup>.—Over 20 species, about 10 in the Palearctic.  
 Parasites of adult beetles of families Chrysomelidae and Curculion-  
 idae.

- 1 (20). Thorax short, not more than 1.5 times as long as high.  
 Metacarpus not longer than stigma. First abdominal tergite  
 in middle lacking basally deep and posteriorly open furrows.
- 2 (19). Ovipositor not shorter than 1st abdominal tergite, its valves  
 not broadened. Eyes small; face much wider than high, ap-  
 proximately as much as longitudinal diameter of eye. First  
 abdominal tergite sculptured.
- 3 (10). Metacarpus as long as stigma, apex of radial cell much closer  
 to wing apex than stigma (Fig. 136: 8).

1, 2—*Chrysophthorus hungaricus*: 1—general appearance, 2—head, frontal view;  
 3–7—*Perilitus brevicauda*: 3—head, dorsal view, 4—head, frontal view, 5—foreleg,  
 6—hind leg, 7—abdomen; 8—*P. longiradialis* sp. n., forewing.

<sup>1</sup> Richards. 1960. *Proc. Roy. Entomol. Soc. London*, 41: 140–144.



- 4 ( 5). Ovipositor valves somewhat longer than 1st abdominal tergite, shorter than broader part of abdomen behind it. Second section of radial vein uniformly curved, in basal half more distinctly than in apical half. Depression on scutellar apex distinctly transverse. First abdominal tergite with thin petiole. Antennae about 30-segmented. Body black; head anteriorly and abdomen behind 1st tergite with somewhat developed light colored pattern, legs yellowish dark brown, hind legs much darker. Body 4. Moldavia .....

..... **P. longiradialis** Tobias, sp. n.

Holotype: Female, Vadatukovo, forest, 8.V.1961 (Talitskii). Paratypes: 3 males, details same.

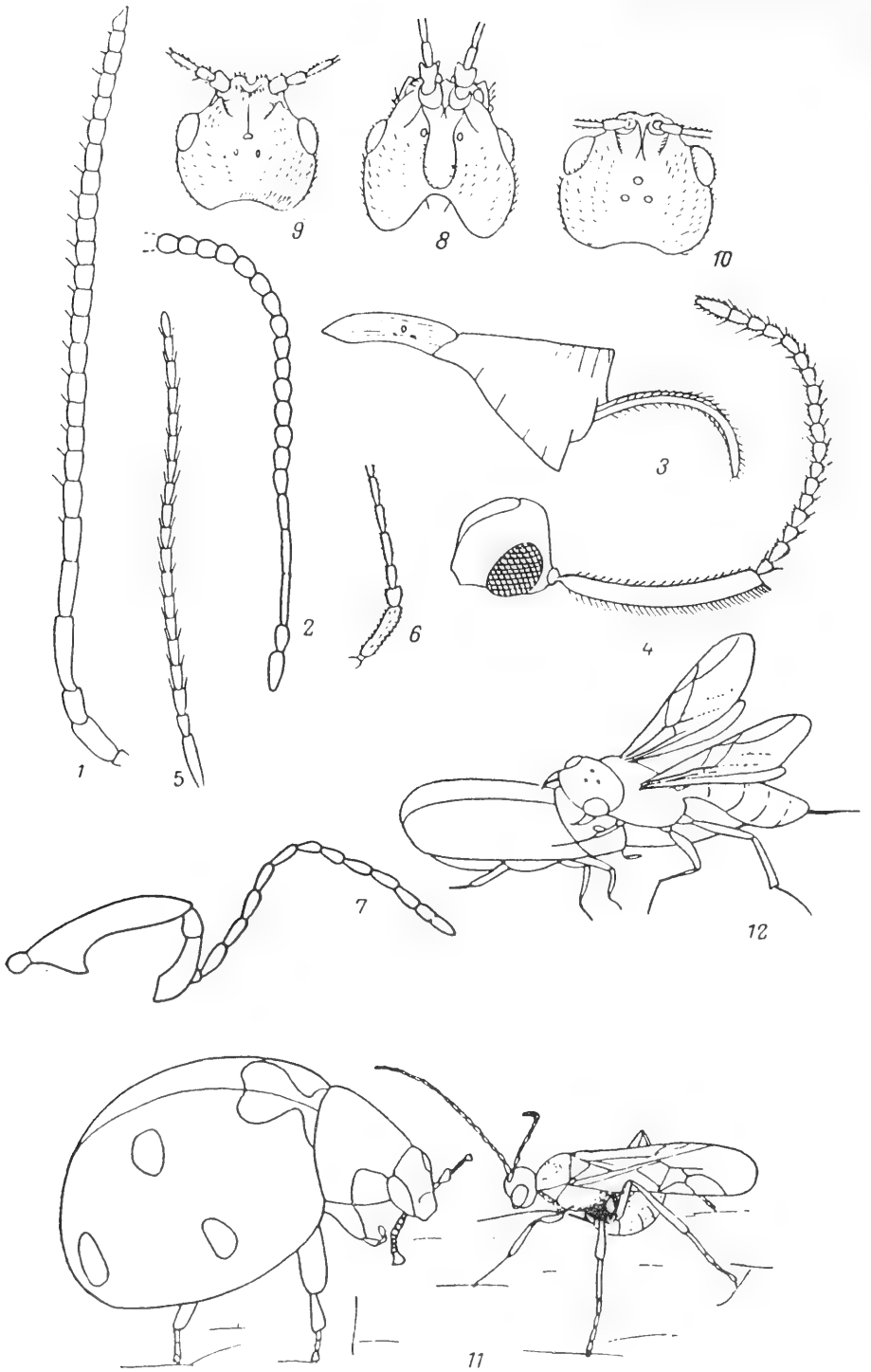
- 5 ( 4). Ovipositor valves not shorter than broader part of abdomen.

- 6 ( 7). Second section of radial vein with S-shaped bend (Fig. 137: 5). Antennae 30-segmented, distinctly longer than body. Ovipositor valves as long as abdomen without 1st tergite. Temples distinctly narrowed,  $\frac{2}{3}$  as long as eyes; distance between posterior ocelli twice ocellar diameter, ocellular distance less than ocellar diameter. Tentorial pits separated from each other by 2 times tentorio-ocular distance. Face somewhat wider than high. Scutellum lacking apical depression. First abdominal tergite with thin petiole, 2.5 times as long as its width at apex. Head dorsally smooth, face densely punctate; thorax weakly and sparsely punctate, notautices and wider sternaui rugose; propodeum nonuniformly reticulate-rugose; 1st abdominal tergite longitudinally-rugose. Body dark brownish yellow, posterior part of thorax darker. Body 3. Northwest, center ..

..... **P. kokujevi** Tobias, sp. n.

Holotype: Female, Leningrad Region, Tolmachevo, 22.VIII.1960 (Tobias). Paratype: Female (without left wing, hind and middle legs). Yaroslavl' Region, "Berdysino, 6.VIII.1894 (Coll. Kokuev)".

1—4—*Dinocampus coccinellae*: 1—head, dorsal view, 2—head, lateral view, 3—outline of upper part of thorax and 1st abdominal segment, 4—forewing; 5—*Perilitus kokujevi* sp. n., forewing; 6, 7—*P. tuberculatus*: 6—forewing, 7—1st abdominal tergite; 8—*P. sicheli*, abdomen; 9, 10—*P. dubius*: 9—forewing, 10—abdomen; 11—*P. rutilus*, forewing.



- 7 ( 6). Second section of radial vein basally uniformly curved (Fig. 137: 11), in apical half at most straightened. Antennae in female 23–26-segmented, shorter than body. Ovipositor valves as long as abdomen or somewhat shorter.
- 231 8 ( 9). Legs dark brownish yellow. Antennae: female 25–26-segmented, male 26–30-segmented. Thorax: female with variable dark brownish yellow pattern, male black. Body 2.5–3. Parasite of species of *Sitona* as well as *Phytonomus variabilis* Hbst. (Curculionidae) Entire Palearctic ..... **P. rutilus** Nees
- 9 ( 8). Hind legs darkened. Antennae: female 23-segmented, male 28–29-segmented. Body 3. England ..... **P. strenuus** Marsh.
- 10 ( 3). Metacarpus shorter than stigma, apex of radial cell closer to stigma than wing apex or their middle (Fig. 137: 6, 9).
- 11 (12). Spiracular tubercles of 1st abdominal tergite distinctly projecting pointedly (Fig. 137: 7). Ovipositor slightly bent, as long as hind tibia. Body yellow, posterior part of thorax including scutellum and spot on vertex black; 1st abdominal tergite basally yellow, apically black. Body 2.9. Bulgaria .... **P. tuberculatus** Zaykov
- 12 (11). Spiracular tubercles of 1st abdominal tergite slightly raised.
- 13 (14). Ovipositor falcately bent (Fig. 138: 3). Apical depression on scutellum narrow, transverse. Antennae: female 23–25-segmented, male 27–29-segmented. Color variable. Body 2.2–3. Parasite of *Orchesia micans* Pz. (Melandryidae) and many species of *Timarcha* (Chrysomelidae). Northwest, center; Kazakhstan, Central Asia; Western Europe ..... **P. falciger** Ruthe
- 14 (13). Ovipositor slightly bent (Fig. 137: 8, 10). Apical depression on scutellum oval.
- 15 (16). Apical depression on scutellum wide and deep, its lower margin distinctly raised. Petiole of 1st abdominal segment short, expanded almost from base, apically 2 times as wide as hind

232 Fig. 138. Euphorinae (from Mason, Richards, Capek, Snoflák, Zeitner, Neizle and Tobias).

1, 2—antenna: 1—*Chrysophothorus hungaricus*, 2—*C. elegans*; 3—*Perilitus falciger*, abdomen; 4—*Sreblocera macroscapa*, female, head and antenna; 5—*S. fulviceps*, male, antenna; 6—*S. macroscapa*, male, antennal base; 7—*S. fulviceps*, female, antenna; 8–10—head, dorsal view: 8—*Cosmophorus regius*, 9—*C. klugii*, 10—*C. cembrae*; 11, 12—attack of host: 11—*Dinocampus coccinellae*, 12—*Cosmophorus henscheli*.

- coxa, uniformly longitudinally rugose almost up to its base. Thorax and abdomen black or almost black. Fig. 137: 8. Body 2.6–2.8. Parasite of *Timarcha* sp. (Chrysomelidae). England; France ..... **P. sicheli** Giard
- 16 (15). Apical depression on scutellum less developed, its lower margin hardly raised. Petiole of 1st abdominal segment narrow, parallel-sided, as long as its broadened part which at apex 1.5 times as wide as hind coxa, less uniformly rugose, more undulate and anastomosing.
- 17 (18). Metacarpus not longer than 4/5 of anterior margin of stigma. Sides of thorax and abdomen posterior to 1st segment dark brownish yellow. Antennae 21–24-segmented. Fig. 137: 9, 10. Body 2.3–3. Parasite of *Phytodecta olivacea* Först (Chrysomelidae). West, Central Ural; Kazakhstan; Western Europe..... **P. dubius** Wesm.
- 18 (17). Metacarpus longer than 4/5 of anterior margin of stigma. Body black or very dark brown. Antennae 23–25-segmented. Body 2–3. Southwest; Kazakhstan; Western Europe .....  
..... **P. foveolatus** Reinh.
- 19 ( 2). Ovipositor shorter than 1st abdominal tergite, with broadened valves. Eyes large, protuberant; face not wider than high, much less than longitudinal diameter of eye. Antennae 22-segmented, near flagellar apex 1.5 times as long as wide. Mesonotum with longitudinal depression in middle. First abdominal tergite 5 times as long as its width at apex. Greater part of body smooth; face, pronotum, notaulices, sides of mesothorax above and in wider lower depression, sides of metathorax, and propodeum densely rugose-punctate, matte. Body black; legs very light brown; wings weakly darkened. Fig. 136: 3–7. Body 2.6. Altai (Chui steppe) .....  
..... **P. brevicauda** Tobias
- 20 ( 1). Thorax twice as long as high. Metacarpus longer than stigma. First abdominal tergite in middle with 2 basally deep and posteriorly open furrows. Forewings usually with 2 radiomedial veins; only in aberrant individuals with 1. ....  
..... **Meteorus varinervis** Tobias, sp. n.

112. *Microctonus* Wesmael, 1835<sup>1</sup>.—About 50–60 species, of which 15 in the Palearctic (more than 30 species have been described mostly from variable character or color). They are parasites of adults and larvae of beetles usually from the families Chrysomelidae and Curculionidae. Sexual dimorphism in color is characteristic: the male is much darker than the female and hardly varies in different species.

- 1 (30). Ovipositor valves not shorter or very slightly shorter than 1st abdominal segment. First abdominal tergite usually sculptured. Eyes not distinctly developed, their longitudinal diameter approximately equaling height of face. Head of female usually with dark brownish yellow pattern; legs usually dark brownish yellow.
- 2 (27). Metacarpus not shorter than half length of stigma. Scape small, shorter than 1st segment of flagellum, 1st to 4th flagellar segments with hair not uniformly dense.
- 3 (6). Metacarpus as long as stigma (Fig. 140: 2). Antennae 25–27-segmented. Body fairly large-sized, 2.5–3.5.
- 4 (5). Legs of female dark brownish yellow; sides of thorax often somewhat dark brownish. First abdominal segment basally dark brownish. Propodeum uniformly bulged, in middle below slightly depressed, uniformly rugose-punctate. Fig. 140: 1, 2. Body 2.5–3. Parasite of adult leaf beetles *Melasoma aenea* L. as well as larvae of *Haltica quercetorum* Foudr. (Chrysomelidae). Southwest; Western Europe..... *M. deceptor* Wesm.
- 5 (4). Legs somewhat darkened, at least hind coxae black, rarely dark brown; thorax and 1st abdominal segment entirely black. Propodeum steeply sloping, in middle below fairly broadly and deeply depressed, more coarsely and nonuniformly sculptured. Body 2.7–3.5. Parasite of larvae and adults of leaf beetles *Haltica ampelophaga* Guer., *Psylliodes napi* F., *P. chrysocephala* L. West, southwest, Central Ural; Kazakhstan, Central Asia, Armenia; Western Europe; northern Africa..... *M. brevicollis* Hal.

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<sup>1</sup> Recently Haeselbarth and Loan (1983, *Contrib. Amer. Entomol. Inst.*, 20: 384–387) have separated from the genus *Microctonus* the genus *Townesilinus* Haes. and Loan, distinguished by distinctly transverse clypeus and 1st abdominal sternite fused with tergite. So far in this genus they have included the Nearctic species *M. bicolor* Wesm. (type species), *M. deceptor* Wesm. and *M. breviradialis* Tobias. Here, these species have been retained under the genus *Microctonus* since the revision of the entire group by these authors has not been concluded.

- 6 ( 3). Metacarpus noticeably shorter than stigma; if as long as latter then body not larger than 2 mm. Antennae not more than 25-segmented (except *M. fulviceps*).
- 7 (26). Antennae not more than 25-segmented.
- 8 ( 9). Antennae with very thin basal segments of flagellum, 1st and 2nd segments 2 to 4 times as long as wide and lighter colored than rest of flagellum (often contrastingly light colored). Color of thorax and abdomen of female variable: often with abundant yellowish dark brown contrasting pattern; base of 1st segment usually dark brownish yellow. Antennae 18–21-segmented. Body 1.7–2. Parasite of leaf beetles from genera *Psylliodes*, *Phyllotreta*, *Chaetocnema*, *Aphthona* (particularly *P. attenuata* Koch., *P. vitula* Redt., *C. aridula* Gyll., *A. euphorbiae* Schr.), *Phyllodecta*. Northwest, west, center, south; Caucasus, Kazakhstan, Central Asia; Western Europe .....  
..... **M. bicolor** Wesm.
- 234 9 ( 8). Basal segments of antennal flagellum less thin, 2.5–3 times as long as wide; usually flagellum monochromatic over entire length, black or dark brown. Lighter and darker body color more contrasting; 1st abdominal segment monochromatic, usually black. Antennae 19–26-segmented, longer than head and thorax together, segments in apical third usually longer than wide.
- 10 (11). Distance between posterior ocelli one-third ocellocular distance. Head, abdomen and legs yellow, pronotum and sides of mesothorax reddish; thorax above and 1st abdominal tergite reddish dark brown. Body 2.8. Western Europe .....  
..... **M. aethiops** Nees (nec auct.)
- 11 (10). Distance between posterior ocelli slightly less than ocellocular distance.
- 12 (13). Body monochromatic, reddish dark brown. Legs yellowish dark brown. Body 2.8. Western Europe ..... **M. secalis** Hal.
- 13 (12). Body bichromatic, at least head much lighter in color than darker parts of body.
- 14 (25). Antennae longer than head and thorax together, usually more than 18-segmented, segments in apical third not transverse.
- 15 (16). Sides of mesothorax dark brownish yellow. Antennae 19–21-segmented. Wings as in Fig. 140: 4. Body 1.5–2.5. Parasite of species of *Ceutorhynchus* as well as *Phytonomus meles* F. (Curculionidae). West, center, east, south; Caucasus, Kazakhstan, Central Asia; Western Europe .....  
..... **M. melanopus** Ruthe



- 16 (15). Thorax entirely black or very dark brown, rarely sides reddish. Antennae 18–26-segmented.
- 17 (20). Anterior margin of radial cell half as long as stigma (Fig. 139: 1). Antennae in female 21–26-segmented.
- 18 (19). Apical width of 1st abdominal tergite in female 0.27–0.32, in male 0.2–0.28. Width of stigma 0.15–0.18. Antennae 21–24-segmented. Figs. 134: 19; 139: 1. Body 2.1–3. Parasite of adult beetles of genera *Sitona* and *Hypera* as well as *Phytonomus meles* F., *P. nigrirostris* F. (Curculionidae). Entire Palearctic; North America (introduced).....  
.....**M. aethioides** Loan (*aethiops* auct.)
- 19 (18). Apical width of 1st abdominal tergite 0.3–0.43. Width of stigma 0.18–0.24. Antennae 23–25-segmented (in male 26–29-segmented). Fig. 139: 2, 3. Body 3.2. Parasite of *Phytonomus variabilis* Hbst. Krasnodar territory; France; Sweden; North America (introduced)..... **M. stelleri** Loan
- 20 (17). Anterior margin of radial cell as long as or slightly shorter than stigma (Fig. 139: 4).
- 21 (22). Ovipositor valves almost as long as abdomen. Antennae 19-segmented. First abdominal tergite 2.5 times as long as its width at apex. Body 2.5. Moldavia; Sweden.....  
..... **M. caudatus** Thoms.
- 22 (21). Ovipositor valves slightly shorter than 1st abdominal tergite.
- 23 (24). Antennae of female 18–20-segmented (in male 21–22-segmented). First abdominal tergite fairly short, less than 2 times as long as its width at apex. Body 1.9. Parasite of *Apion assimile* Kby., *A. flavipes* Pk. (Curculionidae). England.....**M. apiophaga** Loan
- 24 (23). Antennae 24-segmented. First abdominal tergite 3 times as long as its width at apex. Width of face equals longitudinal diameter of eye. Antennae as long as body. Propodeum in middle notched, on sides angular, uniformly and densely rugose-punctate. First abdominal tergite and broadened part of abdomen equal in length. Body black; head, scape, and legs dark brownish yellow; ovipositor valves in apical half light colored. Body 2. Moldavia.....  
.....**M. moldavicus** Tobias, sp. n.  
Holotype: Female, Kishinev, 3.VI.1961 (Talitskii).
- 25 (14). Antennae short, as long as head and thorax together, 16–18-segmented, segments in apical third transverse. Body 1.5–2. Moldavia; Western Europe..... **M. parvicornis** Ruthe

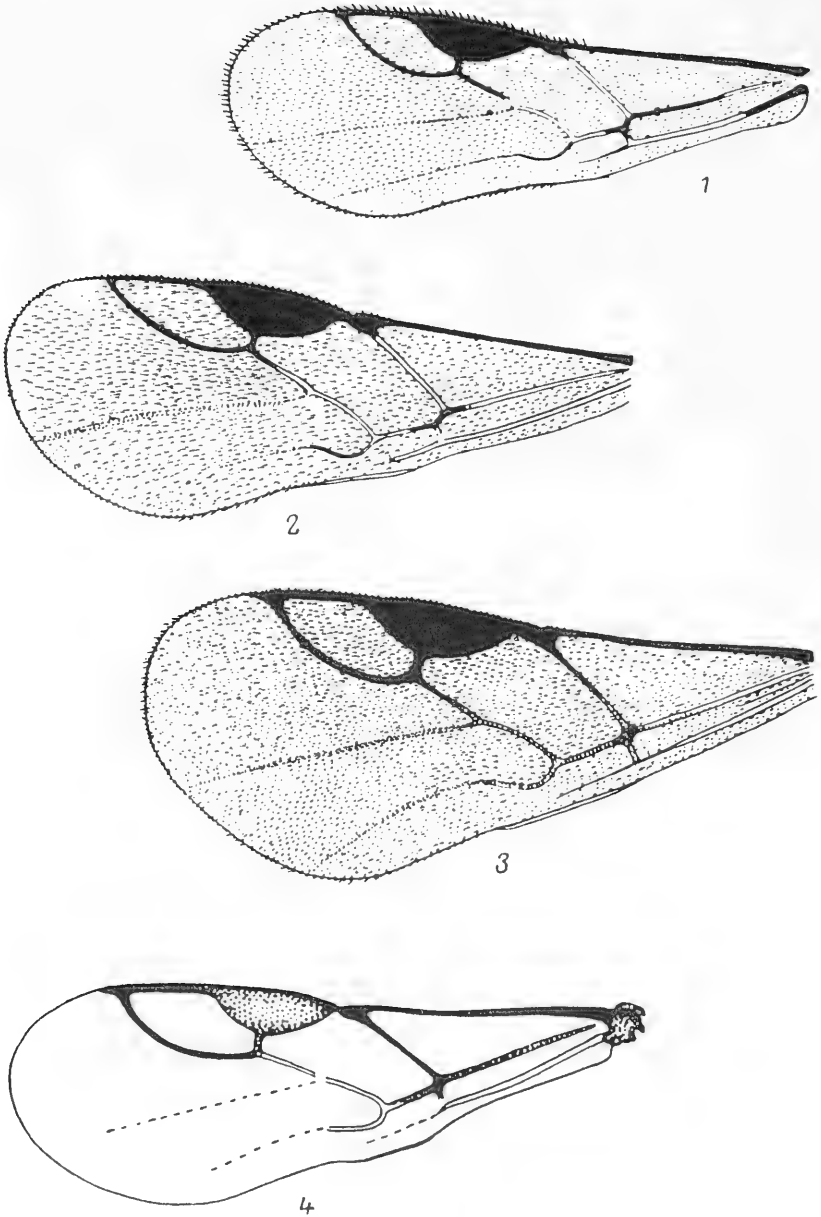


Fig. 139. Euphorinae (from Loan).

1—4—forewing: 1—*Microctonus aethioides*, 2—*M. stelleri*, female, 3—*M. stelleri*, male, 4—*M. apiophaga*.

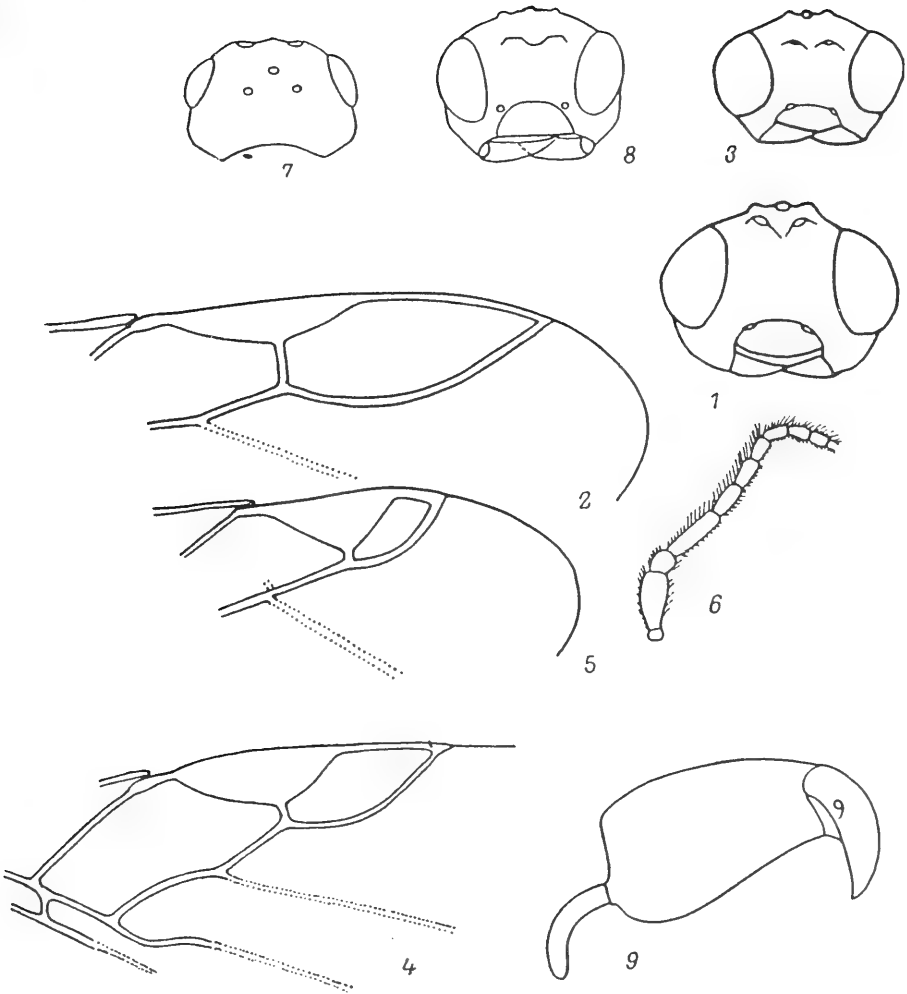


Fig. 140. Euphorinae (from Tobias and original).

1, 2—*Microctonus deceptor*: 1—head, frontal view, 2—part of forewing; 3—*M. facialis*, head, frontal view; 4—*M. melanopus*, part of forewing; 5, 6—*M. plumicornis*: 5—part of forewing, 6—antenna; 7—9—*M. riphaeus* sp.n.: 7—head, dorsal view, 8—head, frontal view; 9—abdomen.

26 ( 7). Antennae about 30-segmented, as long as body. Ovipositor valves slightly more than half as long as abdomen. Propodeum uniformly rugose, notched in middle. Body black;

- head yellowish red, pronotum reddish. Body 1.5–2. Latvia; Central Europe..... **M. fulviceps** Ruthe
- 27 ( 2). Metacarpus one-third as long as stigma (Fig. 140: 5). Propodeum with distinctly striate areola in middle of posterior surface.
- 28 (29). Antennal scape bulged, as long as 1st flagellar segment; 1st to 4th flagellar segments on outer margin with dense erect hair, sharply differing from hair on other segments; first 6 antennal segments dark brownish yellow, remaining contrastingly black. Antennae 19-segmented. Thorax black or with abundant yellowish dark brown pattern. Fig. 140: 5, 6. Body 2–3. Parasite of *Notoxus monoceros* L. (Anthicidae). Western Kazakhstan; Western Europe ... **M. plumicornis** Ruthe
- 29 (28). Antennal scape not bulged, shorter than 1st flagellar segment, 1st to 4th flagellar segments on outer margin with hair differing little from those on other segments, basal antennal segments yellow but less contrastingly colored compared with those in apical part. Body 2. Moldavia, Azerbaidzhan ..... **M. breviradialis** Tobias
- 30 ( 1). Ovipositor valves much shorter than 1st abdominal segment, not broadened. Head black or anteriorly yellowish, legs dark brown or yellowish.
- 31 (32). First abdominal tergite smooth. Eyes distinctly developed, their longitudinal diameter greatly exceeding width of face (Fig. 140: 3). Recurrent and radiomedial veins forming curved line. Body 1.6–1.7. Extracted from tunnels of *Ips typographus* L. (Scolytidae). North, northwest, center; Altai; Sweden ..... **M. facialis** Thoms.
- 32 (31). First abdominal tergite rugose. Eyes small, their longitudinal diameter equaling width of face. Recurrent and radiomedial veins forming straight line. First abdominal tergite 2 times as long as its width at apex, sharply narrowed basally from raised spiracular tubercles. Ovipositor uncinat. Thorax reddish, abdomen yellowish. Fig. 140: 7–9. Body 2. Northern Ural..... **M. riphaeus** Tobias, sp. n.  
Holotype: Female, "Voikar river valley, Obdorsk", 11.VIII.1925 (Fridolin).

113. **Ropalophorus** Curtis, 1837 (*Eustalocerus* Först.)—Two species: One Palearctic, the other Nearctic.

- 1 (1). Body very dark brown. Ovipositor shorter than abdomen. Fig. 134: 10. Body 2–3. Parasite of *Ips typographus* L., *I. amitinus* Eichh., *Hylesinus fraxini* Panz. (Scolytidae). North, north-west, center; Western Europe; Japan.... **R. clavicornis** Wesm.

114. *Ecclitura* Kokujev, 1902.—One species.

- 1 (1). Body dark brownish yellow, face yellow. Body 2.5. Dagestan, Azerbaidzhan, Central Asia; Albania; Iran.....  
..... **E. primoris** Kok.

115. *Streblocera* Westwood, 1833<sup>1</sup>.—Twenty-six species, of which 8 in the Palearctic [2 known only from Japan and China, one of them *S. okodai* Wat., parasitizes *Monolepta nigrobilineata* Motsch. (Chrysomelidae)].

1 (12). Females.

2 ( 9). Third antennal segment in shape and size sharply differing from 4th segment, bigeniculate.

3 ( 8). Third antennal segment  $1/2$ – $1/3$  as long as scape, slightly more than 2 times as long as 2nd segment.

236 4 ( 7). Antennae 18–19-segmented, scape lacking uncinat denticle, only with small projection in its place; 4th antennal segment articulated to apex of cylindrical 3rd segment. First abdominal tergite short (only 1.5 times as long as its width at apex), with deep and wide depression in basal third (Fig. 141: 4).

5 ( 6). Antennae 18-segmented; scape in basal third with transverse depression below, tuberculately raised anterior to it; 3rd, 4th and 5th segments distally angularly projected. Forewing with distinct trace of 1st section of medial vein. Body yellow with chestnut brown ocellar field, 7 apical antennal segments and apices of tarsi dark. Fig. 141: 1–4. Body 2.6. Romania.....  
..... **S. romanica** Lăcătușu

237 6 ( 5). Antennae 18–19-segmented (2 apical segments sometimes almost fused); scape in basal third below with slight depression, anterior to it cuneately raised and with somewhat developed denticle; only 3rd and 4th antennal segments distally angularly projecting. Forewing lacking trace of 1st section of medial vein (radiomedial and discoidal cells

<sup>1</sup> Čapek and Snoflák. 1959. *Časopis Českosl. Spol. Entomol.*, 56, 4: 343–354.

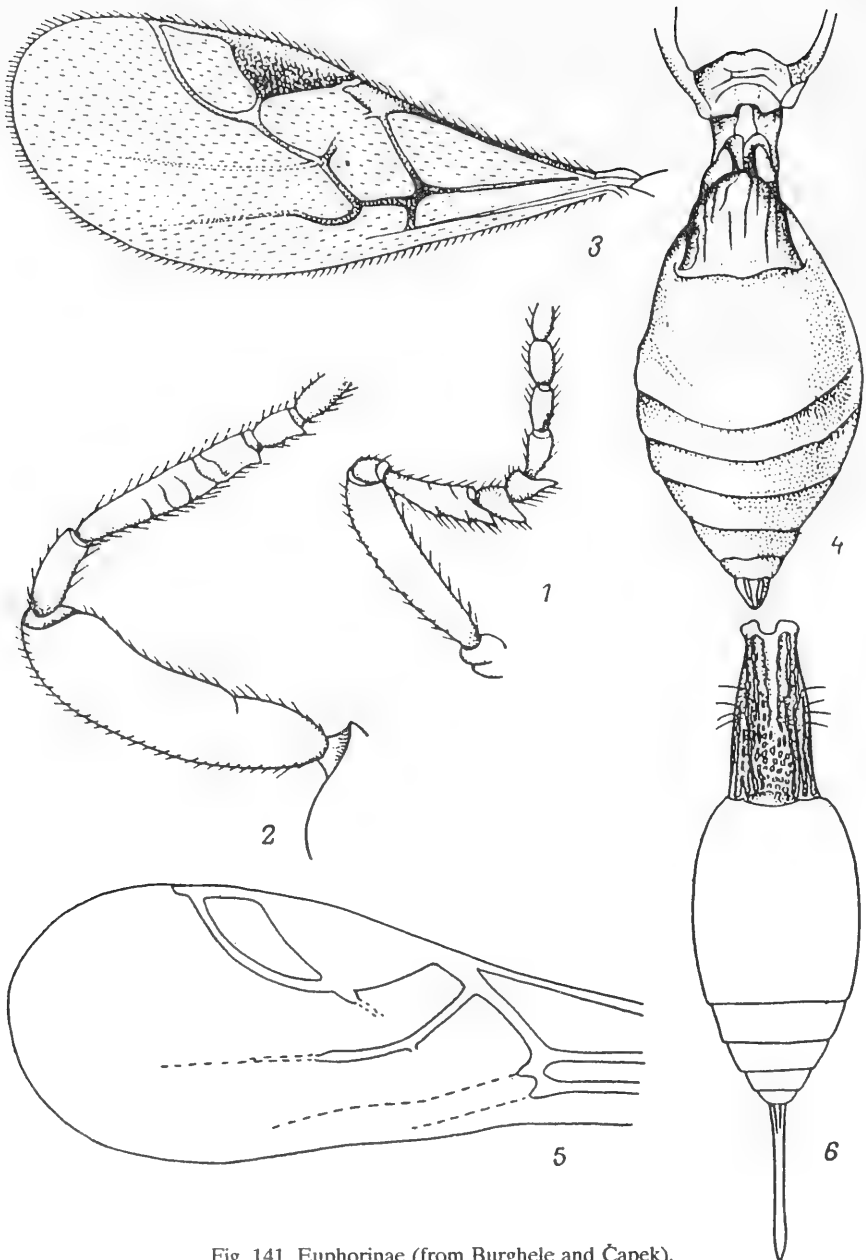


Fig. 141. Euphorinae (from Burghele and Čapek).

1—4—*Sieblocera romanica*: 1—antenna, 2—scape, 3—forewing, 4—abdomen;  
5, 6—*Cryptoxilos cracoviensis*: 5—forewing, 6—abdomen.

- completely fused). Body dark brownish yellow, ocellar field, antennae, beginning with 4th segment, upper part of thorax and abdomen except its middle very dark brown. Apices of 3rd and 4th antennal segments below with dense white hair. Fig. 142: 1–4. Body 2.5–2.7. Lithuania .....  
 ..... **S. antennata** Jakim.
- 7 ( 4). Antennae 16-segmented, with large uncinat denticle on outer side of scape (Fig. 138: 7), 4th segment articulated to middle of flat 3rd segment. First abdominal tergite not less than 2 times as long as its width at apex. Body very dark brown, with light colored pattern. Body 2–2.3. Pacific Coastal Region; England ..... **S. fulviceps** Westw.
- 8 ( 3). Third antennal segment only slightly shorter than scape, almost 3 times as long as 2nd. Antennae 15–16-segmented, scape lacking uncinat denticle, but with denticle-like tubercle in its place and keel above it. Body yellowish dark brown, upper part of thorax and 1st abdominal tergite dark brown. Fig. 142: 5–7, 10. Body 2.5–3. Kazakhstan; England; Czechoslovakia ..... **S. longiscapha** Westw.
- 9 ( 2). Third antennal segment differing less from 4th, antennae unigeniculate or indistinctly bigeniculate. Ovipositor longer than 1st segment of hind tarsus.
- 10 (11). Antennae 17–19-segmented, scape as long as next 10 segments after it together. Body yellowish dark brown. Figs. 138: 4; 142: 8. Body 2.5–3. Northwest, center; Kazakhstan, Far East; Western Europe .....  
 ..... **S. macroscapa** Ruthe
- 11 (10). Antennae 25-segmented, scape not longer than next 4 segments after it together. Body very dark brown; head, 1st and 2nd antennal segments and legs dark brownish yellow. Body 3–3.5. Central Europe ..... **S. flaviceps** Marsh.
- 12 ( 1). Males.
- 13 (14). Antennae 24-segmented (Fig. 142: 9). Body very dark brown ..... **S. flaviceps** Marsh.
- 14 (13). Antennae at most 20-segmented, body lighter colored.
- 15 (16). Second to fourth antennal segments of almost same length. Antennae 19-segmented (Fig. 138: 5). Body dark brown ....  
 ..... **S. fulviceps** Westw.
- 16 (15). Third and fourth antennal segments almost 2 times as long as second segment.

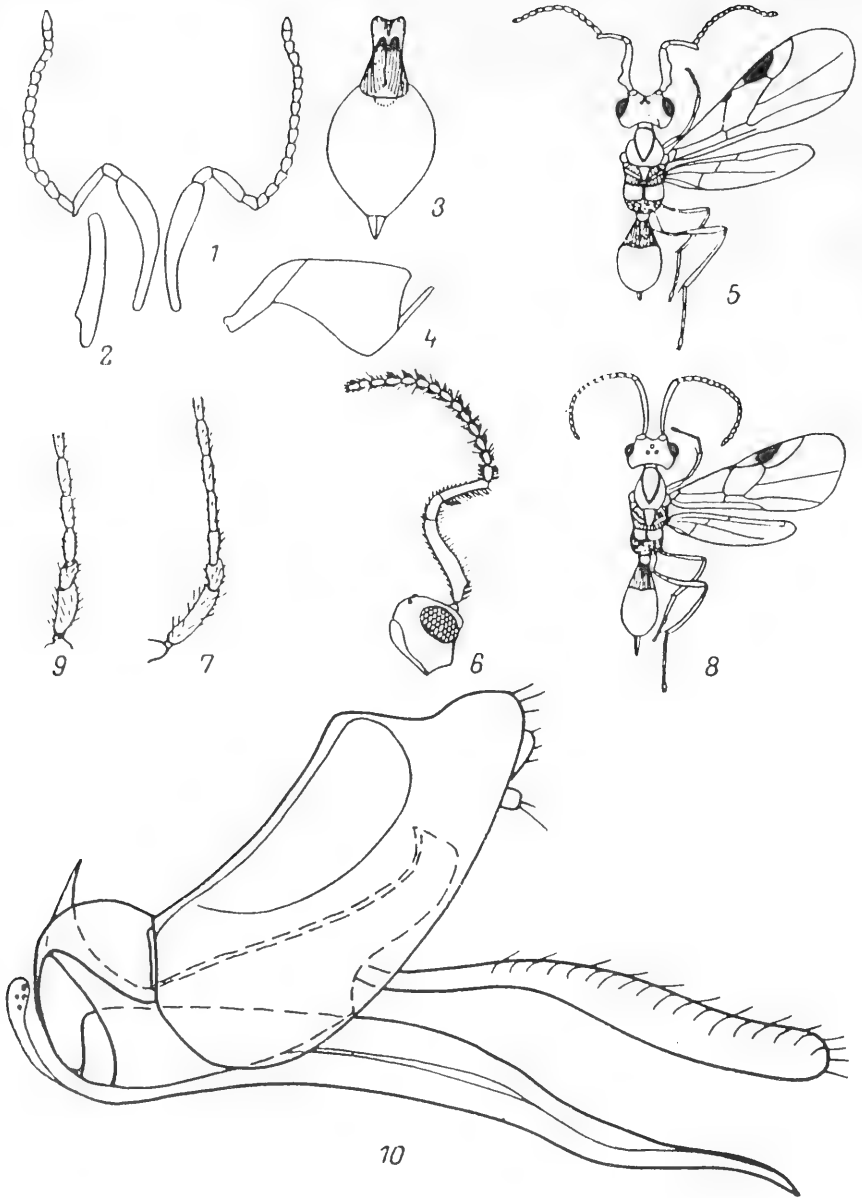


Fig. 142. Euphorinae (from Čapek, Snoflák, Jakimavicius and original).

1-4—*Streblocera antennata*: 1—antennae, 2—scape, 3—abdomen, dorsal view, 4—abdomen, lateral view; 5-7—*S. longiscapha*: 5—general appearance, 6—head with antenna, 7—antennal base, male; 8—*S. macroscapa*; 9—*S. flaviceps*, antennal base, male; 10—*S. longiscapha*, ovipositor.



- 17 (18). Antennae 20-segmented, 3rd segment as wide as 4th, somewhat longer than 2nd (Fig. 138: 6). Body yellowish dark brown.....**S. macroscapa** Ruthe
- 18 (17). Antennae 18–20-segmented, 3rd segment wider than 4th, somewhat longer than 2nd (Fig. 142: 7). Body chestnut-dark brown..... **S. longiscapha** Westw.

116. **Cryptoxilos** Viereck, 1911 (*Cryptoxiloides* Čapek and Capecki).—Four species (3 from North and South America).

- 1 (1). Greater part of body smooth, notaulices as punctate lines, sides of mesothorax, except smooth middle part and propodeum reticulate-rugose; 1st abdominal tergite longitudinally rugose. Body very dark brown, legs dark brownish yellow. Body 1.7. Parasite of adult *Cryphalus piceae* Ratz. (Scolytidae). Poland . . . . . **C. cracoviensis** Čapek and Capecki

117. **Leiophron** Nees, 1818 (*Euphorus* Nees, *Euphoriana* Gahan)<sup>1</sup>.—About 65 species, of which 30 in the Palearctic. Parasites of nymphs and adult bugs of families Miridae and Lygaeidae, sometimes Psocoptera.

- 1 (46). Notaulices as narrow deep furrows, with row of coarse punctures over their entire length, posteriorly contiguous to a distance from prescutellar depression, equaling its length. Metacarpus usually not shorter than one-third length of stigma; radiomedial and recurrent veins on forewing pigmented, almost as longitudinal veins; radiomedial vein originating from radial vein or from same point on stigma with radial vein (Fig. 143: 1a). Antennae in female more than 16-segmented. Hind wing with distinctly separated submedial cell (Figs. 135: 15; 143: 16). First abdominal tergite apically broadened (Fig. 144: 1, 2), its lateral parts below at base usually touching (Fig. 144: 1) but not always (Fig. 144: 2). Penis apically obtuse, projecting beyond narrow parameres (Fig. 144: 6, 7) (Subgenus *Peristenus* Först.).
- 2 (17). Mesonotum smooth, absolutely lacking punctuation or only anteriorly sometimes with weak punctuation.

<sup>1</sup>Richards. 1967. *Trans. Roy. Entomol. Soc. London*, 119, 6: 187–213; Loan. 1974. *Trans. Roy. Entomol. Soc. London*, 126, 2: 207–238.

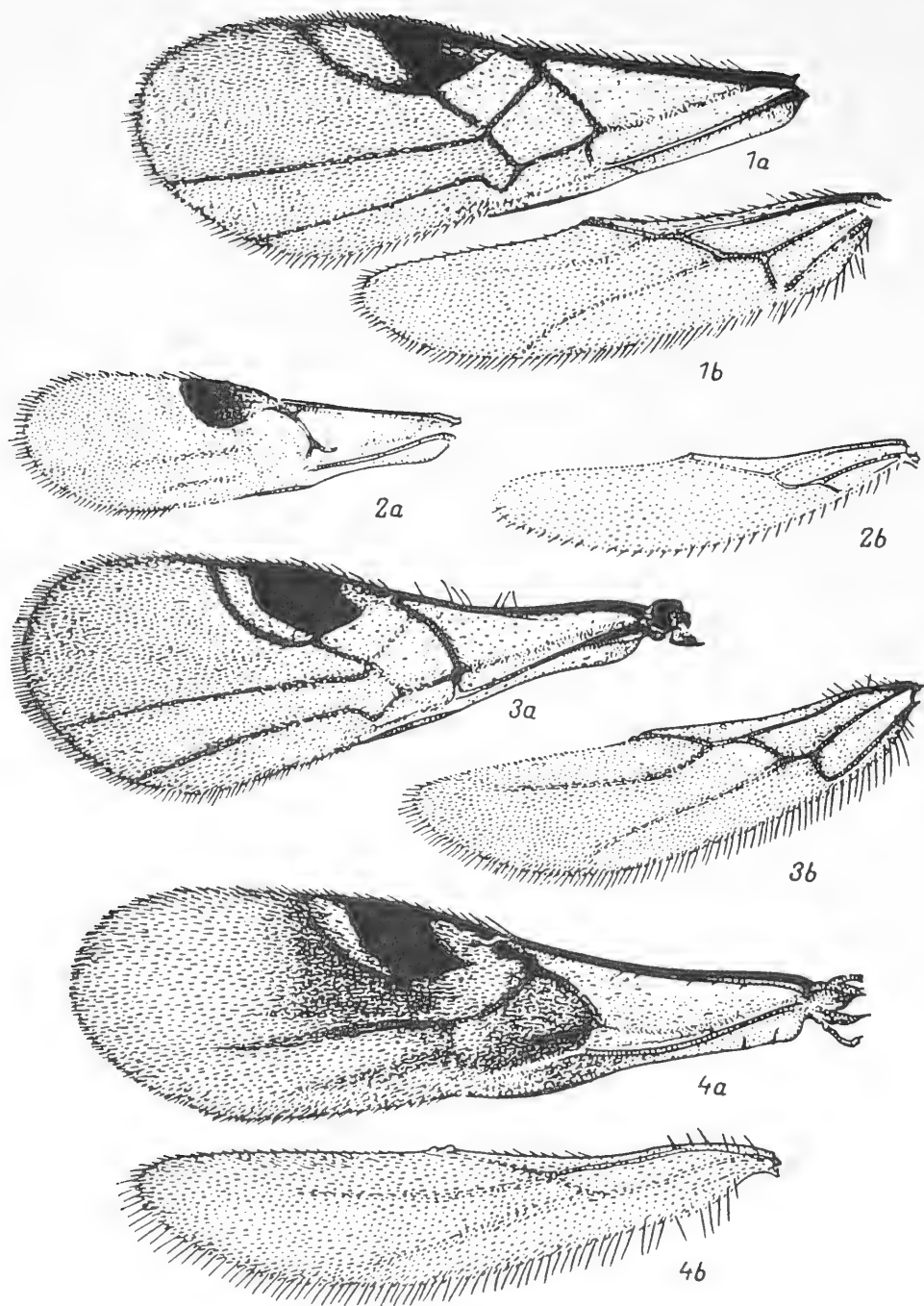
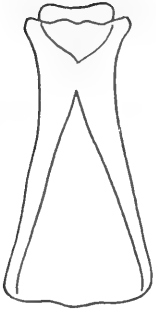


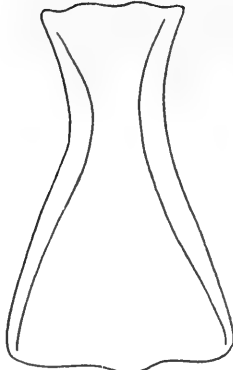
Fig. 143. Euphorinae (from Richards).

1-4—wings (a—forewing, b—hind wing): 1—*Leiofron* (*Peristenus*) *orthoyli*,  
 2—*L. (Leiofron) deficiens*; 3—*L. (L.) heterocordyli*, 4—*L. (L.) apicalis*.

- 3 ( 4). Body yellowish red, thorax above and 1st abdominal tergite reddish dark brown. Head almost cubic (1.4 times as wide as long), with almost vertical flat face and forward projecting eyes (as long as width of face). Antennae in female 21-segmented. Anterior margin of radial cell equaling 0.7 width of stigma. Propodeum rugose, with vertically flattened posterior surface as long as its upper surface (in male more roundish). Sides of mesothorax smooth, partially with granulose sculpture. First abdominal tergite 3 times as long as its width at apex. Body 3.5. Central Europe .....  
 ..... L. (P.) **reclinator** Ruthe
- 238 4 ( 3). Body black (sometimes with lighter colored pattern). Head transverse, with bulged face, not vertical in relation to frons and with eyes not projecting forward.
- 5 (12). Anterior margin of radial cell about half as long as width of stigma. Head black, legs usually darkened. Flagellar segments of female antennae in apical half square or transverse.
- 6 ( 9). Frons softly but densely punctate, weakly lustrous.
- 7 ( 8). Antennal flagellum dark colored. Mesonotum absolutely smooth. Hind femora very dark brown. Parasite of *Lygus rugulipennis* Popp. (Miridae). South (Krasnodar territory); Poland ..... L. (P.) **stygicus** Loan
- 8 ( 7). Antennal flagellum reddish dark brown. Mesonotum anteriorly not entirely smooth. Hind femora reddish dark brown. Body 3. Sweden; England ..... L. (P.) **obscuripes** Thoms.
- 9 ( 6). Frons smooth or weakly punctate, lustrous.
- 10 (11). Legs reddish yellow. Antennae 20-segmented. Notaulices coarsely punctate. Body 2.3–2.8. Central Europe.....  
 ..... L. (P.) **relictus** Ruthe
- 11 (10). Legs somewhat darkened. Antennae of female filiform or slightly broadened apically, 16–19-segmented, roughly as long as head and thorax together. Body 2.2–3. West, center, south, east; Caucasus, Kazakhstan, Central Asia, Far East; Western Europe..... L. (P.) **picipes** Curt. (*coactus* Marsh.)
- 12 ( 5). Anterior margin of radial cell roughly as long as width of stigma (Fig. 143: 1a); if equaling halfwidth of stigma, then thorax with light colored pattern. Head behind eyes often with reddish pattern; legs yellow, hind femora darkened.
- 13 (14). Pronotum dark brownish yellow. Anterior margin of radial cell as long as halfwidth of stigma. Head 1.5 times as wide as thorax, 5/8 as long as wide. Eyes not anteriorly converging on frons, temples behind eyes slightly roundly narrowed, as long



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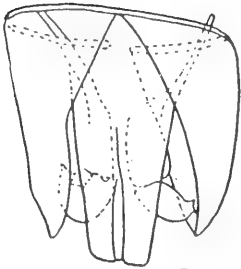
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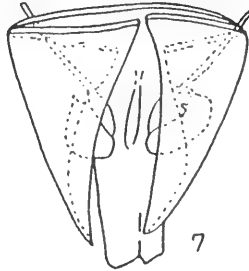
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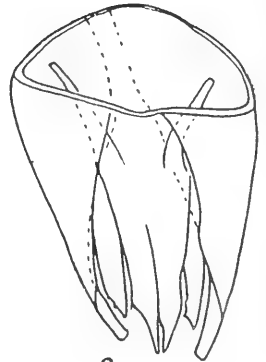
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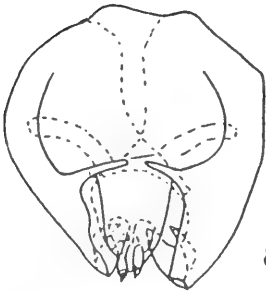
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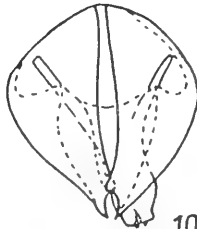
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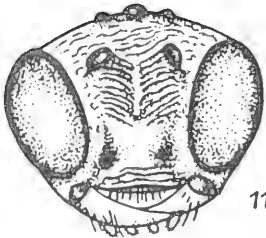
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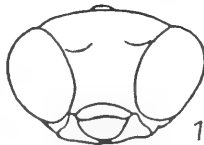
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as eyes; distance between posterior ocelli equaling ocellular distance; width of face in its upper part noticeably more than longitudinal diameter of eye; height of genae equaling width of mandibles at base. Antennae 18-segmented, filiform, as long as head and thorax together; 1st flagellar segment 2.5 times as long as wide, 2nd segment 2 times as long as wide, preapical segment somewhat longer than wide. Propodeum uniformly rounded. First abdominal tergite with few undulating longitudinal folds, 2 times as long as wide. Sides of mesothorax densely rugose-punctate. Diffused reddish spots behind eyes. Legs yellowish dark brown, hind legs darkened. Body 2. Voronezh Region . . . . . L. (P.) **kazak** Tobias, sp.n.

Holotype: Male, Khopyor Reserve, Varvarino, stepped glades in pine forest, 2.VII.1977 (Tobias).

- 14 (13). Thorax entirely black. Anterior margin of radial cell roughly equaling width of stigma. Frons punctate, sides of mesothorax almost smooth with crenulate sternali.
- 15 (16). Temples behind eyes above with reddish spot. Legs dark brownish yellow. Antennae 23–24-segmented. Body 2.5. Moldavia; Central Europe . . . . . L. (P.) **laeviventris** Ruthe
- 16 (15). Temples black. Legs pale yellow. Body 2.4. England . . . . . L. (P.) **accinctus** Hal.
- 17 ( 2). Mesonotum distinctly punctate.
- 18 (25). Head and thorax lacking reddish or yellowish pattern, black.
- 19 (24). Frons fairly densely and coarsely punctate.
- 20 (23). Sides of mesothorax smooth, only with sparse and weak punctures, sternali coarsely crenulate. Antennae: female 18–19-segmented; male 20–23-segmented. Legs yellow or yellowish dark brown.
- 21 (22). First abdominal tergite in apical half with straight longitudinal folds, twice as long as its width at apex. Body black;

Fig. 144. Euphorinae (from Loan, Achterberg and Haddleston).

1–5—1st abdominal segment, ventral view (schematized from photograph): 1—*Leio-phron* (*Peristenus*) *orthotyli*, 2—*L. (P.) grandiceps*, 3—*L. (Leio-phron) pallidistigma*, 4—*L. (L.) fulvipes*, 5—*L. (L.) fuscipennis*; 6–10—male, genitalia: 6—*L. (P.) grandiceps*, dorsal view, 7—*L. (P.) grandiceps*, ventral view, 8—*L. (L.) pallidistigma*, dorsal view, 9—*L. (L.) heterocordyli*, dorsal view, 10—*L. (L.) fulvipes*, ventral view, 11—*Neoneurus auctus*, head; 12, 13—*Elasmosoma platamonense*; 12—head, 13—apex of hind tibia with 1st tarsal segment; 14—*E. luxemburgense*, 6th abdominal sternite; 15, 16—*E. berolinense*: 15—part of forewing, 16—6th abdominal sternite.

- flagellum dark brown or black; legs darkened. Figs. 143: 1; 144: 1. Body 2.5–3. Parasite of nymphs of *Orthotylus virescens* Douglas and Scott, *O. concolor* Kirsch., *O. adenocarpi* Perris, *Ascodema obsoletum* Fieb. (Miridae). Center (Voronezh), south (Crimea); Krasnodar territory (Sochi); England ..... L. (P.) **orthotyli** Rich.
- 22 (21). First abdominal tergite with longitudinal folds, distinct only near spiracles, 1.5 times as long as its width at apex. Body reddish dark brown; flagellum reddish yellow, legs not darkened. Body 2.8. Parasite of *Orthotylus marginalis* Reuter. England; Sweden ..... L. (P.) **facialis** Thoms. (*microcerus* Thoms.)
- 23 (20). Sides of mesothorax distinctly sculptured, punctate or rugose-punctate. Antennae: female 20–23-segmented, male 23–25-segmented. Legs dark brownish yellow. Fig. 135: 9, 12. Parasite of *Calocoris norvegicus* Gmel., *Adelphocoris lineolatus* Gz., *Leptopterna dolobrata* L., species from genera *Plagiognathus*, *Liocoris*, *Chlamydatus*, *Labops* (Miridae), *Lygus* sp. (Lygaeidae). Entire Palearctic, Nearctic ..... L. (P.) **pallipes** Curt. (*tuberculifer* Marsh.)
- 24 (19). Frons smooth. Antennae 22-segmented, yellowish (of same color as legs). Height of genae equaling halfwidth of mandibles at base. Anterior margin of radial cell 7/10 width of stigma. Body 2.5. Western Europe ..... L. (P.) **nitidus** Curt.
- 25 (18). Head or partly also thorax with reddish or yellowish pattern.
- 26 (29). Sides of 1st abdominal tergite below not convergent, leaving broad gap (as in Fig. 144: 2). Thorax monochromatic, dark colored, in female head behind eyes with slightly reddish spot. Anterior margin of radial cell equaling width of stigma.
- 27 (28). Sides of mesothorax smooth, with coarsely sculptured oblique depression. Antennae 27-segmented. Body large, 4.7. Fig. 134: 11, 12. Western Europe (cf. also couplet 38) ..... L. (P.) **orchesia** Curt.
- 28 (27). Sides of mesothorax sculptured, oblique rugose depression indistinctly developed. Antennae: male 22–23-segmented, female 21–22-segmented. Body small, 3–3.5. Fig. 135: 10. Center, south; Caucasus, Kazakhstan, Central Asia; Western Europe ..... L. (P.) **grandiceps** Thoms. (*orchesia* auct.)
- 29 (26). Sides of 1st abdominal tergite below contiguous at its base (as in Fig. 144: 1).
- 30 (37). Males.

- 31 (34). Head with abundant light red coloration, mesonotum also light colored. Anterior margin of radial cell relatively short (about  $3/5$  width of stigma). Frons fairly coarsely punctate.
- 242 32 (33). Propodeum uniformly bulged, monotypically rugose-punctate, lacking transverse ridge. Head behind eyes broadened. Temples somewhat longer than eye. Antennae 23–25-segmented. Fig. 135: 6, 8, 11. Body 2.7–3.5. Parasite of *Lygus rugulipennis* Popp. South (Crimea), southeast; Caucasus, Kazakhstan, Central Asia; Sweden; Poland .....  
 ... **L. (P.) rubricollis** Thoms. (*reclinator* sensu Tobias, 1976)
- 33 (32). Propodeum, close to its base, posterior to arcuate transverse ridge, almost flat (Fig. 145: 1), finely rugose-punctate, behind transverse ridge, closer to it, with distinctly smooth sculpture, lustrous. Temples much longer than eye (Fig. 145: 1). Antennae 23-segmented. First abdominal tergite with undulating longitudinal folds. Head yellowish red, mesonotum including scutellum, prothorax, upper side of mesothorax dark brownish red, antennal bases and legs yellowish dark brown, antennal apices dark brown, sides of mesothorax, 1st tergite and abdominal apex very dark brown, propodeum almost black; stigma dark brown, basally with light colored, almost white, spot. Body 2.8. Caucasus .... **L. (P.) trjapitzini** Tobias, sp. n.  
 Holotype: male, Checheno-Ingushetia, neighborhood of Aramkha, Olgeti. 7.VII.1973 (Trapitsyn).
- 243 34 (31). Head with just light colored spots, mesonotum dark brown or black.
- 35 (36). Antennae 22–23-segmented. Mesonotum only anteriorly punctate. Face about 0.4 mm wide. Anterior margin of radial cell as long as width of stigma or longer. Parasite of *Stenodema virens*. Poland ..... **L. (P.) stenodemae** Loan
- 36 (35). Antennae 19–21-segmented. Mesonotum with punctation over entire middle part (between notaulices). Face about 0.3 mm wide. Anterior margin of radial cell about as long as width of stigma. Parasite of *Lygus rugulipennis* Popp. Moldavia; Crimea; Poland ..... **L. (P.) digoneutis** Loan
- 37 (30). Females.
- 38 (39). Species with larger individuals, body 4.5–5; anterior margin of radial cell about 0.4 mm. Sides of mesothorax smooth with almost vertical crenulate depression. Head black or reddish behind eyes. (cf. also couplet 27) ..... **L. (P.) orchesiaie** Curt.
- 39 (38). Smaller individuals; anterior margin of radial cell much less than 0.4 mm.



Fig. 145. Euphorinae (original).

1—*Leiophron trjapitzini* sp. n., thorax with head; 2—*L. cubocephalus* sp. n., head, dorsal view; 3, 4—*L. kokujevi* sp. n.: 3—head, dorsal view, 4—head, frontal view; 5—*L. psocivorus* sp. n., wings; 6, 7—*L. chryso stigma* sp. n.: 6—part of forewing, 7—abdomen; 8, 9—*L. ruber* sp. n.: 8—part of forewing, 9—1st abdominal tergite; 10–12—*L. frater* sp. n.: 10—head, dorsal view, 11—head, frontal view, 12—head, lateral view; 13–15—*L. clypealis* sp. n.: 13—head, dorsal view, 14—head, lateral view, 15—clypeus, dorsal view; 16–17—*Elasmosoma marikovskii* sp. n.: 16—head, 17—antenna; 18—*E. calcaratum* sp. n., hind tibia and tarsus.



- 40 (41). Mesonotum only anteriorly punctate. Color of head variable, with black or reddish lower side of temples and genae. Anterior margin of radial cell 0.23–0.28 mm ..... L. (P.) *stenodemae* Loan
- 41 (40). Mesonotum punctate over entire middle part (between notaulices). Head black with yellowish face or reddish dark brown face and reddish pattern behind eyes. Anterior margin of radial cell 0.14–0.23 mm.
- 42 (43). Head behind eyes dark colored, lacking reddish spots, rarely behind eyes above with narrow reddish stripe; face yellowish. Antennae 19–20-segmented ..... L. (P.) *digoneutis* Loan
- 43 (42). Head behind eyes with reddish pattern, face reddish dark brown.
- 44 (45). Mesonotum, like head, light colored. Head behind eyes almost not narrowed (Fig. 135: 11), face slightly wider than longitudinal diameter of eye, almost 2 times height of face. Mesonotum lacking distinct granulate sculpture, lustrous. Antennae 22–25-segmented ..... L. (P.) *rubricollis* Thoms.
- 45 (44). Thorax entirely black, head yellowish red, in middle above dark brown. Head behind eyes narrowed (Fig. 145: 3), width of face much less than longitudinal diameter of eye, somewhat more than height of face (Fig. 145: 4). Mesonotum with dense granulate sculpture, matte. (Antennae broken.) Body 2.5. Yaroslavl' Region ..... L. (P.) *kokujevi* Tobias, sp. n.  
 Holotype: Female, "Yaroslavl' district," Kokuev (no date).
- 46 ( 1). Notaulices not developed; if somewhat distinct, then shallow, with uneven row of punctures, usually posteriorly not contiguous but disappearing gradually; distance from them to raised depression, as a rule, not less than length of scutellum. Metacarpus not longer than 1/3 length of stigma (Fig. 143: 2–4); radiomedial and recurrent veins on forewing usually not colored or not developed; radiomedial vein originating from stigma, often at some distance from radial vein. Antennae in female 15–16-segmented, rarely 17–18-segmented. Hind wing often lacking submedial cell (Fig. 135: 16). First abdominal tergite usually slightly broadened apically (Fig. 144: 3–5), its sides usually not contiguous below, leaving gap (Fig. 144: 3, 4) but sometimes joined (Fig. 144: 5). Penis apically pointed, not exerted above apex of parameres (Fig. 144: 8–10). (Subgenus *Leiophron* s. str.).

- 47 (58). Hind wing (Fig. 135: 15) with distinctly separated submedial cell (although anal vein and nervellus contiguous with it are colorless).
- 48 (49). Wing membrane in basal half lacking bristles (Fig. 143: 2a). Notaulices not developed. Head slightly transverse; width of face in female much less than longitudinal diameter of eye and in male about equal to it. Body light colored; wings light colored, stigma dark brown. Fig. 143: 2. Body 1.8–2. South (Moldavia, Krasnodar); Kazakhstan, Yakutia; Western Europe ..... **L. (L.) deficiens** Ruthe (*aremicola* Thoms., *fulviceps* Thoms., *sibiricus* Tobias, syn. n.)
- 49 (48). Wing membrane in basal half with bristles. Notaulices distinct (in *L. psocivorus* only anteriorly).
- 50 (57). Head transverse; eyes not projecting forward; face not vertical (at obtuse angle to plane of frons), its width in female not less or only very slightly less than longitudinal diameter of eye, in male equal to it or greater.
- 51 (54). Body dark colored. Legs and mandibles yellowish, dark brown, wings light colored; antennae yellowish, apically darkened.
- 52 (53). Notaulices only anteriorly somewhat distinct. Stigma yellowish, clypeus very dark brown. Medial vein on hind wing forming distinctly curved line with basal vein; radial cell on forewing less narrow (Fig. 145: 5). Antennae in male 16-segmented, 1st flagellar segment longer than 4th. Body 1.6. Parasite of *Peripsocus phaeopterus* Steph. (Psocoptera). Belorussia .....  
 ..... **L. (L.) psocivorus** Tobias, sp. n. (*intactus* sensu Tobias, 1976).  
 Holotype: Male, Belovezh dense forest, from *P. phaeopterus* (imago), 10.VI.1957 (V. Gorlova).
- 53 (52). Notaulices indicated by row of punctures, divergent in middle of mesonotum. Stigma dark brownish, clypeus reddish. Medial vein on hind wing forming broken line with basal vein (Fig. 143: 36); radial cell on forewing very narrow (Fig. 143: 3a). Antennae in male 17–18-segmented, in female 15–16-segmented; 1st flagellar segment just shorter than 4th segment. Body 2.5. Parasite of *Heterocordylus tibialis* Hahn., *Asciodema obsoletum* Fieb. (Miridae). England .....  
 ..... **L. (L.) heterocordyli** Rich
- 54 (51). Body light colored.

- 244 55 (56). Stigma very wide (Fig. 145: 6), yellow. Antennae 18-segmented. First abdominal tergite 3 times as long as its width at apex (Fig. 145: 7). Head in region of eyes of same width as in region of temples; ocelli in distinctly transverse, obtuse-angled triangle, distance between posterior ocelli equaling ocellocular distance. Face very slightly wider than longitudinal diameter of eye. Frons smooth. Body yellowish dark brown with dark brownish yellow face and legs; wings hyaline, transparent, medial cell with sparse bristles. Body 1.9. Moldavia ..... L. (L.) **chryso stigma** Tobias, sp. n.  
Holotype: Male, Bendery, forest, 15.V.1967 (Talitskii).
- 56 (55). Stigma narrower (Fig. 145: 8), light brown with whitish spot basally. Antennae 16-segmented. First abdominal tergite twice as long as its width at apex. (Fig. 145: 9). Head in region of eyes wider than in region of temples; ocelli in right-angled triangle, distance between posterior ocelli noticeably less than ocellocular distance; width of face very slightly less than longitudinal diameter of eye. Frons weakly but distinctly punctate. Body yellowish red (legs and face of same color); wings light colored but not hyaline, medial cell with more numerous bristles. Body 2. Voronezh Region ..... L. (L.) **ruber** Tobias, sp. n.  
Holotype: Male, Voronezh Reserve, 29.VI.1960 (G. Isaeva).
- 57 (50). Head cubic (slightly wider than long); eyes projecting forward; face vertical in relation to frons, its width much less than longitudinal diameter of eye (Fig. 145: 10–12). Body dark brownish yellow; mesonotum, sometimes sides of mesothorax, 1st abdominal tergite and abdominal apex dark brown; propodeum, sometimes also 1st abdominal tergite very dark brown or black (in male darker parts of body dark brown in color). Antennae 17-segmented (rarely 16- or 18-segmented). Radial and radiomedial veins originating from different points on stigma; often recurrent vein, sometimes radiomedial vein and nervellus reduced. Notaulices deep, almost contiguous posteriorly. Sides of mesothorax smooth in middle, sternauli densely rugose-punctate. Body 1.8–2.5. Northwest, center; Kazakhstan ..... L. (L.) **frater** Tobias, sp. n.  
Holotype: Female, Karaganda Region, Zhana-Arka, Kok-sengir, 11.V.1959 (Tobias); Paratypes: 20 females, 20 males, details same; 7 females, 3 males, same place, 13.V.1959

- (Tobias); Tselinograd Region, Kokshetau, 20.V.1957; 1 female, 1 male, same place, floodplain of Tersakkan River, 25.V.1957 (Tobias); 1 male, Voronezh Reserve, oak grove, 3.VI.1950 (Dovnar); 3 females, 1 male, Leningrad Region, Lake Ladoga, 19.VI.1969 (Tobias).
- 58 (47). Hind wings (Fig. 135: 16) lacking submedial cell (anal vein and nervellus not developed; sometimes present only as traces).
- 59 (66). Notaulices not developed.
- 60 (63). Wing membrane in basal half (up to basal vein) lacking bristles or with bristles sparser than in discoidal cell. Head slightly transverse; width of face in female much less than longitudinal diameter of eye. First abdominal tergite parallel-sided, 3 to 4 times as long as wide (Fig. 144: 5).
- 61 (62). Wing posterior to stigma and in region of discoidal cell darkened. Head and mesonotum with finely granulose sculpture, line of notaulices with transverse striations. Body 3. Western Europe ..... L. (L.) **fascipennis** Ruthe
- 62 (61). Wings light colored or slightly darkened in apical half and in middle (Figs. 135: 16; 143: 4). Head and mesonotum smooth. Body 2. Parasite of *Orthotylus* spp. (Miridae); Ukraine (Kanev); Kazakhstan, Central Asia; Western Europe ..... L. (L.) **apicalis** Hal.
- 63 (60). Wing membrane in basal half with bristles. Width of face in female slightly less than longitudinal diameter of eye, in male equal to it. First abdominal tergite 2.5–3 times as long as its width at apex (Fig. 144: 3, 4). Body dark brown or black; legs dark brownish yellow; wings light colored.
- 64 (65). Apical antennal segments much longer than wide; flagellum usually yellowish. Apices of parameres with 2 hooks (Fig. 144: 8). Body 1.7–2. Parasite of *Peripsocus phalopterus* Steph., *Caecilius flavidus* Steph. (Psocoptera). Center, south; Caucasus; Western Europe ..... L. (L.) **pallidistigma** Curt. (*parvulus* Ruthe, *intactus* Hal., *claviventris* Wesm.)
- 65 (64). Apical antennal segments square; flagellum dark colored. Apices of parameres lacking hooks (Fig. 144: 10). Body 1.5. Parasite of *Elipsocus westwoodi* Mclach., *E. hyalinus* Steph., *Amphigerontia bifasciata* Latr. (Psocoptera). West, south; Caucasus (Sochi); Western Europe.... L. (L.) **fulvipes** Curt.
- 66 (59). Notaulices developed.
- 67 (68). Wing membrane in basal half (up to basal vein) lacking bristles. Head cubic (Fig. 145: 2), eyes projecting forward, their

longitudinal diameter 1.5 times width of face. Antennae 18-segmented, somewhat longer than head and thorax together, apical antennal segments somewhat longer than wide. Ocelli in obtuse-angled triangle, its base shorter than ocellular distance by ocellar diameter. Anterior margin of radial cell as long as halfwidth of stigma. First abdominal tergite 3 times as long as its width at apex. Head smooth, mesonotum with soft granulose sculpture; latter denser in region of sternauli. Body dark brownish yellow; propodeum, 1st abdominal tergite and abdominal apex dark brown. Body 1.7–1.8. Moldavia .....

L. (L.) **cubocephalus** Tobias, sp. n.

Holotype: Female, Karmanovo, 18.V.1967 (Talitskii).

Paratype: Female, Kishinev, 28.V.1960 (Talitskii).

68 (67). Wing membrane in basal half (as also over entire surface) with bristles.

245 69 (70). Head behind eyes distinctly broadened, temples twice as long as eyes (Fig. 145: 13, 14); anterior margin of clypeus extended forward as visor and slightly notched (Fig. 145: 15). Antennae 17-segmented. Notaulices fairly coarsely punctate, mesonotum distinctly punctate between notaulices, sides of mesothorax smooth with vertical arcuately sculptured furrow. First abdominal tergite with noticeably projecting spiracular tubercles, 3.5 times as long as its width at apex. Body very dark brown, legs yellowish dark brown, basal half of antennae dark brownish yellow; wings light colored. Body 3. Voronezh Region; Far East .....

L. (L.) **clypealis** Tobias, sp. n.

Holotype: Male, Voronezh Reserve, 3.VI.1950 (Dovnar). Paratypes: 2 males, Pacific Coastal Region, Gornotaezhnaya station, 24.VI.1981 (Kasparyan).

70 (69). Head behind eyes slightly or not broadened, temples not longer than or somewhat longer than eye; clypeus of usual shape, not projecting forward.

71 (72). Propodeum sharply sloping almost from base. First abdominal tergite short (1.7 times as long as its width at apex), with distinctly projecting spiracular tubercles, narrowed anterior to them, posterior to them almost parallel-sided. Antennae 16-segmented, 1.5 times as long as width of head. Body reddish dark brown. Body 1.8. Central Europe .....

L. (L.) **truncator** Ruthe

72 (71). Propodeum uniformly rounded. First abdominal tergite longer, slightly and uniformly broadened apically, spiracular tubercles at best slightly projecting.

- 73 (74). Antennal flagellum dark colored, much darker than legs. Body 2. West, center; Kazakhstan; Western Europe .....  
..... **L. (L.) similis** Curt.
- 74 (73). Antennal flagellum yellow, in color similar to legs. Body reddish dark brown.
- 75 (76). First and second flagellar segments together as long as width of face, as long as longitudinal diameter of eye (male). Body 2.4. Central Europe ..... **L. (L.) duploclaviventris** Shenef.  
(*ruthei* Loan, *sys. n.*; *brevicornis* Ruthe).
- 76 (75). First and second flagellar segments together much shorter than width of face but as long as longitudinal diameter of eye (male). Body 1.9. England ..... **L. (L.) basalis** Curt.

118. **Syntretus** Förster, 1862.—About 20 species, nearly 15 in the Palearctic. Parasitize adult hymenopterans (ichneumon flies, bumble bees).

- 1 (10). Propodeum almost entirely rugose-punctate, with deep longitudinal depression, lacking transverse ridges on sides from it. Mesonotum at least anteriorly punctate. Second section of radial vein slightly pigmented, slightly curved, insects large, body 3–5.
- 2 ( 5). Eyes small, their longitudinal diameter half as long as width of face, 1.5–2 times height of genae (Fig. 135: 17). Body yellowish dark brown, spot around ocelli and on occiput, propodeum and 1st abdominal tergite black.
- 3 ( 4). Antennae longer than head and thorax together, about 30-segmented. First abdominal tergite apically slightly broadened. Mesonotum anteriorly punctate, face densely punctate, matte. Figs. 134: 13, 14; 146: 1, 2. West, center, south; Caucasus, Kazakhstan; Western Europe ..... **S. elegans** Ruthe
- 4 ( 3). Antennae somewhat shorter than head and thorax together, 19-segmented. First abdominal tergite apically fairly distinctly broadened. Mesonotum only anteriorly weakly punctate, face weakly punctate, lustrous. Body 3. Moldavia .....  
..... **S. microphthalmus** Tobias, *sp. n.*  
Holotype: Male, Faleshty, 3.VI.1960 (Talitskii).
- 5 ( 2). Eyes large, their longitudinal diameter  $10/13$ — $2/3$  as long as width of face, 3 to 5 times height of genae (Fig. 135: 18). Antennae shorter than head and thorax together, about 20-segmented. First abdominal tergite apically distinctly broadened.

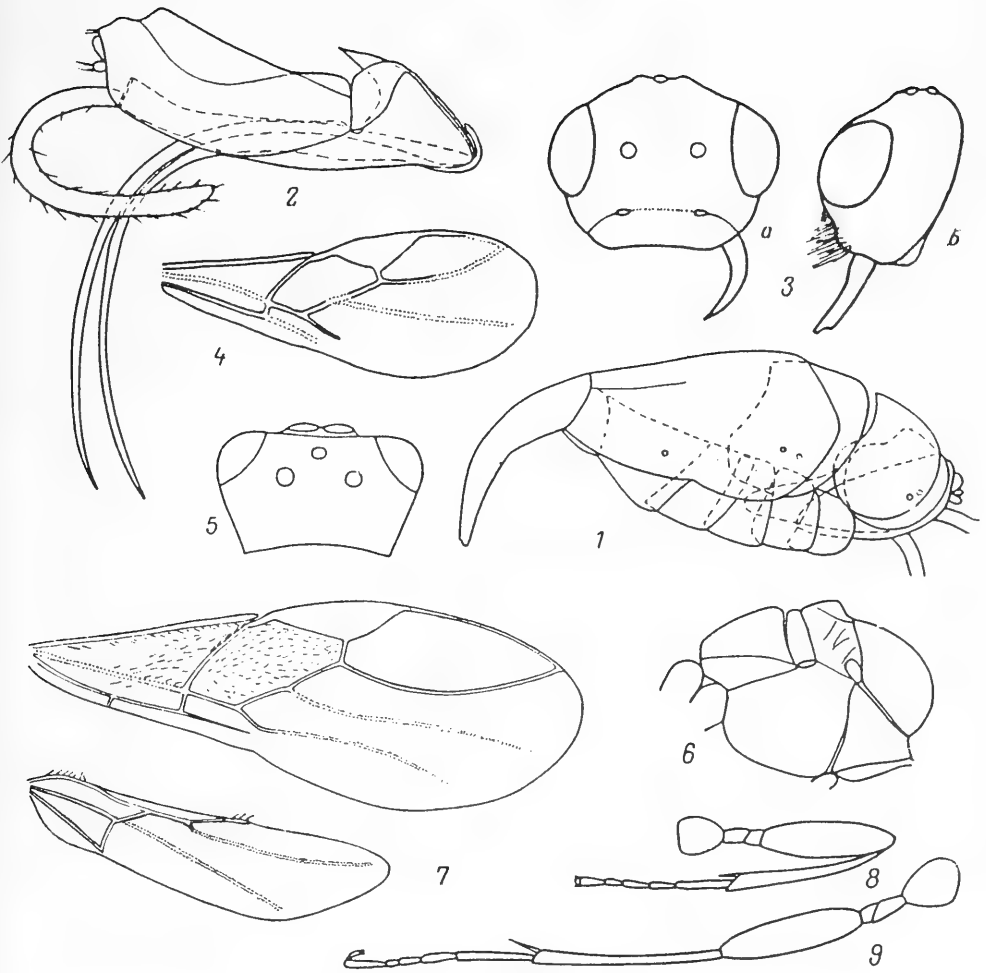


Fig. 146. Euphorinae (from Tobias and original).

1, 2—*Syntretus elegans*: 1—abdomen, 2—ovipositor; 3—*S. daghestanicus*, head (a—frontal view, b—lateral view); 4—*S. niger*, forewing; 5—9—*Falcosyntretus falcifer*: 5—head, 6—thorax, 7—wings, 8—foreleg, 9—hind leg.

6 ( 7). Mesonotum smooth, propodeum softly sculptured, lustrous. Antennae 19-segmented. Body black, head yellowish red. Body 2.8. Parasite of genus *Bombus* as well as *Psithyrus vestalis* Fourcroy (Apidae). England ..... ***S. splendidus* Marsh.**

- 7 ( 6). Mesonotum distinctly punctate; propodeum rugose-punctate, matte.
- 8 ( 9). Longitudinal diameter of eye 5 times height of genae, 10/13 of width of face (Fig. 135: 18). Body usually black. Center, south; Tadzhikistan; Western Europe. .... **S. klugii** Ruthe
- 9 ( 8). Longitudinal diameter of eye 3 times height of genae, almost 2/3 of width of face (Fig. 146: 3). Body yellowish dark brown. Dagestan ..... **S. daghestanicus** Tobias
- 10 ( 1). Propodeum entirely smooth or with somewhat distinct transverse ridges in middle, with weak longitudinal depression; if sculptured, then sculpture usually distinctly smooth, present only around ridges. Mesonotum smooth (in *S. dziedsuzyckii* propodeum and mesonotum sculptured). Second section of radial vein usually pigmented like other veins (Fig. 146: 4). Small insects, body 2–3.5.
- 11 (22). Thorax smooth; propodeum smooth or with smooth sculpture.
- 12 (19). Propodeum with distinct ridges, striating closed cells.
- 13 (18). Medial vein on forewing distinct.
- 14 (17). Antennae 15–19-segmented; 1st flagellar segment as long as pedicel and 2nd flagellar segment or somewhat longer than each of them. Areola on propodeum smooth or weakly sculptured. Head behind eyes slightly broadened or slightly narrowed (Fig. 135: 13).
- 15 (16). Second section of radial vein slightly curved, uniformly sclerotized; nervulus shifted from basal vein by its length. Body dark brownish yellow. South; Krasnodar territory (Sochi), Kirgizia; Western Europe .... **S. testaceus** Capron
- 246 16 (15). Second section of radial vein curved, slightly sclerotized in apical half, nervulus weakly postfurcal (Fig. 146: 4). Body dark colored. Dagestan ..... **S. niger** Tobias
- 17 (14). Antennae about 25-segmented, 1st flagellar segment much longer than pedicel and 2nd flagellar segment. Areola on propodeum somewhat sculptured. Head behind eyes roundly narrowed (Fig. 135: 14). Body with distinct black pattern or almost entirely yellow. West, southwest; Caucasus, Kazakhstan; Western Europe ..... **S. vernalis** Wesm.
- 18 (13). Median vein on forewing not developed. Body smooth, lustrous, color variable, usually body light colored with darkened dorsum. Body 2–2.5. Western Europe ..... **S. conterminus** Nees
- 19 (12). Propodeum lacking distinct ridges, striating closed cells.



- 20 (21). Antennae 25–27-segmented. Body dark brownish yellow, spot on mesonotum and 1st abdominal tergite black. Parasite of *Phaeogenes invisor* Thunb. (Ichneumonidae). West (Lithuania), Central Ural; England ..... *S. lyctaeae* Cole
- 21 (20). Antennae 18–20-segmented. Body dark brown, lower part of head and abdomen yellowish dark brown. Northwest; Caucasus (Georgia); Western Europe ..... *S. parvicornis* Ruthe
- 22 (11). Thorax entirely with soft granulose sculpture, mesonotum longitudinally striate; propodeum uniformly rugose-punctate, weak longitudinal depression transversely rugose. Temples weakly developed, genae very narrow; tentorial pits deep. Antennae 29-segmented. Ovipositor straight, short, directed upward. Body black, head anteriorly yellowish. Body 4.5. Transcarpathia ..... *S. dzieduszyckii* Niez.

247 119. **Falcosyntretus** Tobias, 1965.—One species (*F. falcifer* Tobias), described from Kirgizia with dorsally black and ventrally yellow body. Fig. 146: 5–9. Possibly *Syntretus xanthocephalus* Marsh., known from England, belongs to this genus.

120. **Loxocephalus** Förster, 1862 (*Myiocephalus* Marsh.). —Two Palearctic species. *L. boops* recovered from ant nests.

- 1 (2). Occiput slightly notched. Mesonotum lacking longitudinal furrows. Sides of mesothorax granulosely punctate, not striate. Body dorsally black, head anteriorly, ventral part and sides of thorax, legs dark brownish yellow. Antennae 30-segmented. Fig. 135: 7, 19, 20. Body 2.5–4. North, center; Caucasus, Baikal Region, Far East; Western Europe; North America ..... *L. boops* Wesm. (? *falconivibrans* Morley)
- 2 (1). Occiput distinctly notched. Mesonotum often with longitudinal furrows. Sides of mesothorax usually (in female!) longitudinally striate. Body black; face and mouthparts often yellow. Body 5. North (near Chupa); Austria ..... *L. niger* Fi.

121. **Cosmophorus** Ratzeburg, 1849<sup>1</sup>.—Holarctic genus; 9 species, of which 5 in the Palearctic. Parasites of bark beetles, mostly of family Scolytidae (attack on host shown in Fig. 138: 12).

<sup>1</sup> Čapek. 1958. *Acta entomol. Mus. Nat. Pragae*, 32: 151–169.

- 1 ( 2). Head above with deep longitudinal depression, reaching posterior margins of temples; occiput deeply notched (Fig. 138: 8). First abdominal tergite uniformly broadened posteriorly, more than 2 times as long as its width at apex. Antennae 21–23-segmented. Ovipositor somewhat longer than halflength of abdomen. Body 3. Parasite of *Hylastes cunicularius* Er., *Polygraphus poligraphus* L., *Dryocoetes autographus* Ratz., *D. hectographus* Rtt., *Trypodendron lineatum* Ol. (Scolytidae), *Pityophagus ferrugineus* L. (Nitidulidae). Pacific Coastal Region; Western Europe ..... **C. regius** Niez.
- 2 ( 1). Head above lacking longitudinal depression, only with small depression on frons (Fig. 138: 9, 10).
- 3 (10). Females.
- 4 ( 5). Antennae 16–19-segmented. Posterior pair of ocelli lying on line joining posterior margin of eye; occiput slightly notched (Fig. 138: 9). First abdominal tergite uniformly broadened posteriorly, 1.5 times as long as its width in posterior part. Ovipositor almost as long as abdomen. Fig. 134: 17, 18. Body 2–2.5. Parasite of *Polygraphus poligraphus* L., *P. proximus* Blend., *Pityogenes bidentatus* Hbst., *Pityokteines spinidens* Rtt., *P. vorontzovi* Jacob., *Ips typographus* L., *I. amitinus* Eichh., *Dryocoetes autographus* Ratz., *Hylurgops glabratus* Zett., *Estenoborus perrisi* Chapuis (Scolytidae). North, northwest; Western Siberia (Tomsk), Far East; Western Europe .....  
..... **C. klugii** Ratz.
- 5 ( 4). Antennae not more than 15-segmented.
- 6 ( 9). First abdominal tergite distinctly broadened posteriorly, with fairly coarse sculpture. Antennae 14–15-segmented.
- 7 ( 8). Maxillary palps long, exerted above mandibular apex. Occiput weakly notched (Fig. 138: 10). Propodeum coarsely rugose. First abdominal tergite uniformly rugose almost over entire surface. Ovipositor shorter than abdomen, rarely equaling it. Body 2–2.2. Parasite of *Pityogenes quadridens* Hart., *P. chalcographus* L., *P. conjunctus* Reitt., *P. bistridentatus* Eichh., *Pityokteines spinidens* Rtt., *P. vorontzovi* Jacob., *Cryphalus abietis* Ratz., *C. piceae* Ratz., *Pityophthorus henscheli* Seitner (Scolytidae). North, northwest, center; Western Siberia, Far East; Western Europe .... **C. cembrae** Ruschka
- 8 ( 7). Maxillary palps short, not reaching apex of mandible. Occiput notched. Propodeum softly rugose; 1st abdominal tergite rugose only along median line. Ovipositor longer than abdomen. Antennae 14-segmented. Fig. 138: 12. Body 2.

- Parasite of *Pityothorus henscheli* Seitner. Austria .....  
 ..... **C. henscheli** Ruschka
- 9 ( 6). First abdominal tergite almost parallel-sided, almost smooth. Antennae 13–14-segmented. Body 1.7–2. Parasite of *Pityophthorus lichtensteini* Ratz. Czechoslovakia .....  
 ..... **C. roubali** Capek
- 10 ( 3). Males.
- 11 (14). Wings normally developed.
- 12 (13). Occiput distinctly notched. Anterior ocellus on line connecting posterior margin of eye. Antennae 14–15-segmented ..  
 ..... **C. cembrae** Ruschka
- 13 (12). Occiput weakly notched. Anterior ocellus anterior to line connecting posterior margin of eye. Antennae 14-segmented .....  
 ..... **C. klugii** Ratz.
- 14 (11). Wings somewhat reduced.
- 15 (16). Wings extending somewhat beyond apex of thorax. Propodeum apically steeply sloping, transversely rugose. First abdominal tergite longer than wide. Antennae 13–14-segmented ..... **C. henscheli** Ruschka
- 16 (15). Wings barely developed. Propodeum not steeply sloping, lacking transverse wrinkles. First abdominal tergite short. Antennae 13-segmented ..... **C. roubali** Čapek

122. **Neoneurus** Haliday, 1838.—About 6 Palearctic species (3 European, possibly synonyms of other two given below; *N. armatus* Tobias, described from Mongolia). Parasites of adult ants.

- 248 1 (2). Foretibiae half as long as tarsus, as long as its first two segments. Vertex and frons transversely rugose; frons lacking distinct longitudinal furrow or furrow weak. Face of male slightly transverse. Figs. 134: 20; 144: 11. Body 2.5–3.5. Parasite of *Formica pratensis* Ratz. Center, Ukraine; Kazakhstan, Western Siberia; Western Europe; Mongolia .....  
 ..... **N. auctus** Thoms.
- 2 (1). Foretibiae more than half as long as tarsus, as long as its first three segments. Vertex and frons lacking transverse folds; sometimes weakly striate; frons with distinct longitudinal furrow. Face almost 2 times as wide as high. Body 2.5–3. Parasite of *Formica rufa* L. South, Dagestan; Kazakhstan, Eastern Siberia; Western Europe ..... **N. viennensis** Giraud

123. **Euneoneurus** Tobias and Yuldashev, 1979.—One species.

- 1 (1). Occiput transversely striate, mesonotum in middle with sparse transverse wrinkles, almost smooth on sides; sides of mesothorax above with dense granulose sculpture. Body black; legs dark brownish yellow. Fig. 147: 1–7. Body 3.2–3.3. Central Asia ..... **E. asiaticus** Tobias and Yuldashev

124. **Elasmosoma** Ruthe, 1858<sup>1</sup>.—Holarctic genus, 11 species, 8 species in the Palearctic.

- 1 (4). Ocelli in distinctly transverse triangle, interocellar distance almost 2 times ocellocular distance. Second flagellar segment not longer than wide.
- 2 (3). Foretarsi longer than middle tarsus, inner spur on hind tibiae longer than 1st tarsal segment, obtuse (Fig. 144: 13). Face almost as high as wide (Fig. 144: 12). First two flagellar segments transverse, remaining (except apical) square. Propodeum at apex 5 times as wide as long. First segment of middle tarsi 2–3 times (usually 3 times) as long as 2nd, 3rd and 4th segments, square. Sixth abdominal sternite slightly incised. Parasite of *Cataglyphis bicolor* F. Southern Europe, northern Africa ..... **E. platamonense** Huddleston
- 3 (2). Foretarsi shorter than middle tarsus; inner spur of hind tibiae shorter than 1st tarsal segment, pointed. Face much higher than wide (Fig. 145: 16). First flagellar segment somewhat longer than wide, 2nd segment square, remaining transverse (Fig. 145: 17). Propodeum at apex 3 times as wide as long. First segment of middle tarsi 2 times as long as 2nd, 3rd and 4th segments, much longer than wide. Sixth abdominal sternite uniformly bulged. Body with dense fine granulose sculpture; face, frons and vertex very softly transversely striate; upper angle of sides of mesothorax smooth; propodeum densely reticulate-rugose. Body black; legs yellow (hind coxae dark brownish); labrum and labiomaxillary complex pale yellow; wings almost hyaline-light colored with poorly visible veins, only coastal veins in anterior half of stigma dark brownish. Body 2.8. Kazakhstan ..... **E. marikovskii** Tobias, sp. n.  
Holotype: Female, Alma-Ata, from *Formica pratensis* Retz., 4.IX.1968 (Marikovskii).

<sup>1</sup> Huddleston. 1976. *Ann. Hist.-Natur. Mus. Nat. Hung.*, 68: 215–225.

- 4 ( 1). Ocelli in somewhat right-angled triangle, interocellar distance roughly equaling ocellocular distance. Second flagellar segment distinctly longer than wide.
- 5 ( 6). Inner spur on hind tibiae longer than 1st segment of hind tarsus (Fig. 145: 18). Sixth abdominal sternite apically rectilinearly incised, on sides with 2 projections, with long setae. Propodeum in posterior half with fairly coarse reticulate-sculpture, forming distinct transverse ridge in middle of segment. Face much higher than wide. Second flagellar segment very slightly longer than wide, remaining segments square. Foretarsi very slightly shorter than middle tarsus. Sculpture and color as in previous species but lighter colored parts of body darker and wings distinctly darkened with pale brownish veins. In male face wider than long; flagellar segments longer; inner spur on hind tibiae very slightly shorter than 1st tarsal segment. Body with coarse transverse folds; legs dark brown. Body 2.2–2.4. Moldavia ..... **E. calcaratum** Tobias, sp. n.  
 Holotype: Female, Vadaturkovo, 8.V.1961 (Talitskii). Paratypes: 1 female, Kotovskoe, dense forest, 4.VI.1967 (Tobias); 4 males, Vadaturkovo, 8.V.1961, 1 female, 9.V.1969 (Talitskii); 3 males, Rashkov forest near Vadaturkovo, 13.V.1969 (Tobias).
- 6 ( 5). Inner spur on hind tibiae shorter than 1st segment of hind tarsus. Sixth abdominal sternite of other shape, always lacking projections on sides, with long setae.
- 7 (10). Sixth abdominal sternite transverse, weakly notched in middle, with long ciliate hair, as long as tergite itself. Legs and mouthparts yellow.
- 8 ( 9). Propodeum coarsely reticulate-rugose, with distinct sinuate transverse ridge. Sixth abdominal sternite barely notched in middle, with small membranous triangular area here (Fig. 144: 14); 2nd and base of 3rd tergite yellow. Parasite of *Formica rufibarbis* F. Luxembourg ..... **E. luxemburgense** Wasmann
- 9 ( 8). Propodeum finely sculptured, lacking transverse ridge. Sixth abdominal sternite less transverse, massive, projecting on sides of abdomen, in middle greatly incised, divided by notch into 2 bulged lobes, usually lacking membranous triangular area in notch; 2nd and 3rd tergites almost entirely yellow. Krasnodar territory (Sochi) ..... **E. ciliatum** Tobias

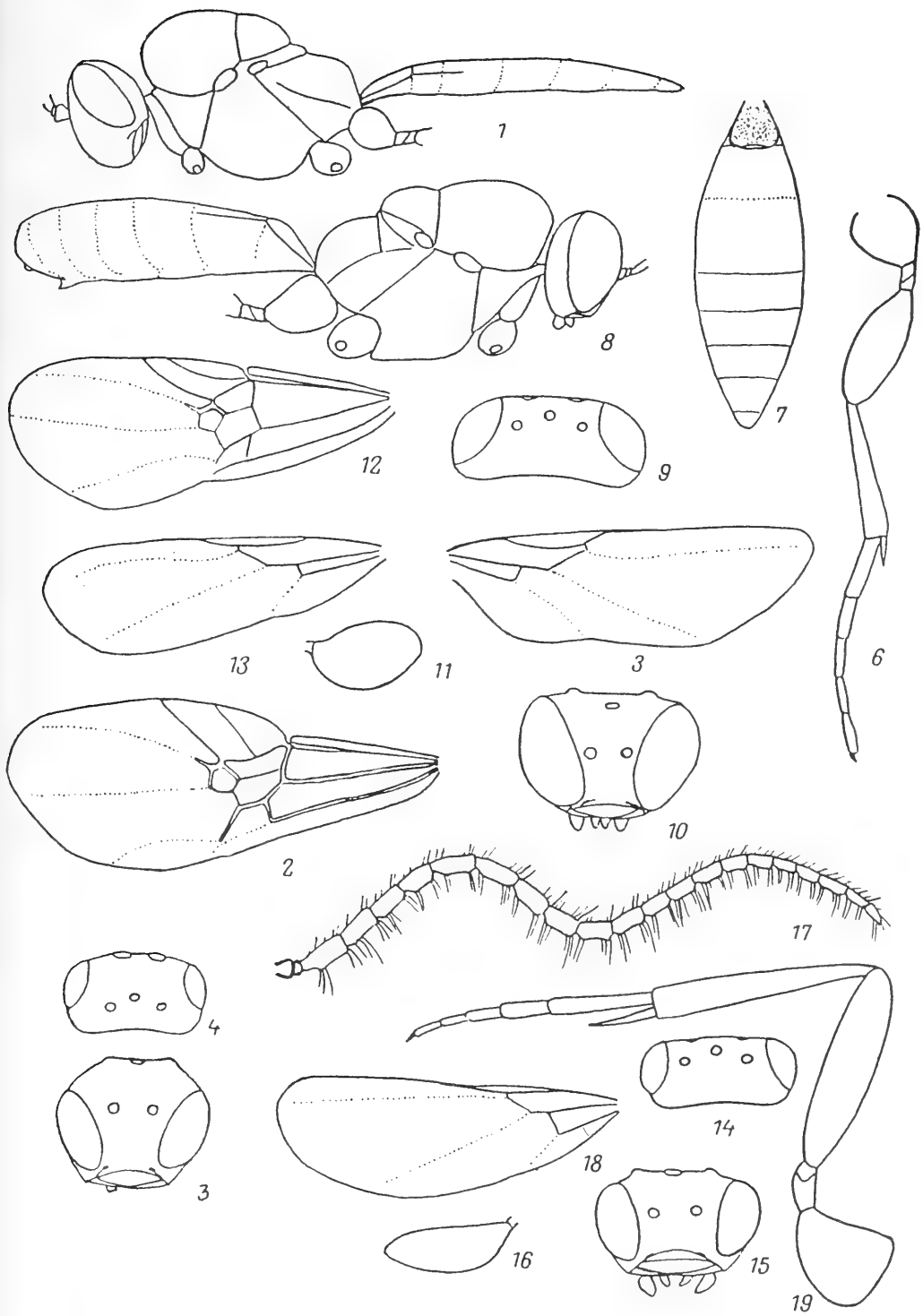
- 10 ( 7). Sixth abdominal sternite elongate and deeply incised. Propodeum posterior to somewhat developed transverse ridge with reticulate sculpture. Fig. 144: 15, 16. Parasite of *Formica rufa* L., *F. sanguinea* Latr., *F. fusca* L., *F. pratensis* Retz., *Lasius niger* L., *Camponotus* sp., *Polyergus* sp. Transpalearctic ..... **E. berolinense** Ruthe

125. **Parelasmosoma** Tobias and Yuldashev, 1979<sup>1</sup>.—Two species.

- 1 (2). Antennae 22-segmented, flagellar segment with projecting and long setae in lower part of their apices and bases. Hind wing with short and wide submedial cell. Hind tarsi as long as tibia. Eyes weakly developed but temples and genae distinctly developed, face transverse; apical segment of maxillary palp elongate. Head in front with deep punctures, lustrous; 1st, 2nd and middle of 3rd abdominal tergite uniformly densely granulosely sculptured. Body black; femora yellowish dark brown, remaining parts of leg dark brownish yellow. Fig. 147: 14–19 (male). Body 2.5. Central Asia ..... **P. antennatum** Tobias and Yuldashev
- 2 (1). Antennae 15-segmented, filiform, not pubescent. Hind wing with long and narrow submedial cell. Hind tarsi longer than tibia. Eyes very distinctly developed but temples and genae very weak, face narrow; apical segment of maxillary palp less elongate. Head frontally granulosely sculptured, matte; 1st abdominal tergite with similar sculpture, remaining tergites with very finely granulose punctation, lustrous. Body black; legs dark brownish yellow, coxae very dark brown. Fig. 147: 8–13. Body 3.3. Central Asia ..... **P. palpator** Tobias and Yuldashev

1–7—*Euneoneurus asiaticus*: 1—body, 2—forewing, 3—hind wing, 4—head, dorsal view, 5—head, frontal view, 6—hind leg, 7—abdomen; 8–13—*Parelasmosoma palpator*: 8—body, 9—head, dorsal view, 10—head, frontal view, 11—apical segment of maxillary palp, 12—forewing, 13—hind wing; 14–19—*P. antennatum*: 14—head, dorsal view, 15—head, frontal view, 16—apical segment of maxillary palp, 17—antenna, 18—hind wing, 19—hind leg.

<sup>1</sup> Tobias and Yuldashev. 1979. *Tr. Zool. In-ta AN SSSR.*, 88: 95–102.



### 9. Subfamily Macrocentrinae<sup>1</sup>

The body is elongate with a somewhat long ovipositor. (The latter is not shorter than the abdomen.) Insects are of average to fairly large body size (usually 3–5 to 10 mm). The characteristic apomorphic feature is the presence of a spine on the 2nd segment of the trochanter. The occipital ridge is not developed. The notaulices are deep, the middle lobe of the mesonotum projects considerably (Fig. 149: 16–19). The abdomen is articulated fairly high with the propodeum (its ventral side is at the level of the upper side of the hind coxae—Fig. 157: 3). The first abdominal tergite usually lacks longitudinal ridges. These are solitary or gregarious endoparasites of lepidopterans; polyembryony is typical of gregarious endoparasites. As far as is known the solitary parasites also follow the polyembryonic pathway of development; however, only a single individual develops. Only one genus is reliably included in this subfamily.

126. *Macrocentrus* Curtis, 1833.<sup>2</sup>—About 120 species, of which there are about 30 in the Palearctic.

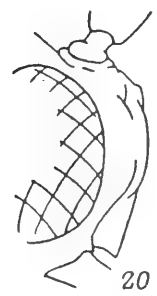
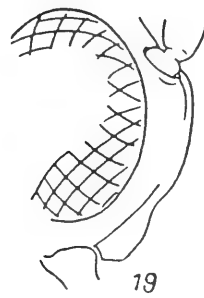
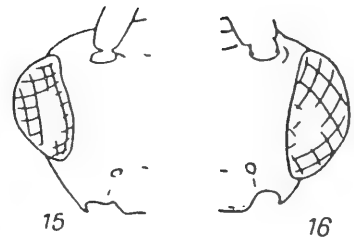
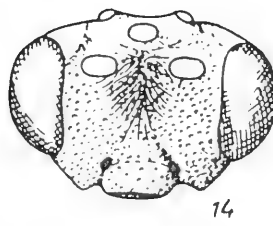
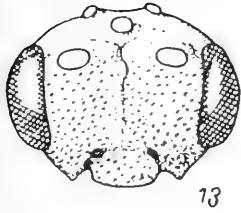
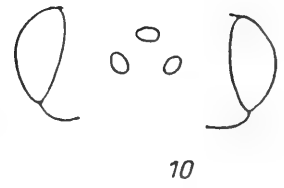
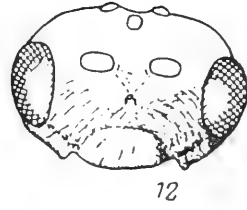
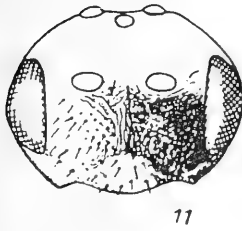
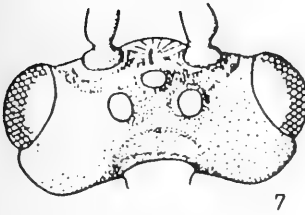
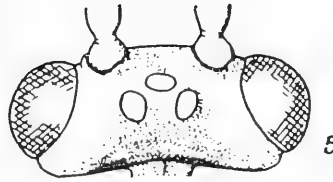
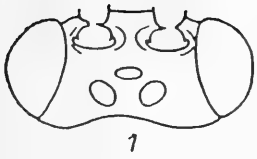
- 1 (36). Claws simple, lacking pointed projection (Fig. 150: 11, 12, 26). Usually gregarious parasites. (Subgenus *Amicroplus* Forst.).
- 2 (35). First abdominal tergite weakly and nonuniformly bulged, usually more than 1.5 times as long as its width at apex.
- 3 ( 6). Basal segments of flagellum short (Fig. 149: 11). Forefemora short, thickened, not curved or barely curved (Fig. 130: 7). Genae as high as almost half longitudinal diameter of eye, in any case longer than basal width of mandible (Fig. 148: 11, 12). Maxillary palps short (Fig. 149: 1, 2). Body black. Parasites of owl moths.

1–10—head, dorsal view: 1—*Macrocentrus gibber*, 2—*M. hungaricus*, 3—*M. buolianae*, 4—*M. resinellae*, 5—*M. thoracicus*, 6—*M. nidulator*, 7—*M. marginator*, 8—*M. pal-lipes*, 9—*M. linearis*, 10—*M. grandii*; 11–14—head, frontal view: 11—*M. infirmus*, 12—*M. blandus*, 13—*M. nidulator*, 14—*M. marginator*; 15, 16—part of head: 15—*M. pal-lipes*, 16—*M. linearis*; 17–20—anterior part of head, lateral view: 17—*M. equalis*, 18—*M. collaris*, 19—*M. buolianae*, 20—*M. resinellae*.

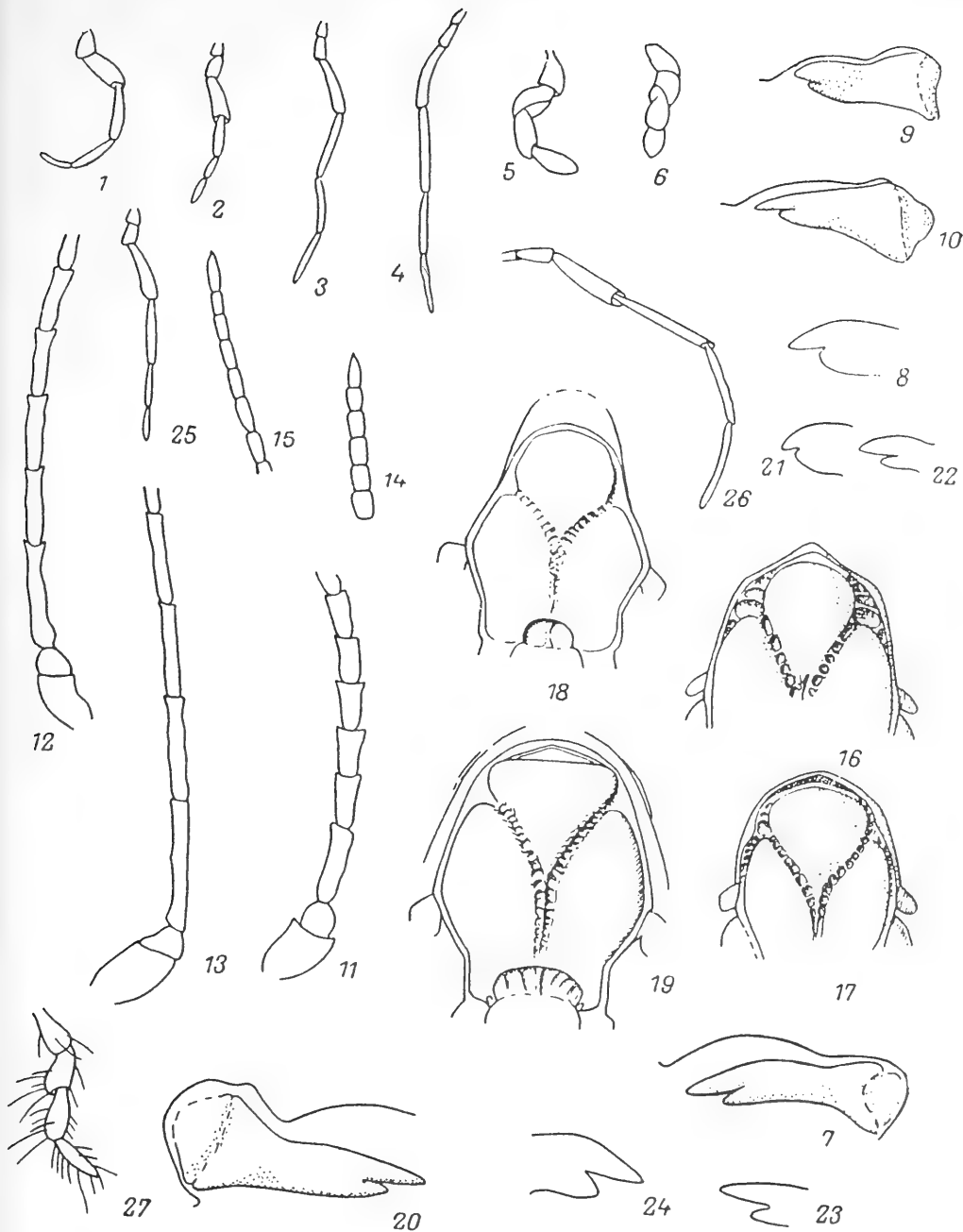
<sup>1</sup> Treatment by V.I. Tobias.

<sup>2</sup> Eady and Clark. 1964. *Entomol. Gazette*, 15, 3: 96–127.





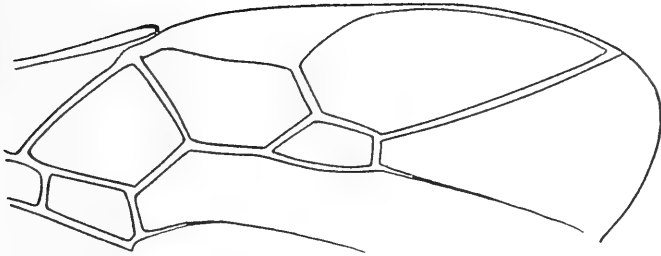
- 4 ( 5). Face relatively less wide, rugose in middle; 5th segment of maxillary palps 2 times as long as 2nd, equal to 4th, and longer than 6th segment; 3rd segment of labial palp 1.5 times longer than wide. Apical part of ovipositor stylet with notch. Figs. 148: 11; 149: 1, 5, 11; 150: 7, 15. Body 3.5–4. Parasite of *Agrotis* spp., *Apamea monoglypha* Hfn. (Noctuidae). Northwest, center, east; Kazakhstan; Western Europe..... **M. (A.) infirmus** Nees
- 5 ( 4). Face wider, weakly sculptured, lustrous; 5th segment of maxillary palp as long as 2nd, more than half as long as 4th, as long as 6th or shorter; 3rd segment of labial palp almost square. Ovipositor at apex lacking notch, sometimes dorsally and ventrally widely curved. Figs. 148: 12; 149: 2, 6; 150: 16, 25; 151: 2. Body 2.5–5. Parasite of *Hydraecia petasitis* Doubl., *H. micaceae* Esp., *Agrotis segetum* Den. and Schiff., *Mesapamea secalis* L. (Noctuidae). Northwest, center, east, south; Kazakhstan, Central Asia (Tien Shan); Western Europe..... **M. (A.) blandus** Eady and Clark
- 6 ( 3). Basal segments of flagellum longer (Fig. 149: 12, 13). Forefemora long and thin, usually curved (Fig. 150: 8). Genae higher than basal width of mandible (Fig. 148: 16) (except *M. pallipes*). Maxillary palps long (Fig. 149: 3, 4); if short (*M. collaris*), then ovipositor not longer than abdomen.
- 7 (12). Ovipositor not longer than abdomen, stylet apically narrowed, often curved (Fig. 150: 18). Mandibles long and thin, plane of apical half not more than barely turned in in relation to plane of basal half of mandible, both denticles on mandible pointed, 1st longer than 2nd (Fig. 149: 7). Parasites of larvae of owlet moths on low bushes and plants.
- 8 (11). Clypeus distinctly projecting; mandibles not very long, their 1st denticle 2 times as long as 2nd. Maxillary palps distinctly longer than height of head.
- 9 (10). Apical section of radial vein uniformly and slightly curved. Color variable; usually legs yellowish; mesonotum somewhat yellowish dark brown; head, propodeum and abdomen dark brown; male usually black. Figs. 148: 17; 149: 3; 150: 18. Body 3–4. Parasite of *Amathes triangulum* Hfn., *Agrotis segetum* Den. and Schiff. (Noctuidae). Center, south; Far East; Western Europe..... **M. (A.) equalis** Lyle



1—4—maxillary palps: 1—*Macrocentrus infirmus*, 2—*M. blandus*, 3—*M. equalis*, 4—*M. pallipes*; 5, 6—labial palps: 5—*M. infirmus*, 6—*M. blandus*; 7—10—Mandibles: 7—*M. collaris*, 8—*M. linearis*, 9—*M. grandii*, 10—*M. buolianae*; 11—13—antennal base: 11—*M. infirmus*, 12—*M. collaris*, 13—*M. linearis*; 14, 15—antennal apex: 14—*M. nidulator*, 15—*M. marginator*; 16—19—mesonotum: 16—*M. gibber*, 17—*M. hungaricus*, 18—*M. linearis*, 19—*M. buolianae*; 20—*M. nidulator*, mandible; 21—24—mandibular apex (frontal view): 21—*M. grandii*, 22—*M. buolianae*, 23—*M. collaris*, 24—*M. nidulator*; 25—26—maxillary palps: 25—*M. collaris*, 26—*M. nidulator*; 27—*M. resinellae*, labial palp.

- 10 ( 9). Apical section of radial vein terminally steeply curved. Maxillary palps shorter than height of head. Radial vein apically steeply curved (Fig. 151: 6). Body yellowish dark brown; stigma basally with large white spot. Body 3.8–4.2. Central Asia ..... **M. (A.) amphigenes** Alexeev
- 11 ( 8). Clypeus slightly projecting; mandibles long and thin, curved, their 1st denticle very long and pointed, 3 times as long as 2nd. Maxillary palps not longer or barely longer than height of head. In color similar to *M. equalis* but legs reddish; male often almost black. Figs. 148: 18; 149: 7, 12, 23, 25; 150: 17. Body 3.5–4.5. Often flies to light; parasite of *Agrotis segetum* Den. and Schiff., *A. clavis* Hfn., *A. exclamationis* L., *Helicoverpa armigera* Hb., *Mamestra brassicae* L., *Polymixis xanthomista* Hb., *Apamea sordens* Hfn. (Noctuidae), *Polygonia c-album* L. (Nymphalidae). Entire Palearctic, except north..... **M. (A.) collaris** Spin.
- 12 ( 7). Ovipositor usually as long as body, with preapical notch (Fig. 150: 19). Mandibles relatively shorter, their plane in apical half turned in in relation to plane in basal half (Fig. 149: 9, 10).
- 13 (16). Species with larger body size, about 10 mm, not less than 8.
- 14 (15). Head dorsally distinctly transverse, temples distinctly narrowed behind eyes; eyes large; clypeus anteriorly straight; ocelli well developed. Middle part of mesonotum stretched, notaulices deeper, especially anteriorly coarsely crenulate. Brachial cell on forewing with sparse bristles, in outer part without them. Body black, legs dark yellow. Apical segment of trochanter of fore- and middle legs with row of denticles. Figs. 148: 1; 149: 16; 150: 3, 10. West, center, south; Western Europe ..... **M. (A.) gibber** Eady and Clark

1—*Macrocentrus kurnakovi*, part of forewing; 2—*M. linearis*, wing, near stigma; 3–6—brachial cell: 3—*M. gibber*, 4—*M. hungaricus*, 5—*M. nidulator*, 6—*M. marginator*; 7–9—forefemur: 7—*M. infirmus*, 8—*M. linearis*, 9—*M. buolianae*; 10—*M. gibber*, trochanter of middle leg; 11–13—claw of hind tarsus: 11—*M. buolianae*, 12—*M. linearis*, 13—*M. marginator*; 14—*M. pallipes*, 2nd–3rd abdominal tergites; 15–21—ovipositor apex: 15—*M. infirmus*, 16—*M. blandus*, 17—*M. collaris*, 18—*M. equalis*, 19—*M. linearis*, 20—*M. nidulator*, 21—*M. marginator*; 22–24—part of forewing: 22—*M. pallipes*, 23—*M. linearis*, 24—*M. grandii*, 25—*M. blandus*, trochanter of middle leg; 26–27—claw of hind tarsus: 26—*M. buolianae*, 27—*M. niidus*.



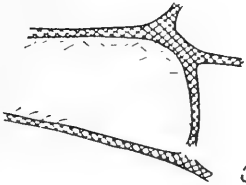
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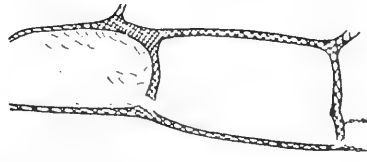
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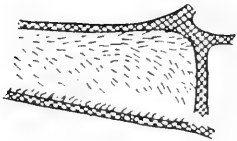
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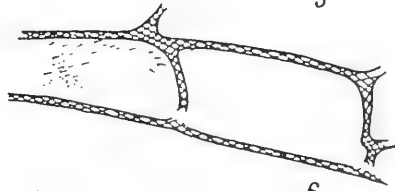
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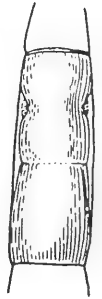
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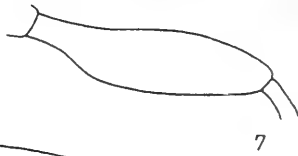
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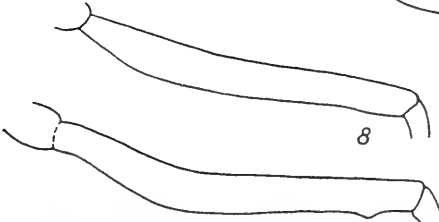
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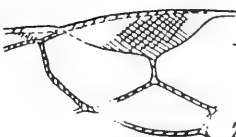
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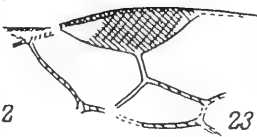
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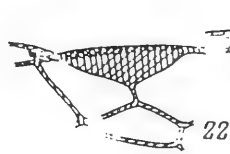
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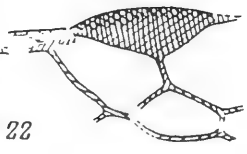
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- 15 (14). Head less transverse, temples behind eyes parallel, later roundly narrowing, eyes small; clypeus truncate anteriorly; ocelli small. Middle part of mesonotum not longer than its maximum width, notaulices less sharply crenulate, less deep. Brachial cell on forewing with dense bristles. Head, pronotum, mesonotum and legs reddish dark brown. Figs. 148: 2; 149: 17; 150: 4. South; Eastern Siberia; Central Europe; Mongolia; China ..... **M. (A.) hungaricus** Marsh. (*macrocephalus* Tel., *tsunekii* Wat., *mongolicus* Papp)
- 16 (13). Species with small body size; about 5 mm, rarely 7.
- 17 (30). Denticles on mandibles short, 2nd barely pointed (Fig. 149: 8, 9). Middle part of mesonotum longer (Fig. 149: 18). Hosts usually in twisted or crimped leaves.
- 18 (19). Genae well developed, ocelli small. Body black, only hairless patch of 2nd tergite yellowish dark brown and lateral parts of 3rd tergite reddish; scutellum and sides of thorax sometimes dark brownish; legs yellowish. Figs. 148: 8, 15; 149: 4; 150: 14, 22. Parasite of *Agonopterix hypericella* Hb. (Oecophoridae), *Syricoris lacunana* Den. and Schiff; *Hedya pruniana* Hb. and *H. nubiferana* Hw. (Tortricidae). West, southwest; Western Europe ..... **M. (A.) pallipes** Nees
- 19 (18). Genae very weakly developed (Fig. 148: 16); ocelli fairly large and sometimes ocellocular distance 1.3 times ocellar diameter (Fig. 148: 9).
- 20 (27). Body yellowish dark brown, often greater part yellow. Second section of medial vein  $1/4-1/2$  as long as 1st radiomedial vein.
- 21 (22). Ovipositor as long as abdomen. Mandibles as in *M. grandii* (cf. Fig. 149: 9). Stigma dark brown, basally with light colored spot. Azerbaidzhan ..... **M. brevicaudifer** Acht. (*brevicaudis* Abdinb.)
- 22 (21). Ovipositor not shorter than body, combination of other characters different.
- 23 (26). Mandibles thinner, their 1st denticle distinctly longer than 2nd (Fig. 149: 8). Stigma yellowish dark brown at least basally and apically. First section of medial vein curved (Fig. 150: 2).
- 24 (25). First abdominal tergite short, usually 1.5 times as long as its width at apex or somewhat longer; 2nd abdominal tergite square or slightly transverse. Second radiomedial cell 1.5 times as long as wide. Face distinctly transverse. Base of ocellar triangle slightly shorter than ocellocular distance;

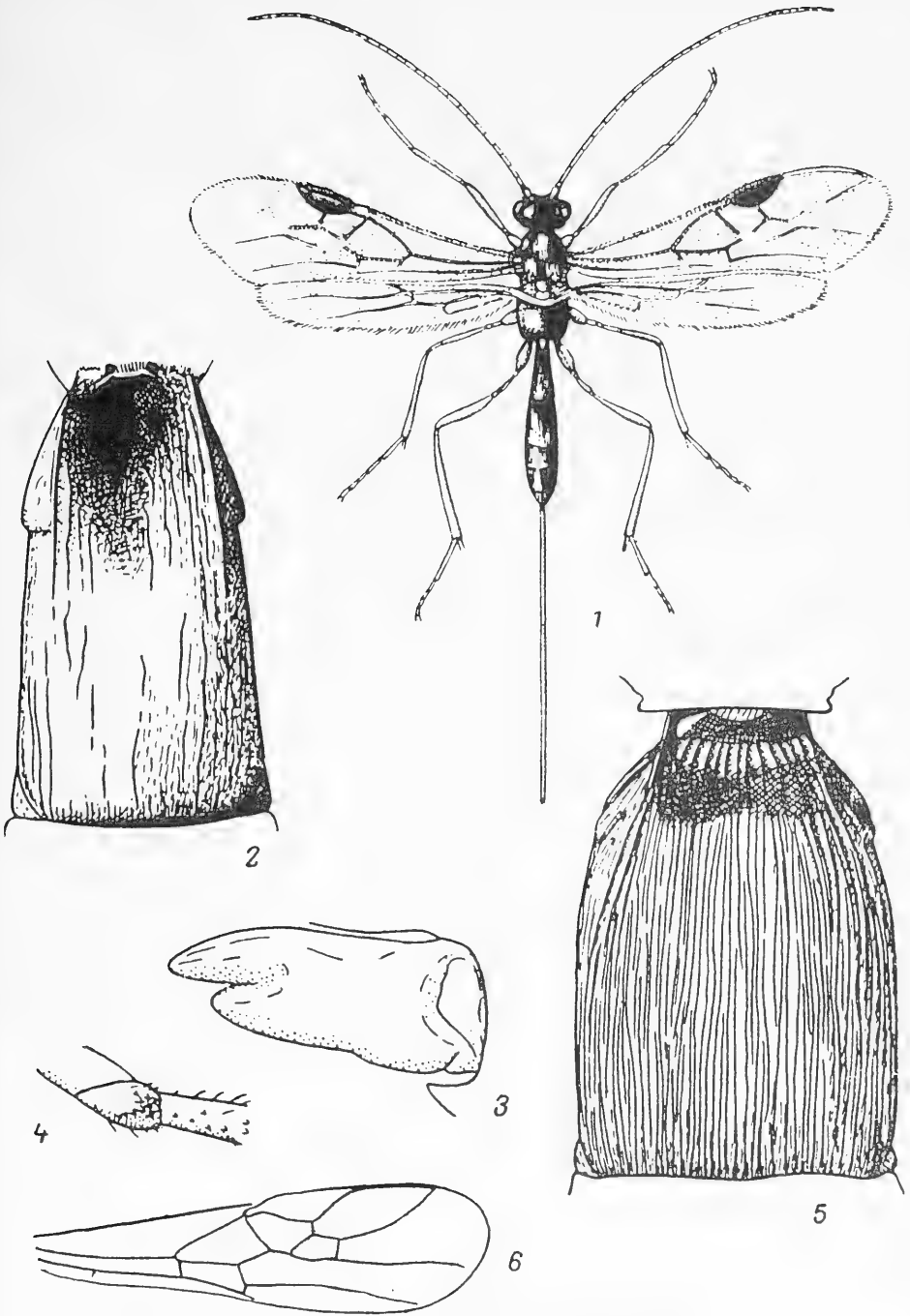


Fig. 151. Macrocentrinae (from Parker, Eady and Clark).

1—*Macrocentrus grandii*; 2—*M. blandus*, 1st abdominal tergite; 3—5—*M. crassus*:  
 3—mandible, 4—trochanter, 5—1st abdominal tergite; 6—*M. amphigenes*, forewing.

ocelli less large. Body yellow. Parasite of *Sesamia cretica* Led. (Noctuidae). Central Asia ..... **M. (A.) turkestanicus** Tel.<sup>1</sup>

Lectotype: Female, Bairam-Ali, 3.VII.1932 (Bogush). In the species description another date, II.VII.1928, has been erroneously mentioned; under the specimen identified as the lectotype, the cut out identification label by N.A. Telenga bears the inscription "*Amicroplus turkestanicus* sp. n." as does the yellow card by which he denoted the type specimen. Paralectotypes: 3 females, details same.

- 257 25 (24). First abdominal tergite long and thin, roughly 2.5 times as long as its width at apex, 2nd tergite much longer than wide. Second radiomedial cell 2 times as long as wide. Face (with clypeus) square. Base of ocellar triangle more than ocellocular distance, ocelli large. Color variable, but usually body light colored, head yellow when body dark colored and mesonotum light colored. Figs. 148: 9, 16; 149: 8, 13, 18; 150: 2, 8, 12, 19, 23. Parasite of *Coleophora ibipennella* Z. (Coleophoridae), *Archips xylosteana* L., *A. oporana* L., *A. sorbiana* Hb., *A. crataegana* Hb., *Ptycholoma lecheana* L., *Pandemis cerasana* Hb., *Tortrix viridana* L., *Lozotaenia forsterana* F., *Eupoecilia ambiguella* Hb. (Tortricidae), *Athrips mouffetella* L. (Gelechiidae), *Achlya flavicornis* L. (Tethyidae), *Euproctis similis* Fuessly (Lymantriidae), *Haritala ruralis* Scop. (Pyraustidae), *Yponomeuta cognatellus* Hb. (Yponomeutidae), *Itame wanaria* L. (Geometridae). Entire Palearctic ..... **M. (A.) linearis** Nees (*abdominalis* F.)
- 26 (23). Denticles on mandibles similar. Stigma entirely darkened. Ocelli small. Color variable: with dark colored body and light colored mesonotum, head usually dark brown. Figs. 148: 10; 149: 9, 21; 150: 24; 151: 1. Parasite of *Ostrinia nubilalis* Hb., *Haritala ruralis* Scop. (Pyraustidae), *Vanessa atalanta* L. (Nymphalidae). West, center, south; Far East; Western Europe; Japan; introduced into North America ..... **M. (A.) grandii** Goid. (*gifuensis* auct.)

<sup>1</sup> Introduced from North America into western Caucasus to counter the oriental peachmoth, *M. ancylivorus* Rohwer; it appears to occupy an intermediate position between *M. turkestanicus* and *M. linearis*; in the structure of the head it resembles the former species but the 2nd radiomedial cell and the 1st and 2nd abdominal tergites are somewhat longer than in *M. turkestanicus*. Reliable information about acclimatization of this species in the USSR is not available. In Europe it was also introduced in France, Italy and Yugoslavia.



- 27 (20). Thorax reddish dark brown (sometimes except propodeum); head (in *M. rossemi* only its upper side) and abdomen black; legs dark brownish yellow.
- 28 (29). Second segment of antennal flagellum about 2/3 as long as 1st. Propodeum narrow and long, basally smooth, distinctly transversely rugose. Submedial cell on forewing with transverse dark spot. Unsculptured lateral parts of 2nd abdominal tergite wide, separated by curved furrow. Posterior part of 2nd tergite smooth. Stigma dark colored, basally light colored. Face light colored, smooth. Hind tibiae entirely light colored. Fig. 152: 1–6. Parasite of *Cacoecimorpha pronubana* Hb. (Tortricidae). Netherlands .....  
 ..... **M. (A.) rossemi** Haes. and Acht.
- 29 (28). Second flagellar segment somewhat shorter than 1st. Propodeum wider and shorter, entirely and less regularly sculptured. Submedial cell lacking dark spot or spot very weak. Unsculptured lateral parts of 2nd tergite narrow, latter sculptured up to its posterior margin. Stigma light colored. Face black, sculptured. Hind tibial apices darkened. First radiomedial vein often shifted from recurrent vein by its length. Figs. 150: 1; 152: 7–13. Parasite of ? *Morophaga boleti* F. (Tineidae). Caucasus (Abkhazia); Netherlands.....  
 ..... **M. (A.) kurnakovi** Tobias
- 30 (17). Denticles on mandibles long, both pointed (Fig. 149: 10). Middle lobe of mesonotum shorter and wider, sometimes anteriorly incised (Fig. 149: 19). Hosts on conifers.
- 31 (32). Head distinctly transverse, temples sharply narrowed directly from eyes; ocelli large; clypeus separated from face by depression. Mesonotum anteriorly incised. Body dark brownish yellow or dark brown. Figs. 148: 3, 19; 149: 10, 19, 22; 150: 9, 11, 26. Parasite of *Rhyacionia buoliana* Den. and Schiff. (Tortricidae). Center; Central Europe .....  
 ..... **M. (A.) buolianae** Eady and Clark
- 32 (31). Head less transverse, temples roundly narrowed; ocelli small (Fig. 148: 4); clypeus slightly separated from face. Apical antennal segment acuminate.
- 33 (34). Sternauli coarsely and densely rugose-punctate, scutellum densely punctate, its sides rugose. Mesonotum anteriorly incised. Body dark brownish red; lower part of mesothorax and lower half of its sides, sides of metathorax and propodeum, apices of fore- and middle femora, apical half of hind femora,

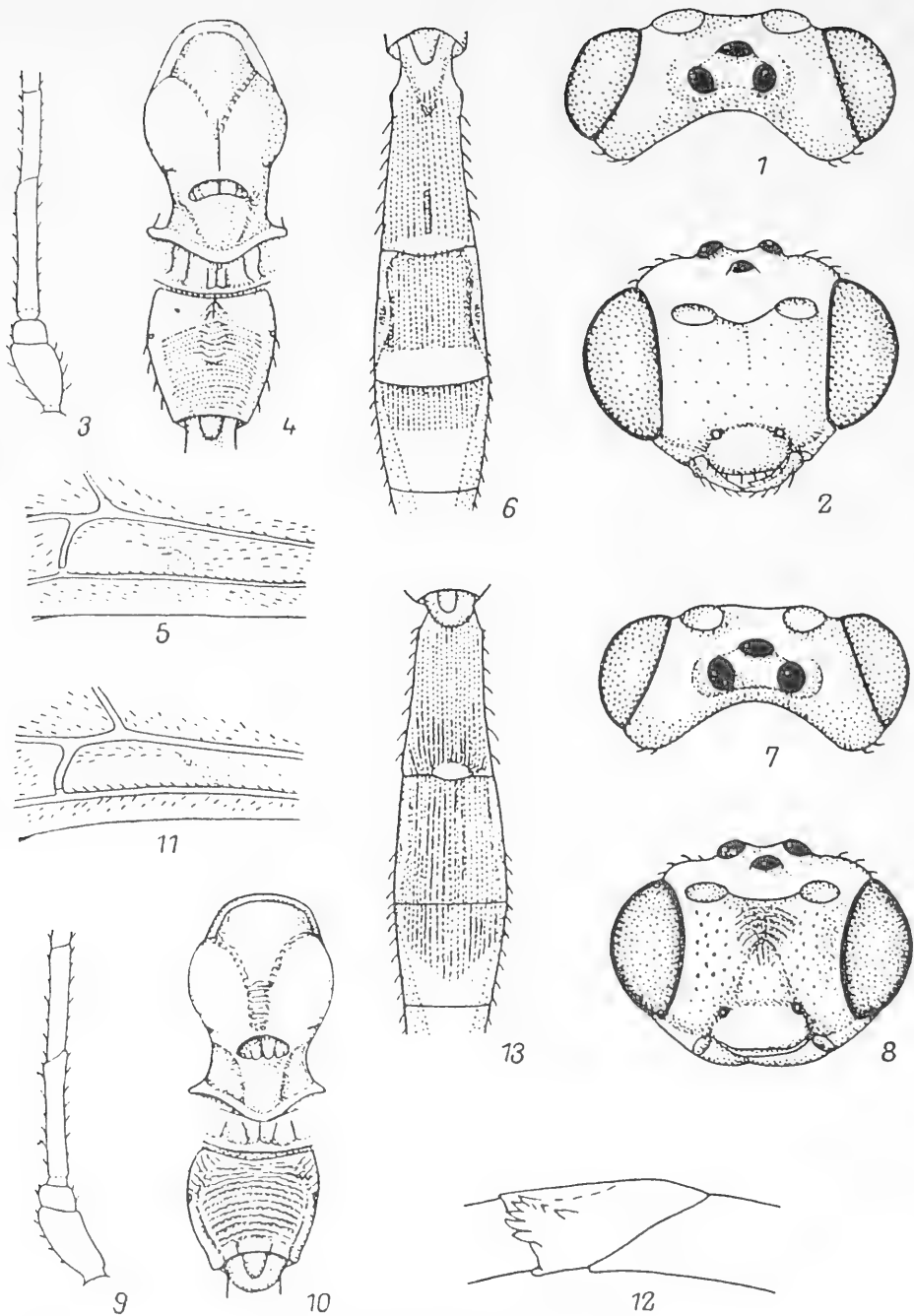


Fig. 152. Macrocentrinae (from Haeselbarth).

1-6—*Macrocentrus rossemsi*: 1—head, dorsal view, 2—head, frontal view, 3—antennal base, 4—thorax, 5—submedial cell, 6—1st-3rd abdominal tergites; 7-13—*M. kurnakovi*: 7—head, dorsal view, 8—head, frontal view, 9—antennal base, 10—thorax, 11—submedial cell, 12—trochanter, 13—1st-3rd abdominal tergites.

middle tibiae except bases, hind tibiae and all tarsi black. Fig. 153. Body 6.2. Austria ..... **M. (A.) bicoloripes** Acht.

- 34 (33). Sternauli with sparse punctures, scutellum weakly punctate, its sides smooth. Mesonotum anteriorly not incised. Color variable from black to reddish dark brown, sometimes head and prothorax dark yellow. Figs. 148: 4, 20; 149: 27. Forest zone. Parasite of *Petrova resinella* L., *P. perangustana* Snell., *Laspeyresia pactolana* Z., *Blastesthia turionella* L. (Tortricidae), *Exoteleia dodecella* L. (Gelechiidae), *Dioryctria splendidella* H.-S. (Phycitidae). West, northwest, center; Caucasus, Kazakhstan, southern Siberia to Far East; Western Europe..... **M. (A.) resinellae** L.
- 35 ( 2). First abdominal tergite uniformly bulged, 1.5 times as long as its width at apex. Mandibles massive. Antennae long and thin, 46-segmented. Nervulus post-furcal, shifted from basal vein by its length. Second segment of trochanter of middle and hind legs with few denticles. Ovipositor stylet preapically with incision. Body very dark brown or black, pronotum and legs yellowish dark brown. Fig. 151: 3–5. Body 6–7. Italy ..  
..... **M. (A.) crassus** Eady and Clark
- 36 ( 1). Claw with pointed projection, appears split (Fig. 150: 13, 27). Solitary parasites (Subgenus *Macrocentrus* s. str.<sup>1</sup>).
- 37 (38). Body light colored, lemon yellow, rarely reddish. Ocelli very large, ocellocular distance not more than 2 times, usually only slightly more than, ocellar diameter. Apical antennal segment with seta. Apex of submedial cell with very sparse bristles. Fig. 154. Body 4.5–6. Parasite of *Acrobasis sodalella* Zck., *A. fallonella* Rag. (Phycitidae), *Apotomis lutosana* Kenn., *Exapate congelatella* Cl. (Tortricidae), *Pseudotelphusa paripunctella* Thunb. (Gelechiidae). South; Caucasus, Central Asia; Western Europe .....  
... **M. flavus** Snellen van Vollenhoven (*turanicus* Tel., syn. n.)
- 38 (37). Body with dark pattern; if reddish dark brown, then head dark colored, black or dark brown. Ocellar diameter not more than half ocellocular distance.
- 39 (42). Eyes large, temples short, ocelli varying in size but always large, sometimes very distinctly developed (Fig. 148: 5). Color variable, usually greater part of thorax yellowish dark brown. Hosts in twisted or crimped leaves. Next two species until

<sup>1</sup> van Achterberg and Haeselbarth. 1983. *Entomofauna*, 4, 2: 37–59.

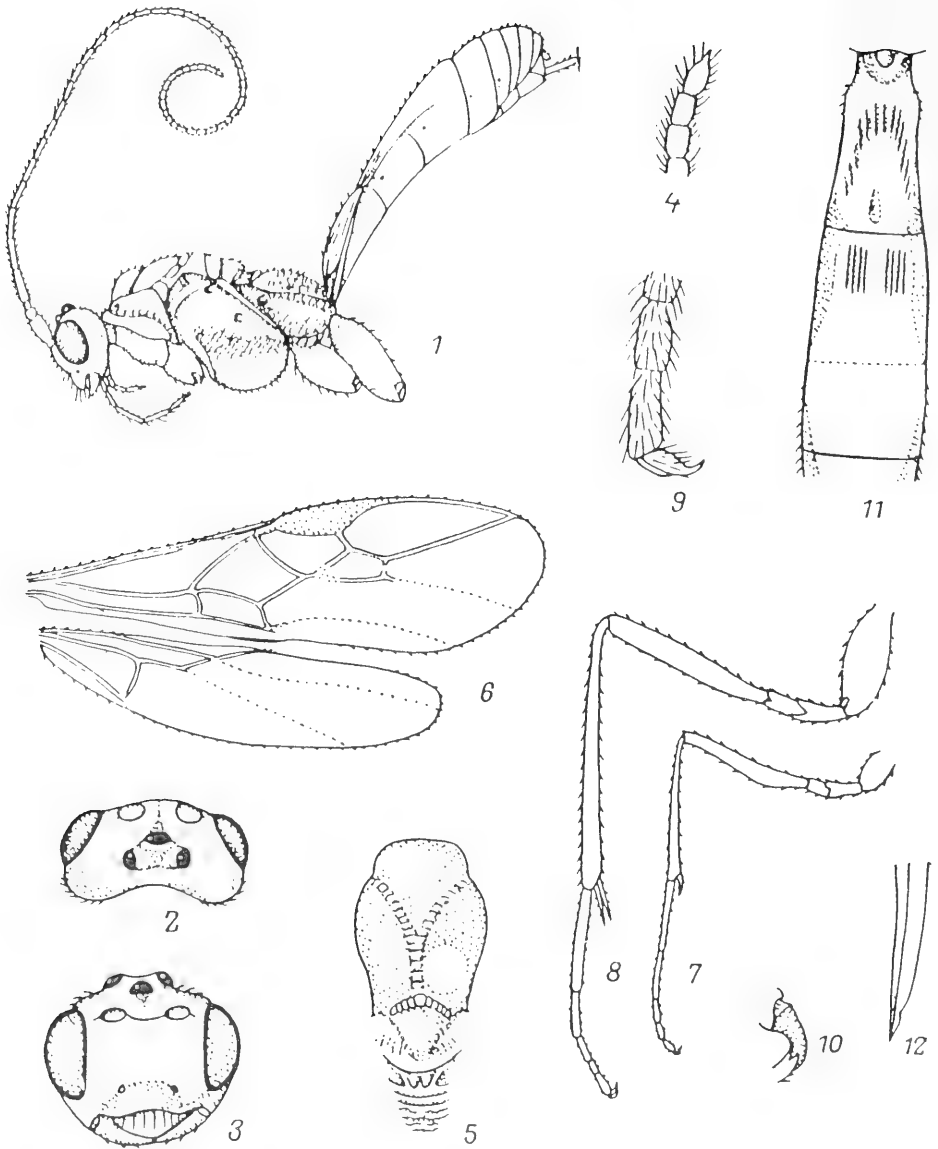


Fig. 153. Macrocentrinae (from Haeselbarth).

1-12—*Macrocentrus bicoloripes*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—antennal apex, 5—mesonotum, 6—wings, 7—foreleg, 8—hind leg, 9—4th and 5th hind tarsal segments, 10—hind tarsal claw, 11—1st-3rd abdominal tergites, 12—apex of ovipositor.

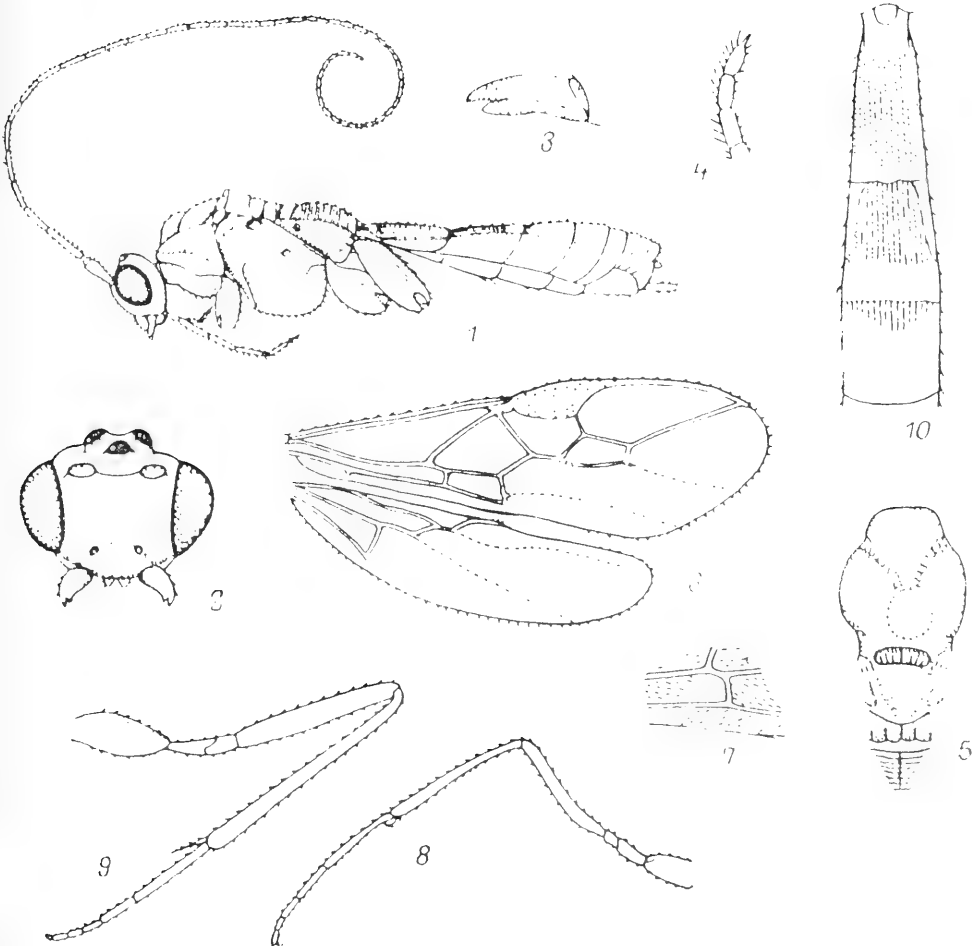


Fig. 154. Macrocentrinae (from Haeselbarth).

1-10—*Macrocentrus flavus*: 1—body, 2—head, 3—mandible, 4—antennal apex, 5—mesonotum, 6—wings, 7—nervulus, 8—foreleg, 9—hind leg, 10—1st-3rd abdominal tergites

recently were confused, including their hosts—*Agonopterix angelicella* Hb., *A. alstroemeriana* Cl., *Depressaria pastinacella* Dup., *D. daucella* Den. and Schiff., *Diurnea fagella* Den. and Schiff. (Occophoridae), *Archips xylosteana* L., *Epinota sordidana* Hb., *Pseudosciaphula branderiana* I. (Tortricidae).

- 40 (41). Submedial cell on forewing evenly covered with bristles. Prepectal ridge well developed only on sides of mesothorax, in lower part of mesonotum reduced. Temples hardly developed. Hind tibiae apically not darkened. Figs. 148: 5; 155: 1–3. Body 5.5–7. Parasite of *Spilonota ocellana* F., *Hedya nubiferana* Hw., *Gypsonoma dealbana* Fröl., *Acleris hippophaeana* Heyd. (Tortricidae), *Recurvaria nanella* Den. and Schiff. (Gelechiidae). West, center, east, south; Caucasus, Transural, Kazakhstan, Western Siberia, Yakutia, Far East; Western Europe; Turkey ..... **M. thoracicus** Nees
- 259 41 (40). Submedial cell on forewing in outer part with very sparse bristles. Prepectal ridge developed both on sides and lower part of mesothorax. Temples short, but distinctly developed. Hind tibiae, at least apically, somewhat darkened. Fig. 155: 4–7. Body 5.5–7.5. Parasite of *Agonopterix ferulae* Z., *Diurnea phryganella* Hb. (Oecophoridae), *Acrobasis consociella* Hb. (Phycitidae). Northwest, center, south, Caucasus, Eastern Siberia, Far East; Western Europe ..... **M. bicolor** Curt.
- 42 (39). Eyes less developed; temples longer (Figs. 148: 6; 158: 2). Body black.
- 43 (46). Palps distinctly darkened. Submedial cell on forewing lacking traces of yellowish smoky spot. Apical antennal segments at most 1.5 times as long as wide. Longitudinal wrinkles usually reaching only middle of 2nd abdominal tergite; 3rd tergite entirely or almost smooth. Ovipositor apex behind dorsal incision relatively obtuse.
- 44 (45). Antennal flagellum entirely dark colored. Ovipositor valves 1.8–2 times as long as forewing. Submedial cell on forewing apically with sparse bristles; brachial cell wider. Thorax shorter; propodeum 10/17–10/19 as long as wide. Head less narrowed below. Section of medial vein on hind wing posterior to nervellus as long as basal vein, rarely longer. Forefemora not broadened in middle and curved. Figs. 148: 6, 13; 149: 14, 20, 24, 26; 150: 5, 20; 157. Body 4.5–7.5. Parasite of larvae of Tortricidae (particularly *Eucosma hohenwartiana* Den. and Schiff.) and Gelechiidae (*Metzneria metzneriell* Stt.)
- 260 living exposed, often in heads of Compositae. Northwest, west, center, east (Perm), south (Kuryazh), southeast (Yanvartsevo); southern Siberia up to Amur Region; Western Europe .....

- .....**M. nidulator** Nees (*procerus* Costa, *curticaudis* Tel.<sup>1</sup>)
- 45 (44). Basal segments of flagellum light colored (in male black). Ovipositor valves 1.4–1.8 times as long as forewing. Submedial cell on forewing except its subapical part densely pubescent, brachial cell narrower. Body better proportioned; propodeum 5/7–5/9 as long as wide. Head distinctly narrowed below. Section of medial vein on hind wing posterior to nervellus somewhat longer than basal vein. Forefemora broadened in middle, relatively slightly curved. Fig. 158. Body 5–6.5. Center, south (Kuryazh); Western Europe .....
- .....**M. townesi** Acht. and Haes.
- 46 (43). Palps light colored. Submedial cell on forewing with somewhat distinct yellowish or smoky spot. Apical antennal segments 1.7–2 times as long as wide. Longitudinal wrinkles reaching or almost reaching apex of 2nd abdominal tergite; 3rd tergite usually in greater part sculptured. Ovipositor apex behind dorsal incision pointed.
- 262 47 (48). Spot on submedial cell on forewing inconspicuous, weakly pigmented. Temples short. Middle lobe of mesonotum distinctly projecting, anteriorly almost vertically truncate. Ovipositor valves not more than 1.5 times as long as forewing. First abdominal tergite long and thin. Head distinctly narrowed below. Anal cross-vein on forewing short. Figs. 150: 27; 159. Body 4–7.6. Parasite of *Acleris hastiana* Hb., *Aphelia paleana* Hb., *Gyponoma dealbana* Fröl. (Tortricidae). North, center, south; Caucasus, Altai, Kemerovo Region; Western Europe .....
- 263 48 (47). Spot on submedial cell on forewing distinctly pigmented, often angular. Temples longer. Middle lobe of mesonotum less projecting, its anterior margin gently sloping. Head less narrowed below. Anal cross-vein longer. Figs. 148: 7, 14; 149: 15; 150: 6, 13, 21; 156. Body 6.5–9. Parasite mostly of larvae of family Sesiidae (*Aegeria culiciformis* L., *A. tipuliformis* Cl., *A. vespiformis* L., *A. cephiformis* O., *A. formicaeformis* Ess., *A. myopaeformis* Bkh., *A. sphaeciformis* Den. and

<sup>1</sup> *M. curticaudis* Tel. (lectotype: Female, Amur Region. Agricultural Experimental Station, 12.VIII.1928) differs from *M. nidulator* by the dark color of all coxae and deformed ovipositor with short upcurved style (short valves broaden apically). Shape of ovipositor is evidently the result of unsuccessful development of cocoon. In the color of the coxae it is possible to consider it as a dark form of *M. nidulator*.

Schiff., rarely Tortricidae (*Epinotia caprana* F., and *E. cruciana* L.) as well as *Quercusia quercus* L. (Lycaenidae). Northwest, west, center, south; Caucasus, southern Siberia up to Far East; Western Europe.....**M. marginator** Nees

### 10. Subfamily Xiphozelinae

The subfamily comprises two South Asian genera. One of the two species of genus 127. *Xiphozele* Cam., *X. compressiventris* Cam., in the north has its distribution area to the Pacific Coastal Region.

### 11. Subfamily Homolobinae (Zelinae)<sup>1</sup>

Insects are relatively large in size (usually 5–9) with a compressed, fairly long abdomen and a short ovipositor. The occipital ridge is developed and is connected to the hypostomal. The apical segment of the antennae bears a spine. The discoidal cell on the forewing is sessile; the forewings have two radiomedial veins but the anal cross-veins are absent. The prepectal ridge is complete. The lower part of the sides of the metathorax has a lamellar projection. The prescutellar depression is large and is separated by the longitudinal keel. Spurs are usually long. The first abdominal tergite is thin and long and lacks longitudinal ridges. The antennae are long and thin. The forewings are longer than the body. The body is usually light colored. They are solitary endoparasites of lepidopterans. The subfamily comprises two genera: the universally distributed *Homolobus* with 5 subgenera and *Exasticolus* Acht., known only from the New World.

Van Achterberg (1979. *Tijdschr. Entomol.*, 122, 7: 241–279) includes the genus *Charmon* in this subfamily. However, we do not consider this view convincing (cf. subfamily Orgilinae).

128. **Homolobus** Förster, 1862<sup>2</sup>.—Forty-three species; 17 in the Palearctic (most of them entering from the tropics); from the fauna of the USSR the key does not include two Far Eastern species, *H. dauricus* Shest. and *H. carbonator* Shest.

- 1 ( 6). Radial cell on hind wing divided at least by weak cross-vein (Fig. 160: 6). Claw with additional denticle (Fig. 160: 7). First section of anal vein on forewing straight (Fig. 160: 6). Radial

<sup>1</sup> Treatment by V.I. Tobias

<sup>2</sup> Van Achterberg. 1979. *Tijdschr. Entomol.*, 122, 7: 241–479.



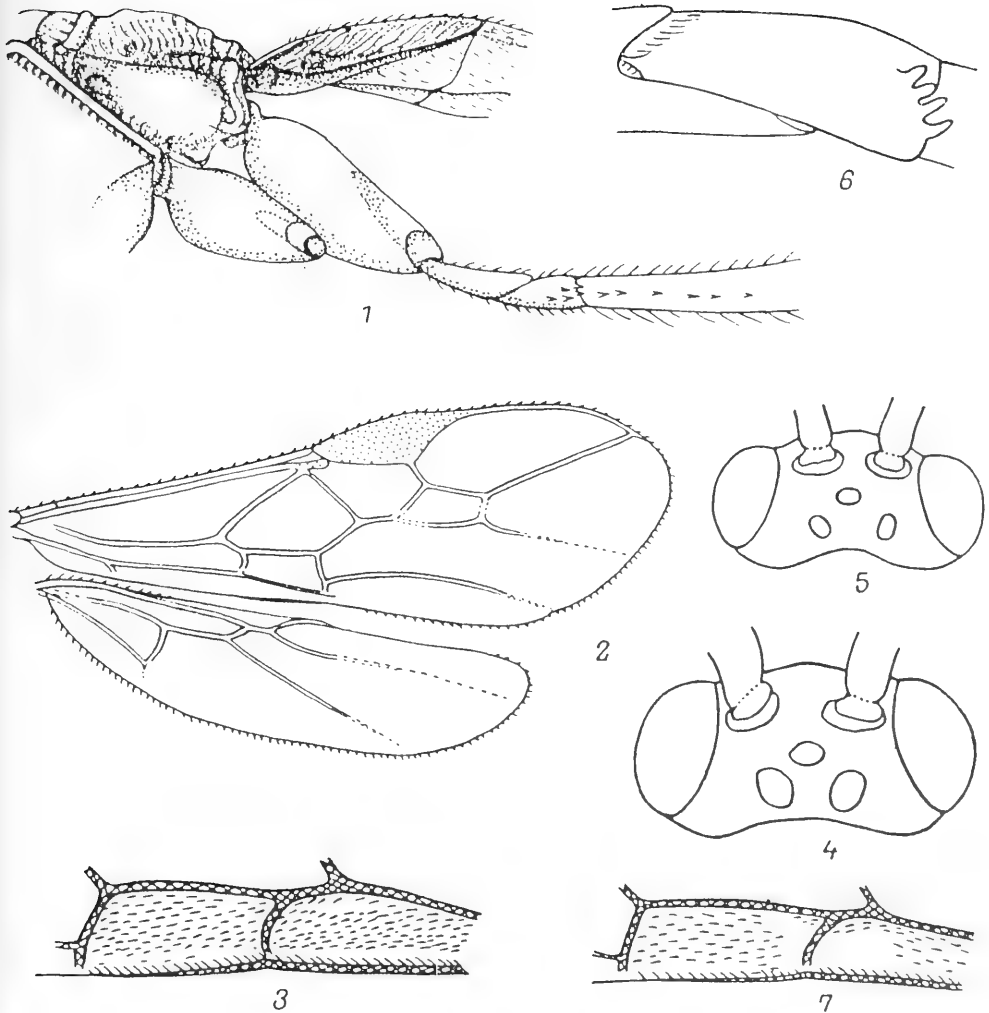
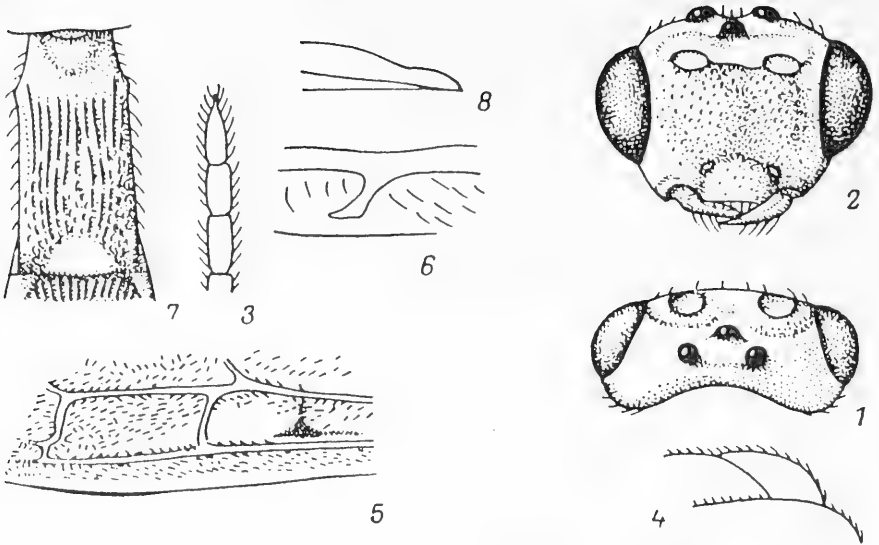


Fig. 155. Macrocentrinae (from Haeselbarth and Achterberg).

1—3—*Macrocentrus thoracicus*: 1—propodeum with abdominal base and hind legs, 2—wings, 3—brachial cell; 4—7—*M. bicolor*: 4—head, 5—head, variation, 6—trochanter of middle leg, 7—brachial cell.

vein on hind wing in basal part somewhat more strongly sclerotized than in apical part.



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Fig. 156. Macrocentrinae (from Haeselbarth and Achterberg).

1—8—*Macrocentrus marginator*: 1—head, dorsal view, 2—head, frontal view, 3—antennal apex, 4—anterior part of mesonotum, lateral view, 5—apex of submedial and brachial cells, 6—2nd anal cross-vein on forewing, 7—1st abdominal tergite, 8—abdominal apex.

2 ( 3). Flagellar segments 1 to 6 of female with thin longitudinal keel on inner side. Additional denticle on claw in female much smaller than apical. Ovipositor valves not longer than 1st segment of hind tarsus. Propodeum weakly sculptured, usually lacking distinctly outlined median cell. Body very dark brown. Fig. 160. Parasite of *Gonodontis bidentata* (Geometridae). Baikal and Amur regions; Western Europe; Japan . . . . .

..... H. (**Homolobus**) **discolor** Wesm.

2 ( 3)\* Flagellar segments of female lacking longitudinal keel (Subgenus *Oulophus* Ach.).

4 ( 5). Height of genae not less than basal width of mandibles. Hind coxae somewhat coarsely rugose. Apical segments of antennae longer than wide. Additional denticle of claw small. Propodeum with median cell and ridges, weakly sculptured behind ridges. Body yellowish or dark brownish, stigma yellowish. Fig. 161. Kuril Islands; Sweden; Finland; Nepal; India . . . . .

..... H. (**O.**) **bohemani** Bengtsson

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\* Mistake in the Russian original; should read 3 (2).—Translator.

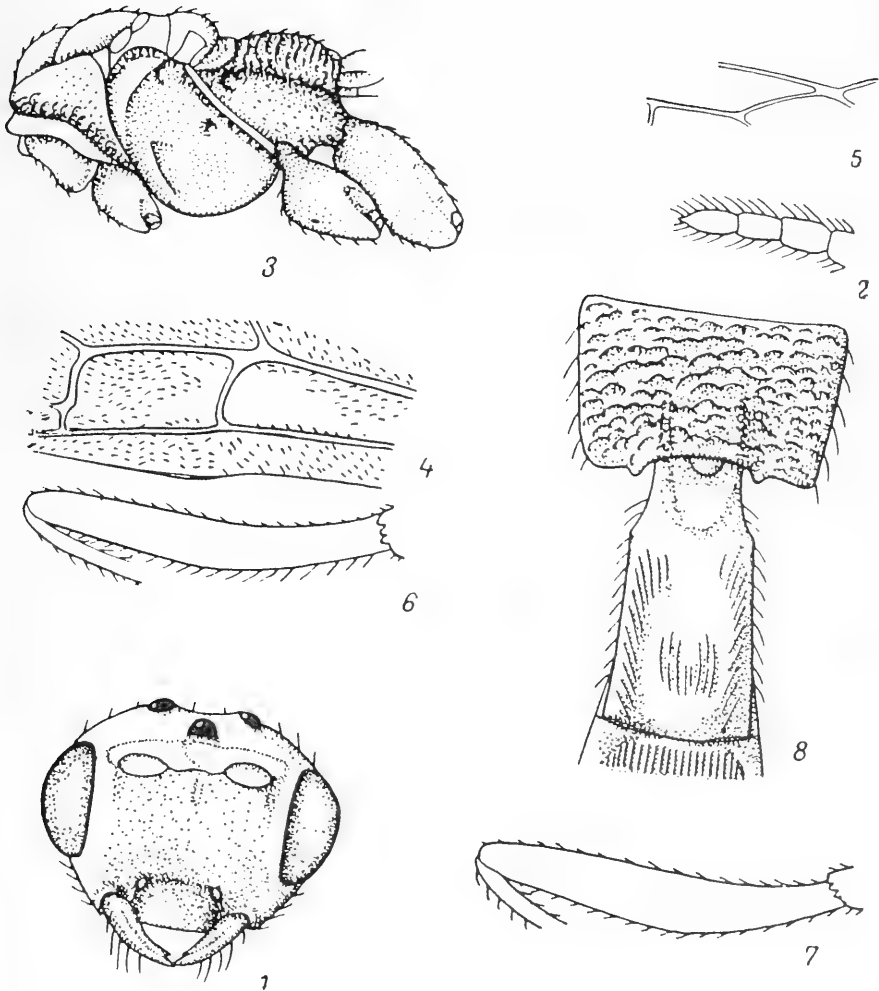


Fig. 157. Macrocentrinae (from Haeselbarth and Achterberg).

1—8—*Macrocentrus nidulator*: 1—head, 2—antennal apex, 3—thorax with coxae, 4—apex of submedial and brachial cells, 5—middle part of hind wing, 6—forefemur, 7—forefemur, variation, 8—propodeum with 1st abdominal segment.

5 (4). Height of genae much less than basal width of mandibles. Hind coxae only above weakly rugose-punctate. Apical segments of antennae thinner, 1.7–3 times as long as wide. Ovipositor valves short. Body dark brownish yellow. Fig. 162. Body 7.3. Parasite of *Eupithecia* spp. as well as *Entephria*

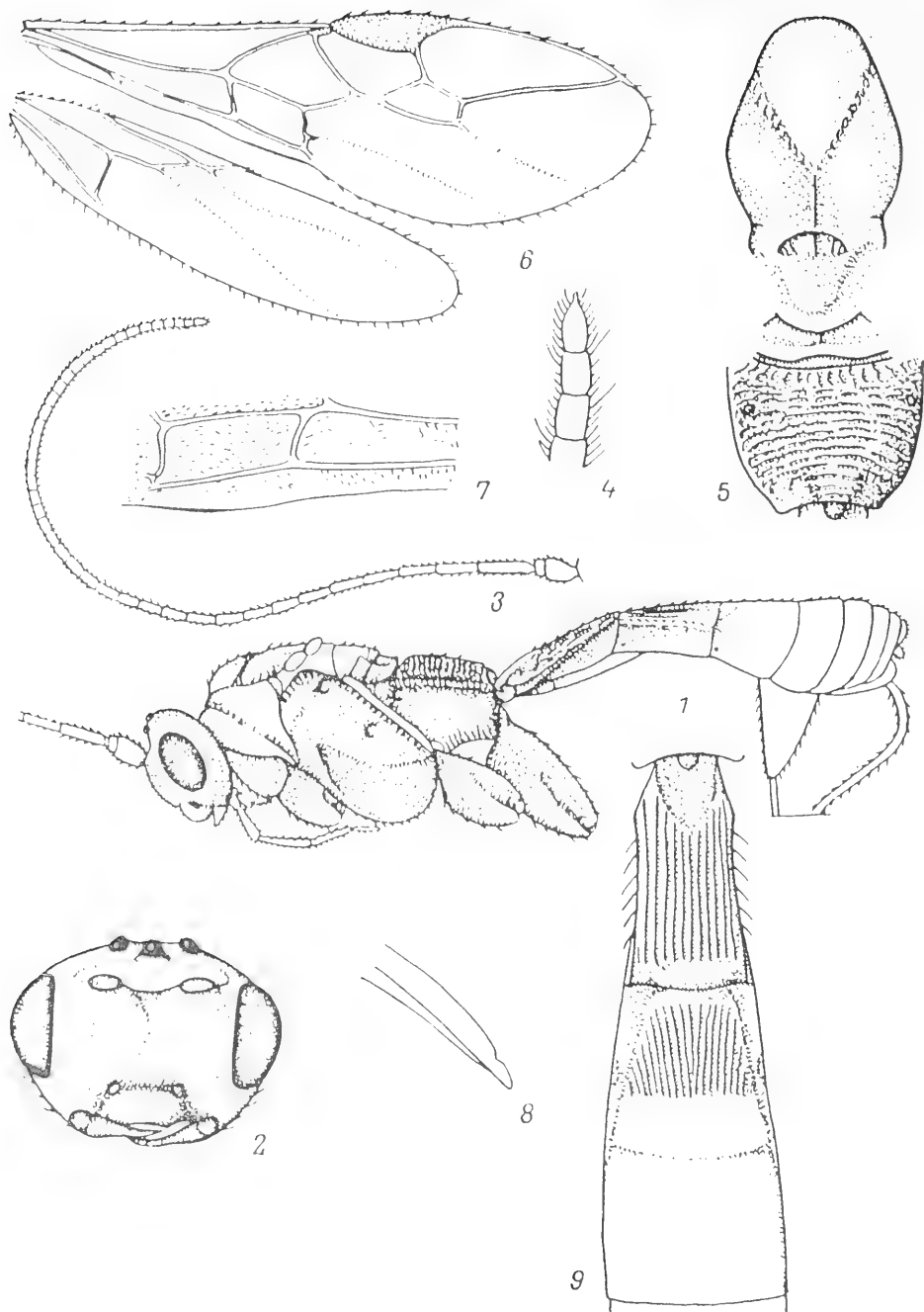


Fig. 158. Macrocentrinae (from Haeselbarth and Achterberg).

1-9—*Macrocentrus townesi*: 1—body, 2—head, 3—antenna, 4—antennal apex, 5—mesonotum with propodeum, 6—wings, 7—apex of submedial and brachial cells, 8—ovipositor apex, 9—1st-3rd abdominal tergites

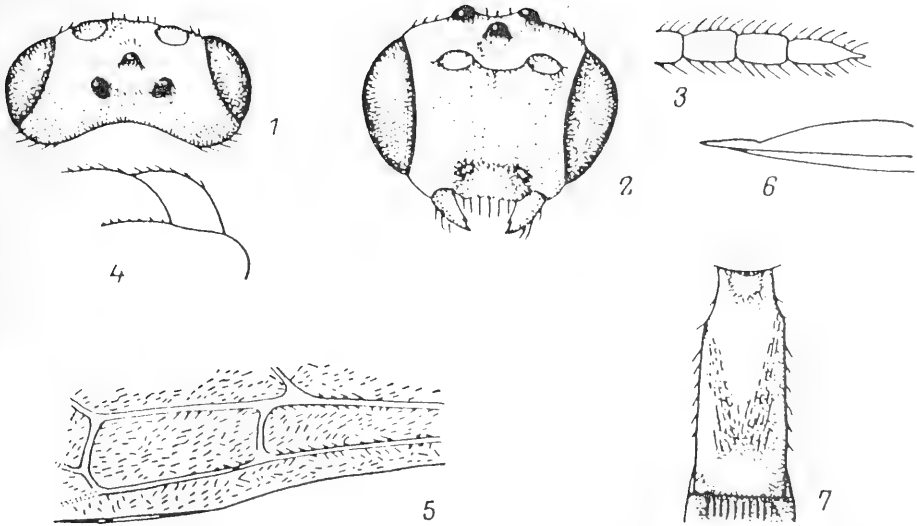


Fig. 159. Macrocentrinae (from Haeselbarth and Achterberg).

1-7—*Macrocentrus niidus*: 1—head, dorsal view. 2—head, frontal view, 3—antennal apex. 4—anterior part of mesonotum, lateral view. 5—apex of submedial and brachial cells; 6—apex of ovipositor, 7—1st abdominal tergite.

*caesiata* Den. and Schiff., *Alcis repandata* L. and other inchworms (Geometridae). Western Europe; Nepal; India; North America. .... **H. (O.) flagitator** Curt.

6 ( 1). Radial cell on hind wing divided by cross-vein. Combination of other characters different.

7 ( 8). Radial vein on hind wing uniformly and not distinct sclerotized. Claw lacking additional denticle. Section of costal vein on hind wing touching its anterior margin, not longer than section of this vein from radial vein to wing margin. Greater spur of hind tibiae in male apically usually broadened and obtuse. Fourth segment of labial palp 4 to 5 times as long as 3rd. Ovipositor short. Body dark brownish yellow. Fig. 163: 1-6. Body 4.5-7. Parasite of *Pyrausta sticticalis* L. (Pyraustidae), *Agrotis segetum* Den. and Schiff., *A. ypsilon* Hfn., *Amates c-nigrum* L., *Anumeta cestina* Stgr., *Spodoptera exigua* Hb., *Panolis flammea* Den. and Schiff. (Noctuidae), *Lycia zonarius* Den. and Schiff., *L. hirtarius* Cl., *Semiothisa clathrata* L. (Geometridae). Center, south; Caucasus.

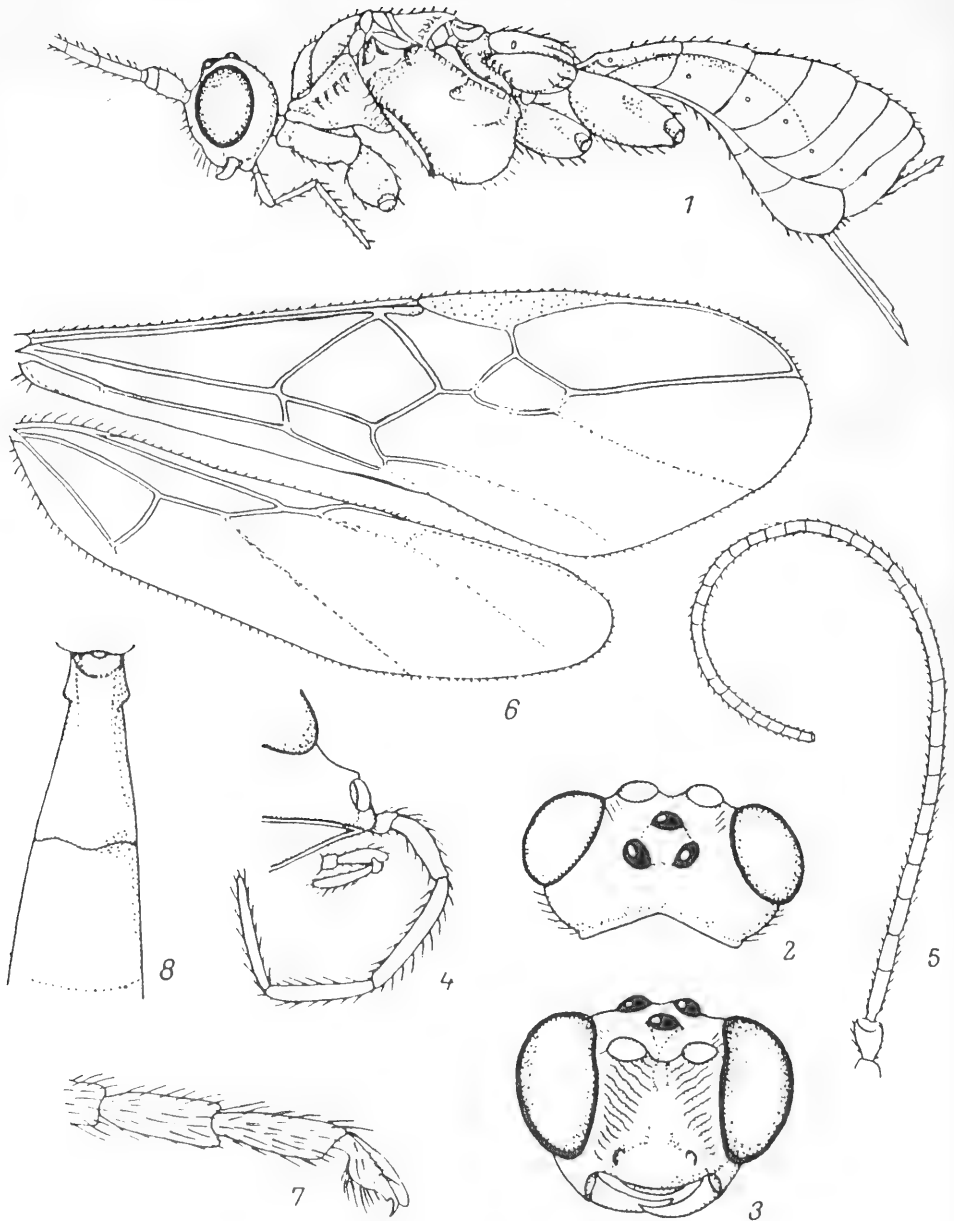


Fig. 160. Homolobinae (from Achterberg).

1—8—*Homolobus discolor*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—gena and palp, 5—antenna, 6—wings, 7—apex of hind tarsus, 8—1st—2nd abdominal tergites.

Kazakhstan, Central Asia, Yakutia; Western Europe; China; India; North and Central America. (Subgenus *Apatia* Enderlein) .....  
 ... H. (A.) *truncator* Say (*calcarator* Wesm., *chlorophthalma* auct.)

- 8 ( 7). Radial vein on forewing only up to point of its flexion distinctly sclerotized (Fig. 163: 9). Claw with additional denticle (Fig. 164: 7). Section of costal vein on hind wing touching its anterior margin much longer than section from radial vein to

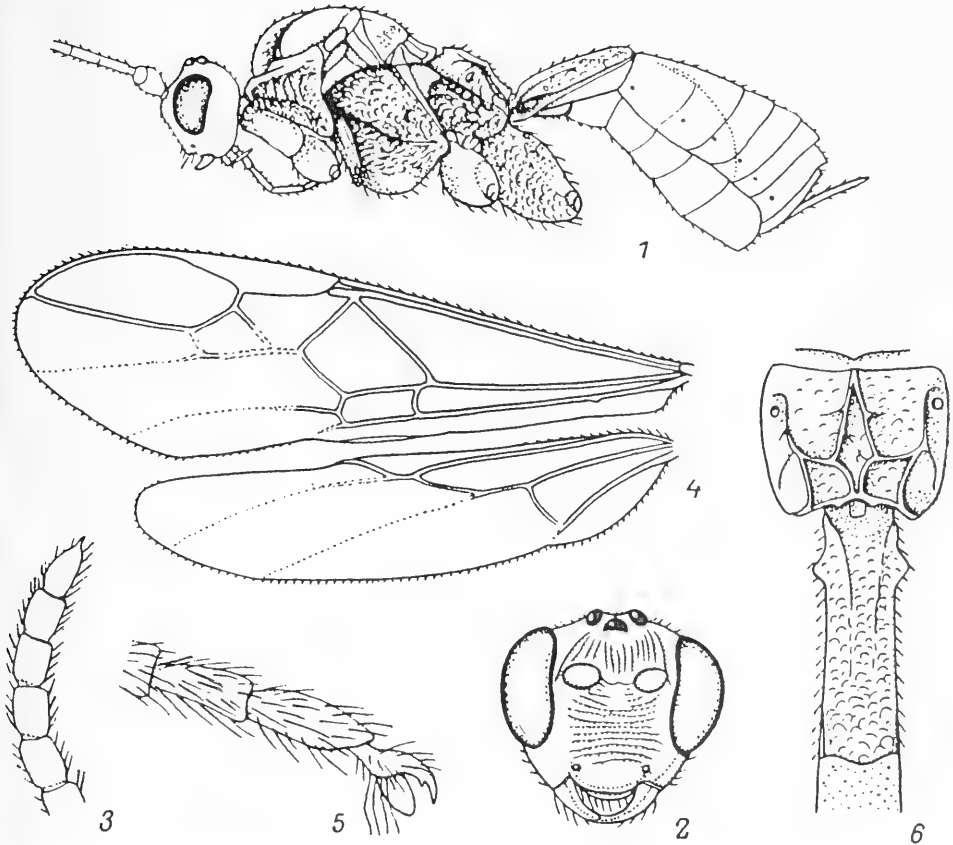


Fig. 161. Homolobinae (from Achterberg).

1-6—*Homolobus bohemani*: 1—body, 2—head, 3—antennal apex, 4—wings, 5—apex of hind tarsus, 6—propodeum with 1st abdominal tergite.

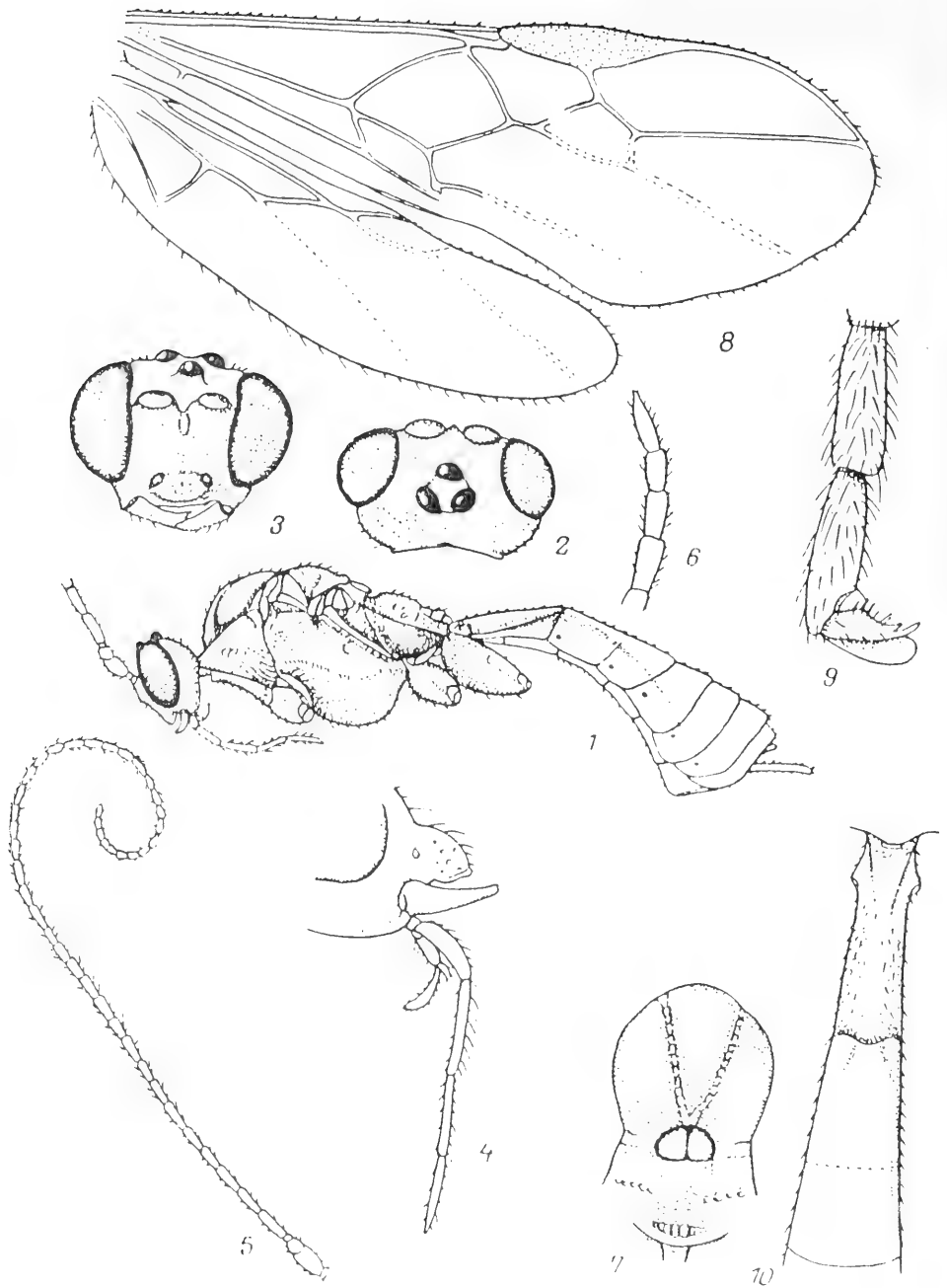


Fig. 162. Homolobidae (from Achterberg).

1-10—*Homolobus flagitator*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—lower part of head with palps, 5—antenna, 6—antennal apex, 7—mesonotum, 8—wings, 9—apex of hind tarsus, 10—1st-3rd abdominal tergites.



wing margin. Greater spur of hind tibiae in male acuminate (Fig. 164: 6).

- 266 9 (10). Basal section of anal vein curved (Fig. 163: 10). Nervulus interstitial or almost interstitial; first two sections of radial vein forming almost straight line. Basal segment of flagellum with longitudinal keel. Ovipositor short. Body including legs dark brownish red. Fig. 163: 7–10. Body 7–9. Parasite of *Alcis repandata* L.; *Bupalus piniarius* L. (Geometridae), *Agonopterix alstroemeriana* Cl. (Oecophoridae). Center, south; Caucasus, Kazakhstan, Siberia (Krasnoyarsk), Far East; Western Europe; China; Nepal; Japan; Southeast Asia; Central and South America (Subgenus *Chartolobus* Acht.) .....  
 ..... H. (C.) **infumator** Lyle
- 268 10 ( 9). Basal section of anal vein straight. Nervulus postfurcal; first two sections of radial vein forming distinct angle. Flagellar segment lacking keel. Ovipositor fairly long, about as long as first two segments of hind tarsus. Body yellowish dark brown; abdomen dorsally dark brown, hind tarsi yellowish. Fig. 164. Body 7–9. Parasite of *Cosmia trapezina* L., *Lithophane lamda* F., *Enargia ypsilon* Den. and Schiff., *Amathes triangulum* Hfn., *Autographa gamma* L., *Mamestra brassicae* L., *Panolis flammea* Den. and Schiff., *Orthosia populi* Ström. (Noctuidae). West, center, south; Caucasus, southern Siberia up to Far East; Western Europe; China; Japan (Subgenus *Phylacter* Reinh.) .... H. (P.) **annulicornis** Nees (*testaceator* auct).

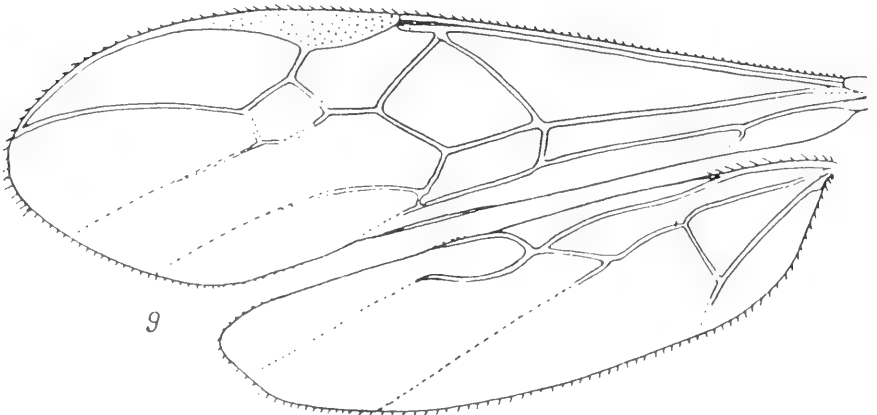
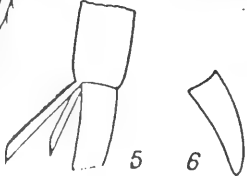
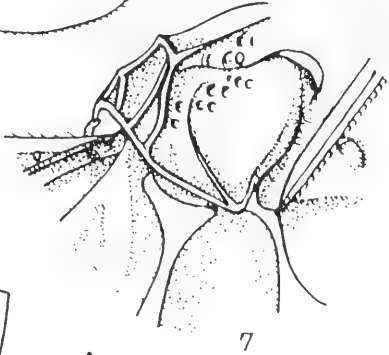
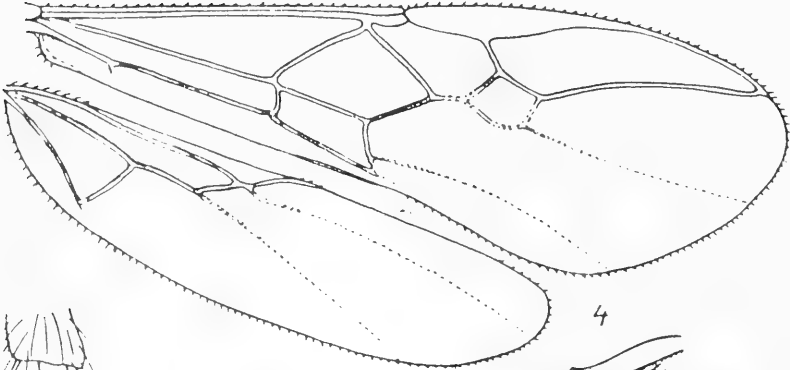
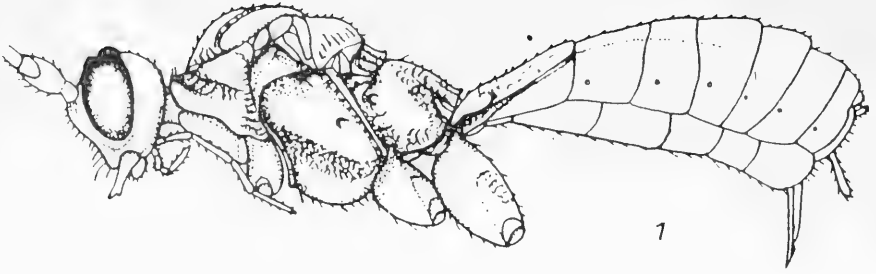
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## 12. Subfamily Orgilinae (Mimagathidinae, Microtypinae)<sup>1</sup>

The body is medium-sized, occasionally quite large, usually with a somewhat long ovipositor. The occipital ridge is somewhat reduced on the dorsal side. The prepectal ridge is developed. The discoidal cell on the forewing is sessile; only the 2nd anal vein is somewhat developed.

The composition of the subfamily is controversial (much more so in the Holarctic groups). If the proximity of genera *Orgilus* and *Microtypus* is proved (in addition to other but plesiomorphic characters) by the presence of the 2nd radiomedial vein in some individuals of the former genus (along with similarity in many other characters), then the relationship of *Charmon* (which is not easily distinguished

<sup>1</sup>Treatment by V.I. Tobias.



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from *Eubazus* of subfamily Brachistinae and even now is sometimes included in this genus) with these becomes problematic. Achterberg suggests that *Charmon* should be included in the subfamily Homolobinae (see introduction to this family), but Čapek (1969, *Proc. Entomol. Soc.*, Washington, 71, 3: 304–312) suggests that it should be included in the subfamily Macrocentrinae (later in the Orgilinae; Čapek, 1973, *Acta Inst. Forest. Zvol.*: 259–268). There are, in all, 8 genera and more than 100 species. All are endoparasites of Lepidoptera.

#### Key to Genera

- 1 (4). Second radiomedial vein not developed (rarely developed and only in aberrant individuals of *Orgilus*) (Fig. 165: 1, 2).
- 2 (3). Grooves in lower part of sides of mesothorax (sternauli) distinct, sculptured. Second section of radial vein somewhat straight (Fig. 165: 1). Height of genae usually greater than width of mandible at base. Face often distinctly bulged ..... 129. **Orgilus**
- 3 (2). Grooves in lower part of sides of mesothorax not developed (Fig. 165: 3). Second section of radial vein curved (Fig. 165: 2). Genae slightly developed, their height less than width of mandible at base. Face moderately bulged... .. 130. **Charmon**
- 4 (1). Second radiomedial vein developed, encloses triangular 2nd radiomedial cell (Fig. 165: 4). Grooves in lower part of sides of mesothorax not developed. Genae slightly developed, their height not greater than width of mandible at base. Face slightly bulged ..... 131. **Microtypus**

#### Key to Species of the Genera

129. **Orgilus** Haliday, 1833—nearly 60 species, more than 65 in the Palearctic.

- 1 (56). Only first two abdominal tergites with laterotergites, separated from tergites by a sharp bend. Tergites in apical half

267 Fig. 163. Homolobinae (from Achterberg and Tobias).

1–6—*Homolobus truncator*: 1—body, 2—lower part of head with palps, 3—1st and 2nd flagellar segments, 4—wings, 5—spurs on hind leg, male; 6—claw; 7–10—*H. infumator*: 7—propodeum and side of metathorax, 8—apex of hind tarsus, 9—wings, 10—anal cell on forewing.

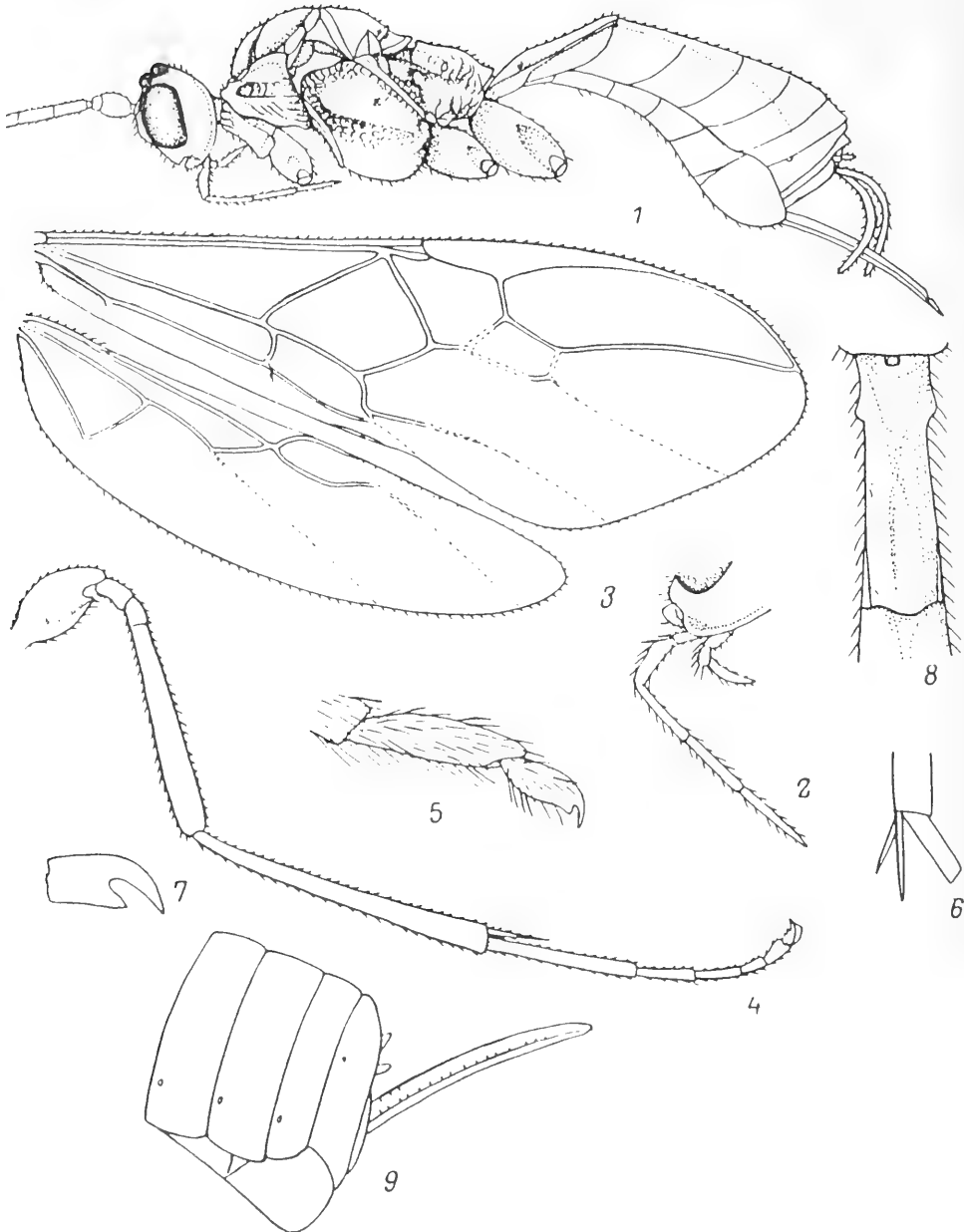


Fig. 164. Homolobinae (from Achterberg and Tobias).

1-9—*Homolobus annulicornis*: 1—body, 2—lower part of head with palps, 3—wings, 4—hind leg, 5—5th segment of hind tarsus, 6—spurs of hind leg, male, 7—claw, 8—1st abdominal tergite, 9—abdominal apex.

- of abdomen most often smooth. First tergite without distinct longitudinal ridge. (Subgenus *Orgilus* s. str.)
- 2 (21). Second abdominal tergite smooth; if somewhat punctate, then wings shortened or ovipositor almost 2 times as long as body.
- 3 ( 8). Coloration of head and thorax variable, but always with distinct brownish yellow pattern (usually almost completely brownish yellow).
- 4 ( 7). Ovipositor 1.5–2 times as long as body. Eyes and ocelli small; height of genae half longitudinal diameter of eye. Face distinctly broadened. Antennae more than 50-segmented.
- 5 ( 6). First abdominal tergite slightly broadened toward apex. Second abdominal tergite somewhat square (Fig. 165: 5). Distance between posterior ocelli same as between anterior and posterior ocelli (Fig. 165: 6). Propodeum rugose, with two median longitudinal ridges in anterior half. Hind femora 3.6 times as long as wide. Body reddish yellow. Ocelli black. Antennae in female 52-segmented. Body 9. Yugoslavia . . . . . **O. (O.) festivus** Papp
- 6 ( 5). First abdominal tergite noticeably broadened toward apex. Second abdominal tergite somewhat broad (Fig. 165: 7). Distance between posterior ocelli distinctly greater than distance between anterior and posterior ocelli (Fig. 165: 8). Propodeum smooth for greater part, without ridges, but with two median longitudinal wrinkled stripes. Hind femora almost 4 times as long as wide. Coloration usually with somewhat developed black spots. Antennae in female 54–59-segmented, in male up to 54-segmented. Body 6.5–7. South; Kazakhstan. Hungary. . . . . **O. (O.) hungaricus** Szépl.
- 7 ( 4). Ovipositor as long as body. Eyes and ocelli enlarged (ocellar diameter greater than ocellocular distance). Genae slightly developed; face square. Antennae in female 24–26-segmented, in male 23–24-segmented. Body 2.8–4.5. Central Asia . . . . . **O. (O.) turkmenus** Tel.  
Lectotype: Female, Bairam Ali, 8.VI.1932 (Bogush). Paralectotype: 3 females, same data, 9.VI. (2 females) and 24.VIII.1932. Date of collection given with description of species 6.VIII.1931. There was probably a printing error as on the specimen of the series, designated here as Lectotype, the identification label was "*Orgilus turkmenus* n. sp." (not *turkmenus*, as in the description of the species).

- 8 ( 3). Head and thorax black. Ovipositor shorter (except in *O. similis*, Szépl.). Antennae with few segments, body small.
- 9 (14). First abdominal tergite almost smooth, lustrous.
- 10 (11). Abdomen in middle brownish red; wings light colored. Propodeum almost smooth. Antennae 28–30-segmented (in male 45–50-segmented), reddish brown. Ovipositor as long as body. Forewings brown. Body 4.5–5. Azerbaidzhan. Central and southern Europe; Mongolia. .... **O. (O.) zonator** Först.
- 11 (10). Abdomen entirely black. Wings distinctly darkened.
- 12 (13). Propodeum sculptured. Ovipositor not as long as body. Head dorsally and mesonotum without granulose sculpture. Legs black. Body 3–4. South; Central Asia; Central Europe .... **O. (O.) laevigatus** Nees
- 271 13 (12). Propodeum almost smooth. Ovipositor as long as body or noticeably longer. Antennal bases black. Hind tibiae dark brown, with reddish ring. Antennae 28-segmented. Body 4–5. Western Europe ..... **O. (O.) annulator** Nees
- 14 ( 9). First abdominal tergite sculptured, as propodeum.
- 15 (16). Antennae 25-segmented. Head, thorax and 1st abdominal tergite densely punctate, matte (sides of mesothorax slightly lustrous). Second abdominal tergite slightly longer than its width at apex. Legs brownish red. Hind coxae and femora darkened. Body 2. Hungary ..... **O. (O.) minutus** Szépl.
- 16 (15). Antennae multiarticulate. Body large.
- 17 (20). Wings shortened, not distinctly reaching abdominal apex. Head and thorax densely and softly punctate, matte; sides of mesothorax slightly lustrous. Ovipositor not as long as body. Antennae 31–32-segmented. Legs yellowish brown. Hind coxae and femora darkened.
- 18 (19). Wings extending beyond apex of 2nd abdominal tergite. Basal half of flagellum and forewings brownish yellow. Body 3–4. Northwest, center, southeast; Sweden; Finland ..... **O. (O.) parvipennis** Thoms.
- 19 (18). Wings hardly reaching halflength of 1st abdominal tergite. Basal half of flagellum and forewings brown. Body 4.3. West Germany ..... **O. (O.) curtipennis** Fi.
- 20 (17). Wings not shortened, reaching abdominal apex, head dorsally and sides of mesothorax smooth, their remaining parts, 1st tergite, sometimes base of 2nd tergite slightly punctate, lustrous. Ovipositor almost 2 times as long as body. Abdomen in middle and legs brownish yellow; body elongate. Radial

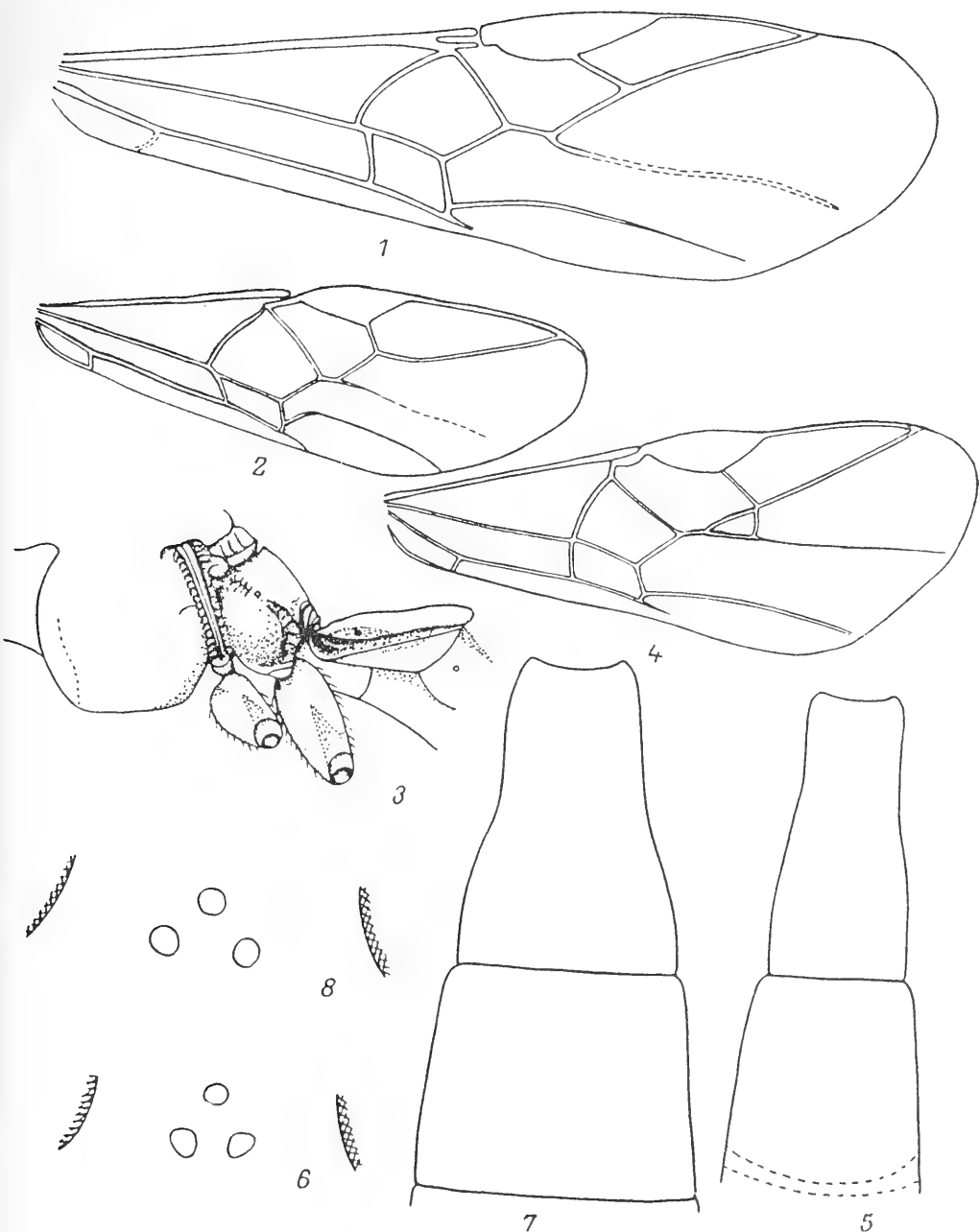


Fig. 165. Orgilinae (from Tobias, Achterberg and Papp).

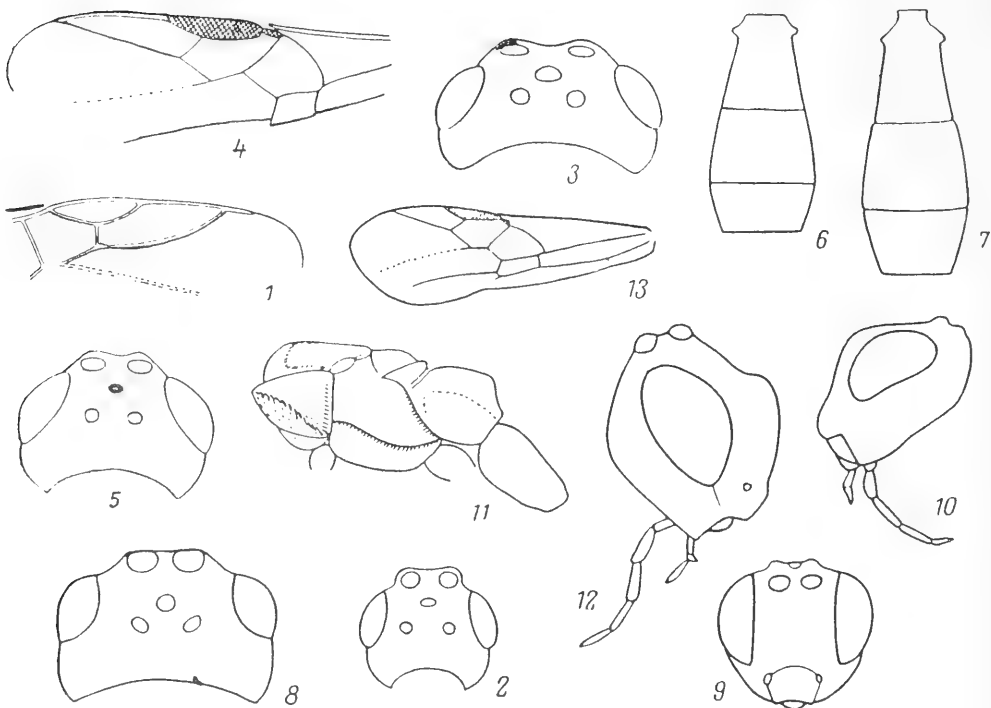
1—*Orgilus obscurator*, forewing; 2, 3—*Charmon extensor*: 2—forewing, 3—thorax (ventral view) and abdominal base; 4—*Microtypus trigonus*, forewing; 5, 6—*Orgilus festivus*: 5—1st and 2nd abdominal tergites, 6—vertex; 7, 8—*O. hungaricus*: 7—1st and 2nd abdominal tergites, 8—vertex.

cell long, terminating before the wing apex, 2nd section of radial vein curved. Antennae 34–41-segmented (in male up to 44-segmented). Body 3.5–5. South; Caucasus (Essentuki, Sochi); Hungary, Mongolia ..... *O. (O.) similis* Szépl.

21 ( 2). Second abdominal tergite sculptured.

22 (25). Second abdominal tergite noticeably longer than its width at base. Antennae about 30-segmented.

23 (24). Head dorsally and sides of mesothorax punctate, lustrous; 2nd abdominal tergite slightly punctate only at base.



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Fig. 166. Orgilinae (from Tobias, Jakimavicius and original).

1—*Orgilus radialis*, part of forewing; 2—*O. punctiventris*, head; 3, 4—*O. ponticus* sp. n.: 3—head, 4—forewing; 5—*O. pimpinellae*, head; 6, 7—1st–3rd abdominal tergites: 6—*O. dovnavi* sp. n., 7—*O. ukrainicus* sp. n.; 8—*O. obscurator*, head; 9, 10—*O. facialis*: 9—head, frontal view, 10—head, lateral view; 11—*O. grunini* sp. n., thorax; 12—*O. rufigaster*, head, lateral view; 13—*O. pimpinellae*, forewing.



- Ovipositor slightly shorter than body. Antennae 32-segmented. Legs darkened. Body 4.5. North; Spain .....  
 ..... **O. (O.) nitidus** Marsh.
- 24 (23). Head and thorax densely punctate, matte; sides of mesothorax slightly lustrous; 2nd abdominal tergite entirely sculptured. Valves of ovipositor as long as abdomen. Body 4. England .....  
 ..... **O. (O.) ischnus** Marsh.
- 25 (22). Second abdominal tergite square or wide, its length not exceeding its width at base.
- 272 26 (27). Second section of radial vein curved, basal and medial veins originate from different points of parastigma (Fig. 166: 1). Valves of ovipositor slightly shorter than abdomen. First abdominal tergite distinctly broadened toward its apex, as long as its width at apex. Second abdominal tergite distinctly broadened. Antennae as long as body, 30-segmented. Body, including abdominal tergites with dense granulate sculpture (slighter on apical abdominal tergites). Body black. Clypeus, legs, spots on apex of 1st abdominal tergite and along the sides of 2nd abdominal tergite, occasionally whole abdomen and pronotum, brownish yellow. Forewings light yellow. Wings slightly darkened. Body 3. Latvia, Moldavia; Mongolia. .... **O. radialis** Jakim.
- 27 (26). Second section of radial vein straight (Fig. 166: 13). Usually basal and medial veins originate from single point on parastigma. Valves of ovipositor longer than abdomen or, if shorter, then antennae about 40-segmented. First and 2nd abdominal tergites longer, apical tergites smooth.
- 28 (31). All abdominal tergites with granulate sculpture (weaker on posterior than on anterior ones). Radial cell narrow and long, terminates before wing apex, its anterior margin longer than stigma (Fig. 166: 4). Body, antennae, palpi and most of legs black. First abdominal tergite slightly longer than its width at apex, 2nd quite broad (approximately 1.5 times as wide as long). Sides of mesothorax smooth, sternauli crenulate.
- 29 (30). Temples approximately 10/13 of eye. Distance between posterior ocelli almost 2 times ocellocular distance (Fig. 166: 2). Valves of ovipositor significantly longer than abdomen. Face and mesonotum weakly punctate, lustrous. Body 3—3.2. Armenia ..... **O. (O.) punctiventris** Tobias
- 30 (29). Temples approximately two-thirds of eye. Distance between posterior ocelli equal to ocellocular distance (Fig. 166: 3). Valves of ovipositor as long as abdomen. Face and

mesonotum with dense granulose sculpture, matte. Basal half of hind tibiae in female contrastingly brownish yellow. Antennae 32–34-segmented. Body 3.5–4. Krasnodar Territory ..... **O. (O.) ponticus** Tobias, sp. n.

Holotype: Female, Sochi (Lazarevskoe), terraced slopes, forest, 28.IV.1975 (V. Tobias). Paratypes: 3 females, 18.IV.1975, data same; 3 males, 28.IV.1975; 2 males, 8–9.V.1975; 1 male, 12.V.1973 (damaged, without head).

- 31 (28). Posterior abdominal tergites smooth. Radial cell shorter, terminating far from wing apex, its anterior margin not longer than stigma.
- 32 (33). Valves of ovipositor shorter than abdomen by the length of 1st abdominal tergite. Antennae nearly 40-segmented. Head with dense granulose sculpture, later slightly weaker on mesonotum. Greater part of legs, antennae and pattern on abdomen yellowish red, except brown basal segment and apical part of antennae. Second abdominal tergite slightly broadened. Body 4–4.5. Parasite of *Psyche viciella* Den. and Schiff., *P. viadrina* Stor. (Psychidae). South, center; Western Europe ..... **O. (O.) rubrator** Ratz. (? *nordmani* Hellén)
- 33 (32). Valves of ovipositor not shorter, usually significantly longer than abdomen. Antennae about 30-segmented.
- 34 (51). Head behind eyes roundly narrowed (Fig. 166: 5).
- 35 (50). Abdomen dark colored, only sometimes ventrally and first 3 tergites with light pattern.
- 36 (43). Head dorsally and mesonotum without distinct granulose sculpture; sculpture if present, slight on head or mesonotum.
- 37 (42). Face with dense granulose sculpture, matte or slightly lustrous.
- 38 (41). Leg yellowish red.
- 39 (40). Valves of ovipositor significantly longer than abdomen (approximately as long as abdomen and thorax up to tegulae). Body 3.7–4; South; Kazakhstan .....  
..... **O. (O.) rudolphae** Tobias
- 40 (39). Valves of ovipositor as long as abdomen. Apex of 1st abdominal tergite and spots along sides of 2nd tergite yellowish red. Body 3.5. Moldavia ..... **O. (O.) moldavicus** Tobias, sp. n.  
Holotype: Female, Vadul-lui-Vode, 29.VIII.1963 (Talitskii). Paratype: Female, Karmanovo, 27.VIII.1963 (Talitskii).
- 41 (38). Legs black or brown. Ovipositor usually significantly longer than abdomen. Granulose sculpture on body variable, may be nearly smooth on head and mesonotum or conspicuous

- only on one of them (sometimes granulose sculpture dense; (cf. also couplet 45). Body 3–4.5. ....  
 ..... **O. (O.) pimpinellae** Niez.
- 42 (37). Face with extremely sparse punctation, lustrous, only its margin and genae with dense, slightly granulose sculpture. Antennae 25–26-segmented. Valves of ovipositor as long as abdomen and thorax up to tegulae or slightly shorter. Legs brown or reddish; occasionally, hind coxae black. Face 1.5 times as wide as high. Body 2.8–3.2. Kazakhstan .....  
 ..... **O. (O.) kazakhstanicus** Tobias, sp. n.  
 Holotype: Female, Kruglyi, 30 km north of Kolmykovo, floodplain of River Ural, found on birth-wort, 22.V.1951 (Tobias). Paratype: One female, Gur'evskaya Region, Lake Inder, karst craters, 16.V.1951 (Tobias). 1 female, Tselinogradskaya Region, 10 km north of Zhana-Arka 17.VI.1957 (Tobias).
- 43 (36). Head or both head and mesonotum with dense granulose sculpture, matte.
- 44 (49). Valves of ovipositor not as long as abdomen and propodeum together. Head above and mesonotum with similar sculpture; 3rd abdominal tergite usually smooth.
- 45 (46). Legs in greater part dark colored, in any case their hind coxae. Antennae about 30-segmented. Sternauli crenulate. Sides of mesothorax above sternauli smooth or somewhat granulosely sculptured; Fig. 166: 5, 13. Body 3–4.5. Parasite of *Phthorimaea operculella* Z. (Gelechiidae). North, northwest, center, south; Caucasus, Kazakhstan, to Far East in southern Siberia. Western Europe, Mongolia .....  
 ..... **O. (O.) pimpinella** Niez.
- 273 46 (45). Legs, including coxae, yellowish red, only upper part of hind femora at apex, apices of hind tibiae and tarsi darkened. Basal half of flagellum yellowish brown. Antennae 30-segmented.
- 47 (48). Second abdominal tergite broad, 1st tergite 1.5 times as long as its width at apex (Fig. 166: 6). Valves of ovipositor as long as abdomen and thorax up to tegulae. Body 3.5–3.7. Voronezhskaya Region ..... **O. (O.) dovnari** Tobias, sp. n.  
 Holotype: Female (partially damaged legs). Voronezh Preserve. 12.VIII.1951 (D. Dovnar). Paratype: Female (with damaged antennae, abdomen and legs), at same place. 24.V.1949 (D. Dovnar).
- 48 (47). Second abdominal tergite square, 1st tergite 1.7 times as long as its width at apex (Fig. 166: 7). Valves of ovipositor as long

as abdomen and propodeum together. Body 3.7. South ....  
 ..... **O. (O.) ukrainicus** Tobias, sp. n.

Holotype: Female Khersonskaya Region, 10 km in the east of Tsyurupinska, 31.V.1974 (Kasparyan). Paratypes: One female, "Nerubaevskaya dacha," 19.VI.1901 (Pomerantsev); 1 female, Kharkov Region, Kuryazh 27.VIII.1896 (Yaroshevskii).

- 49 (44). Valves of ovipositor as long as abdomen. Head above with granulate sculpture, matte. Mesonotum with slight granulate sculpture, sufficiently coarse, sparsely punctate, lustrous. Second abdominal tergite wide, entirely granulately sculptured; 3rd with granulate sculpture. Antennae about 30-segmented. Legs mostly black, antennae black or yellowish brown in basal half of flagellum. Wings dark. Body 2.8–3.3. Parasite of *Recurvaria nanella* Den. and Schiff. (Gelechiidae). Central Povolzhe; Armenia ..... **O. (O.) nanellae** Tobias, sp. n.

Holotype: Female, Erevan, Kanakerskii sovkhos, apricot, *R. nanella*, 15.VII.1964 (A. Avetyan). Paratypes: Kuibyshev, *R. nanella*—pest of cherry, 9.VII.1956 (Vorzhveva); 2 females and 3 males, with data of holotype 7.VII. (2 females, 1 male), 3.VII. (male), 27.VII. (male); 12 females, 14 males, at the same place, pear, cherry, sweet cherry, myrobalan, hawthorn, quince, apple, *R. nanella*, 13.VII–15.VIII.1963, 1–24.VII.1964, 15–25.VII.1965 (Avetyan, Ertevitstyan); 1 male, Erevan, garden SKhI, *R. nanella*, 25.V.1959 (Avetyan); 1 female, Artashatskii District, Village Tsakkashen, apricot, *R. nanella*, 29.VI.1964; 1 female at same place, pear, 1.VII.1964; 1 male at same place, quince, 22.VI.1965 (Avetyan); 3 males, Ashtarak, apple, *R. nanella*, 8 and 10.VII.1964, 3.VII.1967 (Avakyan, Ertevitstyan); 1 female and 1 male, Gegard magaleb cherry, *R. nanella*, 15 and 20.VII.1965 (Avetyan), 1 male, at same place, 17.VII.1963 (Ertevitstyan); 1 female, at same place, 1500 m, 17.V.1971 (Tobias); 2 females, Vokhchavert, apricot, *R. nanella*, 13 and 15.VII.1964 (Avakyan, Ertevitstyan).

- 50 (35). Abdomen entirely, legs, and often flagella in basal half yellowish red. Valves of ovipositor as long as abdomen and thorax up to tegulae or slightly shorter. Head above and mesonotum without distinct granulate sculpture, lustrous. Body 3.5–4. Azerbaidzhan, Central Asia .....  
 ..... **O. (O.) meyeri** Tel.

Lectotype: Female, Uzbekistan, Kokand, 22.IX.1927 (D. Goloviznin). Paralectotype: Female, Azerbaidzhan, Kusary, 30.V.1929 (Bocharnikov).

- 51 (34). Head somewhat broadened behind eyes (Fig. 166: 8). Mesonotum and head above without granulose sculpture. Sides of mesothorax smooth. Antennae 25–33-segmented. Forewings as in Fig. 165: 1.
- 52 (53). Abdomen black. Femora somewhat uniformly colored, black or reddish. Body 4–5. Parasite of *Rhyacionia buoliana* Den. and Schiff. (Tortricidae). West, northwest, center, south; Caucasus, Trans-Ural, Kazakhstan, Amur Region; Western Europe, China, Mongolia, North America ..... **O. (O.) obscurator** Nees
- 53 (52). Abdomen ventrally yellow, with brownish yellow spots at apex of 1st tergite and along sides of 2nd tergite.
- 54 (55). Valves of ovipositor as long as body. Femora brownish red with apical black stripe. Face wrinkled, matte. Body 4. Krasnodar Territory (Sochi), Azerbaidzhan (Nakhichevan) ..... **O. (O.) temporalis** Tobias
- 55 (54). Valves of ovipositor slightly longer than abdomen. Femora completely yellowish red. Face slightly sculptured, ventrally only softly and sparsely punctate, lustrous. Fig. 166: 9, 10. Body 3.5. Kazakhstan ..... **O. (O.) facialis** Tobias
- 56 ( 1). At least first three abdominal tergites, usually 1st to 6th separated from laterotergites by sharp bend. First to 6th tergites sculptured, 1st with two longitudinal ridges. (Subgenus *Ischiolus* Hellén).
- 57 (58). Valves of ovipositor as long as body or slightly shorter. Fifth and 6th abdominal tergites without laterotergites, separated by sharp bend, tergites beyond 2nd relatively slightly sculptured. Wings light colored, almost hyaline. Antennae 35–36-segmented. Legs brownish red, coxae, apices of hind femora, tibiae and tarsi black. Body 4–5.5. Parasite of *Depressaria depressella* Hb. (Oecophoridae). Northwest, south ..... **O. (I.) claripennis** Ivanov
- 58 (57). Valves of ovipositor not longer, usually shorter than abdomen. Fifth and 6th abdominal tergites with laterotergites; 3rd and 4th tergites, sometimes succeeding tergites also densely and coarsely sculptured. Wings darkened.
- 59 (60). Ovipositor not exerted or slightly exerted beyond abdominal apex. Femora and tibiae brownish red. Body 3. Sweden ..... **O. (I.) anurus** Thoms.

- 60 (59). Valves of ovipositor not shorter than halflength of abdomen.
- 61 (68). Recurrent and radiomedial veins far apart from each other. Tibiae light colored, but not yellow at base and slightly darkened at apex.
- 62 (65). Legs dark, hind femora black.
- 63 (64). Thorax 1.5 times as long as high. Abdomen completely black. Antennae 27–28-segmented. Body 3–4. Parasite of species of genus *Coleophora* (Coleophoridae), *Ancylis apicella* Den. and Schiff. (Tortricidae), *Apterona crenulella* Bruand (Psychidae). Northwest, center, south; Caucasus, Kazakhstan; Western Europe, Mongolia ..... **O. (I.) punctulator** Nees
- 274 64 (63). Thorax 2 times as long as high (Fig. 166: 11). Abdomen beyond 1st tergite reddish brown or brown. Antennae 30–32-segmented. Body 3.5–3.8. Parasite of *Coleophora ibipennella* Z. (Coleophoridae). Southeast ..... **O. (I.) grunini** Tobias, sp. n.  
 Holotype: Female, Yanvartsevo, right bank of River Ural, 16.VII.1950 (K. Grunin). Paratypes: Two females, same data; 1 male, at same place, 15.VII.1950 (K. Grunin).
- 65 (62). Hind femora brownish red, sometimes with black apex; abdomen usually brownish red after 2nd tergite.
- 66 (67). Thorax 2 times as long as high. Head as wide as thorax, with roundly narrowed temples. Antennae 32–35-segmented. Body 3–5. Parasite of *Coleophora cerasivorella* Pack., *C. vibicella* Hb., *C. hemerobiella* Scop., *C. consociella* Z. (Coleophoridae). West, northwest, center, south; Caucasus (Sochi); Western Europe, China ..... **O. (I.) rugosus** Nees
- 67 (66). Thorax 1.5 times as long as high. Head (Fig. 166: 12) noticeably narrower than thorax, with temples linearly narrowed. Body 3–5.5. Moldavia, Kazakhstan ..... **O. (I.) rufigaster** Tobias
- 68 (61). Recurrent vein interstitial or almost interstitial to radiomedial vein. Hind tibiae at base yellow, at apex contrastingly black. Abdomen black, antennae 26–27-segmented (in male 29–30-segmented). Body 4–4.5. Parasite of *Coleophora silenella* H.-S. (Coleophoridae). Czechoslovakia ..... **O. (I.) punctatus** Beyr, comb. n.

130. **Charmon** Haliday, 1833 (*Eubadizon* auct., part.).—Two species: one Australian and the other extremely widely distributed.<sup>1</sup>

- 1 (1). Ovipositor noticeably longer than body, rarely equal to it or shorter (var. *brevicauda* Hellén). Second abdominal tergite smooth, occasionally sculptured; 1st tergite sculptured. Thorax on sides and ventrally, scutellum, occasionally thorax, almost entirely yellowish brown, rarely black. Antennae 41–46-segmented (Fig. 165: 2, 3). Body 4.2–6. Parasite of *Tortrix viridana* L., *Zeiraphera rufimitrana* H.-S., *Z. griseana* Hb., *Archips rosana* L., *Grapholitha molesta* Busek, *Blastesthia posticana* Zett., *Rhyacionia buoliana* Den. and Schiff., *Piniphila decrepitana* H.-S., *Ancylis mitterbacheriana* Den. and Schiff., *Notocelia roborana* Den. and Schiff., *Hedya pruniana* Hb., *Apotomis semifasciana* HW., *Laspeyresia pomonella* L., *Pammene fasciana* L., *Choristoneura diversana* Hb., *C. muriana* Hb., *C. fumiferana* Clemens, *Epinotia immundana* F.R., *E. nigricana* H.-S., *E. pusillana* Peyer., *E. tenerana* Den. and Schiff. (Tortricidae), *Earias chlorana* L. (Noctuidae), *Psoricoptera gibbosella* Z., *Anacamptis populella* Cl., *Anarsia lineatella* Z., *Gelechia hippophaella* Schr. (Gelechiidae), *Agonopterix nervosa* Hw., *Depressaria pastinacella* Dup., *Hofmannophila pseudospretella* Stt. (Oecophoridae), *Tischeria ekebladella* Bjerck. (Tischeridae) and other lepidopterans. Whole Palearctic, Nearctic, Africa, India ...  
..... *C. extensor* L. (*cruentatus* Hal., *brevicauda* Hellén).

131. **Microtypus** Ratzeburg, 1848.—Seven species, 3 in the Palearctic.

- 1 (4). Distance between posterior ocellus and eye greater than ocellar diameter or equal to it. Body with black pattern. First abdominal tergite longitudinally wrinkled. Propodeum sculptured.
- 2 (3). Stigma yellow or yellowish brown (Fig. 165: 4). Body 4.5–6. Parasite of *Gelechia tragicella* Heyd. (Gelechiidae), *Acrobasis consociella* Hb. (Phycitidae). Center, east, south;

<sup>1</sup> van Achterberg. 1979 (*Tijdschr. Entomol.*, 122: 263–270) distinguishes 2 species in the Palearctic. However, the distinction between them is primarily in pale shades of coloration (in *C. cruentatus* the middle and hind tibiae and tarsi have the same coloration while in *C. extensor* the tibiae are light colored) and the wide variability in the length of the ovipositor (in the first 0.6–1.20 mm, and in the second, 1.21–1.55 mm).

- Transcaucasia, Tadzhikistan, Altai, Pacific Coastal Region; Western Europe, Mongolia, China ..... **M. trigonus** Nees
- 3 (2). Stigma black. Body 4–5. Parasite of *Acrobasis consociella* Hb. (Phycitidae). Krasnodar Territory (Sochi); Western Europe ..... **M. wesmaeli** Ratz.
- 4 (1). Distance between posterior ocellus and eye less than ocellar diameter, rarely equal to it. Body entirely brownish yellow. First abdominal tergite almost smooth. Propodeum slightly sculptured. Body 3.5–6.5. Central Asia; Iran, Mongolia .... **M. desertorum** Shest. (*mongolicus* Fahr.)
- Lectotype: Female “Khiva, Ravat” 9.V.1927 (V. Gussakovskii). Paralectotypes: Three females, same data, 1 male, same place, 20.VI.1927 (V. Gussakovskii); 1 female, Krasnovodsk, 15.VI.1926. On light (V. Gussakovskii).

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### 13. Subfamily Sigalphinae<sup>1</sup>

These are large (6–11 mm), dark ichneumon flies with a short ovipositor and the first three sculptured abdominal tergites forming a shield. Wing venation is complete (only 2nd anal cross-vein not developed). The occipital ridge is reduced in the middle or reduced totally (*Acampsis*). The prepectal ridge is developed. Notaulices and sternauli are deep. The prescutellar pit is deep, with a sharp longitudinal carina in the middle. They are the sole endoparasites of lepidopterans. Three genera, two in the Palearctic; 8 species.<sup>2</sup>

#### *Key to Genera and Species*

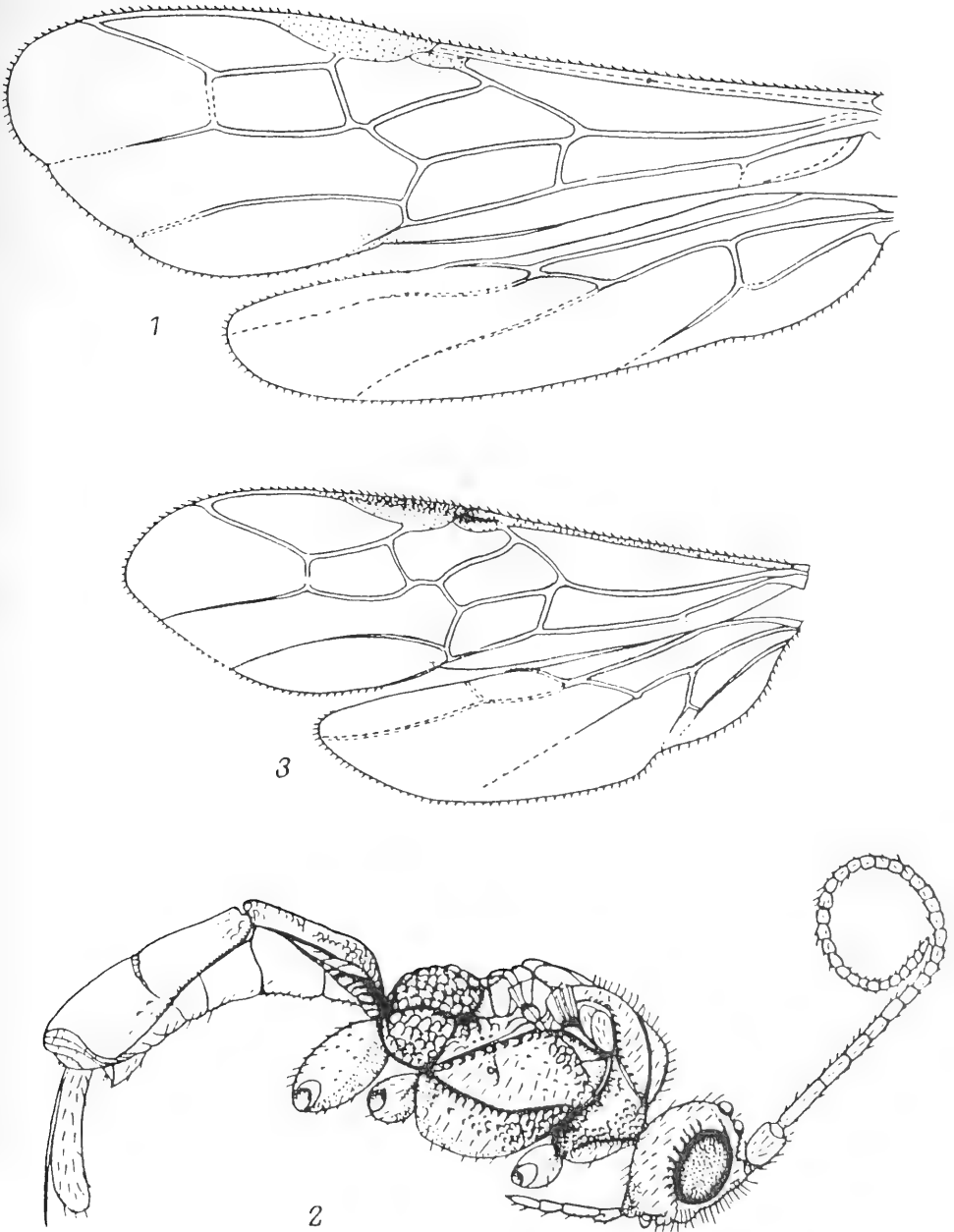
- 1 (2). Abdomen broadened toward apex. Third tergite on lower side with two denticles, and dense appressed golden hairs; 1st tergite sharply elevated in basal third, with two strong carinae and a weak third in middle. Scutellum flat ..... 132. **Sigalphus**
- 276 2 (1). Abdomen longitudinally oval; 3rd tergite without denticles, with sparse hairs. First tergite slightly elevated in basal third, with weak carinae. Scutellum bulged ..... 133. **Acampsis**

132. **Sigalphus** Latreille, 1802.—Five species, 2 in the Palearctic (besides *S. mongolicus* Tobias from Mongolia, given below).

<sup>1</sup> Treatment by V.I. Tobias.

<sup>2</sup> Probably subtribe Minangina (De Saeger, 1948. *Explor. Parc. Nation.* Albert, 53: 272) belongs to this subfamily with three genera and 9 species from Africa.





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Fig. 167. Sigalphinae (from Achterberg).

1—*Sigalphus irrorator*, wings; 2, 3—*Acanpsis alternipes*: 2—body, 3—wings.

- 1 (1). Propodeum with 2 ridges outlining areola. Sides of metathorax with coarse oval and semioval folds. Body black, hind tibiae brownish yellow. Fig. 167: 1. Body 9–11. Parasite of *Acronicta psi* L., *A. tridens* Den. and Schiff., *A. aceris* L., *Mamestra pisi* L., *Calophasia lunula* Hfn. (Noctuidae). Center, south; Ural (Chelyabinskaya Region), southwest, and eastern Siberia, Far East; Western Europe, Japan ..... *S. irrorator* F.

133. *Acampsis* Wesmael, 1835.—One species.

- 1 (1). Propodeum with two slight longitudinal ridges as also sides of metathorax, densely and uniformly rugose-punctate. Body black, legs yellowish red with black pattern. Fig. 167: 2, 3. Body 6–8. Center, southwest; Pacific Coastal Region, Western Europe ..... *A. alternipes* Nees

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#### 14. Subfamily Agathidinae<sup>1</sup>

These are medium and large (up to 12–14 mm) ichneumon flies, often with a long ovipositor. Wing venation is complete, but shifted mediad (short radial and 2nd radiomedial cells). The brachial cell is open and the 2nd anal cross-vein is not developed. The longitudinal cubital vein on the hind wing is developed (Figs. 168; 169: 2). The occipital ridge is not developed; the labiomaxillary complex often forms a somewhat long proboscis; the head (genae) is normally extended distinctly downward (Figs. 169: 2; 170: 1).

There are about 45 genera, most of which are distributed in the tropics (species in genera number more than 750 in all). They are parasites of lepidopterans, developing inside 1st instar caterpillars of the polypede type distinguished from other braconids by leg-like outgrowths on most body segments.

#### *Key to Genera*

- 1 ( 8). Head (frontally) not wide or slightly wide but slightly less than thorax in height (not less than two-thirds), usually distinctly produced downward so that height of genae equals longitudinal diameter of eye or (except in rare cases) with linear genae. Proboscis often distinctly developed (Fig. 170: 1);

<sup>1</sup> Treatment by V.I. Tobias.

width of head not more than 2 times its length; occiput deeply excavate, temples somewhat normally developed.

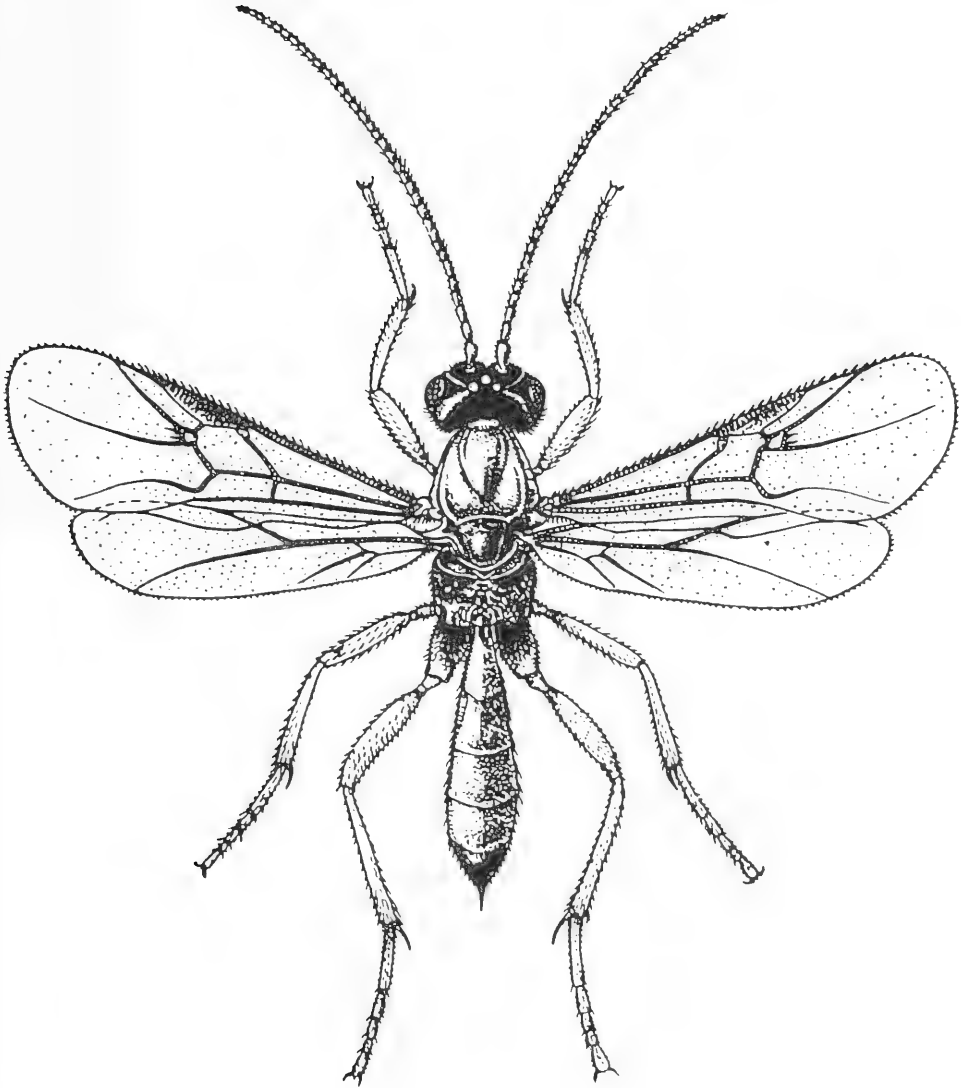
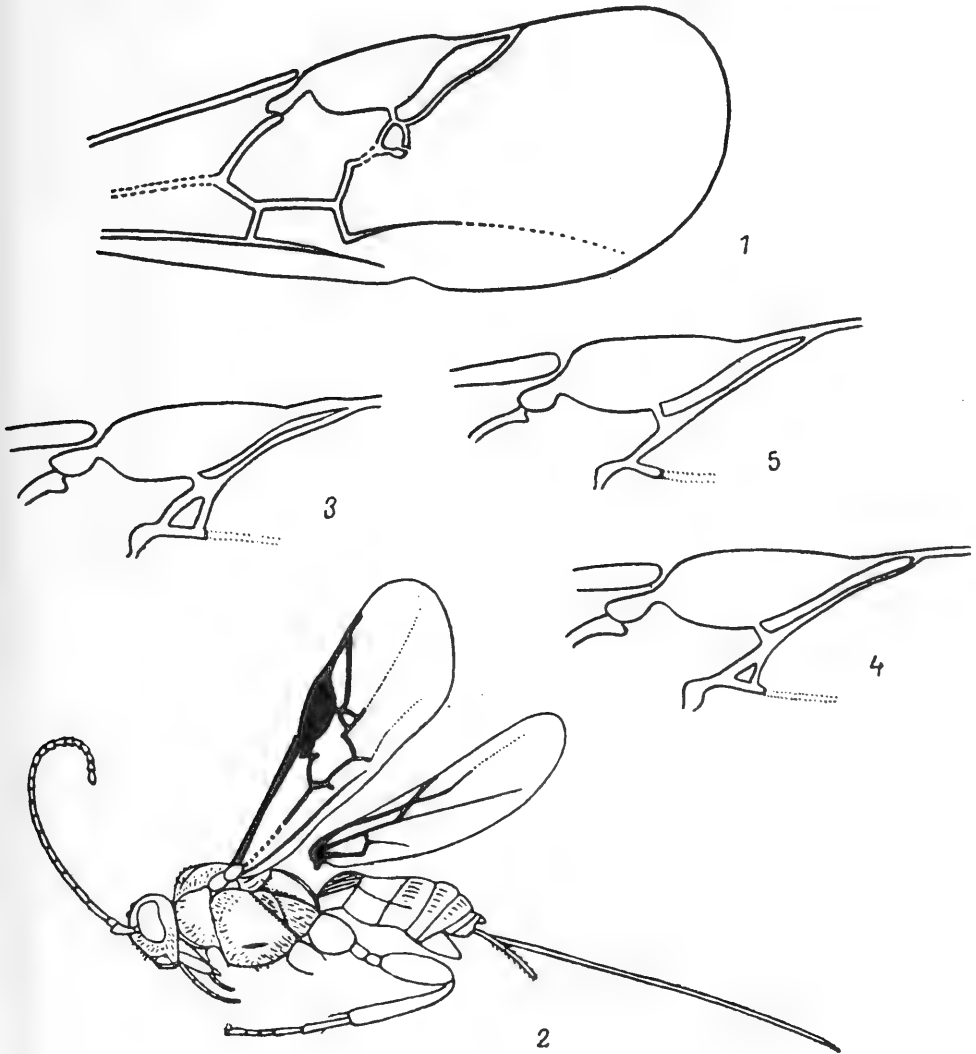


Fig. 168. Agathidinae.

*Disophrys inculcator* L.

- 2 ( 5). Second radiomedial cell with somewhat developed downward directed process, approximately square in shape (as in Fig. 171: 13d). Frons between antennal bases with two odontoid processes (Fig. 170: 1, 2).
- 3 ( 4). Sides of mesothorax coarsely sculptured by longitudinal grooves in lower part. Ovipositor short, slightly exerted. Head broader than thorax (Fig. 168) ..... 134. **Disophrys**
- 4 ( 3). Sides of mesothorax smooth, without grooves. Ovipositor slightly shorter than abdomen. Head not broader than thorax ..... 135. **Vipio**
- 5 ( 2). Second radiomedial cell without process, usually triangular or trapezoid, or nearly triangular (Fig. 169: 1). Frons between antennal bases without odontoid processes. Antennal sockets at midpoint level of eyes, significantly below the flat ocellar field. Claws not bifurcate, often with wide odontoid process at base (Fig. 170: 4). Propodeum without fields, only with somewhat distinct longitudinal ridges. Abdomen longer than thorax. Ovipositor long, not shorter, rarely slightly shorter than abdomen.
- 6 ( 7). Clypeus denticulately projecting forward (Fig. 170: 8, 9). Mesonotum with deep longitudinal depression in middle. Lateral part of pronotum extremely wide, overlapping mesonotal margins above (Fig. 170: 10). ..... 136. **Rhamphagathis**
- 7 ( 6). Clypeus not projecting forward (Fig. 171: 8, 9). Mesonotum uniformly bulged, without longitudinal depression in middle; lateral parts of pronotum less wide and not overlapping mesonotal margins above (Fig. 169: 2) ..... 137. **Agathis**
- 8 ( 1). Head conspicuously wide, almost half (not more than two-thirds) of thorax in height, not produced downward, genae protuberant, their height significantly less than longitudinal diameter of eye. Temples extremely short, distinctly roundly narrowed (in *Euagathis* all these characters indistinct). Proboscis slightly developed, hardly protruding or not protruding. Head more than 2 times as wide as long, occiput slightly and widely excavate.
- 9 (10). First radiomedial and discoidal cells divided by vein, latter only rarely sclerotized slightly in middle. Sides of mesothorax without grooves on lower part. Notaulices weak, absolutely smooth in middle. Valves of ovipositor somewhat thick, with numerous coarse black hairs. Bristles in enclosed cells of

forewing extremely sparse. Body with strikingly large number of long white hairs. Fig. 175 ..... 140. Earinus



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Fig. 169. Agathidinae (from Alekseev, Fischer and original).

1—*Agathis verae* sp. n., forewing; 2—*A. rufipalpis* Fi.; 3–5—*Microdus liogaster*, variation in 2nd radiomedial cell.

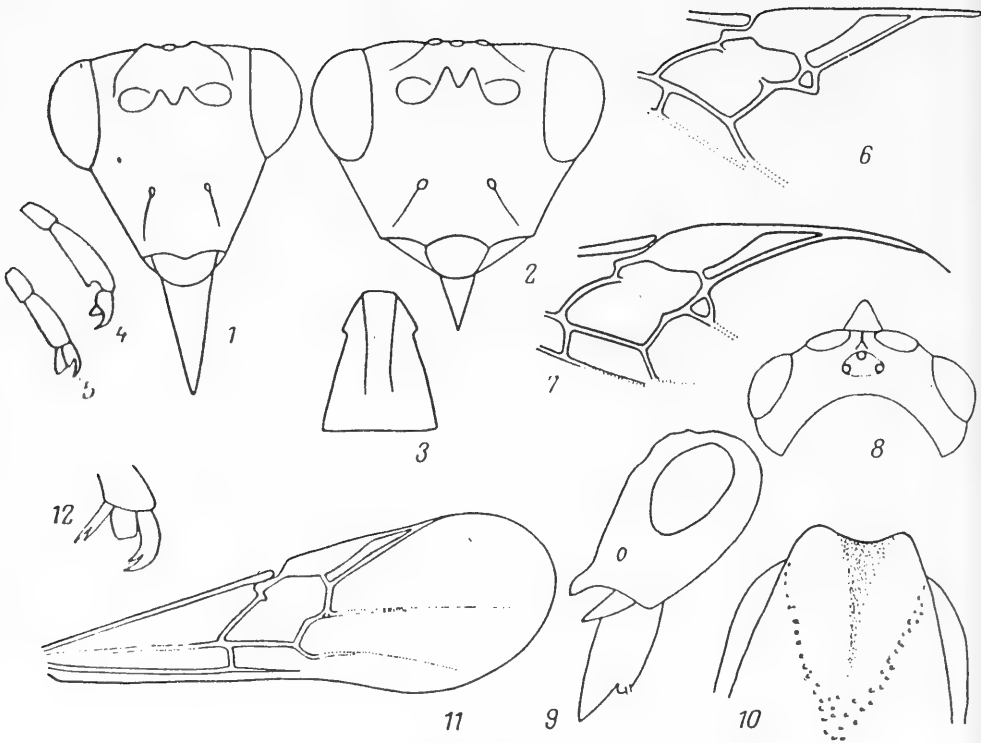
- 277 10 ( 9). First radiomedial and discoidal cells confluent (Fig. 170: 6, 7). If sometimes divided by vein, then latter weakly sclerotized in middle. Sides of mesothorax in lower part with longitudinal grooves (sternauli), latter sometimes weak and short. Notaulices deep. Valves of ovipositor not thickened, with gray coarse hairs.
- 11 (16). Claws simple, not bifurcate (sometimes broadened lobately at base). Ovipositor long, usually not shorter than abdomen, rarely slightly shorter than abdomen.
- 12 (15). Abdomen normally long, slightly longer than thorax, its 1st segment significantly shorter than distance from it to tegulae. Second tergite not longer than its width.
- 13 (14). Radiomedial veins of forewing separate from each other or fused only anteriorly, forming in such case pedunculate 2nd radiomedial cell. Even though 1st abdominal tergite usually with longitudinal wrinkles, in any case, always with wrinkles when sculptured (Fig. 174). ..... 138. **Microdus**
- 14 (13). Both radiomedial veins completely fused, forming only one radiomedial vein. Second radiomedial cell not developed (Fig. 170: 11). Tergites in basal part with fine granulose sculpture or smooth, with clear longitudinal folds .....  
..... 139. **Baeognatha**
- 15 (12). Abdomen extremely long, with distinctly stretched segments, almost 2 times as long as thorax. Length of 1st abdominal tergite equal to distance from it to tegulae. Second tergite longer than its width. Second radiomedial vein with process. Second and 3rd abdominal tergites with coarse longitudinal folds ..... 141. **Braunsia**
- 278 16 (11). Claws bifurcate (Fig. 170: 12). Ovipositor extremely short. Propodeum with fields.
- 17 (18). Eyes not enlarged, in longitudinal diameter slightly longer than genae. Temples well developed. Antennal sockets, at level of upper part of eyes, almost in same plane with ocellar field. Ocelli not developed ..... 142. **Euagathis**
- 18 (17). Eyes greatly enlarged, genae and temples weakly developed. Antennal sockets significantly below level of upper part of eyes and plane of ocellar field. Ocelli enlarged (their diameter greater than distance from posterior ocellus to eye) (Fig. 176). ..... 143. **Zelomorpha**

*Key to Species in the Genera of Subfamily Agathidinae*

134. **Disophrys** Förster, 1862.—About 100 species, mainly in the tropics; 10 in Palearctic (in the southern parts); 5 in the fauna of the USSR.

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- 1 (2). Outer spur of hind tibiae flattened, obliquely truncate on upper side of apical half, concave on lower side. Eyes slightly protuberant along sides of head, temples short. First abdominal tergite 2 times as long as its width at apex. Sternauli crenulate. Body completely or on ventral side of thorax yellowish red. Dorsomedial spot on head, proboscis and sometimes (in lectotype!) abdomen black; wings smoky, light colored at bases. Body 7.5–10.5. Central Asia ..... **D. calcatrix** Tel.  
Lectotype: Female, mountain range Peter the Great, "mountain pass Zakh-Bursi, 5.VII.1917 (K. Gol'beka)"  
Paralectotypes: Three females (one without forewings), data same.
- 2 (1). Outer spur of hind tibiae not flattened, uniformly tapering toward apex.
- 3 (4). Wings slightly darkened, near enclosed cells yellowish, beyond them gray. Veins and stigma yellow. Body completely or thorax and head dorsally brownish yellow. Sometimes abdomen with somewhat developed black pattern. Body 5.7–10.2. Central Asia ..... **D. manifesta** Kok.  
(*sculpturata* Shest. *obliterata* Shest., syn. n.)
- 4 (3). Wings smoky to almost black. Veins and stigma brownish or black. Thorax usually with developed black pattern.
- 5 (6). Eyes protuberant along sides of head (Fig. 170: 1). Sternauli without transverse folds or short. Body, including ventral and lateral sides of thorax (sometimes whole of thorax) yellowish brown; dorsal spot on head and proboscis (sometimes also head frontally), coxae, occasionally abdominal apex, black. Fig. 168. Body 6–8. Caucasus (Azerbaijan), Central Asia ..... **D. inculcator** L.
- 6 (5). Eyes slightly protuberant along sides of head (Fig. 170: 2). Sternauli with transverse folds (their maximum length often about half height of side of mesothorax).
- 7 (8). Temples (dorsally) approximately half size of eye. Body usually yellowish brown, rarely head and thorax black. Body 6.5–9. South (to Poltava-Kharkov in the north);



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Fig. 170. Agathidinae (from Tobias).

1, 2—head: 1—*Disophrys inculcator*, 2—*D. dissors*; 3—*Earinus tuberculatus*, 1st abdominal tergite; 4, 5—apex of hind tarsus: 4—*Microdus calculator*, 5—*M. rufipes*; 6, 7—part of forewing: 6—*M. pumilus*, 7—*M. cingulipes*; 8–10—*Rhamphagathis nasicornis*: 8—head, dorsal view, 9—head, lateral view; 10—mesonotum; 11—*Baecognatha armeniaca*, forewing; 12—*Euagathis semenovi*, claw.

Caucasus, Central Asia; Western Europe ..... **D. dissors** Kok.

Lectotype: Female, "Trans-Caspian [iisk] region (Var-entsov)". Paralectotype: One female without forewing, data same.

8 ( 7). Temples approximately  $10/13$ – $2/3$  of eye. Head and thorax black, rarely mesonotum light colored. Abdomen and legs (except coxae) yellowish brown. Body large: 10–11. Caucasus; Southwestern Europe, North Africa ..... **D. caesia** Klug



135. *Vipio* Latreille, 1804 (*Cremnops* Först.).—More than 50 species (mainly in the tropics), 3 species in Palearctic outside the USSR, 1 species in the USSR fauna.

- 280 1 (1). Body brownish yellow, wings smoky with transverse light colored bands or with light and dark colored bands. Body 6–8. Parasite of *Laspeyresia pomonella* L. (Tortricidae), *Eurrhypara hortulata* L. (Pyraustidae), *Aegeria spheciformis* Den. and Schiff. (Sesiidae). Whole of Palearctic; India, Burma .....  
..... V. *desertor* L.

136. *Rhamphagathis* Tobias, 1962.—One species.

- 1 (1). Hind femora thickened, 3 times as long as wide. Ovipositor as long as abdomen. Body black, hind femora brown. Fig. 170: 8–10. Body 3.5–4. West (Litva), south; Hungary ..... *R. nasicornis* Tel.  
Lectotype: Female, Kharkov Region, “K.S. [?Kuryazh], 30.VIII.1885 (Yaroshevskii).”

137. *Agathis* Latreille 1805<sup>1</sup>.—About 150 species; nearly 60 in the Palearctic; significant number of them described on the basis of variable characters and they are probably only variants of species described earlier. East Siberian *A. genalis* Tel. (Fig. 172: 7) from the USSR is not included in the key.

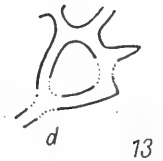
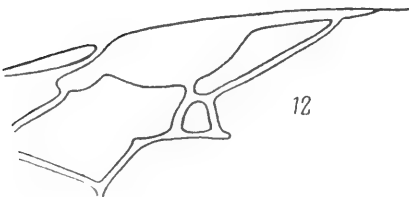
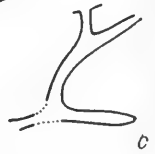
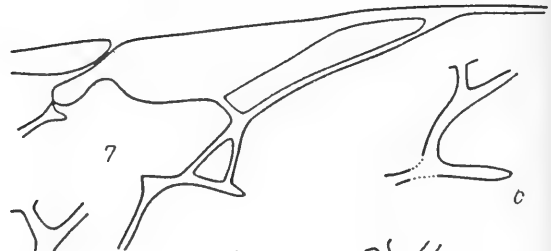
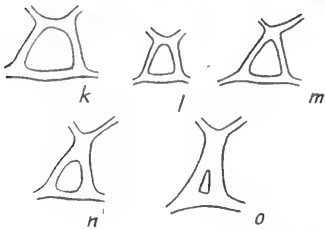
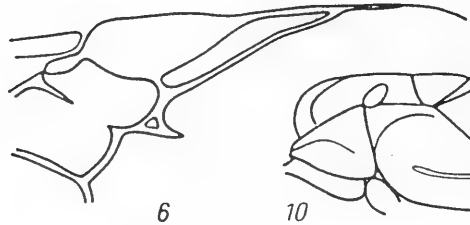
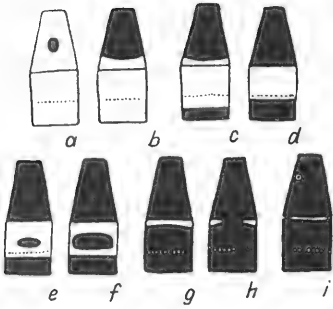
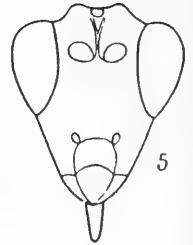
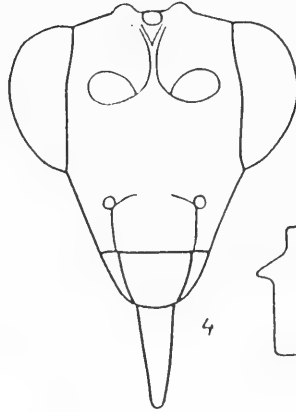
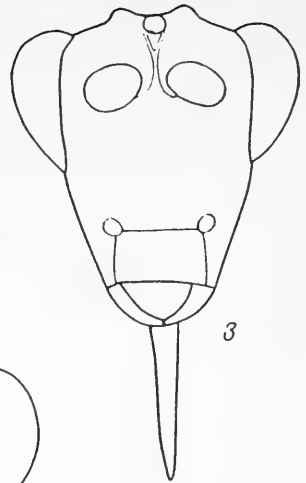
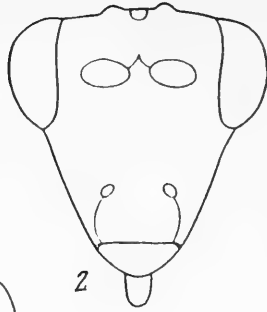
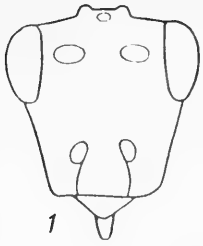
- 1 (2). Head slightly narrowed toward lower side (Fig. 171: 1). Ocellar field slightly elevated, its width hardly less than ocellular distance. Second radiomedial cell pedunculate (Fig. 171: 6). Antennae 32–36-segmented. Ovipositor as long as or slightly shorter than abdomen. Body red-yellow, usually thorax except pronotum and mesonotum black. Body 6–8. Center, south; Caucasus, Kazakhstan, Siberia (Omsk, Irkutsk); Western Europe ..... *A. glaucoptera* Nees
- 2 (1). Head distinctly narrowed toward lower side (Fig. 171: 2); ocellar field slightly elevated, its width 2 times ocellular distance. Second radiomedial cell not pedunculate or with short peduncle (Fig. 171: 7).
- 3 (6). Height of genae noticeably greater than longitudinal diameter of eye. Ovipositor as long as body. Body (including abdomen) with light colored pattern.

<sup>1</sup>Tobias, 1963. *Entomol. Obozrenie*, 42, 4: 864–883.

- 4 ( 5). Notaulices sculptured. Propodeum uniformly finely rugose-alveolate, with slight longitudinal ridges. Head usually almost completely and thorax except its apex, black. Second radio-medial cell (including peduncle) of same width as stigma (Fig. 171: 7). Body 4.5–5. Northwest, south; Caucasus, Central Asia; Western Europe, Turkey .... **A. syngenesiae** Nees
- 5 ( 4). Notaulices smooth. Propodeum slightly rugose, with coarser sculpture only at apex, with two ridges in middle. Body entirely reddish yellow, 5. Central Asia (Tadzhikistan) .....  
.....**A. tadzhica** Tel.
- 6 ( 3). Height of genae not more, usually less than longitudinal diameter of eye. Second radiomedial cell small, its width much less than width of stigma. Propodeum usually with two distinct longitudinal ridges, often smooth along sides.
- 7 (14). Proboscis longer than height of head or equal to it (Fig. 171: 8, 9). Ovipositor much longer than abdomen. Longitudinal grooves on lower part of sides of mesothorax (sternauli) often not developed. Antennae 22–26-segmented. Height of genae not more than  $\frac{2}{3}$  longitudinal diameter of eye.
- 8 ( 9). Sternauli not developed. Proboscis much longer than height of head. Notaulices smooth. Ovipositor as long as abdomen and thorax up to tegulae. Body, including hind coxae, black, 4–5. Crimea, Caucasus (Armenia) ..... **A. taurica** Tel.  
Lectotype: Female, Sevastopol (without date). Paralectotypes: Same place, 1 male, 20.VI. and 1 female and 1 male, 1.VII.1912 (Pliginskii); 1 female “Alma, west coast of Crimea”, 5.VI.1899 (Bezhenov).
- 9 ( 8). Sternauli as deep sculptured grooves. If, rarely, not developed, then notaulices sculptured and proboscis hardly longer than head or ovipositor much longer.
- 10 (11). Notaulices sculptured. Proboscis slightly narrowed toward apex (Fig. 171: 8) (cf. also couplets 47 and 55) .....  
.....**A. montana** Shest.
- 11 (10). Notaulices smooth or slightly sculptured. Proboscis distinctly narrowed toward apex (Figs. 171: 9; 172: 3).
- 12 (13). Proboscis slightly longer than head (Fig. 172: 3). Thorax 1.3–1.5 times high (Fig. 172: 8). Ovipositor as long as thorax and abdomen together, or somewhat shorter. Body 4–5. Kazakhstan .....**A. kazachstanica** Tobias
- 13 (12). Proboscis much longer than head (Fig. 171: 9). Thorax 2 times as long as high (Fig. 171: 10). Ovipositor as long

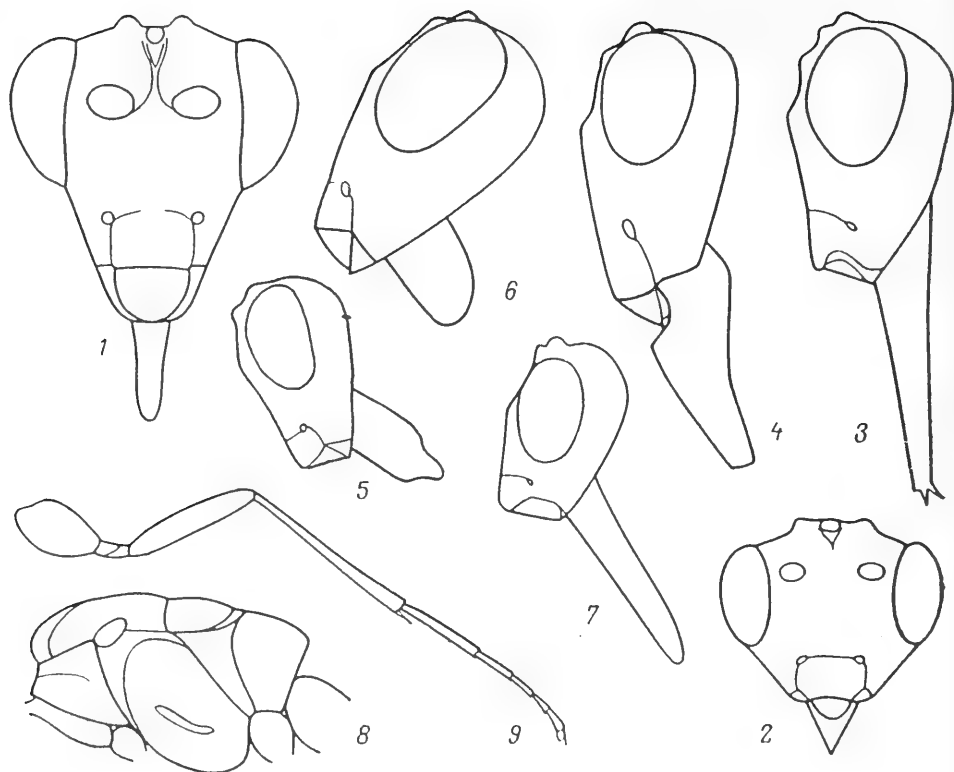
- as body. Body 3.5–5. Parasite of *Cochylus roseana* Hw., *Psycholomalecheana* L., *Acleris quercinana* Z. (Tortricidae), *Coleophora argentula* Z., *C. vestianella* L., *C. meridionella* Rbl. (Coleophoridae), *Pyrausta sambucalis* Den. and Schiff., *P. aurata* Sc. (Pyraustidae), *Apodia bifractella* Dup., *Isophric-tis striatella* Den. and Schiff., *Scrobipalpa atriplicella* F.R., *Metzneria metzneriella* Stt. (Gelechiidae). West, center, south; Caucasus, Kazakhstan; Western Europe, Iran, Mongolia ...  
 ..... **A. nigra** Nees
- 14 ( 7). Proboscis shorter than height of head; if not shorter, then ovipositor nearly as long as abdomen. Sternauli developed.
- 15 (82). Hind femora of normal length (not more than 5 times as long as their width in middle). Tarsal segments shorter.
- 16 (17). Second abdominal tergite square, its central elevation rounded. Head slightly narrowed posteriorly, temples half size of eye. Genae as high as longitudinal diameter of eye. Body black. Second abdominal tergite red-brown. Body 7. Kazakhstan ..... **A. tatarica** Tel.<sup>1</sup>
- 17 (16). Second abdominal tergite broad, with broadly oval central elevation.
- 18 (23). Notaulices not developed or extremely weak, smooth.
- 19 (20). Sternauli developed. Ovipositor as long as abdomen with propodeum. Body reddish yellow, only head and sometimes thorax ventrally with somewhat dark pattern. Body 5. Kazakhstan ..... **A. rubens** Tobias
- 20 (19). Sternauli not developed, if developed, then ovipositor not shorter than body, and body black.
- 21 (22). Body brownish red. Longitudinal ridges sharp in basal (horizontal) part of propodeum, in apical part smooth. Body 5. Azerbaijan, Kazakhstan ..... **A. adzhulphensis** Abdinb.
- 22 (21). Body black, tibiae, sometimes femora also, yellowish brown. Longitudinal ridges in basal part of propodeum smooth, in apical more distinct. Sternauli sometimes developed. Body 4.5. Caucasus ..... **A. levis** Abdinb.
- 23 (18). Notaulices deep, sculptured.
- 24 (31). Thorax with reddish pattern.
- 25 (26). Height of head greater than its width. Longitudinal diameter of eye equal to height of gena (Fig. 171: 3). Ovipositor as long

<sup>1</sup>*A. tatarica* Tel. and *A. tadzika* Tel. (cf. couplet 5) are included in the key only on the basis of descriptions. The type, probably, is lost.



- as body or slightly longer. Wings smoky. Body 4.5–7.5. Parasite of *Metzneria lappella* L., *M. aestivella* Z. (Gelechiidae). South; Caucasus, Kazakhstan, Central Asia; Western Europe  
 ..... **A. umbellatarum** Nees
- 26 (35). Height of head equal to its width or slightly less. Longitudinal diameter of eye greater than height of gena (Fig. 171: 4). Ovipositor as long as thorax and abdomen together.
- 27 (30). Wings light colored. Body with profuse yellowish red pattern. Proboscis shorter than height of face with clypeus (Fig. 172: 1).
- 28 (29). Anterior margin of radial cell noticeably longer than half length of stigma. Propodeum with distinct longitudinal ridges. Head, thorax, ventrally and laterally, coxae and 1st abdominal tergite black. Stigma brown. Body 4–5. Southeast; Kazakhstan ..... **A. arida** Tobias
- 283 29 (28). Anterior margin of radial cell shorter than half length of stigma (Fig. 169: 1). Propodeum slightly sculptured along median line, its longitudinal ridges not distinct. Body completely reddish yellow, stigma yellowish. Body 3.3. Western Kazakhstan ..... **A. verae**, sp. n.  
 Holotype: Female, River Derkul, Block Kuznetsovo. 25.VI.1949 (V. Rudolf).
- 30 (27). Wings smoky. Thorax on mesonotum and pronotum or only along notaulices yellowish red. Head, thorax ventrally and laterally black. Abdomen at apex black, at base red-yellow. Proboscis equal to height of face with clypeus or slightly longer. Body 3.5–6. South (Crimea); Central Asia .....  
 ..... **A. gussakovskiyi** Tobias
- 31 (24). Thorax completely black.
- 32 (33). First abdominal tergite with sharply projecting spiracular tubercles (Fig. 171: 11). Propodeum with sharp longitudinal

1–5—head, frontal view: 1—*Agathis glaucoptera*, 2—*A. syngenesiae*, 3—*A. umbellatarum*, 4—*A. arida*, 5—*A. assimilis*; 6, 7—part of forewing: 6—*A. glaucoptera*, 7—*A. syngenesiae*; 8—*A. montana*, head, lateral view; 9, 10—*A. nigra*: 9—head, lateral view, 10—thorax; 11—*A. jakowlewii*, 1st abdominal tergite; 12—*A. malvacearum*, part of forewing, a–i—variation in color of 1st–3rd abdominal tergites, k–o—variation in 2nd radiomedial cell; 13(a–d)—*A. montana*, variation in 2nd radiomedial cell.



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Fig. 172. Agathidinae (from Tobias and original).

1, 2—head, frontal view: 1—*Agathis arida*, 2—*A. zaisanica*; 3—7—head, lateral view: 3—*A. kasachstanica*, 4—*A. laticarpa*, 5—*A. schmieedekechti*, 6—*A. ferulae*, 7—*A. genalis*; 8—*A. kasachstanica*, thorax; 9—*A. tenuipes*, hind leg.

- ridge, depressed in middle (male). Body 2.5. Center .....  
 ..... *A. jakowlewi* Kok.<sup>1</sup>  
 33 (32). First abdominal tergite without spiracular tubercles or the latter weak. Propodeum uniformly bulging, usually with two longitudinal ridges.  
 34 (37). Ovipositor as long as body including thorax.

<sup>1</sup>This probably represents only a morphological aberration of species without such tubercles on 1st abdominal segment but with two ridges on the propodeum.

- 35 (36). Wings brownish. First abdominal tergite longitudinally wrinkled, 2nd smooth or wrinkled around central elevation. Body 3. Kazakhstan ..... **A. gracilentia** Tobias
- 36 (35). Wings hyaline-light colored or slightly yellowish darkened. Abdomen entirely smooth, occasionally 1st tergite slightly sculptured along sides at base. Body 4.5–6.5. Kazakhstan ..  
..... **A. serratulae** Tobias
- 37 (34). Ovipositor not longer, at most slightly longer than body. If, occasionally, much longer than body (*A. malvacearum*), then either body larger than 3, or wings darkened.
- 38 (39). Forewings and usually stigma yellow. Hind femora thickened (2.5 times longer than wide), reddish yellow or black with yellowish apices. Anterior margin of radial cell half length of stigma. Second abdominal tergite smooth or slightly sculptured. Ovipositor as long as abdomen and thorax or abdomen and propodeum together. Wings light colored. Fig. 172: 2. Body 3–3.5. Kazakhstan; Mongolia ..... **A. zaisanica** Tobias
- 39 (38). Forewings black or brown. Stigma brown to nearly black. Hind femora usually not thickened, not less than 3 times as long as wide.
- 40 (63). Ovipositor much longer than abdomen, usually not shorter than thorax and abdomen together.
- 41 (42). Second abdominal tergite absolutely smooth. Ovipositor usually, though slightly, longer than body. Head as high as wide. Proboscis slightly shorter than height of head. Antennae 25–28-segmented. Coloration of abdomen and legs various. Often reddish pattern (*malvacearum* auct.) on 2nd and 3rd abdominal tergites, or abdomen entirely black, legs brownish red (var. *simulatrix* Kok.), or hind femora black (var. *tibialis* Nees). Figs. 171: 12, 173. Body 4.5–7.5. Parasite of *Leioptilus scarodactyla* Hb. (Pterophoridae), *Pexicopia malvella* Hb., *Metzneria lappella* L., *M. aestivella* Z. (Gelechiidae). Whole Palearctic, except northern regions .....  
..... **A. malvacearum** Latr. (*tibialis* Nees, *simulatrix* Kok., *glabricollis* Tel., *dissimilis* Shest.)
- 42 (41). Second abdominal tergite somewhat sculptured, at least in transverse depression. Ovipositor not longer, often slightly shorter than body (if longer, then abdomen almost entirely brownish red).
- 43 (46). Abdomen with brownish red pattern, at least on 2nd tergite.

- 44 (45). Stylets of ovipositor longer than body. Hind femora 4 times as long as wide. Abdomen almost entirely brownish red, only at apex of 1st tergite dark. Body 4. Northern Caucasus ....  
..... **A. caucasica** Tobias
- 45 (44). Stylets of ovipositor slightly shorter than body. Hind femora 3 times as long as width in middle. Abdomen black, only 2nd tergite brownish red. Body 3.6. Azerbaidzhan .....  
..... **A. transcaucasica** Abdinb.
- 46 (43). Abdomen entirely black.
- 47 (48). Proboscis slightly shorter than height of head, but not shorter than height of face with clypeus (Fig. 171: 8). Height of head greater than width. Ovipositor as long as body or slightly shorter. Usually 2nd abdominal tergite sculptured around its central elevation. Variation in elevation of forewing as in Fig. 171: 13. Body 3–5. Parasite of *Pyrausta aurata* Scop. (Pyrastidae). Center, south; Caucasus, Trans-Urals, Kazakhstan, Central Asia, Far East; Mongolia (cf. also couplets 10 and 55) ..... **A. montana** Shest.  
Lectotype: Female, "Fergana, Pass of Ak-Tel," 10.VIII.1928 (V. Kuznetsov).
- 48 (47). Proboscis not longer than height of face with clypeus (Fig. 171: 5).
- 49 (50). Face square or almost square. Clypeus half as high as face (Fig. 171: 5). Frons with ridge, bifurcate almost from base. Body 3–4. West, center, south; Trans-Urals, Caucasus; Western Europe ..... **A. assimilis** Kok.
- 50 (49). Face broad, its width much greater than height; clypeus not less than 2/3 as high as face; frons with ridge, bifurcate only at its upper end, near anterior ocellus.
- 51 (54). Genae as high as longitudinal diameter of eye or slightly less. First and 2nd abdominal tergites entirely longitudinally wrinkled.
- 52 (53). Antennae 24–28-segmented, segments in apical third slightly longer than wide. Body 3.5–5.5. South; Caucasus, Kazakhstan ..... **A. semiaciculata** Ivanov (*striola* Shest.)
- 53 (52). Antennae 19–22-segmented, segments in apical third 1.5–2 times longer than wide. Body 2.5–3. Kazakhstan .....  
..... **A. sculpturata** Tobias
- 284 54 (51). Genae usually not as high as longitudinal diameter of eye (Fig. 171: 8). Second abdominal tergite usually sculptured not more than around central elevation, sometimes almost smooth.



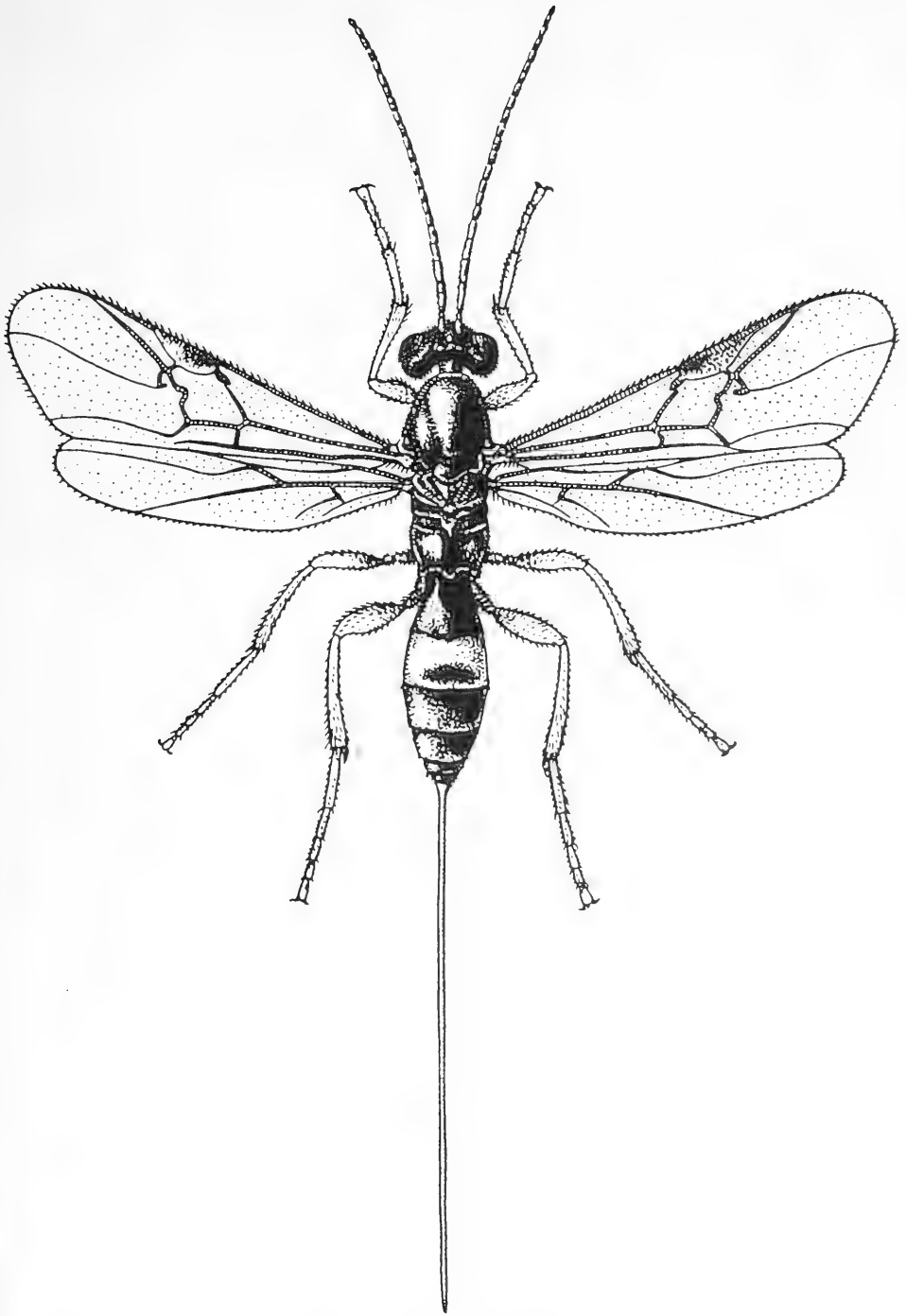


Fig. 173. Agathidinae (original).

*Agathis malvacearum* Latr.

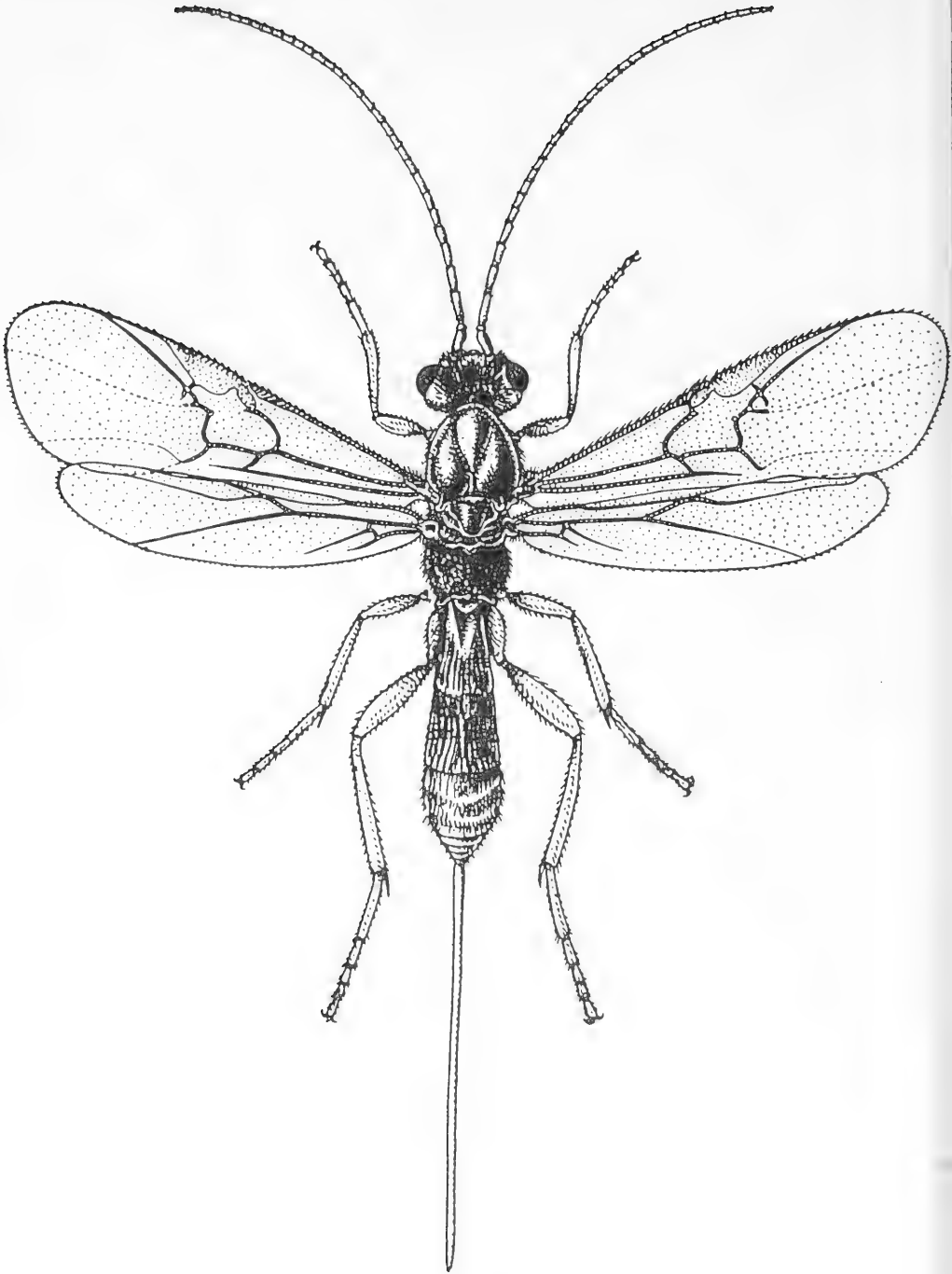


Fig. 174. Agathidinae (original).

*Microdus rufipes* Nees.

- 285 55 (56). Ovipositor as long as abdomen and thorax up to tegulae. Proboscis longer than height of face (cf. also couplets 10 and 47) ..... **A. montana** Shest.
- 56 (55). Ovipositor usually longer. Proboscis not longer than height of face.
- 57 (58). Body large, 5–6. Hind femora brownish red. Genae as high as longitudinal diameter of eye. Antennae 31–33-segmented. Ovipositor slightly shorter than body. Fig. 172: 4. South; Central Ural, Caucasus, Kazakhstan, Altai, southeastern Siberia, Far East ..... **A. laticarpa** Tel.  
 Lectotype: Female, Chernigovskaya Region “Nerubaevskaya dacha, on cut grass.” 9.VII.1900 (Pomerantsev).
- 58 (57). Body smaller, 3.5–5. Hind femora black. Genae as high as 2/3 longitudinal diameter of eye. Antennae 22–31-segmented.
- 59 (62). Ovipositor as long as body or slightly shorter.
- 60 (61). Antennae 27–31-segmented, as long as body or slightly shorter, segments in apical third usually longer than wide. Parasite of *Scrobipalpa ocellatella* Boyd., *Pexicopia malvella* Hb. (Gelechiidae). Northwest, west, center, south; Central Urals, Caucasus, to Far East in Southern Siberia; Finland, Italy, Mongolia .....  
 ..... **A. duplicata** Shest. (*longicauda* Kok. ?*propinqua* Kok.)  
 Lectotype: Female, Armenia, Erevan, Parakor 12.V.1925 (A. Shelkovnikov).
- 61 (60). Antennae 22–26-segmented, shorter than body, segments in apical third square or slightly longer than wide. West, center, south; Caucasus, Kazakhstan, Central Asia, Siberia (Altai, Irkutsk); Western Europe, Mongolia .....  
 ..... **A. genualis** Marsh.
- 62 (59). Ovipositor longer than body. Propodeum roundly truncate, with two widely situated longitudinal ridges. Hind femora 5 times as long as wide. Finland ..... **A. gracilipes** Hellén  
 Lectotype: Female, Tvärminne, Henricksberg. 723 (Nordmann)—preserved in Helsinki.
- 63 (40). Ovipositor as long as abdomen or slightly longer or shorter.
- 64 (67). Proboscis equal to height of head or slightly shorter.
- 65 (66). Head not as wide as high; frons with weak longitudinal ridge. First abdominal tergite completely sculptured and 2nd around central elevation. Abdomen and greater part of legs black. Body 2.5–4. West, south; Kazakhstan .....  
 ..... **A. rostrata** Tobias

- 66 (65). Head as wide as high; frons with sharp longitudinal ridge. First and 2nd abdominal tergites smooth. Abdomen in basal half and legs in greater part yellowish red. Body 6.5. Caucasus (Azerbaijan) ..... **A. nachitshevanica** Abdinb.
- 67 (64). Proboscis not longer than height of face with clypeus.
- 68 (69). Head noticeably narrower than high. Face square or slightly broad. Body 3.5–4. Center; Kazakhstan, Mongolia .....  
..... **A. brevis** Tobias
- 69 (68). Head not narrower than high. Face markedly broad.
- 70 (77). Genae relatively well developed, their height not less than half longitudinal diameter of eye. Antennae 23–28-segmented.
- 71 (72). Longitudinal diameter of eye 2 times or almost 2 times height of gena (Fig. 172: 5). Face weakly punctate. Sides of mesothorax relatively slightly pubescent, with extensive glabrous area in middle. Hind femora black. Body 3–4. Center, southeast; Caucasus, Central Asia, Siberia (Altai, Krasnoyarsk, Transbaikal); Western Europe ..... **A. schmiedeknechti** Kok.
- 72 (71). Longitudinal diameter of eye distinctly less than 2 times but more 1.5 times height of gena (Fig. 172: 6).
- 73 (74). Face with dense, finely granulose microsculpture, weakly lustrous; similar but finer microsculpture on sides of mesothorax. Wings contrastingly darkened beyond stigma compared to their large basal part. Antennal segments in apical part significantly longer than wide. Second abdominal tergite entirely rugose. Sides of mesothorax, except small area in middle, with numerous light colored hairs. Body 5.6. Central Asia ..... **A. dichroptera** Alexeev
- 74 (73). Face and sides of thorax smooth, lustrous. Wings uniformly but weakly darkened.
- 75 (76). Second abdominal tergite usually sculptured, though along margin of central elevation. Sides of mesothorax with few hairs only along margin. Hind femora black. Body 3–3.5. Parasite of *Aethes rutilana* Hb., *Argyroploce mygindiana* Den. and Schiff., *Spilonota ocellana* F. (Tortricidae), *Chrysoesthia hermannella* F., *Paltodora cyisella* Curt. (Gelechiidae), *Aganopterix liturella* Den. and Schiff. (Oecophoridae), *Coleophora trochilella* Dup., *C. albitarsella* Z., *C. inulae* Hein.-Wocke (Coleophoridae), *Pyrausta purpuralis* L. (Pyraustidae). Center, south; Trans-Urals, Caucasus, Central Asia, southern Siberia; Western Europe, Mongolia ..... **A. breviseta** Nees

- 76 (75). Second abdominal tergite smooth. Sides of mesothorax, except middle part, with dense light colored appressed hairs. Hind femora yellowish red. Fig. 172: 6. Body 5–6. Kazakhstan ..... **A. ferulae** Tobias
- 77 (70). Genae relatively weakly developed, their height  $2/5-1/4$  longitudinal diameter of eye. Hind femora yellowish brown or somewhat darkened.
- 78 (81). Second and 3rd abdominal tergites smooth, at most 2nd tergite with weak sculpture. Antennae about 25-segmented.
- 79 (80). Ovipositor as long as abdomen with propodeum. Apical segments of antennae square or longer than wide. Second radiomedial cell triangular. Body 2.7–2.8. South; Western Europe, Northern Africa ..... **A. nugax** Reinh.
- 80 (79). Ovipositor shorter than abdomen. Apical segments of antennae much longer than wide. Second radiomedial cell quadrangular. Body 2–3. Parasite of *Coleophora laricella* Hb. (Coleophoridae), *Blastotere laevigatella* H.-S. (Argyresthidae). Northwest, south; south of eastern Siberia; Western Europe, North America (introduced) .....  
..... **Microdus pumilus** Ratz.
- 286 81 (78). Second and 3rd abdominal tergites with granulose sculpture. Antennae 23–29-segmented. Second radiomedial cell quadrangular. Ovipositor as long as or slightly shorter than abdomen. Body 3–4.5. Parasite of *Coleophora palliatella* Zk., *C. fuscidinella* Z., *C. onosmella* Brahm (Coleophoridae). Center, south, east; Caucasus; Western Europe .....  
..... **A. mediator** Nees
- 82 (15). Hind femora thin and long, 6 times as long as wide. Fourth segment of hind tarsi 2 times and 3rd 3 times as long as wide (Fig. 172: 9). Second abdominal tergite square, with transversely oval elevation at base, smooth. Height of genae slightly shorter than longitudinal diameter of eye. Ovipositor slightly longer than body. First abdominal tergite sculptured. Body black, legs yellowish for greater part, coxae, trochanters and femoral bases black. Wings light colored, tegulae yellow. Body 3.5. Central Asia ..... **A. tenuipes** Tobias

138. **Microdus** Nees, 1814.—Nearly 100 species, of which 30 species Palearctic. Half of Palearctic species distributed only in Far East. In USSR fauna *M. amurensis* Shest., *M. angustatus* Tel., *M. diversus* Mues., *M. glycinivorellae* Wat., *M. inopinatus* Tobias, *M. kovalevi* Tobias, *M. pilosus* Tobias, *M. quadratus* Tobias, *M. romani* Shest.,

*M. ussuriensis* Tel. are not included in the key.) Associated with Lepidoptera, caterpillars of which develop mainly on trees and shrubs.

- 1 ( 2). Claws without denticles (Fig. 170: 4). Hind tibiae black, at base white. Second abdominal tergite somewhat sculptured, 3rd smooth. Ovipositor as long as body. Mesonotum and scutellum brownish red. Body 5–8. Parasite of *Morophaga boleti* F., *Archinemapogon laterellus* Thunb., *Triaxomera parasitella* Hb. (Tineidae). Center, south; Caucasus; Western Europe ..... **M. calculator** F<sup>1</sup>.
- 2 ( 1). Claws with wide denticle at base (Fig. 170: 5). Hind tibiae light colored, apically somewhat darkened.
- 3 ( 6). First to 3rd abdominal tergites sculptured, others smooth. Body black.
- 4 ( 5). Legs including hind coxae brownish red. First to 3rd abdominal tergites coarsely longitudinally wrinkled. Second and 3rd abdominal tergites together shorter than 2 times basal width of 2nd tergite. Ovipositor slightly shorter than body. Antennae 29–33-segmented. Body 4–7. Parasite of *Laspeyresia pomonella* L., *Rhopobota ustomaculana* Curt., *Cacoecimorpha pronubana* Hb., *Gypsonoma sociana* Hw., *G. oppressana* Tr., *Notocelia cynosbatella* L., *Spilionota ocellana* F., *Hedya nubiferana* Hw., *Tortrix viridana* L., *Rhyacionia buoliana* Den. and Schiff., *Apotomis capreana* Hb., *A. semifasciana* Hw. (Tortricidae), *Recurvaria nanella* Den. and Schiff., *Gelechia nigra* Hw. (Gelechiidae), *Agonopterix ocellana* F. (Oecophoridae), *Acrobasis consociella* Hb. (Phycitidae), *Gonopteryx rhamni* L. (Pieridae), *Coleophora gryphipennella* Bouché (Coleophoridae), *Yponomeuta malinellus* Z. (Yponomeutidae). Center, south; Caucasus, Kazakhstan, Kirgizia, Western Siberia; Western Europe ..... **M. rufipes** Nees
- 5 ( 4). Hind coxae black. First to 3rd abdominal tergites with granulate sculpture and faint wrinkles. Second and 3rd abdominal tergites together almost 2 times as long as basal width of 2nd tergite. Ovipositor as long as body. Center, south; Caucasus ..... **M. punctatus** Abdinb.

<sup>1</sup>*M. liogaster* Alexeev, a species close to this species, has been described from the south of Central Asia (Repetek); it is distinguished by a shorter ovipositor, smooth 2nd abdominal tergite, hyaline, light colored wings, yellow stigma and hind tibiae (Fig. 169: 3–5).

- 6 ( 3). At most, 1st and 2nd abdominal tergites sculptured or all tergites with similar, extremely fine punctures (*M. anuphrievi*, *M. sculptilis*).
- 7 (16). Second abdominal tergite completely or for greater part sculptured.
- 8 (15). Body black. Hind femora, sometimes pattern on abdomen, brownish red.
- 9 (12). Hind femora whitish, in apical third black. Ovipositor as long as body. Abdomen black. In male (occasionally in female also), 2nd tergite with yellowish pattern.
- 10 (11). Second abdominal tergite longitudinally wrinkled; in female yellow only at base. Body 3–5. Parasite of *Spilonota ocellana* F., *Pandemis heparana* Den. and Schiff., *P. cerasana* Hb., *Archips rosana* L., *A. crataegana* Hb., *Croesia bergmanniana* L., *Epinotia tetraquetra* Hw., *Parasyndemis histrionana* Fröl., *Tortrix viridana* L., *Aleimma loeflingiana* L. (Tortricidae), *Recurvaria nanella* Den. and Schiff. (Gelechiidae). West, center, south; Caucasus; Western Europe (cf. also couplet 36) ..... **M. dimidiator** Nees (? *angulator* Ratz.)
- 11 (10). Second abdominal tergite with granulose sculpture, with faint wrinkles only in the depression posterior to central elevation; entirely yellow. Body 3.6. Central Asia ..... **M. tergalis** Alexeev
- 12 ( 9). Hind tibiae reddish. If with yellowish tinge, then slightly darkened apically. Ovipositor slightly longer than abdomen, at most as long as abdomen and half thorax. Abdomen with profuse brownish red pattern (at least on 2nd tergite).
- 13 (14). Hind coxae brownish red. Second abdominal tergite with longitudinal wrinkles. Body 4–5. Parasite of *Coleophora palliatella* Zk. (Coleophoridae), *Tortrix viridana* L. (Tortricidae). Caucasus (Georgia); Western Europe ..... **M. fortipes** Reinh.
- 14 (13). Hind coxae black. Second abdominal tergite punctate, without longitudinal wrinkles. Body 5. Caucasus (Azerbaijan, Dagestan) ..... **M. rufiventris** Abdinb.
- 287 15 ( 8). Thorax above and 2nd abdominal tergite brownish yellow, legs entirely yellow; wings light colored with yellowish veins. Second radiomedial cell pedunculate. Ovipositor shorter than body. Body 4. Central Asia ..... **M. discolorites** Shenef. (*discolor* Tel.)  
Lectotype: Female, Tadzhikistan, "Sarai Komar."  
20.IX.1931 (Fursov).

- 288 16 ( 7). Second abdominal tergite smooth or slightly sculptured only in transverse depression, or very finely sculptured as remaining tergites.
- 17 (24). Abdomen (sometimes) and part of thorax with reddish pattern, at least, on 2nd tergite. Ovipositor as long as body.
- 18 (23). Second radiomedial cell pedunculate, peduncle longer than 1st section of radial vein.
- 19 (20). All abdominal tergites with extremely fine and dense punctation, dimly lustrous. Body black; legs brownish yellow; apices of hind tibiae brownish, hind tarsi dark brown; 2nd, 3rd and base of 4th tergite red. Body 5.1. Krasnodar Territory .....  
 ..... **M. anuphrievi** Tobias, sp. n.  
 Holotype: Female, Krasnodar, Kuban River, 29.V.1974 (L. Anuphriev).
- 20 (19). Abdominal tergites smooth, at most only 1st tergite and depression on 2nd tergite sculptured.
- 21 (22). Abdomen reddish yellow, darkened only at apex; head except yellowish orbits and thorax black. Body 5.9. Kazakhstan, Far East (Blagoveshchensk).<sup>1</sup> ..... **M. victoris** Tel.  
 Lectotype: Female, "Steppe near Petropavlovsk [in the first description erroneously mentioned as Akmolinsk], 19.VI.1898 (N.N. Shiryayev)."
- 22 (21). Abdomen usually with distinctly developed black pattern or nearly entirely black. If almost entirely light colored then head and thorax also with profuse lustrous pattern. Body 4–5. Parasite of *Grapholitha molesta* Busck., *Laspeyresia pomonella* L., *Phalonidia manniana* F.R., *Pammene regiana* Z., and *Gypsonoma nitidulana* Z. (Tortricidae). South; Caucasus; Western Europe ..... **M. conspicuus** Wesm.
- 23 (18). Second radiomedial cell not pedunculate; if with short peduncle, then not longer than 1st section of radial vein. Coloration extremely variable from yellowish brown with somewhat developed dark pattern on head, antennae, propodeum, sides of metathorax, mesothorax and prothorax and on apex of abdomen to almost entirely black (except legs and part of 2nd abdominal tergite). Body 4–7. Parasite of *Procheuusa inopella* Z. (Gelechiidae), *Lobesia botrana* Den. and Schiff., *Gypsonoma minutana* Hb., *Grapholitha compositella* F.,

<sup>1</sup> The type material from Blagoveshchensk is obviously lost.



- G. pallifrontana* Z., *G. dilineana* Wlk., *Sparganothis pilleriana* Den. and Schiff., *Rhopobota ustomaculana* Curt (Tortricidae), *Agonopterix atomella* Den. and Schiff. (Oecophoridae), *Mompha epilobiella* Den. and Schiff. (Mompidae). North, northwest, west, center, east; Caucasus, Kazakhstan, Far East; Western Europe (cf. also couplet 29) .....
- M. tumidulus** Nees (?? *linguarius* Nees, *intermedius* Ivanov).
- 24 (17). Second abdominal tergite like entire body black.
- 25 (26). Hind coxae yellowish brown. Second abdominal tergite square. Hind tibiae yellowish in basal half. Ovipositor as long as body. Body 5–7. Northwest, center, south; Caucasus (Georgia); Western Europe ..... **M. arcuatus** Reinh.
- 26 (25). Hind coxae black; if light colored (in *M. tumidulus*), then 2nd abdominal tergite broad.
- 27 (30). Hind tibiae reddish, uncontrastingly darkened at apex.
- 28 (29). Ovipositor noticeably longer than body. Second abdominal tergite square, head entirely black. Body 5–8. Parasite of *Agonopterix atomella* Den. and Schiff., *A. scopariella* Hein. (Oecophoridae), *Pseudohermenias clausthaliana* Sax, *Epinoxia tedella* Cl., *Spilonota ocellana* F., *Pammene gallicana* Gn., *Epiblema scutulana* Den. and Schiff., *Archips oporana* L. (Tortricidae). Northwest; Western Europe .....  
..... **M. clausthalianus** Ratz.
- 29 (28). Ovipositor not longer than body, often shorter. Second abdominal tergite broad (cf. also couplet 23) .....  
..... **M. tumidulus** Nees
- 30 (27). Hind tibiae in basal half whitish yellow, contrastingly darkened, usually apically black. Ovipositor significantly longer than abdomen.
- 31 (32). All abdominal tergites densely and finely, granulosely sculptured, dimly lustrous. Second radiomedial cell not pedunculate, triangular. Hind femora black. Antennae 34-segmented, brown, yellowish brown toward apex (in male 32-segmented, black). Body 4.3 (male 3.7). Krasnodar Territory .....  
..... **M. sculptilis** Tobias, sp. n.
- Holotype: Female, village Severskaya, alfalfa mowing (weed), 8.VI.1973 (V. Vorontsova). Paratype: One male, Novokubanskii District, Sovkhos Khutorok, alfalfa, 13.VI.1975 (G. Nalivaiko).
- 32 (31). Abdominal tergites smooth, only 1st and 2nd sometimes sculptured in depression.

- 33 (34). Second radiomedial cell not pedunculate, usually quadrangular (Fig. 170: 6). Ovipositor shorter than abdomen. Body 2–3. Parasite of *Coleophora laricella* Hb. (Coleophoridae), *Blastodere laevigatella* H.-S. (Argyresthiidae). Transpalearctic; acclimatized in North America. ....  
..... **M. pumilus** Ratz.
- 34 (33). Second radiomedial cell pedunculate (Fig. 170: 7).
- 35 (36). Hind femora black or dark brown. Body 3–4.5. Parasite of *Eupithecia intricata* Zett. (Geometridae), *Tortrix viridana* L., *Spilonota laricana* Hein., *Phalonidia curvistrigana* Stt., *Aethes francillana* F. (Tortricidae), *Aproaerema anthyllidella* Hb., *Metzneria aestivella* Z. (Gelechiidae). Northwest, center, Siberia (Irkutsk), Far East; Western Europe. ....  
..... **M. cingulipes** Nees
- 36 (35). Hind femora brownish red, apically somewhat darkened (cf. also couplet 10) ..... **M. dimidiator** Nees
- 289 139. **Baeognatha** Kokujev, 1903 (*Camptothlipsis* Enderlein). About 20 species, mainly in Madagascar; 3 species in Palearctic.
- 1 (4). Hind tibiae slightly broadened toward apex, hind femora not thickened. If body light colored, then ovipositor as long as body.
- 2 (3). Ovipositor as long as abdomen. Hind femora and body black. Body 3. South; Caucasus (Azerbaijan); Czechoslovakia ...  
..... **B. nigra** Tel.  
Lectotype: One specimen (severely damaged, without abdomen), "V. Dneprovka [Burt(inskii) district], Orenburg [Province], 3.VIII.1932 (Zimin).
- 3 (2). Ovipositor as long as body. Hind femora brownish yellow; coloration of body various, usually with well developed yellowish brown pattern (Fig. 170: 11). Body 3–4.5. Parasite of *Grapholitha funebrana* Tr. (Tortricidae), *Anarsia eleagnella* Kuzn., *Recurvaria nanella* Den. and Schiff. (Gelechiidae). South (to Kharkov Region in the north); Caucasus .....  
..... **B. armeniaca** Tel.  
Lectotype: Female, "No. 25.3, Eriv [Erevan], settlement."
- 4 (1). Hind tibiae quite abruptly broadened at apex. Hind femora thickened (3 times as long as wide). First abdominal tergite slightly longer than its width at apex. Propodeum and 1st abdominal tergite weakly sculptured. Ovipositor slightly longer than abdomen. Body yellow, 4–4.5. Kazakhstan, Central Asia ..... **B. turanica** Kok.

140. *Earinus* Wesmael, 1837.—15 species, 5 to 7 in the Palearctic.

- 1 (2). Mesonotum and scutellum with red pattern. Hind tibiae brownish red. Body 6–8. Center, south; Western Europe ..... *E. thoracicus* Nees
- 2 (1). Thorax entirely black.
- 291 3 (8). Third abdominal tergite smooth, usually also 2nd.
- 4 (5). First abdominal tergite with distinctly projecting spiracular tubercles (Fig. 170: 3). Hind tibiae yellowish. Body 5–7. Parasite of *Coleophora laricella* Hb. (Coleophoridae). South; Western Europe ..... *E. tuberculatus* Wesm.
- 5 (4). First abdominal tergite without distinctly projecting spiracular tubercles.
- 6 (7). Hind tibiae brownish red. Body 7–10. Parasite of *Aconita lucida* Hfn., *Dichonia convergens* Den. and Schiff. (Noctuidae), *Alsophila aescularia* Den. and Schiff., *Lycia hirtarius* Cl. (Geometridae), *Caloptilia syringella* F. (Gracillariidae). Center, south; Caucasus, to Far East in southern Siberia; Western Europe ..... *E. nitidulus* Nees (*pilosus* Tobias, syn. n.)
- 7 (6). Hind tibiae whitish yellow, at apex darkened. Fig. 175. Body 4–7. Parasite of *Orthosia stabilis* Den. and Schiff. (Noctuidae). Northwest, center, south; Caucasus; Western Europe ..... *E. gloriatorius* Panz.
- 8 (3). Bases of 3rd and 2nd abdominal tergites longitudinally wrinkled. Legs yellowish red, hind tibiae whitish. Body 5.5. England ..... *E. transversus* Lyle

141. *Braunsia* Kriechbaumer, 1894.—Almost 60 species, mainly in the tropics of the Old World, 5 in the Palearctic, all in the Far East; one Far Eastern species in the fauna of the USSR, *B. romani* Shest.

142. *Euagathis* Szépligeti, 1900.—More than 70 species; 4 in the Palearctic (distribution of this genus similar to that of preceding genus). One Far Eastern species in the fauna of the USSR, *E. semenovi* Shest.

143. *Zelomorpha* Ashmead, 1900 (*Ahngeria* Kok.).—Thirteen species, mainly in the tropics; one species in the Palearctic and Nearctic.

- 1 (1). Abdomen compressed, eyes reniform. Antennae approximately 45-segmented. Propodeum wrinkled. Abdominal tergites

smooth. Body reddish yellow. Fig. 176. Body 8–9. Central Asia;  
 Iran ..... *Z. transcaspica* Kok. (*opaca* Shest.)

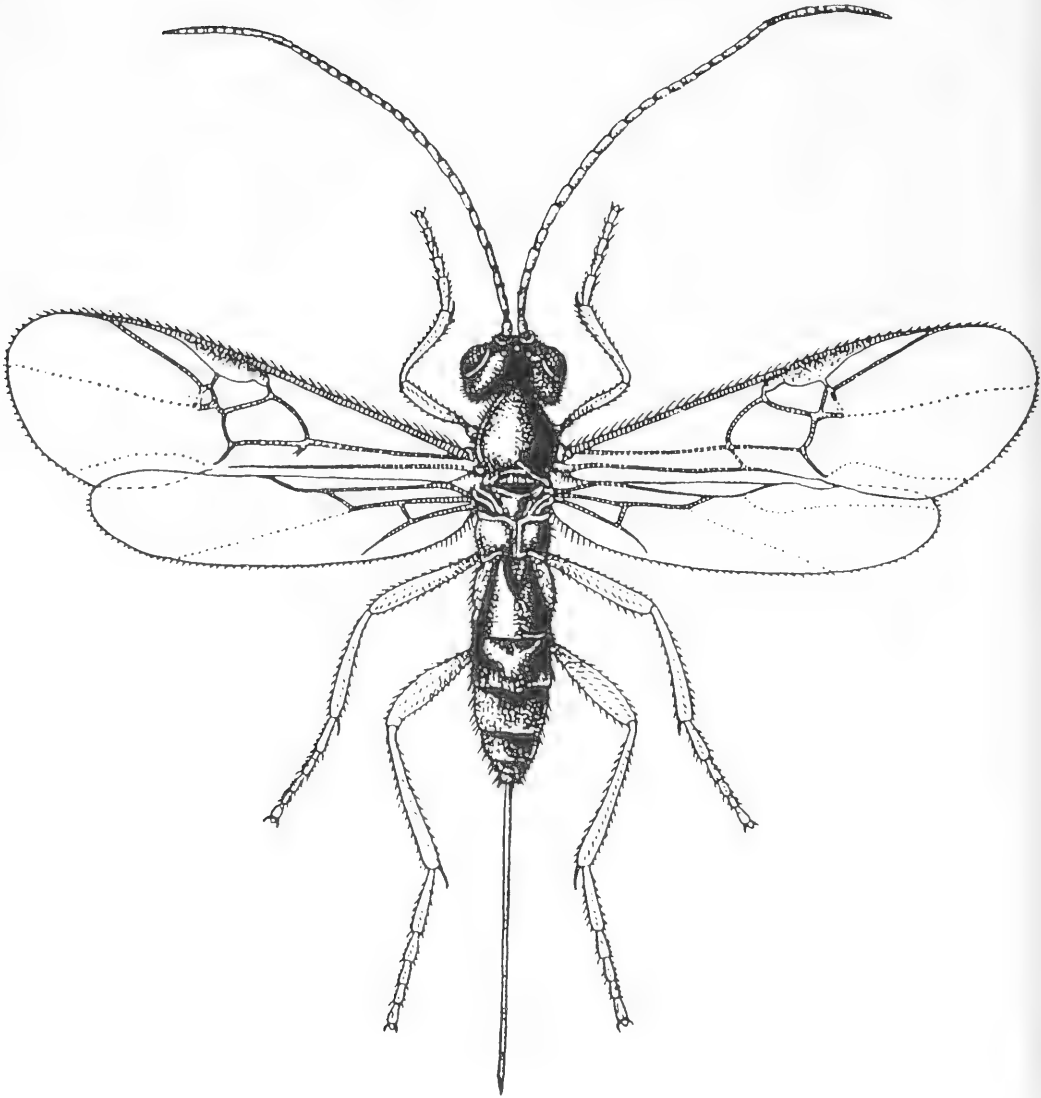
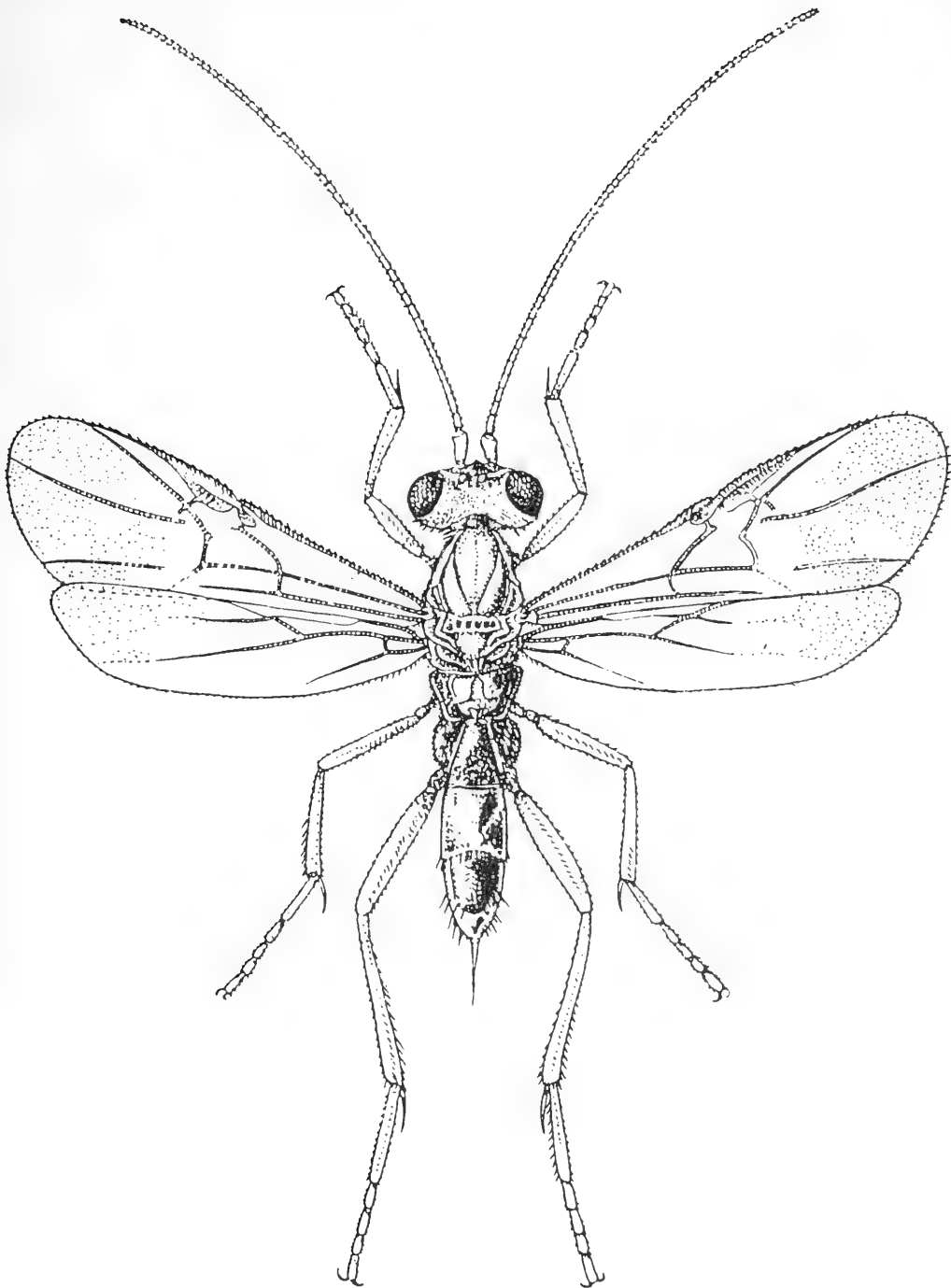


Fig. 175. Agathidinae (original).

*Earinus gloriatorius* Panz.



15. Subfamily Ichneutinae<sup>1</sup>

These are medium (5–7 mm) or small (up to 2.5 mm) ichneumon flies with a fairly compact body and short ovipositor. The occipital ridge is not developed. The radial cell of the forewing is short and the discoidal cell pedunculate. The common biological characters of the genera of the subfamily are expressed in their connection with sawflies (both are parasites of eggs and larvae, emerging from the host after the latter spin the cocoon, inside which they spin their own cocoon). There are three genera in the subfamily: Holarctic *Proterops* and *Ichneutes* and Nearctic *Ichneutidea*. One of the three genera (*Proterops*) is sharply distinguished morphologically from the other two, forming a special tribe.<sup>2</sup>

*Key to Tribes and Genera*

- 1 (2). Anterior ocelli shifted very far anteriorly to level of antennal sockets. Tentorial pits extremely deep and wide (Fig. 177: 1). Discoidal cell pedunculate; 2nd section of radial vein shorter than 1st (Fig. 177: 2). Wings with dense dark bristles. Sternauli not developed (Tribe Proteropini) ..... 144. **Proterops**
- 2 (1). Anterior ocelli situated beyond antennal sockets. Tentorial pits not deep and wide. Discoidal cell sessile; 2nd section of radial vein much longer than 1st (Fig. 177: 4, 6). Wings with sparse, light colored bristles. Sternauli developed, sculptured (Tribe Ichneutini) ..... 145. **Ichneutes**

*Key to Species of Genera*

144. **Proterops** Wesmael, 1835.—4 species, 2 in the Palearctic (one from Japan).

- 1 (1). Body and legs black, abdomen brownish red, wings smoky. Fig. 177: 1–3. Body 5.5–7. Parasite of *Argenigripes* Retz., *A. berberidis* Schr., *A. ochropus* Gmelin, *A. rustica* L. and other species of this genus. Northwest, center; Kazakhstan,

<sup>1</sup> Treatment by V.I. Tobias.

<sup>2</sup> Mason (1969. *Proc. Entomol. Soc. Washington*, 71, 3: 263–278) isolated tribe Muesebeckiini with six genera (of these, species of genus *Oligoneurus* are found in our Far East) which he included in the subfamily Ichneutinae. However, this tribe is not related to sawflies but to Lepidoptera (also on the basis of complex morphological characters) and must be included in the subfamily Miracinae.

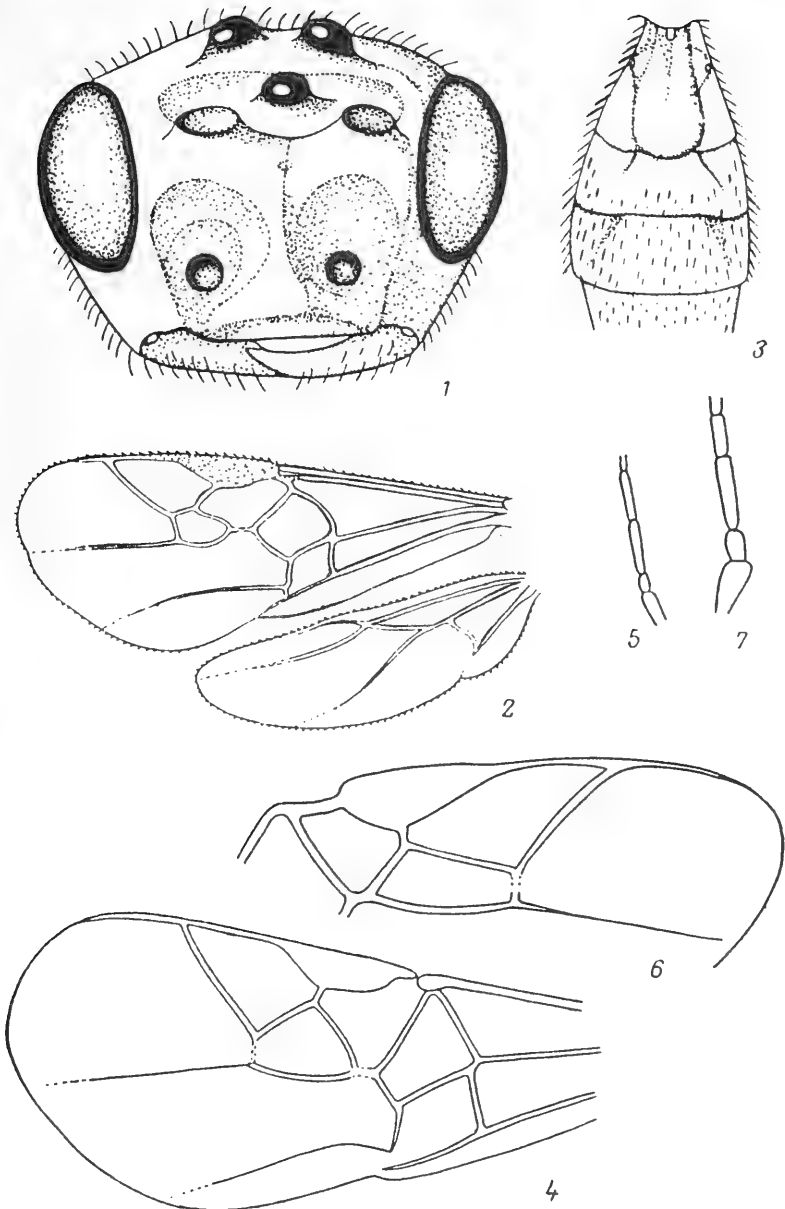


Fig. 177. Ichneutinae (from Achterberg, Tobias and original).

1—3—*Proterops nigripennis*: 1—head, 2—wings, 3—1st to 4th abdominal tergites; 4, 5—*Ichneutes levis*: 4—part of forewing, 5—base of antenna; 6—7—*I. facialis*: 6—part of forewing, 7—base of antenna.

Transcaucasia, Pacific Coastal Region; Western Europe,  
Mongolia ..... **P. nigripennis** Wesm.

292 145. **Ichneutes** Nees, 1816<sup>1</sup>—Holarctic genus, 15 species, 8 in  
Palearctic.

1 ( 4). Head, sides of mesothorax and 2nd abdominal tergite smooth,  
lustrous; face weakly punctate, lustrous.

2 ( 3). Radial cells much shorter than stigma. Third section of radial  
vein almost straight (Fig. 177: 4). Second flagellar segment  
slightly shorter than 1st (Fig. 177: 5), 4 times as long as wide.  
Hind tarsi thick, their 4th segment almost as long as wide.  
Antennae 22–27-segmented. Legs and basal part of anten-  
nae brownish yellow, body black, 2.5–3. Parasite of *Pontania*  
*viminalis* L., *Fenusa dohrnii* Tisch., *F. ulmi* Sund. (Tenthre-  
dinidae). South, southeast; Caucasus (Sochi); Western Eu-  
rope ..... **I. levis** Wesm.

293 3 ( 2). Radial cell not shorter than stigma. Third section of radial  
vein curved. Second flagellar segment 2.5 times as long as  
wide. Hind tarsi thin, their 4th segment much longer than  
wide. Antennae 24-segmented. Legs somewhat darkened. No-  
vaya Zemlya ..... **I. liosternus** Roman

4 ( 1). At least face, partly sides of mesothorax and 2nd abdominal  
tergite punctate, matte or weakly lustrous. Radial cell slightly  
shorter than stigma or as long as it. Third section of radial  
vein often somewhat curved. Second antennal segment much  
shorter than 1st.

5 ( 6). Abdomen entirely brownish yellow. Head above almost  
smooth. Antennae 26–30-segmented. Legs brownish yel-  
low, antennae black. Body 3–4.5. Center; Finland .....  
..... **I. flaviventris** Hellén

6 ( 5). Abdomen black or yellowish or reddish brown only in middle.

7 ( 8). Head on lower side, clypeus and mandible at least and an-  
tennae entirely brownish yellow. Head above smooth and  
lustrous. Antennae 30-segmented. Legs brownish yellow.  
Fig. 177: 6, 7. Body 4.5. Center; Northern Europe .....  
..... **I. facialis** Thoms.

<sup>1</sup>Roman, 1924. In Report Sci. Results Norweg. Exped. Novaya Zemlya, 1921, 1,  
14: 18; Hellén, 1958. *Fauna Fennica*, IV: 17–19.



- 8 ( 7). Head including clypeus and antennae (sometimes except base) black. Genae smooth, lustrous.
- 9 (10). Valves of ovipositor long and wide (about 1/3 as long as abdomen, exerted far beyond its apex) but hind tibiae in their mid part equal to valvular width. Sixth abdominal sternite distinctly developed, almost 1/2 as long as abdomen. Third section of radial vein almost straight. Second flagellar segment 2.5 times as long as wide. First abdominal tergite as long as its apical width. Body 3.5. Sweden. ....  
 ..... **I. lapponicus** Thoms.
- 10 ( 9). Valves of ovipositor short and narrow (barely exerted beyond 6th abdominal sternite), narrower than median width of hind tibia. Sixth abdominal sternite small, not as long as 1/3 length of abdomen. Third section of the radial vein curved. Second flagellar segment 2 times as long as wide. First abdominal tergite much shorter than its width at apex.
- 11 (14). Frons smooth or weakly sculptured, lustrous. Abdomen black.
- 12 (13). Genae coriaceous, matte. Flagellum noticeably thickened basally. Spitsbergen ..... **I. hyperboreus** Holmgren
- 13 (12). Genae smooth or with rare punctures, lustrous. Flagellum not thickened or thickened slightly at base. Antennae 24-segmented. Body 3.5–4. Parasites of *Nematus ribesi* Scop., *N. salicis* L., *Euura venusta* Zadd., *Pontania viminalis* L., *Fenusa pusilla* Lep. (Tenthredinidae). North, center; Caucasus (El-brus), Kazakhstan, Pacific Coastal Region; Western Europe ..... **I. brevis** Wesm.
- 14 (11). Frons somewhat densely punctate, matte or weakly lustrous. Antennae 28–35-segmented. Forewing as in Fig. 4: 6. Abdomen in middle black or reddish or yellowish brown. Body 3.5–5. Parasite of *Nematus salicis* L., *N. melanaspis* Htg., *N. leucotrochus* Htg., *N. ribesii* Scop., *Amauronematus* sp., *Pontania viminalis* L., *Priophorus pallipes* Lep., *Pristiphora abietina* Christ., *P. compressa* Htg., *P. melanocarpa* Htg., *P. micronematica* Hal., *Croesus septemtrionalis* L. (Tenthredinidae), *Neodiprion sertifer* Geoffr. (Diprionidae). Northwest, center; Caucasus, Kazakhstan, southern Siberia, Kamchatka; Western Europe, Alaska. .... **I. reunitor** Nees

## 16. Subfamily Cheloninae <sup>1</sup>

These are small or medium sized (body usually 2–6 mm) ichneumon flies with a compact, sculptured body, with the first three abdominal tergites fused to form a shield and, as a rule, with a short ovipositor, occasionally concealed inside the shield (in this case, the male can be distinguished from the female by thinner and longer, somewhat setaceous antennae; in female, they are generally thickened in the middle with depressions in the apical flagellar segments). Wing venation is complete but shifted to the middle part of the wing (radial and 2nd radiomedial cells short); only the 1st anal cross-vein is usually somewhat developed. The postpectal ridge is well developed. Eyes are usually pubescent; the body is usually black, rarely light colored (as a rule in *Phanerotoma*).

Ten genera, about 700 species. Parasites of lepidopteran eggs and larvae.

### *Key to Tribes and Genera*

- 1 (4). Abdominal shield of three distinct tergites, demarcated by sutures, not tucked in from behind. Body light colored. (Tribe Phanerotomini).
- 2 (3). Radial vein with three sections. Second radiomedial cell neither triangular nor pedunculate (Fig. 178: 3). Antennae in female 23-segmented ..... 146. **Phanerotoma**
- 3 (2). Radial vein with two sections. Second radiomedial cell triangular or pedunculate (Fig. 178: 13). Antennae in female 30–40-segmented. .... 147. **Phanerotomella**
- 4 (1). Abdominal shield of completely fused tergites without sutures, usually somewhat tucked in from behind. Body usually black. (Tribe Chelonini).
- 5 (6). First radiomedial and discoidal cells divided (Fig. 182: 5–7). Clypeus usually with denticles. Flagellar segments in female always without depressions. Apex of abdomen in male always without aperture ..... 148. **Ascogaster**
- 294 6 (5). First radiomedial and discoidal cells confluent (Fig. 192: 3–7). Clypeus usually without denticles. Flagellar segmentation often suppressed in female. Apex of abdomen in male often with aperture.

<sup>1</sup> Treatment by V.I. Tobias.

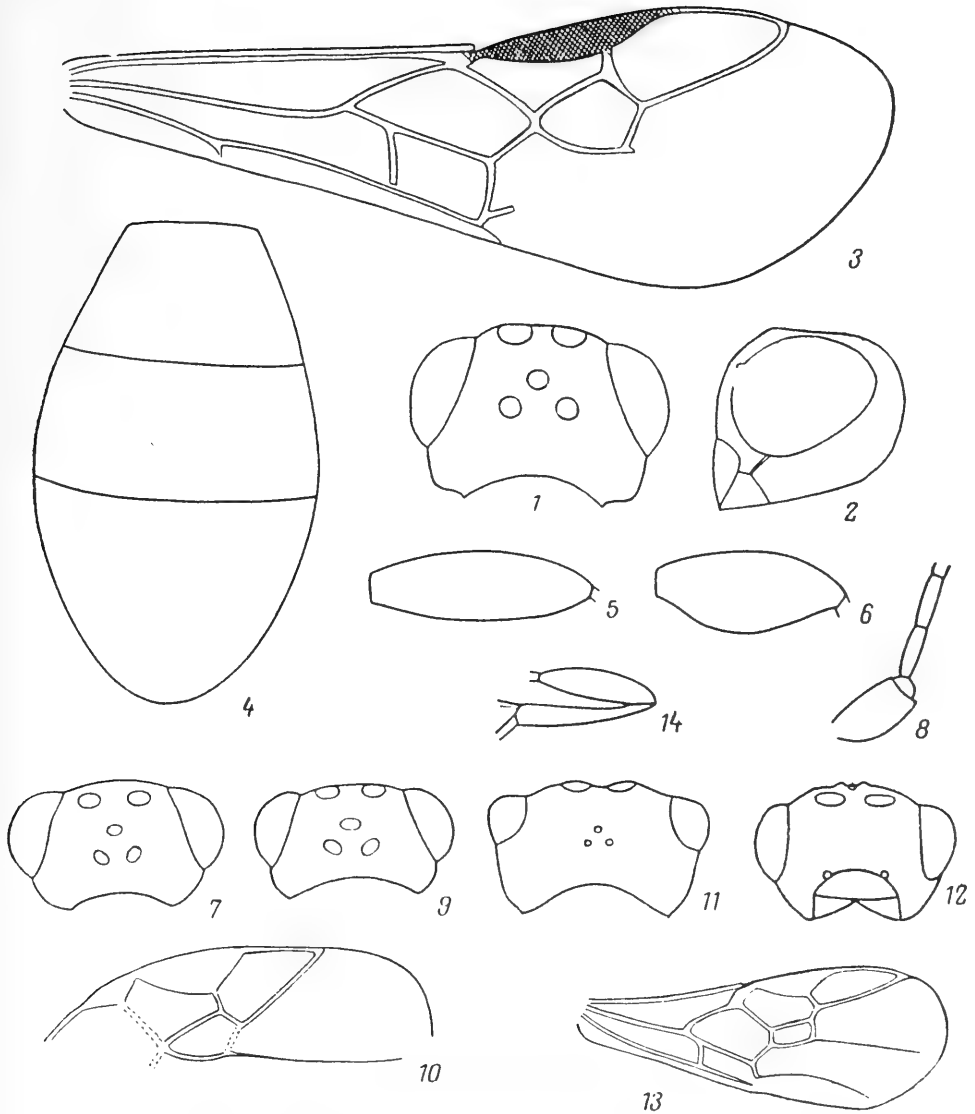


Fig. 178. Cheloninae (from Tobias and original).

1—6—*Phanerotoma nocturna*: 1—head, dorsal view, 2—head, lateral view, 3—forewing, 4—abdomen, 5—hind femur, female, 6—same, male; 7, 8—*P. semenowi*: 7—head, 8—antennal base; 9—*P. kozlovi*, head; 10—*P. parva*, part of forewing; 11, 12—*P. kasachstanica*: 11—head, dorsal view, 12—head, frontal view; 13, 14—*Phanerotomella flavipes*: 13—forewing, 14—hind femur and tibia.

- 7 (8). Antennae in female more than 16-segmented. Apex of abdominal shield in male without aperture .... 149. **Chelonus**  
 8 (7). Antennae in female as a rule 16-segmented. Apex of abdominal shield in male usually with aperture .....  
 ..... 150. **Microchelonus**

*Key to Species of Genera*

146. **Phanerotoma** Wesmael, 1838.—More than 100 species. Nearly 40 species in the Palearctic. Three Far Eastern species from the fauna of the USSR have not been included in the key. They are: *P. (Phanerotomina) gracilis* Tobias, *P.(P.) sculptifrons* Tobias and *P.(P.) ussuriensis* Tel.

- 1 (16). Temples short,  $1/3$  to  $1/2$  length of eye from above. Eyes distinctly protuberant, almost hemispherical, their longitudinal diameter 4–6 times, rarely 3 times, height of gena. Ocellar field large, base of ocellar triangle usually equal to or, at most,  $2/3$  ocellocular distance. Radial cell usually somewhat shortened, its anterior margin equal to, rarely longer than, stigma. Hind femora in male much more thickened than in female, usually  $1/4$  to  $1/3$  as wide as long ( $1/5$  to  $1/4$  of length in female). Body usually with smooth sculpture (rarely on mesonotum, more often on sides and particularly in lower part of thorax). Ocelli enlarged as a rule so that interocellar distance is less than ocellar diameter. Body light colored. (Subgenus *Phanerotomina* Shest.).
- 2 (15). Second section of radial vein significantly longer than 1st (not less than 2 times).
- 3 (14). First section of radial vein well developed, at least 2 times as long as wide.
- 4 (13). Anterior margin of radial cell, at most, slightly longer than stigma. Base of ocellar triangle approximately as long as ocellocular distance or slightly less. Temples not less than  $2/5$  of eye.
- 5 ( 8). Head and thorax smooth, lustrous, without granulose sculpture, with sparsely scattered punctures. Punctures large on mesonotum, their interstices much larger than their diameter.
- 6 ( 7). Temples equal to halflength of eye from above. Height of genae slightly less than  $1/3$  longitudinal diameter of eye. Clypeus anteriorly with 3 denticles. Stigma yellow. Body 4.

- Kazakhstan (northeast coast of Aral Sea), Central Asia ...  
 ..... **P. (P.) glabra** Tel.<sup>1</sup>
- 7 ( 6). Temples 1/4 to 1/3 length of eye from above. Height of genae 1/5 longitudinal diameter of eye. Clypeus anteriorly without denticles. Stigma yellowish brown with yellow spots at base. Fig. 178: 1–6. Body 3.5–3.8. Central Asia .....  
 ..... **P. (P.) nocturna** Tobias
- 8 ( 5). Head and thorax with somewhat developed granulose sculpture, usually matte dorsally. If granulose sculpture very smooth, then deep punctation fine and dense.
- 9 (10). Mesonotum, scutellum and head with very smooth granulose sculpture, lustrous with fine deep punctation. Third abdominal tergite hemispherical, matte. Temples 1/3 length of eye. Body, stigma and wing venation reddish yellow. Body 5.5. Central Asia ..... **P. (P.) transcaspica** Kok.
- 10 ( 9). Mesonotum, scutellum and head with granulose sculpture, matte or weakly lustrous.
- 11 (12). Third abdominal tergite almost smooth (or weakly sculptured), lustrous. Basal antennal segment bulged, 3 times thicker than flagellum. Temples 1/3 length of eye. Height of genae 1/3 longitudinal diameter of eye. Base of ocellar triangle equal to ocellocular distance. Anterior margin of radial cell equal to length of stigma. Stigma yellow for most part ..... **P. (P.) semenowi** Kok.  
 Lectotype: Female, Turkmenia, Repetek, 13.V.1889 (A. Semenov). Paralectotypes: one female (without head), 1 male with same data.
- 12 (11). Third abdominal tergite densely sculptured, matte. Basal antennal segment not bulged, only 2 times as thick as flagellum. Temples 2/5 length of eye (Fig. 178: 9). Height of genae 1/5 longitudinal diameter of eye. Base of ocellar triangle much shorter than ocellocular distance. Anterior margin of radial cell slightly longer than stigma. Stigma brown, at base yellow. Body 4.5–5. Caucasus, Central Asia; Mongolia .....  
 ..... **P. (P.) kozlovi** Shest.<sup>2</sup>
- 13 ( 4). Anterior margin of radial cell much longer than stigma. (Fig. 179: 6). Base of ocellar triangle 2/3 ocellocular distance. Temples 1/2 length of eye. Longitudinal diameter

<sup>1</sup> Syntypes, apparently, lost.

<sup>2</sup> The characters distinguishing *P. kozlovi* Shest. from *P. minuta* Kok. are extremely minor; probably, the former is a variant of the latter.

- of eye approximately 5 times height of gena. Body with dense granulose sculpture. Stigma brown, at base with yellow spot. Body 3.5–4. Parasite of *Ectomyelois ceratoniae* Z., *Paramyelois transitella* Walk. (Phycitidae). Southern Europe, Israel. .... **P. (P.) flavotestacea** Fi.
- 14 ( 3). First section of radial vein extremely short, as long as or almost as long as its width. Anterior margin of radial cell as long as stigma or slightly longer. Base of ocellar triangle as long as ocellocular distance. Temples  $1/3$  length of eye. Genae very slightly developed, their height approximately  $1/6$  longitudinal diameter of eye. Body densely sculptured, matte. Sides of mesothorax and 3rd abdominal tergite weakly lustrous. Body 4.5–8. Kazakhstan, Central Asia; China. ....  
..... **P. (P.) minuta** Kok.  
Lectotype: Female, Turkmenia, Repetek, 13.V.1889 (A. Semenov). Paralectotypes: One female, 2 males (one without head)—with the data of holotype; 1 male, Uch-Adzhi, 18.V.1889. 1 male, Chardzhou, 15.VI.1889 (S. Semenov).
- 15 ( 2). First and 2nd sections of radial vein short, both approximately of same length (Fig. 178: 10). Base of ocellar triangle  $2/3$  ocellocular distance. Temples  $2/5$  length of eye. Longitudinal diameter of eye approximately 5 times height of gena. Body with dense granulose sculpture. Stigma brown. Body 2–3. Caucasus, Central Asia ..... **P. (P.) parva** Kok.  
Lectotype: Female, Turkmenia, Repetek, 13.V.1897 (A. Semenov). Paralectotypes: one female, 1 male—with same data.
- 16 ( 1). Temples not shorter or only slightly shorter than eye. Eyes relatively slightly protuberant, their longitudinal diameter not more than 3 times height of gena. Ocellar field small, base of ocellar triangle not more, usually less, than  $2/3$  ocellocular distance. Anterior margin of radial cell often longer than stigma. Hind femora in female and male approximately of same thickness. Body with dense granulose sculpture. Ocelli usually not enlarged (interocellar distance not less than ocellar diameter). Body often dark colored.
- 17 (26). First and 2nd sections of radial vein short, of approximately same length. Second section, at most, slightly longer than 1st. Body usually dark colored. Temples usually longer than eye.
- 18 (19). Genae well developed, only  $10/13$  longitudinal diameter of eye. Radial cell shorter than stigma. Clypeus along anterior margin with two denticles in middle. Temples 1.5 times

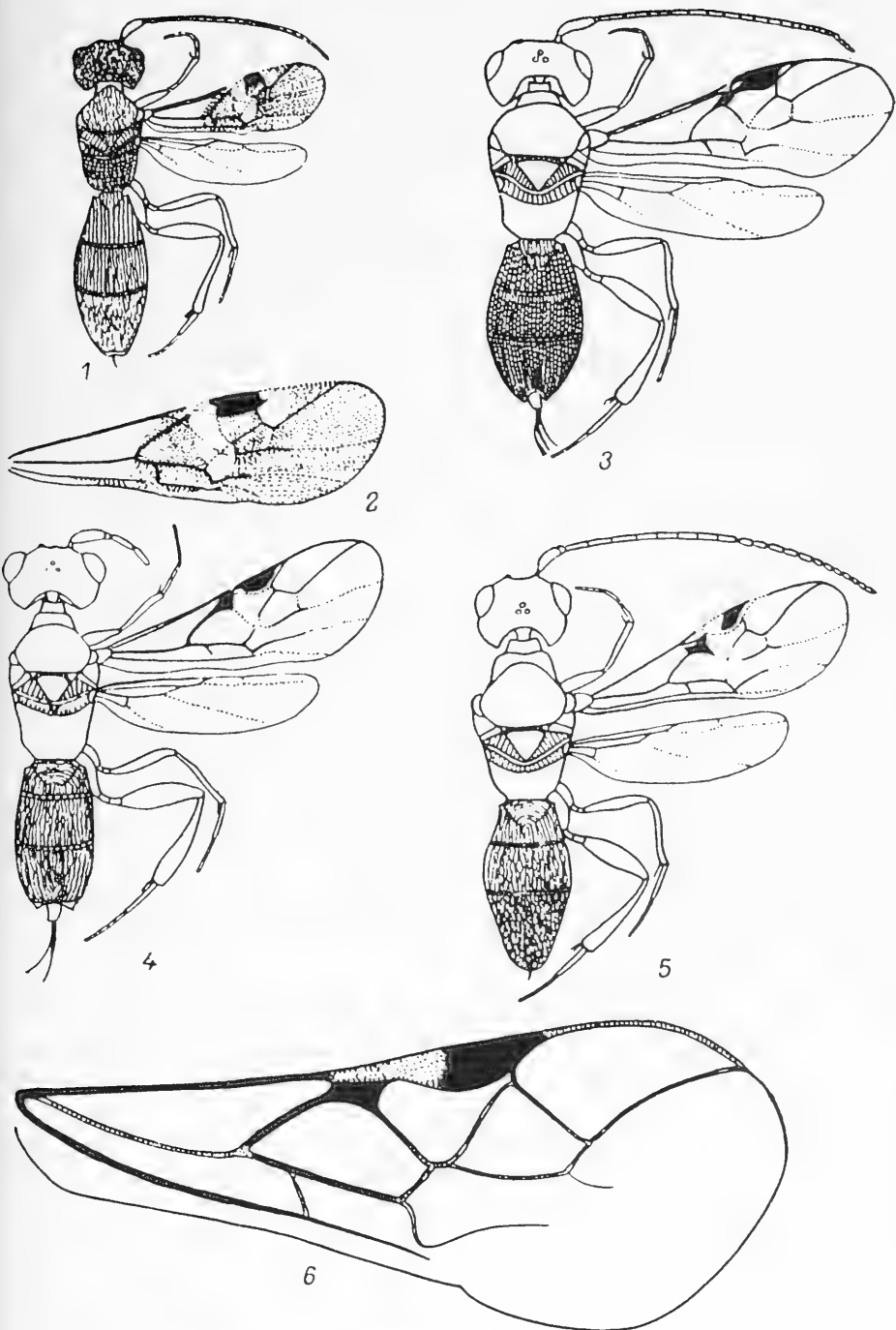


Fig. 179. Cheloninae (from Šnoflak and Fischer).

1—*Phanerotoma moravica*; 2—*P. moravica*, forewing; 3—*P. atra*; 4—*P. gregori*;  
 5—*P. acuminata*; 6—*P. flavotestacea*, forewing.

- longer than eye. Wings light colored at base, darkened for most part with light colored transverse stripe in middle. Body black. Legs reddish brown, tegulae yellowish. Fig. 179: 1, 2. Body 3–3.5. Center (Voronezh); Moldavia; Czechoslovakia ..... **P. (Unica) moravica** Šnofl.<sup>1</sup>
- 19 (18). Genae 2/5 to 1/2 longitudinal diameter of eye. Radial cell slightly longer than stigma. (Subgenus *Bracotritoma* Csiki).
- 20 (21). Mesonotum and scutellum faintly sculptured, lustrous. Body black, vertex brownish yellow. Body 4.5. England ..... **P. (B.) tritoma** Marsh.
- 21 (20). Mesonotum and scutellum with dense granulose sculpture, matte. Head unichromatic.
- 22 (23). Temples slightly shorter than eye. Body black (cf. couplet 29) ..... **P. (P.) atra** Šnofl.
- 23 (22). Temples 1.5 times longer than eye. Body usually light colored.
- 24 (25). Head behind eyes narrowed. Clypeus with slightly granulose sculpture. Female reddish brown, male black. Fig. 178: 11, 12. Body 2.5–3.2. Kazakhstan ..... **P. (B.) kasachstanica** Tobias
- 25 (24). Head behind eyes broadened. Clypeus without granulose sculpture, polished only in deep punctation. Body yellowish brown, much larger, 4. Kazakhstan ..... **P. (B.) popovi** Tel.  
Lectotype: Female (without abdomen and hind leg), “m[outh] of Chit-Irgiz River, Turg. region, 10.VII.1928 (V. Popov)”.
- 26 (17). Second section of radial vein longer than 1st. Body usually light colored. Temples not longer than eye. (Subgenus *Phanerotoma* s. str.).
- 27 (30). Body black. Base of ocellar triangle 2/3 ocellular distance.
- 28 (29). Second section of radial vein 3–5 times longer than 1st. Third abdominal tergite longitudinally striate. Clypeus along outer margin uniformly rounded, without denticles. Fig. 180: 1. Body 4.5–6.5. Parasite of *Laspeyresia strobilella* L. (Tortricidae), *Dioryctria abietella* Den. and Schiff., *Hyphantidium terebellum* Zck. (Phycitidae). West, northwest, north (Komi ASSR), south; Siberia (Irkutsk); Czechoslovakia ..... **P. (P.) obscura** Šnofl.

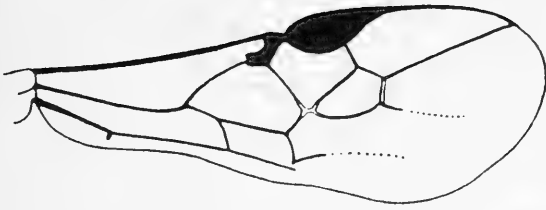
<sup>1</sup> Among Palearctic species, the Mongolian species *P. genalis* Tobias with still more developed genae, typically belongs to the subgenus *Unica* Šnofl.



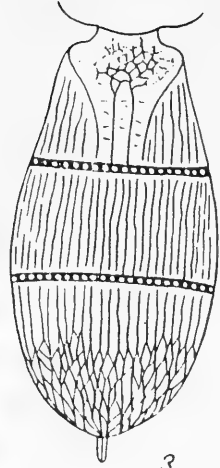
- 29 (28). Second section of radial vein 1.5--2 times longer than 1st. Longitudinal folds on 3rd abdominal tergite hardly developed. Clypeus in middle of anterior margin with 2 small denticles. Fig. 179: 3. Body 3--3.5. South; Caucasus; Czechoslovakia (cf. also couplet 22) ..... **P. (P.) atra** Šnofl.
- 30 (27). Body yellowish brown, rarely brown or thorax with light colored pattern. Base of ocellar triangle half ocellular distance.
- 31 (32). Third abdominal tergite apically deeply emarginate. Stigma and basal vein yellow. Ocelli quite large but ocellar triangle small. First section of radial vein extremely small. Body with very dense granular punctation, entirely matte. Fig. 179: 4. Body 3--3.4. Moldavia, Azerbaidzhan; Czechoslovakia ..... **P. (P.) gregory** Šnofl.
- 32 (31). Third abdominal tergite without deep emargination. Stigma and basal vein brown.
- 33 (36). Third abdominal tergite almost linearly narrowed toward apex, at apex narrowly rounded (Fig. 179: 5) or broadly truncate, distinctly longer than its width at base.
- 34 (35). Basal segment of antennae not thickened, approximately 1.5 times thicker than flagellum. Abdomen entirely sculptured granulosely and densely, with fine and deep punctation. Stigma brown, at base with light colored spot ..... **P. (P.) acuminata** Szépl.
- 35 (34). Basal segment of antennae thickened, almost 2.5 times thicker than flagellum. Thorax on lower side without granulose sculpture, lustrous, with coarse punctation. Stigma yellow. Body 5--6. Center, south, Kazakhstan; Mongolia ... **P. (P.) katkowi** Kok.<sup>1</sup>
- 36 (33). Third abdominal tergite uniformly roundly narrowed toward apex, somewhat hemispherical or transversely oval.
- 37 (42). First radiomedial vein of forewing much longer than 2nd section of radial vein. Third section of radial vein straight or slightly curved (Fig. 180; 2).
- 38 (39). Third abdominal tergite finely punctate, with distinct longitudinal folds, though in basal half. Temples shorter, not longer

<sup>1</sup> The tendency to form depressions which are more often broad in the apical part of the 3rd abdominal tergite is characteristic of this species. The depressions may be one or (particularly in the holotype, apparently lost, described by N.P. Kokuev) two. In one of the specimens described from Ryazanskaya Region there were two rounded pits divided by a longitudinal rib.

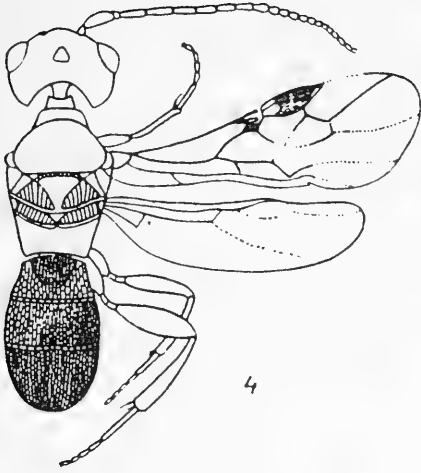
- than eye in any case. Body brownish yellow; rarely somewhat uniformly darkened, nearly dark brown. Fig. 180: 2, 3. Body 3.5–5. Parasite of *Rhopobota ustomaculana* Curt., *Zeiraphera isertana* F., *Phalonidia curvistrigana* Stt., *Pammene gallicolana* Lienig and Z., *P. regiana* Z., *P. populana* F., *P. amygdalana* Dup., *Grapholitha funebrana* Tr., *Epinotia ramella* L. (Tortricidae), *Carcina quercana* F. (Oecophoridae), *Ectomyelois ceratoniae* Z., *Myelois vinipars* Dyar, *Etiella zinckenella* Tr., *Acrobasis consociella* Hb., *A. sodalella* Zck. (Phycitidae), *Aegeria andreaeformis* Lasp. (Sesiidae). Northwest, west, center, east, south; Caucasus, Trans-Ural, Central Asia, Western Siberia (Novosibirsk); Western Europe, Northern Africa, Japan, Central Africa ..... **P. (P.) dentata** Panz. (? *antennalis* Šnofl., *bilinea* Lyle, sensu Telenga)
- 39 (38). Third abdominal tergite without distinct longitudinal folds, punctate or reticulately rugose.
- 40 (41). Third abdominal tergite finely alveolate (Fig. 180: 4). Temples slightly longer than eye. Body light colored. Fig. 180: 4. Body 3–4.5. Parasite of *Lymantria dispar* L. (Lymantriidae), *Acrobasis consociella* Hb., *A. sodalella* Zck. (Phycitidae). Northwest, east, south; Caucasus, Kazakhstan; Czechoslovakia ..... **P. (P.) minor** Šnofl.
- 41 (40). Third abdominal tergite with coarser sculpture, alveolate-rugose. Temples not longer than eye. Body somewhat darkly colored, 4.5–5. South (Kammenaya steppe); Czechoslovakia ..... **P. (P.) picta** Šnofl.
- 42 (37). First radiomedial vein of forewing not longer, often shorter than 2nd section of radial vein. Third section of radial vein curved. Body 4.5–5. Parasite of *Grapholitha molesta* Busck., *Laspeyresia strobilella* L., *L. zebeana* Saxesen (Tortricidae), *Acrobasis zelleri* Rag., *Hyphantidium terebrellum* Zinck., *Etiella zinckenella* Tr., *Phycita diaphana* Stgr., *Ephestia elutella* Hb. (Phycitidae), *Dendrolimus punctatus* Wlk. (Lasiocampidae). Center, east, south; Caucasus, Trans-Ural,



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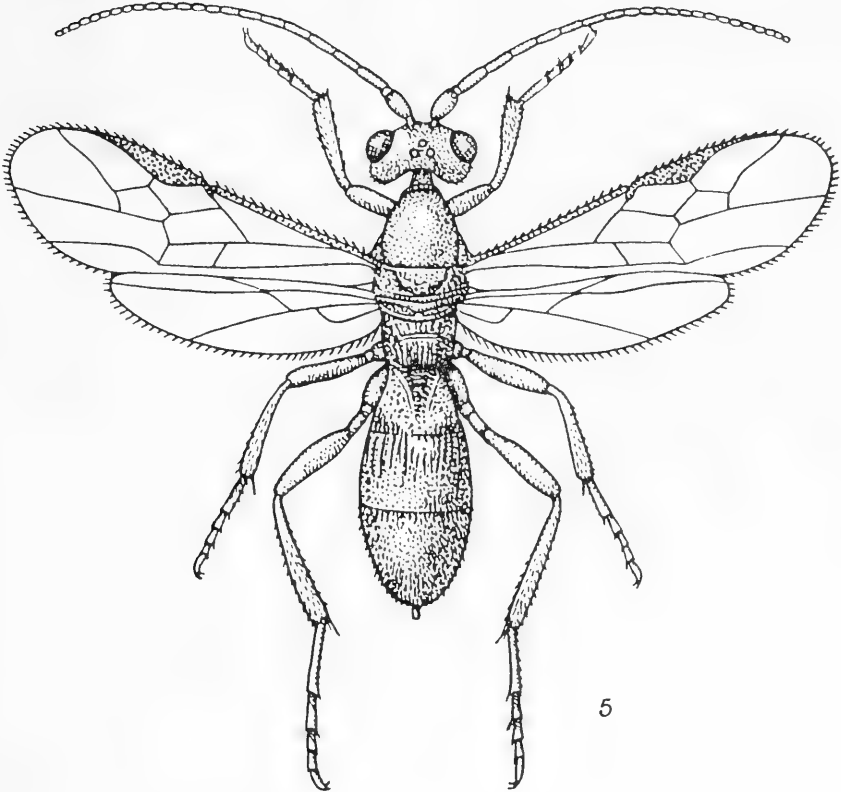
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4



1



5

Kazakhstan, Central Asia, Siberia; Western Europe, Afghanistan, China, Japan .....  
 ..... **P. (P.) planifrons** Nees (*fracta* Kok., *rjabovi* Voin.-Kr., *media* Shest., *?platypyga* Šnofl.)

147. **Phanerotomella** Szépligeti, 1900.—24 species, all from the Old World, 6 in the Palearctic.

- 1 ( 2). Mesonotum with distinct longitudinal groove in middle. Antennae 31-segmented. Body with dense granulose sculpture; brownish black; legs yellowish, wings faintly darkened. Stigma brown. Body 2.5. Hungary .....  
 ..... **P. nigra** Szépl.
- 2 ( 1). Mesonotum without longitudinal groove in middle.
- 3 ( 4). Antennae 40-segmented. Body reddish yellow. Second and 3rd abdominal tergites brown. Wings light colored, stigma dark brown. Body 2.5–3. Moldavia; Yugoslavia .....  
 ..... **P. kerteszi** Szépl.
- 4 ( 3). Antennae about 30-segmented.
- 5 ( 6). Body black, antennae at base yellow. Legs brownish yellow. Abdomen reticulately rugose, transversely oval. Body 3. Moldavia; Western Europe .....  
 ..... **P. bisulcata** H.-Sch.
- 6 ( 5). Body light colored, if dark, then antennae also dark and legs darkened.
- 7 ( 8). Middle tibiae distinctly thickened. Wings smoky, stigma yellowish brown. Body yellowish red with dark face, sides of thorax and margins of abdominal shield. Body 3–4. Italy, Yugoslavia .....  
 ..... **P. rufa** Marsh.
- 8 ( 7). Middle tibiae not thickened (Fig. 178: 14). Wings faintly darkened. Stigma dark brown or brown.
- 9 (10). Face with longitudinal elevation in middle, above with small keel. Radial cell of forewing short, with metacarpus extending far beyond apex of radial cell. Abdomen with fine alveolate sculpture. Coloration various. Fig. 178: 13, 14. Body 3. Moldavia, Krasnodar Territory (Sochi); Czechoslovakia .....  
 ..... **P. flavipes** Šnofl.
- 10 ( 9). Face uniformly bulged, without longitudinal elevation and keel. Radial cell of forewing longer, with metacarpus slightly extending beyond radial cell. Body light brown. Yugoslavia .....  
 ..... **P. graeffei** Fi.

148. *Ascogaster* Wesmael, 1835.<sup>1</sup>—More than 100 species, about 50 in the Palearctic. Some species at present known only from the male are included in the key below. It is not easy to distinguish female from male (if the ovipositor is concealed). In the male, antennae are longer and setaceous. In the female, antennae are somewhat thickened in the middle and segments usually somewhat distinctly visible in their apical part, at the most, slightly longer than their width.

- 1 ( 4). Abdomen posteriorly with process, apically truncate (Fig. 181: 11). Clypeus with 2 denticles. Body black, hind femora somewhat reddish.
- 2 ( 3). Outgrowth of abdominal shield as transverse plate. Antennae thin, 25–30-segmented, slightly shorter than body, with a slight keel between antennal bases. Body densely punctate, matte; mesonotum weakly sculptured, dimly lustrous. Body 4.5–6. South; Caucasus (Azerbaijan), Kazakhstan, Central Asia, southern part of Western Europe (cf. also couplet 11) ..... *A. excisa* H.-Sch.
- 3 ( 2). Outgrowth of abdominal shield as narrow roof, along upper surface with sharp rib. Antennae thick, 21-segmented, almost half of body length. Head and thorax coarsely punctate, mesonotum lustrous; abdomen much more softly and densely punctate than thorax. Body 4–5. Kazakhstan ..... *A. dentiventris* Tel.<sup>2</sup>
- 4 ( 1). Abdomen posteriorly lacking process.
- 5 ( 6). Posterior margin of abdominal shield with deep excavation on its lower side, distinctly curved. Sixth sternite distinctly developed. Ovipositor sabre-shaped (Fig. 181: 12). Clypeus with two blunt slightly developed denticles. Antennae short, equal to half of body length, 22-segmented. Body dimly lustrous. Abdomen more softly punctate than thorax. Body and hind femora black. Body 4.5–5. Center; Kazakhstan ..... *A. excavata* Tel.

Lectotype: Female, "M.L. Shipovo and [initials illegible] Malysheva, 17.VI.1898 (A. Semenov)." In the first description, specimen collector was incorrectly stated as Silant'ev.

<sup>1</sup>Huddleston, 1984. *Bull. Brit. Mus. (Nat. Hist.), Entomol.*, 49, 5: 341–392.

<sup>2</sup>The type material *A. dentiventris* was lost. In the collection of the Zoological Institute of the Academy of Sciences of the USSR, there is one female from Tselinograd Region: bank of Lake Zharkol (south), 9.VII.1957 (Tobias).

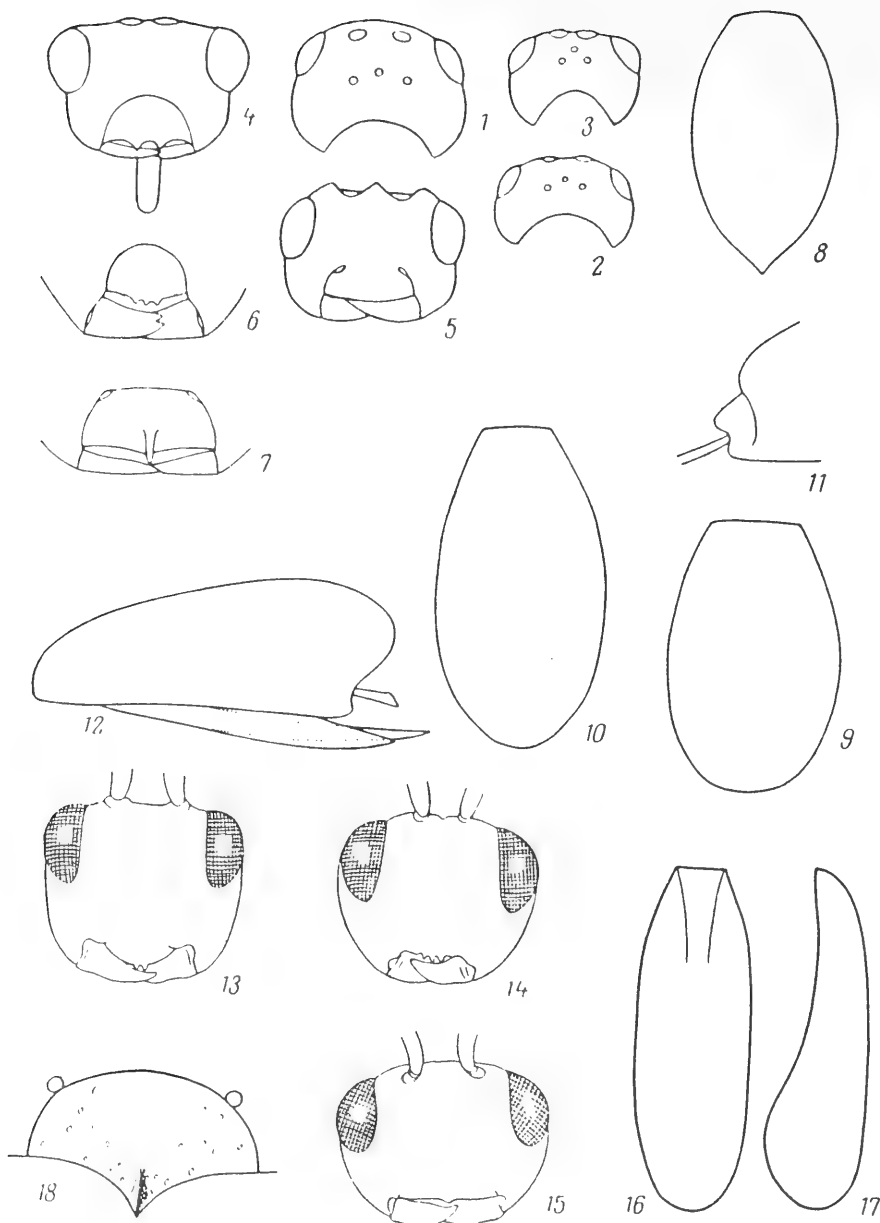
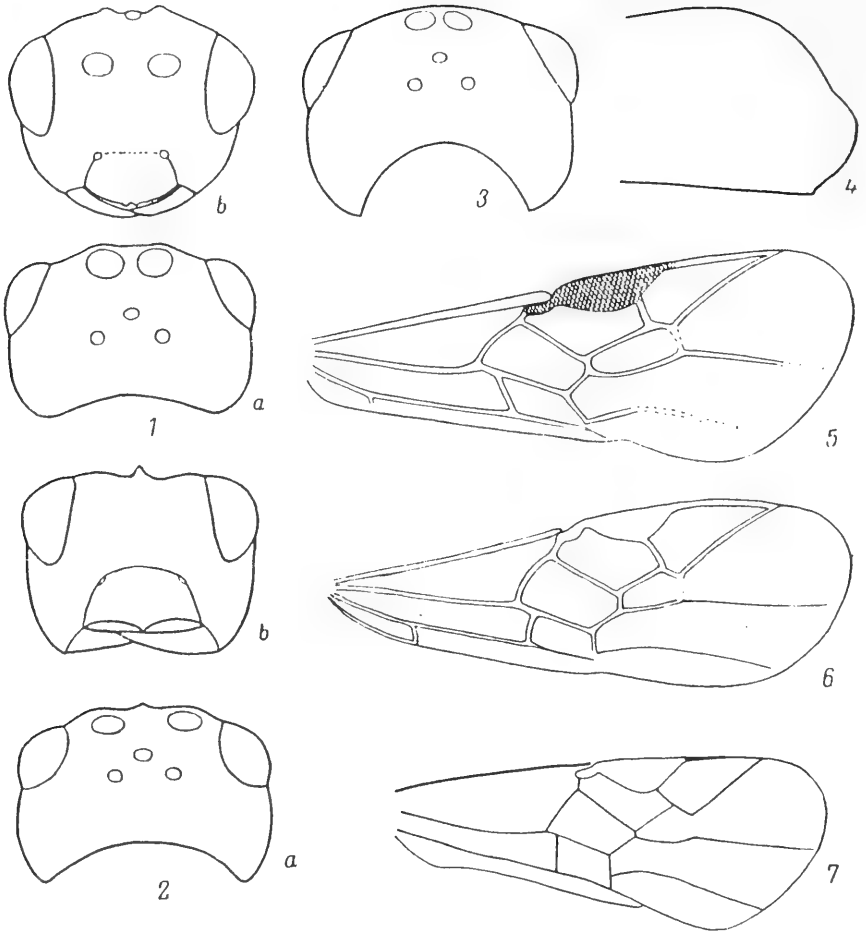


Fig. 181. Cheloninae (from Tobias and Telenga).

1-3—head, dorsal view: 1—*Ascogaster armata*, 2—*A. rufipes*, 3—*A. canifrons*;  
 4-5—head, frontal view: 4—*A. bicarinata*, 5—*A. armata*; 6, 7—lower part of head:  
 6—*A. rufidens*, 7—*A. abdominalator*; 8-10—abdomen, dorsal view: 8—*A. quadridentata*,  
 9—*A. scabricula*, 10—*A. armata*; 11—*A. excisa*, abdominal apex; 12—*A. excavata*  
 abdomen, lateral view; 13-15—head, frontal view: 13—*A. identula*, 14—*A. rufidens*,  
 15—*A. abdominalator*; 16, 17—*A. excisa*: 16—abdomen, dorsal view, 17—abdomen, lateral  
 view; 18—*A. dispar*, clypeus.

- 6 ( 5). Posterior margin of abdominal shield without excavation on lower side. If somewhat excavate then not tucked in anteriorly.
- 7 (24). Clypeus anteriorly with 2 or 3 denticles, latter occasionally small and hardly noticeable.
- 8 (23). Clypeus anteriorly with two denticles.
- 9 (12). Denticles on clypeus extremely large and pointed.
- 10 (11). Labiomaxillary complex extended into long proboscis, such that usually it is as long as height of gena (Fig. 181: 4). Abdominal shield at apex slightly decurved. Body, antennae and hind femora usually black. Antennae 24–25-segmented, slightly shorter than body. Body 3.5–5. Transcaucasia; Western Europe; Iran ..... *A. bicarinata* H.-Sch. (*caucasicus* Kok.)
- 11 (10). Labiomaxillary complex not extended into proboscis, slightly projecting. Abdominal shield at apex decurved up to quarter of its length. Antennae (male!) 29–30-segmented. Hind femora apically brownish yellow. Fig. 181: 11, 16, 17. Body 4.5–5 (female—cf. couplet 2) ..... *A. excise* H.-Sch. (*longiventris* Tobias)
- 12 ( 9). Denticles on clypeus weakly developed. Proboscis weakly developed, may be slightly projecting or not.
- 13 (20). Face 2 times as wide as high. Clypeus weakly punctate, lustrous; noticeably distinguished from significantly more strongly sculptured face.
- 14 (19). Legs black. Abdomen at apex curved forward.
- 15 (16). Temples roundly narrowed (Fig. 182: 1), longer by 1/3 transverse diameter of eye. Height of genae almost 1/2 longitudinal diameter of eye. Abdomen apically uniformly rounded. Middle and hind tibiae dark colored. Smaller, body 3–3.8. Georgia; Greece. .... *A. kasparyani* Tobias
- 16 (15). Temples almost straight, only posteriorly rounded (Fig. 182: 3), 1.5 times longer than transverse diameter of eye. Mesonotum with coarse but not dense punctation lustrous.
- 17 (18). Height of gena slightly shorter than longitudinal diameter of eye. Abdomen at apex produced (Fig. 182: 4), slightly curved from below. Frons and vertex slightly punctate more densely than mesonotum; without coarse wrinkles. Middle and hind tibiae brownish yellow in basal half and darkened in apical half. Body 4.5. Azerbaidzhan. .... *A. kabystanica* Tobias



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Fig. 182. Cheloninae (from Tobias).

1, 2—head (a—dorsal view, b—frontal view): 1—*Ascogaster kasparyani*, 2—*A. dentifer*;  
 3, 4—*A. kabystanica*: 3—head, 4—abdominal apex; 5—7—forewing: 5—*A. kasachstanica*,  
 6—*A. rufidens*, 7—*A. quadridentata*.

18 (17). Height of genae half longitudinal diameter of eye. Abdomen at apex uniformly rounded, decurved almost to 1/3 its length. Frons and vertex with coarse-rugose punctation. Middle and hind tibiae yellowish brown, in apical part slightly darkened. Fig. 182: 5. Body 4.5—5. Kazakhstan. ....  
 .....**A. kasachstanica** Tobias



- 19 (14). Legs, except coxae and trochanters, brownish yellow. Abdomen at apex posteriorly not bent under. Temples roundly narrowed, slightly longer than eye. Height of genae  $\frac{2}{3}$  of eye. Antennae 29-segmented, slightly shorter than body, slightly thickened in middle and thin at apex with almost square segments. Mesonotum broad. Anterior margin of radial cell equal to length of stigma; recurrent vein antefurcal; nervulus removed from basal vein to a distance  $\frac{2}{3}$  its length. Hind femora 4 times as long as wide. Abdomen ovate, 2 times as long as wide. Abdominal sternites projecting beyond apex of shield; ovipositor thin. Head and thorax relatively less densely and less coarsely punctate, slightly lustrous. Lower side of temples and scutellum softly punctate, lustrous. Abdomen with dense and soft-rugose punctation, almost matte. Body black, wings brownishly darkened. Body 3.1. Moldavia ..... **A. moldavica** Tobias, sp. n.  
 Holotype: Female, Faleshty, many years old fallow, 3.VI.1960 (Talitskii).
- 20 (13). Face 1.5 times as wide as high. Clypeus, densely punctate, at least in upper part so that its sculpture slightly distinguished from that of face.
- 21 (22). Abdomen in basal half and legs brownish yellow. Denticles of clypeus weak. Body 3.5–6. Central Urals; Western Europe ..... **A. gibbiscuta** Thoms.
- 22 (21). Abdomen entirely black. Hind femora brownish yellow or reddish brown, occasionally apically darkened. Hind tibiae and tarsi without contrasting whitish coloration. Antennae as long as body, 35-segmented. Fig. 181: 13. Body 3.5–4. Parasite of *Griselda myrtillana* Westw. (Tortricidae). Far East; Western Europe ..... **A. bidentula** Wesm.
- 302 23 ( 8). Clypeus anteriorly with 3 small denticles. Body black; legs yellowish or reddish brown. Hind femora often somewhat darkened. Antennae as long as body, 36-segmented. Mesonotum with smoothed sculpture, lustrous. Abdomen 1.5 times as long as wide. Figs. 181: 6, 14; 182: 6. Body 3–4. Parasite of *Arctia caja* L. (Arctiidae), *Pandemis heperana* Den. and Schiff., *P. cerasana* Hb., *Archips xylosteana* L., *A. rosana* L., *Spilonota ocellana* F., *Tortrix viridana* L., *Gypsonoma minutana* Hb., *Laspeyresia pomonella* L. (Tortricidae), *Malacosoma neustria* L., *Lymantria dispar* L. (Lymantriidae), *Cosmia trapezina* L. (Noctuidae). Far East; Western Europe .....  
 ..... **A. rufidens** Wesm.

- 24 ( 7). Clypeus with one denticle or without it.
- 25 (26). Temples angularly extending backward as plate-like outgrowths (Fig. 183: 1, 2); vertex steeply declivous immediately behind ocelli. Antennae slightly shorter than body, quite thick, thinned at apex with square segments, 30-segmented (in male, antennae setaceous, their apical segments 2 times as long as wide). Mesonotum distinctly broadened, steeply truncate anteriorly. Radial cell along anterior margin slightly longer than stigma; recurrent vein interstitial; nervulus removed from basal vein by less than half its length. Hind femora thickened, 3 times as long as wide. Abdomen ovate, 2 times as long as wide, 3 times as long as high in apical third. Abdominal shield decurved  $\frac{1}{5}$  its length at apex in male and very slightly in female. Body with coarse rugose punctation, sides of mesonotum and scutellum sparsely punctate, lustrous. Propodeum with 4 blunt denticles. Body black; face, genae, temples below angular projection, mouthparts (except lower side of clypeus and outer surface of mandibles), basal segment of antennae, tegulae, legs except coxae and brown middle and hind tarsi and apex of hind tibiae brownish yellow. Wings darkened with light colored transverse stripe in middle (in male light colored at base). Body 4.1 (male 4.2). Moldavia; Western Europe ..... **A. gonocephala** Wesm.  
Material: One female, 25.VII.1962 (Talitskii); 1 male Kishinev, 5.VII.1960 (Talitskii).
- 26 (25). Temples uniformly rounded, vertex roundly bulged behind ocelli.
- 27 (30). Clypeus at anterior margin straight, with large denticle in middle, depressed on both sides of denticle (Fig. 181: 7, 15). Mesonotum not densely punctate, lustrous.
- 304 28 (29). Abdomen often and sometimes thorax also yellowish brown. Hind femora usually darkened. Antennae as long as body, about 35-segmented. Abdomen 2 times as long as its maximum width. Figs. 181: 7, 15; 184: 1-3. Body 4-5. Northwest, center, south; Caucasus, Siberia (Tomsk); Western Europe ..... **A. abdominalator** Dahlbom (*instabilis* Wesm.)
- 29 (28). Abdomen like entire body black, only at base on sides yellowish. Hind femora entirely brownish red. Antennae shorter than body, 27-segmented. Abdomen as long as or slightly longer than 1.5 times its maximum width. Body 4.2. Azerbaidzhan; Mongolia ..... **A. nachitshevanica** Abdinb.

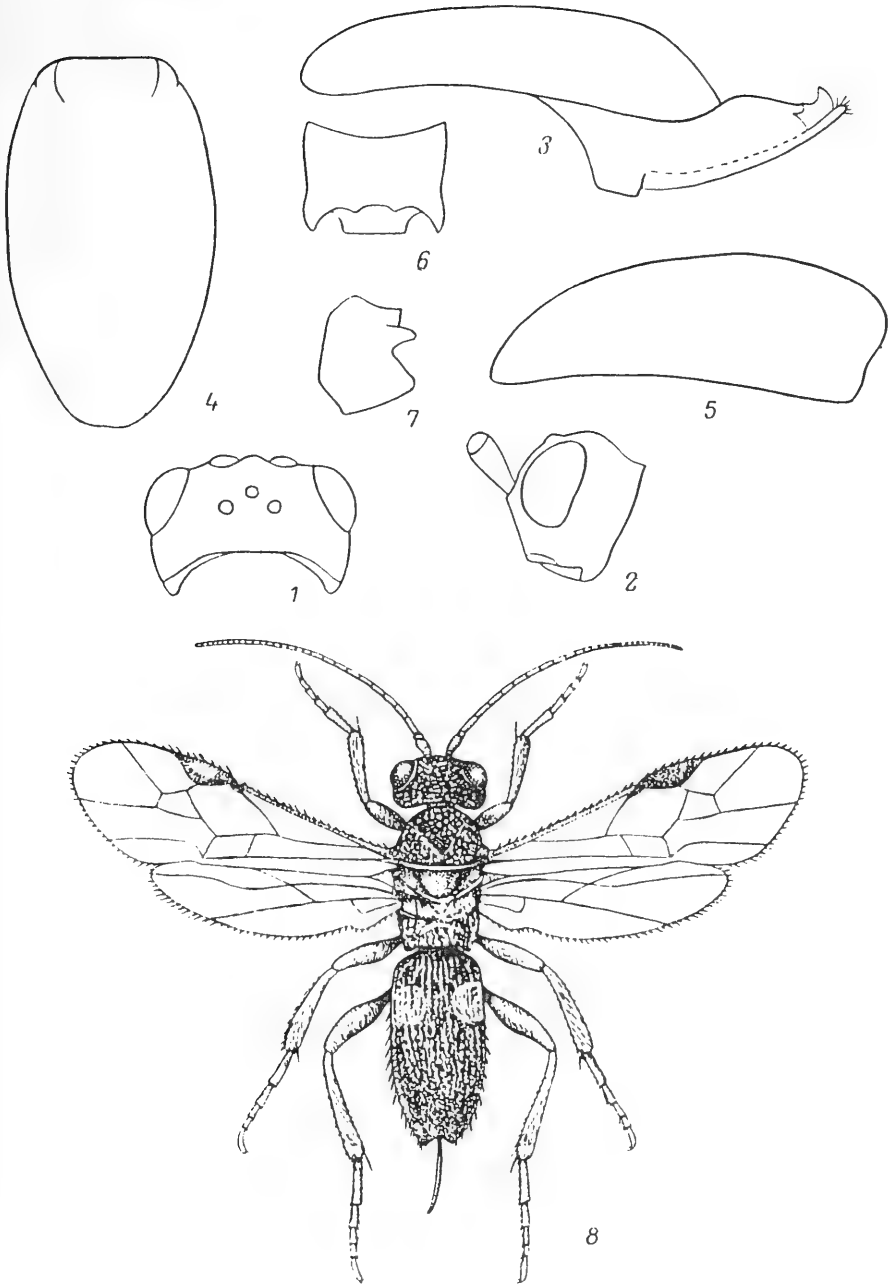


Fig. 183. Cheloninae (original).

1, 2—*Ascogaster gonocephala*: 1—head, dorsal view, 2—head, lateral view; 3—*A. bimaris* sp. n., abdomen; 4—7—*A. magnidentis* sp. n.: 4—abdomen, dorsal view, 5—abdomen, lateral view, 6—propodeum, dorsal view, 7—propodeum, lateral view; 8—*Chelonus submuticus*.

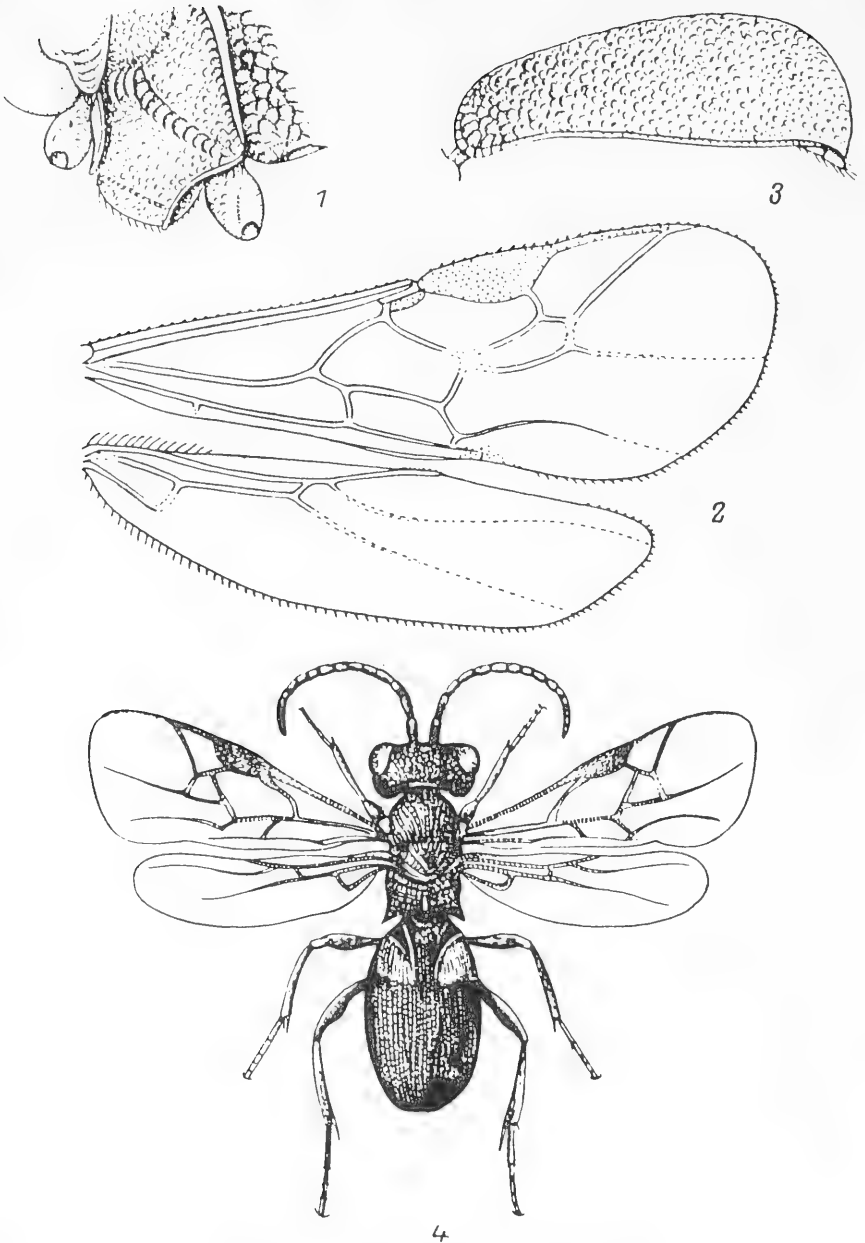


Fig. 184. Cheloninae (from Achterberg and Vance).

1-3—*Ascogaster abdominalator*: 1—lower side of thorax, 2—wings, 3—abdomen;  
4—*Chelonus annulipes*.

- 30 (27). Clypeus at anterior margin bulged, denticles on it much less developed or absent.
- 31 (36). Face with reddish or yellowish pattern. Antennae as long as body, 30-segmented. Head much wider than thorax.
- 32 (33). Abdomen longitudinally oval, at apex not at all decurved; posterior sternite projecting beyond apex of shield (Fig. 183: 3). Scutellum smooth; mesonotum, except wrinkled middle part in front of scutellum and sides of mesothorax weakly punctate, lustrous. Temples approximately as long as eye. Face 2 times as wide as high. Anterior margin of radial cell noticeably longer than stigma; recurrent vein slightly postfurcal; nervulus removed from basal vein by half its length. Hind femora 4 times as long as wide. Face densely punctate, faintly striate transversely. Propodeum with soft rugose punctation, weak denticles, weak transverse ridge with two median longitudinal ridges in front. Abdomen with dense and soft-rugose punctation. Body brownish yellow, with black spots on upper and lower sides of head, scutellum, lower part of prothorax and mesothorax, sides of metathorax and propodeum. Wings darkened with smoky spot below stigma and bright spot in front of it. Abdomen narrowed toward anterior side in male, at apex slightly curved forward. Body black, head frontally yellow. Body 4.2–4.5. Caucasus .....  
 ..... **A. bimar**is Tobias, sp. n.  
 Holotype: Female, Lenkoran, Isti-su, forest 4.V.1971 (Tobias). Paratypes: Two females, 2 males, with data of holotype; 1 male, Lenkoran 6.V.1971, 3 females Astara, park, 29–30.IV.1971 (Tobias); 1 male, Novyi Afon, 12.V.1932 (B. Rodendorf) [identified as *A. ruficeps* by N.A. Telenga]; 2 females, Sochi (Lazarevskoe), terraced slopes, forest, 12.V.1973 and 17.IV.1975 (Tobias).
- 33 (32). Abdomen longitudinally oval, at apex distinctly decurved; posterior sternite not projecting beyond apex of shield. Scutellum sculptured; mesonotum and sides of mesothorax more densely punctate, dimly lustrous.
- 34 (35). Recurrent vein antefurcal. Body brownish yellow with dark spots on vertex, clypeus, genae, scutellum, on lower part mesothorax, metathorax and middle of propodeum. Scutellum quite densely punctate, dimly lustrous. Face without distinct longitudinal ridge in middle. Hind tibiae distinctly darkened in apical half; yellowish white in basal half. Hind femora 4 times as long as wide. In male body black, head brownish

- yellow with dark spots on vertex; legs yellow; hind tibiae darkened only at apex. Body 3.3–3.5 (male 3–3.7). Krasnodar Territory ..... **A. disparilis** Tobias, sp. n.
- Holotype: Female, Sochi (Lazarevskoe), terraced slopes, forest, 11.VI.1974 (V. Tobias). Paratypes: Same place—1 male, 15.V.1973; 5 males, 23.V.1974; 4 females, 1 male, 14.VI.1974; 1 male, 22.V.1979 (V. Tobias).
- 35 (34). Recurrent vein interstitial. Body black, only head frontally (at least orbits), base of antennae, tegulae and legs (sometimes except hind coxae and apex of hind tibiae), sometimes pronotum brownish yellow. Scutellum with sparse punctation, lustrous. Face with longitudinal keel like elevation. Body 3.7–4. Parasite of *Borkhausenia stipella* L. (Oecophoridae). West, southwest; Trans-Ural; Western Europe .....  
.....**A. klugii** Nees (*ruficeps* Wesm.)
- 36 (31). Face entirely black.
- 37 (40). Antennae in female shorter than body, 22–25-segmented.
- 38 (39). Mesonotum softly punctate, lustrous, scutellum smooth. Abdomen with posteroventral groove and basal yellowish spots, legs often brownish yellow. Body 3.5–4. Parasite of *Borkhausenia lambdella* Don. (Oecophoridae), *Pandemis heperana* Den. and Schiff. (Tortricidae), *Recurvaria leucata* Cl., *R. nanella* Den. and Schiff. *Parachronistis albiceps* Z. (Gelechiidae), *Chrysochlista linneella* Cl. (Momphidae), *Narycia monilifera* Geoffr. (Psychidae), *Yponomeuta malinellus* Z. (Yponomeutidae). Center, east (Permskaya Region), south; Central Ural; Caucasus, Western Kazakhstan, Siberia (Chita); Western Europe ..... **A. annularis** Nees<sup>1</sup>
- 39 (38). Mesonotum and scutellum with coarse rugose punctation, matte. Abdomen and hind femora black. Body 3.5–5.5. Parasite of *Yponomeuta padellus* L. (Yponomeutidae). Center, south; Western Europe .....**A. similis** Nees
- 40 (37). Antennae 30-segmented, usually as long as body or slightly shorter. Propodeum with denticles along sides. Medial vein emerging from basal, distinctly removed from parastigma.
- 41 (42). Mesonotum mildly punctate, lustrous. Abdomen often with yellowish pattern, apically uniformly rounded. Coloration of hind femora various, often yellowish brown, rarely

<sup>1</sup>*A. grahami* Huddleston, 1984, was separated out of this species, distinguished by abdomen posteroventrally ungrooved and usually without basal yellow spots and shorter temples (shorter than eye).

- 305 black. Body 3–4. Parasite of *Laspeyresia zebeana* Sax., *L. pactolana* Z., *Grapholitha compositella* F. (Tortricidae), *Gelechia rhombella* Den. and Schiff. (Gelechiidae). Center, south; Caucasus (Dagestan), Kazakhstan, Baikal Region; Western Europe ..... **A. varipes** Wesm.
- 42 (41). Mesonotum with coarse rugose punctation or with dense punctation, matte.
- 43 (50). Abdominal shield turned distinctly forward from below, length of its lower groove 0.7–0.8 of abdomen. Abdomen approximately 1.7 times as long as wide.
- 44 (47). Temples bulged, head broadened behind eyes. Entire body densely punctate and coarsely rugose, matte. Body black, femoral apices and foretibiae yellowish red; tarsi, middle and hind tibiae dark brown to black.
- 45 (46). Denticle on anterior margin of clypeus pointed (Fig. 181: 18). Antennae as long as body, setaceous, without broad segments (in male). Face around eyes with longitudinal folds. Body 3.7–4.5. Caucasus, Kazakhstan; Western Europe .....  
..... **A. dispar** Fahr. (*spinifer* Tobias)
- 46 (45). Denticles on anterior margin of clypeus almost undeveloped. Antennae much shorter than body, with distinctly broadened segments beyond middle (female). Face uniformly and finely reticulate-rugose, without longitudinal folds near eyes. Body 4.4. Central Ural ..... **A. temporalis** Tobias, sp. n.  
Holotype: Female, Il'menskii Protected Forest, 17.VII.1958 (Tobias).
- 47 (44). Temples not bulged, head roundly narrowed behind eyes, denticle in middle of clypeus blunt.
- 48 (49). Mesonotum densely punctate without clear alveolate sculpture. Abdomen at apex uniformly rounded or slightly narrowed angularly. Hind femora always black. Body small, 2.8–3. Center; Central Ural, Caucasus (Krasnodar Territory, Armenia, Azerbaidzhan) ..... **A. jaroslawensis** Kok.
- 49 (48). Mesonotum with coarse rugose punctation and alveolate sculpture. Abdomen at apex usually (not always) angularly pointed. Coloration of hind femora various, often black, rarely reddish or red.—Figs. 181: 8; 182: 7. Parasite of *Laspeyresia pomonella* L., *Grapholitha molesta* Busck, *G. funebrana* Tr., *Pandemis heperana* Den. and Schiff., *Spilonota ocellana* F., *Archips rosana* L., *Eupoecilia ambiguella* Hb., *Lobesia botrana* Den. and Schiff. (Tortricidae), *Recurvaria namella* Den. and Schiff. (Gelechiidae). West, northwest,

- central belt, south; Caucasus, Kazakhstan, Central Asia (except gardens in extremely arid conditions), southern Siberia (to Far East); Western Europe, North America .....
- ..... **A. quadridentata** Wesm. (*rufipes* auct. *egregius* Kok.)
- 50 (43). Abdominal shield slightly curved, length of its lower groove only slightly less than length of whole shield. If, sometimes, shield distinctly curved, then abdomen 2 times as long as wide.
- 51 (52). Abdomen short, 1.5 times as long as wide (Fig. 181: 9), apically very weakly sculptured, dimly lustrous. Hind femora black. Body 4–5. Center, east; Western Europe .....
- ..... **A. scabricula** Dahlbom (*clypealis* Thoms.)
- 52 (51). Abdomen long, almost 2 times, more often even longer, than wide.
- 53 (54). Abdomen longitudinally oval. Denticles of propodeum extremely large (lateral ones significantly longer than their width), blunt. Head behind eyes broadened, temples much longer than eye, height of genae 1/2 of eye. Antennae setaceous, 35-segmented, slightly shorter than body, with broad segments beyond middle. Anterior margin of radial cell as long as stigma; recurrent vein slightly postfurcal; nervulus emerging from basal vein at a distance equaling 1/3 its length. Hind femora 3 times as long as wide. Abdominal apex with slight transverse depression. Body with uniformly dense and quite coarse rugose punctation. Sculpture of clypeus softer but dense. Scutellum with minute longitudinal wrinkles. Body black. Apices of fore- and middle femora, fore- and middle tibiae, base of hind tibiae brownish yellow. Antennae (colorless at base), hind tibiae at apex brown. Palpi and tarsi brownish. Wings slightly darkened. Fig. 183: 4–7. Body 4.5. Parasite of *Laspeyresia millenniana* Adamcz (Tortricidae). Center .....
- ..... **A. magnidentis** Tobias, sp. n.
- Holotype: Male, Ivanovskaya Region (“Letnyayabaza”), host *L. millenniana*, emergence 15.VI.1976 (V. Grebenshchikova).
- 54 (53). Abdomen almost parallel-sided. Denticles on propodeum less developed (lateral denticles usually not longer than wide) and somewhat pointed.
- 55 (58). Upper part of face between antennal sockets elevated triangularly or denticulately. Temples very distinctly developed, 2–2.5 times longer than transverse diameter of eye. Head slightly broadened behind eyes.



- 56 (57). *Notaulices indistinct*. Temples 2.5 times longer than transverse diameter of eye. Frons elevated acutely angularly between antennal bases. Denticle on anterior margin of clypeus weak. Abdomen often brownish red; sometimes with yellow spots at base, rarely black. Fig. 181: 1, 5, 10. Body 3.5–5. Center, southeast; Western Europe ..... **A. armata** Wesm.
- 57 (56). *Notaulices deep*. Temples 2 times as long as transverse diameter of eye. Frons between antennal bases with denticle. Denticle on anterior margin of clypeus well developed (Fig. 182: 2), of same shape as that between antennal bases. Abdomen black. Body 3.5. Armenia; Western Europe ..... **A. dentifer** Tobias
- 58 (55). Upper part of face between antennal sockets slightly elevated. Temples weakly developed, less than 2 times as long as eye.
- 306 59 (60). Head behind eyes broadened, temples almost 2 times as long as eye (Fig. 181: 2). Thorax almost 2 times as long as high. Body, including mesonotum, densely punctate, matte. Abdomen very slightly curved (to 1/5 to 1/6 its length). Hind femora reddish or black. Abdomen at base black or yellowish. Body 3–4. Northwest, south; Caucasus (Azerbaijan), Kirgizia, Yakutia; Western Europe ..... **A. rufipes** Latr. (*soror* Tel., *ratzeburgi* Marsh.)
- 307 50 (59). Head behind eyes narrowed. Temples distinctly less than 2 times as long as eye (Fig. 181: 3). Thorax 1.5 times as long as high. Face with dense hairs covering sculpture. Coloration of legs and abdomen various. Abdomen black or at base with yellow spots, hind femora brownish yellow or black. Body 4–5. Parasite of *Laspeyresia pomonella* L., *L. splendana* Hb., *Gypsonoma dealbana* Fröl., *Endothenia antiquana* Hb., *Eupoecilia angustana* Hb., *Rhopobota naevana* Hb. (Tortricidae), *Eupithecia pyreneata* Mab. (Geometridae). Northwest; Central Ural; Western Europe ..... **A. canifrons** Wesm.

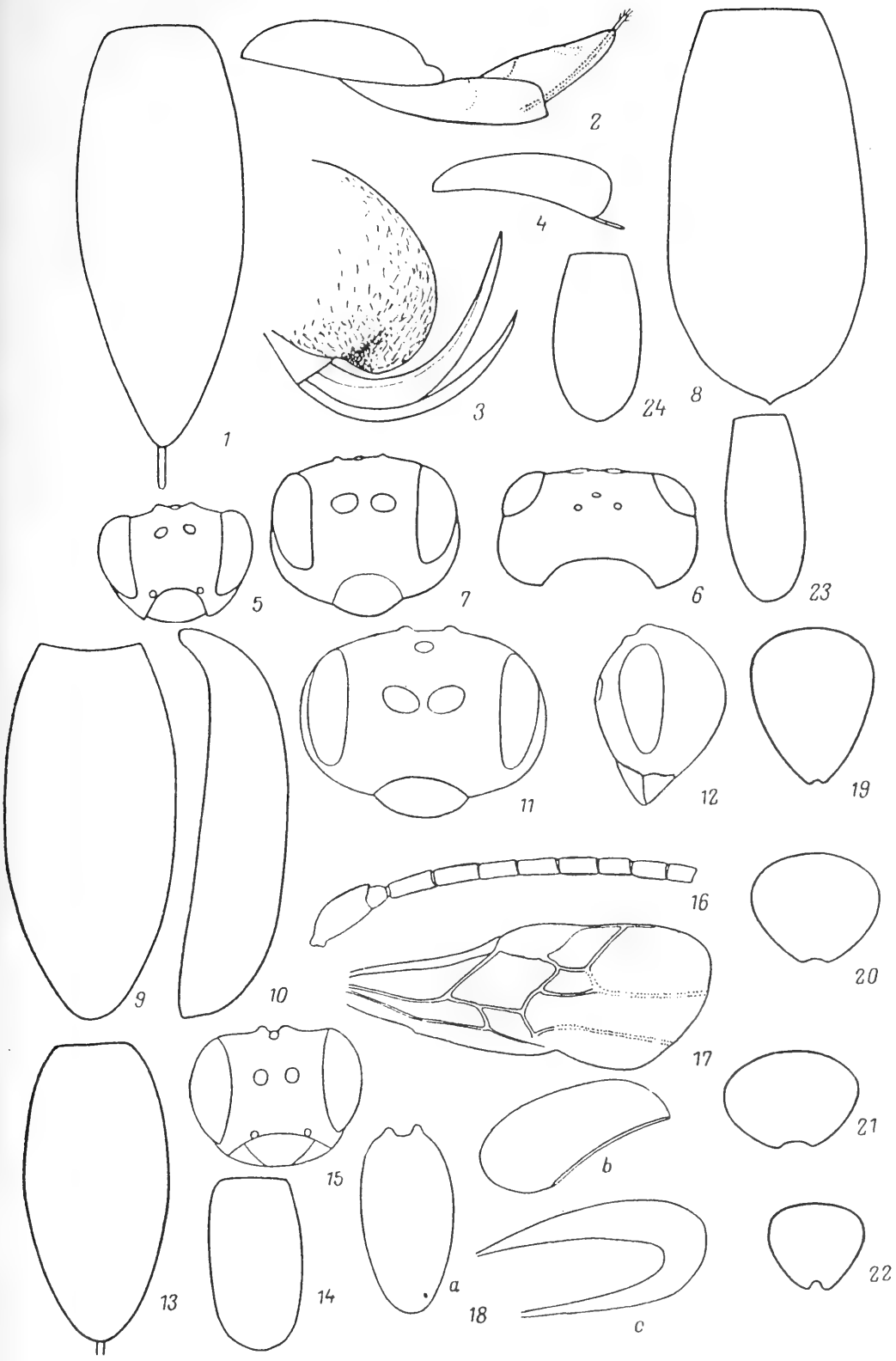
149. **Chelonus** Jurine, 1801.<sup>1</sup>—About 180 species, half of them Palearctic.

- 1 ( 6). Abdomen longer than head and thorax together, sharply narrowed toward apex (Fig. 185: 1).

<sup>1</sup>Tobias, 1972. *Tr. Vsesoyuz Entomol O-va*, 55: 284–299.

- 2 ( 5). Abdomen apically not decurved. Antennae 38–44-segmented.
- 3 ( 4). Posterior sternite projecting slightly or not at all beyond apex of abdomen. Thorax with brownish red pattern. Fig. 185: 1. Body 6–7. Transcaucasia, Central Kazakhstan, Uzbekistan; Spain, Hungary ..... *C. olgae* Kok.
- 4 ( 3). Posterior sternite not projecting much beyond apex of abdomen (Fig. 185: 2). Body entirely black, 6. (without posterior sternite). Central Kazakhstan .....  
... *C. sternalis* Tobias (*kasachstanicus* Tobias, 1972, *lapsus calami*)
- 5 ( 2). Abdomen apically decurved by 0.2 of its length. Antennae about 20-segmented. Head roundly narrowed behind eyes. Temples as long as eye. Antennae thin, setaceous. Hind femora 5 times as long as wide. Head quite densely punctate. Vertex behind eyes and face transversely striate. Thorax quite uniformly rugose-punctate. Propodeum with slight lateral denticles, without transverse ridge. Abdomen with dense granulose and wavy punctation, mild longitudinal folds in basal half. Anterior margin of radial cell as long as stigma. Second radiomedial cell quite long, stigma narrow, not large. Body black. Fore- and middle tibiae and tarsi, forefemora, except base, apices of middle and hind femora brownish yellow. Hind tibiae apically, hind tarsi, except basal segment, brownish. Middle of hind tibiae and basal segment of hind tarsi yellow. Wings light colored, stigma brown. Fig. 189: 1–3. Body 4.2. Kazakhstan, Central Asia ..... *C. elongatus* Tobias, sp. n.

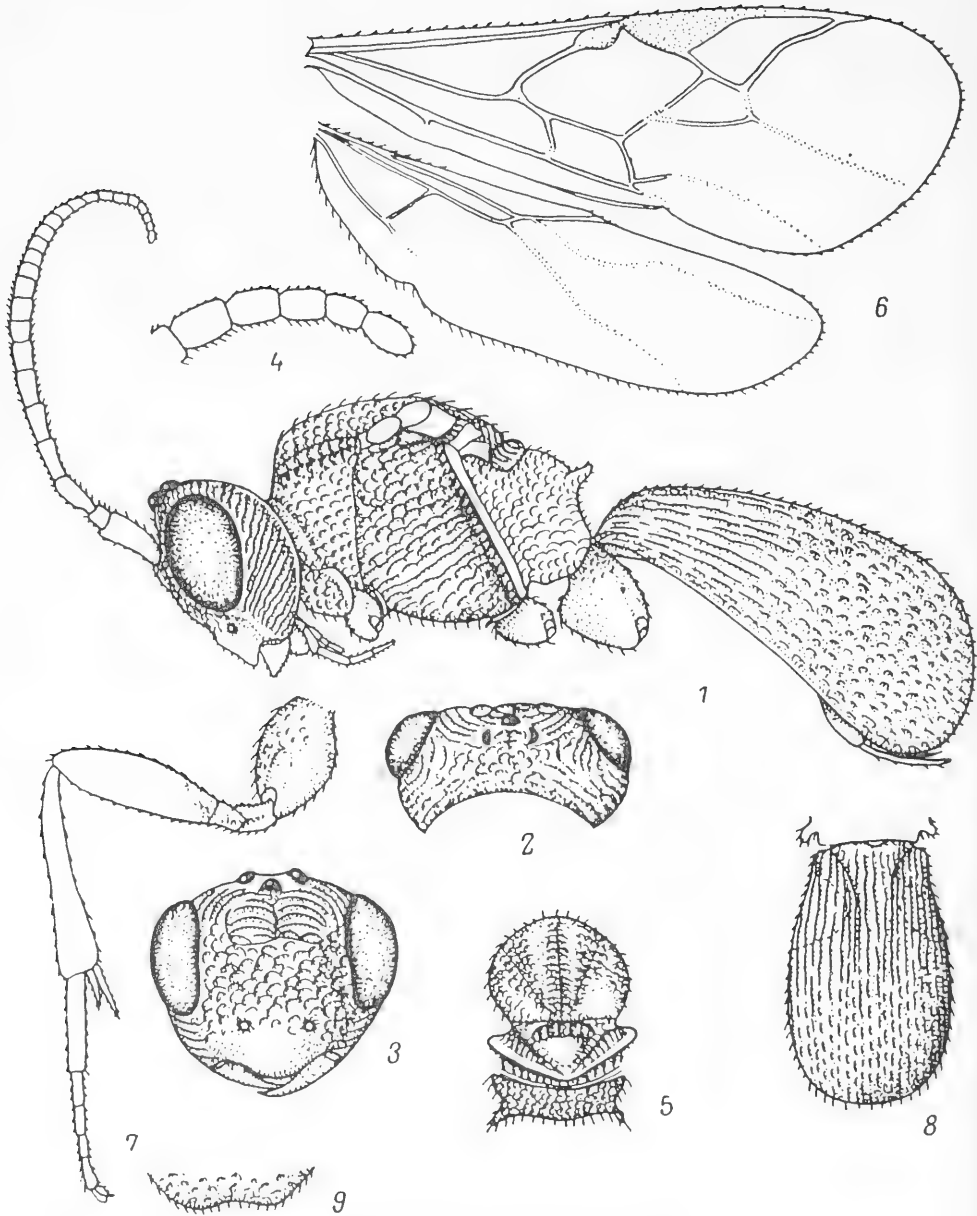
1—*Chelonus olgae*, abdomen, dorsal view; 2—*C. sternalis*, abdomen, lateral view; 3—*C. inanius*, abdominal apex; 4—*C. obscuratus*, abdomen, lateral view; 5—*C. microsomus*, head; 6–8—*C. tuberculifer*: 6—head, dorsal view, 7—head, frontal view, 8—abdomen; 9–12—*C. planiventris*: 9—abdomen, dorsal view, 10—abdomen, lateral view, 11—head, frontal view, 12—head, lateral view; 13, 14—abdomen, dorsal view: 13—*C. andrievskii*, 14—*C. annulatus*; 15–18—*C. subannulatus*: 15—head, 16—antenna, 17—forewing, 18—abdomen (a—dorsal view, b—lateral view, c—ventral view); 19–22—abdominal apex, from behind: 19—*C. submuticus*, 20—*C. oculator*, 21—*C. scabrator*, 22—*C. caradrinae*, 23, 24—abdomen, dorsal view: 23—*Microchelonus alboannulatus*, 24—*M. starki*.



Holotype: Male, Kazakhstan, Malye Barsuki, Ak-Tash, 13.VI.1931 (Luipova). Paratype: Male, Uzbekistan, Kamashi, 27.V.1931 (V. Gussakovskii).

- 6 ( 1). Abdomen not longer than head and thorax together, usually uniformly rounded apically, less abruptly narrowed in any case. Antennae less than 40-segmented.
- 7 (130). Abdomen at apex without platelike appendage.
- 8 ( 9). Abdomen at apex with two reddish spots. Antennae as long as body, thin (male). Body with quite coarse alveolate sculpture, occiput with 6–8 transverse folds. Body black. Hind femora brownish red or black. Body 4–4.5. Center; Kirgizia; Western Europe ..... *C. bonellii* Nees
- 9 ( 8). Abdomen at apex without such spots.
- 10 ( 23). Hind femora brownish red. Body large (5–7), coarsely sculptured, usually with not more than five transverse folds on vertex behind ocelli (except in *C. macrocerus* and *C. obscuratus*). Abdomen at base along sides usually with yellow spots. Apex of abdominal shield curved forward. Thorax black, matte for greater part.
- 11 ( 12). Apex of abdominal shield on lower side with deep and wide groove. Ovipositor long and thick, distinctly falcate (Fig. 185: 3). Antennae 24–26-segmented. (In male, depression on abdominal apex sometimes extremely faint.) Body 5–9. Parasite of *Aethes francillana* F., *Eucosma tripoliiana* Barr., *E. aemulana* Schläg. (Tortricidae), *Sylepta derogata* F., *Ostrinia nubilalis* Hb. (Pyraustidae), *Etiella zinckenella* Tr. (Phycitidae), *Oligia literosa* Hw., *Photodes elymi* Tr. (Noctuidae). All of Palearctic (except north); from Western Europe to Far East ..... *C. inanitus* L.
- 12 ( 11). Apex of abdominal shield without ventral groove or groove slight and narrow. Ovipositor shorter and thinner, slightly curved or straight.
- 13 ( 14). Apex of abdominal shield distinctly narrowed downward, with longitudinal groove on part curved forward (Figs. 183: 8; 185: 19). Clypeus distinctly projecting forward. Body 6–7. Parasite of *Homoeosoma nebulellum* Hb. (Phycitidae). South, east; Kazakhstan; Western Europe ..... *C. submuticus* Wesm.
- 14 ( 13). Apex of abdominal shield uniformly rounded downward or slightly narrowed, without longitudinal groove on lower side (except in *C. obscuratus*).

- 15 ( 20). Vertex with coarse transverse folds behind ocelli. Abdominal shield posteriorly sharply curved forward on lower side, 2–3 times as long as high in apical third.
- 16 ( 17). Legs entirely, including coxae and tegulae brownish red. Antennae and abdomen reddish brown (male). Body 6. Transcaucasia ..... *C. shevyrjevi* Tobias
- 17 ( 16). Coxae, tegulae and antennae black; abdomen usually black.
- 18 ( 19). Abdomen in male (female not known) 2.5 times as long as wide, weakly sculptured in apical third, posteriorly less distinctly curved forward. Mesonotum except notaulices, mildly sculptured, lustrous. Abdomen brownish red. Antennae 31-segmented. Body 6. Orenburg Region .....  
..... *C. zimini* Tobias (*erythrogaster* Lucas sensu Telenga)
- 309 19 ( 18). Abdomen in male, at most 2 times as long as wide; in female still shorter, coarsely sculptured in apical third, posteriorly very distinctly curved on lower side. Mesonotum with coarse cellular sculpture. Abdomen usually black with yellow basal spots, rarely red. Antennae in female 22–25-segmented. Figs. 185: 20; 186. Body 4.5–6. Parasite of *Agrotis segetum* Den. and Schiff., *Helicoverpa armigera* Hb., *Heliothis virescens* Hfn., *H. peltigera* Den. and Schiff.,  
310 *Spodoptera exigua* Hb., *Photedes elymi* Tr. (Noctuidae), *Etiella zinckenella* Tr. (Phycitidae), *Pyrausta sticticalis* L. (Pyraustidae), *Coleophora anatipennella* Hb. (Coleophoridae), *Zeiraphera isertana* F. (Tortricidae). Northwest, center, east, south; Caucasus, Kazakhstan, Central Asia; Western Europe, North Africa, Iran ..... *C. oculator* Panz.
- 20 ( 15). Vertex with weak transverse striations or without them. Abdominal shield posteriorly slightly downcurved, 3.5–4 times as long as high in apical third.
- 21 ( 22). Antennae 28–30-segmented, apical segments square. Costal vein and parastigma yellow. Abdomen on lower side of apex without longitudinal groove. Body 4–5.5. West, center, east, south; Northern Europe .....  
..... *C. macrocerus* Thoms. (*obscurator* sensu Telenga)
- 22 ( 21). Antennae 24–25-segmented, apical segments longer than wide. Costal vein and parastigma brown. Abdomen on lower side of apex with longitudinal groove. Temples slightly longer than transverse diameter of eye, slightly broad. Abdomen in basal third with two sharp longitudinal ridges. Body uniformly with dense rugose punctation, vertex almost not transversely wrinkled. Tegulae brown.



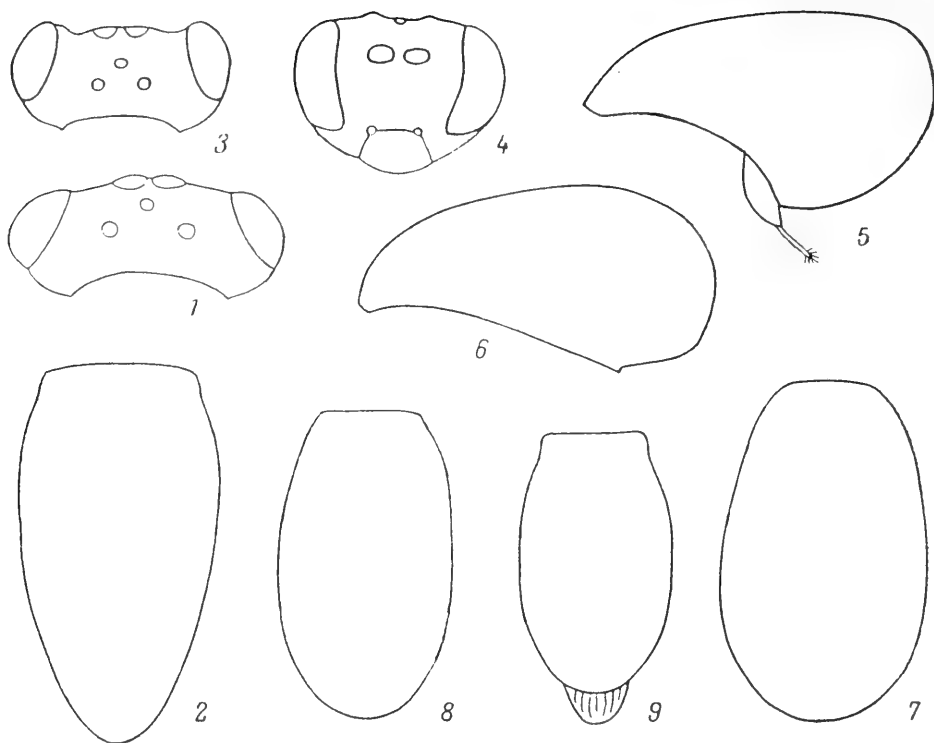
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Fig. 186. Cheloninae (from Achterberg).

1-9—*Chelonus oculator*: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—antennal apex, 5—mesonotum and postscutellum, 6—wings, 7—hind leg, 8—abdomen, 9—lower part of abdominal apex.

- Fig. 185: 4. Body 4.5–5.2. Parasite of *Rhyacionia buoliana* Den. and Schiff. (Tortricidae). Center, south; Western Europe ..... **C. obscuratus** H.-Sch.
- 23 ( 10). Hind femora usually black; if with somewhat developed reddish pattern, then combination of characters different.
- 24 ( 25). Antennae 17–19-segmented.
- 25 ( 26). Abdomen (in male except apex) red. Head with extremely soft sculpture. Thorax with irregularly scattered punctation. Propodeum with weak denticles. Antennal bases, tegulae and legs except coxae, red. Southwestern Europe, Algeria ..... **C. erythrogaster** Lucas
- 26 ( 25). Abdomen black, at most with yellow spots in basal part.
- 27 ( 28). Wings hyaline-transparent, stigma yellow. Head distinctly narrowed behind eyes (Fig. 187: 1). Occiput and temples slightly sculptured, lustrous. Mesonotum lustrous, mildly sculptured. Abdomen distinctly narrowed toward apex (Fig. 187: 2). Tegulae yellow. Body 3–3.5. Central Asia ..... **C. popovi** Tobias
- 28 ( 27). Wings noticeably darkened, stigma brown. Head slightly narrowed behind eyes. Occiput, temples and mesonotum more coarsely sculptured, matte.
- 29 ( 30). Abdominal shield posteriorly very slightly curved forward ventrally, lower groove of shield equal to 2/3 of abdominal length. Abdomen and hind femora black. Body 5–6. Hungary (cf. also couplet 103) ..... **C. pannonicus** Szépl.
- 30 ( 29). Abdominal shield posteriorly slightly curved forward ventrally.
- 311 31 ( 36). Abdomen entirely yellow or at base along sides with yellow spots.
- 32 ( 33). Antennae 17-segmented, like greater part of femora of all legs black. Anterior margin of radial cell slightly shorter than stigma. Body rugosely alveolate, 3.2. Caucasus ..... **C. armeniacus** Tobias
- 33 ( 32). Antennae 18-segmented, antennal bases or legs light colored.
- 34 ( 35). Legs brownish yellow. Hind femora at apex darkened. Antennae entirely black. Abdomen at base whitish yellow. Body 3.4. Center; Far East; Western Europe. .... **C. gravenhorsti** Wesm.<sup>1</sup>

<sup>1</sup> The report about the occurrence of this species in Transcaucasia (Telenga, 1936. Fauna SSSR, Vol. 5, 2: 214) really refers to *C. tricolor* Tobias.



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Fig. 187. Cheloninae (from Tobias).

1, 2—*Chelonus popovi*: 1—head, dorsal view, 2—abdomen; 3—4—*C. ahngeri*: 3—head, dorsal view, 4—head, frontal view; 5, 6—abdomen, lateral view: 5—*C. capsa*, 6—*C. lisogaster*; 7—9—abdomen, dorsal view: 7—*C. annulipes*, 8—*C. asiaticus*, 9—*C. processiventris*.

- 35 ( 36). Greater part of legs black. Antennae in basal part brownish yellow. Body 4—5. Center; Sweden.....  
 ..... **C. antennalis** Thoms.
- 36 ( 31). Abdomen entirely black. Legs mostly black.
- 37 ( 38). Tegulae yellow. Face with dense, short light colored hair. Body 3—4. Center; Far East; Western Europe.....  
 ..... **C. canescens** Wesm.
- 38 ( 37). Tegulae black. Face weakly pubescent, hairs not conspicuous.



- 39 ( 40). Body relatively large, 4–5. In male abdomen at apex with aperture ..... **Microchelonus mucronatus** Thoms.
- 40 ( 39). Body relatively small, 2–2.5.
- 41 ( 42). Eyes elongate, their longitudinal diameter 2.5 transverse diameter, 6 times height of gena (Fig. 185: 5). Anterior margin of radial cell half of stigma. Abdomen 1.5 times as long as wide in middle part. Body 2.5. Kazakhstan .....  
..... **C. microsomus** Tobias
- 42 ( 41). Eyes normally developed, their longitudinal diameter 2 times transverse diameter, 3 times height of gena. Anterior margin of radial cell slightly shorter than stigma. Abdomen 2 times as long as wide in middle part. Antennae 18-segmented. Apex of abdomen in male with aperture (species belongs to genus *Microchelonus*).
- 43 ( 44). Abdomen at apex with pointed tubercle. (Abdominal apex in male with extremely small aperture.).....  
..... **M. pusillus** Szépl.<sup>1</sup>
- 44 ( 43). Abdomen at apex with pointed tubercle. (Abdominal apex in male with fairly wide aperture.) (cf. also couplet 53) ..  
..... **M. tuberculiventris** Tobias, sp. n.
- 45 ( 24). Antennae not less than 20-segmented.
- 46 ( 79). Abdomen longitudinally oval, posteriorly slightly curved ventrally or not, 3.5–4.5 times as long as high in apical third.
- 47 ( 52). Eyes distinctly elongate; their longitudinal diameter 2 times transverse diameter, 4–5 times height of gena. Head broadened behind eyes (if not broadened, then abdomen at apex with pointed tubercle). Temples longer than transverse diameter of eye. Abdomen 2.2 times as long as wide in middle. Antennae 20–24-segmented, apical segments longer than wide. Body uniformly rugose-punctate, entirely matte.
- 48 ( 51). Temples 2 times or slightly less than transverse diameter of eye. Abdominal shield posteriorly curved ventrally to 1/5 its length.
- 49 ( 50). Thorax of usual structure: anterior part of pronotum not produced as neck. Legs for greater part black. Abdomen

<sup>1</sup> Material presented under this species name (Tobias, 1972) belongs to *M. tuberculiventris* sp. n.

- in female at apex usually (but not always) with pointed tubercle (Fig. 185: 6–8). Antennae thin, segments in apical half noticeably longer than wide (male not known). Body 2.5–3. Crimea, Trans-Ural..... **C. tuberculifer** Tobias
- 50 ( 49). Pronotum distinctly produced anteriorly as neck. Legs yellowish red. Abdomen at apex uniformly rounded (in male with apical aperture out of which projects short vertical keel). Antennae slightly thickened in middle, with square segments (apical segments longer than wide) .....  
..... **Microchelonus pedator** Dahlbom.
- 51 ( 48). Temples 1.5 times as long as transverse diameter of eye. Abdomen at apex not curved forward ventrally, posteriorly uniformly rounded. Flagellar segments slightly longer than wide in apical third. Fig. 185: 9–12. Body 4.4. Central Asia..... **C. planiventris** Tobias
- 52 ( 47). Longitudinal diameter of eyes less than 2 times transverse diameter, not more than 3 times height of gena. Head broadened behind eyes, temples not longer than or slightly longer than eye.
- 53 ( 54). Abdomen at apex curved forward ventrally by 1/6 to 1/5 of its length, apically usually with pointed tubercle (cf. Fig. 185: 8). Antennal segments slightly flattened and square in apical third (antennae 18–20-segmented). Margin of radial cell slightly shorter than stigma. Hind femora 4 times as long as wide. Body densely and finely sculptured, black; foretibiae, apices of forefemora and greater part of middle and hind tibiae brownish yellow. Apices of middle and hind tibiae and tarsi brown. Wings darkened. Body 2.5. (cf. also couplet 44.) .....  
..... **Microchelonus tuberculiventris** Tobias, sp. n.
- 54 ( 53). Abdomen at apex without pointed tubercle, slightly curved or not curved ventrally.
- 55 ( 60). Abdomen at apex slightly sculptured, occasionally almost smooth. Hind femora 4–5 times as long as wide.
- 312 56 ( 57). Apex of abdominal shield not at all curved forward ventrally. Shield without noticeable semitransparent edging. Antennae 25–27-segmented, only last 5 to 6 segments thinner than others. Height of genae equal to 1/2 longitudinal diameter of eye. Scutellum in middle weakly and clypeus somewhat densely punctate. Abdomen, tegulae and

hind femora black. Body 4–5. Northwest, center; Eastern Siberia, Central Asia ..... *C. dauricus* Tel.<sup>1</sup>

Lectotype: Female, Altai (K.F. Moravitsa). Paralectotype: Female (without head), “2 Tylyminsk, adjoining Yakut. Outskirts, 2.VII.1925, Ivanov”.

- 57 ( 56). Apex of abdominal shield distinctly curved forward ventrally. Height of genae 1/3 longitudinal diameter of eye.
- 58 ( 59). Abdomen distinctly narrowed toward apex (Fig. 185: 13). Shield without semitransparent edging on lower side. Antennae 25-segmented; segments not longer than wide or only slightly. Scutellum and clypeus quite distinctly punctate. Abdomen at base with yellow spots. Tegulae brown; hind femora on outer side brown, on inner side yellow. Body 3.8. Turkey ..... *C. andrievskii* Tobias
- 59 ( 58). Abdomen slightly narrowed toward apex. Shield bordered with yellow or brownish semitransparent edging on lower side. Antennae about 30-segmented, last 10–12 segments much thinner than others. Scutellum and clypeus weakly punctate, almost smooth. Abdomen at base often with yellow spots. Tegulae yellowish; hind femora with somewhat developed, yellowish brown pattern, at least at apex. Fig. 185: 14. Body 3.2–5. Parasite of *Dichrorampha petiverella* L. (Tortricidae), *Recurvaria nanella* Den. and Schiff., *Borkhausenia lambdella* Don. (Oecophoridae), *Parachronistis albiceps* Z. (Gelechiidae), *Chrysoclista linneella* Cl. (Momphidae), *Narycia monilifera* Geoffr. (Psychidae), *Yponomeuta padellus* L., *Y. malinellus* Z. (Yponomeutidae). West, northwest, center, south; Caucasus, Trans-Ural, Kirgizia, Siberia (Tomsk, Yakutsk);

<sup>1</sup> Among syntypes of *C. dauricus* in the collection of the Zoological Institute, Academy of Sciences of the USSR, two specimens from Irkutsk belong to other species, distinguished from *C. dauricus* by shorter (ratio of length to breadth being, respectively, 8.5:5.2 and 9.5:5.2) and less flat (ratio of length to height in apical 1/3 being, respectively, 8.5:3.3 and 9.5:3.2) body and densely wrinkly-punctate abdomen at apex. In addition, they are distinguished by coarser sculpture of the mesonotum and scutellum (coarsely alveolate-rugose for the most part) and by the vertex behind the ocelli and temples (which are with coarse transverse anastomosing folds; in *C. dauricus*, they are with mild transverse striations), wrinkled hind coxae (in *C. dauricus* weakly punctate), less developed genae (shorter than half of transverse diameter of eye), cellularly wrinkled face (in *C. dauricus* it is with mild and oblique folds), wide stigma (2 times as long as wide, in *C. dauricus* 3 times) and slightly darkened wings (in *C. dauricus* distinctly darkened). The name of this species is *C. cisdauricus* Tobias, sp. n.

Holotype: Female, Irkutsk, without date, V. Yakovlev. Paratype: Male, same data.

- Western Europe, Mongolia.....  
 ..... *C. annulatus* Nees (? *carbonator* Marsh., *decorus* Marsh.)
- 60 ( 55). Abdomen in apical half slightly less sculptured than in basal.
- 61 ( 62). Abdomen brownish yellow except brown apex. Body extremely small: 2.5. Antennae 25-segmented. Head distinctly narrowed behind eyes, temples much shorter than eye; height of genae 1/4 longitudinal diameter of eye. Abdomen flattened; its height slightly more posteriorly than anteriorly, 1/4 of length. Apex of abdominal shield slightly curved ventrally. Hind femora approximately 4 times as long as wide. Body with dense granulose sculpture, matte; vertex mildly and transversely striate behind ocelli; mesonotum alveolate-rugose in front of scutellum, sides of mesothorax finely alveolate. Abdomen with quite dense and wavy longitudinal folds in basal half. Basal antennal segment and legs yellowish brown; apices of hind tibiae and hind tarsi black (fore- and middle tarsi lighter color). Wings distinctly darkened. Stigma brown. Krasnodar Territory..... *C. sochi* Tobias, sp. n.  
 Holotype: Female, Sochi (Lazarevskoe), forest clearing, 30.VII.1982 (V. Tobias).
- 62 ( 61). Abdomen black or with light colored pattern only at base. Body larger.
- 63 ( 76). Hind femora not thickened, 4–5 times as long as wide. Antennae usually more than 25–30-segmented, rarely less. Body usually less than 5.
- 64 ( 67). Temples significantly longer than transverse diameter of eye. Clypeus with two denticles. Height of genae equal to half longitudinal diameter of eye. Abdomen, tegulae and hind femora black. Face with coarse transverse wrinkles.
- 65 ( 66). Antennae 27–30-segmented. Abdomen at apex curved ventrally. Body 4.5–6. Center, south; Kazakhstan (cf. also couplet 93) ..... *C. bidens* Tobias
- 66 ( 65). Antennae 20–22-segmented. Abdomen at apex almost not curved. Body 3–4.5. Kazakhstan..... *C. contrarius* Tobias
- 67 ( 64). Temples usually not longer than transverse diameter of eye. Clypeus along anterior margin uniformly rounded, without denticles. Height of genae noticeably less than 1/2 longitudinal diameter of eye. Mesonotum uniformly with quite coarse, rugose punctation.

- 68 ( 71). Abdomen flattened, 4 times as long as high in middle. Height of abdomen in anterior third equal to that in posterior third. Antennae 30–38-segmented. Sides of mesothorax with alveolate sculpture.
- 313 69 ( 70). Propodeum with weak lateral denticles and very weak transverse ridge. Sides of mesothorax with dense rugose punctation. Insects black; forelegs, greater part of middle legs and middle of hind tibiae, reddish yellow. Body 5.5. Hungary ..... **C. elongatus** Szépl.
- 314 70 ( 69). Propodeum with well developed lateral denticles and transverse ridge. Sides of mesothorax with alveolate sculpture. Insects black; legs with well developed light coloration, hind femora yellowish red. Abdomen at base along sides with yellow spots. Body 3.5–5.5. Western Kazakhstan ..... **C. jaicus** Tobias
- 71 ( 68). Abdomen not flattened, its height in posterior third significantly greater than in anterior third. Antennae 25-segmented. Sides of mesothorax more softly sculptured. Alveolate sculpture weak.
- 315 72 ( 75). Mesonotum with uniform and fairly coarse rugose punctation. Notaulices not distinct. Hind femora, sometimes except reddish apex, black.
- 73 ( 74). Abdomen at apex noticeably curved (Fig. 189: 10). Vertex with relatively fewer folds (about 7–8) behind ocelli. Height of genae  $1/3$ – $2/5$  longitudinal diameter of eye. Hind trochanters black. Abdomen entirely black, rarely with yellowish spots. Body 3–6. Parasite of *Autographa gamma* L., *Porphyria pannonica* Ferr., *P. respersa* Hb., *Cucullia verbasci* L. (Noctuidae), *Scrobipalpa atriplicella* F.R. (Gelechiidae), *Chamaesphexia leucopsiformis* Esp. (Sesiidae), *Epiblema foenella* L. (Tortricidae), *Coleophora caespitiella* Z. (Coleophoridae). West, northwest, center, south; Caucasus, Trans-Ural, Eastern Siberia; Western Europe, Mongolia, China .....  
..... **C. corvulus** Marsh. (? *suturalis* Szépl.)
- 74 ( 73). Abdomen at apex not curved (Fig. 189: 5). Vertex with extremely fine numerous transverse folds behind ocelli, height of genae slightly less than longitudinal diameter of eye (Fig. 189: 4). Hind trochanters brown. Abdomen along sides of base with yellow spots. Body 3.7–4. Northwest; Finland ..... **C. jacobsoni** Tobias, sp. n.

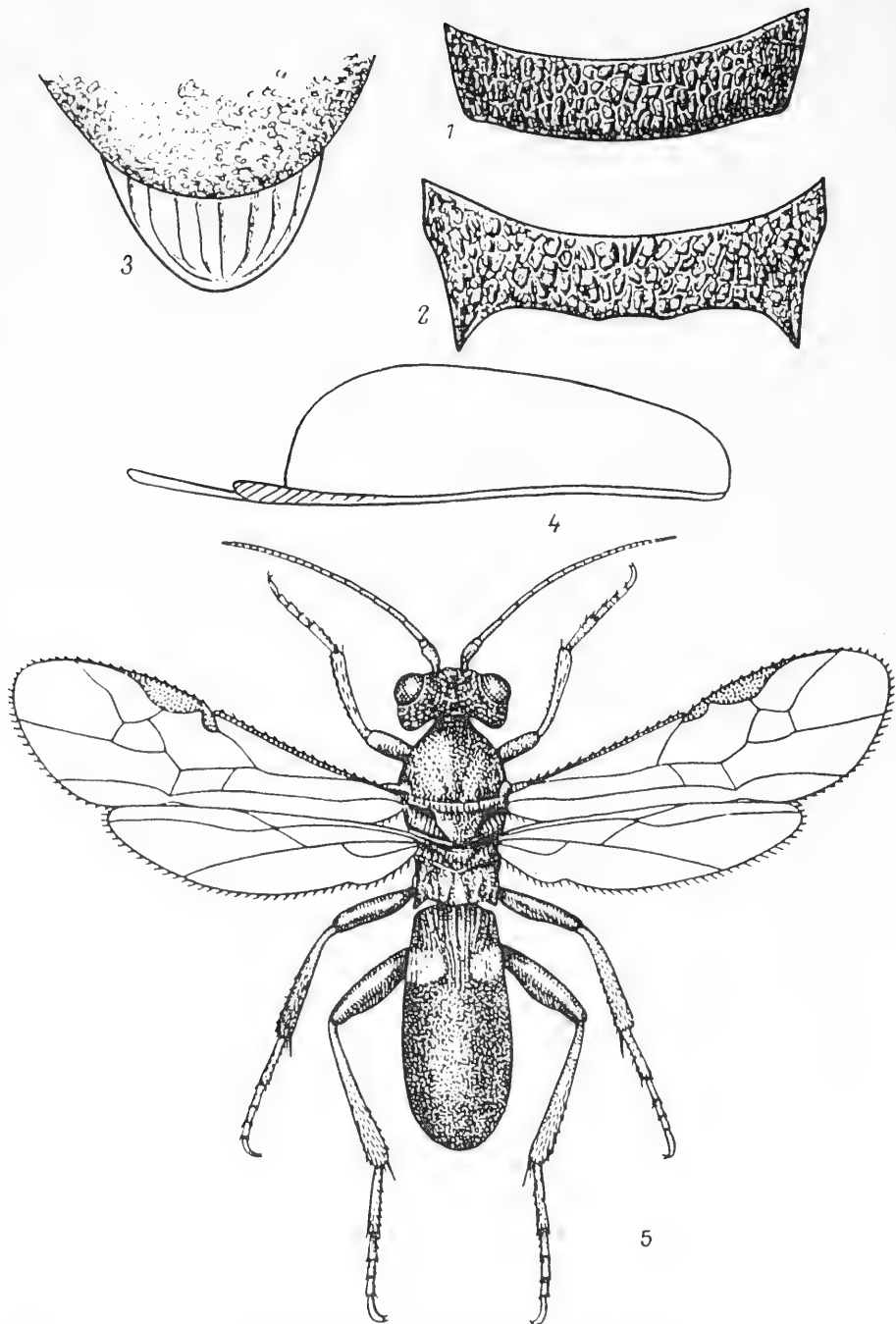


Fig. 188. Cheloninae (from Tobias and original).

1, 2—Propodeum: 1—*Chelonus aberrans*, 2—*C. propodealis*; 3, 4—*C. processiventris*:  
3—abdominal apex, 4—abdomen, lateral view; 5—*C. asiaticus*.

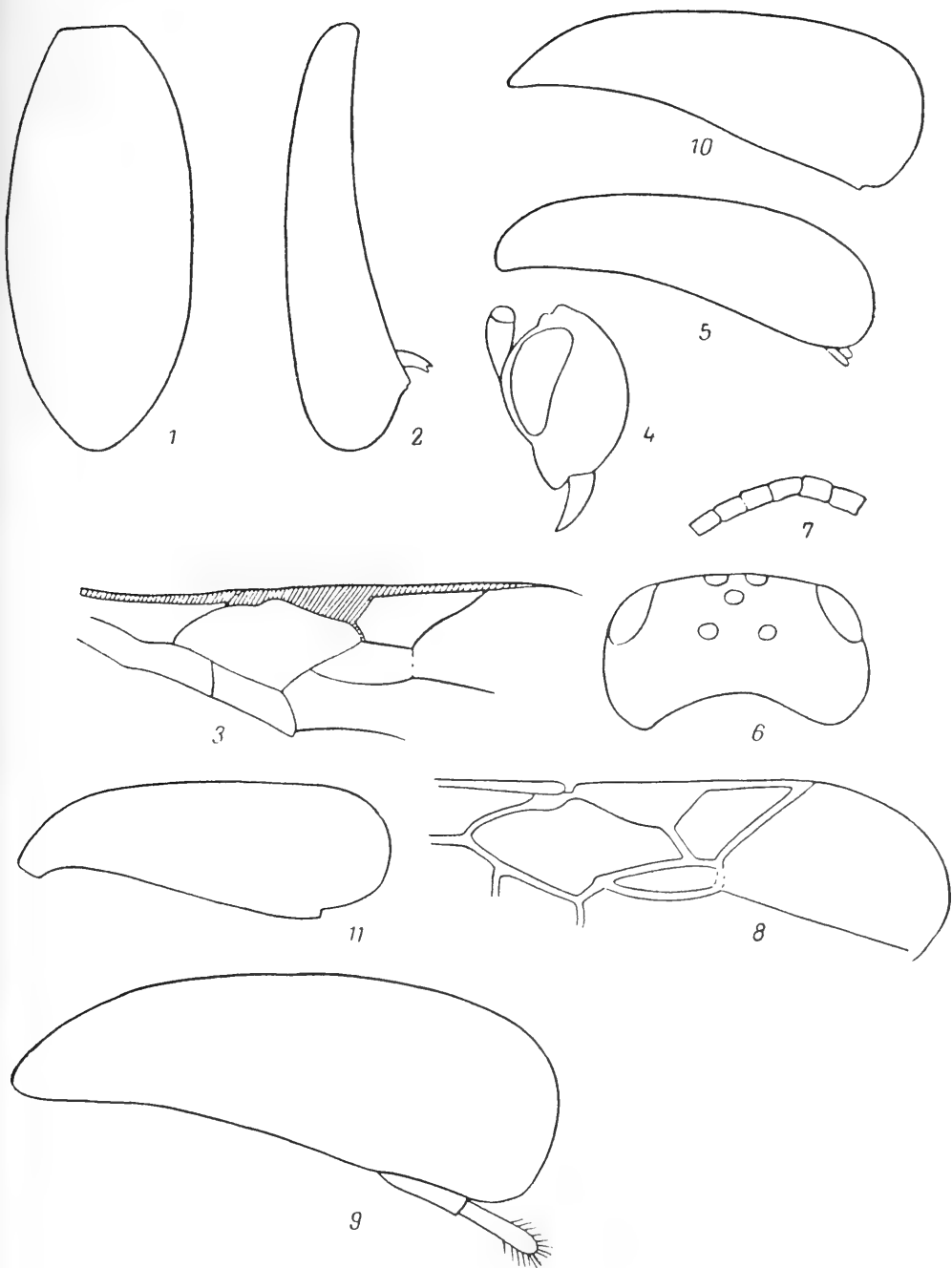


Fig. 189. Cheloninae (original).

1-3—*Chelonus elongatulus* sp. n.: 1—abdomen, dorsal view, 2—abdomen, lateral view, 3—part of forewing; 4, 5—*C. jacobsoni* sp. n.: 4—head, lateral view, 5—abdomen; 6-8—*C. riphaeicus* sp. n.: 6—head, dorsal view, 7-10th-15th antennal segments, 8—part of forewing; 9—*C. varimaculatus* sp. n., abdomen; 10, 11—abdomen, lateral view; 10—*C. corvulus*; 11—*C. bimaculatus*.

Holotype: Female, Leningrad, Shuvalovo, 27.VI.1897 (Yakobson). Paratype: Female, Kajala, Saima-Kanal, Finland, 3.VII.1909 (Adelung).

- 75 ( 72). Mesonotum in middle not densely punctate, somewhat lustrous, noticeably less punctate and lustrous on sides; notaulices distinct. Hind femora in basal half entirely reddish or brownish yellow. Abdomen at base yellow or with yellow spots along sides. Body 3.2–3.7. Trans-Ural; ? Western Europe .....
- ..... **C. tricolor** Tobias (*adjaricus* Tobias, syn. n.)
- 76 ( 63). Hind femora thickened, 3 times as long as wide. Antennae usually slightly more than 20-segmented. Body not less than 5 (species of genus *Microchelonus*; in male, abdominal shield posteriorly with aperture).
- 77 ( 78). Abdomen 2.5 times as long as its maximum width (Fig. 185: 23). Hind femora and antennae black. Abdomen black or basally with yellowish spots. Body 4.5–6.....
- .....**Microchelonus alboannulatus** Szépl.
- 78 ( 77). Abdomen 2 times as long as wide (Fig. 185: 24). Hind femora and basal segment of antennae brownish red. Body 4–5 .....
- ..... **Microchelonus starki** Tel.
- 79 ( 46). Abdomen usually transversely oval or simply ovate, posteriorly curved forward ventrally for not less than 1/5 to 1/6 of its length, 2–3 times longer than high in apical third.
- 80 ( 85). Abdomen on lower side at apex noticeably compressed. Body coarsely sculptured, with not more than 5 transverse folds on occiput.
- 81 ( 82). Abdomen at apex without longitudinal groove on ventral side, apically weakly sculptured, lustrous. Fig. 185: 15–18. Body 5–5.8. Azerbaidzhan .....
- ..... **C. subannulatus** Abdinb.
- 82 ( 81). Abdomen on lower side of apex with longitudinal groove; coarsely sculptured all over surface, matte.
- 83 ( 84). Head noticeably broadened behind eyes, hind femora entirely black or only at apex reddish. Antennae 24–27-segmented, thickened in middle. Abdomen slightly narrowed ventrad (Fig. 185: 21), with large yellowish spots at base. Body 5–8. Parasite of *Griselda stagnana* Den. and Schiff. (Tortricidae), *Pyrausta sticticalis* L. (Pyraustidae), *Oligia strigilis* L. (Noctuidae). West, northwest, center, south; Central Asia, Siberia; Western Europe, Mongolia .....
- ..... **C. scabrator** F.



- 84 ( 83). Head narrowed behind eyes. Hind femora with profuse red pattern, but sometimes almost black. Antennae 20–22-segmented, thickened in middle. Abdomen at apex quite distinctly narrowed ventrad (Fig. 185: 22) with weakly developed yellow spots or without them. Body 3.5–5.2. Parasite of *Spodoptera exigua* Hb. (Noctuidae). Northwest, south; Caucasus, Kazakhstan, Central Asia .....  
..... **C. caradrinae** Kok.
- 85 ( 80). Abdomen at apex uniformly rounded. Body more softly sculptured, on vertex behind ocelli with more than 5 weak transverse folds (except in *C. subseticornis*).
- 86 ( 87). Wings colorless, hyaline; stigma, tegulae, greater part of tibiae of all legs yellow, hind femora black. Antennae 21–23-segmented. Body 4. Southeast..... **C. smirnovi** Tel.
- 87 ( 86). Wings noticeably darkened; stigma brown, usually tegulae and greater part of legs black.
- 88 ( 89). Mesonotum weakly and softly sculptured, lustrous; occiput slightly more coarsely sculptured, lustrous. Tegulae yellow. Basal segment of antennae and greater part of legs reddish brown. Abdomen 2 times as long as its maximum width, ovate. Body 3.5. Central Asia .... **C. kryzhanovskii** Tobias
- 89 ( 88). Mesonotum coarsely sculptured, usually matte. Combination of remaining characters different.
- 90 ( 97). Antennae 30–35-segmented. Legs usually with profuse brownish red pattern. Abdomen at apex curved ventrally, quite coarsely sculptured, matte. Tegulae black. Abdomen 2.5 times as long as its maximum height.
- 91 ( 92). Eyes distinctly developed, temples 1/2 transverse diameter of eye, longitudinal diameter of eyes 5 times height of gena (Fig. 187: 3, 4). Thorax with coarse alveolate sculpture. Abdomen entirely black. Body 5. Central Asia .....  
..... **C. ahngeri** Tobias
- 316 92 ( 91). Eyes weakly developed, temples approximately as long as transverse diameter of eye, longitudinal diameter of eyes 2 to 3 times height of gena.
- 93 ( 94). Temples significantly longer than eye, longitudinal diameter of eyes 2 times height of gena. Mesonotum with smoothed sculpture, lustrous, coarsely wrinkled in front of scutellum. Body 4.5–6 (cf. also couplet 65) .....  
..... **C. bidens** Tobias
- 94 ( 93). Temples approximately as long as eye, longitudinal diameter of eyes 3 times height of gena.

- 95 ( 96). Thoracic sculpture not coarse. Abdomen at base with yellow spots. Body 4. Hungary ..... **C. szepligetti** D.-T.
- 96 ( 95). Thoracic sculpture alveolate. Abdomen entirely black. Body 4.5. Kazakhstan ..... **C. mirandus** Tobias
- 97 ( 90). Antennae usually 20–27-segmented; if more than 30-segmented, then abdomen at apex distinctly curved forward ventrally or weakly sculptured apically. Hind femora black.
- 98 (117). Antennae 20–22-segmented.
- 99 (100). Vertex behind ocelli with not more than 5 coarse transverse folds. Thorax coarsely alveolate. Lower groove of abdominal shield  $4/5$  its length. Antennae 20-segmented, apical segments square. Abdomen entirely black, with mild longitudinal folds. Body 4.3–4.5. Center, south; Caucasus, Kazakhstan, south of Western Siberia ..... **C. subseticornis** Tobias (*seticornis* Thoms. sensu Telenga).
- 100 ( 99). Vertex behind ocelli with numerous mild transverse folds. Thorax more softly sculptured, without conspicuous alveolate sculpture (except in *C. shirvanicus*).
- 101 (104). Abdominal shield distinctly curved forward ventrally, length of its lower groove  $2/3$  abdominal length (Fig. 191: 12).
- 102 (103). Antennae longer than head and thorax together, thin; their apical segments significantly longer than wide (antennae in male and female 16-segmented). Body 2.5–3.5 ..... **Microchelonus devius** Tobias
- 103 (102). Antennae shorter than head and thorax together, thick; apical segments square or wider (cf. also couplet 29) .... **C. pannonicus** Szépl.
- 104 (101). Abdominal shield slightly curved, its lower groove not less than  $3/4$  as long as abdomen. Antennae significantly shorter than body.
- 105 (106). Mid-flagellar segments and beyond longer than wide, antennae thin. Head noticeably broadened behind eyes. Eyes narrow, their longitudinal diameter 2.5 times transverse diameter. Propodeum along sides with very weak denticles, without distinct transverse ridge. Radial cell shorter than stigma. Hind femora 4 times as long as wide. Abdomen ovate, posteriorly curved to  $1/5$  its length. Abdomen 2 times as long as its width in middle part, 3 times its height in posterior third. Body densely and uniformly sculptured.

- Abdomen at base yellow, hind femora dark brown, at base reddish. Antennae dark brown. Wings weakly darkened. Fig. 189: 6–8. Body 2.6. Central Ural .....  
 ..... **C. riphaeicus** Tobias, sp. n.  
 Holotype: Female, Chelyabinsk Region, Il'men Reserve, 13.VII.1958 (Tobias) [apical antennal segments broken].
- 106 (105). Flagellar segments not longer than wide in middle and beyond. Head not broadened behind eyes. Body usually larger.
- 107 (116). Body softly sculptured. Abdomen at base only with weak longitudinal folds.
- 108 (109). Occiput weakly sculptured, mildly striate transversely, lustrous. Temples almost smooth. Abdomen and thorax with fairly coarse sculpture. Caucasus.....  
 ..... **C. shirvanicus** Abdinb.
- 109 (108). Head densely sculptured, matte. Sculpture of thorax and abdomen different.
- 110 (113). Abdomen at base with two yellow spots; if abdomen entirely black occasionally, then its length exceeds its width by more than 1.5 times or mesonotum with coarse sculpture.
- 111 (112). Abdomen curved forward ventrally up to 1/5 to 1/4 its length. Mesonotum densely punctate, matte. Fig. 189: 11. Body smaller: 3–4. Center; Ukraine (Zhitomir); Hungary ..... **C. bimaculatus** Szépl.
- 112 (111). Abdomen curved to 1/6 to 1/7 its length (Fig. 189: 9). Mesonotum with coarse, almost alveolate punctation, with interspersed smoothed microsculpture, distinctly lustrous. Ovipositor concealed. Coloration various. Abdomen either with yellow spots, occasionally merging into single spot, or sometimes entirely black; basal segment of antennae, occasionally only on lower side and often base of flagella also yellowish red. Hind femora black. Body 4.7–5. South; Azerbaidzhan .....  
 ..... **C. varimaculatus** Tobias, sp. n.<sup>1</sup>

<sup>1</sup> *C. varimaculatus* sp. n. is closest of all to *Microchelonus alboannulatus* Sépl. from which it is distinguished by abdomen strongly curved ventrad at apex (in *M. alboannulatus* it is almost not curved) and coarser sculpture on mesonotum. It is possible, that in this species also male is with aperture at abdominal apex, and in such a case, it should be included in genus *Microchelonus*.

Holotype: Female, Moldavia, Dubossary, plum orchard 1.VIII.1963 (Talitskii). Paratypes: One female, with the same label; 1 female, Chumai, slopes, 17.VIII.1967 (Talitskii); 2 females, Crimea; Sevastopol 17.VII.1907 and 19.VI.1912 (Pliginskii); 1 female, Azerbaidzhan, Agdashskii, district Karagan, 17.VI.1965 (Kamarli).

- 317 113 (110). Abdomen entirely black; or short (1.5 times as long as wide) or mesonotum (except for alveolate sculpture in front of scutellum) softly punctate and hind femora lightly colored.
- 114 (115). Abdomen 1.7 times as long as wide. Hind femora black, sometimes with contrastingly brownish yellow apex, wings hyaline, almost colorless. Mesonotum with alveolate sculpture in front of scutellum, with faint longitudinal folds. Vertex with transverse folds behind ocelli or if smoothed, then lustrous. Body 4.5. Crimea, Central Asia..... **C. ocellatus** Alexeev
- 115 (114). Abdomen 1.5 times as long as its width in middle. Hind femora brownish red. Wings noticeably darkened. Mesonotum in front of scutellum with coarse folds. Vertex with clear, transverse striation behind ocelli, matte. Body 3. Kazakhstan ..... **C. subcorvulus** Tobias
- 116 (107). Body coarsely sculptured; abdomen only at apex lacking distinct longitudinal folds; abdomen entirely black. Body 4–5. Southeast; Caucasus (Sochi), southern Siberia (Krasnoyarsk); Western Europe, Mongolia ..... **C. brachyurus** Thoms.
- 117 ( 98). Antennae more than 22-segmented.
- 118 (129). Abdomen at apex uniformly rounded.
- 119 (120). Lower groove of shield as long as halflength of abdomen or slightly more (Fig. 187: 5). Antennae 30-segmented, thickened in middle and very distinctly thinning toward apex. Temples as long as transverse diameter of eye. Longitudinal diameter of eyes 3 times height of gena. Thorax with dense rugose punctation. Abdomen at base with two yellow spots. Body 4.5–5. Southeast ..... **C. capsa** Tobias
- 120 (119). Lower groove of shield  $2/3$ – $3/4$  abdominal length.
- 121 (122). Height of abdominal shield in apical third  $1/2$  length of abdomen (Fig. 187: 6). Abdomen apically weakly sculptured, lustrous. Antennae 32–36-segmented, thinning distinctly toward apex. Tegulae yellow, apices of femora often

- brownish red, abdomen at base with two yellow spots. Body 3.7–4.6. South, Kazakhstan . . . . . **C. lissogaster** Tobias
- 122 (121). Height of abdominal shield in apical third  $1/3$  to  $2/5$  length of abdomen. Abdomen apically densely sculptured, matte. Antennae 25-segmented, gradually thinning toward apex. Tegulae brown or black. Abdomen at base with or without yellow spots.
- 123 (124). Propodeum without median transverse ridge and lateral denticles (Fig. 188: 1). Abdomen almost 2 times as long as its width in middle. Mesonotum fairly coarsely rugose-alveolate, matte, with longitudinal folds in front of scutellum. Body 3.8. Kazakhstan . . . . . **C. aberrans** Tobias
- 124 (123). Propodeum along sides with denticles and usually with transverse ridge between them.
- 125 (126). Propodeum without transverse ridge, but with distinct lateral denticles (Fig. 188: 2). Abdomen 1.5 times as long as its width in middle. Mesonotum not coarsely rugose, without sharp longitudinal folds in front of scutellum, its sides and anterior part lustrous, softly sculptured. Body 4.5. Kazakhstan . . . . . **C. propodealis** Tobias
- 126 (125). Propodeum with transverse ridge, denticles along sides weakly developed.
- 127 (128). Abdomen 1.5 times as long as its width in middle. Mesonotum coarsely rugose, with sharp longitudinal folds in front of scutellum. Figs. 184: 4; 187: 7. Parasite of *Pyrausta sticticalis* L., *Ostrinia nubilalis* Hb. (Pyraustidae), *Laspeyresia pomonella* L. (Tortricidae), *Spodoptera exigua* Hb., *Agrotis segetum* Den. and Schiff., *Heliothis virescens* Hfn., *Porphyrinia pannonica* Ferr. (Noctuidae). West, northwest, center, south; Caucasus, Kazakhstan, Central Asia, southern part of Western and eastern Siberia, Yakutia, Western Europe, Iran, North America . . . . . **C. annulipes** Wesm.
- 128 (127). Abdomen 2 times as long as its width in middle or slightly less (Fig. 187: 8). Mesonotum with softer sculpture, usually without conspicuous longitudinal folds in front of scutellum. Fig. 188: 5. Body 3–5. West, northwest, center, south; Kazakhstan, Siberia, Mongolia . . . . . **C. asiaticus** Tel.

Lectotype: Female, Mongolia, River Sugu-Nur, Khara-Gola river head, 29.VI.1929 (Kozlov). Paralectotypes: Mongolia, Toly River valley Khalkha. 1–10.VI.1926 (Kozlov); 1 male, River Ongipin-gol and North Gobi, 20.VIII.1926 (Kozlov); 1 male, Gobi Dzhargalantl-bulyk,

- 19.VII.1926 (Kozlov); 1 male, USSR, Transbaikal, Lake Barum-Torei, mouth of River Ulyzy (Vinogradov).
- 129 (118). Abdomen distinctly narrowed toward apex, distinctly curved forward ventrally, length of its lower groove  $2/3$  length of abdomen. Body with densely granulose sculpture all over, 4. Hungary ..... **C. sculpturatus** Szépl.
- 130 ( 7). Abdomen posteriorly with ventral plate-like appendage. Antennae 18-segmented. Vertex striate transversely behind ocelli. Mesonotum mildly sculptured, lustrous. Insects black, wings lustrous. Figs. 187: 9; 188: 3, 4. Body 3.5—4. Kazakhstan..... **C. processiventris** Tobias

150. **Microchelonus** Szépligeti, 1908 (*Chelonella* Szépl., *Neochelonella* Hincks, *Stylochelonus* Hellén, syn. n.<sup>1</sup> The genus is sometimes regarded as subgenus of genus *Chelonus* (cf. for example Tobias, 1971, 1976) because the combination of features typical of *Microchelonus* female (16-segmented antennae) and male (aperture at the apex of the abdominal shield) is not always found. Occasionally species are found with male characters, typical for *Microchelonus* but with multiarticulate antennae in the female; less frequently a female with 16-segmented antennae corresponds to a male without the aperture on the abdomen. The presence of the aperture on the abdomen is accepted as the main criterion for *Microchelonus*. To facilitate identification of females, females of *Microchelonus* with multiarticulate antennae are included in the key to the genus *Chelonus*. All species having female with 16-segmented antennae are retained in *Microchelonus*. There are in all 250 species, 90 Palearctic (many species have not been described). In the USSR fauna, Far Eastern species *M. carinatikovi* Shenef. (*carinata* Shest.), *M. abditus* Tobias and *M. kozlovi* from Transbaikal (and Mongolia) along with *M. pectinophorae* Cush described from the Korean Peninsula but also widely distributed in our Far East have not been included in the key.

- 1 (228). Body black, at most abdomen with light colored pattern.
- 2 (129). Antennae 16-segmented. Abdominal apex without aperture—females.

<sup>1</sup> Hellén (1958, *Notul. entomol.*, 38: 33) separated species *Stylochelonus M. pedator* Dahlb. from this monotypic genus on the basis of pronotal collar produced as neck. In male a keel at the abdominal apex and depression lateral to it was indicated by him. As a matter of fact the male has the aperture at the abdominal apex, typical for *Microchelonus*. This species differs slightly from other species of *Microchelonus* with produced thorax.

- 3 ( 4). Head broadened behind eyes. Antennae thin and long, apical segments 2–3 times as long as wide. Abdomen quite distinctly narrowed posteriorly, its posterior margin not curved forward. Entire body finely rugose-punctate, matte; abdomen with smooth longitudinal folds. Anterior margin of radial cell as long as stigma. Hind femora black. Figs. 190: 1; 191: 1, 3. Body 3–4. Parasite of *Cosmopterix scribaiella* Z. (Cosmopterigidae). Central belt, south; Caucasus, Trans-Ural, Kazakhstan; Western Europe, Mongolia ..... **M. exilis** Marsh.
- 4 ( 3). Head usually not broadened behind eyes; if, occasionally, somewhat broadened, then antennae less thin, with shorter apical segments and abdomen rounded toward apex (as much as or almost as much as toward its base) with posterior margin somewhat curved forward.
- 5 ( 8). Head distinctly elongate behind eyes, with temples beyond genae projecting laterally and angularly; temples 2 times as long as eye; occiput deeply excavate (Fig. 193: 1).
- 6 ( 7). Abdomen at apex with tubercle (Fig. 193: 2). Anterior margin of radial cell not longer than stigma; recurrent vein originating from 2nd radiomedial cell. Abdomen 2.2 times as long as wide, curved up to 1/6 its length along its posterior margin. Antennae 1/2 as long as body apical segments slightly longer than wide. Eyes distinctly narrowed downward, their longitudinal diameter 3 times height of gena. Thorax 1.3 times as long as high. Anterior margin of radial cell as long as stigma. Body entirely densely punctate, matte. Greater part of forefemora and apices of middle femora brownish yellow. Fig. 193: 1, 2. Body 3. Center (Ulyanovsk), southwest; Mongolia ..... **M. excavatus** Tobias
- 7 ( 6). Abdomen at apex without tubercle. Anterior margin of radial cell longer than stigma. Recurrent vein originating before 2nd radiomedial cell. Body 4–5. Western Europe ..... **M. atripes** Thoms.
- 8 ( 5). Head of usual shape, not projecting laterally and angularly beyond genae; temples usually not, or only slightly, rarely 2 times as long as eye. Occiput very slightly excavate. Abdomen at apex without tubercle.
- 9 ( 34). Abdomen narrowed toward posterior side. Posterior margin of shield not curved forward ventrally (Fig. 193: 5).

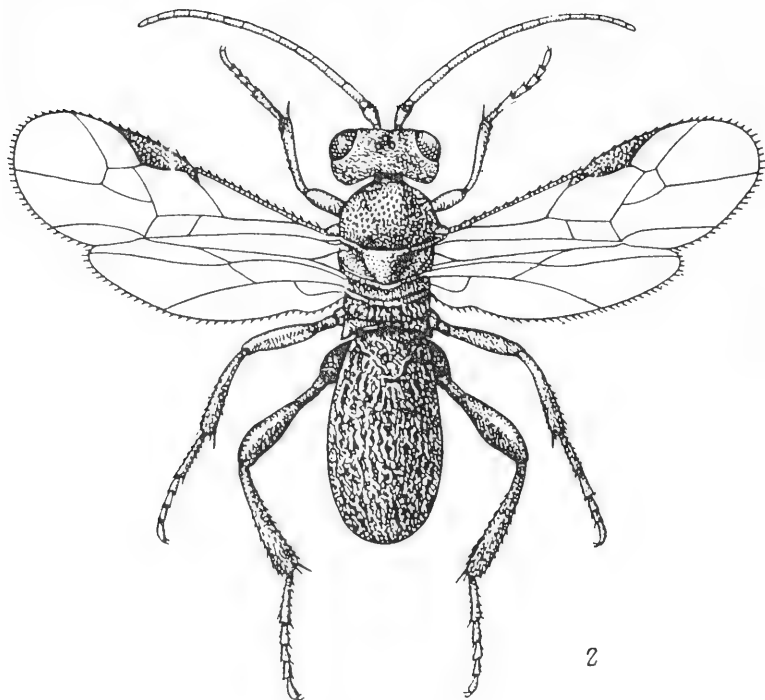
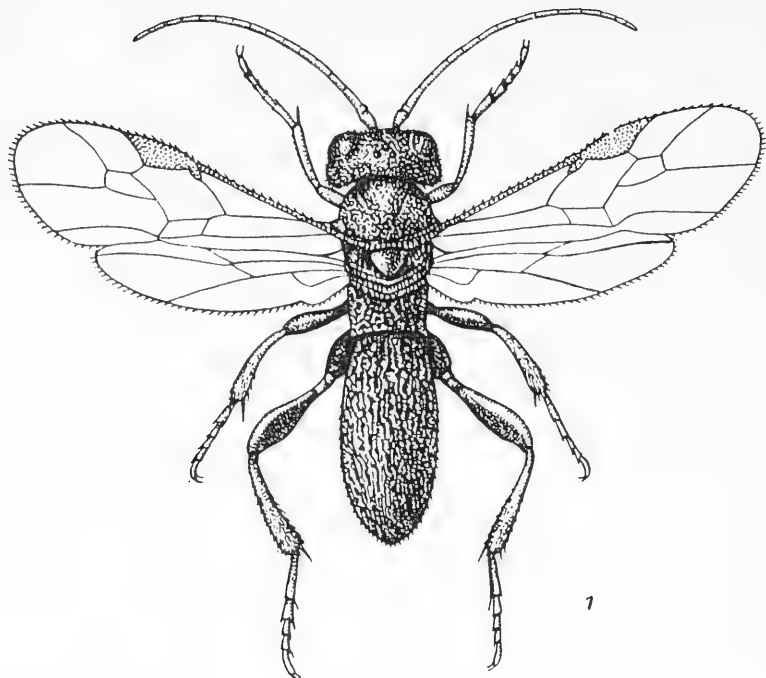
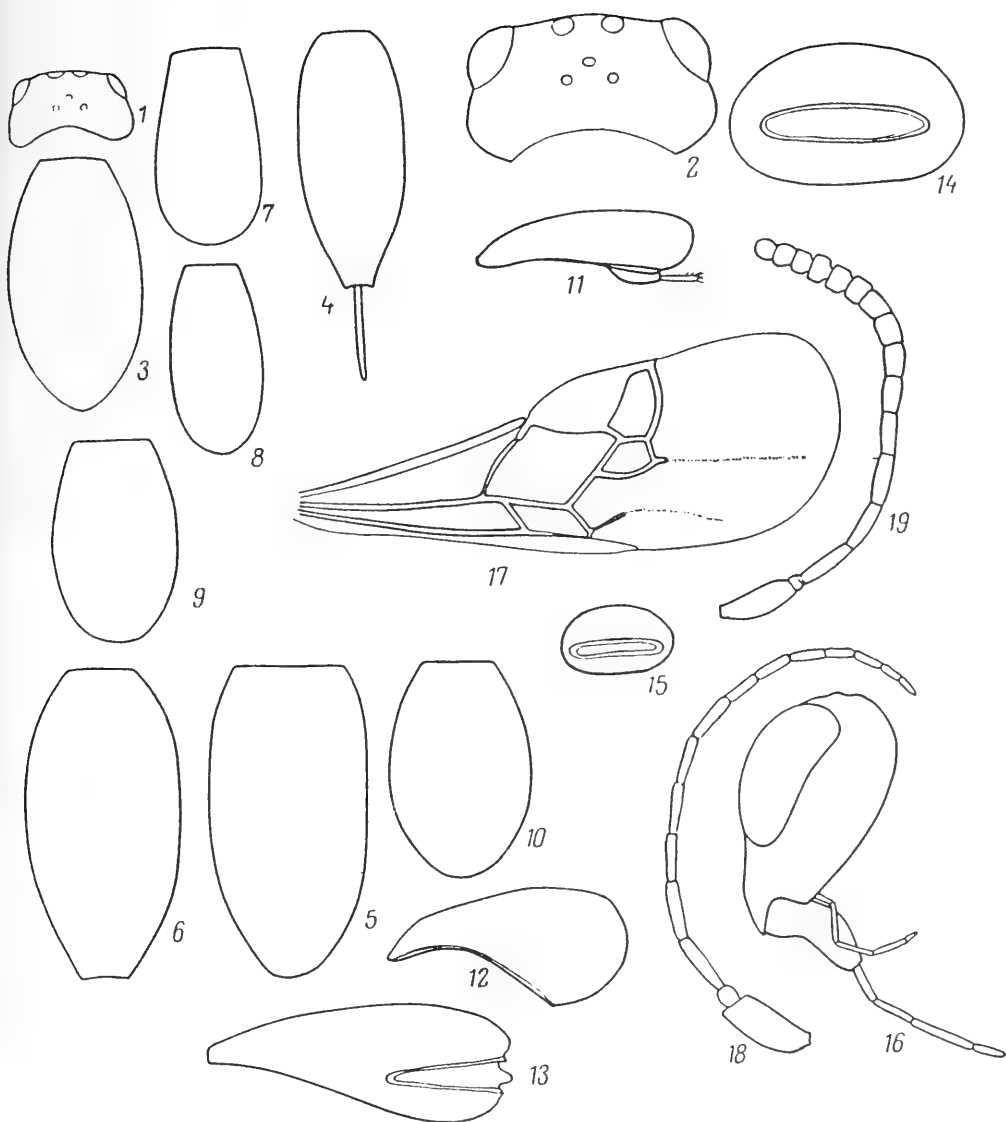


Fig. 190. Cheloninae (original).

1—*Microchelonus exilis* Marsh.; 2—*M. contractus* Nees.



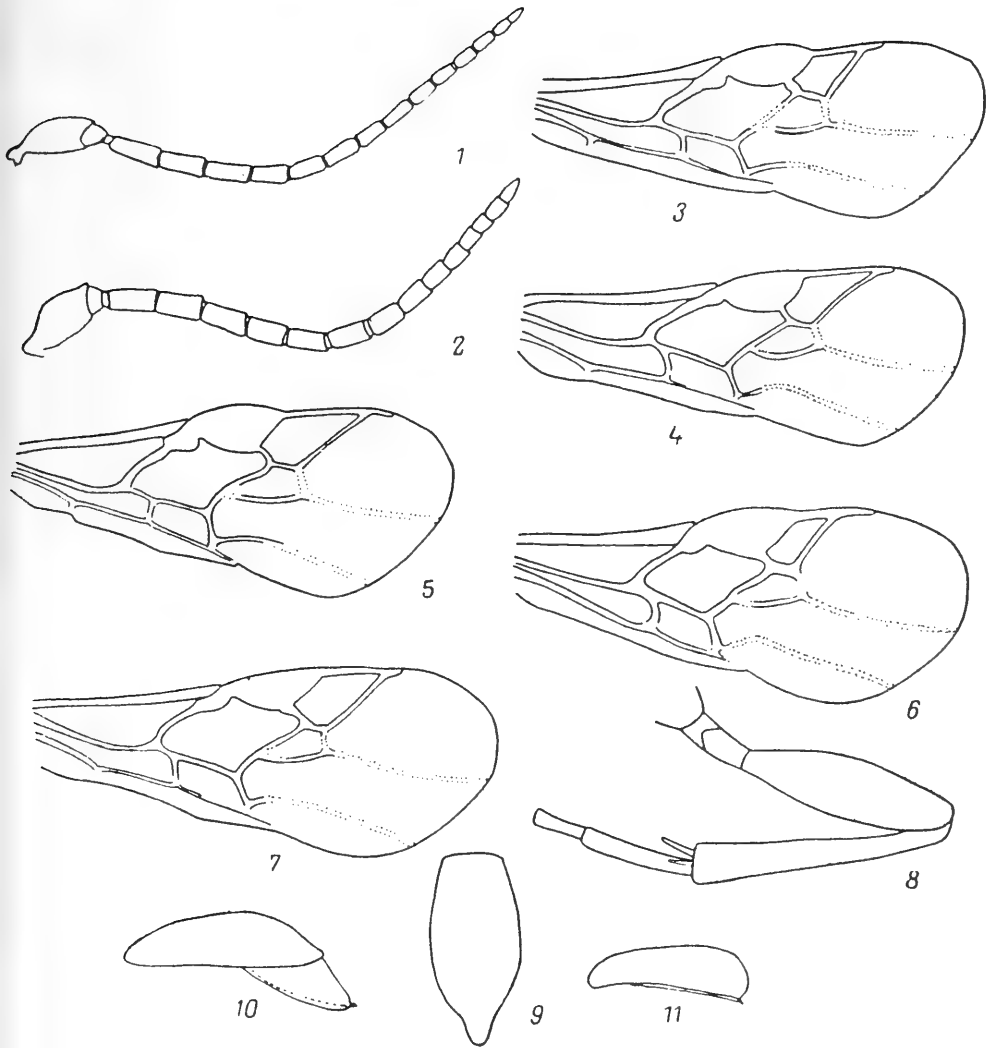


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Fig. 191. Cheloninae (from Tobias).

1—2—head: 1—*Microchelonus exilis*, 2—*M. azerbaijhanicus*; 3—10—abdomen, dorsal view: 3—*M. exilis*, 4—*M. arnoldii*, 5—*M. kiritschenkoi*, 6—*M. retusus*, 7—*M. flavipalpis*, 8—*M. longiventris*, 9—*M. luzhetzkii*, 10—*M. subcontractus*; 11—13—abdomen, lateral view: 11—*M. longiventris*, 12—*M. devius*, 13—*M. risorius*, male; 14, 15—abdomen, male, posterior view: 14—*M. azerbaijhanicus*, 15—*M. flavipalpis*; 16—*M. rostratus*, head; 17—*M. rudolphae*, forewing; 18, 19—antennae: 18—*M. caucasicus*, 19—*M. uralicus*.

- 10 ( 11). Abdomen at apex deeply notched. Hind femora at apex brownish red. Wings darkened, with light colored transverse stripe below stigma. Body 3. Parasite of *Scoparia phaeoleuca* Z., *S. frequentella* Stt. (Pyralidae). Western Europe ..... **M. parvicornis** H.-Sch.
- 11 ( 10). Abdomen without notch, rarely slightly notched or body extremely large (6–6.5). Hind femora usually entirely black. Wings light colored or slightly darkened.
- 12 ( 15). Antennal segments square in apical third or slightly longer than wide. Hind femora 3.5–4 times as long as wide.
- 13 ( 14). Temples slightly roundly narrowed, equal to length of eye from above. Abdomen 2 times as long as wide. Light colored parts of legs yellowish brown. Body 3.5–4. Northwest, center; Kazakhstan; Western Europe ..... **M. rimulosus** Thoms.
- 14 ( 13). Temples slightly broadened behind eyes, much longer than eye from above. Abdomen almost 2.5 times as long as wide. Light colored parts of legs bright yellow. Fig. 193: 3–5. Body 4.5. Caucasus ..... **M. subcaudatus** Tobias
- 15 ( 12). Antennal segments in apical 1/3, 1.5–2 times as long as wide.
- 16 ( 17). Abdomen apically almost smooth, lustrous. Mesonotum with quite sparse but coarse punctation, lustrous. Hind femora 4 times as long as wide (Fig. 192: 8). Anterior margin of radial cell slightly shorter than stigma (Fig. 192: 3). Abdomen and hind femora entirely black. Body 4–5. Armenia, Azerbaidzhan ..... **M. nachitshevanicus** Abdinb.
- 17 ( 16). Abdomen apically sculptured, matte, or slightly lustrous.
- 18 ( 19). Abdomen (Fig. 191: 4) almost without longitudinal folds, but with yellow lateral spots on base. Wings short, in repose not extending beyond apex of abdomen. Anterior margin of radial cell noticeably shorter than stigma. Abdominal shield with small arcuate emargination. Hind femora 3 times as long as wide. Mesonotum with uniformly granulose sculpture. Body 3–3.3. Southeast (Saratov); Kazakhstan ..... **M. arnoldii** Tobias
- 320 19 ( 18). Abdomen entirely black, with distinct longitudinal folds. Wings in repose extending beyond apex of abdomen. Anterior margin of radial cell as long as stigma or slightly shorter.
- 20 ( 21). Apex of abdomen emarginate. Forewings with 2nd anal cross-vein. Antennae slightly longer than half-length

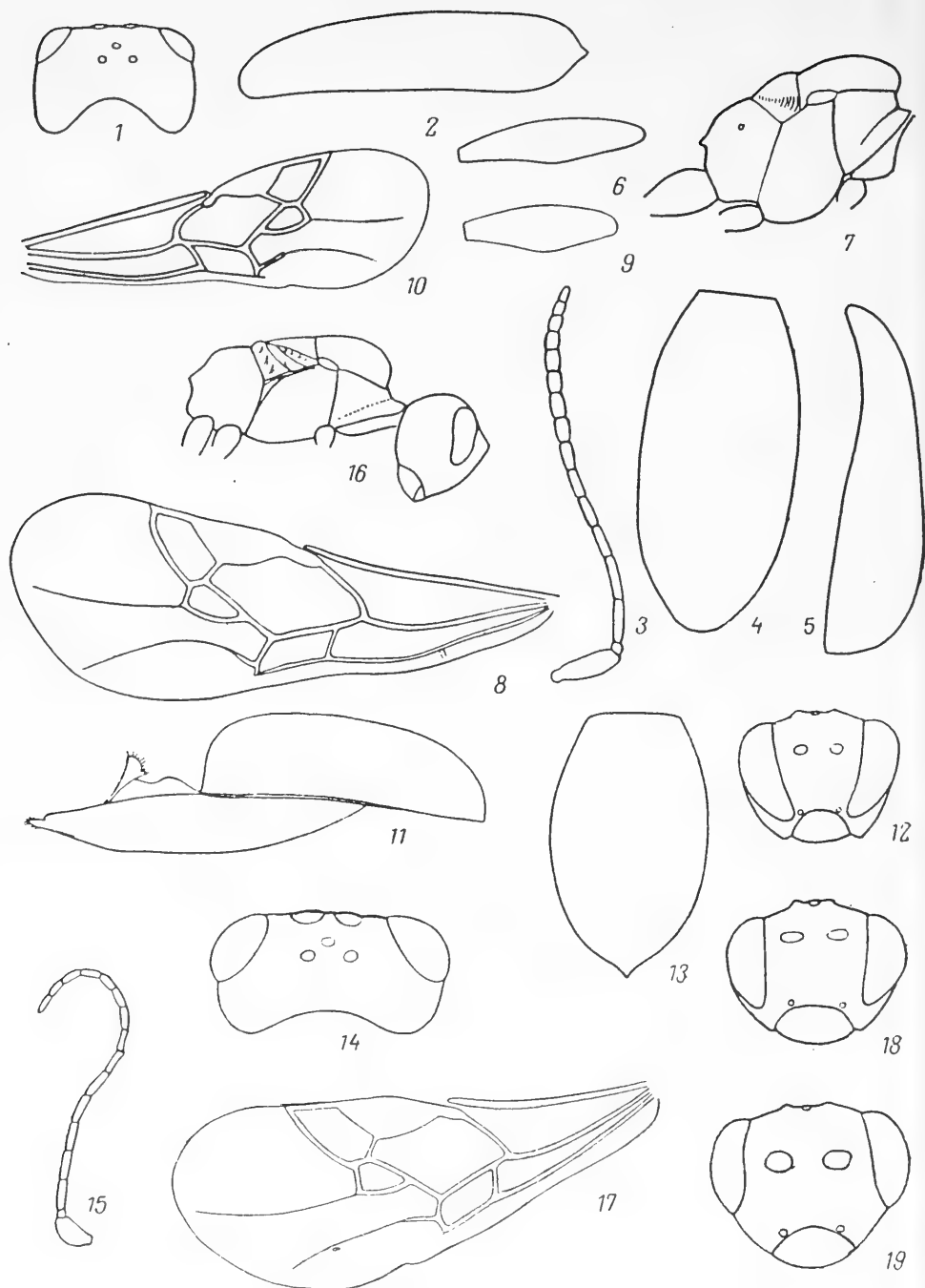


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Fig. 192. Cheloninae (from Abdinbekovaya and Alexeev).

1, 2—antennae: 1—*Microchelonus flavonaevulus*, 2—*M. nigritibialis*; 3—7—forewing: 3—*M. nachtshevanicus*, 4—*M. flavonaevulus*, 5—*M. nigritibialis*, 6—*M. subcontractus*, 7—*M. caucasicus*; 8—*M. nachtshevanicus*, hind leg; 9—10—*M. alexeevi*: 9—abdomen, dorsal view, 10—abdomen, lateral view; 11—*M. xanthosoma*, abdomen, lateral view.

of body. Mesonotum coarsely wrinkled, with median longitudinal ridge; scutellum coarsely rugose-punctate;



1, 2—*Microchelonus excavatus*: 1—head, 2—abdomen, lateral view; 3—5—*M. subcaudatus*: 3—antenna, 4—abdomen, dorsal view, 5—abdomen, lateral view; 6—*M. kopetdagicus*, hind femur; 7—*M. pectoralis*, thorax; 8, 9—*M. karakumicus*: 8—forewing, 9—hind femur; 10—*M. chrysoiegula*, forewing; 11—*M. sternatus*, abdomen; 12, 13—*M. longiculis*: 12—head, frontal view, 13—abdomen; 14—*M. luzhetzkii*, head, dorsal view; 15—*M. akmolensis*, antenna; 16—*M. pedator*, head and thorax; 17—*M. radialis*, forewing; 18, 19—head, frontal view: 18—*M. brevigenis*, 19—*M. erythrosoma*.

- head with coarse transverse folds; transverse ridge on propodeum not distinct. Body 6–7. Austria .....
- ..... **M. analipennis** Fahr.
- 21 ( 20). Apex of abdomen not emarginate (except in *M. frivaldskyi*). Forewing without 2nd anal cross-vein.
- 22 ( 23). Abdomen preapically sharply narrowed (Fig. 192: 9, 10), its narrow posterior part carinate in middle. Antennae very long and thin, as long as body, segments in middle 4–5 times as long as wide. Hind femora 4.5 times as long as wide. Middle of hind tibiae and basal segment of hind tarsi pale yellow. Body 3.5. Central Asia .....
- ..... **M. alexeevi** Tobias, nom. n. (*apicalis* Alexeev)<sup>1</sup>
- 23 ( 22). Abdomen uniformly narrowed toward apex, preapically not carinate. Antennae less thin, usually shorter than body, segments in middle also shorter.
- 24 ( 31). Hind femora 4 times as long as wide in middle.
- 25 ( 26). Abdomen narrowed toward apex from its middle and almost linear (Fig. 196: 2). Temples longer than eye, slightly narrowed roundly (Fig. 196: 1); longitudinal diameter of eyes 2 times the transverse, face 2.5 times as wide as high, significantly wider than longitudinal diameter of eye. Thorax short, 1.2 times as long as high. Propodeum with transverse ridge and fairly large flattened lateral denticles, middle denticles weakly developed. Posterior face of propodeum almost vertical. Body densely and mildly sculptured, matte, vertex with mild and weak transverse folds behind ocelli, lustrous; clypeus not densely punctate, lustrous; mesonotum with coarser alveolar wrinkles before scutellum. Mesothorax laterally with thimble-shaped alveolar sculpture. Abdomen in basal half with numerous tortuous longitudinal folds. Body black; femora brown with yellow apex; tibiae yellow, hind tibiae darkened at apex. Body 3.8. Lower Volga .....
- ..... **M. volgensis** Tobias, sp. n.
- Holotype: Female, Volga delta, commercial greenhouse, 5.V.1911 (Bukash).
- 26 ( 25). Abdomen narrowed roundly only in apical third. Antennae shorter than body, setaceous, apical segments 2 times as long as wide. Occiput with numerous transverse wrinkles.

<sup>1</sup>*M. [Chelonus] apicalis* Alexeev was described in 1971. In the same year, but earlier, *M. apicalis* Papp was described from Mongolia.

- 27 ( 30). Abdomen without emargination at apex, with coarse longitudinal folds, almost reaching up to its posterior margin. Body small, 3.5–4.
- 28 ( 29). Antennae thicker, 1st segment of flagellum 3 times and middle segments 2 times as long as wide. Thorax slightly longer than high. Abdomen 2 times as long as wide or less (Fig. 191: 5). Vertex behind ocelli transversely striate. Body 4. Caucasus (northern Osetiya, Azerbaidzhan); Bulgaria ..  
..... **M. kiritshenkoi** Tobias
- 29 ( 28). Antennae thin, 1st segment of flagellum 5 times and middle segments 4–5 times as long as wide. Thorax 1.5 times as long as high. Abdomen slightly more than 2 times as long as wide. Vertex behind ocelli with coarse transverse folds. Body 3.5. Moldavia ..... **M. artus** Tobias, sp. n.  
Holotype: Female, Dubossary, 2.VII.1961 (V. Talitskii).  
Paratypes: 2 females, same data.
- 30 ( 27). Abdomen emarginate at apex, with longitudinal folds in basal half. Body large, 6–6.5. Body and legs black, wings darkened. Krasnodar Territory (Sochi); Hungary, Rumania ..... **M. frivaldskiyi** Shenef. (*hungaricus* Szépl.)
- 31 ( 24). Hind femora 4.5–5 times as long as wide in middle. Mesonotum quite uniformly sculptured, slightly lustrous anteriorly, without longitudinal ridge in middle; abdomen with fine longitudinal folds, hardly extending beyond its middle.
- 32 ( 33). Abdomen widely emarginate at apex (Fig. 191: 6). Hind femora 5 times as long as wide. Body 3–4. Parasite of *Orneodes hexadactyla* L. (Orneodidae). Southwest; Armenia, Azerbaidzhan, Central Asia (Pamir), southeastern Siberia; Western Europe..... **M. retusus** Nees (*caudatus* Thoms.)
- 33 ( 32). Abdomen without emargination at apex. Hind femora 4.5 times as long as wide (Fig. 193: 6). Central Asia .....  
..... **M. kopetdagicus** Tobias
- 34 ( 9). Abdomen uniformly rounded in posterior part, apically somewhat curved on lower side.
- 35 ( 38). Maxillary palpi long, longer than height of head. Proboscis usually projecting by more than genal height (Fig. 191: 16). Longitudinal diameter of eyes 3 times genal height. Antennal segments in apical part 2–3 times as long as wide. Hind femora 3–3.5 times as long as wide. Abdomen apically slightly curved on lower side. Hind femora black.

- 36 ( 37). Anterior margin of radial cell as long as stigma. Abdomen with coarse, almost not anastomosing longitudinal folds more or less reaching abdominal apex. Propodeum with lateral denticles Fig. 191: 16 Body 3.3–4. Moldavia, Crimea, Volgograd Region; Caucasus (Checheno-Ingush ASSR, Armenia); Hungary ..... **M. rostratus** Tobias
- 37 ( 36). Anterior margin of radial cell shorter than stigma. Longitudinal folds on abdomen faint, anastomosing. Propodeum without or with weak lateral denticles. Body 2.7–3. Azerbaijan; Hungary ..... **M. hungaricus** Szépl.
- 38 ( 35). Palpi much shorter; proboscis slightly developed, not projecting or slightly projected.
- 39 ( 40). Radial cell extremely short, vein on its anterior margin slightly longer than width of cell (Fig. 191: 17). Stigma yellow; antennae basally and large part of legs brownish yellow. Hind femora reddish, abdomen with yellow spots at base. Mesonotum anteriorly and head dorsally weakly punctate, lustrous. Antennal segments in apical part slightly longer than wide. Body 2.5–3. Southeast....  
..... **M. rudolphae** Tobias
- 40 ( 39). Radial cell significantly longer.
- 41 ( 42). Posterior margin of abdominal shield distinctly curved forward up to 1/3 of its length on lower side. (Fig. 191: 12). Antennae thickened in middle, segments in apical part of flagellum square. Anterior margin of radial cell as long as stigma. Body, including head, quite coarsely rugose-punctate, entirely black; hind femora black (in male apex of abdominal shield without aperture). Body 2.5–3.5. Southeast; Kazakhstan, Central Asia .....  
..... **M. devius** Tobias
- 42 ( 41). Posterior margin of abdominal shield much less curved.
- 43 ( 44). Abdomen with coarse, straight longitudinal wrinkles, almost reaching up to its apex. Antennae short, segments in apical part of flagellum slightly longer than wide. Abdomen black or with yellow spot at base. Body 3–4. Parasite of *Pexicopia malvella* Hb. (Gelechiidae). South; Caucasus, Kazakhstan, Central Asia; Western Europe. ..  
..... **M. rimatus** Szépl. (*Chelonella sulcata* Jur. sensu Telenga, *C. elaphila* Silv. sensu Telenga; *curvisulcatus* Szépl., syn. n.)
- 44 ( 43). Abdomen with longitudinal folds, usually not extending beyond its middle (not extending beyond middle, if folds

coarse). If folds distinctly extending beyond mid-abdomen, then antennae thin with long segments or body smaller.

45 ( 66). Abdomen 2–2.5 times as long as wide in middle.

46 ( 47). Whole body, including head and mesonotum, with coarse, alveolar sculpture (only clupeus weakly punctate, lustrous). Abdomen with emargination at apex (Fig. 196: 4). Head slightly broadened behind eyes, temples distinctly longer than eye, occiput deeply emarginate (Fig. 196: 3). Antennae thin, but short, shorter than head and thorax together. First segment of flagellum 4 times, preapical segment 1.5 times longer than wide. Thorax 1.5 times longer than high. Anterior margin of radial cell half of stigma. Hind femora 3.5–4 times as long as wide. Wings smoky; femoral apices brownish yellow. Body 4–4.2. Moldavia ..  
..... **M. sculptilis** Tobias, sp. n.

Holotype: Female, Chumai, dry pools, 9.VI.1967 (Tobias). Paratype: 1 female, same data.

47 ( 46). Body with less uniform though with less coarse and non-alveolar sculpture on head and major part of mesonotum. Apex of abdomen without emargination on lower side.

48 ( 61). Segments in apical part of antennae square or slightly longer than wide.

49 ( 50). Abdomen with small denticulate projection at apex, 2 times as long as wide (Fig. 196: 5). Whole body densely and finely punctate, matte. Temples slightly longer than eye. Genae 1/3 as high as longitudinal diameter of eye, height of face 1/2 its width. Radial cell noticeably shorter than stigma. Thorax 1.3–1.5 times as long as high. Body including antennae, palpi and hind legs entirely black. Wings darkened. Body 2.2–2.7. Moldavia ..  
..... **M. denticulatus** Tobias, sp. n.

Holotype: Female, Bendery, forest, 25.V.1962 (Talitskii). Paratypes: 1 female, 3 males with the same label; 1 female, Kotovskoe, forest, slopes, 4.VI.1967 (Talitskii); 1 male, Badalurkovo, 8.V.1961 (Talitskii).

50 ( 49). Abdomen without denticulate projection at apex.

51 ( 60). Body relatively large, 2.5–4.

52 ( 55). Abdomen broadened toward apex (Fig. 191: 7), with yellow spot at base, rarely entirely black. Basal segment of antennae, palpi, sometimes hind femora yellowish brown, rarely dark colored. Head roundly narrowed behind eyes, temples as long as eye.



- 53 ( 54). Abdomen slightly longer than wide. Yellow spot at base of abdomen fainter, sometimes not developed; basal segment of antennae reddish or black, hind femora black. Antennal segments in apical part not depressed. Head and thorax as in male (aperture at abdominal apex in male small, oval). Kola Peninsula, Central Urals .....  
 ..... **M. ripaeus** Tobias, sp. n.  
 Holotype: Female, Il'men Forest Reserve, 17.VII.1958 (Tobias). Paratypes: Same place, 1 female, 14.VII; 9 females, 17.VII, 3 females, 1 male, 20.VII.1958 (Tobias). One male, village Khibiny, 9.VIII.1928 (Cheburova).
- 54 ( 53). Abdomen more than 2 times as long as wide. Yellow spot at base of abdomen distinct. Basal antennal segment reddish yellow, legs often light colored. (Aperture on abdominal apex of male extremely large, slit-shaped.) Body 2.5–3. Parasite of *Parametriotes theae* Kuzn. (Momphidae), *Sparganothis pilleriana* Den. and Schiff. (Tortricidae). South; Caucasus (Georgia); Hungary .....  
 ..... **M. flavipalpis** Szépl.
- 55 ( 52). Abdomen not broadened toward apex (maximum width in middle), entirely black or with two yellow spots at base. Antennae, including basal segment, palpi and legs black.
- 56 ( 59). Abdomen entirely black.
- 57 ( 58). Abdomen at apex slightly curved on lower side. Head behind eyes noticeably broadened; temples 1.5 times longer than eye. Longitudinal diameter of eyes 2.5 times height of gena. Head very mildly but densely punctate; face with faint and long transverse folds; about 10 fine transverse folds on vertex behind ocelli. Fig. 193: 7. Body 3.8 (male not known). Southwest; Caucasus.... **M. pectoralis** Tobias
- 58 ( 57). Abdomen at apex curved on lower side for 1/4 of its length (Fig. 196: 7). Head not broadened behind eyes; temples slightly longer than eye (Fig. 196: 6); longitudinal diameter of eye almost 4 times height of gena. Head quite coarsely sculptured. Face with short transverse folds. Five to seven relatively coarse transverse folds on vertex behind ocelli. Wings darkened (In male apical aperture extremely small and oval). Body 3.1–3.4. Moldavia .....  
 ..... **M. minifossa** Tobias, sp. n.  
 Holotype: Male, Rashkovo, steppe, slopes of Dnestra, 13.VI.1967 (Tobias). Paratypes: 2 females, 1 male with

label of holotype; 2 females, 3 males, Vadaturkovo, forest, 13.VI.1967 (Goncharenko).

- 59 ( 56). Abdomen with two basal whitish yellow spots, at apex curved on lower side for 1/5 its length. Head behind eyes roundly narrowed; temples slightly longer than eye. Longitudinal diameter of eyes 3 times height of gena. Head densely punctate; vertex with faint transverse folds behind ocelli; longitudinal folds on abdomen developed weakly only at its base. Abdomen 1.5 times as long as high. Hind femora 4 times as long as wide. Body 3.1. Moldavia.....  
..... **M. leucomaculus** Tobias, sp. n.  
Holotype: Female, Dubossary, 2.VII.1961 (V. Talitskii).
- 60 ( 51). Body extremely small, approximately 1.5, densely and finely sculptured. Head behind eyes and only in posterior half of temples slightly narrowed. Abdomen with large yellow spot at base. Western Europe (cf. also couplet 93) .....  
..... **M. basalis** Curt.
- 61 ( 48). Antennal segments in apical third of flagellum much longer than wide; if almost square, then abdomen with maximum width in middle, without yellow spot at base.
- 62 ( 65). Temples narrowed behind eyes, slightly longer than eye. Abdomen almost parallel-sided, with maximum width in middle, without two sharp ridges at base.
- 63 ( 64). Abdominal shield curved on lower side up to 1/3 its length. Antennal segments in apical third 2 times as long as wide. Anterior margin of radial cell 2/3 length of stigma. Thorax 1.3 times as long as high. Head behind eyes narrowed almost linearly. Fig. 195: 1–3. Body 3.6. Hungary .....  
..... **M. fatigatus** Papp
- 325 64 ( 63). Abdominal shield curved on lower side 1/6 to 1/7 its length. Antennal segments in apical third approximately 1.5 times as long as wide. Anterior margin of radial cell as long as stigma. Thorax 1.5 times as long as high. Head behind eyes roundly narrowed. Fig. 191: 8, 11. Body 2.8–3. Northwest, center, southeast; Kazakhstan .....  
..... **M. longiventris** Tobias
- 65 ( 62). Temples behind eyes slightly but noticeably broadened, longer than eye. Abdomen broadened posteriorly, maximum width in apical third (Fig. 196: 8), with two sharp approximating ridges in basal third. Thorax slightly longer than high (3:2.3). Longitudinal diameter of eyes less than width of face, 2 times its transverse diameter and height

of gena. Face 1.5 times as broad as high. Propodeum with posterior face vertical and transverse ridge and four small, almost similar, denticles. Hind femora 4 times as long as wide. Head mildly sculptured, with numerous fine transverse wrinkles behind eyes. Clypeus quite densely punctate, weakly lustrous; thorax with coarse alveolar sculpture; abdomen with long longitudinal folds. Body black; hind tibiae with whitish yellow ringlet in basal third, foretibiae brownish yellow. Body 4–4.5. Center; Central Ural.....

..... **M. semenovi** Tobias, sp. n.

Holotype: Female, Kazachii black-station of Chaplygina, Lipetskaya region (Ranenburgsk District) 13.V.1900 (A. Semenov). Paratypes: 1 female, 1 male Il'menskii Protected Forest, 17.VII.1958 (V. Tobias).

66 ( 45). Abdomen less than 2 times as long as wide (usually 1.5 times).

67 ( 78). Hind femora reddish or yellowish brown.

68 ( 69). Abdomen brownish red, somewhat darkened apically. Anterior margin of radial cell as long as stigma. Thorax with coarse alveolar sculpture. Antennal segments in apical part 1.5–2 times as long as wide. Body 4–5. Azerbaidzhan, Armenia; Iran ..... **M. telengai** Abdinb.

69 ( 68). Abdomen black, sometimes at base with yellow spots. Anterior margin of radial cell much shorter than stigma. Thorax with milder sculpture, rugose-punctate. Segments in apical part of antennae square or slightly longer than wide.

70 ( 71). Anterior margin of radial cell as long as stigma. Scutellum wrinkled. Tegulae and spots at base of abdomen yellow. Stigma brown (male without aperture on apex of abdomen). England ..... **M. dispar** Marsh.

71 ( 70). Anterior margin of radial cell shorter than stigma. Scutellum in middle usually with somewhat smooth sculpture.

72 ( 73). Wings hyaline transparent, bristles on them almost colorless. Scutellum occasionally densely punctate, matte. Abdomen at base with yellow spot. Tegulae black. Face densely punctate, with mild transverse wrinkles. Vertex behind ocelli densely punctate, without distinct transverse wrinkles. Abdomen densely rugose-punctate, with faint longitudinal folds at base. Radial cell and hind femora short (Fig. 193: 8, 9). Body 2.5–2.8. Central Asia .....

..... **M. karakumicus** Tobias

- 73 ( 72). Wings slightly but distinctly darkened, with pigmented bristles. If hyaline transparent, then tegulae yellow but head with coarse sculpture. Abdomen with two lateral yellow spots at base or entirely black.
- 74 ( 77). Abdomen 1.5 times as long as wide. Face coarsely punctate. Abdomen with quite wavy longitudinal folds. Tegulae and two spots on base of abdomen yellow.
- 75 ( 76). Vertex behind ocelli with long and coarse transverse folds. Stigma brownish yellow. Fig. 193: 10. Body 3.3. Kazakhstan ..... **M. chrysolegula** Tobias
- 76 ( 75). Vertex behind ocelli with short, weak transverse folds. Stigma yellowish brown. Fig. 192: 11. Body 3. Central Asia ..... **M. xanthosoma** Alexeev
- 77 ( 74). Abdomen 1.5 times as long as wide. Face mildly and densely sculptured; longitudinal folds on abdomen fine and short. Tegulae brown. Abdomen entirely black. Body 2.5–3. Center; Caucasus; Western Europe ..... **M. latrunculus** Marsh.
- 78 ( 67). Hind femora black, sometimes reddish at apex.
- 79 ( 88). Antennae thin, flagellar segments in apical third 2–3 times as long as wide (Fig. 192: 1). Flagellum usually 1/3 as thin as basal segment. Temples as long as transverse diameter of eye (except in *M. temporalis* sp. n.).
- 80 ( 87). Apical sternite of abdomen not projecting from under shield. Body uniformly rugose-punctate, matte.
- 81 ( 82). Anterior margin of radial cell half as long as stigma (cf. also couplet 127) ..... **M. akmolensis** Tobias
- 82 ( 83). Radial cell longer.
- 83 ( 84). Abdomen at base yellow. Antennal flagella and basal segment thin, former half as thin as latter. Head behind eyes narrowed, temples slightly longer than eye. Fig. 192: 1, 4. Body 3–3.5. Center, south, Caucasus ..... **M. flavonaevulus** Abdinb.
- 84 ( 83). Abdomen entirely black.
- 85 ( 86). Antennal flagella moderately thin, approximately half as thin as basal segment (Fig. 196: 9). Temples distinctly developed, 2 times as long as eye or slightly shorter; genae less than half as long as eye. Face with small longitudinal median carina; its height 1/2 its width. Thorax 1.3 times as long as high. Propodeum with transverse ridge, with 2 small lateral and 2 weak median denticles. Abdomen almost 2 times as long as wide. Head behind ocelli with fine

transverse striations. Face densely punctate, matte, with a few short wrinkles; clypeus sparsely punctate, lustrous; abdomen with longitudinal folds, reaching up to its middle. Body black; tibiae brownish yellow, except for brown apices of hind and occasionally of middle tibiae. Body 3—3.3. West, center, east .....

..... **M. temporalis** Tobias, sp. n.

Holotype: Female, Yaroslav Region, Berditsyno 10.VI.1896 (Yakovlev). Paratypes: 1 female, Berditsyno (K. Kokueva); 1 female, Yaroslavskaya Region, Belkino, 9.VI.1894 (Kokuyev); 1 female, South Ural, Katav-Ivanovsk, Dvoinishi, VII.1920 (Bakulenko).

86 ( 85). Antennal flagella extremely thin, approximately 1/3 basal segment. Temples very weakly developed, not longer or hardly longer than eye. Figs. 191: 18; 192: 7. Body 2.7—3.7. Northwest, center; Central Ural, Caucasus, Kazakhstan ...

..... **M. caucasicus** Abdinb.

87 ( 80). Apical sternite of abdomen projecting far beyond from under shield (Fig. 193: 11). Mesonotum, scutellum, sides of mesothorax and underside of thorax with coarse but sparse punctuation, lustrous. Anterior margin of radial cell as long as stigma. Abdomen in basal half with quite coarse longitudinal folds, at apex slightly curved on lower side, bordered with lustrous fringe, with maximum width in basal third. Abdomen and legs black, wings pale. Body 4.2. Kazakhstan .....

..... **M. sternatus** Tobias

88 ( 79). Antennae in apical third of flagellum thicker; segments square or slightly longer than wide (Fig. 191: 19).

89 ( 98). Abdomen at base with two yellow spots or with one large yellow spot.

90 ( 91). Tegulae and basal part of antennae yellowish brown. Anterior margin of radial cell as long as stigma. Fig. 191: 19. Body 3.5. Southeast .....

..... **M. uralicus** Tobias

91 ( 90). Tegulae and antennae black.

92 ( 95). Anterior margin of radial cell as long as stigma.

93 ( 94). Abdomen at base with completely yellow band. Body small,

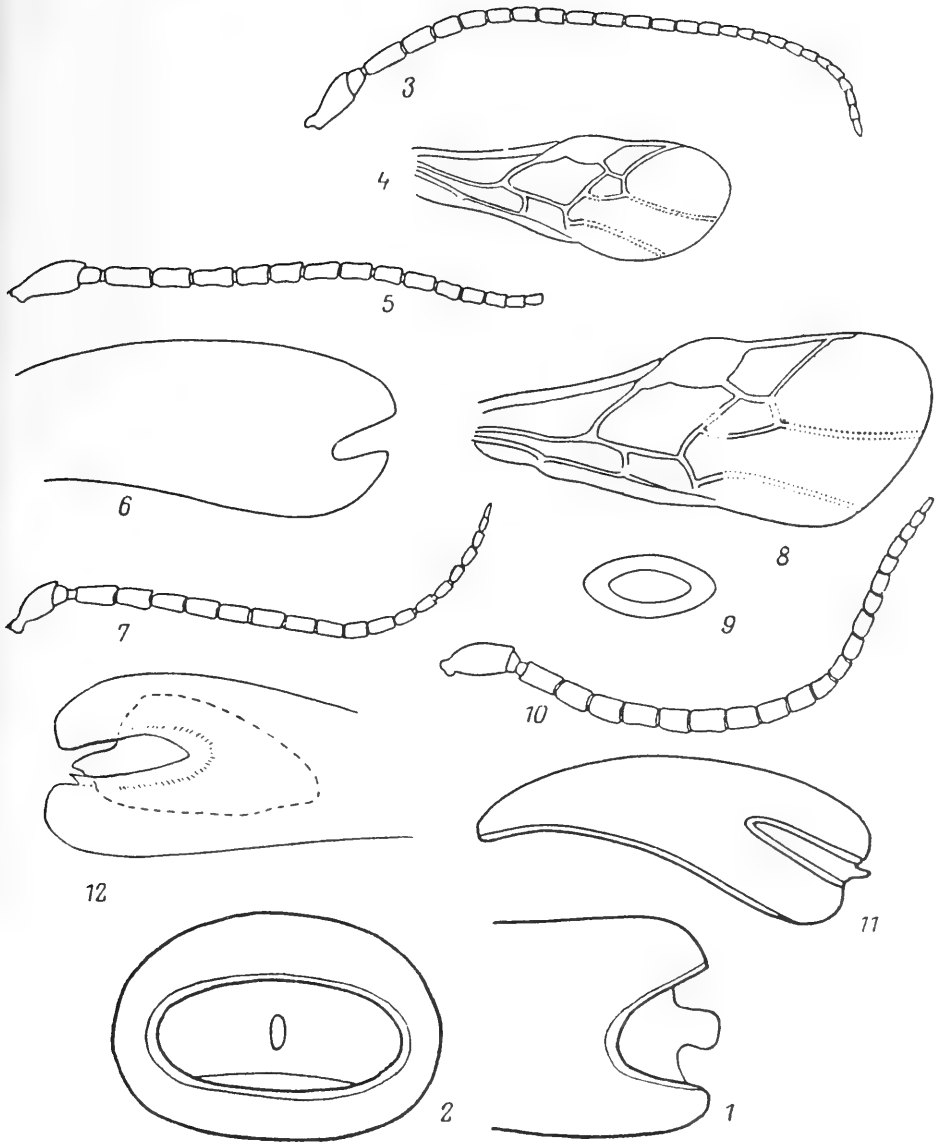
1.5—2 (cf. also couplet 60) .....

..... **M. basalis** Curt.

94 ( 93). Abdomen at base with two yellow spots (if they merge, then one brown spot in middle of abdominal base), with longitudinal folds extending beyond its middle. Body large, 3—4. Southwest, east; Western Europe .....

..... **M. fenestratus** Nees (*basalis* sensu Telenga, 1941)

- 95 ( 92). Anterior margin of radial cell usually almost 1/2 as long as stigma.
- 96 ( 97). Abdomen at base with two lateral yellow spots. Antennae usually entirely black. Abdomen mildly sculptured, with weak longitudinal folds only at base (cf. also couplet 126) ..... **M. subcontractus** Abdinb.
- 97 ( 96). Abdomen at base with median yellow spot. Basal segment of antenna usually reddish brown (cf. also couplet 124) ..  
..... **M. luzhetzkii** Tobias
- 98 ( 89). Abdomen entirely black.
- 99 (118). Anterior margin of radial cell as long as stigma (Fig. 192: 5).
- 100 (101). Wings smoky, with contrasting transverse, pale strip below base of stigma; sides of mesothorax with coarse alveolar sculpture, abdomen with coarse longitudinal folds. Body 3.5–4. Center, southwest; Siberia (Irkutsk); Hungary, Czechoslovakia ..... **M. scabrosus** Szépl.
- 101 (100). Wings pale or slightly darkened, without contrasting pale, transverse strip. Sculpture usually milder and uniform, longitudinal folds on abdomen less coarse or absent.
- 102 (103). Abdomen without longitudinal folds at base. Mesonotum with smooth sculpture, lustrous. Hind tibiae entirely black. Fig. 192: 2, 5. Body 2.6. Moldavia, Azerbaidzhan .....  
..... **M. nigriritibialis** Abdinb.
- 103 (102). Abdomen with distinct longitudinal folds. Mesonotum more distinctly sculptured, matte or slightly lustrous. Hind tibiae in middle light colored.
- 104 (105). Wings light, hyaline-transparent in basal half. Basal segment of antennae reddish yellow. Mesonotum with longitudinal ridge in middle. Fig. 194: 1, 2. Body 3.5. Azerbaidzhan ..... **M. talyshensis** Tobias
- 105 (104). Wings noticeably darkened, basal segment of antennae black.
- 106 (107). Abdomen extremely short, 1.3 times as long as wide. Thorax slightly longer than high (27:25). Mesonotum with longitudinal ridge in middle. Body 3.8. Krasnodar Territory (Sochi) ..... **M. brevis** Tobias
- 107 (106). Abdomen longer, usually not less than 1.5 times as long as wide. Thorax longer. Mesonotum usually without longitudinal ridge in middle.
- 108 (109). Body large, 5–6. Hind tibiae with yellowish ring in middle. Parasite of *Orneodes hexadactyla* L. (Orneodidae).



328 Fig. 194. Cheloninae, males (from Abdinbekovaya, Tobias and original).

1, 2—*Microchelonus tahyshensis*: 1—abdominal apex, lateral view, 2—abdomen, posterior view; 3, 4—*M. azerbaijhanicus*: 3—antenna, 4—forewing; 5, 6—*M. nachitshevanicus*: 5—antenna, 6—abdomen, lateral view; 7—9—*M. magnifissuralis*: 7—antenna, 8—forewing, 9—abdominal apex; 10—*M. caucasicus*, antenna; 11—*M. fissuralis*, abdomen, lateral view; 12—*M. alboannulatus*, abdominal apex, lateral view.

- Caucasus, Central Ural; Western Europe .....  
 ..... **M. rugicollis** Thoms.
- 109 (108). Body not large, 3.5–4.5.
- 110 (111). Longitudinal folds on abdomen weak (Fig. 190: 2). Body 2.5–3. Parasite of *Argyresthia pygmaella* Hb. (Argyresthiidae), *Plutella maculipennis* Curt. (Plutellidae). Center, south; Central Ural, Caucasus, Kazakhstan, Siberia (Irkutsk); Western Europe ..... **M. contractus** Nees
- 111 (110). Longitudinal folds on abdomen long, almost reaching abdominal apex.
- 112 (113). Head narrowing linearly behind eyes. Frons in upper part and along sides coarsely wrinkled; above antennal sockets with smooth or weakly punctate lustrous fields. Hind femora 4.5–5 times as long as wide. Thorax usually 1.3 times as long as high. Figs. 191: 6; 195: 4, 5. Body 3.5. Parasite of *Orneodes heterodactyla* Latr. (Orneodidae). Southwest; Central Asia; Western Europe .....  
 ..... **M. retusus** Nees (*pamiricus* Voin.-Kr.)
- 113 (112). Head behind eyes roundly narrowed.
- 114 (117). Head densely punctate, with faint and numerous transverse, small folds on face and vertex behind ocelli.
- 115 (116). Genae 2/5 as high as longitudinal diameter of eye, temples longer than eye, with distinct, numerous wrinkles, parallel to hind margin of eye. Abdomen 2 times as long as wide. Body 3.7–4.3. Kazakhstan. .... **M. fissuralis** Tobias
- 116 (115). Genae 1/3 as high as longitudinal diameter of eye; temples not longer than eye, with less distinct, very smooth wrinkles in anterior half. Body 3. Hungary .....  
 ..... **M. vescus** Kok. (*minusus* Szépl.)
- 117 (114). Head coarsely wrinkled, a few coarse transverse wrinkles behind ocelli. Abdomen 1.5 times as long as wide. Fig. 196: 26, 27. Body 3.4–3.7 .....  
 ..... **M. subarcuatilis** Tobias, sp. n.
- 118 ( 99). Radial cell short, its anterior margin usually 1/2 as long as stigma. Body uniformly and mildly rugose-punctate, matte.
- 119 (120). Genae very weakly developed, their height half of basal width of mandible. Face distinctly narrowed toward lower side, less high than its width in lower part (Fig. 193: 12). Abdomen with somewhat developed (sometimes distinctly) longitudinal rib at apex (Fig. 193: 13). Body 2–2.5. Kazakhstan. .... **M. longiocularis** Tobias



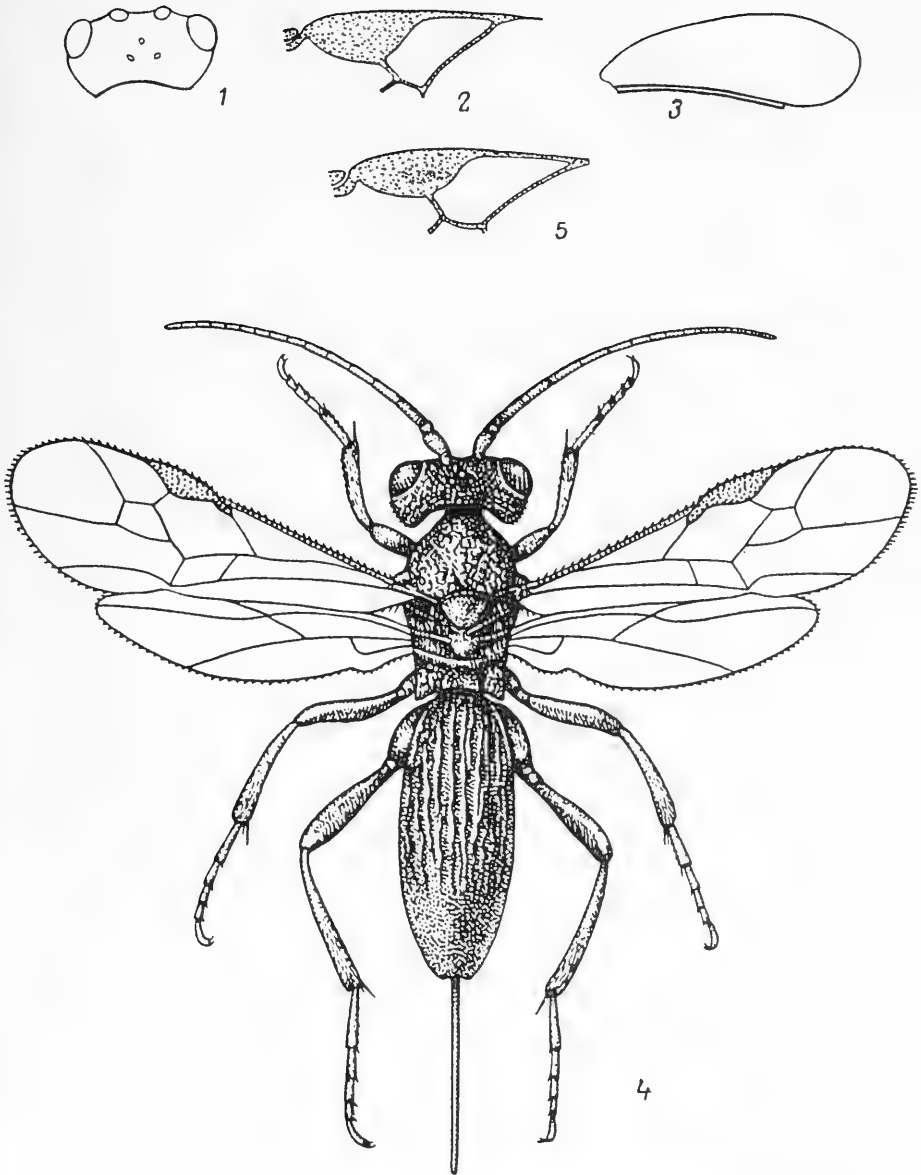
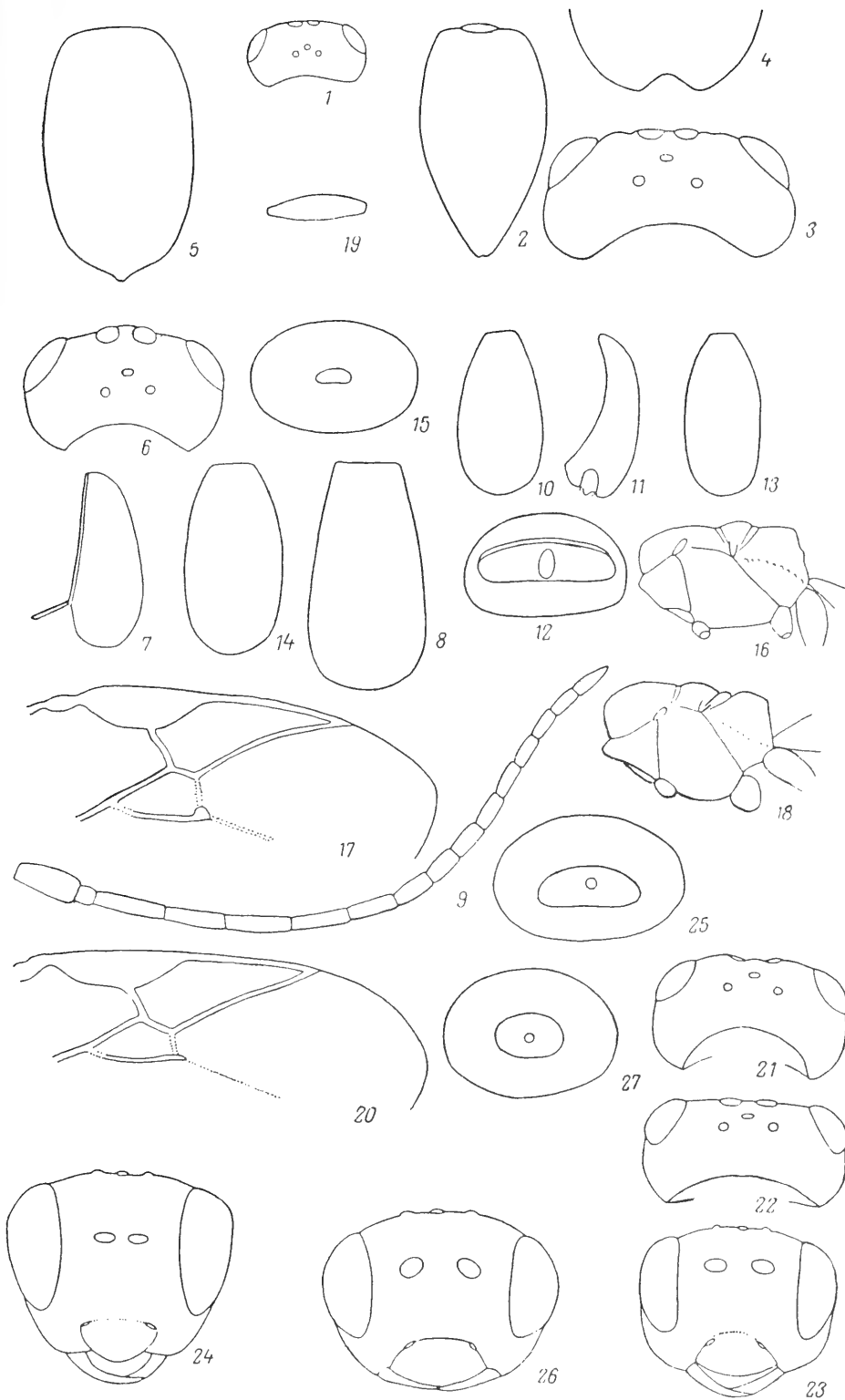


Fig. 195. Cheloninae (from Papp and original).

1-3—*Microchelonus fatigatus*: 1—head, 2—stigma and radial cell, 3—abdomen;  
 4, 5—*M. reusus*: 4—general appearance, 5—stigma and radial cell.

- 120 (119). Genae very distinctly developed, their height not less than basal width of mandible; face not narrowed toward lower side and significantly wider. Abdomen without longitudinal rib at apex.
- 121 (128). Body 2–3. Abdomen 3 times as long as high.
- 122 (123). Genae 1/5 to 1/4 as high as longitudinal diameter of eye height equal to width of mandibular base (Fig. 193: 18). Abdomen 1.5–1.7 times as long as wide. Head densely punctate, with faint, short folds. Middle segments of antennae 1.3–1.5 times as long as wide. Body 2.3–2.7. Kazakhstan ..... **M. brevigensis** Tobias
- 123 (122). Genae 1/3 to 1/2 as high as longitudinal diameter of eye, height distinctly greater than width of mandibular base.
- 124 (125). Abdomen in middle approximately 1.7 times as long as wide. Basal antennal segment usually reddish brown. Figs. 191: 9; 193: 14, Body 2.2–3. Parasite of *Yponomeuta padellus* L., *Y. malinellus* Z. (Yponomeutidae), *Coleophora* spp. (Coleophoridae). South, Caucasus, Central Asia (cf. also couplet 97) ..... **M. luzhetzkii** Tobias
- 125 (124). Abdomen in middle 1.5 times as long as wide. Antennae entirely black.
- 126 (127). Face finely wrinkled, matte. Mid-antennal segments 1.5 times as long as wide. Tegulae black. Figs. 191: 10; 192: 6. Body 2.4–3. South; Caucasus, Kazakhstan, Central Asia (cf. also couplet 96) ..... **M. subcontractus** Abdinb.
- 127 (126). Face with coarse, transverse folds, lustrous. Mid-antennal segments 2–2.5 times as long as wide. Tegulae yellow. Fig. 193: 15. Body 3–3.5. Kazakhstan (cf. also couplet 81) ..... **M. akmolensis** Tobias

1, 2—*Microchelonus volgensis* sp. n.: 1—head, 2—abdomen; 3, 4—*M. sculpilis* sp. n.: 3—head, 4—abdominal apex; 5—*M. denticulatus* sp. n., abdomen, dorsal view; 6, 7—*M. minifossa* sp. n.: 6—head, 7—abdomen, lateral view; 8—*M. semenovi* sp. n., abdomen, dorsal view; 9—*M. temporalis* sp. n., antenna; 10–12—*M. incisus* sp. n.: 10—abdomen, dorsal view, 11—abdomen, lateral view, 12—abdomen, posterior view; 13—*M. furtivus* sp. n., abdomen, dorsal view; 14, 15—*M. minifossa* sp. n.: 14—abdomen, dorsal view, 15—abdomen, posterior view; 16, 17—*M. scrobiculatus* sp. n.: 16—thorax, 17—part of forewing; 18–20—*M. rugilobus* sp. n.: 18—thorax, 19—hind femur, 20—part of forewing; 21—*M. insincerus* sp. n., head, dorsal view; 22–23—*M. ripaeus* sp. n.: 22—head, dorsal view, 23—head, frontal view, 24–25—*M. arcuatilis* sp. n.: 24—head, frontal view, 25—abdomen, posterior view; 26–27—*M. subarcuatilis* sp. n.: 26—head, frontal view, 27—abdomen, posterior view.



- 128 (121). Body extremely small, 1.5. Abdomen flat, 4 times as long as wide. Kazakhstan..... **M. minutissimus** Tobias
- 129 ( 2). Antennae more than 16-segmented. Abdomen with aperture at apex—males.
- 130 (165). Aperture in hind part of abdominal shield large, in posterior view occupying whole or almost whole of its width or, in any case, much more than half of it. Anterior margin of radial cell as long as stigma or slightly shorter.
- 131 (136). Aperture in hind part of abdominal shield occupying almost 1/3 of its length in lateral view. Antennae, abdomen and hind femora black.
- 132 (135). Aperture in hind part of abdomen occupies nearly half of its length (Fig. 191: 13).
- 133 (134). Thorax quite coarsely rugose-punctate, vertex behind ocelli very mildly striate transversely. Abdomen with coarse longitudinal folds on basal half. Antennae 19–21-segmented. Hind femora 4 times as long as wide in middle. Body 3.5–4. Moldavia, Kazakhstan; Western Europe .....  
..... **M. risorius** Reinh.
- 134 (133). Whole body densely and mildly sculptured. Abdomen at base with faint folds. Temples narrowed roundly, as long as eye. Genae 1/2 as high as longitudinal diameter of eye. Antennae thin, first flagellar segment 3 times its width, apical segments slightly longer than wide. Anterior margin of radial cell as long as stigma. Abdomen 2.5 times as long as wide. Propodeum with weak transverse ridge and two lateral denticles. Body 3. Hungary..... **M. magnifissus** Tobias, nom. n. (*fissus* Szépl., non Provancher)  
Holotype: Male, P. Maroth, 13.VIII.1895 (Szépliget). Preserved in Budapest.
- 135 (132). Aperture in hind part of abdomen occupies about 1/3 its length. Fig. 194: 11. Antennae 18–19-segmented. Body coarsely sculptured. Abdomen with longitudinal folds ...  
..... **M. fissuralis** Tobias
- 136 (131). Aperture in hind part of abdominal shield less wide.
- 137 (152). Body large, 3.5–6. Aperture on abdominal apex with parallel upper and lower margins.
- 138 (139). Wings distinctly darkened, with pale transverse strip in middle. Temples 1.5 times as long as eye. Genae 2/5 as high as longitudinal diameter of eye. Face half as high as wide. Antennae 23–24-segmented. Abdominal shield 2 times as long as wide, aperture in hind part slit-shaped,

occupies 1/5 abdominal length in lateral view. Head behind eyes mildly striate transversely. Mesonotum quite densely punctate, with coarse wrinkles only before scutellum, sides of mesothorax with fine alveolar sculpture. Abdomen in basal half with intensely wavy, weak longitudinal folds. Body 3.2–3.5. Moldavia . . . . **M. fumipennis** Tobias, sp. n.

Holotype: Male, Rashkov, slope, 2.VIII.1967 (Talitskii). Paratypes: 2 males, B. Malokshi, 2.VIII.1967 (Talitskii); 1 male, Karmanovo, 18.V.1967 (Talitskii).

- 139 (138). Wings slightly darkened, without distinct pale transverse strip in middle.
- 140 (143). Abdomen with coarse longitudinal folds, reaching almost up to its apex, entirely black. Head behind eyes not broadened or slightly broadened. Antennae about 20-segmented.
- 329 141 (142). Abdomen almost parallel-sided, without distinct carinae at base, but with extremely coarse longitudinal folds, 2 times as long as wide . . . . . **M. rimatus** Szépl.
- 142 (141). Abdomen distinctly broadened toward apex, at base with two longitudinal carinae, folds less coarse, 2 times as long as wide . . . . . **M. semenovi** Tobias, sp. n.
- 143 (140). Abdomen with less coarse and shorter longitudinal folds.
- 144 (145). Head behind eyes broadened. Antennae 27-segmented, Mesonotum with coarse alveolar sculpture, vertex behind ocelli transversely wrinkled. Abdomen and hind femora black. Figs. 191: 2, 14; 194: 3, 4. Body 6. Azerbaidzhan, Armenia . . . . . **M. azerbaidzhanicus** Abdinb.
- 145 (144). Head behind eyes not broadened.
- 146 (147). Hind femora brownish red. Antennae 25–28-segmented. Body 4.5–5. Parasite of *Aegeria formicae-formis* Esp., *A. tipuliformis* Cl., *Paranthrene tabaniformis* Rott. (Sesiidae), *Laspeyresia pomonella* L. (Tortricidae). Center, south; Kazakhstan (Alma-Ata), Far East . . . . . **M. starki** Tel.
- 330 147 (146). Hind femora black.
- 148 (151). Hind tibiae yellow in middle.
- 149 (150). Head behind genae angularly broadened and here temples longer than eye (in lateral view). Antennae 22-segmented. Body 5–6. ? Azerbaidzhan; Western Europe . . . . . **M. rugicollis** Thoms.
- 150 (149). Head behind genae without angular broadening. Temples as long as eye. Body small, about 3.5–4. Genae 1/4 as high as eye. Face almost 2 times as wide as high

(2:1.1), noticeably greater than longitudinal diameter of eye (2:1.7). Antennae 23–24-segmented, distinctly shorter than body, setaceous, basal segment 2 times as thick as flagellum, first flagellar segment 2.5 times as long as wide, preapical segments slightly longer than wide. Thorax slightly longer than high. Propodeum with weak transverse ridge and four small denticles. Anterior margin of radial cell as long as stigma. Hind femora 3 times as long as wide. Abdomen broadest in apical third (Fig. 196: 10–12), with large aperture in hind part occupying almost whole of its width and almost half of its height (in posterior view), its height in middle 1/5 to 1/6 its width. Head densely punctate, face with fine, short and transverse, near eyes longer, longitudinal wrinkles. Transverse wrinkles behind ocelli faint; mesonotum densely punctate, alveolarly wrinkled before scutellum. Abdomen with long, wavy, mild longitudinal folds, reaching up to its apical third. Body 3–3.3. Central Ural ..... **M. incisus** Tobias, sp. n.

Holotype: Male, Il'menskii Protected Forest, 17.VII.1958 (Tobias). Paratypes: 4 males, same data, 2 males, same place, 20.VII.1958 (Tobias).

- 151 (148). Hind tibiae entirely black or at base slightly paler. Antennae 24-segmented. Mesonotum with sparse punctation along sides and anteriorly, lustrous. Fig. 194: 5, 6. Body 4 ..... **M. nachitshevanicus** Abdinb.
- 152 (137). Body usually small, 2–3; if 3–5, then aperture on abdominal apex oval. Body uniformly and densely rugose-punctate, matte. Vertex transversely striate behind ocelli.
- 153 (160). Aperture on apex of abdominal shield oval (Fig. 194: 9). Abdomen and hind legs entirely black.
- 154 (159). Wings darkened (sometimes weakly, but distinctly). Basal antennal segment black. Mesonotum densely and somewhat uniformly sculptured, matte, without longitudinal ridge.
- 155 (156). Entire body densely punctate, matte, generally without coarse wrinkles even before scutellum, but only at base of abdomen with fine alveolar sculpture without distinct longitudinal folds. Antennae 18–20-segmented. Fig. 194: 7–9. Body 3. Azerbaidzhan ..... **M. magnifissuralis** Abdinb.
- 156 (155). Body with distinct wrinkles, coarse at least before scutellum and at base of abdomen where these form longitudinal folds.

- 157 (158). Antennae 20–22-segmented. Wings smoky .....  
 ..... **M. scabrosus** Szépl.
- 158 (157). Antennae 27–30-segmented. Wings darkened, but not  
 smoky..... **M. parvicornis** H.-Sch.
- 159 (154). Wings pale, hyaline-transparent in basal half. Basal an-  
 tennal segment reddish yellow. Mesonotum coarse be-  
 fore scutellum, more faintly sculptured along sides and  
 anteriorly, with longitudinal ridge in middle. Fig. 194: 1,  
 2 ..... **M. talyshensis** Tobias
- 332 160 (153). Aperture on apex of abdominal shield slit-shaped  
 (Fig. 191: 15). Hind trochanters and tibiae in basal half  
 yellowish.
- 161 (162). Aperture of abdominal shield occupies approximately 1/4  
 its margin. Basal segment of antennae, palpi, spot in ante-  
 rior third of abdomen brownish yellow .....  
 ..... **M. flavipalpis** Szépl.
- 162 (161). Aperture of abdominal shield less wide, margin of shield  
 visible along sides in posterior view of abdomen.
- 163 (164). Abdomen finely rugose-punctate, without clear longitudi-  
 nal folds. Body 1.5–2 ..... **M. basalis** Curt.
- 164 (163). Abdomen with mild longitudinal folds. Body 3–3.5 .....  
 ..... **M. vescus** Kok.
- 165 (130). Aperture on apex of abdomen much smaller, occupies not  
 more than half abdominal width.
- 166 (169). Temples distinctly elongate, projecting angularly laterally,  
 2 times as long as eye. Occiput very deeply emarginate  
 (Fig. 193: 1). Aperture on apex of abdomen small.
- 167 (168). Anterior margin of radial cell not longer than stigma, re-  
 current vein originating from 2nd radiomedial cell. Aper-  
 ture on apex of abdomen transversely oval. Antennae  
 20–21-segmented..... **M. excavatus** Tobias
- 168 (167). Anterior margin of radial cell longer than stigma, recurrent  
 vein originating before 2nd radiomedial cell. Aperture on  
 apex of abdomen round. Antennae 19–20-segmented....  
 ..... **M. atripes** Thoms.
- 169 (166). Temples much shorter, not projecting angularly. Occiput  
 significantly less emarginate.
- 170 (181). Aperture on apex of abdomen extremely small, somewhat  
 punctiform, sometimes slightly noticeable. Head behind  
 eyes narrowed.
- 171 (180). Hind femora and tegulae black; wings somewhat distinctly  
 darkened:

- 172 (177). Anterior margin of radial cell as long as stigma or slightly shorter. Mesonotum densely sculptured, matte.
- 173 (174). Genae behind eyes angularly broadened. Body large, 4–5. Sweden ..... **M. mucronatus** Thoms.
- 174 (173). Genae behind eyes not broadened angularly.
- 175 (176). Abdomen oval, approximately 1.5 times as long as wide. Genae 1/3 as high as longitudinal diameter of eye. Antennae 18-segmented. Body 2. Hungary .... **M. pusillus** Szépl.
- 176 (175). Abdomen elongate, almost parallel-sided, 2.2 times as long as wide (Fig. 196: 13). Genae 1/4 as high as longitudinal diameter of eye. Antennae 22-segmented, slightly shorter than body, preapical segment slightly longer than wide. Temples slightly roundly narrowed, as long as transverse diameter of eye. Thorax 1.5 times as long as high. Anterior margin of radial cell slightly shorter than stigma. Hind femora 3.5 times as long as wide. Aperture on apex of abdomen oval, situated noticeably higher than mid-abdomen, its width equal to 3rd segment of hind tarsus. Hind femora black, hind tibiae yellowish in middle, dark brown in apical third. Wings darkened. Body 3. Krasnodar Territory .....  
 ..... **M. furtivus** Tobias, sp. n.  
 Holotype: Male, Sochi (Lazarevskoe), terraced slopes, forest, 8–9.V.1976 (V. Tobias).
- 177 (172). Anterior margin of radial cell much shorter than stigma. Mesonotum more coarsely and sparsely rugose-punctate.
- 178 (179). Abdomen less than 2 times as long as wide, aperture on apex of abdomen punctiform (rounded). Head behind ocelli with extremely fine transverse folds. Hind tibiae light colored in basal half. Wings weakly darkened. ....  
 ..... **M. luzhetzkii** Tobias
- 179 (178). Abdomen 2 times as long as wide, aperture on apex of abdomen small, but distinctly oval (Fig. 196: 14, 15). Head behind ocelli with coarser folds. Hind tibiae almost entirely black. Wings distinctly darkened. Fig. 196: 6, 7. Body 3.3 ..  
 ..... **M. minifossa** Tobias, sp. n.
- 180 (171). Hind femora yellowish red, tegulae yellow, wings hyaline-transparent with extremely short radial cell (Fig. 193: 17). Body 2.5. Central Asia .....  
 ..... **M. radialis** Tobias
- 181 (170). Aperture on apex of abdomen much larger, oval.
- 182 (187). Body large, 4–6. Antennae approximately 25-segmented. Vertex finely striate transversely.



- 183 (184). Aperture on apex of abdomen with parallel upper and lower margins (Fig. 194: 12). Hind femora 3 times as long as wide. Anterior and lateral parts of mesonotum relatively faintly sculptured, in middle, somewhat lustrous. Temples more than 1.5 times as long as eye. Basal vein of forewing usually yellow. Body large, 5–6 (in female, antennae more than 16-segmented). Center, south; Caucasus.....  
..... **M. alboannulatus** Szépl.
- 184 (183). Aperture on apex of abdomen oval. Hind femora 3.5–4 times as long as wide. Mesonotum more distinctly sculptured at least laterally, matte or only weakly lustrous. Temples not more than 1.5 times as long as eye. Basal vein of forewing somewhat brown. Body small, 4–4.5.
- 185 (186). Mesonotum almost entirely with coarse alveolar sculpture, without distinct transverse folds. Abdomen in basal half with distinctly wavy, longitudinal folds. Thorax 1.5 times as long as high (Fig. 196: 16). Hind femora 3.5 times as long as wide. Anterior margin of radial cell as long as stigma, its apex lying between stigma and wing-apex (Fig. 196: 17). Body 4.2. Moldavia..... **M. scrobiculatus** Tobias, sp. n.  
Holotype: Male, Dubossari, plum orchard, 1.VIII.1963 (Talitskii).
- 186 (185). Mesonotum with coarse transverse wrinkles laterally and in middle. Abdomen in basal part with almost straight (especially in middle) folds. Thorax 1.3 times as long as wide. Femora 4 times as long as wide. Anterior margin of radial cell slightly longer than stigma, its apex closer to wing-apex than to stigma (Fig. 196: 18–20). Body 4.3. Moldavia....  
..... **M. rugilobus** Tobias, sp. n.  
Holotype: Male, Vadul-lui-vode, banks of River Dnestr, 17.VIII.1960 (V. Talitskii).
- 187 (182). Body size half or less than half. Antennae with fewer segments.
- 188 (191). Head behind eyes broadened, wider here than in ocular region. Abdomen 2.5 times as long as wide.
- 189 (190). Pronotal collar extending greatly forward as cervix (Fig. 193: 16). Head massive, much wider than mesonotum, 1.5 times as wide as long. Aperture of abdominal shield with carina-like protuberance. Body 3.3–3.5. Parasite of *Aphelia paleana* Hb. (Tortricidae). West; Western Europe (see also key to genus *Chelonus*—for female) .....  
..... **M. pedator** Dahlbom, comb. n.

- 190 (189). Pronotal collar extending slightly forward (beyond vertical plane, touching the anterior margin of mesonotum). Head broader ( $1/2$  as long as wide), not wider than mesonotum. Aperture of abdominal shield without carina-like protuberance (only small mammilate protuberance hidden in its depth) ..... **M. exilis** Marsh.
- 191 (188). Head roundly narrowed behind eyes, sometimes slightly broadened, but its maximum width behind eyes not greater than in ocular region.
- 192 (193). Basal segment of antennae compressed distinctly, almost flat. Aperture on apex of abdominal shield 3 times as wide as high. Antennae 22-segmented. Body 3. Hungary ..... **M. compressiscapus** Szépl.
- 193 (192). Basal segment of antennae compressed slightly.
- 194 (195). Hind femora reddish brown. Aperture of abdominal shield 2–3 times as wide as high, reddish, small ..... **M. latrunculus** Marsh.
- 195 (194). Hind femora black.
- 196 (197). Aperture in hind part of abdominal shield large, reddish, its height half or almost half height of abdomen in posterior part. Temples 2 times as long as eye. Antennae and abdomen black. Body 3–3.5. Parasite of *Coleophora hemerobiella* Scop. (Coleophoridae). Northwest, center; Central Asia (according to Telenga, 1941), Far East; Western Europe..... **M. microphthalmus** Wesm.
- 197 (196). Aperture on apex of abdomen black, its height  $2/5$  height of abdomen in apical part.
- 198 (203). Anterior margin of radial cell much shorter than stigma. Aperture of abdominal shield wide, transversely oval.
- 199 (200). Genae  $1/5$  to  $1/6$  as high as longitudinal diameter of eye, equal to basal width of mandible. Face  $2/3$  as high as its width (Fig. 193: 18). Aperture on abdominal apex small, its width approximately equal to length of apical segment of hind tarsus. Longitudinal folds at base of abdomen faint. Hind tibiae brown, pale in middle. Wings weakly darkened. Antennae 18-segmented ..... **M. brevigensis** Tobias
- 200 (199). Genae  $1/2$  to  $2/3$  as high as longitudinal diameter of eye, much greater than basal width of mandible. Face  $2/5$  to  $1/3$  as high as its width.
- 201 (202). Tegulae black, wings weakly but distinctly darkened. Aperture on apex of abdomen large, its width a few times

- greater than length of apical segment of hind tarsus ....  
 ..... **M. subcontractus** Abdinb.
- 202 (201). Tegulae yellow, wings hyaline-transparent. Aperture on apex of abdomen small, its width slightly greater than 1st segment of hind tarsus. Hind femora at apex yellowish red  
 ..... **M. chrysotegula** Tobias
- 203 (198). Anterior margin of radial cell as long as stigma or slightly shorter.
- 204 (217). Abdomen 2–2.5 times as long as wide. Width of aperture on apex of abdomen 2–3 times its height.
- 205 (208). Body small (2–2.5), with fine, dense punctation all over, matte.
- 206 (207). Hind tibiae entirely dark colored (antennae in female 16-segmented). Body 1.6–1.8 .....  
 ..... **M. denticulatus** Tobias, sp. n.<sup>1</sup>
- 207 (206). Hind tibiae in basal half somewhat yellow (in female antennae 18–20-segmented, and hind tibiae in basal half brownish yellow). Body 2–2.4 (see description of female in key for genus *Chelonus*). Northwest, center, southwest; Central Ural..... **M. tuberculiventris** Tobias, sp. n.<sup>1</sup>
- 334 Holotype: Female, Chelybinskaya Region, Il'menskii protected forest, 17.VII.1958 (Tobias). Paratypes: 1 female with the same label; 1 female, Yaroslavskaya Region, Berditsyno, 1–9.VI.1897 (Yakovlev); 1 female, Ul'yanovsk, Dubovyi forest, 24.VII.1958 (Tobias); 1 female, 1 male, Leningrad Region, Tolmachevo, 23.VIII.1960 (Tobias); 4 females, 1 male, Moldavia, Bendery, forest, 25.VI.1962 (Talitskii); 1 female, Voronezhskii Protected Forest, Belyevo, 29.V.1960 (Dovnar).
- 208 (205). Body large, sculpture of body coarser, with distinct wrinkles.
- 209 (216). Head behind eyes slightly roundly narrowed (Fig. 196: 21, 22). Hind femora 3.5–4 times as long as wide.

<sup>1</sup> Undoubtedly, both the species are close, though the female of one has 18–20-segmented antennae and may be included in the genus *Chelonus* on the basis of this character. The males differ very slightly, only in the color of hind tibiae. However, this character is extremely unreliable as it has hardly any definite contrasts and the main problem is that it is, apparently, variable. Both the species were collected from the same habitat (Bendery) at the same time and it is therefore impossible to completely exclude (in spite of significant differences in females) the possibility that they are only variants of a single species (cf. note to couplets 214 and 215).

- 210 (213). Frons quite uniformly, densely rugose-punctate. Thorax slightly, at most 1.3 times as long as high.
- 211 (212). Mesonotum transversely wrinkled anteriorly and posteriorly along sides. Head quite massive, temples 2 times as long as eye (Fig. 196: 21). Genae  $\frac{2}{5}$  as high as longitudinal diameter of eye. Face  $\frac{2}{3}$  as high as its width. Body 3.5. Ukraine..... **M. insincerus** Tobias, sp. n.  
Holotype: Male, Krivoi Rog., mowings, 11.VI.1954 (V. Boichenko).
- 212 (211). Mesonotum without distinct transverse wrinkles. Temples 1.5 times as long as eye. Genae  $\frac{1}{3}$  as high as longitudinal diameter of eye. Face  $\frac{1}{2}$  as high as its width (Fig. 196: 22, 23). Body 3.1–3.5 ..... **M. ripaeus** Tobias, sp. n.
- 213 (210). Frons all over its surface and face with coarse folds. Temples as long as eye. Genae  $\frac{1}{3}$  to  $\frac{2}{7}$  as high as longitudinal diameter of eye. Vertex behind ocelli with coarse transverse wrinkles. Clypeus almost smooth or slightly punctate. Abdomen with coarse, slightly wavy longitudinal folds, running from its base to its apex.
- 214 (215). Aperture on apex of abdomen large, slightly less than half width of abdomen or equal to it (Fig. 196: 25). Face  $\frac{2}{3}$  as high as wide (Fig. 196: 24). Antennae 18-segmented. Thorax 1.5 times as long as high. Folds on frons in concentric semicircles but straight on face, directed obliquely downward toward its middle. Body 3.6–3.8. Moldavia .....  
..... **M. arcuatilis** Tobias, sp. n.<sup>1</sup>  
Holotype: Male, Dubossary, 2.VII, 1961 (Talitskii). Paratypes: 1 male with the same label; 1 male, Plol; 20.VII.1960 (Talitskii).
- 215 (214). Aperture on apex of abdomen small, rounded (Fig. 196: 27). Face  $\frac{1}{2}$  as high as wide (Fig. 196: 26). Antennae 22-segmented. Thorax 1.3 times as long as high. Frons and face with wavy folds, forming alveolar sculpture. In this species concentric semicircles on frons and oblique wrinkles on face less determinately oriented. Body 3.5–3.9. Moldavia ..... **M. subarcuatilis** Tobias, sp. n.<sup>1</sup>

<sup>1</sup> These two species are undoubtedly close. It is interesting that both were collected simultaneously from the same habitat, and this compels us to assume their possible identity. However, substantial differences, especially in the shape of the aperture on the apex of the abdomen in the male, do not permit us to describe them only as variants of a single species.

Holotype: Male, Dubossary, 2.VII.1961 (Talitskii).  
Paratypes: 1 male, 3 females with same label; 1 male  
Kotovskoe, 29.VI.1960 (Talitskii).

- 216 (209). Head behind eyes distinctly or almost linearly narrowed (Fig. 195: 4). Hind femora 4.5–5 times as long as wide ..  
..... **M. retusus** Nees
- 217 (204). Abdomen less than 2 times as long as wide, usually 1.6–1.8 times.
- 218 (223). Aperture on apex of abdominal shield rounded or slightly wide, its width not more than 1.5 times its height.
- 219 (222). Maxillary palpi short, mouthparts not produced into proboscis. Abdomen without sharp longitudinal folds.
- 220 (221). Abdomen black ..... **M. contractus** Nees
- 221 (220). Abdomen at base yellow..... **M. flavonaevulus** Abdinb.
- 222 (219). Maxillary palpi long, approximately as long as height of head. Mouthparts produced into proboscis. Abdomen with sharp longitudinal folds..... **M. rostratus** Tobias
- 223 (218). Aperture on apex of abdominal shield 2–3 times as wide as high. Abdomen without sharp longitudinal folds. Head behind eyes roundly narrowed. Temples not longer than transverse diameter of eye.
- 224 (227). Maxillary palpi short, mouthparts not produced into proboscis.
- 225 (226). Aperture on abdominal shield large, occupies more than half width of abdomen. Longitudinal folds on base of abdomen hardly noticeable. Hind tibiae entirely black or brown..... **M. nigriritibialis** Abdinb.
- 226 (225). Aperture on abdominal shield smaller, its width usually not more than halfwidth of abdomen. Longitudinal folds on base of abdomen distinct. Hind tibiae in basal half distinctly lighter colored than in apical half .....  
..... **M. caucasicus** Abdinb.
- 227 (224). Maxillary palpi long, approximately as long as height of head, mouthparts produced into proboscis .....  
..... **M. hungaricus** Szépl.
- 228 ( 1). Body brownish red. Abdomen at apex slightly but distinctly curved on lower side, approximately 1.5 times as long as wide.
- 229 (230). Genae very distinctly developed, slightly shorter than longitudinal diameter of eye (Fig. 193: 19). Antennae thinner, 1st flagellar segment 3 times and preapical 1.5 times as long as wide. Anterior margin of radial cell 1/2 as long

as stigma. Hind femora 4 times as long as wide. Mesonotum very densely and finely punctate, matte. Head, as also body, yellowish red. Body 2.8. Kazakhstan .....

- ..... **M. erythrosoma** Tobias  
 230 (229). Genae very slightly developed,  $2/7$  as high as longitudinal diameter of eye. Fourth flagellar segment 2.5 times and preapical slightly longer than wide. Anterior margin of radial cell slightly shorter than stigma. Hind femora 3 times as long as wide. Mesonotum less densely, but more coarsely punctate, with distinct luster. Head black. Aperture on apex of abdomen in male as wide slit, occupying half width of abdomen. Parasite of *Cochylis* [*Phalonia*] sp. (Tortricidae). Kazakhstan..... **M. phalloniae** Tel.

Lectotype: Male, Koilibai sands, M. Barsuki, 30.XI.1931 (Luppova). Paralectotypes: 1 male, Karachokatsk village, sandy strip at Chondrilla, 18.VIII (N. Emel'yanov); 1 female, Koiteles sands, block Terekty, Karakum Mountains on coast of Aral Sea, 9.IX.1930 (Luppova).

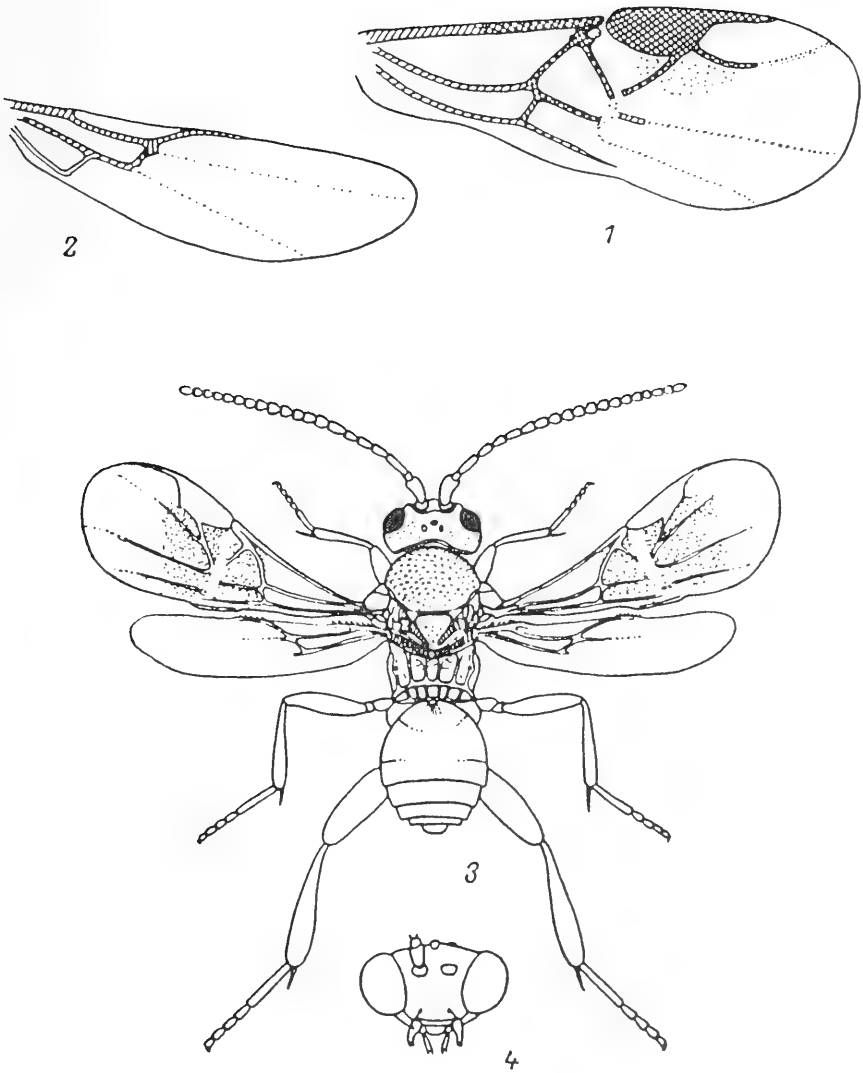
### 17. Subfamily Acaeliinae (Adeliinae)<sup>1</sup>

Small subfamily with two genera, one of which (*Myriola*) is often regarded only as a synonym of the other (*Acaelius*). Body is small. First three abdominal tergites are fused but smooth, and, as distinguished from Cheloninae, which is close to it, do not form hard shield. Wing venation is greatly reduced. It includes the solitary endoparasites of lepidoterous miners.

#### *Key to Genera*

- 1 (2). Radial vein consists of one section and originates from stigma at some distance from radiomedial vein (Figs. 197: 1, 198: 2). Temples approximately as long as eye. Eyes elongate, their longitudinal diameter 2–2.5 times transverse. Intertentorial distance equal to or slightly greater than tentorio-ocular distance (Fig. 197: 3, 4). Body usually black ..... 151. **Acaelius**  
 2 (1). Radial vein consists of two sections, or if 1st section indistinct, it originates along radiomedial vein from a single point on stigma (Fig. 198: 4). Temples usually not less than  $1/2$  as long as eye. Eyes not elongate, their longitudinal diameter 1.5

<sup>1</sup> Treatment by V.I. Tobias.



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Fig. 197. Acaeliinae (from Nixon and Birn).

1, 2—*Acaelius subfasciatus*: 1—forewing, 2—hind wing; 3, 4—*A. pyrthia*: 3—general appearance, 4—head.

times transverse. Intertentorial distance much greater (usually 2 times) than tentorio-ocular distance (Fig. 198: 5). Body usually light colored ..... 152. **Myriola**

## Key to Species of Genera

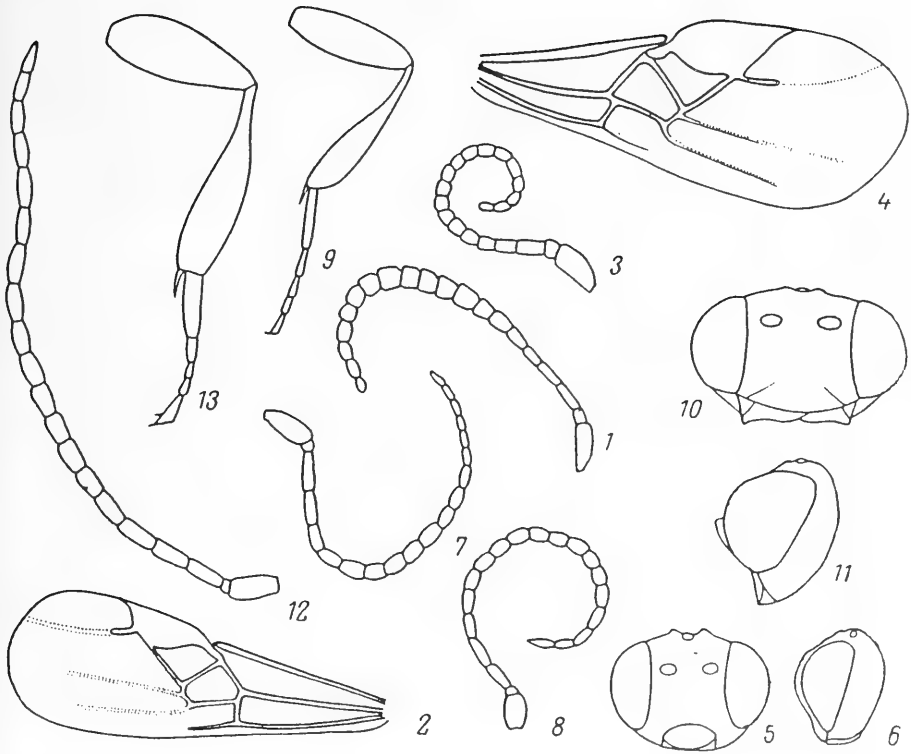
151. *Acaelius* Haliday, 1834 (*Acoelius* Hal., *Adelius* Hal.).—About 20 species have been described; most of them are Palearctic. However, their distinguishing characters (position of recurrent vein in relation to radiomedial vein, nervulus in relation to basal vein, coloration) vary greatly. The genus requires revision, which may show that in the Palearctic only one extremely variable species is distributed. Parasites of miner caterpillars from genera *Nepticula* (Nepticulidae) and *Lithocolletis* (Gracillariidae).

- 337 1 (2). Body large, 2.5–3, black. Western Europe .....  
 ..... **A. determinatus** Först (? *concinus* Ruthe)  
 2 (1). Body much smaller, 1–1.5.  
 3 (4). Body black Fig. 197: 1, 2 North, west, center, south, Caucasus  
 ..... **A. subfasciatus** Hal.  
 4 (3). Body with somewhat developed yellowish red pattern.  
 Fig. 198: 1, 2 South; Caucasus, Central Asia; Western Europe  
 ..... **A. erythronotus** Först  
 (*flavus* Tobias, syn. n., ?*pyrrhia* Beyrne)

152. *Myriola* Shestakov, 1932.—Four species from arid habitats of Central Asia and Kazakhstan; probably penetrate into southeast.

- 1 (2). Body black, wings hyaline-transparent. Longitudinal diameter of eyes 1.5 times transverse, equal to width of face. Temples half as long as eye. Clypeus 2 times as wide as high. Thorax noticeably depressed more than 2 times as long as high (7:3). First section of radial vein not distinct (Fig. 198: 4). Fifth segment of hind tarsus almost as long as 4th and 3rd segments together. Head and mesonotum uniformly and densely punctate. Body 2–2.6. Kazakhstan .....  
 ..... **M. ferulae** Tobias  
 2 (1). Body with somewhat developed yellowish red pattern. Wings somewhat darkened, especially in middle. Longitudinal diameter of eyes not more than 1.3 times transverse. Thorax not more than 2 times as long as high.  
 3 (4). Fifth segment of hind tarsus small, as long as 3rd. Head and mesonotum uniformly and densely punctate. Head without transverse and mesonotum without longitudinal wrinkles. Temples slightly narrowed backward 1/2 as long as eye. First section of radial vein usually somewhat developed. Longitudinal





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Fig. 198. Acaeliinae (from Tobias and original).

1, 2—*Acaelius erythronotus*: 1—antenna, 2—forewing; 3, 4—*Myriola ferulae*: 3—antenna, 4—forewing; 5–9—*M. arida*: 5—head, frontal view, 6—head, lateral view, 7—antenna, female, 8—antenna, male, 9—hind leg; 10–13—*M. magna*: 10—head, frontal view, 11—head, lateral view, 12—antenna, 13—hind leg.

- diameter of eyes 1.3 times transverse, equal to width of face. Clypeus  $\frac{1}{2}$  as high as wide. Fig. 198: 5–9. Body 1.6–2.1. Central Asia ..... *M. arida* Tobias
- 4 (3). Fifth segment of hind tarsus as long as 4th and 3rd segments together. Head, besides dense punctation with transverse wrinkles; thorax with longitudinal wrinkles. Temples distinctly narrowed backward,  $\frac{2}{5}$  as long as eye. Clypeus  $\frac{2}{5}$  to  $\frac{1}{3}$  as high as wide.
- 5 (6). Eyes almost rounded, their longitudinal diameter only slightly greater than transverse and much less than width of face. Mid-antennal segments in female at most 1.5 times as long as wide.

- Mesonotum with numerous fine and only longitudinal wrinkles. Body 1.6–2.2. Central Asia ..... **M. gussakowskii** Shest.
- 6 (5). Longitudinal diameter of eyes 1.3 times transverse, equal to width of face. Mid-antennal segments in female 2 times as long as wide. Mesonotum with a few less determinately oriented folds (some almost transverse). Fig. 198: 10–13. Body 2.6. Central Asia ..... **M. magna** Tobias.

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### 18. Subfamily Cardiochilinae<sup>1</sup>

Until recently, the subfamily was regarded as a tribe of Microgasterinae (the relation with which is certain). However, such plesiomorphic characters as antennae with numerous and indefinite number of segments and a large radiomedial cell in combination with more anomorphic (without the 2nd radiomedial cell) venation of the hind wing compels us to agree with Mason (1981, *Mem. Entomol. Soc. Canada*, N 115: 1–147), restituting to this group the rank of subfamily. There are 4 genera in the subfamily (not considering one excavated from Baltic amber), 2 genera in the Palearctic.

#### Key to Genera

- 1 (2). Proboscis short or relatively slightly elongate (length of galeae not exceeding longitudinal diameter of eye) .....  
 ..... 153. **Cardiochiles**
- 2 (1). Proboscis very long (due to distinctly extended glossa), longer than thorax with hind coxae ..... 154. **Asiacardiochiles**

#### Key to Species of Genera

153. **Cardiochiles** Nees, 1818 (*Pseudocardiochiles* Hedwig).<sup>2</sup>  
 —About 140 species, 40 in the Palearctic (outside the USSR, in southern part of the Palearctic, mainly in Northern Africa); Far East species *C. rugosus* Tel. from USSR fauna not included in the Key.

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- 1 ( 4). Ovipositor short, unciform, distinctly pointed apically, its valves approximately 1/2 as long as 1st segment of hind tarsus. Hind tibiae with backwardly directed protuberance at apex or distinctly widened (width at base 1/4 length). Claws simple, at most with short, slightly thickened and wideset

<sup>1</sup> Treatment by V.I. Tobias.

<sup>2</sup> Tobias and Alekseev. 1977. *Tr. Zool. In-ta. AN SSSR*, 71: 94–104.

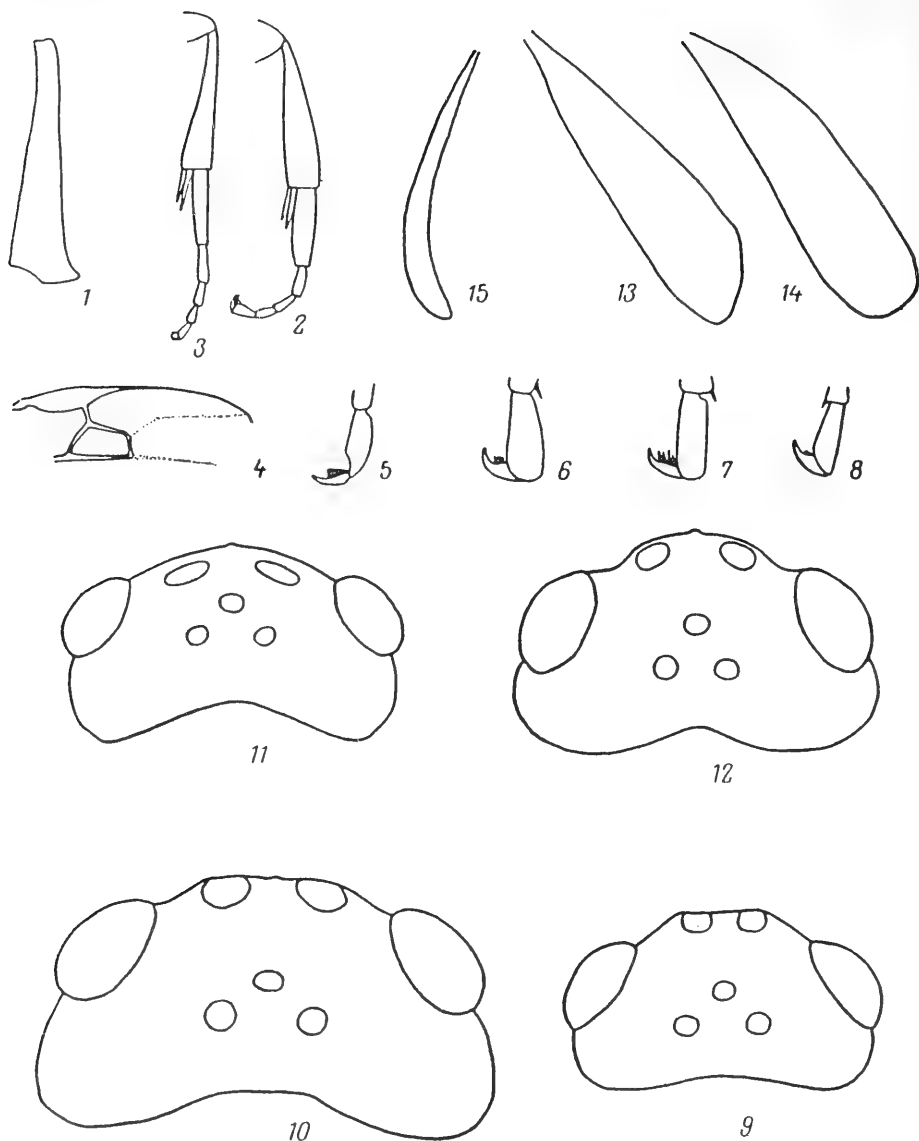
setae. Ocelli in obtuse-angled triangle. Eyes glabrous. Proboscis short. Antennae 35–38-segmented. Propodeum without transverse ridge, wrinkled, and somewhat distinctly areolate.

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- 2 ( 3). Apex of hind tibiae distinctly produced backward, thickened and truncate (Fig. 199: 1). First segment of hind tarsus thin (slightly wider than 2nd), parallel-sided. Hind femora 3 times as long as wide. Spurs of hind tibiae thin, inner one 1/2 as long as 1st segment of hind tarsus. Claws with short, wideset and stout setae. Head behind eyes slightly broadened. Notaulices faint, smooth, joining in posterior third of mesonotum. Scutellum uniformly bulged. Sternauli narrow, smooth. Second radiomedial cell 2 times as long as wide. Second abdominal tergite as long as 3rd, with oblique groove demarcating triangular field, its width slightly more than 2 times its length. Body color varies from yellowish red with flagellum and lower part of thorax black and stigma yellow to almost black body and reddish brown stigma; eyes black. Body 4.5–5.5. Central Asia ..... *C. acutus* Tobias and Alexeev
- 3 ( 2). Apex of hind tibiae not produced backward as protuberance, but widened (width at apex 1/4 length). First segment of hind tarsi broadened, particularly in basal third, where it is more than 2 times as wide as 2nd tarsal segment. Hind femora thick, only 2 times as long as wide. Spurs of hind tibiae quite thick, inner one slightly longer than halflength of 1st segment of hind tarsus. Claws without such setae. Head behind eyes roundly narrowed. Notaulices deep, sculptured, terminating near prescutellar depression. Scutellum relatively flat, often with longitudinal depression in middle. Sternauli deeply depressed, somewhat wrinkled, rarely smooth. Second radiomedial cell 2.5–3 times as long as wide. Second abdominal tergite much shorter than 3rd, without oblique grooves and central field, 4 times as wide as long. Body brownish yellow except dark ocellar field and flagellum, sometimes a few spots on thorax, stigma yellow; eyes greenish. Body 5.5–6.5. Kazakhstan, Central Asia; Mongolia ..... *C. eremita* Kok.
- 4 ( 1). Ovipositor much longer, slightly curved, its valves not shorter than 1st segment of hind tarsus (usually as long as two basal segments). Hind tibiae less widened toward apex (not less than 4–5 times as long as wide) and without protuberance (Fig. 199: 2, 3). Claws, usually on inner margin of base with dense and dark setae or protuberance (Fig. 199: 5–8).

- 5 ( 6). Body extremely small, 3. Notaulices meeting at right angles in middle of mesonotum. Sternauli not developed at all. Mesonotum polished. Propodeum smooth. Second abdominal tergite slightly shorter than 3rd, with distinctly transverse trapezoid field, striate with grooves along sides. Prescutellar groove narrow, slightly crenulate. Claws simple. Ovipositor long, its valves as long as hind tibia. Hind femora slightly more than 2 times as long as wide. Ocelli in right-angled triangle. Body brownish yellow; wings in apical third slightly darkened, stigma yellow ..... **C. glaphyrus** Alexeev
- 6 ( 5). Body quite large, not less than 4 (except in *C. falcatus*). Notaulices meeting at acute angle much beyond middle of mesonotum. Sternauli present, though only as smooth depressions. Mesonotum not polished, though punctate due to numerous hairs. Second abdominal tergite either much shorter than 3rd and without median field or if slightly shorter than 3rd, then median field triangular or somewhat wide. Claws at base with dark setae or with outgrowth. Ovipositor shorter, its valves shorter than hind tibia.
- 7 (12). Proboscis extremely long, galeae thin but approximately as long as eye. Second abdominal tergite slightly shorter than 3rd, with oblique depressions, striate, protuberant, trapezoid median field. Ocelli in acute-angled or right-angled triangle. Eyes pubescent. Notaulices deep, slightly sculptured, joining each other near prescutellar depression. Hind femora thickened slightly more than 2 times as long as wide. First segment of hind tarsi almost parallel-sided, 1.5 times as wide as 2nd segment, large spur of hind tibiae much longer than half length of 1st segment of hind tarsus. Nervulus removed from basal vein by distance of half its length. Second radiomedial vein inclined toward medial vein at highly acute angle.
- 8 ( 9). Sternauli crenulate. Propodeum with sharply striate rhomboid areola and transverse ridge originating from it. Head behind eyes distinctly broadened. Valves of ovipositor as long as 1st segment of hind tarsus. Head and thorax with profuse black pattern. Wings at apex contrastingly darkened. Body 6—6.5. Spain ..... **C. robustus** Tel.  
Lectotype: Female "Pozuelo de C.A." (La Fuente).  
Paralectotypes: 1 female, 1 male. "Rio Alberche (Dusmet); 1 male "Vacía Madrid" (Dusmet).

- 9 ( 8). Sternauli as wide smooth depressions. Propodeum with weakly striate areola, without distinct transverse ridges. Head behind eyes slightly broadened or not broadened. Valves of ovipositor noticeably longer than 1st segment of hind tarsus. Body brownish yellow, sometimes with small black spots.
- 10 (11). Forewings in apical third, from top of 2nd radiomedial cell contrastingly darkened. Stigma at base yellow with brown spot in apical half. Body 5.5–6. Central Asia (possibly, only a variant of more common *C. desertus*) . . . . *C. antennalis* Tel.  
Lectotype: Female, Imam-Baba "(A.Sh.)" [A. Shestakov].  
Paralectotypes: 1 female, 1 male, same data.
- 11 (10). Forewing in apical third not darkened or weakly and non-contrastingly darkened (usually from base of 2nd radiomedial cell). Stigma yellow. Fig. 199: 4. Body 5–6. Central Asia  
..... *C. desertus* Tel.  
Lectotype: Female, Ashkhabad, 24.V.1928 (V. Gussakovskii). Paralectotypes: Turkmenia, 1 female [without head]. Uch-Adzhi, 1–3. 1929 (A. Shestakov); 1 male, Imam-Baba, 3–8.V.1912 (Kozhanchikov); 1 specimen [without abdomen and hind legs], 16.VI.1928 (V. Gussakovskii); 1 male, village Farab, 20.IV.1914 (Gol'-bek).
- 12 ( 7). Proboscis short, if sometimes projecting and long, then galeae broad, much shorter than eye. Second abdominal tergite much shorter than 3rd, often without distinct depression and median field. Ocelli usually in obtuse-angled triangle.
- 13 (16). Claws basally with protuberance (Fig. 199: 5). Hind tibiae and tarsi and abdominal tergites with numerous white bristles. Head distinctly broadened (its width approximately 3 times its length), distinctly narrowed behind eyes, with short temples. Wings hyaline-transparent with white bristles contrastingly darkened in apical third. Spurs of hind tibiae relatively short, inner one not longer than halflength of 1st segment of hind tarsus. Antennae about 30-segmented. Hind femora slightly more than 2 times as long as wide.
- 14 (15). Eyes glabrous. Mesonotum or scutellum also with yellowish brown pattern. Hind femora somewhat reddish. First segment of hind tarsi at base whitish. Valves of ovipositor slightly longer than 1st segment of hind tarsus, 2 times as wide as it. Body 4.5–4.7. Kazakhstan, Central Asia. . . . *C. lucidus* Tel.  
Lectotype: Female, Tartugai [block Kzyl-Ord], 3–15.VI.1929 (A. Sheshtakov). Paralectotype: 1 female, Farab [block: Chardzhou], 12–28.V.1929 (A. Shestakov).

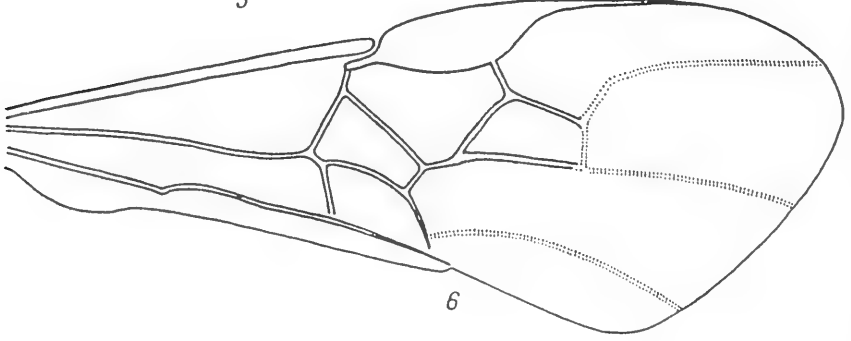
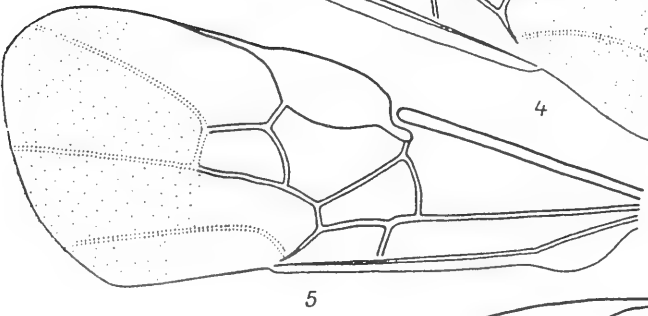
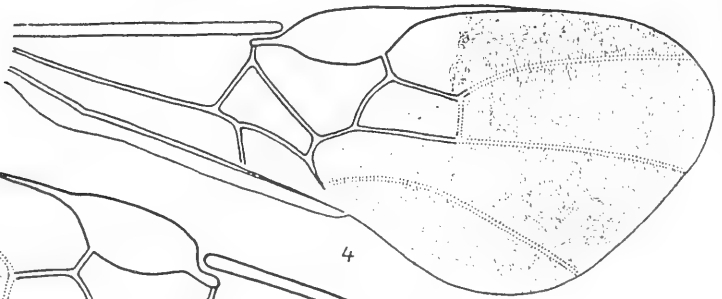
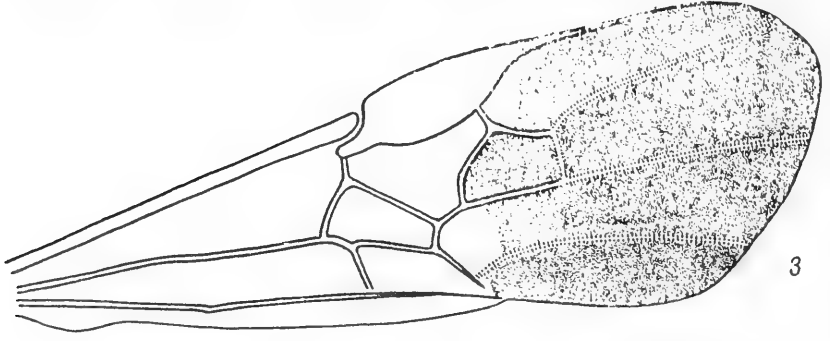
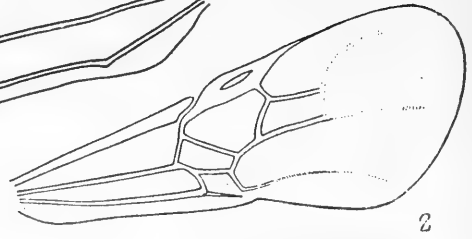
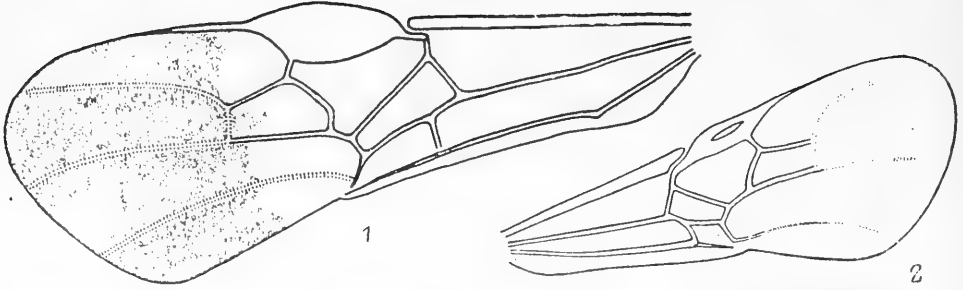


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Fig. 199. Cardiochilinae (from Tobias and Alekseev).

1—*Cardiochites acutus*, hind tibia; 2, 3—hind tibia and tarsus: 2—*C. fallax*, 3—*C. saltator*; 4—*C. desertus*, part of forewing; 5—8—5th segment of hind tarsus: 5—*C. vitripennis*, 6—*C. saltator*, 7—*C. tjanshanicus*, 8—*C. karakumicus*; 9—12—head: 9—*C. turcmenicus*, 10—*C. saltator*, 11—*C. kasachstanicus*, 12—*C. tjanshanicus*; 13—15—ovipositor valve: 13—*C. saltator*, 14—*C. tjanshanicus*, 15—*C. falcatus*

- 15 (14). Eyes slightly but distinctly pubescent. Body entirely black, hind femora dark brown or nearly black. First segment of hind tarsi almost entirely dark colored, not whitish at base. Fig. 199: 5 (male). Body 4—4.5. Central Asia. (Probably, only opposite sex of preceding species) .....  
 ..... **C. vitripennis** Tobias and Alexeev
- 16 (13). Claws basally without protuberance but usually with row of dark setae (Fig. 199: 6—8). Bristles on legs and mesonotum less light colored and dense. Head less broad, less narrowed, somewhat broadened behind eyes. Propodeum with areola and transverse ridges.
- 17 (20). Hind legs black, their tibiae at base contrastingly yellowish white. Head behind eyes noticeably broadened. Second radiomedial cell 1.5 times as long as wide. Nervulus removed from basal vein by slightly less than its own length. Wings at base light colored, in apical part contrastingly darkened (including 2nd radiomedial cell). Ovipositor valves as long as 1st and 2nd segments of hind tarsus together. Eyes glabrous.
- 18 (19). Notaulices fully developed. Head and thorax entirely or for greater part (in male) yellowish red. Body 5—6. Central Asia .....  
 ..... **C. alboannulatus** Tel.  
 Lectotype: Female, village Kaakhka [Turkmenia], 6.VI.1928 (V. Gussakovskii). Paralectotype: 1 male, same data.
- 19 (18). Notaulices only anteriorly developed, mesonotum smoothened for greater part. Body entirely black, only sides of mesonotum reddish. Fig. 200: 1. Body 6.5. Central Asia .....  
 ..... **C. calculator** Tel.  
 Lectotype: Female, Krasnovodsk, 14.VI.1928 (V. Gussakovskii).
- 20 (17). Hind tibiae without contrasting yellowish white color at base.
- 21 (38). Thorax with yellowish red pattern.
- 22 (27). Eyes glabrous or with sparse, short, slightly noticeable hairs.
- 23 (26). Wings light colored, darkened in apical third.
- 24 (25). Hind femora, abdomen and thorax, except apex, black. First segment of hind tarsi noticeably broadened (4 times as long as wide), with noticeably protuberant apical and basal margins, with black setae on inner side as also on outer side of hind tibiae. Propodeum more rugose-punctate, with narrow rhomboid areola, striate with extremely high ridges (nearly 1/2 or 1/3 as high as wide) and usually with short longitudinal ridge in front of it. Coloration of head variable from





entirely yellowish red to completely black. Body 4.5–6.5. Caucasus (Azerbaijan), Central Asia, Afghanistan .....  
..... *C. pseudofallax*  
Tel. (*gussakowskii* Tel., 1955; nec *gussakovskii* Tel., 1949)

Lectotype: Male, Turkmenia, "Imam-Baba, Merv. District (presently Mary). Transcaspian region," 13–14.V.1912 (Kozhanchikov). (Lectotype with black head; 1 female, 1 male with same label but with yellowish red pattern on head, identified by N.A. Telenga as *C. gussakovskii* Tel.).

- 25 (24). Body and legs brownish yellow, at most, coxae, underside of thorax and part of abdomen darkly colored. First segment of hind tarsi not broadened, parallel-sided, 5 times as long as wide, as also hind tibiae, with light colored bristles. Propodeum mildly rugose-punctate, with wide rhomboid areola, striate with low ridges, without longitudinal ridge in front. Body 4–5. Central Asia ..... *C. shestakovi* Tel.

Lectotype: Female, Tadzhikistan: "City Koi-pyaz-tau, block Kabadiana [presently Kabodiyon] 25.VI.1924 (*Gussakovskii*)". Paralectotype: Female, ravines of Chuli, Kopetdag, 6–8.V.1913. (Gol'bek).

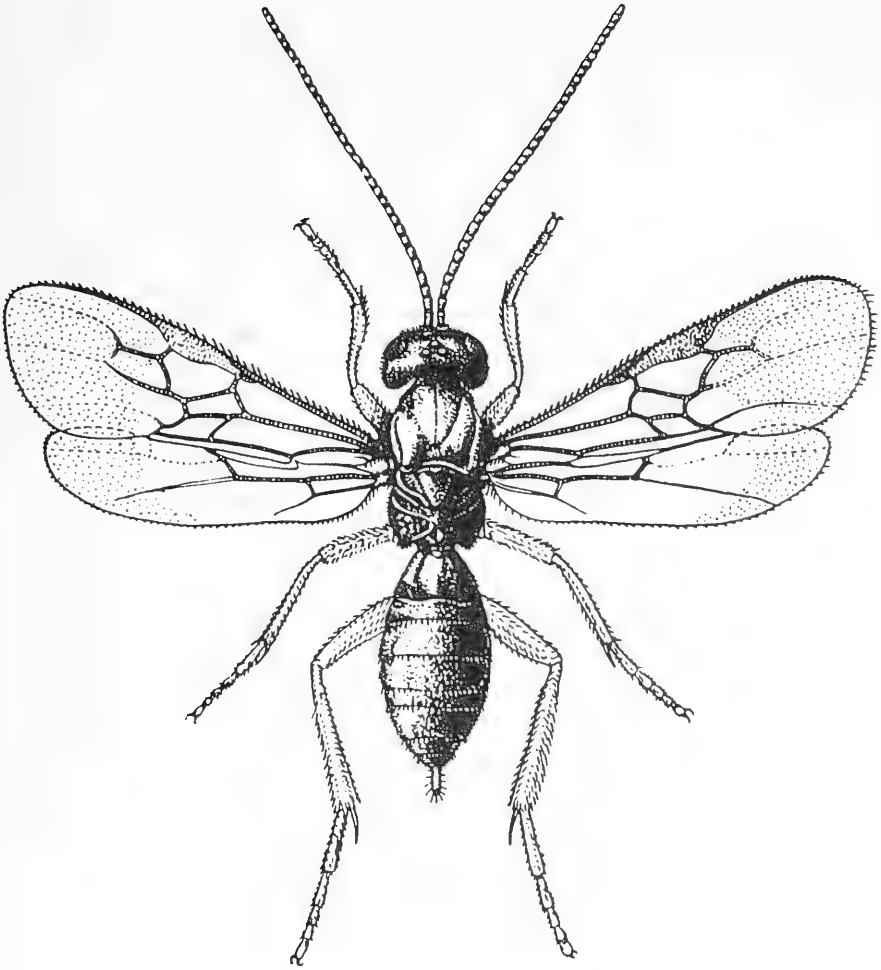
- 26 (23). Wings uniformly darkened. First segment of hind tarsi parallel-sided, 5 times as long as wide. Head yellowish red thorax either entirely yellowish red or, except apex, black. Middle and hind legs dark colored. Body 5–5.5. Kazakhstan, Central Asia ..... *C. turkestanicus* Tel.

Lectotype: Female, Kazakhstan "Karataugeb bei Djulek, Balamurun (Koshantschikov)". Paralectotypes: 1 male, same data; 3 females, Tartugai, 3–15.V.1929 (A. Shestakov). Turkmenia: 1 female, "Tedzhen, 14.VI.1923 (A. Zhelochovtsev)".

- 27 (22). Eyes with numerous isolated hairs. Legs dark colored.

- 28 (29). Propodeum sharply truncate, its truncate part vertical to longitudinal axis of body, sharply bordered from sides and with carinae on dorsal side, with coarse alveolar wrinkles. First segment of hind tarsi broadened. Wings at base pale, at apex darkened, without smoky spots around basal vein. Body black. Mesonotum, scutellum, top of pronotum and

- forelegs except coxae and trochanters, brownish yellow. Body 5. Lower Volga Region ..... **C. volgensis** Tobias, sp. n.  
 Holotype: Male, "Sarenta" [presently Krasnoarneiskii district of Volgograd (Bekker)].
- 29 (28). Propodeum uniformly protuberant, its hind part not vertically truncate, bordered with weakly developed ridges, weakly wrinkled. Combination of remaining characters different.
- 342 30 (35). First segment of hind tarsi broadened, 2 times as wide as 2nd, with noticeably protuberant margins, 4 times as long as wide.
- 31 (32). Forewing without smoky spot around basal vein. Head and thorax (except brown propodeum) brownish yellow. Body 5.5. Central Asia ..... **C. gussakovskii** Tel.  
 Lectotype: Male, Tadzhikistan: Kabadian (presently Kabodiyon), 21.VI.1934 (Gussakovskii).
- 32 (31). Forewing with smoky spot around basal vein. Head and often thorax with somewhat distinctly developed black pattern.
- 33 (34). Thorax, often hind coxae and usually somewhat distinctly developed pattern on head yellowish red. Body 4.5–5.5. Kazakhstan, Central Asia ..... **C. fumatus** Tel.  
 Lectotype: Female, Uzbekistan, Kagan, 2.VIII.1930 (Zhelokhovtsev). Paralectotypes: 1 male, same data; 1 female, Kazakhstan, village Arys', 28.VII.1931 (Fursov); 1 male, Tadzhikistan, "City Koi-P'yaz-Tau, block Kabadian" [presently Kabodiyon], 25.VI.1934 (Gussakovskii).
- 34 (33). Thorax, except apex, head and legs black. Fig. 199: 2. Body 5–6.5. Parasite of *Salebria marmorata* Alph. (Phycitidae). South; Caucasus, Kazakhstan, Central Asia; Romania ..... **C. fallax** Kok.
- 35 (30). First segment of hind tarsi parallel-sided, not broadened, only 1.5 times as wide as 2nd.
- 36 (37). Face uniformly bulged or slightly angularly projecting along median line. Wings, at base, pale, at apex somewhat contrastingly darkened. Figs. 199: 3, 6, 10, 13; 200: 2; 201. Body 5.5–6.5. Parasite of *Pyrausta sticticalis* L. (Pyraustidae). South; Caucasus, Kazakhstan, southern Siberia; Southwestern Europe (cf. also couplet 43) ..... **C. saltator** F. (? *brachialis* Rondani, *katkowi* Kok., *sibiricus* Tel., syn. n.).
- 37 (36). Face with longitudinal carinate elevation. Wings uniformly darkened. Body 6.3. Southern Siberia (Minusinsk) ..... **C. fumipennis** Szépl.
- 38 (21). Thorax like whole body, entirely black.



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Fig. 201. Cardiochilinae (original).

*Cardiochiles saltator* F.

- 39 (58). Hind tibiae dark colored, at base pale. Ovipositor valves quite broadened toward apex and in their widest part (at apex) as wide as apex of hind tibia (Fig. 199: 13, 14). Claws of hind tarsi usually with setae or, instead, denticles on inner margin of basal part and often much longer than pulvillus. Ocelli (except *C. tianshanicus*) in obtuse-angled triangle, base of which greater than ocellocular distance (Fig. 199: 9–11).

- Distance between anterior and posterior ocelli as long as ocellar diameter. Third (weakly sclerotized) section of radial vein somewhat uniformly curved (Fig. 200: 2, 3).
- 40 (47). Head behind eyes somewhat broadened (Fig. 199: 10–12). Face usually with distinct longitudinal angular elevation in middle.
- 41 (46). Wings, at least, smoky in apical half (Fig. 200: 3), with brownish veins; discoidal cell with some dense bristles as entire alar membrane. First segment of hind tarsi broadened, less than 1/2 as narrow as hind tibia, approximately 4 times as long as wide; 5th segment of hind tarsi as long as 2nd, its claws much less than 1/2 as long as pulvillus in basal half with somewhat long setae, of which outer one usually more than 1/2 as long as distance from it to apex of claw. Antennae and hind legs entirely black.
- 42 (45). Head behind eyes distinctly broadened (Fig. 199: 10, 12). Setae of claws of hind tarsi more distinctly developed, longest of them reaches at least middle of claw. Body with numerous dark hairs. Antennae usually more than 35-segmented.
- 43 (44). Ovipositor valves at apex obliquely truncate. Ocelli in obtuse-angled triangle. Forefemora and tibiae largely yellowish red. Setae of claws of hind tarsi numerous, close-set (Fig. 199: 6). Frons near eyes with wide and deep, somewhat triangular depression on each side, often transversely wrinkled. Wings in basal half noticeably more light colored than at apex. Body 5.5–7 (cf. also couplet 36) .....  
..... *C. saltator* F. var. *brachialis* Rondani
- 44 (43). Ovipositor valves at apex rounded. Ocelli in acute-angled triangle. Forefemora black, foretibiae dark brown. Setae of claws of hind tarsi sparse. Frons near eyes with slight and somewhat rounded smooth depressions. Wings in basal half slightly paler than in apical. Fig. 199: 7, 12, 14. Body 5. Central Asia ..... *C. tjanshanicus* Tobias and Alexeev
- 45 (42). Head behind eyes slightly broadened (Fig. 199: 11). Setae of claws of hind tarsi slightly developed. Body slightly pubescent. Antennae 35-segmented. Depressions on frons near eyes faint, longitudinal and smooth. Body 4–5 (cf. also couplet 52) ..... *C. kasachstanicus* Tobias and Alexeev
- 46 (41). Wings pale, slightly darkened only in apical part (in female!); discoidal cell and part of alar membrane adjacent to it with sparser bristles than remaining alar membrane. First segment of hind tarsi less broad, 1/2 as narrow as hind tibia at apex, 5

times as long as wide; 5th longer than 2nd, its claws 2 times as long as pulvillus, with slightly developed setae, of which outer one a few times shorter than distance from it to apex of claw. Antennae yellowish brown, hind tibiae light colored at base as also apices of 2nd to 4th segments of hind tarsi. Body 4—4.5. Central Asia ..... **C. hyalipennis** Tel.

Lectotype: Female, Bakharden, 15.VI.1903 (Ahnger). Paralectotype: 1 male, same data. [In the initial description, Ashkhabad was indicated as type habitat. Bakarden, situated not far from Ashkhabad, is also in the label of author N.A. Telenga “(*Cardiochiles hyalipennis* sp. n.)”. There remains no doubt that the mentioned specimens are really type specimens.]

- 47 (40). Head behind eyes not broadened, face usually without angular longitudinal elevation.
- 48 (49). Wings at base pale, contrastingly darkened in apical half beyond stigma (Fig. 200: 4). Propodeum with coarse alveolate wrinkles. Body 5 (male!). Kazakhstan ..... **C. melanotus** Tel.  
Lectotype: Male [without hind legs], Tartugai, 3—15.VI.1929 (A. Shestakov).
- 49 (48). Wings more uniformly colored, pale or almost entirely darkened, or gradually and uncontrastingly darkened toward apex. Propodeum relatively smoothly sculptured.
- 50 (57). Ovipositor valves much shorter than hind tibia. Propodeum either slightly sculptured, lustrous or sculpture not uniform (apex usually less sculptured than base). Wings pale; if dark, then stigma brown.
- 51 (56). Wings somewhat darkened (Fig. 200: 3).
- 52 (53). Sternauli distinctly sculptured. Hind legs black, only their 1st tarsal segment yellowish at base. Valves of ovipositor at apex obliquely truncate (Fig. 199: 13). Propodeum quite coarsely and uniformly wrinkled. Figs. 199: 11; 200: 3. South (Black Sea Protected Forest); Kazakhstan (cf. also couplet 45). ...  
..... **C. kasachstanicus** Tobias and Alexeev
- 344 53 (52). Sternauli smooth. Hind legs brown, their tarsal segments yellowish at apex (1st also at base). Propodeum slightly sculptured, lustrous.
- 54 (55). Ovipositor valves at apex rounded (see Fig. 199: 14). Costal vein and stigma brown. Propodeum with mild granulose sculpture and with a few wrinkles near ridges, delimiting cell. Fig. 199: 9. Body 4. Central Asia .....  
..... **C. turcmenicus** Tobias and Alexeev

- 55 (54). Ovipositor valves at apex obliquely truncate (cf. Fig. 199: 13). Costal vein and anterior margin of stigma yellowish. Propodeum with faint but numerous wrinkles. Body 4. Central Asia ..... *C. microsomus* Tobias and Alexeev
- 56 (51). Wings hyaline-transparent, only slightly darkened at apex. Wing venation and stigma brown. Claws of hind tarsi with short denticle at base (Fig. 199: 8). Sternauli smooth; propodeum with distinctly smooth sculpture. Body 4. Central Asia ..... *C. karakumius* Tobias and Alexeev
- 57 (50). Ovipositor valves almost as long as hind tibia. Propodeum densely and uniformly sculptured. Wings uniformly darkened, stigma yellowish. Body 4. Central Asia .....  
..... *C. fuscus* Tobias and Alexeev
- 58 (39). Hind tibiae brownish yellow, only darkened at apex. Ovipositor valves narrow, falcate. Their part of maximum width (preapical) narrower than apex of hind tibia (Fig. 199: 15). Claws of hind tarsi short, only slightly longer than pulvillus, plain, without distinct setae. Ocelli in right-angled triangle, base of which as long as ocellular distance; distance between anterior and posterior ocelli 1.5 times ocellar diameter. Third section of radial vein curved angularly in basal third (Fig. 200: 6). Sternauli quite short, somewhat fused with short groove in posterior part of sides of mesothorax. Eyes with numerous hairs. Face bulged tuberculately in middle. Antennae 23–26-segmented, black. Fifth segment of hind tarsi shorter than 2nd. Wings pale. Body 3–3.5. Central Asia ..... *C. falcatus* Tobias and Alexeev

154. *Asiacardiachiles* Telenga, 1955.—1 species.

- 1 (1). Ovipositor valves as long as hind tibia. Notaulices deep, almost smooth, 1st segment of hind tarsi parallel-sided; inner spur of hind tibiae equal to half its length. Hind femora 3 times as long as wide. Propodeum with fields, sculpture near ridges separating them, but with distinctly smooth sculpture for greater part. Body black; middle and hind legs dark colored; wings uniformly darkened. Body 3.2–4. Kazakhstan, Central Asia .....  
..... *A. minutus* Tel.  
Lectotype: Female, Kazakhstan; Tartugai, 3–15.VI.1929 (A. Shestakov). Paralectotypes: 2 males, same data.

19. Subfamily Microgasterinae<sup>1, 2, 3</sup>

Representatives of the subfamily parasitize caterpillars of Lepidoptera. Some species may infest eggs but develop in caterpillars (parasites of eggs and larvae).

According to recent revision of the genera of world fauna (Mason, 1981), there are 51 genera in this subfamily. However, most of them are based on the division of genus *Apanteles* into a few independent genera, partially merged with other genera. At present it is difficult to assess this division. Although the polyphletic origin (due to the independent reduction of the 2nd radiomedial vein) of some groups of *Apanteles* is undoubted (from the Palearctic, it should be presumed as justified only for groups *A. parasitellae*). It is difficult to separate most *Apanteles* groups (especially such large groups as *A. glomeratus*, *A. popularis*, *A. vitripennis*, *A. circumscriptus*, *A. metacarpalis*, *A. butalidis*, *A. laevigatus*, *A. ultor*, *A. ater*) from each other due to the large number of intermediate species, which can only conditionally be included in one of the groups. The groups given above in parenthesis are arranged in order of development of such characters as elongation of ovipositor, faintness of sclerotization connected with it, enlargement of 6th abdominal sternite, elongation of 1st abdominal sternite and its narrowing toward apex, faintness of sculpture of basal abdominal tergites with the appearance of oblique grooves on 2nd tergite connected with it; the last three groups exhibit different degrees of formation of areola on the propodeum and not always enough distinction of such important characters as curvature or bulge of the anal lobe of the hind wings. A serious argument in favor of division of the genus *Apanteles*, put forward by Mason, and the inclusion of these genera in different tribes is that the isolated genera are characterized by sufficiently distinct complexes of hosts (for example, macrolepidopterans—noctuids, microlepidopterans—leafrollers) bringing it closer to forms which have the 2nd radiomedial cell and the same complex of hosts. There is similarity also of such biological characteristics which, on one hand, have group parasitism while

<sup>1</sup> Treatment by V.I. Tobias.

<sup>2</sup> Telenga, N.A. 1955. Fauna SSSR, V, 4, Hymenoptera, Family Braconidae, subfamily Microgasterinae, subfamily Agathinae, 311 p; Nixon, G.E.J. 1965. A reclassification of the Tribe Microgasterini (Hymenoptera: Braconidae), *Bull. Brit. Mus. (Nat. Hist.), Entomol.*, Suppl. 2, London, 284 p; Mason, W.R.M. 1981. The polyphyletic nature of *Apanteles* Foerster (Hymenoptera: Braconidae): a phylogeny and reclassification of Microgasterinae. *Mem. Entomol. Soc. Canada*, 115, 147 p.

<sup>3</sup> Key to the genus *Apanteles* prepared in collaboration with A.G. Kotenko.

on the other, individual parasitism and such morphological characters as length of ovipositor and structure of the 6th abdominal sternite.

However, we must remember that all these similarities may be due to their acquiring the same group of hosts (not essentially related forms). For example, the use of free living large caterpillars of noctuids as hosts must entail shortening of the ovipositor and the 6th abdominal sternite along with group parasitism (large host with parasites of same size) but with cryptic, small leafrollers there is a contradictory tendency, that is, polyphyly is possible not only on the basis of the character of wing venation.

All this compels us for the present to restrain from dividing *Apanteles* into several genera (moreover, most Palearctic species were not investigated by Mason in terms of his system). Furthermore, it must not be refuted on the basis of the fact that *Apanteles* are distinctly characterized by the absence of 2nd radiomedial cell and grouping of species with such venation with forms which have this character makes their identification more difficult.

Following Mason (1981), we regard Cardiochilinae and Miracinae as independent subfamilies and not tribes of the subfamily Microgasterinae, as accepted earlier.

#### *Key to Genera*

- 1 (14). Second radiomedial vein developed, encloses small radiomedial cell (Fig. 203: 1, 5).
- 2 ( 3). Hind coxae small, not longer or slightly longer than 1st abdominal tergite. Second abdominal tergite slightly separated from 3rd, smooth or slightly sculptured. Large spur of hind tibiae not 1/2 as long as 1st segment of hind tarsus. Ovipositor short. Head and thorax usually densely sculptured. Propodeum coarsely wrinkled ..... 155. **Microgaster**
- 3 ( 2). Hind coxae large, longer than 1st abdominal tergite (in doubtful cases, combination of remaining characters different).
- 4 ( 7). First abdominal tergite distinctly narrowed toward base, usually less long than wide at apex. Second abdominal tergite, at most, slightly shorter than 3rd, usually wrinkled and without trace of median field. Propodeum wrinkled, with somewhat distinct median ridge. Second radiomedial cell relatively large, 2nd radiomedial vein originates from 2nd section of radial vein or interstitial to 1st. Ovipositor noticeably produced beyond apex of abdomen.



- 5 ( 6). Third abdominal tergite as long as 2nd or longer, rarely slightly shorter, smooth or weakly sculptured. First abdominal tergite somewhat gradually narrowing toward base, appearing uniformly curved in lateral view (Fig. 214: 6), with slight depression at base. Apical tarsal segment not enlarged ..... 156. **Lissogaster**
- 6 ( 5). Third abdominal tergite much shorter than 2nd, coarsely punctate. First abdominal tergite parallel-sided, sharply narrowed at base and appearing steeply curved in lateral view (Fig. 214: 7), with deep depression at base. Apical tarsal segment enlarged (almost 2 times as wide as preceding). Abdomen often with reddish pattern, stigma with yellow spot at base ..... 157. **Hygroplitis**
- 7 ( 4). First abdominal tergite not narrowed toward base, if at all narrowed, then 2nd abdominal tergite much shorter than 3rd, usually smooth, and (or) with median field and 2nd radiomedial vein interstitial to 1st section of radial vein.
- 8 (11). Median field of 2nd abdominal tergite (when sometimes faint, then entire 2nd tergite sculptured) wide, never triangular. Ovipositor noticeably produced beyond apex of abdomen, its valves at least 1/2 as long as hind tibia.
- 9 (10). Propodeum with longitudinal ridge or with somewhat developed sculpture along its middle, or smooth. First abdominal tergite, though slightly narrowed toward apex, often somewhat cuneate, 2nd tergite extremely short (much shorter than 3rd) and distinctly broadened, without distinct oblique grooves or the same pushed to its base and directed laterad. Mesonotum somewhat punctate, with quite dense and long, appressed, light colored hairs ..... 158. **Choeris**
- 10 ( 9). Propodeum without longitudinal ridge, with transverse sculpture in middle. First abdominal tergite parallel-sided, 2nd slightly shorter than 3rd, with wide-set oblique grooves, directed toward hind corners. Mesonotum almost smooth, with sparse, short, oblique, isolated gray hairs ..... 159. **Paroplitis**
- 11 ( 8). Median field of 2nd abdominal tergite not wide, triangular or almost triangular or extended along middle of tergite. Ovipositor short, slightly produced beyond apex of 6th abdominal sternite.
- 12 (13). Base of 1st abdominal tergite uniformly concave, without deep longitudinal grooves. Valves of ovipositor at apex only with usual thin hairs ..... 160. **Rasivalva**

- 13 (12). Base of 1st abdominal tergite in basal half with deep longitudinal grooves. Ovipositor valves at apex often with thickened setae ..... 161. **Diolcogaster**
- 14 ( 1). Second radiomedial vein not always developed (Fig. 219: 10, 14), rarely as short offshoot ..... 162. **Apanteles**.

155. **Microgaster** Latreille, 1804 (*Microplitis* Först).<sup>1</sup>—About 140  
346 species, in Palearctic about 80 species. Characters used for separating species of this genus often very changeable and demarcation between many species is insufficiently distinct due to transgression of characters (shape of 1st abdominal tergite, sculpture and coloration of body). Coloration of cocoons is variable, usually greenish or bluish during summer, brown or gray during autumn; more compact and often costate.

- 1 (106). Mesonotum with distinct sculpture, though along notaulices. Head dorsally somewhat punctate.
- 2 ( 97). Mesonotum densely punctate, matte. If with smooth sculpture, then 1st abdominal tergite relatively short and not narrowed toward apex.
- 3 ( 4). Oral cavity between clypeus and mandibles wide and deep (Fig. 203: 4). Antennae short, as long as head and thorax together, segments in apical half square. Hind femora thickened, 3 times as long as wide. Second radiomedial cell weakly pedunculate (Fig. 203: 5). First abdominal tergite in apical third roundly narrowed, rugose-punctate, matte, 2 times as long as wide in middle. Body 3.5–3.8. Cocoons brown, thick-set. Northwest, south; Azerbaidzhan .....  
..... **M. excisa** Tel.
- Lectotype: ?female (specimen without abdomen, antennae, wings, middle and hind legs) “Askaniya Nova” (Label illegible). (Medvedev).
- 4 ( 3). Cavity between mandibles and clypeus not deep. Antennae usually longer, with longer segments. Hind femora, as a rule, longer. Second radiomedial cell not pedunculate (Figs. 202: 12; 203: 1; 204: 5).
- 5 ( 42). First abdominal tergite (Figs.: 202: 1, 2, 10; 203: 6, 7) strongly narrowed toward apex or parallel-sided, at apex

<sup>1</sup> Nixon, 1970. *Bull. Brit. Mus. (Nat. Hist.) Entomol.*, 25, 1: 30; Papp, 1984. *Entomol. Abh. Mus. Tierk. Dresden*, 47, 7: 95–140 (work consulted only partially, as published after submission of this book for printing).

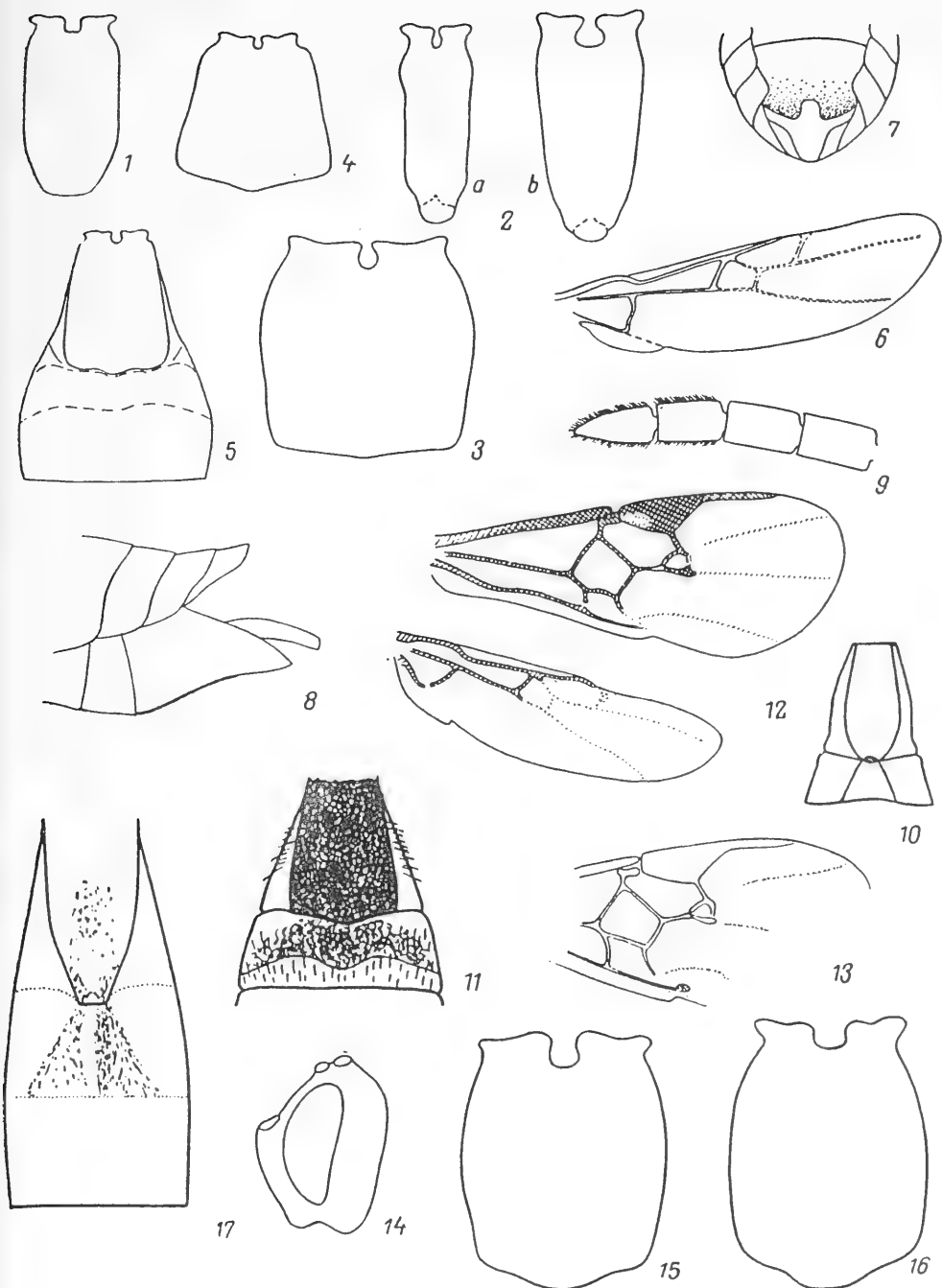


Fig. 202. Microgasterinae (from Nixon and Tobias).

1-4—first abdominal tergite: 1—*Microgaster trochanterata*, 2—*M. tuberculifer* (a, b—variation in shape of tergite), 3—*M. ocellatae*, 4—*M. ratzeburgi*; 5—*M. tuberculata*, 1st-3rd abdominal tergites; 6—*M. trochanterata*, hind wing; 7—*M. ocellatae*, apex of abdomen, ventral view; 8—*M. xanthopus*, apex of abdomen, lateral view; 9—*M. vidua*, apex of antenna; 10, 11—first and 2nd tergites: 10—*M. rufiventris*, 11—*M. spinolae*; 12—*M. mediator*, wings; 13—*M. lugubris*, part of forewing; 14, 15—*M. capeki*: 14—head, 15—first abdominal tergite; 16—*M. idia*, first abdominal tergite; 17—*M. decens*, 1st-3rd abdominal tergites.

- with lustrous protuberance, 2–3 times as long as wide in middle. Body usually 2–3.
- 6 ( 27). Legs, including hind femora brownish or reddish yellow. Tegulae usually yellow, abdomen often light-colored, 2nd and 3rd tergites, stigma usually with yellow spot at base.
- 7 ( 8). Wings hyaline-transparent, bristles on wing membrane not pigmented. Body with variable coloration on thorax and abdomen—from completely black to (including tegulae) entirely brownish red. First abdominal tergite densely and mildly rugose-punctate, matte, 2 times as long as wide (Fig. 230: 6). Body 2.5–2.8. Azerbaidzhan, Kazakhstan ..  
..... **M. varicolor** Tobias
- 8 ( 7). Wings somewhat darkened, with pigmented bristles.
- 9 ( 12). Abdomen reddish yellow. Antennae black, preapical segment 2 times as long as wide.
- 10 ( 11). Abdomen entirely reddish yellow, only at apex darkened slightly. First abdominal tergite very roundly narrowed in apical part (Fig. 202: 10), weakly sculptured. Stigma brownish with yellow spot at base. Body 3. Parasite of *Spodoptera exigua* Hb., *Helicoverpa armigera* Hb. (Noctuidae). Central Asia; Romania, North Africa .....  
..... **M. rufiventris** Kok.
- 11 ( 10). First abdominal tergite black, parallel-sided, densely sculptured, matte. Stigma pale yellowish brown, lighter colored at base. Body 2.5. Southwestern Siberia .....  
..... **M. pellucida** Tel.  
Lectotype: Female, neighborhood of Barnaula.
- 12 ( 9). Abdomen black, if with pale pattern, then at most 1st to 3rd abdominal tergites light colored.
- 13 ( 16). Antennae in basal half on lower side or entirely reddish brown. First abdominal tergite not narrowed or slightly narrowed at apex, 2–2.5 times as long as wide in middle (Fig. 202: 1). Nervellus distinctly produced beyond middle of anal lobe of hind wing (Fig. 202: 6). First abdominal tergite densely sculptured, matte; scutellum mildly punctate, weakly lustrous.
- 14 ( 15). Antennae short, their preapical segment not more than 1.5 times as long as wide. First abdominal tergite parallel-sided, not narrowed or slightly narrowed toward apex (Fig. 202: 1); sixth sternite not produced beyond apex of abdomen. Stigma with yellow spot at base. Body 2.5–3.5.

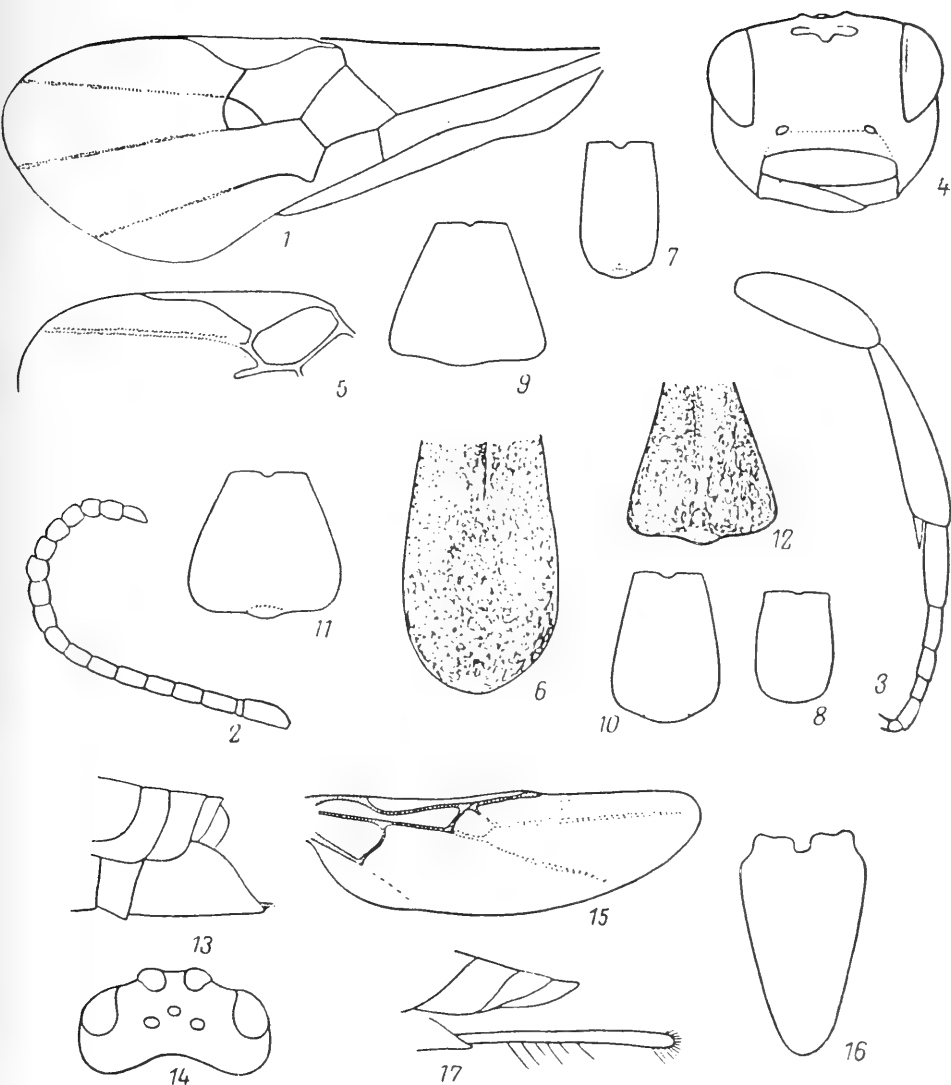


Fig. 203. Microgasterinae (from Tobias and Nixon).

1—*Microgaster spinolae*, forewing; 2, 3—*M. steinbergi*: 2—antenna, 3—hind leg; 4, 5—*M. excisa*: 4—head, frontal view, 5—part of forewing; 6–12—first abdominal tergite: 6—*M. variicolor*, 7—*M. mediator*, 8—*M. spectabilis*, 9—*M. xanthopus*. 10—*M. strenua*, 11—*M. deprimator*, 12—*M. pallidipennis*; 13—*M. fulvicornis*, apex of abdomen, 14–17—*M. impressa*: 14—head, dorsal view, 15—hind wing, 16—first abdominal tergite, 17—apex of abdomen.

- Center, south; Caucasus, Kazakhstan, Far East; Western Europe. (cf. also couplet 36) . . . . **M. trochanterata** Thoms.
- 15 ( 14). Antennae as long as body, their preapical segment 2 times as long as wide. First abdominal tergite narrowed toward apex and base; 6th sternite distinctly developed, produced beyond apex of abdomen (Fig. 203: 13). Body 3.5. South-west; Caucasus; Western Europe . . . . .  
 . . . . . **M. fulvicornis** Wesm.  
 (*calcarata* sensu Nixon, ? *pallidicornis* Marsh.)
- 16 ( 13). Antennae dark colored. First abdominal tergite usually greatly narrowed toward apex, 2–3 times as long as wide in middle. Body small, 2.3–2.5.
- 17 ( 18). Antennae distinctly shorter than body, their preapical segment not more than 1.5 times as long as wide. Sides of mesonotum posteriorly, scutellum and 1st abdominal tergite weakly sculptured, lustrous. Stigma brown, slightly paler at base. First abdominal tergite 2 times as long as wide. Body 3.2–3.3. (cf. also couplets 34 and 105.) . . . . .  
 . . . . . **M. naenia** Nixon
- 18 ( 17). Antennae as long as body, their preapical segment 2 times as long as wide.
- 19 ( 20). First abdominal tergite somewhat narrowed from base toward apex, 2.5–3 times as long as wide in middle (Fig. 202: 2), sculptured. Second and 3rd abdominal tergites black or brownish yellow. Spot at base of stigma yellow, light brown or indistinct. Body 2.5–3.5. Parasite of *Mamestra brassicae* L., *Diachrysis chrysitis* L., *Naenia typica* L., *Orthosia stabilis* Den. and Schiff. (Noctuidae), cocoon grayish brown or greenish. Entire Palearctic . . . . .  
 . . . . . **M. tuberculifer** Wesm. (*calcarata* Thoms.)
- 20 ( 19). First abdominal tergite narrowed toward apex only in hind third, not more than 2 times as long as wide in middle.
- 21 ( 24). Stigma brown, without yellowish spot at base, sometimes slightly paler at base only; abdomen black.
- 22 ( 23). Basal segment of antennae yellowish red. First abdominal tergite in apical third sculptured, matte, in basal half smooth. Stigma without pale spot at base. Body 3.5. Caucasus; Romania . . . . . **M. marshalli** Kok.  
 Lectotype: Female, Lagodekhi (Mlokosevich).
- 23 ( 22). Basal segment of antennae black. First abdominal tergite almost smooth (Fig. 202: 17). Stigma at base with diffuse pale spot. Body 2.3. Kazakhstan . . . . . **M. decens** Tobias

- 24 ( 21). Stigma at base with yellow spot. Second and 3rd abdominal tergites often light colored.
- 25 ( 26). Hind tarsi somewhat darkened, antennae usually entirely black. First abdominal tergite almost entirely sculptured. Figs. 202: 12; 203: 7. Body 2.5–3. Parasite of *Mamestra brassicae* L., *M. illopa* Butl., *Autographa gamma* L., *Orthosia miniosa* Den. and Schiff., *Naenia typica* L., *Mythimna unipuncta* Hw., *Amathes xanthographa* Den. and Schiff., *A. c. nigrum* L., *Cucullia verbasci* L. (Noctuidae); cocoon grayish brown or yellow. Northwest, west, center, south; Caucasus, Kazakhstan, Siberia, Far East; Western Europe..... **M. mediator** Hal. (*mediana* Ruthe)
- 26 ( 25). Hind tarsi light colored, antennae usually somewhat brownish. First abdominal tergite usually with noticeably smooth sculpture. Body 2.4–3.2. Parasite of *Jodia croceago* Den. and Schiff., *Noctua fimbriata* Schreb. (Noctuidae). Northern part of Western Europe ..... **M. mandibularis** Thoms.
- 27 ( 6). Legs for most part dark colored, hind femora, at least in basal half, black.
- 28 ( 35). First abdominal tergite at apex roundly narrowed, 2 times as long as wide in middle.
- 29 ( 30). Wings hyaline-transparent with unpigmented bristles. Stigma brown at base with slightly pale spot. Body 2.8. Azerbaidzhan..... **M. albipennis** Abdinb.
- 30 ( 29). Wings distinctly darkened, bristles on them pigmented.
- 31 ( 34). Scutellum densely punctate, matte. Hind femora 4 times as long as wide.
- 32 ( 33). Preapical segment of antennae 2 times as long as wide. Valves of ovipositor short, punctate, slightly produced and weakly lustrous. Second abdominal tergite in antero-lateral angles without contrastingly desclerotized areas. Stigma brown, with yellow spot at base. Body 3–3.5. Parasite of *Arctia caja* L. (Arctiidae), *Cosmia trapezina* L., *Melanarcha cespidis* F., *Autographa gamma* L. (Noctuidae). Center, south; Caucasus, Trans-Urals, Kazakhstan, Central Asia; Western Europe ..... **M. stigmatica** Ratz. (*sofron* Nixon)
- 33 ( 32). Preapical segment of antennae slightly longer than wide. Ovipositor valves longer, noticeably produced (sometimes) almost as much as length of 1st segment of hind tarsus, thin, pointed toward apex, smooth and lustrous. Second abdominal tergite with contrastingly desclerotized areas

- in antero-lateral angles. Stigma entirely brown. Body 2.2. Parasite of *Plutella maculipennis* Curt. (Pleutellidae). Kola Peninsula; North America ..... **M. ptutellae** Mues.<sup>1</sup>
- 34 ( 31). Scutellum slightly punctate, lustrous. Stigma without yellow spot at base. (cf. also couplets 17 and 105.) .....  
..... **M. naenia** Nixon
- 35 ( 28). First abdominal tergite gradually narrowing from base toward apex (as in Fig. 202: 2) or parallel-sided. Wings darkened, with brown bristles.
- 36 ( 37). First abdominal tergite parallel-sided as also scutellum, densely punctate, matte or slightly lustrous. Stigma with distinct yellow spot at base (male!). Body 2.5–3.5. (cf. also couplet 14.) ..... **M. trochanterata** Thoms.
- 37 ( 36). First abdominal tergite distinctly narrowed toward apex, as also scutellum, weakly sculptured, lustrous.
- 38 ( 41). Hind femora at apex smooth on inner side. First abdominal tergite at apex smooth.
- 39 ( 40). Stigma brownish, slightly paler at base. In female, antennae shorter than body, segments in their apical half square, distinctly visible. Hind femora 5 times as long as wide. Fig. 202: 13. Body 2.5–3. North, center; Caucasus; Western Europe ..... **M. lugubris** Ruthe (*borealis* Marsh.)
- 40 ( 36). Stigma at base with large yellow spot (in male faint). Antennae as long as body, apical segments 2 times as long as wide. Hind femora in apical third yellowish brown, 6 times as long as wide. Mesonotum very densely, but mildly punctate, matte. Body 3.5–4. Central Asia.....  
..... **M. alajensis** Tel.  
Lectotype: Female, "village Sary-Tash," Alaiskaya Valley, 18.VII.1918 (V. Kuznetsov). Paralectotypes: 5 females, 3 males, same data.
- 41 ( 38). Hind femora at apex, above thin carina, with fine longitudinal folds on inner side. First abdominal tergite at apex wrinkled. Preapical segments of antennae 2 times as long as wide. Mesonotum densely sculptured, matte, with coarser sculpture along notaulices. Nervulus situated relatively close to basal vein. Hind femora black, stigma

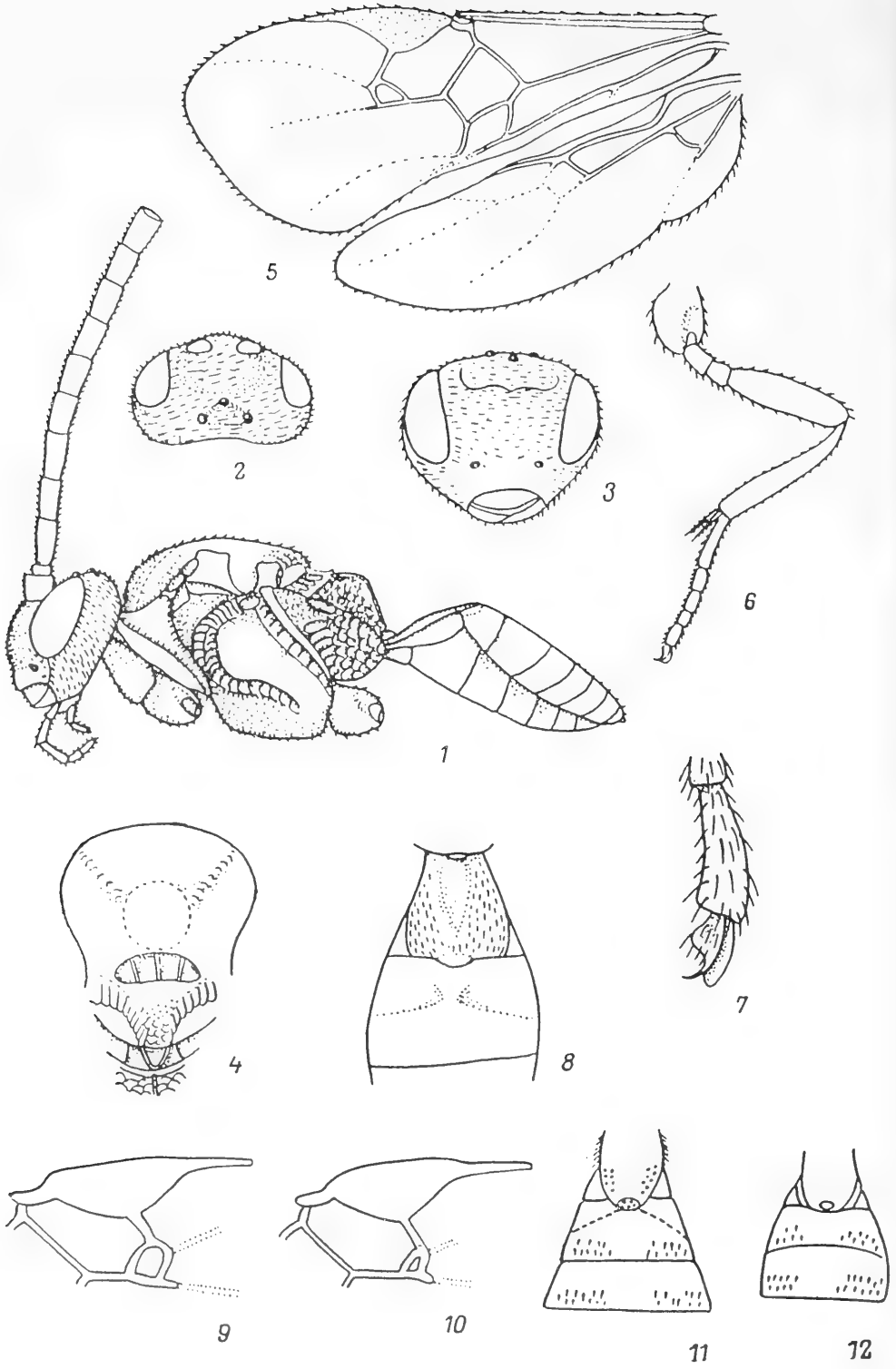
<sup>1</sup>This North American species (first noted in Palearctic fauna) apparently penetrated into our country through Murmansk Port, possibly in Kandalaksha, and was extracted from the same host as in its native place: Loukhi, south of Kandalaksha, from *Plutella maculipennis* in 1956 (L. Stepanova).



- with pale basal spot. Body 3.8–4. Mountains of Central Europe ..... **M. cebes** Nixon
- 42 ( 5). First abdominal tergite somewhat narrowed toward base, apically only with rounded lateral angles, 1.5 times as long as wide in middle, without lustrous protuberance at apex or protuberance faint or inconspicuous (Figs. 202: 3, 5, 11; 203: 8–12). Body usually large, 3.5–4.5.
- 43 ( 46). Body yellowish brown; if dark colored, then mesonotum, as a rule, with somewhat developed reddish pattern, with smooth sculpture, somewhat lustrous.
- 44 ( 45). Wings darkened, with pigmented bristles. First abdominal tergite very distinctly narrowed toward base, slightly longer at apex, rugose-punctate, matte. Second abdominal tergite distinctly sculptured. Stigma brown. Body 3–4. South; Caucasus, Central Asia; Hungary, Iran .....  
..... **M. ochracea** Szépl.
- 350 45 ( 44). Wings almost hyaline-transparent, only slightly darkened in middle. First abdominal tergite slightly narrowed toward base, 1.5 times as long as wide at apex, weakly sculptured, lustrous. Second abdominal tergite smooth. Stigma yellow. Cocoons bright yellow. Body 3.5. Central Asia .....  
..... **M. desertorum** Tel.  
Lectotype: Female, "village Murunich, Karakum mountain range near Aral Sea, takyr, cutting along tamarisk (*Tamarix*)" 26.VI.1926 (Lupova). Paralectotype: 1 male, same place, 26.VI.1926 (Lupova).
- 46 ( 43). Body black, only abdomen occasionally with pale pattern; mesonotum, as a rule, densely punctate, sometimes matte.
- 47 ( 48). Antennae much shorter than body, their apical segments square or slightly longer than wide. First abdominal tergite (Fig. 203: 8) weakly narrowed toward base, approximately 1.5 times as long as wide, mildly sculptured, matte, 2nd abdominal tergite smooth. Nervellus slightly curved. Scutellum punctate, weakly lustrous. Prescutellar groove narrow, 3–4 times shorter than scutellum. Stigma brownish at base with yellow spot. Hind femora from reddish brown to black. Body 2.3–3. Parasite of *Agrotis segetum* Den. and Schiff.; *A. exclamationis* L., *Xylene exsoleta* L., *Spodoptera exigua* Hb., *Enargia ypsilon* Den. and Schiff., *Charanyca trigrammica* Hfn., *Polychrysis moneta* F., *Eupsilia transversa* Hfn. (Noctuidae); cocoons brown, in clusters. Northwest, west, center, south, Central Ural;

- Kazakhstan, Central Asia, Siberia (Chitinskaya Region);  
Western Europe, North Africa ..... **M. spectabilis** Hal.
- 48 ( 47). Antennae not shorter than body, apical flagellar segments much longer than wide. If segments short, then (*M. xanthopus*) 1st tergite distinctly narrowed toward base and 2nd abdominal tergite sculptured or (*M. tristis*) prescutellar groove wide, only half as long as scutellum, scutellum almost smooth, lustrous; nervellus strongly curved.
- 49 ( 94). Bristles on wings pigmented; wings somewhat darkened.
- 50 ( 85). Hind femora reddish yellow, occasionally with somewhat developed dark pattern.
- 51 ( 52). Sixth abdominal sternite emarginate at apex (Fig. 202: 7). First abdominal tergite almost smooth, lustrous, noticeably narrowed toward apex, very clearly narrowed toward base (Fig. 202: 3), usually reddish in basal part. Stigma monochromatic, brownish. Body 3.5–4. Parasite of *Smerinthus ocellatus* L., *Laothoe populi* L., *Dilina tiliae* L. (Sphingidae). Cocoons gray-brown, in clusters. Northwest, south; Sakhalin; Western Europe, China, Japan.....  
..... **M. ocellatae** Bouché
- 52 ( 51). Sixth abdominal sternite without emarginate apex. First abdominal tergite usually rugose-punctate, matte or weakly lustrous (smooth in *M. glabrior*), at apex hardly narrowed.
- 53 ( 60). Second abdominal tergite distinctly sculptured all along width, posteriorly, behind sculptured part, with slightly curved groove and with straight groove after that, smooth between these grooves (Fig. 202: 11). Stigma usually with yellow spot at base, abdominal tergites black.
- 54 ( 59). Apical flagellar segments 2/3 as long as basal. Hind tarsi somewhat darkened. Ovipositor slightly produced beyond apex of abdomen.
- 55 ( 56). Upper part of supra-antennal pits and at least small areas of frons above them smooth, lustrous. First abdominal tergite slightly narrowed toward base, approximately 1.5 times as long as its width at apex, stigma at base with yellow spot; tegulae yellow to black. Figs. 205; 202: 11; 203: 1. Body 3.5–4.5. Parasite of *Autographa gamma* L., *Syngrapha circumplexa* L. (Noctuidae); cocoons brown, costate (during autumn) or bluish green (during summer). Northwest, west, center, south; Caucasus, Kazakhstan, Central Asia, Far East; Western Europe .....  
..... **M. spinolae** Nees (*radiorimata* Tel.)

- 56 ( 55). Upper part of supra-antennal pits always with transverse wrinkles and frons above them with dense granulate sculpture, matte. Stigma without or with slight yellow spot at base.
- 57 ( 58). First abdominal tergite less wide, less narrowed toward base (Fig. 202: 5). Mesonotum in middle without longitudinal carina, often only with weakly elevated strongly sculptured area. Tegulae yellowish. Body 3–4. Parasite of *Acronicta rumicis* L., *A. auricoma* Den. and Schiff., *A. menyanthidis* Esp., *A. euphorbiae* Den. and Schiff. (Noctuidae). Center (Voronezh), south; Caucasus, Western Siberia; Western Europe.....  
..... **M. tuberculata** Bouché (*fumipennis* Ratz.)
- 58 ( 57). First abdominal tergite wide, strongly narrowed toward base (Fig. 202: 4). Mesonotum in middle with longitudinal carina. Tegulae black or brown. Body 4. Parasite of *Cerura vinula* L., *C. lanigera* Butler (Notodontidae); cocoons brown. Northwest; Caucasus; Western Europe, Japan ..... **M. ratzeburgi** Ruthe
- 59 ( 54). Apical flagellar segments short, half as long as basal. Hind tarsi light colored, not darker than tibiae. First abdominal tergite strongly narrowed toward base, 2 times as wide at apex as at base (Fig. 203: 9). Ovipositor strongly produced beyond apex of abdomen (Fig. 202: 8). Tegulae black. Stigma at base with yellow spot. Body 3.5–4.8. Northwest, west, center, south; Siberia (Irkutsk); Western Europe ..  
..... **M. xanthopus** Ruthe
- 60 ( 53). Second abdominal tergite smooth, rarely sculptured only in middle, with rather distinct, curved groove along posterior margin but without straight groove behind it.
- 61 ( 74). Stigma with yellow spot at base or entirely yellow.
- 351 62 ( 63). First abdominal tergite smooth (Fig. 204: 11), antennal segments in apical third 2 times as long as wide. Sixth abdominal sternite quite large, slightly produced beyond apex of abdomen. Mesonotum densely, finely and uniformly punctate. Antennae brown, second abdominal tergite yellowish brown along margins, tegulae yellow. Wings weakly darkened. Stigma yellow in basal half, in apical half light brown. Body 2.5. Central Asia .....  
..... **M. glabrior** Alexeev
- 63 ( 62). First abdominal tergite sculptured.
- 64 ( 73). Stigma with yellow spot at base.



- 65 ( 70). Abdomen dorsally with somewhat developed reddish or yellowish pattern.
- 66 ( 67). Abdomen almost entirely reddish yellow; only its apex darkened. Second abdominal tergite smooth. Body 3. South; Azerbaidzhan; Turkmenia .....  
..... **M. erythrogaster** Abdinb.
- 67 ( 66). Posterior half of abdomen, starting from 4th abdominal tergite, often 1st tergite also, black. If occasionally abdomen entirely light colored, then 2nd abdominal tergite sculptured.
- 68 ( 69). Second abdominal tergite distinctly sculptured in middle. Body large, about 3.5. Azerbaidzhan, Kazakhstan, Central Asia ..... **M. murina** Tel. (*tadzhica* Tel.)  
Lectotype: Female, UzSSR, Yargak, 18.V.1928 (Zimin).  
Paratypes: 2 males with the same label; 1 female, 3 males, Khiva, 25.IV; 27.IV; 2.VI; 12.VII.1927 (V. Gussakovskii); 1 female, Dzhizak, 7.VI.1931 (V. Gussakovskii); 1 female, Kamashi, 29.IV.1932 (V. Gussakovskii); Turkm SSR; 1 male, village Akhcha-Kuima, 6.VII.1934 (V. Popov). AzSSR; 1 female, Talysh Belyasuvor, 9.VII.1910 (K. Satunin).
- 69 ( 68). Second abdominal tergite entirely smooth. Body small, about 2.5. Parasite of *Pyrrhia umbra* Hfn. (Noctuidae). South; Caucasus, Kazakhstan, Far East .....  
..... **M. pseudomurina** Abdinb.
- 70 ( 65). Abdominal tergites entirely black, at most antero-lateral angles of 2nd abdominal tergite reddish. Antennae on lower side usually yellowish brown.
- 71 ( 72). Mesonotum with coarse sculpture along notaulices and sides. Scutellum with smooth sculpture in middle. Fig. 204: 1—8. Body 3.5—4. (cf. also couplet 84.) .....  
..... **M. depressor** F. (? *scrophulariae* Szépl.)
- 72 ( 71). Mesonotum very mildly punctate, punctuation denser only along notaulices and along margins of mesonotum. More sparsely punctate parts of mesonotum lustrous but densely

1—8—*Microgaster depressor*, male: 1—body, 2—head, dorsal view, 3—head, frontal view, 4—mesonotum, 5—wings, 6—hind leg, 7—fifth tarsal segment, 8—1st and 2nd abdominal tergites; 9, 10—*M. suavis*: 9—part of forewing, 10—the same, variation; 11, 12—1st—3rd abdominal tergites: 11—*M. glabrior*, 12—*M. crassifemoralis*.

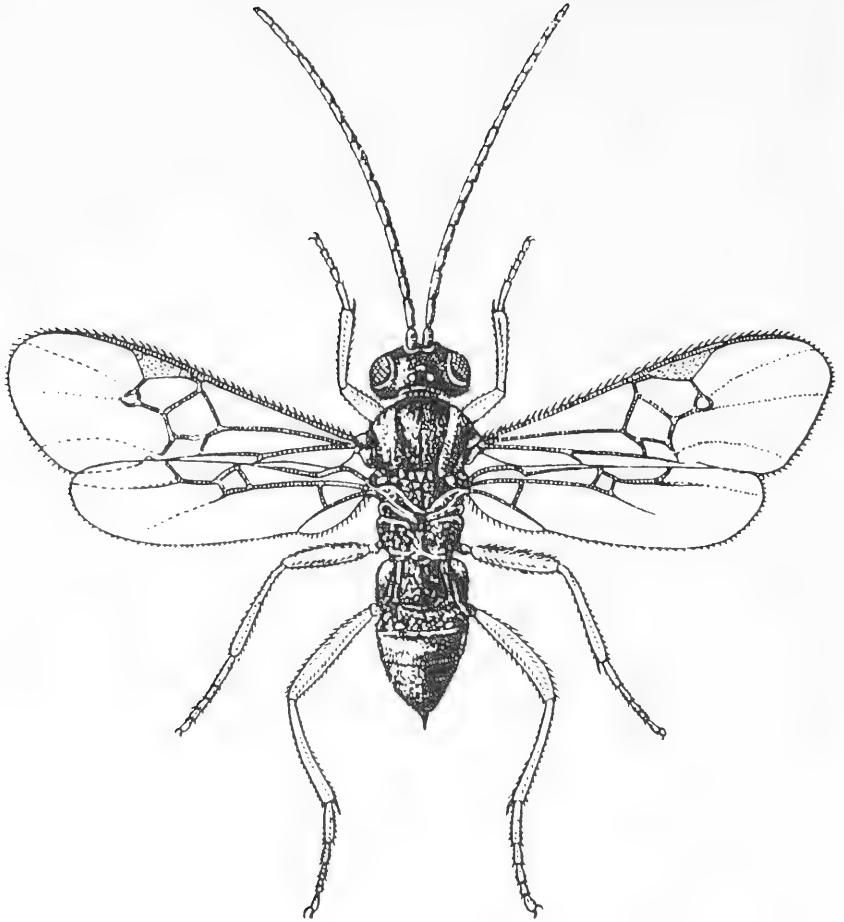


Fig. 205. Microgasterinae (original).

*Microgaster spinolae* Nees.

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punctate ones with quite long, dense, semi-appressed light colored hairs. First abdominal tergite weakly sculptured, lustrous. Fig. 204: 9, 10. Body 2.6–2.8. Parasite of geometrids. Cocoons brownish gray. Central Asia .....

- ..... *M. suavis* Alexeev  
 73 ( 64). Stigma entirely yellow. Preapical antennal segment 2 times as long as wide. Mesonotum densely punctate, matte, with smoother sculpture on sides, weakly lustrous. First

- abdominal tergite with soft, dense, rugose punctation, matte, second abdominal tergite sometimes weakly sculptured in middle. Body 3.3–3.5. Kazakhstan .....
- ..... **M. chryso stigma** Tobias
- 74 ( 61). Stigma monochromatic, brown, sometimes at base light colored, but not yellow.
- 75 ( 76). Scutellum coarse, alveolately wrinkled, lustrous. On outer margin of stigma, 4 to 6 black setae. Preapical antennal segment slightly less than 2 times as long as wide. First abdominal tergite slightly narrow at apex. Basal antennal segment and 2nd and 3rd abdominal tergites reddish. Body 3.2. Finland..... **M. docilis** Nixon
- 76 ( 75). Scutellum more finely and densely sculptured; matte; if lustrous, then only with mild punctation.
- 77 ( 80). Tegulae black. First abdominal tergite weakly narrowed toward base.
- 78 ( 79). Antennae with quite long, isolated hairs, preapical segment 1.3–1.5 times as long as wide (Fig. 202: 9). Hind femora usually somewhat darkened. Body 2.5–3.5. Parasite of *Helicoverpa armigera* Hb., *Mamestra bicolorata* Hfn. (Noctuidae); cocoons isolated, brown or yellow. Southwest; Caucasus, Central Asia (Uzbekistan); Western Europe. (cf. also couplet 89) ..... **M. vidua** Ruthe
- 79 ( 78). Antennae with short, semi-appressed hairs, preapical segment 1.5–2 times as long as wide. Hind femora entirely red, rarely darkened only at base. Body 3.5–4. West, center, south; Caucasus, Kazakhstan; Western Europe .....
- ..... **M. flavipalpis** Brullé (*ruicola* Lyle)
- 80 ( 77). Tegulae yellow.
- 81 ( 82). Scutellum entirely sculptured, matte. First abdominal tergite slightly narrowed toward base (Fig. 203: 10). Body 2.5–3.5. Parasite of *Acrionicta tridens* Den. and Schiff. (Noctuidae), *Diloba caeruleocephala* L. (Notodontidae); cocoons gray, with greenish shade. Center, south; Kazakhstan, southern Siberia; Western Europe. ....
- ..... **M. strenua** Reinh. (? *eremita* Reinh.)
- 82 ( 81). Scutellum smooth in middle or slightly sculptured, lustrous. First abdominal tergite strongly narrowed toward base, approximately 1/3 as wide at apex as at base (Fig. 203: 11).
- 83 ( 84). Preapical segment of antennae more than 2 times as long as wide. Sides of mesonotum more faintly

sculptured, lustrous; scutellum intensely lustrous, smooth, with isolated hairs. Wings without darkening below stigma. Mesonotum without longitudinal ridge in middle. First abdominal tergite less broadened toward apex (Fig. 202: 15). Head in upper part of temples angular (Fig. 202: 14). Body 3.8. Parasite of *Penthophera morio* L. (Lymantriidae). Czechoslovakia.....

- ..... **M. capeki** Nixon
- 84 ( 83). Preapical segment of antennae 1.3–1.5 times as long as wide. Sides of mesonotum densely punctate, matte, scutellum with sculpture along margins, more pubescent. Wings with darkening below stigma. Mesonotum in middle with longitudinal ridge. First abdominal tergite more distinctly broadened at apex (Fig. 203: 11). Head in upper part of temples not angular. Body 3.5–4. Parasite of *Acronicta alni* L., *A. psi* L., *A. tridens* Den. and Schiff., *A. ruminicis* L., *Xylena exsoleta* L., *Autographa gamma* L., *Eupsila transversa* Hufn., *Cucullia scrophulariae* Den. and Schiff. (Noctuidae), *Euproctis similis* Fuessly (Lymantriidae). Cocoons brown or greenish, isolated. Throughout, whole of Palearctic. (cf. also couplet 71). .....
- ..... **M. deprimator** F. (*sordipes* Nees)
- 85 ( 50). Hind femora black, sometimes in middle reddish. Tegulae black.
- 86 ( 91). Stigma brown, often at base light colored, but without distinctly outlined light colored spot. Mesonotum densely punctate, matte, with 3 black, faint stripes.
- 87 ( 88). Antennae long and thin, preapical segment 2 times as long as wide. Scutellum almost smooth, lustrous. Hind femora without longitudinal, carinate elevation on inner side. Stigma entirely dark brown. Flagellum with short hairs. First abdominal tergite 1.3–1.5 times as long as wide (Fig. 202: 16). Body 4. Northwest; Sweden.....
- ..... **M. idia** Nixon
- 88 ( 87). Antennae shorter, preapical segment 1.3–1.5 times as long as wide. Scutellum sculptured, matte. Hind femora with longitudinal, carinate elevation on inner side.
- 89 ( 90). Flagellum with conspicuous, long, isolated, hairs (Fig. 202: 9). Stigma at base usually diffusely pale. First abdominal tergite slightly more than 1.5 times as long as wide. Body 2.5–3.5. (cf. also couplet 78). .....
- ..... **M. vidua** Ruthe



- 90 ( 89). Flagellum with extremely short hairs. Stigma at base slightly paler than in its middle part. First abdominal tergite almost 2 times as long as wide. Body 3.2. Parasite of *Chesias legatella* Den. and Schiff., *C. rufata* F., *Thera juniperata* L. (Geometridae). Center; England. ....  
 ..... **M. fordi** Nixon
- 91 ( 86). Stigma at base with yellow spot.
- 354 92 ( 93)<sup>1</sup>. Antennae as long as body, apical segments 2 times or less than 2 times as long as wide. Nervellus slightly curved. Scutellum densely punctate, matte. Wings slightly darkened, without contrasting pale spots in middle. Hind femora usually entirely black, sometimes somewhat reddish in middle. Body 3–3.5. Center, south; Caucasus (Azerbaijan); Western Europe. .... **M. varipes** Ruthe
- 93 ( 92). Antennae shorter than body, apical segments not more than 1.5 times as long as wide. Nervellus strongly curved. Scutellum almost smooth, lustrous. Wings intensely darkened with pale spot in middle. Body 3–3.5. Parasite of *Polychrysis moneta* F., *Euchalcia consona* F., *Hadena rivularis* F., *H. bicruris* Hfn. (Noctuidae); cocoons white or dirty-brown, in clusters. Northwest, south; Kazakhstan (Alma-Ata); Western Europe. .... **M. tristis** Nees
- 94 ( 49). Bristles on wing membrane not pigmented, slightly pigmented only in its apical half. Wings hyaline-transparent and slightly darkened only in apical half. Mesonotum with fairly deep depressions, densely sculptured with lines of notaulices, weakly punctate in remaining part, lustrous. Preapical segment of antennae 2 times as long as wide. Legs and tegulae brown.

<sup>1</sup> *M. albotibialis* Tel., described from Vladivostok, and having yellowish white tibiae with contrasting dark apex, long antennae and matte scutellum, also comes close to the couplet. In the Zoological Institute of the Academy of Sciences of the USSR, there is a female specimen from the collections of N.A. Telenga, with full details corresponding to the earlier description, but having another clearly later pinned and apparently confused label, "Yaroslavl". There is also another female specimen with the geographic label "R. Suifun, Pacific Coast, 9.VIII.1915, Rimsk, Kors." belonging to the same species but distinguished in details of coloration (not fully corresponding to the description). Under it, there is the identification label of N.A. Telenga "*Microplitis albitibialis* sp. n.". Undoubtedly, this species is a Far Eastern one, and the specimen mentioned above, corresponding to the description and designated as lectotype, must in correspondence with the first description bear the label "Vladivostok" (Rimskii-Korsakov).

- 95 ( 96). First and 2nd tergites of abdomen sculptured. Stigma brown, at base with yellow spot. Fig. 203: 12. Body 3—3.5. South; Kazakhstan..... **M. pallidipennis** Tobias
- 96 ( 95). First tergite of abdomen weakly sculptured, 2nd smooth. Stigma yellow, only at apex brownish or brown with large yellow spot at base. Body 2.5—3. Central Asia. .... **M. chivensis** Tel.  
Lectotype: Male, "Khiva, Nurlambai", 18.IV.1927 (V. Gussakovskii).
- 97 ( 2). Mesonotum weakly punctate, lustrous. First tergite of abdomen usually not broadened toward apex, more often narrowed.
- 98 ( 99). Ovipositor noticeably produced beyond apex of abdomen. First abdominal tergite distinctly narrowed from its base toward apex. Hind wings with large anal lobe. Head behind eyes slightly broadened. Preapical segment of antennae 2 times as long as wide. Body black, legs brownish yellow. Hind femora at base sometimes darkened; wings pale, stigma brown. Fig. 203: 14—17. Body 4. Parasite of *Orthosia stabilis* Den. and Schiff. (Noctuidae). West Germany, Czechoslovakia. .... **M. impressa** Wesm. (*sispes* Nixon)
- 99 ( 98). Ovipositor much shorter, not produced beyond apex of abdomen. Hind femora often thickened, usually 3—4 times as long as wide (Fig. 203: 3). Antennae relatively short, as long as head and thorax together. Apical segments of antennae square or slightly longer than broad. Head behind eyes visibly broadened.
- 100 (101). First tergite of abdomen parallel-sided, sculptured, slightly longer than wide. First flagellar segment distinctly less than 2 times as long as wide. Stigma brownish, at base with pale spot; hind femora black or reddish. Body 3—3.3. Parasite of *Dicycla oo* L. (Noctuidae); cocoons dirty white. South; Caucasus (Checheno-Ingush ASSR); Western Europe. ... **M. heterocera** Reinh.
- 101 (100). First tergite of abdomen at apex distinctly narrowed. First flagellar segment 2 times as long as wide. Pale spot at base of stigma usually faint or absent. Hind femora dark brown.
- 102 (103). Thorax and head depressed. Thorax 2 times as long as high, head (in lateral view) only slightly less long than high.

- Antennal segments in apical half square and wide. First abdominal tergite weakly sculptured. Stigma with distinct pale spot. Fig. 203: 2, 3. Body 2.3–2.8. Kazakhstan. ....  
 ..... **M. steinbergi** Tobias
- 103 (102). Thorax and head not depressed. Thorax approximately 1.5 times as long as high. Head much less long than high.
- 104 (105). Antennae short, preapical segment, at most, 1.3 times as long as wide. Stigma at base with faint yellow spot. First section of radial vein obliquely directed toward longitudinal axis of stigma. First abdominal tergite smooth. Anal lobe of hind wing extremely small. Head visibly broadened behind eyes. Body 2.8. Western Europe. ....  
 ..... **M. adunca** Ruthe
- 105 (104). Antennae shorter, preapical segment 1.5 times as long as wide. Stigma monochromatic, brown. First section of radial vein directed perpendicularly to longitudinal axis of stigma. First abdominal tergite sculptured along sides. Anal lobe of hind wing large. Body 3.2. Parasite of *Orthosia cruda* Den. and Schiff., *Eupsilia transversa* Hfn., *Cosmia trapezina* L. (Noctuidae). Northwest, center; Western Europe. (cf. also couplets 17 and 34). .... **M. naenia** Nixon
- 355
- 106 ( 1). Mesonotum absolutely smooth, only with sparse fine punctures due to hairs, at most, with denser punctation in front. Head dorsally almost smooth. Wings hyaline-transparent, tegulae yellow.
- 107 (108). Mesonotum in front, especially along anterior half of lines of notaulices, with punctation denser than in remaining parts of disk. First abdominal tergite parallel-sided or slightly broadened toward apex, 2 times as long as wide at apex (male!; in female, probably, distinctly but slightly broadened toward apex and shorter). Hind femora 4 times as long as wide, brown, with somewhat yellowish apex. Stigma brown, at base with small pale spot. Body 3.3–3.5. Central Asia. ....  
 ..... **M. hyalipennis** Alexeev
- 108 (107). Mesonotum absolutely smooth, only with sparse fine punctures due to hairs. First abdominal tergite broadened toward apex, 1.3–1.5 times as long as wide (Fig. 204: 12). Hind femora 3 times as long as wide. Legs brownish yellow, antennae yellowish brown. Stigma light brown, with pale spot at base. Body 3.5–3.8. Central Asia. ....  
 ..... **M. crassifemoralis** Alexeev

156. *Lissogaster* Bengtsson, 1926 (*Microgaster* auct.)<sup>1</sup>—About 50 species in the Palearctic (in the world fauna, almost 3 times more species have been described, but many of them should have been included in other genera). Genus is basically Holarctic. Among USSR fauna, *L. reticulata* Shest., comb. n. from eastern Siberia, has not been included in the key.

- 1 ( 2). Second tergite of abdomen smooth. Inner side of discoidal cell 5 times as long as section of basal vein from discoidal cell to parastigma. Apical antennal segments slightly longer than wide. Large spur of hind tibiae slightly longer than 1st tarsal segment. Nervulus originates between basal third and middle of posterior side of discoidal cell. Claws simple. Mesonotum in front slightly punctate, lustrous, almost smooth in hind part. Ovipositor valves broadened toward apex, their broadened part 2/3 hind tibia. Hind femora brown or black, wings slightly darkened. Body 3–3.5. Parasite of *Argyresthia conjugella* Z. (*Argyresthiidae*). Northwest; Caucasus (Armenia); Western Europe. .... **L. polita** Marsh.
- 2 ( 1). Second tergite of abdomen sculptured. Inner side of discoidal cell not more than 4 times as long as section of basal vein from discoidal cell to parastigma.
- 3 (22). Face mildly and not densely punctate (distance between punctures usually not less than diameter of punctures), lustrous, without transverse striations along sides. Mesonotum weakly punctate for most part, lustrous. Claws simple.
- 4 ( 5). Body small, 2.5. First section of radial vein straight, originates almost from mid-stigma. Ovipositor valves shorter than hind tibia. Inner spur of hind tibiae shorter by 1/3 of 1st hind tarsal segment. Second abdominal tergite shorter than 3rd, slightly sculptured. Hind femora and tibiae reddish yellow, with dark apices. Hind spurs whitish. Northern Ireland, Yugoslavia. . . . . **L. opheltes** Nixon
- 5 ( 4). Body somewhat large, 3.5–5. First section of radial vein distinctly curved, originates beyond mid-stigma. Ovipositor valves longer than 1/2 of hind tibia.
- 6 (11). Face very faintly punctate, intensely lustrous, distance between punctures usually more than diameter of punctures. Nervulus originates from mid-discoidal cell. Apical segments

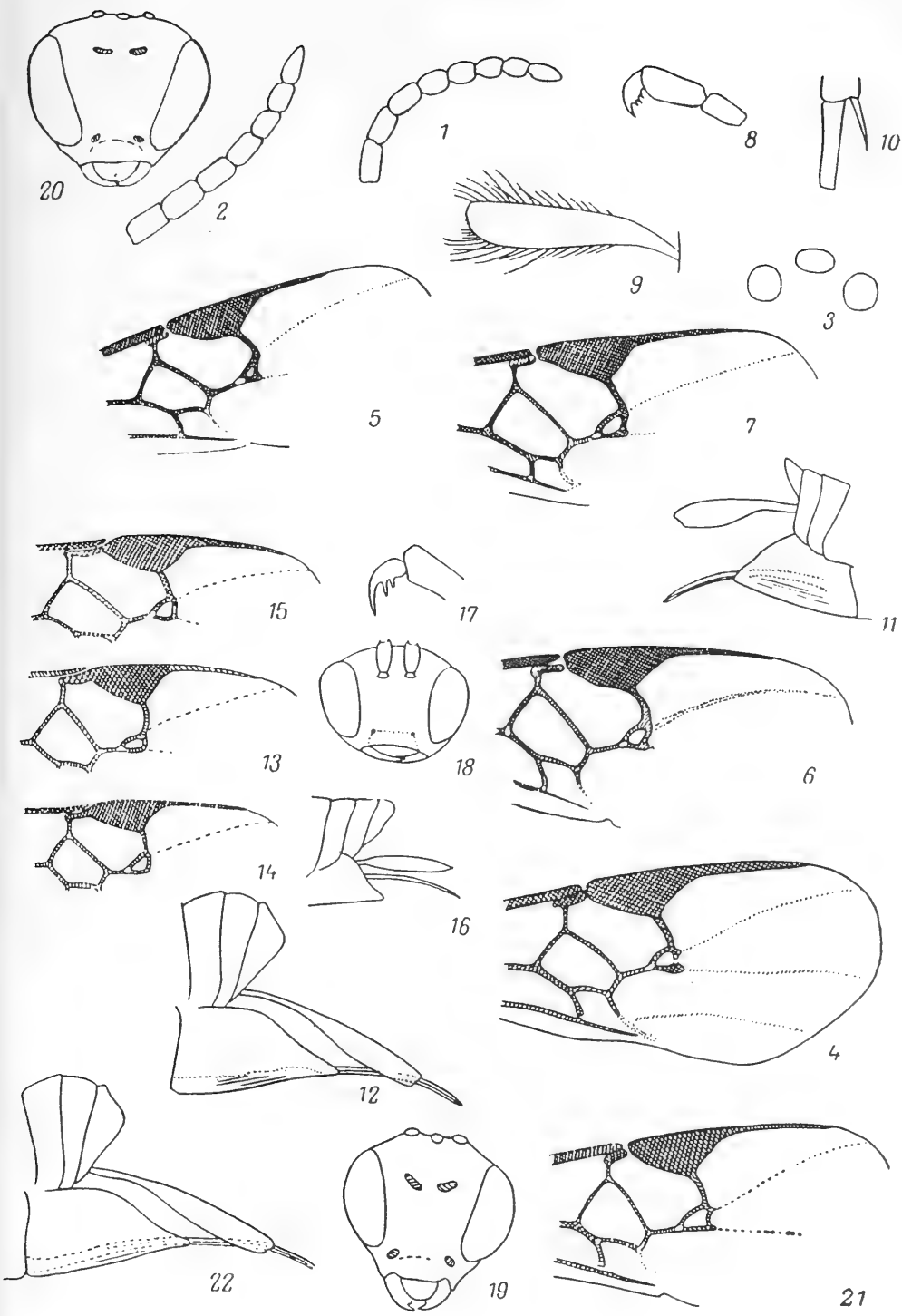
<sup>1</sup> Nixon, 1968. *Bull. Brit. Mus. (Nat. Hist.), Entomol.*, 22, 2: 33–72; Papp, 1976. *Acta Zool. Acad. sci. hung.*, 22: 1–2: 97–117.

of antennae 2 times as long as wide. Hind femora usually reddish brown, at apex darkened, rarely black.

- 7 (10). Distance between anterior and posterior ocelli as much as ocellar diameter (Fig. 208: 1). Clypeus strongly emarginate, oral cavity (Fig. 214: 1) between it and mandibles wide, oval, depressed. Abdominal tergites with brownish red pattern. Radial vein forms acute angle with outer margin of stigma (Fig. 208: 2). Inner spur of hind tibiae slightly longer than 1/2 of 1st segment of hind tarsus. Radiomedial cell of hind wings not longer or slightly longer than wide (Fig. 208: 3). Stigma at base and sometimes along anterior margin yellow.
- 8 ( 9). Second tergite of abdomen slightly sculptured, lustrous, 2/3 to almost 1/2 of 3rd. Inner side of discoidal cell 2 times as long as section of basal vein from it to parastigma. Hind femora brownish red. Fig. 207: 1, 2. Body 5–6. Center, south; Western Europe. .... **L. nobilis** Reinh.
- 9 ( 8). Second tergite of abdomen strongly sculptured, matte, 10/13 of 3rd. Inner side of discoidal cell 2.5–4 times as long as section of basal vein from it to parastigma. Hind femora vary from brownish red to black. Figs. 208: 1–4; 214: 1. Body 3.8–5. South; Siberia (Krasnoyarsk); Hungary. ....  
..... **L. hungarica** Szépl. (*deprimator* F. sensu Telenga)
- 10 ( 7). Distance between anterior and posterior ocelli much less than ocellar diameter. Clypeus slightly emarginate along anterior margin. Cavity between it and mandibles not developed. Labrum almost in same plane as clypeus. Abdominal tergites black, somewhat yellow only along posterior margin. Radial vein forms right angle with outer margin of stigma. Inner spur of hind tibiae much longer than 1/2 of 1st segment of hind tarsus. Radiomedial cell of hind wings distinctly longer than wide. Stigma entirely brown. Fig. 208: 5–7. Body 5. Western Europe. ....  
..... **L. procera** Ruthe (? *intermedia* Ivanov)
- 11 ( 6). Face more intensely and densely punctate, less lustrous, distance between punctures about as much as their diameter. Clypeus not emarginate, its upper and lower margins parallel, cavity between it and mandibles not wide, slightly depressed (Fig. 214: 3). Body, including abdomen entirely black.
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- 12 (13). Apical segments of antennae 2 times as long as wide (Fig. 214: 2). Ovipositor valves 1/2 as long as hind tibia. Large spur of hind tibiae longer than 1/2 of 1st tarsal segment. Hind femora brownish red, sometimes at base darkened. Body

- 3.7–5. South; Caucasus (Azerbaijan), Kazakhstan. ....  
 ..... **L. campestris** Tobias
- 359 13 (12). Apical segments of antennae not more than 1.5 times as long as wide (Fig. 206: 1, 2). Ovipositor valves  $1/3$  as long as hind tibia.
- 14 (21). Hind coxae smooth or only weakly punctate.
- 15 (18). Hind femora reddish yellow, at most at apex darkened (in *L. fulvicrus* sometimes for most part darkened).
- 16 (17). First segment of abdomen as long as wide (Fig. 207: 3). Apical segments of antennae cylindrical. Large spur of hind tibiae slightly longer than first segment of hind tarsus. Nervulus originates before middle of discoidal cell, close to it. Usually 3rd to 5th abdominal tergites along posterior margin with yellowish border and 3rd tergite along sides with yellowish spots. Stigma with yellowish basal spot. Body 4.5. Southwest; Central Europe, Romania, Turkey (Istanbul). ....  
 ..... **L. obsepiens** Nixon
- 17 (16). First abdominal tergite less long than wide at apex. Three to four preapical segments of antennae barrel-shaped. Large spur of hind tibiae distinctly longer than half of hind tibia. Nervulus originates beyond middle of discoidal cell. Abdominal tergites entirely black. Stigma monochromatic, brown or almost black. Figs. 206: 1; 207: 13. Body 4.5–5. Parasite of *Agonopterix ocellana* F. (Oecophoridae). Dagestan (Sergokala, forest), Central Asia (sands of Alma-Kul'kum, north Tashkent); Western Europe..... **L. fulvicrus** Thoms.
- 18 (15). Hind femora black. Apical segments of antennae cylindrical (Fig. 206: 2).
- 19 (20). Ovipositor valves (their broader part pubescent) shorter by  $1/3$  of hind tibia. Tangent to hind margin of anterior ocellus does not cross or hardly crosses posterior ocelli.

1, 2—antenna: 1—*Lissogaster fulvicrus*, 2—*L. curvicrus*; 3—*L. erro*, ocelli; 4–7—Forewing: 4—*L. curvicrus*, 5—*L. tibialis*, 6—*L. australis*, 7—*L. caris*; 8—*L. australis*, 4th and 5th segments of hind tarsus; 9—*L. grandis*, ovipositor valves; 10—*L. globata*, tibial apex and 1st segment of hind tarsus; 11, 12—abdominal apex: 11—*L. hospes*, 12—*L. dudichi*; 13–15—part of forewing: 13—*L. fusca*, 14—*L. fischeri*, 15—*L. famulus*; 16—*L. fusca*, abdominal apex; 17—*L. eupolis*, claw; 18–20—Head: 18—*L. fischeri*, 19—*L. deductor*, 20—*L. fusca*; 21—*L. consors*, part of forewing; 22—*L. ductilis*, abdominal apex..



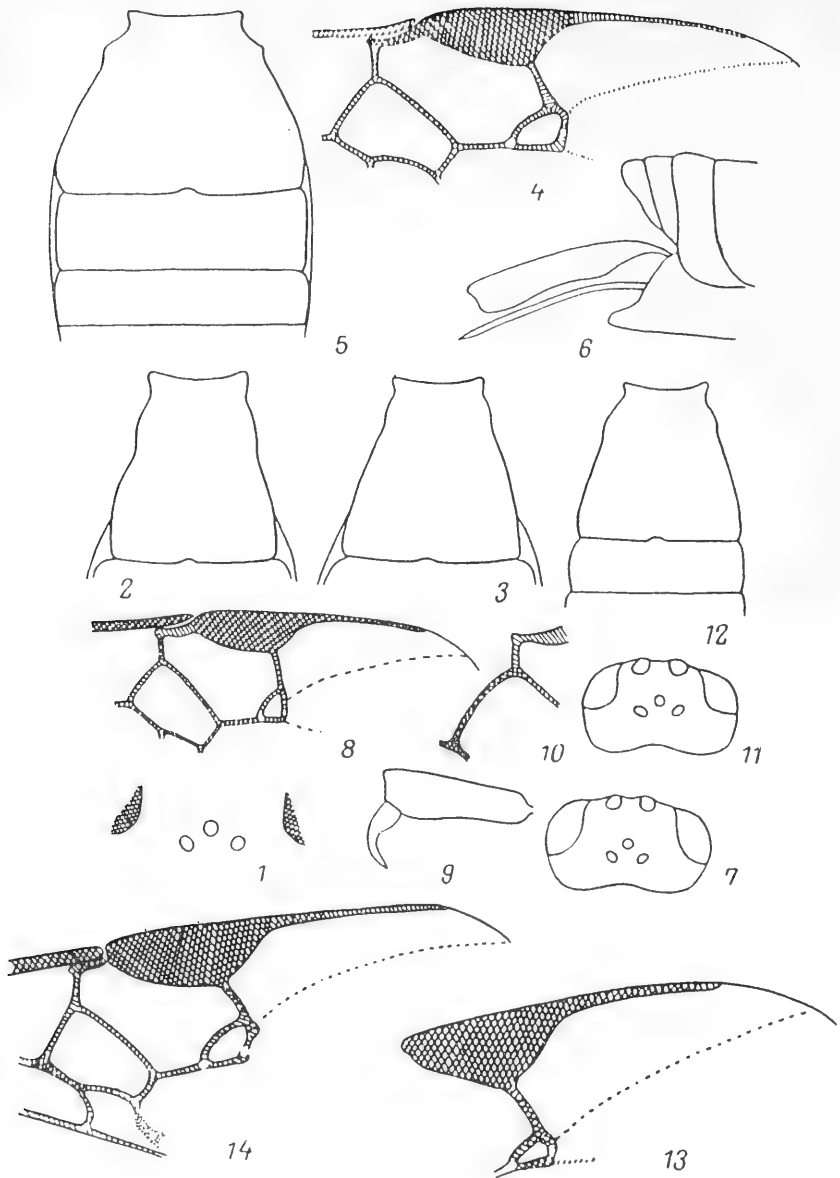


Fig. 207. Microgasterinae (from Papp).

1, 2—*Lissogaster nobilis*: 1—vertex, 2—first abdominal tergite; 3—*L. obsepiens*, first abdominal tergite; 4–6—*L. uliginosa*: 4—part of forewing, 5—1st–3rd abdominal tergites, 6—abdominal apex; 7–9—*L. postica*: 7—head, 8—part of forewing, 9—fifth segment of hind tarsus; 10—*L. novicius*, basal vein; 11–12—*L. parvistriga*: 11—head, 12—1st and 2nd abdominal tergites; 13, 14—part of forewing: 13—*L. fulvicrus*, 14—*L. deceptor*.



- Figs. 206: 2, 4; 214: 3. Body 3.5–6. Parasite of *Agonopterix pallorella* Z. (Oecophoridae). Northwest, center, east, south; Caucasus, Central Asia (Ashkhabad); Western Europe, Mongolia..... **L. curvicrus** Thoms.
- 20 (19). Ovipositor valves almost as long as hind tibia. Tangent to hind margin of anterior ocellus crosses posterior ocelli (Fig. 206: 3). Body 4–4.5. East; Western Europe, Mongolia. .... **L. erro** Nixon
- 21 (14). Hind coxae (Fig. 210: 1) wrinkled (with somewhat smooth sculpture on lower side). Mesonotum strongly and uniformly punctate, distance between punctures less than their diameter. Scutellum punctate, almost smooth in middle. Nervulus originates before middle of discoidal cell. Ovipositor valves extremely short, about 1/2 as long as 1st segment of hind tarsus. Underside of abdomen yellow; legs almost dark brown with reddish yellow pattern (including on femora). Body 4. Hungary..... **L. rugosicoxa** Papp
- 22 ( 3). Face much coarser and more densely punctate, matte or slightly lustrous, usually somewhat transversely wrinkled along sides.
- 23 (30). Legs, including at least large part of hind coxae, yellow or reddish yellow.
- 24 (25). Abdominal sternites dark colored. Mesonotum almost entirely wrinkled, 2nd abdominal tergite coarsely wrinkled. Claws with 2 to 3 denticles. Pubescent part of ovipositor valves as long as 2/3 of hind tibia. Preapical segment of antennae 1.5 times as long as wide. Body 4.5. Parasite (in North America) of *Pantographa lineata* Grote and Robinson (Pyralidae). England, USA. .... **L. pantographae** Mues.
- 25 (24). All abdominal sternites yellow or reddish yellow.
- 26 (27). Third abdominal tergite in basal half sculptured; longer than 2nd. First abdominal tergite much (approximately 5/7) less long than wide at apex. Nervulus originates before middle of elongate discoidal cell. Tangent to anterior margin of posterior ocellus touches anterior ocellus. Propodeum with longitudinal ridge. Sixth abdominal sternite noticeably produced backward, strongly sclerotized. Ovipositor valves 1/3 as long as hind tibia. Abdominal tergites black, hind margin of 3rd tergite reddish. Wings slightly darkened. Fig. 207: 4–6. Body 4.5. Sweden, Finland. .... **L. uliginosa** Thoms.
- 27 (26). Third abdominal tergite smooth (sometimes with faint sculpture at very base), usually not longer than 2nd. First

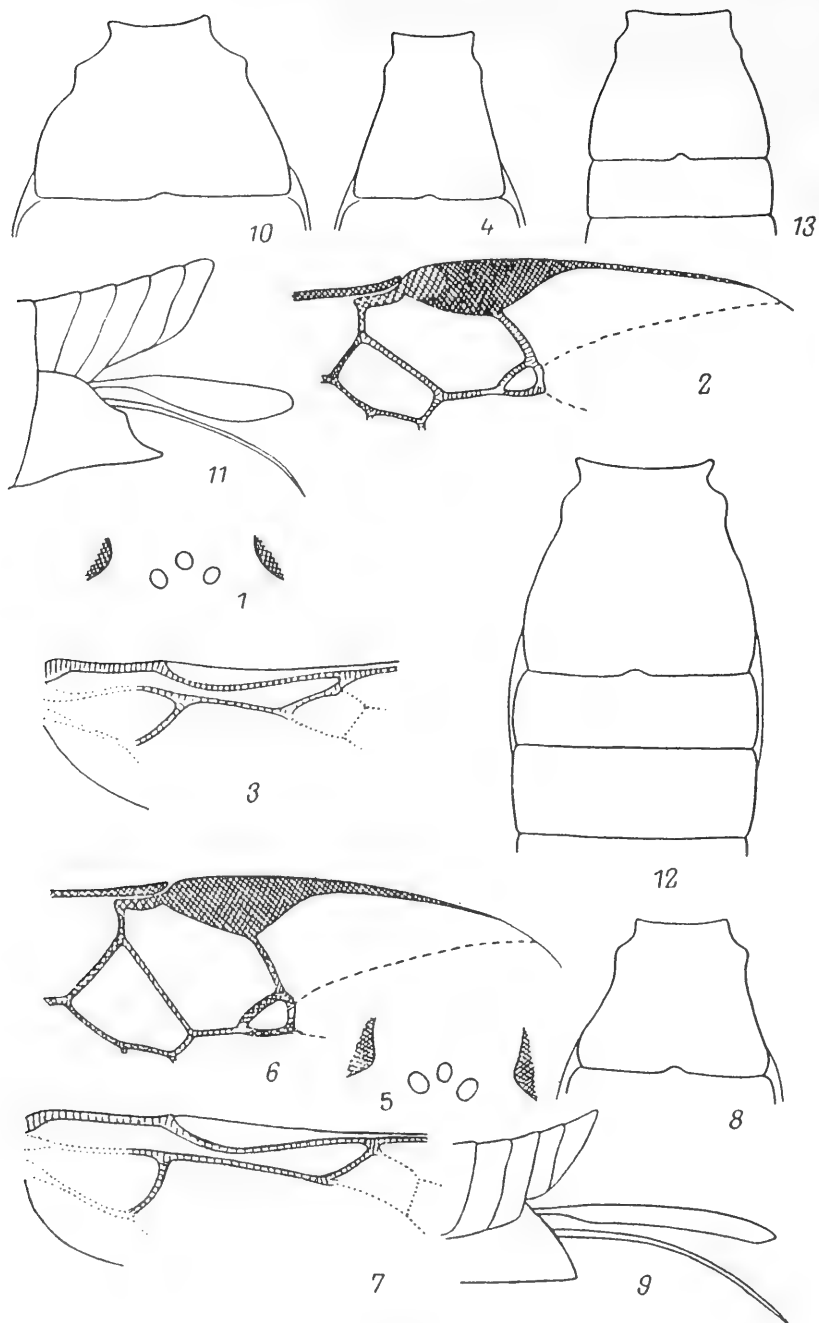


Fig. 208. Microgasterinae (from Papp).

1-4—*Lissogaster hungarica*: 1—vertex, 2—part of forewing, 3—part of hind wing, 4—first abdominal tergite; 5-7—*L. procera*: 5—vertex, 6—part of forewing, 7—part of hind wing; 8, 9—*L. postica*: 8—first abdominal tergite, 9—abdominal apex; 10, 11—*L. grandis*: 10—first abdominal tergite, 11—abdominal apex; 12—*L. alebion*, 1st-3rd abdominal tergites; 13—*L. hospes*, 1st and 2nd abdominal tergites.

- abdominal tergite not longer or slightly longer than its width at apex. Basal abdominal tergite often with reddish pattern.
- 28 (29). Body small, 3.2–3.5. Head uniformly rounded behind eyes. Sides of 1st abdominal tergite concave in middle. Claws of usual length. Second radiomedial cell triangular, nervulus originates almost from middle of discoidal cell. Ovipositor valves slightly longer than 1/2 of hind tibia. Tegulae light yellow. Figs. 207: 7–9; 208: 8, 9. Parasite of *Euproctis chryso-rrhoea* L., *E. similis* Fuessly (Lymantriidae). Western Europe. .... **L. postica** Nees
- 29 (28). Body large, 4–4.5. Head distinctly narrowed behind eyes. First abdominal tergite with straight lateral margin. Claws unusually long. Second radiomedial cell quadrangular, nervulus originates at great distance before middle of discoidal cell. Ovipositor valves slightly shorter than 1/2 of hind tibia. Tegulae black. Figs. 209: 1–4; 210: 16. Southwest; Central Europe, Italy. .... **L. auriculata** F.
- 30 (23). At least coxae, trochanters, often also femora of middle and hind legs, and also apical sternite of abdomen dark brown or black.
- 31 (36). Mesonotum and sides of mesothorax, except their hind third, distinctly punctate. Hind coxae somewhat strongly punctate.
- 32 (33). Claws with distinct basal protuberance. Mesonotum strongly punctate (distance between punctures equal to their diameter, along line of notaulices punctures almost merge into each other); scutellum with weaker punctation, becoming dense along sides. Head frontally rounded-triangular. Hind femora and tibiae entirely reddish yellow. Wings pale, stigma with pale basal spot. Figs. 206: 19; 210: 17. Body 5.2. Finland. . . . . **L. deductor** Nixon
- 33 (32). Claws without basal protuberance, simple or pectinate. Head frontally rounded transversely.
- 34 (35). Claws pectinate (Fig. 206: 17). Head behind eyes roundly narrowed. Scutellum punctate, lustrous, with interpuncture spaces larger than diameter of punctures. On mesonotum interpuncture spaces equal to or less than diameter of punctures. Inter-puncture spaces on sides of mesothorax with microsculpture. Distance between anterior and posterior ocelli less than ocellar diameter. Tangent to anterior margin of posterior ocellus crosses posterior margin of anterior ocellus. Preapical segment of antennae almost as long as wide. Ovipositor valves slightly longer than 1/2 of hind tibia.

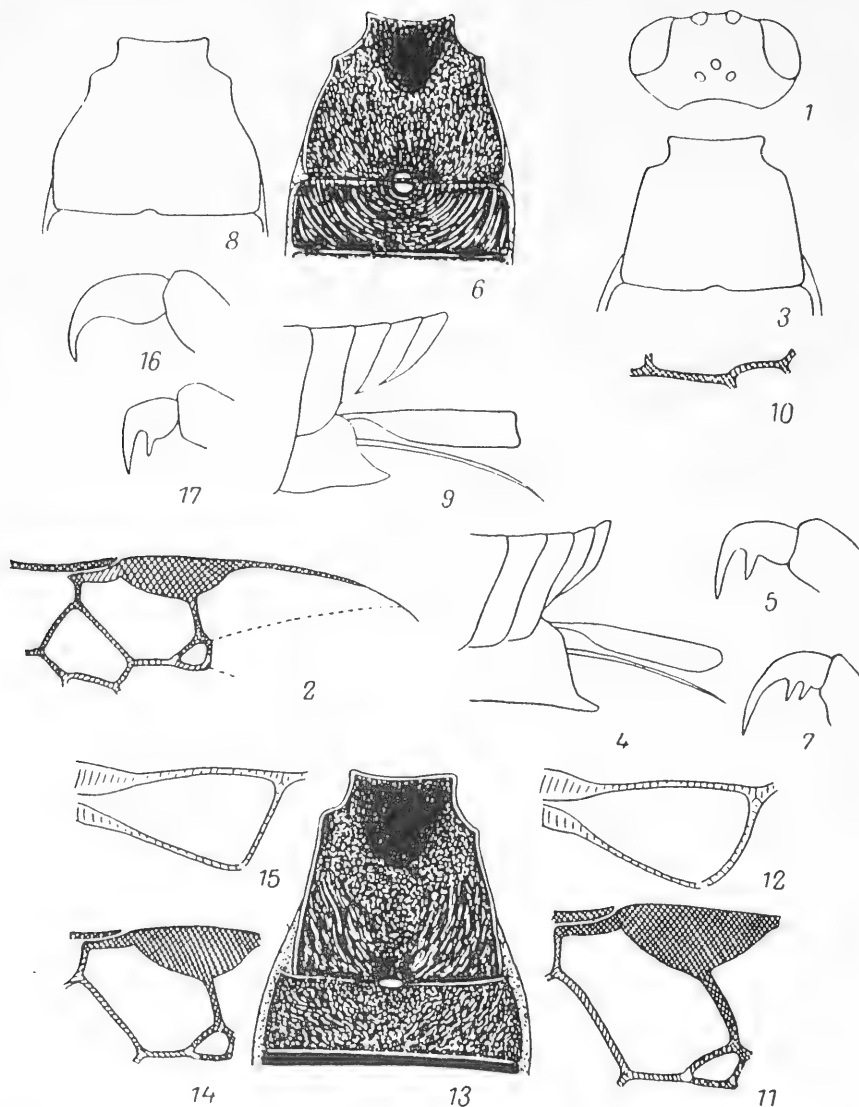


Fig. 209. Microgasterinae (from Papp).

1-4—*Lissogaster auriculata*: 1—head, 2—part of forewing, 3—1st abdominal tergite, 4—abdominal apex; 5—*L. crassicornis*, hind claw; 6—*L. areolaris*, 1st and 2nd abdominal tergites; 7—*L. consors*, hind claw; 8, 9—*L. acilius*: 8—1st abdominal tergite, 9—abdominal apex; 10—*L. caris*, base of discoidal cell; 11-13—*L. nitidula*: 11—part of forewing, 12—submedial cell of hind wing, 13—1st and 2nd abdominal tergites; 14-16—*L. asramenes*: 14—part of forewing, 15—submedial cell of hind wing, 16—hind claw; 17—*L. areolaris*, hind claw.

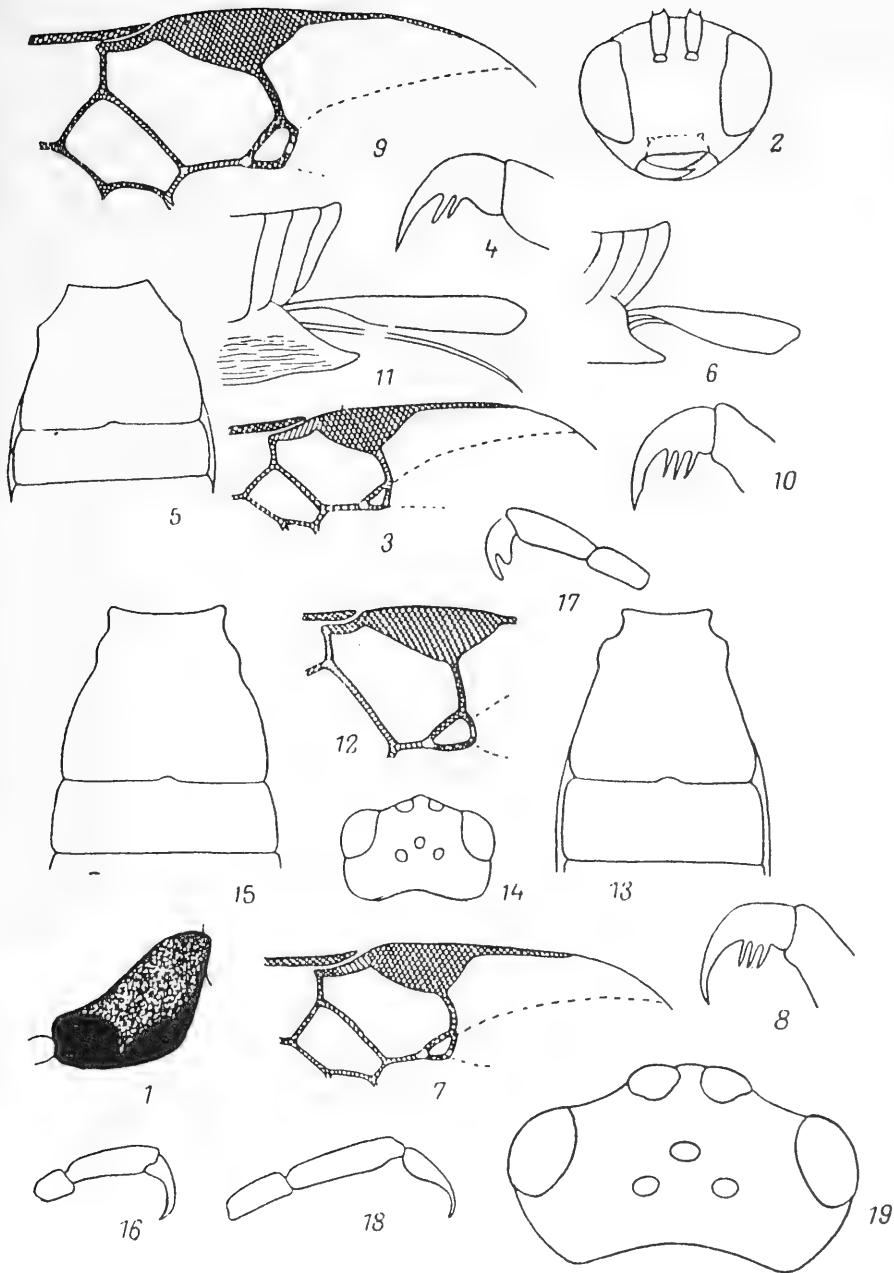
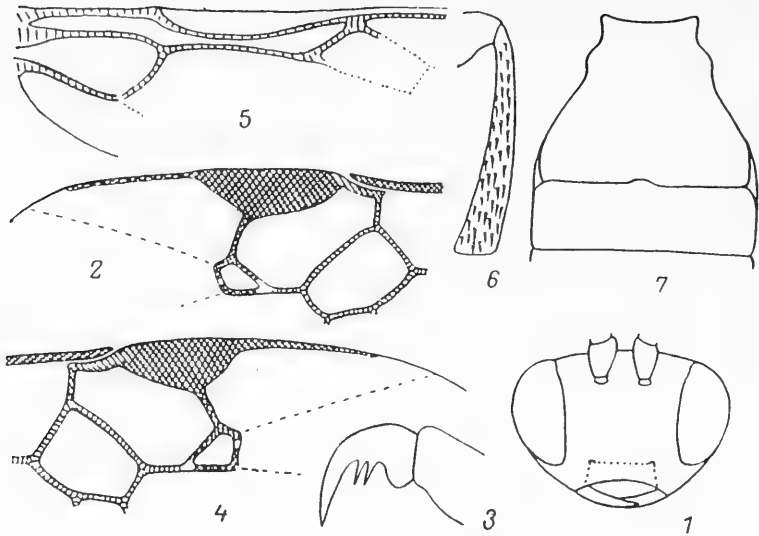


Fig. 210. Microgasterinae (from Papp).

1—*Lissogaster rugosicoxa*, hind coxa; 2—6—*M. dudichi*: 2—head, 3—part of forewing, 4—hind claw, 5—1st and 2nd abdominal tergites, 6—abdominal apex; 7, 8—*L. tibialis*: 7—part of forewing, 8—hind claw; 9—11—*L. australis*, 9—part of forewing, 10—hind claw, 11—abdominal apex; 12, 13—*L. stictica*: 12—part of forewing, 13—1st and 2nd abdominal tergites; 14, 15—*L. subcompleta*: 14—head, 15—1st and 2nd abdominal tergites; 16—18—apex of hind tarsus: 16—*L. auriculata*, 17—*L. deductor*, 18—*L. deceptor*; 19—*L. deceptor*, head, dorsal view.

- Coxae, trochanters and bases of fore and middle femora black, hind tarsi darkened. Abdominal sternites dark brown. Body 5.2. Austria, northern Italy. (cf. also couplet 48.). . . . .  
 . . . . . **L. eupolis** Nixon
- 361 35 (34). Claws not pectinate, extremely long. Head behind eyes strongly narrowed. Scutellum smooth, lustrous, weakly punctate only along sides. Mesonotum wrinkled, sides of mesothorax with extremely dense and fairly coarse punctation. Distance between anterior and posterior ocelli equal to ocellar diameter. Tangent to anterior margin of posterior ocellus not touching anterior ocellus. Ovipositor valves slightly shorter than 1/2 of hind tibia. Only hind coxae black, hind tarsi not darkened. First to 3rd abdominal sternites yellow. Figs. 207: 14; 210: 18, 19. Body 4. Finland . . . . .  
 . . . . . **L. deceptor** Nixon
- 362 36 (31). Mesonotum and sides of mesothorax relatively weakly punctate, punctation noticeably weaker in posterior part of mesonotum (except in *L. fusca* and *L. fischeri*); hind coxae smooth or very weakly punctate.
- 37 (52). Claws, at least of hind legs, with one (up to four) additional denticle (Fig. 209: 5) or with thick setae.
- 38 (41). All claws with additional denticle, hind claw curved almost at right angle (Fig. 209: 5). Antennae somewhat thickened, preapical segment as long as wide. Second abdominal tergite with longitudinal wrinkles. Ovipositor valves as long as hind tibia.
- 39 (40). Pubescence of three preapical segments of antennae relatively long (about the width of segment). Between hind ocelli longitudinal carina not developed or slightly developed. Claws longer (Fig. 209: 5). Hind femora in female reddish yellow; sometimes on upper side of base with dark spot (in male black). Body 4–4.5. Parasite of *Eupithecia pimpinellata* Hb. (Geometridae). Center (Yaroslavl' and Belgorod regions); Western Europe . . . . .  
 . . . . . **L. crassicornis** Ruthe
- 40 (39). Pubescence of antennae shorter, on three preapical segments equal to 1/4 of segmental width. Distinct longitudinal carina between posterior ocelli. Claws shorter. Hind femora at base and at apex darkened. Second abdominal tergite with very smooth sculpture. Figs. 209: 6, 17; 214: 4. Body 4–5. Northern Ural, center, south; Caucasus, Eastern Siberia (Katun'); Western Europe. . . . . **L. areolaris** Thoms.

- 41 (38). At least hind claws with 2 to 3 additional denticles or bristles, hind claws less sharply curved (Fig. 209: 7). Antennae thinner, preapical segments longer than wide. Ovipositor valves usually shorter than hind tibia.
- 42 (43). Nervulus originates clearly before middle of discoidal cell. Basal vein within limits of discoidal cell 4 times as long as its section from this cell to parastigma; stigma 2 times as long as wide. Two additional denticles of hind claws short. Preapical segment of antennae almost as long as wide. Propodeum faintly wrinkled, with few noticeably coarse, transverse folds. Ovipositor valves slightly (almost by 1/3) shorter than hind tibia. Hind femora reddish yellow, sometimes on outer side with dark basal spot (in male) or entirely black. Figs. 206: 21; 209: 7. Body 3.5–3.8. England, Czechoslovakia, Hungary ...  
..... **L. consors** Nixon
- 43 (42). Nervulus originates from middle of discoidal cell or slightly beyond its middle. Basal vein, within limits of discoidal cell, 3 times as long as its section from this cell to parastigma. Stigma usually narrower (Fig. 210: 3). Claws with 2 denticles. Preapical segment of antennae 1.4–1.3 times as long as wide. Propodeum coarsely and not uniformly wrinkled.
- 44 (47). Second tergite of abdomen with smooth sculpture and longitudinal folds. Claws somewhat bulged before additional denticles (Fig. 210: 4).
- 45 (46). Head distinctly broadened frontally, height of face 2/3 its width, its sculpture coarser. First abdominal tergite almost as long as wide. Stigma 3 times as long as wide, metacarpus 3 times as long as distance from it to apex of radial cell. Hind femora reddish yellow, darkened at base, on outer side and at apex. Fig. 211: 1–3 (male!). Body 4. England, Sweden ...  
..... **L. nigricans** Nees
- 46 (45). Head almost rounded frontally, with almost square, more weakly sculptured face. First abdominal tergite much less long than wide at apex (its sculpture fainter). Stigma 2 times as long as wide, metacarpus slightly longer than distance from it to wing apex. Hind femora dark brown. Length of ovipositor valves approximately 1/3 hind tibia. Figs. 206: 12; 210: 2–6. Body 3. East Germany ..... **L. dudichi** Papp
- 47 (44). Second tergite of abdomen somewhat coarsely wrinkled. Claws at base without protuberance (Figs. 206: 17; 210: 8).
- 48 (47). Mesonotum and scutellum strongly and uniformly punctate. (cf. also couplet 34.) ..... **L. eupolis** Nixon



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Fig. 211. Microgasterinae (from Papp).

1-3—*Lissogaster nigricans*: 1—head, frontal view, 2—part of forewing, 3—hind claw; 4-7—*L. incurvata*: 4—part of forewing, 5—part of hind wing, 6—hind tibia, 7—1st and 2nd abdominal tergites.

49 (48). Mesonotum punctate much more strongly and densely on anterior than on posterior side. Scutellum smooth and weakly punctate. Large spur of hind tibiae longer than half of 1st segment of hind tarsus.

50 (51). Metacarpus distinct, slightly longer than distance from it to wing apex (radial cell). Pubescent part of ovipositor valves shorter than half of hind tibia. Mesonotum, except its posterior, rarely punctate, part densely punctate, almost matte. Hind femora black. Figs. 206: 5; 210: 7, 8; 214: 6. Body 3.2-4.5. Parasite of *Aspilapterix tringipennella* Z. (Gracillariidae), *Acleris aspersana* Hb. (Tortricidae). Northwest, center, south; Caucasus, Central Asia; Western Europe ..... *L. tibialis* Nees

51 (50). Metacarpus gradually tapering toward apex, no distinct boundary with margin of wing, on its outer side approximately 1.5 times as long as distance from it to wing apex. Pubescent part of ovipositor valves almost as long as hind tibia. Mesonotum more sparsely punctate anteriorly, lustrous,



almost smooth posteriorly. Hind femora brownish red. Nervulus divides posterior side of discoidal cell approximately into equal sections. Figs. 206: 6, 8; 210: 9–11. Body 4.5–5. Northwest, center, south; Caucasus, Kazakhstan, Central Asia; Western Europe, Iran, Mongolia .....

..... **L. australis** Thoms.  
 (*deprimator* auct., *globata* sensu Telenga)

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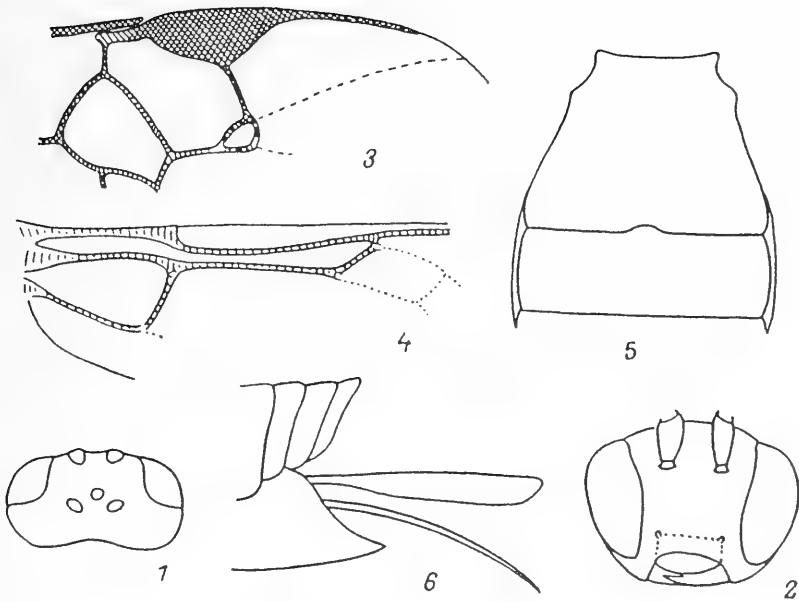
- 52 (37). Hind claws without additional denticles (Fig. 209: 16) or bristles, at most with one dark seta at base. Inner side of discoidal cell usually 2 to 3 times as long as section of basal vein from it to parastigma. Inner orbits almost parallel to each other.
- 53 (56). Sixth sternite of abdomen strongly sclerotized, without longitudinal striation (fine folds), not flattened on lower side to form fine carina. Pubescent part of ovipositor valves about 1/3 of hind tibia.
- 54 (55). First tergite of abdomen distinctly broadened toward apex, significantly more than 2 times as wide at apex as at base. Hind margin of 6th abdominal sternite above apex slightly concave. Anterior half of mesonotum with scattered coarse punctation, distance between punctures noticeably more than diameter of punctures. Middle and hind femora usually entirely black, but sometimes yellowish red. Figs. 206: 9; 208: 10, 11. Body 4.5–5. West (Lithuanian SSR), north; England, Northern Europe..... **L. grandis** Thoms.
- 55 (54). First tergite of abdomen distinctly broadened toward apex, not more than 2 times as wide at apex as at base (Fig. 209: 8). Hind margin of 6th abdominal sternite above apex strongly concave (Fig. 209: 9). Punctation on mesonotum sparser mainly in its anterior third. Middle and hind femora reddish yellow, at most, base of middle and hind femora except apex, darkened. Fig. 209: 8, 9. Body 3.5–4. England.....  
 ..... **L. acilius** Nixon
- 56 (53). Sixth sternite of abdomen significantly less sclerotized, somewhat distinctly striate longitudinally (with thin longitudinal folds), often on lower side flattened to form thin carina.
- 57 (60). Face narrowed downward (Fig. 206: 20) (in *M. fischeri* sometimes barely tapering). Mesonotum densely and very coarsely punctate almost up to posterior margin (sculpture toward posterior side weaker), completely matte in anterior half. Ovipositor valves not longer than 1st segment of hind tarsus. Hind coxae smooth. Preapical segment of antennae square or slightly longer than wide.

- 58 (59). Face strongly narrowed downward, its height usually more than its width in lower part. Ovipositor valves as wide as 1st segment of hind tarsus. Hind femora reddish yellow; wings weakly darkened. Fig. 206: 13, 16, 20. Body 2.3–3. Southwest (Moldavia); Hungary, Yugoslavia ..... *L. fusca* Papp (*phryne* Nixon)
- 59 (58). Face slightly narrowed downward, its height usually less than its width in lower part. Ovipositor valves wider than 1st segment of hind tarsus. Hind femora black. Wings intensely darkened. Fig. 206: 14, 18. Body 2.5–3. Southwest (Moldavia); Krasnodar Territory (Sochi); England, Austria, Hungary, Mongolia. (cf. also note to couplet 86.) ..... *L. fischeri* Papp
- 60 (57). Face not narrowed downward. Mesonotum with sparser punctation, always lustrous in posterior half. Ovipositor valves usually longer. Body usually large, 3.
- 61 (62). Section of basal vein from discoidal cell to parastigma extremely small, 1/4 as long as this vein within discoidal cell (Fig. 207: 10). Preapical segment of antennae 1.5 times as long as wide (16th segment—2 times as long). Pubescent part of ovipositor valves shorter than half of hind tibia. Hind claws at base with long bristle-like seta. Basal abdominal sternite and legs yellow. Body 3–3.5. Parasite (in USA) of *Swammerdamia castanea* Busck (Yponomeutidae). Western Europe, North America. .... *L. novicius* Marsh. (*swammerdamiae* Mues.)
- 62 (61). Section of basal vein from discoidal cell to parastigma usually not less than 1/3 as long as this vein within discoidal cell (Fig. 206: 7).
- 63 (64). Nervulus divides posterior side of discoidal cell into unequal sections, inner one much longer than outer. Two preapical segments of antennae slightly longer than wide. Mesonotum quite densely punctate, matte in anterior part. Large spur of hind tibiae 3/4th as long as 1st segment of hind tarsus. Ovipositor valves half as long as hind tibia. Hind femora and tibiae brownish yellow, at apex contrastingly darkened, anterior abdominal sternites yellow. Figs. 206: 7; 209: 10. Body 3.5. Parasite of *Archips rosana* L. (Tortricidae). Center (Pyazanskaya Region); Austria, Hungary .... *L. caris* Nixon
- 64 (63). Nervulus divides posterior side of discoidal cell into approximately equal sections, inner one often slightly shorter than outer.

- 65 (68). Sculpture of 1st and 2nd abdominal tergites regular, so folds form somewhat distinct arches (Fig. 209: 13). Ovipositor valves shorter than hind tibia by 1/3. Inner spur of hind tibiae slightly shorter than 1st segment of hind tarsus.
- 66 (67). In hind wings nervellus curved. First abdominal tergite as long as its width at apex (sculpture of 1st and 2nd tergites as in Fig. 209: 13). Preapical segment of antennae almost square. Hind tibiae reddish yellow, at base whitish; bases of antennae black. Fig. 209: 11–13. Body 5. Western Europe.<sup>1</sup> ..... **L. nitidula** Wesm.
- 67 (66). In hind wings, nervellus almost straight. First abdominal tergite noticeably less long than wide at apex (14: 11). Preapical segment of antennae 1/3 as long as wide. Hind tibiae trichromatic: reddish in middle, whitish at base and almost black at apex. Basal segment and pedicel of antennae reddish. Fig. 209: 14–16. Body 3.7–4.2. Parasite of *Eudemis porphyra* Hb. (Tortricidae). South; Caucasus (Tbilisi); Hungary, Italy, Romania, Turkey..... **L. asramenes** Nixon
- 364 68 (65). Sculpture of 1st and 2nd abdominal tergites without concentric folds; if folds present, then ovipositor as long as hind tibia.
- 69 (70). Second abdominal tergite, at most 2.5 times (usually even more) as wide as long. Radial vein originates from apical part of stigma. Preapical segment of antennae 1.5 times as long as wide. Ovipositor valves slightly shorter than half of hind tibia. Legs reddish yellow. Middle and hind femora sometimes darkened at apex. Basal abdominal sternite often bright yellow. Fig. 210: 12, 13. Body 3–4. Western Europe, Mongolia..... **L. stictica** Ruthe (*confusus* Papp)
- 70 (69). Second abdominal tergite not less than 3 times as wide as long.
- 71 (72). Sixth abdominal sternite long and wide, pointed, produced beyond apex of abdomen, flattened laterally. Preapical segment of antennae square or slightly longer than wide. Ovipositor valves somewhat shorter than hind tibia (Fig. 206: 22). Hind femora black. Body 4. Northwest; Caucasus (Georgia); Finland, Hungary ..... **L. ductilis** Nixon

<sup>1</sup> Telenga (1955) and apparently Papp (1976) following his data indicate this species is from the European part of the USSR. However, material of Telenga, identified as *M. nitidula*, could not be preserved and there is no certainty that this identification is correct.

- 72 (71). Sixth abdominal sternite less large and not produced beyond apex of abdomen.
- 73 (76). Head relatively slightly broader, temples behind eyes straight (Fig. 210: 14). Ovipositor usually as long as hind tibia. Preapical segment of antennae distinctly longer than wide. Hind femora reddish yellow.
- 74 (75). Ovipositor valves as long as hind tibia, narrower than it. Sculpture of 1st and 2nd abdominal tergites relatively coarse. Figs. 210: 14, 15; 214: 5. Body 4–5. Parasite of *Vanessa atalanta* L. (Nymphalidae), *Haritala ruralis* Scop., *Eurhuypara hortulata* L. (Pyraustidae); cocoons in clusters. Center, south; Caucasus, Far East (Khabarovsk); Western Europe, North America ..... **L. subcompleta** Nees
- 75 (74). Pubescent part of ovipositor valves hardly longer than hind tibia but of same width. Sculpture of 1st and 2nd abdominal tergites relatively less coarse. Fig. 207: 11, 12. Body 3–5. Parasite of *Anacamptis disquei* Mees (Gelechiidae). Cocoons isolated. Caucasus (Erevan); Western Europe ..... **L. parvistriga** Thoms.
- 76 (73). Head broad, roundly narrowed behind eyes. Ovipositor shorter than hind tibia.
- 77 (78). Vertex smooth. Discoidal cell elongate, 1.5 times as long as wide. Anterior half of mesonotum relatively coarsely and densely punctate. Preapical segment of antennae 1.5 times as long as wide. Hind femora reddish yellow, with dark apex. Wings darkened. Fig. 206: 15. Body 4–4.5. Southwest (Moldavia); Austria, Czechoslovakia, Hungary, Romania, Yugoslavia ..... **L. famulus** Nixon
- 78 (77). Vertex somewhat sculptured. Discoidal cell not elongate, not more than 1.3 times as long as wide (Fig. 211: 4).
- 79 (80). Nervellus on hind wing curved, radiomedial cell longer. Vertex relatively coarsely, transversely wrinkled. Outer side of hind tibiae with dense appressed bristles. Ovipositor valves slightly shorter than hind tibia. Hind femora reddish yellow, darkened in apical third. Fig. 211: 4–7. Body 4.8. Turkey (Bosporus) ..... **L. incurvata** Papp
- 80 (79). Nervellus on hind wing almost straight, radiomedial cell shorter (Fig. 212: 4). Vertex weakly sculptured.
- 81 (82). Ovipositor valves slightly shorter than hind tibia. Preapical segment of antennae slightly or 1.3 times as long as wide. Inner spur of hind tibiae slightly (not more than 1/3) shorter than 1st segment of hind tarsus, significantly longer than



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Fig. 212. Microgasterinae (from Papp).

1-6—*Lissogaster globata*: 1—head, dorsal view, 2—head, frontal view, 3—part of forewing, 4—part of hind wing, 5—1st and 2nd abdominal tergites, 6—abdominal apex.

outer spur. Hind femora reddish yellow, sometimes darkened in apical third. Fig. 208: 12. Body 4.5–5.5. Parasite of *Platyptilia gonodactyla* Den. and Schiff. (Pterophoridae). Northwest, west, center, southwest; England .....

..... **L. alebion** Nixon

82 (81). Ovipositor valves approximately as long as half of hind tibia.

83 (84). Underside of abdomen, sometimes except apex, and spots (or apical bands) on 3rd and 4th tergites yellow. Inner spur of hind tibiae longer than 1/2 of 1st segment of hind tarsus and almost 1.5 times as long as outer spur. Mesonotum weakly punctate in posterior half, densely punctate anteriorly. Antennae thin, preapical segment 1.3 times as long as wide. Broadened part of ovipositor valves slightly longer than 1/2 of hind tibia. Legs, except dark coxae (sometimes only hind ones), reddish yellow. Body 2.7–3.6. Southwest (Moldavia) ..

..... **L. chrysosternis** Tobias, sp. n.

Holotype: Female, Karyl, 28.VIII.1963 (Talitskii). Paratypes: 2 females, same data; 10 females, Chumai,

swimming pools, 9.VI.1967 (Talitskii); 1 female, 1 male, same place, 9.VI.1967 (Tobias).

- 84 (83). Underside of abdomen dark colored, only anterior sternites sometimes yellowish. In latter case, spurs of hind tibiae shorter and not differing significantly in length.
- 85 (86). Preapical segment of antennae 1.3–1.5 times as long as wide. Broadened part of ovipositor valves 0.5–0.7 of hind tibia. Hind femora brownish or yellowish red. Figs. 206: 10; 212; 213. Body 3.5–4. Parasite of *Spilonota ocellana* F., *Tortrix viridana* L., *Acleris variegana* Den. and Schiff., *Archips xilosteana* L., *A. rosana* L., *A. sorbiana* Hb., *A. crataegana* Hb., *Hedya atropunctana* Zett., *Ptychiloma lecheana* L., *Eudemis profundana* Den. and Schiff., *Ancylis*

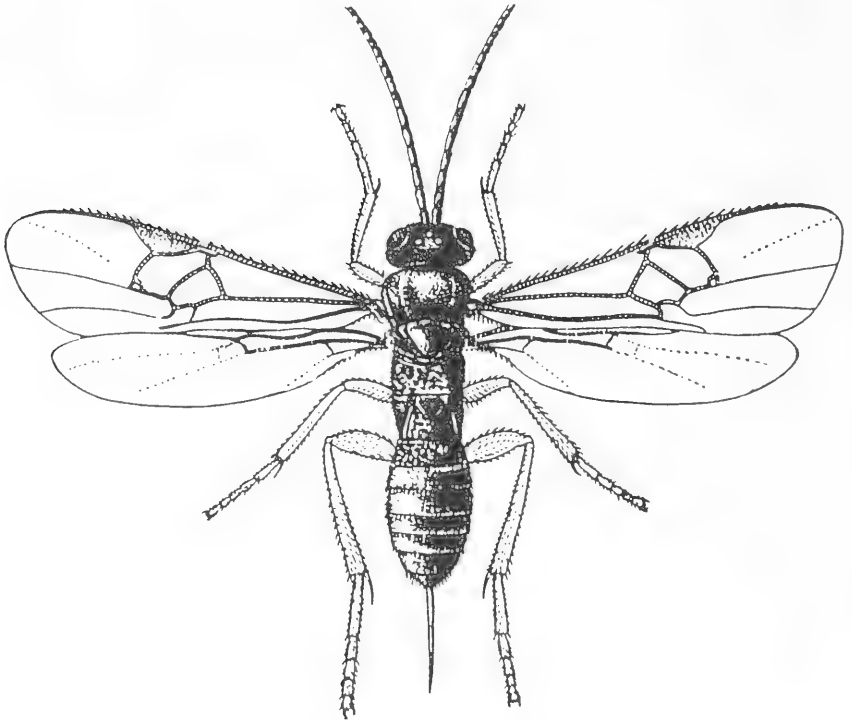


Fig. 213. Microgasterinae (original).

*Lissogaster globata* L.

*unculana* Hw. (Tortricidae), *Pseudotelphusa paripunctella* Thunb., *Anacamptis disquei* Mees (Gelechiidae), *Acrobasis tumidana* Den. and Schiff. (Phycitidae); cocoons white, isolated. West, center, south; Caucasus, Far East; Western Europe .....

*L. globata* L.

(*laeviscuta* Thoms., *meridiana* sensu Telenga)

- 86 (85). Preapical segment of antennae not longer or slightly longer than wide. Broadened part of ovipositor valves 0.5 of hind tibia or slightly shorter. Hind femora often darkened basally or entirely. Figs. 206: 11; 208: 13. Body 3–3.2. Parasite of *Gelechia hippophaella* Schr. (Gelechiidae), *Acleris hastiana* L., *A. aspersana* Hb. (Tortricidae), *Polychrysis monteta* F. (Noctuidae). Cocoons white. Northwest, east, south; Buryatskaya ASSR; Western Europe..... *L. hospes* Marsh.<sup>1</sup>

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157. *Hygroplitis* Thomson, 1895.—Holarctic genus with three species (two in the Palearctic).

- 1 (2). Inner spur of hind tibiae shorter than half of 1st segment of hind tarsus. Second abdominal tergite in middle almost 2/5 as long as its width at base. Ovipositor valves shorter than 1st segment of hind tarsus. Hind coxae and 1st to 3rd abdominal tergites black. Fig. 215: 1. Body 4–4.5. Parasite of *Acronicta rumicis* L., *A. tridens* Den. and Schiff. (Noctuidae). Western Europe .....

*H. rugulosa* Nees

- 2 (1). Inner spur of hind tibiae longer than half of 1st segment of hind tarsus. Second abdominal tergite in middle slightly less than half as long as its width at base. Ovipositor valves longer than 1st segment of hind tarsus. Hind coxae and 1st to 3rd abdominal tergites brownish yellow. Fig. 214: 7, 8. Body 4–4.5. Parasite of *Orthotaelia sparganella* Thunb. (Plutellidae), *Chilo suppressalis* (Walk.), *C. simplex* Butler, *Calamotropha paludellus* Hb. (Crambidae). Northwest, south; Siberia (Barnaul); Western Europe.....

*H. russata* Hal.

158. *Choeras* Mason, 1981.—According to Mason, who isolated the genus (Mason, 1981; reference cited in literature of Microgasterinae), nearly 20 species with the reduced 2nd radiomedial vein (retained as a short appendix) should be included in this genus (about

<sup>1</sup> Small specimens of *L. hospes* resemble *L. fischeri* but distinguishable by mesonotum weakly sculptured posteriorly.

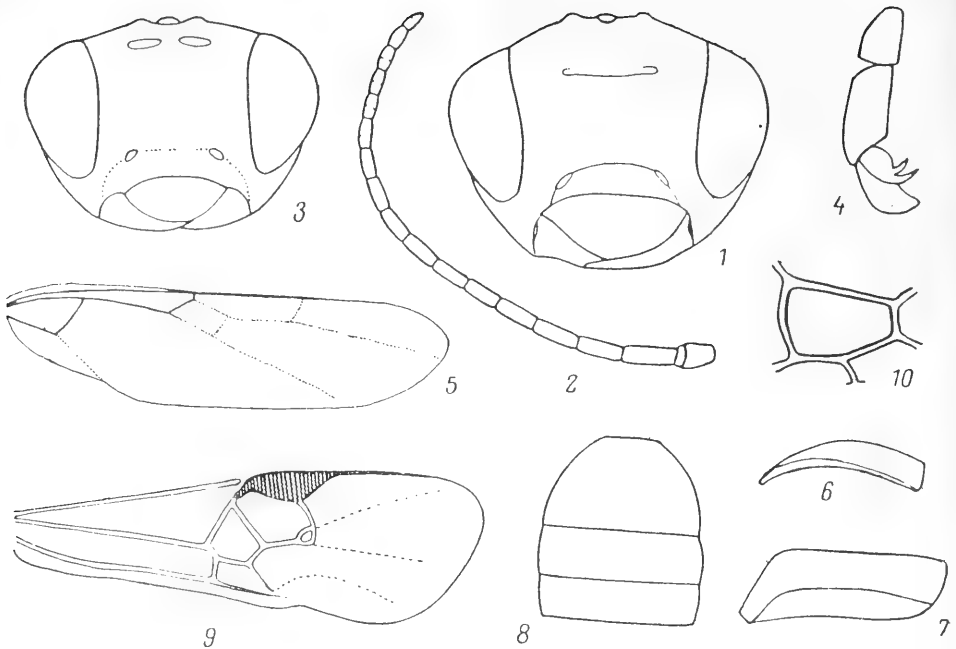


Fig. 214. Microgasterinae (from Tobias).

1—*Lissogaster hungarica*, head; 2—*L. campestris*, antenna; 3—*L. curvicrus*, head; 4—*L. arcolaris*, 4th and 5th segments of hind tarsus; 5—*L. subcompleta*, hind wing; 6—*L. tibialis*, 1st abdominal tergite, lateral view; 7, 8—*Hygroplitis russaia*: 7—1st abdominal tergite, lateral view, 8—1st to 3rd abdominal tergites; 9—*Diolcogaster kasachstanica*, forewing; 10—*D. stepposa*, discoidal cell.

10 in the Palearctic); these are usually included in the genus *Apanteles* (*A. parasitellae* group). Actually a very close relationship of these species with two species given in the Key below (noted also by European taxonomists: Nixon and Papp) is highly probable. However, for practical reasons, we prefer to retain the *A. parasitellae* group within the genus *Apanteles*. The main reason for doing so is that all the species of this group are quite easily isolable from species of some other groups of *Apanteles* but the ultimate conclusions must be based on critical investigations.

1 (2). Stigma extremely wide (Fig. 215: 2), without pale spot at base. Antennae as long as body, of usual form. Ovipositor valves as long as hind tibia. First abdominal tergite narrowed



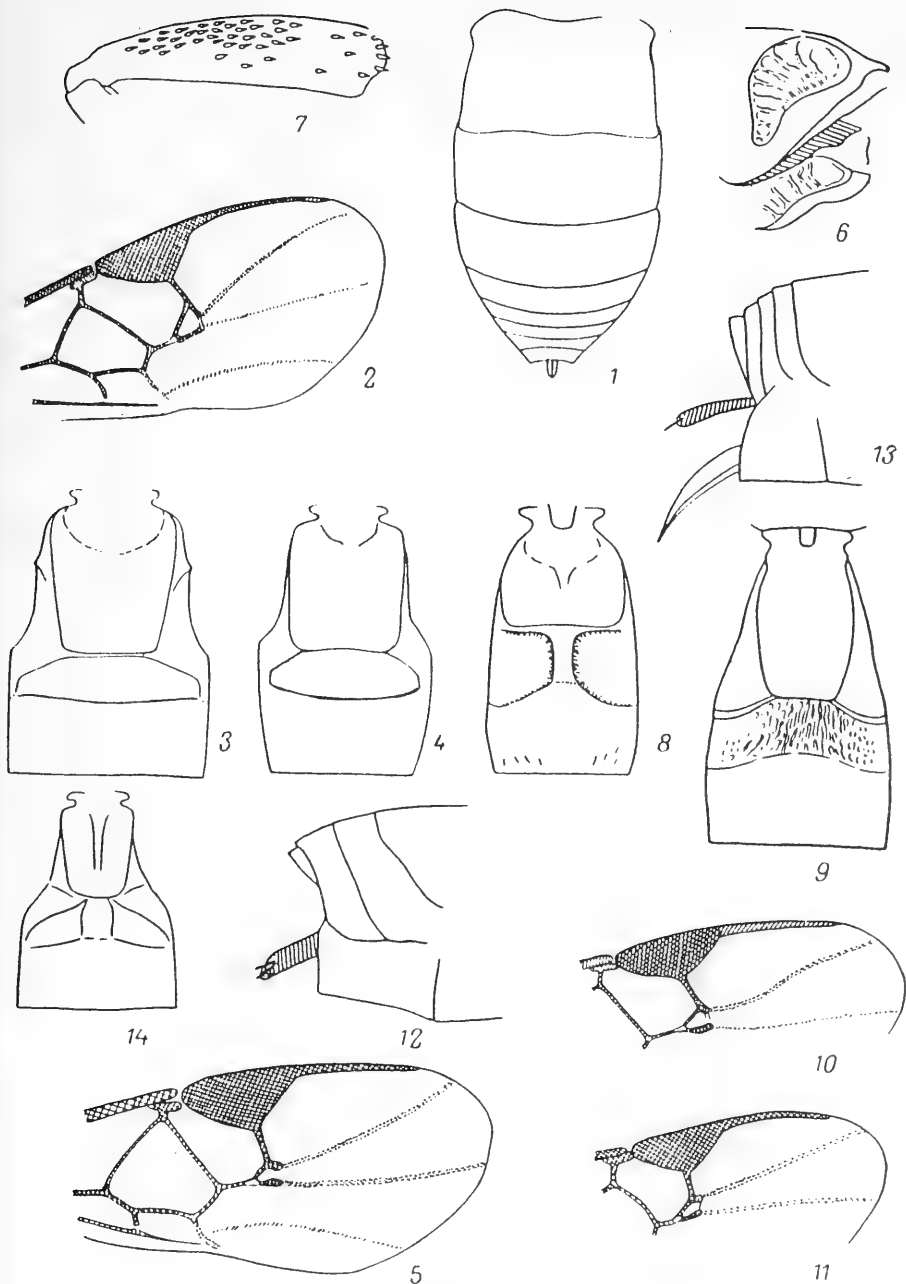


Fig. 215. Microgasterinae (from Papp).

1—*Hygroplitis rugulosa*, abdomen; 2, 3—*Choeras suffolciensis*: 2—forewing, 3—1st to 3rd abdominal tergites; 4—*C. tiro*, 1st to 3rd abdominal tergites; 5—*Rasivalva calceata*, forewing; 6—*R. marginata*, scutellum with postscutellum; 7—*R. circumvecta*, hind tibia; 8—*Diolcogaster spreta*, 1st to 3rd abdominal tergites; 9, 10—*D. connexa*: 9—1st to 3rd abdominal tergites, 10—part of forewing; 11—*D. alvearia*, part of forewing; 12—*D. hinzi*, abdominal apex; 13—14—*D. orontes*: 13—abdominal apex, 14—1st to 3rd abdominal tergites.

- toward apex (Fig. 215: 3). Body coloration variable, from almost completely black to almost brownish red, except head. Body 3–3.5. Parasite of *Rhodaria aurata* Den. and Schiff. (Pyralidae), *Nephoptyx abductella* Fischer (Pycitidae). Caucasus, Central Asia; Western Europe ..... **C. suffolciensis** Morley
- 2 (1). Stigma not wide, with pale spot at base. Antennae shorter than body, extremely thin, apical segments closely articulate, lustrous. Ovipositor valves slightly shorter than hind tibia. First abdominal tergite hardly narrowed toward apex (Fig. 215: 4). Body black. Hind femora darkened, with pale strip in middle. Body 2.5–3. Parasite of *Cnephasia chrysanthemana* Dup., *C. pascuana* Hb., *C. interjectana* Hw. (Tortricidae). Center; Sakhalin; Western Europe ..... **C. tiro** Reinh.

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159. **Paroplitis** Mason, 1981 (*Hypomicrogaster* Ashm., sensu Nixon, part.).—Three species, one in the Palearctic.

- 1 (1). Metacarpus short, hardly longer than distance from it to apex of radial cell. Antennae short, thickened. Mesonotum smooth. First and 2nd abdominal tergites smooth. First abdominal tergite parallel-sided, much longer than wide. Ovipositor valves half as long as hind tibia. Body black; hind femora dark brown, hind tibiae brown. Body 2–2.5. Caucasus (Sochi, Lenkoran); Western Europe ..... **P. wesmaeli** Ruthe

160. **Rasivalva** Mason, 1981.—Seven species in world fauna, but a large number of species from different continents, except Australia, not described. Four species in the Palearctic.

- 1 (4). Postscutellum not closely apposed to scutellum, so that phragma of scutellum clearly visible (Fig. 215: 6). Metacarpus 4 times longer than distance from it to apex of radial cell (Fig. 215: 5). Preapical antennal segment 2 times as long as wide. Second abdominal tergite with narrow field in middle. Bristles on outer side of hind tibiae thin, uniformly and widely scattered. First section of posterior side of discoidal cell much shorter than 2nd (Fig. 215: 5). Hind femora and tibiae darkened at apex.
- 2 (3). Scutellum finely and sparsely punctate, lustrous; smooth posteriorly. Propodeum without trace of longitudinal carina. Second

- and 3rd abdominal tergites and antennae black. Fig. 215: 5. Parasite of *Thera variata* Den. and Schiff., *T. obeliscata* Hb. (Geometridae). Cocoons isolated, reddish brown. Center; Western Europe..... **R. calceata** Hal.
- 3 (2). Scutellum densely punctate, dense posterior sculpture interrupts smooth edging in middle. Propodeum with very slight but distinct longitudinal carina. Second abdominal tergite lateral to middle field yellow, 3rd abdominal tergite along sides somewhat light colored. Flagellum, except apex, yellowish. Fig. 215: 6. Body 3.5–4. Parasite of *Xanthorhoe biriviata* Bkh. (Geometridae). Western Europe ..... **E. marginata** Nees
- 4 (1). Postscutellum closely apposed to scutellum, phragma of scutellum invisible. Metacarpus shorter.
- 5 (6). Metacarpus 2 times as long as distance from it to apex of radial cell. Mesonotum weakly punctate, lustrous; scutellum smooth posteriorly. Propodeum without longitudinal ridge. Preapical antennal segment 2 times as long as wide. Bristles on outer side of hind tibiae thickened, very compact in its middle part (Fig. 215: 7). Second abdominal tergite with smooth fields at anterior angles, with distinctly demarcated elongate middle field. First section of posterior side of discoidal cell much shorter than second. Hind femora and tibiae entirely reddish yellow. Parasite of *Trichopteryx carpinata* Bkh. (Geometridae). Cocoons isolated, dark brown, somewhat barrel-shaped. Body 3–3.5. England, Finland ..... **R. circumvecta** Lyle
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- 6 (5). Metacarpus half as long as distance from it to apex of radial cell. Mesonotum densely and very coarsely punctate, matte. Dense posterior punctation of scutellum interrupts smooth edging in middle. Propodeum with longitudinal ridge. Preapical antennal segment 1.5 times as long as wide. Bristles on hind tibiae thin, sparse and somewhat uniformly scattered. Second abdominal tergite slightly sculptured, with smooth fields at anterior angles, separated by transverse grooves and with faintly demarcated longitudinal narrow middle field. First section of posterior side of discoidal cell slightly shorter than 2nd (outer one). Hind femora dark brown, hind tibiae brown, darker at apex. Body 2.8. Crimea ..... **R. karadagi** Tobias, sp. n.  
 Holotype: Female, Karadat, steppe with motely and feather grass. 11.V.1972 (Tobias).

161. **Diolcogaster** Ashmead, 1900. (*Protomicroplitis* Ashm., sensu Nixon, part.).—About 40 species, 15 in the Palearctic.

- 1 (22). Posterolateral smooth part of scutellum interrupted in middle by wrinkled area. Propodeum usually with longitudinal ridge.
- 2 ( 3). Second abdominal tergite divided by two curved grooves into three fields, of which middle narrowing toward posterior side (Fig. 215: 8). First abdominal tergite short, its length less than its apical width, distinctly broadened toward posterior side. Antennae as long as head and thorax together, their 10 to 12th segments slightly longer than wide. Metacarpus 2 times as long as distance from it to radial cell. Third abdominal tergite smooth. Legs, except hind coxae, brownish yellow. Body 2.5. Parasite of *Salebria palumbella* Den. and Schiff., *Acrobasis consociella* Hb. (Phycitidae). Cocoons isolated, white. Southwest (Moldavia); Western Europe ..... **D. spreta** Marsh.
- 3 ( 2). Second abdominal tergite without such grooves and fields narrowing toward posterior side.
- 4 (13). Inner section of posterior side of discoidal cell much shorter than outer; if sometimes slightly shorter than outer, then 2nd and 3rd abdominal tergites coarsely wrinkled. Lateral grooves on 2nd abdominal tergite not clear or directed toward its lateral margin.
- 5 (10). Third abdominal tergite, as also 2nd, coarsely wrinkled. Ocelli in greatly widened triangle, tangent to hind margin of anterior ocellus crosses posterior ocelli. Stigma in basal half orange-yellow. Head dorsally smooth. Mesonotum coarsely but not densely punctate, lustrous. First abdominal tergite somewhat wide.
- 368 6 ( 7). Section of basal vein within discoidal cell slightly, at most 1.5 times, longer than recurrent vein (Fig. 214: 10). Wings uniformly colored, yellowish, without smoky spots. Second to 4th or 2nd to 5th abdominal tergites reddish. Hind femora reddish brown, antennae black. Body 3.3–3.8. Kazakhstan (cf. also couplet 17.) ..... **D. stepposa** Tobias, comb. n.
- 7 ( 6). Section of basal vein within discoidal cell almost 2 times as long as recurrent vein (Fig. 214: 9). Wings at base pale with contrasting smoky spots in and beyond middle. Usually, at most, 2nd and 3rd abdominal tergites reddish. Basal segment of flagellum yellowish brown.

- 8 ( 9). Hind femora usually black. Scutellum with sparse punctation (interpuncture distance in middle of scutellum much greater than puncture diameter). Body 3.3–4. Kazakhstan .....  
..... **D. kasachstanica** Tobias, comb. n.
- 9 ( 8). Hind femora usually reddish brown, somewhat darkened at apex. Scutellum with dense punctation (interpuncture distance less than puncture diameter). Body 3.5–4.5. South; Caucasus, Kazakhstan, Siberia (Buryatskaya ASSR); Western Europe .....  
..... **D. abdominalis** Nees
- 10 ( 5). Third abdominal tergite smooth or relatively weakly sculptured. If sculpture resembles that of 2nd tergite, then without coarse wrinkles and wings without smoky spots. Ocelli in less wide triangle, usually tangent to hind margin of anterior ocellus only touching or not touching posterior ocelli.
- 11 (12). Second abdominal tergite much shorter than 3rd (Fig. 215: 9). Mesonotum coarsely punctate, without microsculpture. First section of radial vein obliquely inclined toward longitudinal axis of stigma (Fig. 215: 10). Thorax black. Vertex smooth. Apical antennal segments 2 times as long as wide. Legs, pattern on abdomen (at least its anterior sternite), often antennae, yellowish red. Body 2.2–3.2. Parasite of *Euproctis similis* Fuessly, *E. chrysoorrhoea* L., *Porthesia auriflua* F. (Lymantriidae). Cocoons white, in clusters sharing a common tissue. Center, east; Siberia (Tuvinskaya AO); Western Europe ..... **D. connexa** Nees
- 12 (11). Second abdominal tergite as long as 3rd. Mesonotum more softly and densely punctate with indistinct micropunctation. First section of radial vein almost perpendicular to longitudinal axis of stigma (Fig. 215: 11). Thorax (except propodeum) brownish red. Body 2–2.5. Parasite of *Paribatodes rhomboidaria* Den. and Schiff., *Alcis repandata* L. (Geometridae). Cocoons in compact clusters, situated parallel to each other in transverse rows. South; Caucasus (Sochi); Western Europe ..... **D. alvearia** F.
- 370 13 ( 4). Inner section of posterior side of discoidal cell as long as outer or somewhat shorter.
- 14 (15). Eyes and ocelli prominent, genae as narrow strips, temples extremely narrow. Distance between posterior ocellus and eye half ocellar diameter, face much higher than wide. Antennae longer than body, apical segment more than 2 times as long as wide. Propodeum slightly sculptured, lustrous.

- Ovipositor extremely short. Body with profuse brownish yellow pattern, rarely black, 2.8–3. Attracted to light. Southeast; Caucasus (Azerbaijan, Armenia), Kazakhstan, Central Asia; Iran ..... **D. mayae** Shest.
- 15 (14). Eyes and ocelli not prominent, genae and temples regular. Distance between posterior ocellus and eye much greater than ocellar diameter. Face much less high than wide.
- 16 (19). Mesonotum very coarse and densely punctate (punctures concentrated along notaulices), without distinct microsculpture, lustrous. Section of basal vein within discoidal cell 3 times as long as section between it and parastigma. Hind coxae coarsely wrinkled, black.
- 17 (18). Hind coxae on lower side yellowish brown, hind tibiae hardly darkened at apex. Punctuation on mesonotum coarser (prescutellar area thimble-shaped), punctures sparser in middle of mesonotum, separated by large (equal to several times diameter of punctures) smooth intervals. (cf. also couplet 6.) ..... **D. stepposa** Tobias
- 18 (17). Hind coxae entirely black. Hind tibiae apically darkened. Punctuation on mesonotum less coarse, closer in middle. (Male of preceding species with same characters; male of *D. meges* not known.). Switzerland, Austria, Italy ..... **D. meges** Nixon, comb. n.
- 19 (16). Mesonotum more finely and uniformly punctate, with microsculpture, matte. Section of basal vein within discoidal cell 4 times as long as section between it and parastigma. Hind coxae punctate, somewhat lustrous but at least apically light colored.
- 20 (21). Ovipositor valves 3/4 1st segment of hind tarsus, without thickened setae at apex. First abdominal tergite broadened toward apex; slightly longer than wide; 2nd tergite markedly broadened, 2 times as wide as long. Body 3.5–4. Parasite of *Mamestra suasa* Den. and Schiff. (Noctuidae). Cocoons isolated, white. West, north, center; Siberia (Irkutsk); Western Europe, North America ..... **D. scotica** Marsh. (*marginata* Nees sensu Telenga).
- 21 (20). Ovipositor valves not more than 2/3 1st segment of hind tarsus, with thickened setae at apex (Fig. 215: 12). First abdominal tergite slightly broadened toward apex, 2nd tergite less wide, its length 2/3 its width. Body 3.5–4. Parasite of *Cabera pusaria* L. (Geometridae). Northwest; West Germany, Finland ..... **D. hinzi** Nixon, comb. n.

- 22 ( 1). Posterolateral smooth part of scutellum not interrupted in middle, beyond scutellar disk, by wrinkled area. First abdominal tergite somewhat parallel-sided, narrowed in apical part, 2 times as long as wide. Propodeum with longitudinal ridge.
- 23 (24). Second abdominal tergite markedly broadened, much shorter than 3rd, at base with two distinctly demarcated smooth, wide, fields. Metacarpus long, terminating slightly short of wing apex. Propodeum almost smooth, scutellum weakly punctate. Second abdominal tergite smooth. Apical segment of antennae 1.5 times as long as wide. Body, including legs, black, 2–2.5. Fig. 215: 13, 14. West, center, south; Caucasus, Kazakhstan, Central Asia; Finland .....  
 ... **D. orontes** Nixon (*mintua* Reinh. sensu Telenga), comb. n.
- 24 (23). Second abdominal tergite slightly broad, longer than 3rd, without such fields at base. Metacarpus extending slightly beyond wing apex (radial cell). Propodeum sculptured. Second abdominal tergite densely sculptured, with longitudinal elevation in middle and longitudinal depressions along its sides. Body black, legs yellowish brown. Body 2.3–2.8. Parasite of *Alcis jubata* Thunb. (Geometridae). Cocoons in compact clusters, rosy, in transverse rows. Caucasus (Armenia), Baikal Coast, Tuva Autonomous District; Western Europe ..  
 ..... **D. minuta** Reinh., comb. n.

162. **Apanteles** Förster, 1862.<sup>1</sup>—Largest genus of family Braconidae, about 1000 species, more than 380 species in the Palearctic. Far Eastern species, *A. arcuatus* Tel., *A. forensis* Tobias, *A. intercedens* Tobias, *A. kaspariyani* Tobias, *A. purgatus* Tel., *A. scaber* Tobias, *A. ussuriensis* Tel., from USSR fauna not included in the key.<sup>2</sup>

- 1 (772). Propodeum without areola, if rarely with trace of areola, then always without transverse ridge and outer margin of anal lobe of hind wing not concave.

<sup>1</sup> Wilkinson, 1945. *Trans. Roy. Entomol. Soc. London*, 95: 35–226; Nixon, 1965. *Bull. Brit. Mus. (Nat. Hist.)*, *Entomol. Suppl.*, 2: 1–284; Nixon, 1972–1976. *Bull. Entomol. Res.*, 61 (1972): 701–743; 63 (1973): —; 64 (1974): 453–524; 65 (1976): 687–732; Papp, 1976–1982. *Ann. Hist. Nat. Mus. Mat. Hung.*, 68 (1976): 251–274; 70 (1978): 265–301; 71 (1979): 235–250; 72 (1980): 241–272; 73 (1981): 263–291; 74 (1982): 255–267.

<sup>2</sup> Couplets 15 to 49 and 363 to 838 written by A.G. Kotenko, the remaining by V.I. Tobias.

- 371 2 ( 3). Second abdominal tergite with longitudinal elevation, extending to 3rd tergite; both these tergites large, forming greater part of abdominal apex. First abdominal tergite distinctly narrowed toward apex and slightly toward base, 2–2.5 times as long as wide in middle (Fig. 216: 1). First abdominal tergite smooth, others mildly punctate. Propodeum smooth, without longitudinal ridge. Antennae as long as body, tapering toward apex, quite thickened at base, preapical segment 1.5 times as long as wide. Ovipositor valves thin, thinner than 2nd segment of hind tarsus, produced as much as length of this segment. Sixth abdominal sternite very weakly sclerotized. Body black; antennae in basal half yellowish brown; mouthparts, fore- and middle tarsi and spurs of tibiae pale yellow; remaining part of legs, except hind coxae or only their base, basal half of abdomen on dorsal and ventral sides brownish yellow. Wings pale, stigma light brown. Body 1.5–1.9. Parasite of *Bucculatrix ulmella* Z. (Bucculatricidae). Southwest (Moldavia), center (Voronezh Reserve Forest); ?Armenia. (Group *A. moldavicus*.) ..... **A. moldavicus** Tobias
- 3 ( 2). Second abdominal tergite without such elevation. Combination of other characters different.
- 4 ( 11). First to 3rd abdominal tergites entirely, mildly sculptured, weakly lustrous or matte. Second abdominal tergite noticeably narrower than 3rd, approximately of same length, without oblique grooves (Fig. 217: 1, 2). Propodeum usually smooth, lustrous, with longitudinal ridge in middle. Ovipositor short. Antennae as long as or slightly longer than body. Segments in apical third of flagellum slightly longer than wide. Inner spur of hind tibiae about 1/3 of 1st tarsal segment. Mesonotum very coarsely and uniformly punctate, matte. Hind coxae smooth. Body small (1.5–1.8). Parasite of leaf-mining caterpillars of family Bucculatricidae. Cocoons inside white ribbed cocoons of host. (Group *A. carbonarius*.)
- 5 ( 6). First abdominal tergite hardly longer than wide. Sculpture of 1st to 3rd abdominal tergites relatively coarse (Fig. 217: 1). Propodeum usually wrinkled. Body black; legs brownish or yellowish; wings slightly darkened, stigma and veins pale brown. West, center; Western Europe ....  
..... **A. carbonarius** Wesm.



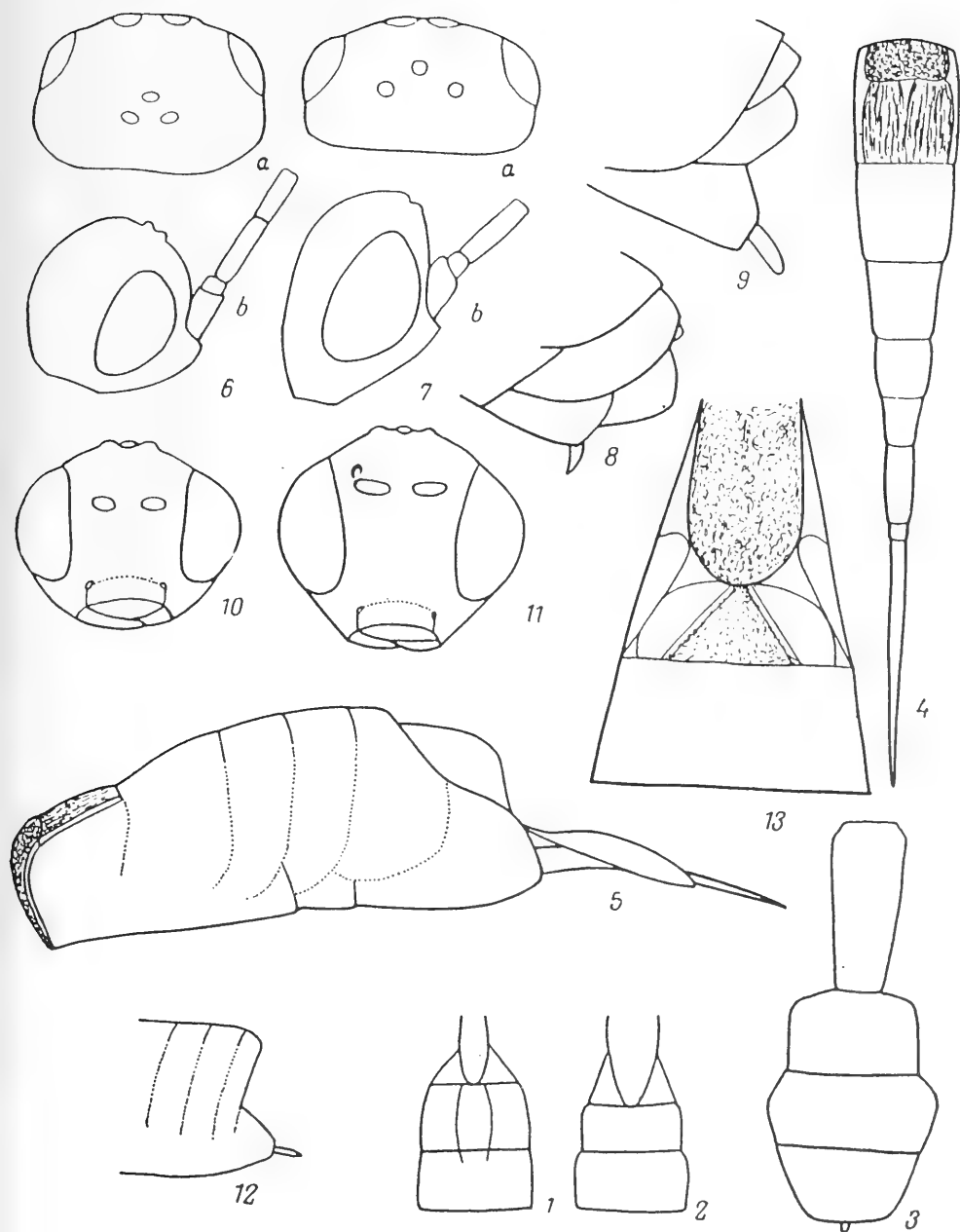


Fig. 216. Microgasterinae (from Tobias).

1, 2—1st to 3rd abdominal tergites: 1—*Apanteles moldavicus*, 2—*A. pluganii*; 3—*A. condarensis*, abdomen; 4, 5—*A. cultellatus*: 4—abdomen, dorsal view, 5—abdomen, lateral view; 6, 7—head (a—dorsal view, b—lateral view): 6—*A. ferrugineus*, 7—*A. glomeratus*; 8, 9—abdominal apex: 8—*A. glomeratus*, 9—*A. vanessae*; 10, 11—head, frontal view: 10—*A. lineola*, 11—*A. praepotens*; 12—*A. plutellae*, abdominal apex; 13—*A. rufulus*, 1st to 3rd abdominal tergites.

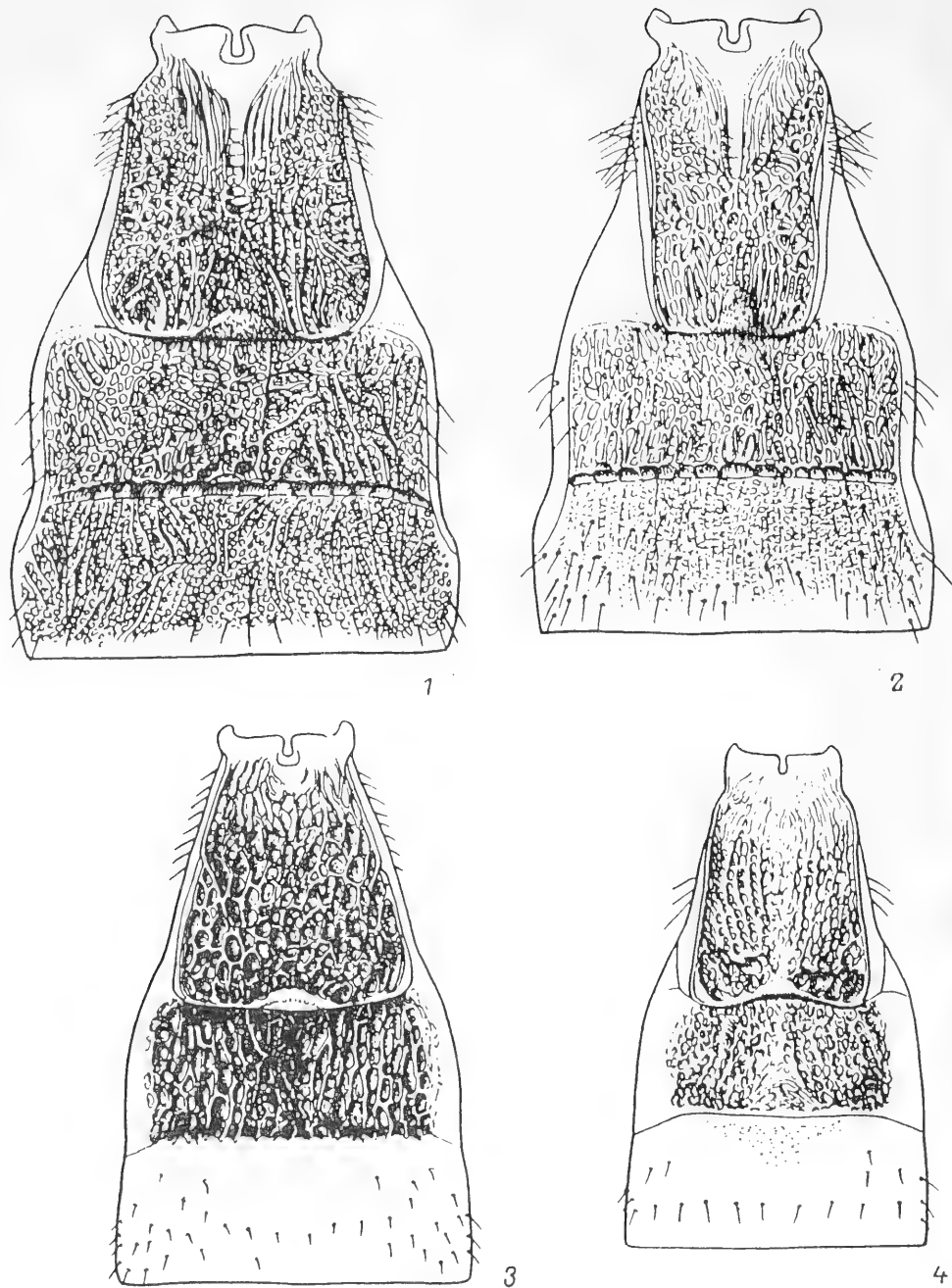


Fig. 217. Microgasterinae (from Wilkinson).

1—4—1st to 3rd abdominal tergites: 1—*Apanteles carbonarius*, 2—*A. comes*, 3—*A. villanus*, 4—*A. leucaniae*.

- 6 ( 5). First abdominal tergite much longer, somewhat narrowed from base toward apex. First to 3rd abdominal tergites more faintly sculptured. Propodeum smooth.
- 7 ( 8). First abdominal tergite slightly narrowed toward apex (Fig. 217: 2). Scutellum punctate. Coloration of body as in preceding species. Parasite of *Bucculatrix cristatella* Z. Center (Voronezh), southeast; Caucasus (Azerbaijan), Kazakhstan, Central Asia (Uzbekistan); Western Europe..... **A. comes** Wilk. (? *rimulosus* Niez.)
- 8 ( 7). First abdominal tergite markedly narrowed toward apex (Fig. 216: 2, 3). Legs and base of abdomen yellow.
- 9 ( 10). First abdominal tergite less markedly narrowed toward apex; at apex widely blunt (Fig. 216: 3). Scutellum punctate, lustrous. Parasite of *Leucoptera scitella* Z. Central Asia..... **A. condarensis** Tobias
- 10 ( 9). First abdominal tergite markedly narrowed toward apex, cuneate (Fig. 216: 2). Scutellum with sparse punctation, lustrous. Parasite of *Bucculatrix ulmella* Z. Southwest....  
..... **A. plugarui** Tobias
- 11 ( 4). Basal abdominal tergites if sculptured, then often only 1st and 2nd; if sometimes 3rd sculptured, then sculpture coarse and 2nd not narrower than 3rd. Second abdominal tergite usually with oblique grooves (if coarsely sculptured, then grooves not noticeable).
- 12 (729). Outer margin of anal lobe of hind wing projecting or straight, usually fringed with bristles; if (very rarely) concave, then mouthparts distinctly produced into proboscis.
- 13 (720). Palps normally developed, not elongate. Labio-maxillary complex not produced into proboscis, concealed or slightly projecting; if proboscis developed, then (as with undeveloped proboscis) head rounded frontally or transversely oval.
- 14 (363). Sixth (last visible) abdominal sternite uniformly and usually heavily sclerotized, without longitudinal striations (fine longitudinal folds) along lower margin. Ovipositor valves short, their broadened part, as a rule, not longer, usually shorter than 1st segment of hind tarsus (extending beyond apex of 6th sternite by not more than length of 2nd segment of hind tarsus); hairs present only at apex of valves (even when valves are relatively long). If ovipositor valves long, then either wide and falcate (*A. falcatus*) or short, pectinate (*A. validus*). In doubtful cases, anterior

- margin of postscutellum without forward directed small protuberances.
- 15 ( 22). Propodeum extremely short, with spiracles in middle of lateral margin (Fig. 218: 12). Pronotum without longitudinal groove along upper margin. Ovipositor short. At junction of sclerotized parts of radial and radiomedial veins, usually short process of 2nd radiomedial vein directed outward (Fig. 218: 13). Hind femora yellow. (Group *A. formosus*.)
- 16 ( 21). Hind coxae black. Spiracles on propodeum not interrupting lateral carina.
- 17 ( 18). Scutellum usually protuberant. Fifth segment of foretarsi in female with band in middle, appearing bisegmented; with bristle on inner side. Stigma less wide. First abdominal tergite yellow. Sixth abdominal sternite almost completely concealing ovipositor valves. Fig. 218: 1, 9. Body 3–3.5. Parasite of *Calospilos sylvata* Scop., *Abraxas grossulariata* L., *Lycia hirtarius* Cl. (Geometridae). Cocoons yellowish, isolated, on pleated filaments. Crimea, Caucasus, Western Siberia; Western Europe..... *A. formosus* Wesm.
- 372 18 ( 17). Scutellum much less protuberant. Last segment of foretarsi without band and bristle. Stigma extremely wide (Fig. 218: 13). First abdominal tergite reddish brown or black. Ovipositor valves extending far beyond apex of 6th abdominal sternite.
- 19 ( 20). First abdominal tergite reddish brown, contrasts with black middle field of second tergite. Body 2.5–3. Parasite of *Lycaena* sp. (Lycaenidae). Cocoons white, in small compact groups. Crimea, Azerbaidzhan; France.....  
..... *A. sancus* Nixon
- 20 ( 19). First abdominal tergite black, not contrasting with middle field of 2nd tergite. Body 3. Georgia .... *A. iraklii* Kotenko
- 21 ( 16). Hind coxae yellow. Spiracles on propodeum clearly interrupting lateral carina. Body 3–3.5. Parasite of *Euproctis similis* Fuessly (Lymantriidae). Czechoslovakia, Japan ...  
..... *A. pompelon* Nixon
- 373 22 ( 15). Propodeum normal sized, with spiracles far in front of middle of lateral margin. Pronotum with longitudinal groove along upper margin (may be not developed or slightly in *A. pallipes*).
- 23 (362). Ovipositor short, its valves much shorter than hind tibia (if slightly shorter, then claws pectinate). Male genitalia small, slightly produced.

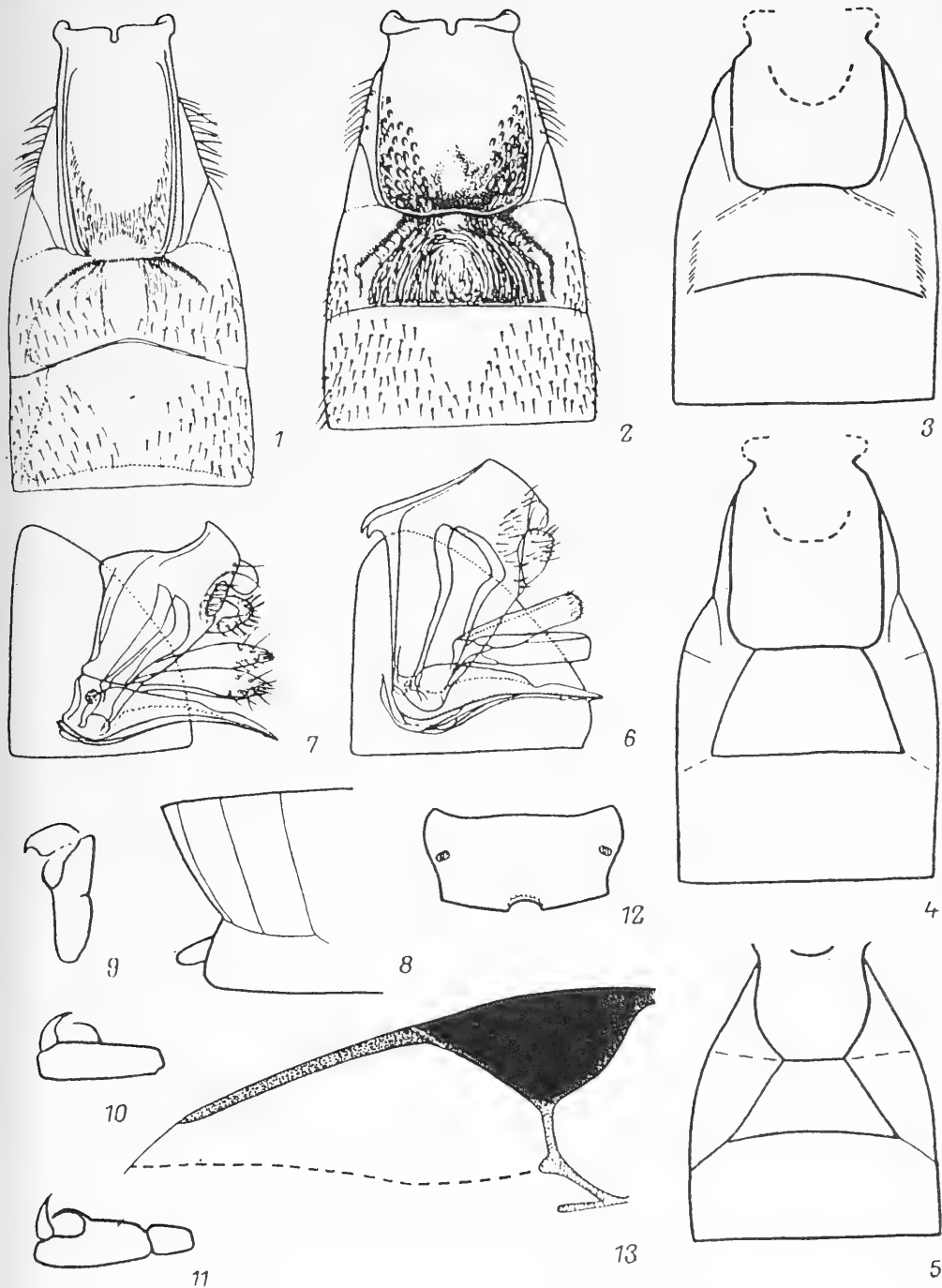


Fig. 218. Microgasterinae (from Wilkinson, Nixon and original).

1—5—1st to 3rd abdominal tergites: 1—*Apanteles formosus*, 2—*A. popularis*, 3—*A. imminis*, 4—*A. caberae*, 5—*A. hirtariae* sp. n.; 6, 7—6th abdominal sternite and ovipositor; 6—*A. formosus*, 7—*A. popularis*; 8—*A. hirtariae* sp. n., abdominal apex; 9—11—5th segment of foretarsus: 9—*A. formosus*, 10—*A. popularis*, 11—*A. caberae*; 12—*A. formosus*, propodeum, 13—*A. iraklii*, part of forewing.

- 375 24 (361). Claws simple. Ovipositor valves not longer than half of hind tibia.
- 25 ( 50). First abdominal tergite (as a rule, weakly sculptured, as the 2nd tergite also) narrowed toward base, usually with rounded posterolateral angles, at most slightly longer than wide. Propodeum usually with weak sculpture. Middle field of 2nd abdominal tergite rectangular, or if slightly striate, then oblique grooves directed toward its lateral margins (not toward posterior margin). Apical segment of foretarsi almost always with well-developed, curved bristle on lower side and depression outer to it. (Group *A. popularis*.)
- 26 ( 27). Metacarpus short, approximately 2 times as long as its distance from wing apex. Outer margin of anal lobe of hind wing with clearly noticeable fringe of bristles beyond part of its maximum width. Tangent to anterior margin of hind ocelli touches hind margin of anterior ocellus. Preapical segment of antennae approximately 2 times as long as wide. Mesonotum slightly lustrous. Propodeum almost entirely wrinkled. Apical segment of foretarsi with very weak bristle. Inner spur of hind tibiae hardly longer than outer and distinctly longer than half of 1st segment of hind tarsus. Body 2.8. Parasite of *Colotois pennaria* L. (Geometridae). England.(cf. also note to couplet 182.).....  
..... **A. chares** Nixon
- 27 ( 26). Metacarpus much longer, not less than 3 times as long as its distance from wing apex. Fringe on outer margin of anal lobe of hind wing hardly noticeable.
- 28 ( 31). Apical segment of foretarsi without bristle on inner side.
- 29 ( 30). Mesonotum and scutellum extremely smooth, with superficial punctation. Propodeum smooth, brilliantly lustrous. Body 2.8. Parasite of *Eustroma reticulata* Den. and Schiff. (Geometridae). Central Europe .....  
..... **A. mandanis** Nixon
- 30 ( 29). Mesonotum and scutellum densely and relatively coarsely punctate, matte. Propodeum wrinkled. Body 2.5. Parasite of *Hemithea aestivaria* Hb. (Geometridae). England .....  
..... **A. parallelus** Lyle
- 31 ( 28). Apical segment of foretarsi with bristle on inner side (Fig. 218: 10, 11).
- 32 ( 47). Bristle on inner side of foretarsi firm, with depression behind it (Fig. 218: 11).
- 33 ( 36). Genae with distinct whitish spot.

- 34 ( 35). Hind femora black or intensely darkened all over. Middle field of 2nd abdominal tergite smooth for most part, nearly triangular. Body 2.5–2.8. Central belt, south; Central Europe..... **A. andromica** Nixon
- 35 ( 34). Hind femora reddish yellow. Middle of 2nd abdominal tergite sculptured, nearly rectangular. Body 2.5–3. Parasite of *Plagodis dolabraria* L., *Erannis difoliaria* Cl. (Geometridae). Central belt, south; England, Bulgaria .....  
..... **A. enephes** Nixon
- 36 ( 33). Genae without whitish spot, entirely black.
- 37 ( 38). Propodeum behind spiracles with weak transverse carina, delimiting much smoother and more lustrous posterolateral field compared to middle part. Preapical segment of antennae more than 1.5 times as long as wide. Mesonotum densely punctate with satiny sheen. First abdominal tergite 1.3–1.4 times as long as its maximum width. Hind femora reddish yellow, sometimes somewhat darkened. Body 2.5–2.8. Parasite of *Abraxas glossulariata* L. (Geometridae). South; Kazakhstan; Scotland, France .....  
..... **A. endemus** Nixon
- 38 ( 37). Propodeum without carina behind spiracles.
- 39 ( 42). Oblique grooves on 2nd abdominal tergite directed laterad (Fig. 218: 3), not extending up to its hind margin, field between them expansive, clearly widened, very much quadrangular.
- 40 ( 41). Middle field of 2nd abdominal tergite intensely wrinkled. Radial vein originates from stigma near its middle. Bristle on apical segment of foretarsi much more curved, smaller, body smaller, 2.5–2.8. Antennae as long as body. Mesonotum mildly punctate, with satiny sheen. Metacarpus 5–6 times as long as its distance from wing apex. First abdominal tergite 1.3 times as long as its maximum width. Coloration of hind femora variable from brownish yellow to almost black. Parasite of *Operophtera brumata* L., *Erannis defoliaria* Cl., *Bupalus piniarius* L., *Cabera pusaria* L., *Electrophaes corylata* Thunb., *Oporinia dilutata* Den. and Schiff., *Campaea margaritata* L. (Geometridae), *Hypena proboscidalis* L. (Noctuidae), *Orgyia antiqua* L. (Lymantriidae). Cocoons isolated, yellowish. Center, southwest, south; Armenia, Kazakhstan, Western Siberia; Western Europe.....  
..... **A. immunis** Hal.

- 41 ( 40). Middle field of 2nd abdominal tergite weakly sculptured, almost smooth. Radial vein originates from stigma noticeably close to its apex. Bristle on apical segment of foretarsi almost straight. Body larger, 3–3.5. (cf. also couplet 43.) . . . . . **A. caberae** Marsh.
- 42 ( 39). Groove on 2nd abdominal tergite directed toward suture between 2nd and 3rd tergites, distinctly reaching up to posterior margin of 2nd tergite, field between them triangular or almost triangular (Fig. 218: 5).
- 43 ( 44). Hind femora reddish yellow. Inner spur of hind tibiae much longer than outer, equal to 7/10 length of 1st segment of hind tarsus. Body larger, 2.5–3. Antennae slightly longer than body, preapical segment almost 2 times as long as wide. Mesonotum with satiny sheen. Sculpture of middle field of 2nd abdominal tergite usually very weak. Parasite of *Cabera pusaria* L., *Bupalus piniarius* L., *Ernomos fuscantaria* Hw., *Biston betularius* L., *Iodis lactearia* L. (Geometridae). Cocoons white. Center, southwest, south; Sweden, England, Central Europe. (cf. also couplet 41.) . . . . . **A. caberae** Marsh. (*mihalyii* Papp)
- 376 44 ( 43). Hind femora black or brown. Inner spur of hind tibiae hardly longer than outer, slightly longer than half of 1st segment of hind tarsus. Body smaller, 1.8–2.3. Mesonotum densely and mildly punctate, matte or almost matte. First abdominal tergite approximately 1.3 times as long as its maximum width.
- 45 ( 46). Metacarpus 4 times as long as its distance from wing apex. Radiomedial vein forms slightly curved line with sclerotized 1st section of radial vein, 2/3 of this section equal to section of medial vein between it and recurrent vein. Middle field of 2nd abdominal tergite smooth. Body 2.3. Armenia. . . . . **A. armeniacus** Tobias
- 46 ( 45). Metacarpus 3 times as long as its distance from wing apex. Radiomedial vein forms distinct angle with sclerotized 1st section of radial vein, slightly longer than this section and much longer than section of medial vein between it and recurrent vein. Hind femora brown. Middle field of 2nd abdominal tergite slightly sculptured in posterior half (Fig. 218: 5). Sixth abdominal sternite slightly blunt (Fig. 218: 8); ovipositor slightly produced beyond its apex. Body 1.8–2. Parasite of *Lycia hirtarius* Cl. (Geometridae).



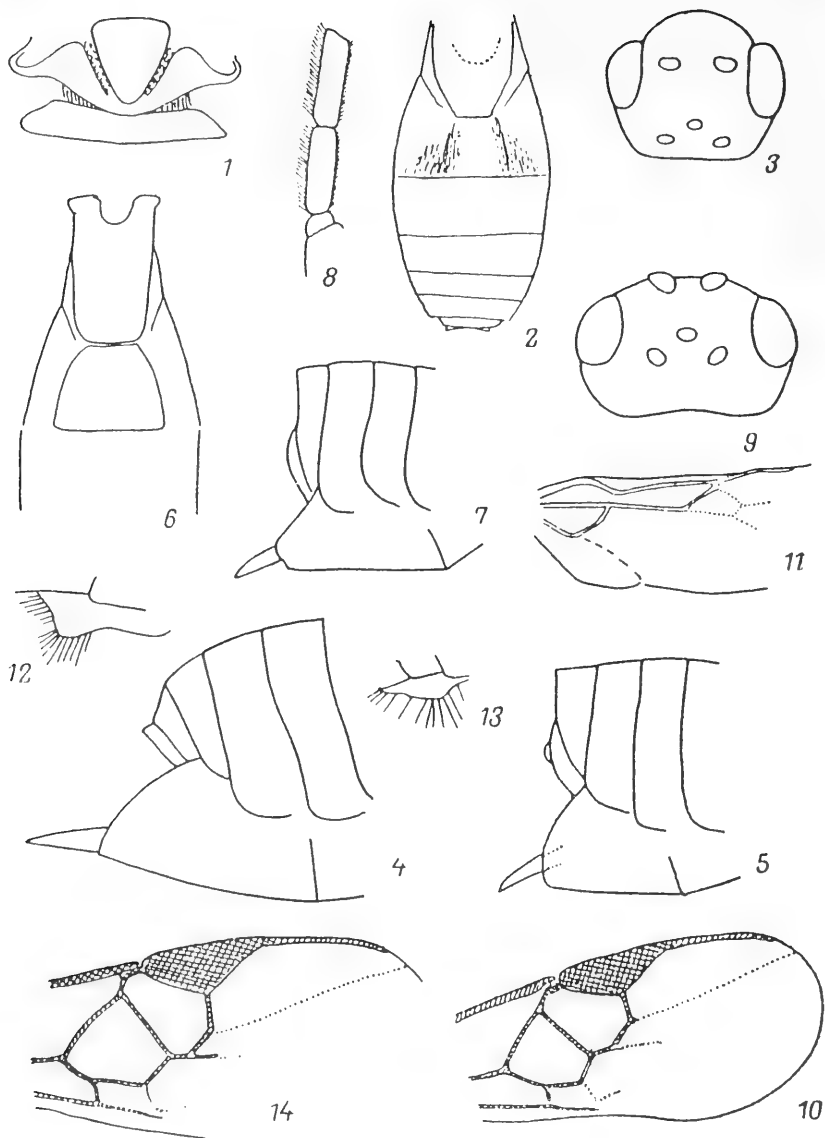
Cocoons rosy, with paler ribs, isolated. Southeast.....  
 ..... **A. hirtariae** Kotenko and Tobias, sp. n.

Holotype: Female, "Volgograd Region, from caterpillars of *Biston hirtaria* Cl., 26.VI.1963". Paratypes: 1 female and 1 male, same place.

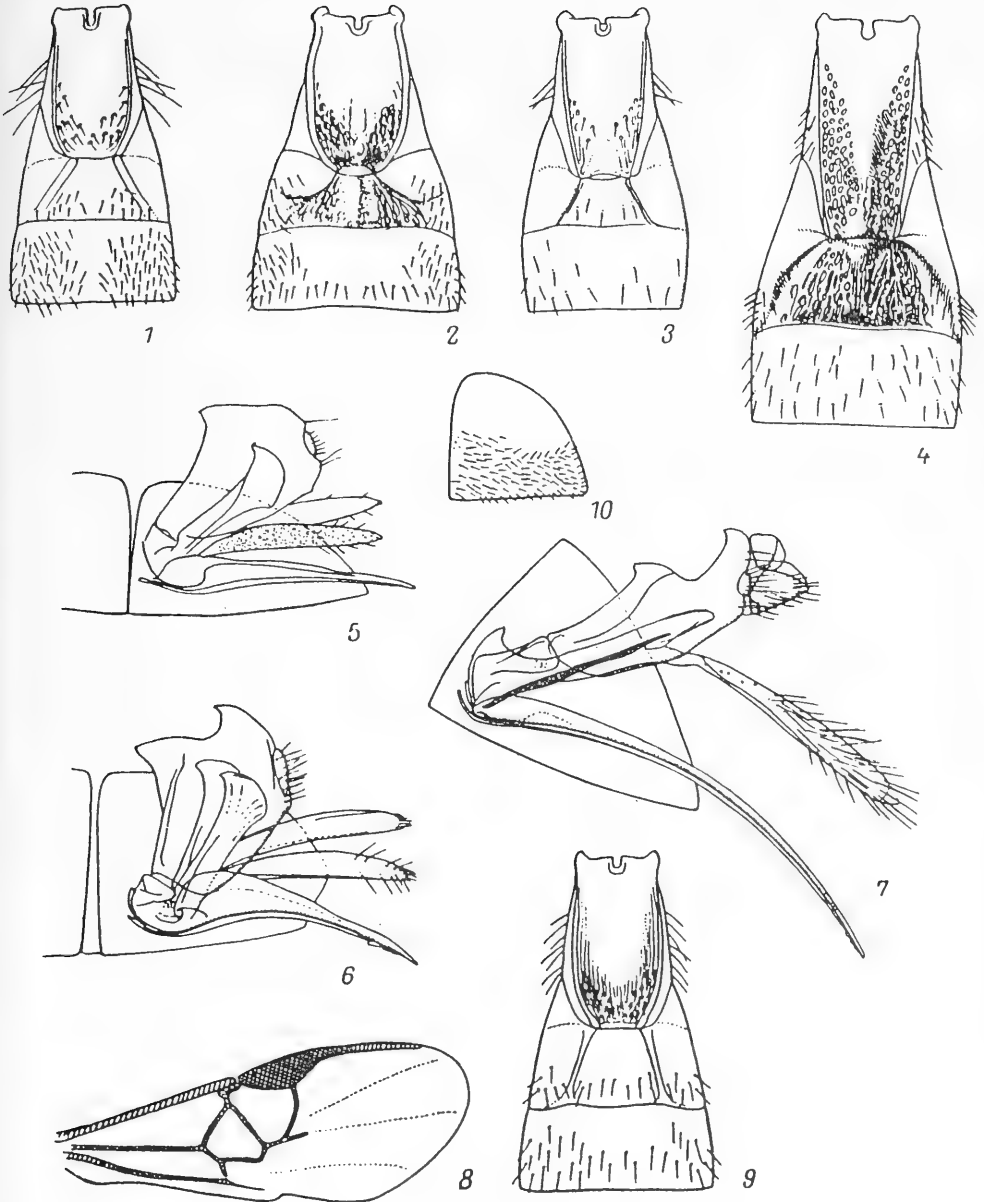
- 47 ( 32). Bristle on inner side of foretarsi weak, depression behind it absent (Fig. 218: 10). Hind femora somewhat darkened, often black.
- 48 ( 49). Sixteenth and 17th segments of antennae distinctly longer than wide. Antennae approximately as long as thorax and abdomen together. Inner spur of hind tibiae hardly longer than outer. Oblique grooves on 2nd abdominal tergite somewhat curved. Mesonotum matte in anterior and lustrous in posterior part. Propodeum almost entirely smooth, intensely lustrous; 1st and 2nd abdominal tergites weakly sculptured. Sixth abdominal sternite extremely short, almost rectangular in lateral view. Fig. 218: 2, 7, 10. Body 2.5. Parasite of *Hypacrita jacobaeae* L. (Arctiidae). Cocoons white, in clusters. South; Western Europe.....  
 ..... **A. popularis** Hal.
- 49 ( 48). Sixteenth and 17th segments of antennae square or almost square. Antennae short. Inner spur of hind tibiae distinctly longer than outer. Grooves on 2nd abdominal tergite straight. Body 2.5. West Germany.....  
 ..... **A. iapetus** Nixon
- 50 ( 25). First abdominal tergite if short and narrow toward base (or parallel-sided), then propodeum somewhat coarsely rugose-punctate. If propodeum with faint sculpture, then 1st abdominal tergite narrowed toward apex, usually right from base (somewhat cuneate), occasionally from its apical third. Apical segment of foretarsi usually without curved bristle on lower side and depression behind it. If these characters present, then 1st abdominal tergite distinctly narrowed toward apex but middle field of 2nd tergite triangular or propodeum, also 1st and 2nd abdominal tergites, with strongly developed sculpture.
- 51 ( 52). Abdomen compressed; 1st abdominal tergite slightly broadened from base to apex, long (2 times as long as wide), with rounded posterolateral angles, 2nd abdominal tergite square, without oblique grooves (Fig. 216: 4). Propodeum, 1st and 2nd abdominal tergites densely rugose-punctate, propodeum and 1st tergite with median

- longitudinal ridge. Broadened part of ovipositor valves as long as 1st segment of hind tarsus. Apical segments of antennae square. Hind femora black. Fig. 215: 4, 5. Body 2.9. Central Asia. (Group *A. cultellatus*, nov.).....
- ..... **A. cultellatus** Tobias
- 52 ( 51). Abdomen, if compressed, then to a lesser degree and only at apex. If very compressed, then 1st tergite distinctly narrowed toward apex but 2nd tergite with oblique grooves or 1st tergite not so long and 2nd tergite broad.
- 53 (120). Propodeum, as also usually 1st and 2nd abdominal tergites, weakly sculptured, almost smooth or extremely densely but mildly sculptured without coarse folds. First abdominal tergite either gradually and distinctly narrowed from base to apex or rarely almost parallel-sided and distinctly narrowed at apex. Middle field of 2nd abdominal tergite triangular, grooves delimiting it directed toward suture between 2nd and 3rd tergites. Apical segment of foretarsi sometimes with bristle on inner side and depression behind it.
- 54 ( 57). Sclerotized part of radial vein forms uniformly slightly curved line. First abdominal tergite parallel-sided, rounded at apex. Second abdominal tergite with very widely separated grooves (Fig. 220: 1, 9), almost smooth, propodeum densely punctate, slightly lustrous with metallic tinge. Large spur of hind tibiae longer than half of 1st tarsal segment. Antennae as long as body, apical segments slightly longer than wide. (Group *A. octonarius*).
- 55 ( 56). Apical segment of foretarsi with bristle on lower side. Sixth abdominal sternite weakly developed, blunt at apex. Ovipositor valves slightly produced, parallel-sided, rounded at apex. First abdominal tergite softly sculptured. Hind femora yellow. Fig. 220: 8–10. Body 2.5. Parasite of *Lithosia quadra* L. (Lithosiidae), *Eilema deplana* Esp. (Arctiidae). Caucasus (Georgia); England, Central Europe..... **A. octonarius** Ratz.
- 56 ( 55). Apical segment of foretarsi without bristle on lower side. Sixth abdominal sternite large, extending beyond abdominal apex, blunt; ovipositor valves distinctly produced beyond 6th sternite, pointed toward apex. First abdominal tergite almost smooth. Hind femora somewhat darkened. Fig. 220: 1, 5. Parasite of *Euproctis similis* Fuessly, *E. chryssorrhoea* L. (Lymantriidae). Cocoons white or yellow, in

- clusters. Center, south, east; Caucasus, southern Siberia; Western Europe.....**A. inclusus** Ratz. (*rectinervis* Tel.)
- 57 ( 54). Sclerotized part (first section) of radial vein and radiomedial vein from somewhat distinct angle.
- 58 ( 59). Lateral smooth part of scutellum wide, separated from its apex by groove slightly widening toward front (Fig. 219: 1). First abdominal tergite 1.5 times as long as wide, parallelsided, rounded only at apex. Middle field of 2nd abdominal tergite wide (Fig. 220: 2). Antennae as long as body, apical segments of flagellum longer than wide. Large spur of hind tibiae half as long as 1st tarsal segment or slightly shorter. All femora and major part of tibiae dark brown or black. Propodeum in basal half smooth, in apical half wrinkled. Mesonotum dense but delicately punctate, weakly lustrous, scutellum smooth. Body 2–2.5. Parasite of *Pseudoterpna pruinata* Hfn. (Geometridae). Cocoons white with yellowish tinge, in small clusters. Center; Western Europe. (Group *A. triangulator*) ..... **A. triangulator** Wesm.
- 59 ( 58). Lateral smooth part of scutellum narrower, separately from its apex by depression, distinctly broadened in front. First abdominal tergite not less than 2 times as long as wide in middle, either narrowing from base to apex or (rarely) only in apical third. Middle field of 2nd abdominal tergite not broad (base of triangle not greater than sides). Legs usually sclerotized.
- 60 ( 63). Second abdominal tergite entirely wrinkled, its oblique grooves not clear (Fig. 220: 1). Propodeum with longitudinal ridge, with dense rugose punctation in apical half, matte. Groove along upper margin of sides of mesonotum sometimes not developed or faint. Mesonotum very coarsely, but not densely punctate, weakly punctate posteriorly, lustrous. Large spur of hind tibiae as long as 1st tarsal segment or slightly shorter. Sixth abdominal sternite short, at apex blunt. Cocoons white, in compact clusters, wound in common white filament. (Group *A. pallipes*.)
- 61 ( 62). Sculptured part of 2nd abdominal tergite usually slightly broad or as long as wide at apex (Fig. 222: 1). Pronotum with slight groove along upper margin or without it. Preapical antennal segments 1.5–2 times as long as wide. Legs brownish yellow, sometimes coxae and apex of hind femora darkened. Hind coxae intensely and densely punctate, slightly lustrous. Body 2.5–3. Parasite of *Diachrysia*



- 1—*Apanteles triangulator*, scutellum and postscutellum; 2—*A. menander*, abdomen; 3—*A. nigerrimus*, head; 4, 5—abdominal apex: 4—*A. porthetriae*, 5—*A. vitripennis*; 6—*A. anchisiades*, 1st to 3rd abdominal tergites; 7—*A. acasta*, abdominal apex; 8—*A. aletta*, anterinal base; 9—12—*A. fulvipes*: 9—head, 10—forewing, 11—hind wing, 12—paramere of genitalia, male; 13—*A. acasta*, paramere of genitalia, male; 14—*A. luciana*, part of forewing.



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Fig. 220. Microgasterinae (from Wilkinson and Nixon).

1—4—1st to 3rd abdominal tergites: 1—*A. inclusus*, 2—*A. triangulator*, 3—*A. thompsoni*, 4—*A. lateralis*; 5—7—sixth abdominal sternite and ovipositor: 5—*A. inclusus*, 6—*A. thompsoni*, 7—*A. lateralis*; 8—10—*A. octonarius*: 8—forewing, 9—1st to 3rd abdominal tergites, 10—sixth abdominal sternite.

- chrysitis* L., *Autographa gamma* L., *A. pulchrina* Hw. (Noctuidae), *Haritala ruralis* Scop. (Pyraustidae). Northwest, west, center; Caucasus, Far East; Western Europe, North America ..... **A. pallipes** Reinh.
- 62 ( 61). Sculptured part of 2nd abdominal tergite extremely broad, half as long as wide at apex. Pronotum with deep groove along upper margin. Preapical antennal segment 1.3–1.5 times as long as wide. Legs including coxae, yellow. Hind coxae weakly punctate, lustrous. Body 2. Southwest.....  
..... **A. palabundus** Tobias, sp. n.  
Holotype: Female, Transcarpathian Region, Beregov District, village Varsivo, 1978 (M. Sevryukova). Paratypes: 19 females, same data (all from a single batch of cocoons).
- 63 ( 60). Sculpture of 2nd abdominal tergite weak, not concealing oblique grooves. Propodeum without longitudinal ridge (except *A. antioe*, in which propodeum has coarse sculpture, but lustrous, weak ridge occasionally present in *A. fulvipes*), usually without clear rugosity, somewhat punctate or smooth. Groove along upper margin of pronotal side always distinct.
- 64 ( 65). Body small, not more than 2. Mesonotum finely and densely punctate, matte, with metallic tinge. Sclerotized part (first section) of radial vein much shorter than radio-medial vein. Legs brown to almost black. Oblique grooves of smooth 2nd abdominal tergite directed toward its hind margin (Fig. 222: 2). Large spur of hind tibiae shorter than half of 1st segment of hind tarsus. Sixth abdominal sternite short. Sides and underside of thorax weakly punctate. Cocoons in clusters, white, compactly arranged in transverse rows. Parasite of *Semiaspilates ochrearius* Rossi, *Perconia strigillaria* Hb., *Scotopteryx bipunctaria* Den. and Schiff., *Ourapteryx sambucaria* L., *Selidosema plumaria* Den. and Schiff. (Geometridae). South; Kazakhstan, Central Asia, Siberia (Tuva Autonomous District); Western Europe. (Group *A. fraternus*) .....  
..... **A. fraternus** Reinh.
- 65 ( 64). Mesonotum usually with sparse punctation, lustrous (if densely punctate, then somewhat coarse and without metallic sheen). First section of radial vein usually not short or slightly shorter than radio medial vein (except in *A. rufulus*). Legs light colored. Body larger, usually 3–3.5; if small, then sides and underside of thorax with quite

coarse and dense punctation and tegulae light colored. Cocoons either isolated or in loose clusters.

- 66 ( 67). Head massive, broadened behind eyes, temples 2 times as long as transverse diameter of eye. Thorax depressed, 2 times as long as high. Antennae short, thickened, segments in apical half square and wide. Mesonotum weakly punctate, lustrous. Hind femora reddish brown. Body 2.2. Central Asia. (Group *A. stackelbergi*, nov.) .....  
 ..... **A. stackelbergi** Tel.  
 Lectotype: Female, "near river Sary-bel", Fergana", 11.VIII.1928 (V. Kuznetsov). Paralectotypes: 2 specimens, same data (both specimens highly damaged, without abdomen).
- 378 67 ( 66). Abdomen of usual structure, roundly narrowed behind eyes, temples not longer than eye. Thorax not depressed, significantly less than 2 times as long as high. (Group *A. vitripennis*.)
- 68 ( 69). Antennae extremely short, much shorter than body, segments in apical half square and wide. Face extremely broad, 1/2 as high as wide. Body including 1st and 2nd abdominal tergites slightly sculptured, lustrous, black, hind femora brownish yellow. Fig. 220: 3, 6. Body 2.5. Parasite of *Ostrinia nubilalis* Hb. (Pyraustidae). Cocoons white, in clusters. Center; Western Europe, introduced into the USA . .  
 ..... **A. thompsoni** Lyle
- 69 ( 68). Antennae not shorter or slightly shorter than body, with longer segments. Face less wide.
- 379 70 (115). Body black, only abdomen sometimes with somewhat developed light colored pattern.
- 71 ( 74). Metacarpus short, 2–2.5 times as long as its distance from wing apex (radial cell). Preapical segment of antennae slightly (usually not more than 1/3) longer than wide. Apical segment of foretarsi without bristle, spurs of hind tibiae almost similar, about 1/2 as long as 1st segment of tarsus.
- 72 ( 73). Foretarsi with extremely short segments, second segment slightly longer than wide. Face slightly bulged. Body stout. Mesonotum weakly punctate, lustrous. Propodeum densely and mildly rugose, matte. First abdominal tergite almost similarly sculptured, short. Middle field of 2nd abdominal tergite longitudinally striate, with wide oblique grooves along sides, wrinkled. Sixth sternite quite large,

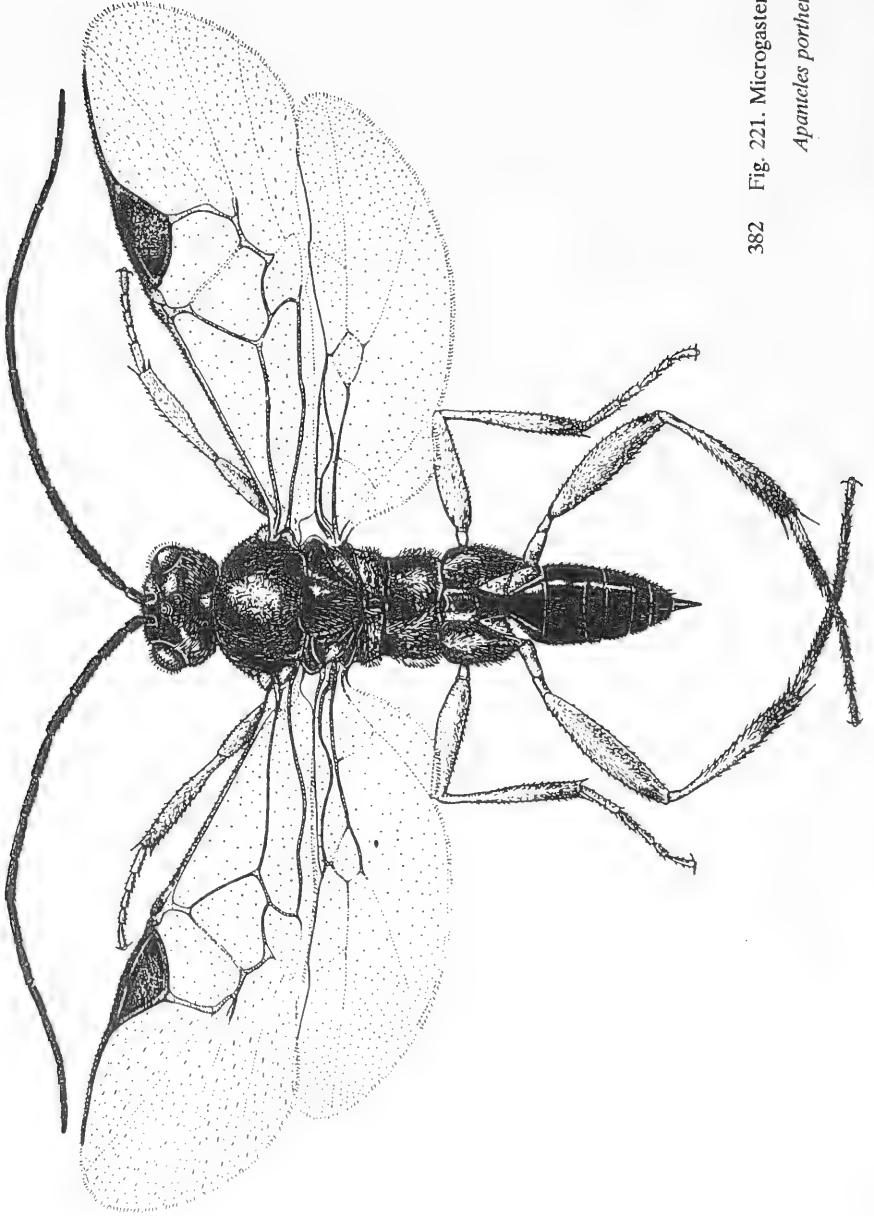
- slightly pointed. Ovipositor valves short. Figs. 219: 2; 222: 12. Body 2.5. Scotland, Finland .....
- ..... **A. menander** Nixon
- 380 73 ( 72). Foretarsi of usual structure, 2nd segment approximately 2 times as long as wide. Face markedly bulged (Fig. 219: 3). Propodeum and middle field of 2nd abdominal tergite mildly wrinkled. First abdominal tergite almost parallel-sided, distinctly narrowed at apex, 2 times as long as wide in middle. Sixth abdominal sternite and ovipositor valves weakly developed. Body 2. Novaya Zemlya .....
- ..... **A. nigerrimus** Roman
- 74 ( 71). Metacarpus long, 4–6 times as long as its distance from wing apex. If short (*A. fulvipes*), then antennae thin and long, their preapical segments 1.5–2 times as long as wide.
- 75 ( 82). Hind coxae densely punctate, matte.
- 76 ( 77). Inner spur of hind tibiae shorter than half of 1st segment of hind tarsus. Mesonotum and sides of mesothorax, except small smooth field behind sternauli quite densely and relatively coarsely punctate. Apical segment of foretarsi with weakly curved bristle. Ovipositor slightly produced. Hind coxae brown, hind femora brownish yellow. Body 3–3.5. Parasite of *Parasemia plantaginis* L. (Arctiidae), *Abraxas grossulariata* L. (Geometridae), *Noctua orbona* Hfn. (Noctuidae). Cocoons white, in clusters. West, south (Khar'kov Region), Caucasus (Georgia); Western Europe .....
- ..... **A. callidus** Hal.
- 77 ( 76). Inner spur of hind tibiae noticeably longer than half of 1st segment of hind tarsus. Mesonotum delicately punctate, lustrous, sides of mesothorax with large, smooth surface. Apical segment of foretarsi without bristle. Hind coxae black, hind femora brownish yellow.
- 78 ( 79). Ovipositor quite long, part of ovipositor valves produced beyond 6th sternite, as long as 1st segment of hind tarsus. Preapical segment of antennae about as long as wide (not more than 1.5 times). Abdominal tergites black. Fig. 220: 4, 7. Body 2.5–3. Parasite of *Anthophila fabriciana* L. (Choreutidae). Cocoons white, isolated. Center, south; Caucasus; Western Europe.....
- ..... **A. lateralis** Hal.
- 79 ( 78). Ovipositor short, its valves hardly produced beyond 6th sternite. Preapical segment of antennae more than 1.5



- times as long as wide. Third and 4th abdominal tergites may be with somewhat developed lustrous pattern.
- 80 ( 81). Nervulus divides posterior side of discoidal cell into almost equal sections. Preapical segment of antennae almost 2 times as long as wide. Body 3.2–3.5. England, Sweden..... **A. aliphera** Nixon
- 81 ( 80). Section of posterior side of discoidal cell before nervulus 2/3 of section beyond it. Preapical segment of antennae 1.5 times as long as wide. Body 3.5. Krasnodar Territory (Sochi), Trans-Caucasian Republics ..... **A. sublateralis** Tobias
- 82 ( 75). Hind coxae weakly and sparsely punctate, lustrous.
- 83 ( 88). Sternauli faintly, but definitely wrinkled. Apical segment of foretarsi without bristle. Sixth abdominal sternite slightly pointed. Ovipositor short.
- 84 ( 87). Inner spur of hind tibiae slightly longer than outer, slightly shorter than half of 1st segment of hind tarsus.
- 85 ( 86). Head and thorax faintly and sparsely punctate for most part, lustrous. Mesonotum coarsely punctate, lustrous. Propodeum coarsely wrinkled with somewhat developed longitudinal ridge, lustrous. Preapical segment of antennae 1.3 times as long as wide. First abdominal segment with sparse punctation, lustrous. Middle field of 2nd abdominal tergite almost smooth. Hind coxae, except dark basal third part, and hind femora yellow. Body 2.3. Austria..... **A. antinoe** Nixon
- 86 ( 85). Head finely and densely punctate, matte; thorax with quite coarse and dense punctation, matte, only sides of mesothorax above sternauli and sides of metathorax smooth. Propodeum with smooth wrinkles, without longitudinal ridge. Preapical segment of antennae 1.5 times as long as wide. First abdominal tergite and middle field of 2nd tergite quite densely punctate, slightly lustrous. Hind legs brownish yellow; upper side of coxae, trochanters, apices of femora and tibiae and tarsi brownish yellow. Metacarpus 4 times as long as its distance from apex of radial cell. First abdominal tergite almost parallel-sided, only narrowed at apex, 2 times as long as wide. Wings weakly darkened, stigma with faint, pale basal spot. Body 1.9. Southwest..... **A. penelopeus** Tobias, sp. n.  
Holotype: Female, Kishinev, 25.V.1960 (V. Talitskii).

- 87 ( 84). Inner spur of hind tibiae much longer than outer and half of 1st segment of hind tarsus. Head and mesonotum slightly punctate, lustrous. Propodeum smooth, without longitudinal ridge. Apical segments of antenna square. First abdominal tergite parallel-sided, only in apical third distinctly and roundly narrowed and only here weakly sculptured. Second abdominal tergite smooth, with oblique grooves directed laterad and reaching only up to its middle (Fig. 232: 1). Hind femora brownish yellow, with small dark spot at apex (in male entirely black). Hind tibiae brown in apical third. Coxae black, spurs of hind legs white. Base of 1st abdominal tergite yellow. Basal abdominal sternite yellow. Wings weakly darkened. Body 2.2. Parasite of *Quercusia quercus* L. (Lycaenidae). Crimea.....**A. querceus** Tobias, sp. n.  
 Holotype: Female, Bakhchisarai, from caterpillars of *Q. quercus*, 28.V.1982 (Evstafev). Paratypes: 1 female, 2 males, same data.
- 88 ( 83). Sternauli smooth (sometimes not developed at all). Mesonotum usually finely punctate, but propodeum, at most, softly wrinkled, without trace of longitudinal ridge.
- 381 89 ( 92). Ovipositor valves produced far beyond abdominal apex, noticeably broadened toward apex, their hairy part 7/10 of 1st segment of hind tarsus or even longer. Two preapical segments of antennae almost 2 times as long as wide.
- 90 ( 91). Antennae profusely hairy (Fig: 219: 8). Hind coxae almost absolutely smooth, entirely yellow or darkened only at base. Abdomen often with distinctly developed reddish yellow pattern on tergite (except 1st). Body 3.5. Parasite of *Anthophila fabriciana* L. (Choreutidae). England, Austria, East Germany, Sweden, Finland..... **A. fausta** Nixon
- 91 ( 90). Antennae with very short and sparse hairs. Hind coxae delicately wrinkled longitudinally, legs and underside of abdomen yellow, abdominal tergites dark colored. Ovipositor valves as long as first two segments of tarsus. Body 3. West (Latvia); Hungary.....  
 ..... **A. magnicoxis** Jakim. (*eugeni* Papp)
- 92 ( 89). Ovipositor valves short, if greatly produced, then pointed toward apex and covered with hairs, significantly less than 7/10 of 1st segment of hind tarsus.
- 93 ( 94). Abdomen strongly compressed, with extremely long 6th sternite, produced far beyond abdominal apex, and

- pointed. First to 3rd abdominal tergites as in Fig. 222: 3. Ovipositor valves quite long, straight, pointed toward apex. Hind coxae in apical part usually yellow. Apical segment of hind tarsus without bristle. Forewing entirely covered with bristles. Antennae long and thin, two preapical segments 2 times as long as wide. Body 3–3.5. Parasite of *Ocnogyna picretti* Rambur, *O. loewii* Z., *Arctia villica* L., *Phragmatobia fuliginosa* L., *Spilosoma mendica* Cl. (Arctiidae). Cocoons white, in clusters (up to 200 together). Northwest, north, south; Caucasus, Kazakhstan; Western Europe, Turkey, North America . . . . . **A. compressiventris** Mues.
- 94 ( 93). Abdomen not compressed or compressed only at apex, and more weakly compressed from sides, with shorter, not produced or slightly produced and less pointed 6th sternite.
- 95 ( 98). Membrane of forewing, at least in basal half of submedial cell and, usually, also along mediocubital vein in medial cell without bristles. Preapical segment of antennae 1.5–2 times as long as wide. Hind femora brownish yellow, somewhat darkened at apex.
- 96 ( 97). Sixth abdominal sternite quite large, pointed. Apical segment of foretarsi with faint, sometimes almost unnoticeable bristle. Hind coxae at apex sometimes yellow. Figs. 219: 4; 221; 224: 1. Body 3–3.5. Parasite of *Lymantria dispar* L. (Lymantriidae); cocoons white, in clusters. Center, south; Caucasus, south of Eastern Siberia; Central Europe, North Africa (Morocco) . . . . . **A. porthetriae** Mues.
- 97 ( 96). Sixth abdominal sternite short, blunt. Apical segment of foretarsi with large curved bristle. Hind coxae entirely black. Figs. 219: 5; 222: 5, 6. Body 3–3.5. Parasite of *Acronicta psi* L., *Eupsilia transversa* Hfn., *Catocala nupta* L., *Cucullia verbasci* L. (Noctuidae), *Biston stratararius* Hfn., *Cabera pusaria* L., *Chesias legatella* Den. and Schiff., *C. rufata* F., *Cleorodes lichenaria* Hfn., *Alcis repandata* L., *Earophila badiata* Den. and Schiff., *Operophtera brumata* L., *Thera juniperata* L. (Geometridae), *Archips rosana* L. (Tortricidae), *Plutella maculipennis* Curt. (Plutellidae), *Yponomeuta cognatellus* Hb., *Y. padellus* L., *Y. malinellus* Z. (Yponomeutidae). Cocoons white, isolated. Northwest, center; Caucasus, Kazakhstan,



382 Fig. 221. *Microgasterinae* (original).

*Apanicles porthetriacae* Mues.

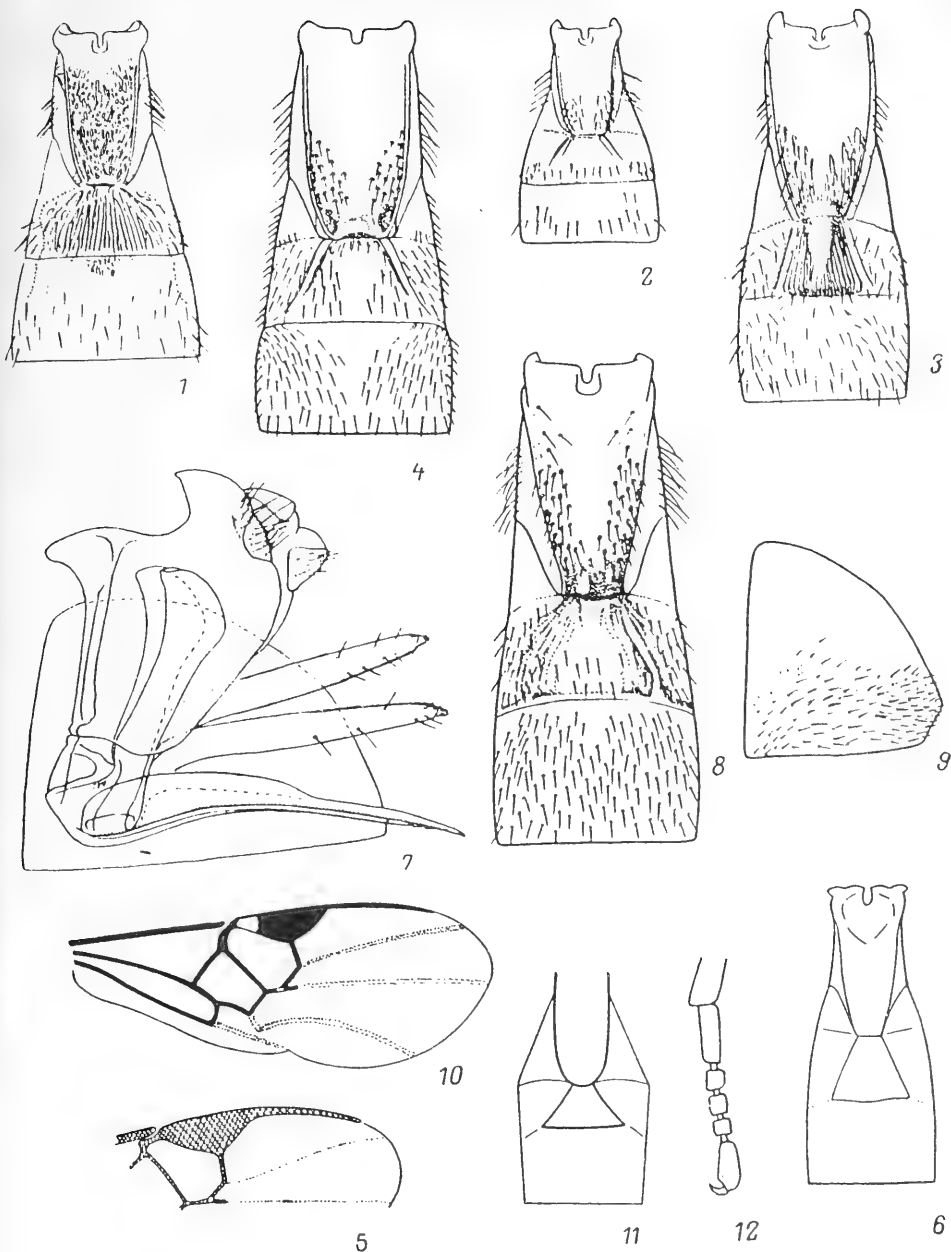


Fig. 222. Microgasterinae (from Wilkinson, Nixon and Balevskii).

1—4—1st to 3rd abdominal tergites: 1—*Apanteles pallipes*, 2—*A. fraenatus*, 3—*A. compressiventris*, 4—*A. liparidis*; 5, 6—*A. vitripennis*: 5—part of forewing, 6—1st to 3rd abdominal tergites; 7—*A. liparidis*, 6th abdominal sternite and ovipositor; 8, 9—*A. pini-cola*: 8—1st to 3rd abdominal tergites; 9—6th abdominal sternite; 10, 11—*A. intermedius*: 10—forewing, 11—1st to 3rd abdominal tergites; 12—*A. menander*, foretarsus.

- Central Asia, Siberia (Irkutsk Region); Western Europe, introduced into North America ..... **A. vitripennis** Curt.
- 98 ( 95). Membrane of forewing uniformly pubescent; if basal part of submedial cell almost without bristles, then stigma at base with pale spot.
- 99 (100). First abdominal tergite somewhat parallel-sided, rounded only in apical part; middle field of 2nd abdominal tergite as broad-based triangle (Fig. 219: 6), somewhat sculptured. Sixth sternite and ovipositor valves short. Nervulus divides posterior side of discoidal cell into approximately equal segments. Inner spur of middle tibiae slightly longer than first segment of middle tarsus. Apical segment of foretarsi with curved bristle. Preapical segment of antennae 2 times as long as wide. Hind femora yellow, darkened along upper side. Body 3–3.5. Parasite of *Alcis repandata* L., *Oporinia autumnata* Bkh., *O. dilatata* Den. and Schiff. (Geometridae). Kola Peninsula; north of Western Europe, Switzerland ..... **A. anchisiades** Nixon
- 100 ( 99). First abdominal tergite of form usual for group; gradually narrowing from base toward apex. Middle field of 2nd tergite narrower. If 1st and 2nd tergites almost as those in couplet (in *A. liparidis*) then middle field of 2nd tergite smooth and 6th sternite and ovipositor much longer.
- 101 (104). Apical segment of foretarsi with curved bristle on lower side, with depression toward its outer side.
- 102 (103). Inner spur of middle tibiae shorter than 1st segment of middle tarsus. Spurs of hind tibiae almost alike. Bristle on apical segment of foretarsi relatively weakly developed, depression behind it small. Preapical segment of antennae 1.5 times as long as wide. Sixth abdominal sternite and ovipositor very distinctly developed. Hind femora yellow, darkened on upper side at apex. Parameres of genitalia in male pointed. Fig. 219: 7, 13. Body 3. Parasite of *Amphipyra pyramidea* L., *A. perflua* F., *Diarsia mendica* F., *Allophyes oxyacanthae* L. (Noctuidae). Northwest, center; Caucasus, Altai; England ..... **A. acasta** Nixon
- 103 (102). Inner spur of middle tibiae slightly longer than 1st segment of middle tarsus. Inner spur of hind tibiae much longer than outer. Bristle on lower side of apical segment of foretarsi distinctly developed, as also depression on its outer side. Apices of hind coxae yellow, flagellum noticeably paler on lower than on upper side. Body

3.5. Parasite of *Operophtera brumata* L., *Phigalia pilosaria* Den. and Schiff., *Puengeleria capreolaria* Den. and Schiff. (Geometridae), *Choreutis pariana* Cl. (Choreuti-  
dae). Center; Trans-Baikal; England, Ireland, Switzerland,  
Finland ..... **A. mygdonia** Nixon

- 104 (101). Apical segment of foretarsi without bristle.
- 105 (106). Grooves on 2nd abdominal tergite diverging toward posterolateral angles of tergite. First abdominal tergite almost parallel-sided in basal half, roundly narrowed in apical third. Propodeum and 1st and 2nd abdominal tergites almost absolutely smooth. Inner spur of hind tibiae much longer than half of 1st tarsal segment. Figs. 222: 4, 7; 223; 224: 2. Body 2.5–3.5. Parasite of *Lymantria dispar* L., *Dasychira abietis* Den. and Schiff., *Euproctis chrysorrhoea* L. (Lymantriidae), *Dendrolimus pini* L., *D. spectabilis* Butler, *Malacosoma neustria* L., *Eriogaster lanestris* L. (Lasiocampidae), *Clostera anastomosis* L. (Notodontidae). Cocoons white, in clusters. Center, south; Caucasus, Kazakhstan, southern Siberia up to Far East; Western Europe, Japan .....  
..... **A. liparidis** Bouché
- 106 (105). Grooves on 2nd abdominal tergite slightly diverging, terminating far away from posterolateral angles of tergite. First abdominal tergite somewhat cuneate, uniformly narrowing from base to apex. Propodeum and 1st abdominal tergite somewhat sculptured.
- 107 (108). Flagellum with long, isolated hairs, equal to half flagellar width (Fig. 219: 8). Inner spur of hind tibiae much longer than outer, noticeably longer than half of 1st segment of hind tarsus. Inner section of posterior side of discoidal cell shorter than outer. Sixth sternite at apex blunt. Hind coxae at apex yellow, Body 3. Parasite of leaf-roller moth on apple trees. ? *Choreutis pariana* Cl. (Choreuti-  
dae). West (Minsk); Finland..... **A. aletta** Nixon
- 108 (107). Flagellum with shorter appressed hairs.
- 109 (110). Inner spur of hind tibiae much longer than outer, distinctly longer than half of 1st segment of hind tarsus. On frons before ocellus small pointed tubercle, changing anteriorly into faint carina. Preapical segment of antennae 1.5 times as long as wide. First section of posterior side of discoidal cell slightly shorter than 2nd. Sixth sternite short, blunt. Ovipositor valves

slightly produced. Fig. 222: 8, 9. Body 3.2–3.7. Parasite of *Thera obeliscata* Hb., *T. variata* Den. and Schiff. (Geometridae). Cocoons isolated, yellowish white. England, Czechoslovakia ..... *A. pinicola* Lyle

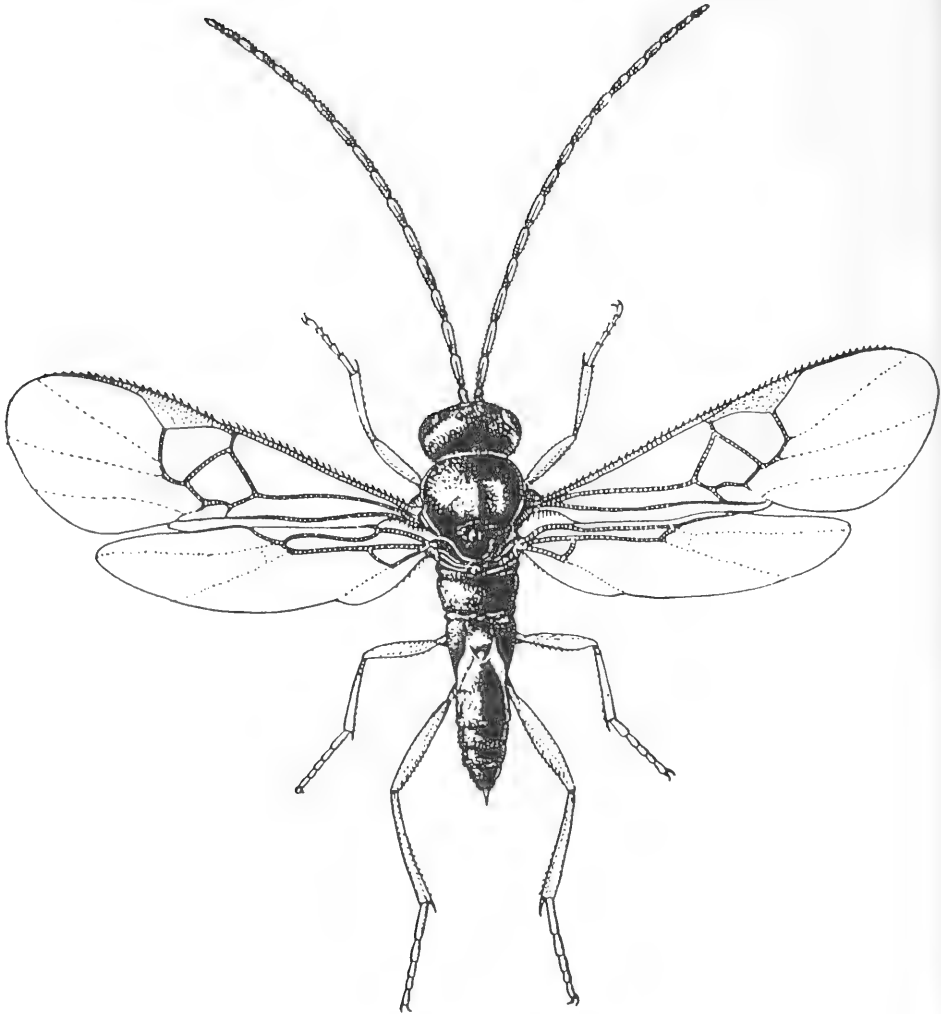


Fig. 223. Microgasterinae (original).

*Apanteles liparidis* Bouché.



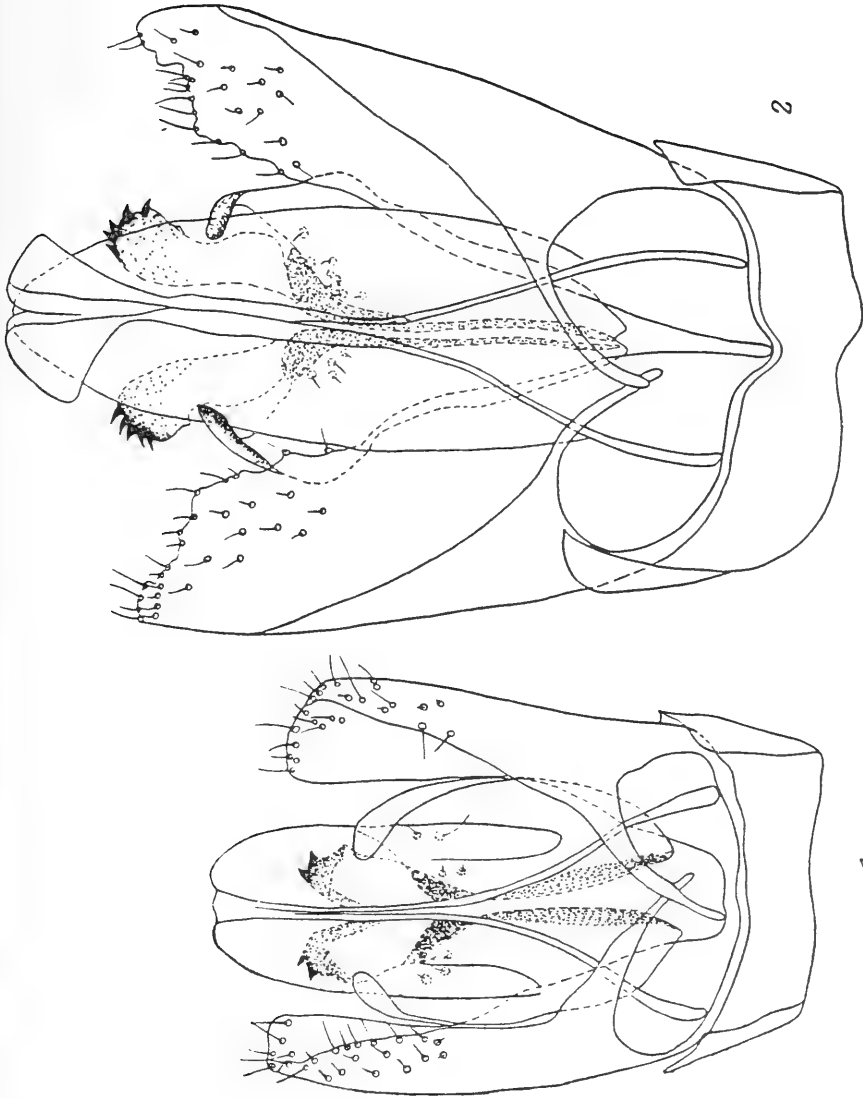


Fig. 224. Microgasterinae (from Kotenko).

1—2—Genitalia, male: 1—*Apanteles porthetiae*, 2—*A. liparidis*.

- 110 (109). Inner spur of hind tibiae slightly longer than outer, not longer than half of 1st segment of hind tarsus. Frons without distinct pointed tubercle and ridge. Hind femora yellow, apices of hind tibiae not darkened or slightly darkened. Large spur of middle tibiae shorter than 1st segment of middle tarsus.
- 385 111 (112). Stigma at base with pale spot. Forewing at base with sparse bristles. Abdomen distinctly compressed, with very large 6th sternite extending beyond its apex. Preapical antennal segment 2 times as long as wide. Inner section of posterior side of discoidal cell much shorter than outer. Metacarpus 3 times as long as its distance from apex of radial cell. Body 3.2. Central Asia . . . . . **A. popovi** Tel.  
Lectotype: Female, B. Balkhany, "Sauttul'ch Spring" 21.VI.1934 (V. Popov).
- 112 (111). Stigma monochromate, brown or yellow. Forewing with almost as many bristles at base as in middle. Abdomen of usual shape, only at apex somewhat compressed, with small 6th sternite.
- 113 (114). Metacarpus 2.5–3 times as long as its distance from wing apex. Nervulus divides posterior side of discoidal cell into almost two equal sections. Propodeum and 1st abdominal tergite often with dense sculpture, matte. Parameres, of male genitalia broadened. Fig. 219: 9–12. Body 3. Parasite of *Amathes xanthographa* Den. and Schiff., *Cucullia asteris* Den. and Schiff., *C. gnaphalii* Hb., *Mythimna impura* Hb., *Allophytes oxyacanthae* L., *Syngrapha interrogationis* L., *Spaelotis ravidata* Den. and Schiff., *Noctua pronuba* L. (Noctuidae), *Diloba caeruleocephala* L. (Notodontidae), *Epirrhoe alternata* O.F. Müller (Geometridae). North, west, center, south; Caucasus, Kazakhstan, Western Siberia; Western Europe . . . . .  
. . . . . **A. fulvipes** Hal.
- 114 (113). Metacarpus approximately 4–5 times as long as its distance from wing apex (Fig. 219: 14). Nervulus divides posterior side of discoidal cell into unequal parts, inner much shorter than outer. Propodeum and 1st abdominal tergite with relatively weak sculpture, lustrous. Body 3.5. Scotland, Sweden, Switzerland . . . . . **A. luciana** Nixon
- 115 ( 70). Body with pale pattern or completely light colored.
- 386 116 (119). Propodeum wrinkled. First and 2nd abdominal tergites slightly punctate. Mesonotum matte, densely punctate.

- Large spur of hind tibiae equal to half of 1st segment of hind tarsus. First abdominal tergite narrowed only near apex (Fig. 216: 13). Head dark colored, thorax with somewhat developed yellowish red pattern. Stigma with diffused pale basal spot.
- 117 (118). Middle field of 2nd abdominal tergite slightly wide, its base (at suture between 2nd and 3rd tergites) almost equal to lateral sides (Fig. 216: 13). First section of radial vein 2/3 radiomedial vein. Body 2. Southeast; Kazakhstan, Caucasus (Azerbaijan) ..... **A. rufulus** Tobias
- 118 (117). Middle field of 2nd abdominal tergite wide, its base much greater than its lateral sides. First section of radial vein slightly shorter than radiomedial vein. Fig. 222: 10, 11. Body 2. Bulgaria. .... **A. intermedius** Balevski
- 119 (116). Propodeum, 1st and 2nd abdominal tergites smooth. Mesonotum lustrous. Large spur of hind tibiae slightly greater than half of 1st tarsal segment. First abdominal tergite narrowed from base. Entire body reddish brown. Stigma uniformly colored. Body 3. Parasite of *Acronicta rumicis* L. (Noctuidae). Center; Western Europe. ....  
..... **A. rubens** Reinh.
- 120 ( 53). Set of characters different. Usually propodeum and two basal tergites of abdomen with wrinkled sculpture. First abdominal tergite if also narrowed toward apex, then slightly or only at apex.
- 121 (360). Propodeum (usually 1st and 2nd abdominal tergites) somewhat coarsely rugose-punctate. First abdominal tergite narrowed toward base or parallel-sided. Middle field of 2nd abdominal tergite often not clear or quadrangular, wide, oblique grooves directed toward lateral margins of tergite or curved along them. Apical segment of foretarsi without bristle, very rarely with bristle.
- 122 (123). Head behind eyes broadened, temples much longer than eyes. Face strongly bulged (Fig. 216: 6). Thorax depressed, 2.5 times as long as high. Antennae slightly shorter than body, segments in apical third slightly longer than wide. Large spur of hind tibiae as long as 1/3 of 1st tarsal segment. Mesonotum sparsely but quite coarsely punctate, shining, scutellum smooth, hind coxae quite densely but softly punctate, matte, 1st to 3rd tergites as in Fig. 225: 3. Head, propodeum, sides of metathorax and 1st abdominal tergite black; antennae, underside of thorax and 2nd

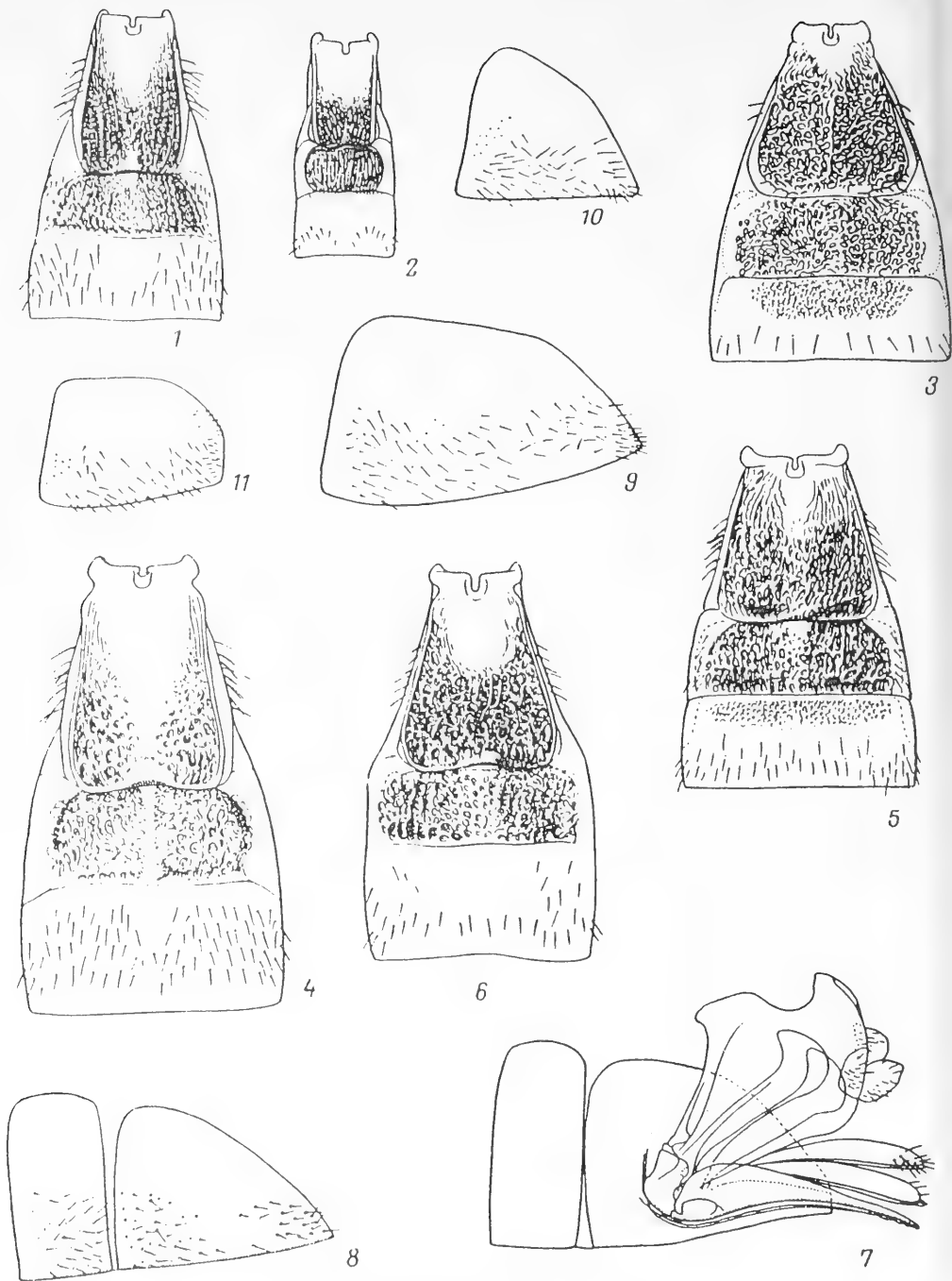


Fig. 225. Microgasterinae (from Wilkinson).

1—6—1st to 3rd abdominal tergites: 1—*Apanteles geryonis*, 2—*A. brevicornis*, 3—*A. ferrugineus*, 4—*A. ordinarius*, 5—*A. teticus*, 6—*A. melitaearum*; 7—*A. ordinarius*, 5th and 6th abdominal sternites with ovipositor; 8—*A. teticus*: 5th and 6th abdominal sternites; 9—11—6th abdominal sternite: 9—*A. villanus*, 10—*A. geryonis*, 11—*A. brevicornis*.

- abdominal tergite brown; remaining part of thorax and abdomen and also legs and mouthparts brownish yellow; stigma and veins light brown. Body 2.5–3. Parasite of caterpillars of *Chilo phragmitellus* Hb. (Crambidae), *Phragmataecia castaneae* Hb. (Cossidae), *Archanara geminipuncta* Hw. (Noctuidae). West (Lithuania), Ukraine; Western Europe. (Group *A. ferrugineus*) .....
- ..... **A. ferrugineus** Marsh.
- 123 (122). Head behind eyes roundly narrowed, temples not longer, usually shorter than transverse diameter of eye. Face slightly bulged. Thorax usually not depressed, not more than 2 times as long as high. Body usually black. (Group *A. glomeratus*.)
- 124 (171). Hind coxae densely punctate, matte or dimly lustrous. Mesonotum usually densely and quite coarsely punctate.
- 125 (128). Inner spur of hind tibiae longer than 1/2 of 1st segment of hind tarsus. Antennae as long as body. Scutellum faintly punctate, shining. Wings slightly darkened. Stigma and veins brown.
- 126 (133). First abdominal tergite 1.5 times as long as wide, parallel-sided. Hind coxae coarsely but relatively not densely punctate, lustrous. Major part of legs and underside of abdomen brownish yellow. Apical segments of antennae usually 2 times as long as wide. Mesonotum coarsely punctate, dimly lustrous.
- 127 (130). Mesonotum densely punctate, dimly lustrous. Metacarpus 2–2.5 times as long as its distance from wing apex. Wings brownish.
- 128 (129). Mesonotum with dense rough sculpture along notaulices and in front of scutellum, absolutely matte. Preapical segment of antennae 1.5 times as long as wide. Hind femora black, hind tibiae intensely darkened in apical half. Body 2.7–2.8. Parasite of caterpillars of family Arctiidae on vetch trees. Cocoons muddy brown, in loose clusters. Sverdlovsk Region; Sweden, Switzerland (in mountains) .....
- ..... **A. setebis** Nixon
- 129 (128). Mesonotum more uniformly sculptured, without distinct areas of dense and rough sculpture along notaulices and in front of scutellum. Preapical segment of antennae 2 times as long as wide. Hind femora yellowish or reddish in basal half, darkened on upper and lower sides at apex.

- Body 3–3.5. Parasite of *Argynnis* sp. (Nymphalidae). Ireland, Finland ..... **A. callimone** Nixon
- 130 (127). Mesonotum not densely and relatively softly punctate, lustrous.
- 131 (132). Ovipositor valves as wide as 1st segment of hind tarsus. Large spur of hind tibiae slightly longer than half of 1st segment of hind tarsus. Hind coxae black, basal abdominal sternite bright yellow. Fig. 225: 4, 7. Body 2.8–3. Parasite of silkworms *Dendrolimus pini* L., *D. sibiricus* Tschetv. (Lasiocampidae) on conifers. Cocoons white, often in dense rows along cones. South; Siberia, Far East; Western Europe, Japan. (cf. also couplet 192.) ..... **A. ordinarius** Ratz.
- 132 (131). Ovipositor valves thin, half as wide as 1st segment of hind tarsus. Large spur of hind tibiae 7/10 1st segment of hind tarsus. Hind coxae at apex and on lower side, and major part of abdominal sternite brownish yellow, apical sternite reddish. Body 2.7. Caucasus .... **A. subordinarius** Tobias
- 387 133 (126). First abdominal tergite as long as its width at apex, distinctly narrowed toward base. Hind coxae more densely and softly punctate, matte or dimly lustrous. Major part of legs black.
- 134 (137). Segments in apical third of antennae usually 1.5 times as long as wide. Mesonotum quite densely punctate, especially along notaules, matte. Hind tibiae brownish yellow, noncontrastingly brownish at apex. Anterior abdominal sternites yellow.
- 388 135 (136). Middle field of 2nd abdominal tergite striate with deep grooves from sides and behind. First abdominal tergite with sharp longitudinal carina (Fig. 232: 2). Flagellar segments with distinct rhinaria. Face punctate, slightly lustrous. Metacarpus sharply demarcated, 2 times as long as its distance from apex of radial cell. Surface of scutellum between large deepened punctures with fine microsculpture, imparting matte—metallic tinge. Body 2.6. Kola Peninsula ..... **A. khibinicus** Tobias, sp. n.  
 Holotype: Female, basin of Lake Vudyavr, Khibini Mountains, 7.VII.1930 (Fridolin). Paratypes: 2 females, same data (one specimen without antennae).
- 136 (135). Middle field of 2nd abdominal tergite striate with extremely faint grooves from sides. First abdominal tergite without longitudinal carina. Flagellar segments with faint

rhinaria. Face slightly punctate, lustrous. Metacarpus less sharply demarcated, approximately 2.5 times as long as its distance from apex of radial cell. Surface of scutellum between large deepened punctures smooth. Body 2.6. East .....

**A. sceleratus** Tobias, sp. n.

(*melanoscellis* sensu Telenga, 1955)

Holotype: Female, Kirov (Vyatka), 25.VIII.1930.

Paratype: 1 female, same data (without antennae and left wing).

137 (134). Apical segments of antennae 2 times as long as wide. Hind coxae, though densely punctate, lustrous. (cf. also couplets 232 and 351.) .....

..... **A. zygaenarum** Marsh.

138 (125). Inner spur of hind tibiae not longer, usually shorter than half of 1st segment of hind tarsus.

139 (140). Third abdominal tergite almost entirely (except lateral margins) rugose-punctate, with same sculpture as on 2nd tergite. Apical segments of antennae square. Metacarpus 4 times as long as its distance from apex of radial cell. First abdominal tergite distinctly narrowed toward base, its length noticeably less than its width at apex. Ovipositor valves thin, shining, with sparse hairs (Fig. 232: 3). Face mildly, not densely, punctate, shining. On mesonotum punctation along notaulices slightly denser than on remaining part of disk; scutellum bulged, with uniform and relatively less dense punctation (interpuncture distance as much as puncture diameter), lustrous. Antennal bases, femora and tibia, anterior sternites of abdomen brownish yellow. Hind femora and tibiae at apex darkened. Wings faintly darkened, hyaline-transparent till basal vein, with sparse bristles above and below mediocubital vein. Body 2.5. Moldavia, Uzbekistan. ....

..... **A. tenuivalvis** Tobias, sp. n.

Holotype: Female, Moldavia, alfalfa, 24.VIII.1963 (Talitskii). Paratypes: 1 female, Tashkent, 10.V.1968 (Mirzalieva); 1 female, Sochi (Lazarevskoe), forest along stream, 22.VI.1979 (Tobias).

140 (139). Third abdominal tergite, at most only at base, sculptured.

141 (142). Sixth abdominal sternite extremely large, extending far beyond abdominal apex, pointed. Metacarpus 2 times as long as its distance from wing apex. Scutellum weakly punctate, lustrous. Hind coxae black, hind femora reddish brown,

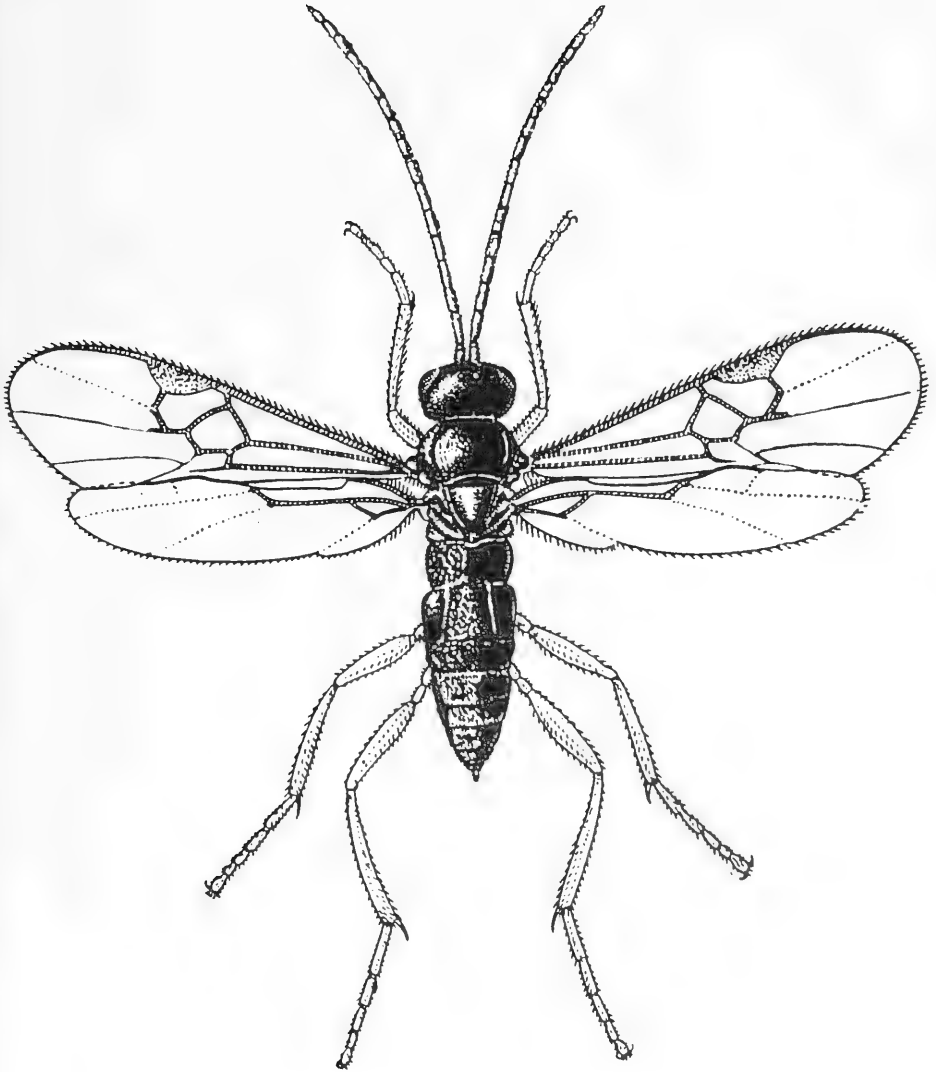
- hind tibiae yellowish brown. Fig. 232: 4, 5. Body 2.1. West  
 ..... **A. acutulus** Tobias
- 142 (141). Sixth abdominal sternite shorter, not extending or slightly  
 extending beyond abdominal apex. If very distinctly developed,  
 then metacarpus longer but hind femora black.
- 143 (156). Scutellum, at least in posterior half, densely punctate,  
 matte.
- 144 (145). Sixth abdominal sternite short, hardly longer than half of  
 hind tibia, at apex widely blunt. Mesothorax anterolaterally  
 and ventrally not densely punctate, lustrous. Metacarpus 3  
 times as long as its distance from apex of radial cell. Radial  
 vein originates from middle of stigma. Hind femora brownish  
 yellow, darkened at apex, hind tibiae dark yellow. Apex of  
 3rd abdominal tergite with yellowish spots. Third abdominal  
 tergite smooth, with extremely sparse hairs on posterior margin.  
 Mesonotum uniformly rugose-punctate, lustrous. Body 2.5. Parasite  
 of *Melitaea didyma* Esp. (Nymphalidae). France.....  
 ..... **A. lycophron** Nixon
- 145 (144). Sixth abdominal sternite more distinctly developed; if only  
 slightly longer than half of hind tibia then mesothorax anteriorly  
 and laterally at base densely punctate, matte or slightly lustrous.
- 146 (149). Tegulae brownish yellow. Antennae as long as body, segments  
 in apical third approximately 1.5 times as long as wide. First  
 abdominal tergite noticeably narrowed toward base, slightly longer  
 than wide at apex. Sixth abdominal sternite at apex somewhat blunt.  
 Legs largely yellowish brown, apices of hind femora darkened.
- 147 (148). Third abdominal tergite with scattered hairs all over its  
 surface, often with somewhat distinct sculpture. Scutellum densely  
 punctate, matte. Figs. 216: 12; 229: 19. Body 2–2.5. Parasite of  
*Plutella maculipennis* Curt. (Plutellidae), *Hyphantria cunea*  
 Drury, *Spilosoma urticae* Esp. (Arctiidae), *Nymphalis urticae*  
 L. (Nymphalidae), *Anthocharis cardamines* L. (Pieridae),  
*Sparganothis pilleriana* Den. and Schiff. (Tortricidae),  
*Hyponephele jurtina* L. (Satyridae), *Malacosoma castrensis*  
 L., *M. neustria* L. (Lasiocampidae), *Autographa gamma*  
 L., *Helicoverpa armigera* Hb. (Noctuidae), *Pyrausta stric-  
 ticalis* L., *P. verticalis* L. (Pyraustidae) and some other  
 lepidopterans. Cocoons isolated, white. Entire Palearctic,  
 throughout..... **A. plutellae** Kurd.



- 389 148 (147). Third abdominal tergite with hairs only along posterior margin, absolutely smooth. Scutellum in anterior half with smooth sculpture between punctures. Body 2–2.5. Parasite of *Acronicta rumicis* L., *Eugraphe subrosea* Stephens, *Mythimna unipuncta* Hw. (Noctuidae) (the last named host from the Far East). Beyond the boundaries of the Palearctic also there is a series of other hosts. Cocoons white, in clusters. Distributed almost all over the globe, in the USSR recorded in the Far East (all references in literature from other places of the USSR pertain to *A. plutellae* Kurd.) ..... **A. ruficrus** Hal.
- 149 (146). Tegulae black or brown.
- 150 (151). Genae distinctly developed, their height much greater than basal width of mandible. Wings relatively short, distinctly shorter than body, with yellowish tinge. Preapical segment of antennae 1.5 times as long as wide. Third abdominal tergite smooth. Hind femora yellowish brown, darkened in apical part. Figs. 217: 3; 225: 9; 229: 20. Body 2.3–2.7. Parasite of *Arctia testudinaria* Fourcroy, *A. fasciata* Esper, *A. villica* L., *Coscinia cribraria* L., *Spiris striata* L. (Arctiidae). South; Western Europe ..... **A. villanus** Reinh.
- 151 (150). Genae less developed, their height slightly greater than basal width of mandible. Wings approximately as long as body, without yellowish tinge.
- 152 (153). Third abdominal tergite in basal half sculptured (slightly longer than 2nd). Wings weakly darkened, stigma light brown. Coxae and hind femora black. Fig. 225: 5, 8. Body 2–2.5. Parasite of *Hyponephela jurtina* L., *Lasiommata megera* L. (Satyridae). Center; Northwestern Europe ....  
..... **A. tetricus** Reinh.
- 153 (152). Third abdominal tergite smooth. Wings pale, stigma brownish.
- 154 (155). Third abdominal tergite distinctly longer than 2nd (Fig. 225: 6). Preapical segment of antennae 1.5 times as long as wide. Fore- and middle coxae black or brown. Hind femora entirely or at apex darkened. (Remaining characters like those of *A. ruficrus*). Body 2.5–3.5. Parasite of *Melitaea cinxia* L., *M. leucippe* Schneider, *Euphydryas aurinia* Rott., *Nymphalis antiopa* L. (Nymphalidae), *Lymantria dispar* L. (Lymantriidae). Cocoons white, in loose clusters. Center; Caucasus; Western Europe .....  
..... **A. melitaeorum** Wilk. (*vestalis* auct.)

- 155 (154). Third abdominal tergite as long as 2nd. Preapical segment of antennae 2 times as long as wide. Hind femora black. Mesonotum very coarsely and densely sculptured, matte. Sixth sternite distinctly developed, extending beyond abdominal apex, at apex blunt. Laterotergites completely cover abdominal sternites. Body 3.5–3.8. Parasite of *Euphydryas cynthia* Den. and Schiff. (Nymphalidae); cocoons bright yellow, in clusters. Switzerland, Austria . . . . .  
 . . . . . **A. cynthiae** Nixon
- 156 (143). Scutellum faintly punctate, lustrous, sometimes quite coarsely punctate and lustrous only in anterior half.
- 157 (166). Segments in apical third of antennae 1.3 to almost 2 times as long as wide. Hind femora often brownish yellow, with dark spot at apex, occasionally femora almost black. Wings pale or slightly darkened.
- 158 (165). Mesonotum densely punctate, matte. Scutellum somewhat punctate, bulged.
- 159 (164). Wings as long as body. Abdomen slightly compressed. Sixth sternite not extending beyond abdominal apex. Ovipositor slightly produced. Segments in apical third of antennae not distinctly visible, usually not less than 1.5 times as long as wide. Coloration of hind femora variable.
- 160 (163). Scutellum mildly punctate. Tegulae dark colored. Antennae as long as body, two preapical segments approximately 1.5 times as long as wide. Sixth abdominal sternite slightly developed, dark colored.
- 161 (162). Sides of mesothorax at base and top of pronotum almost smooth, lustrous. Apical segment of foretarsi without bristle. First and 2nd abdominal tergites slightly sculptured, lustrous. Fig. 229: 3. Body 2.2. Bulgaria. . . . .  
 . . . . . **A. fluvialis** Balevski
- 162 (161). Sides of mesothorax at base and top of pronotum sculptured, matte. Apical segment of foretarsi with small bristle. First and 2nd abdominal tergites densely rugose-punctate, matte. Fig. 226. Body 2.3–3. Parasite of *Hyponephele jurina* L., *Pyronia tithonus* L. (Satyridae), *Anarta myrtilli* L., *Orthosia gracilis* Den. and Schiff., *Amathes triangulum* Hfn. (Noctuidae). Transpalearctic, throughout . . . . .  
 . . . . . **A. tibialis** Curt. (*congestus* Nees)<sup>1</sup>

<sup>1</sup> Nixon (1974) also differentiates species *A. ofella* as differing from *A. tibialis* by finer features which could not be confirmed from the material at our disposal.



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Fig. 226. Microgasterinae (original).

*Apanteles tibialis* Curt.

163 (160). Scutellum with coarse punctation. Tegulae yellow. Antennae longer than body, two preapical segments 2 times as long as wide. Sixth abdominal sternite quite large, light

- colored. Fig. 229: 1, 2. Body 2.4. Bulgaria .....
- ..... **A. intermixtus** Balevski
- 164 (159). Wings distinctly shorter than body. Abdomen at apex strongly compressed, sixth sternite extending beyond tip of abdomen, at apex widely blunt. Ovipositor valves produced beyond abdomen by 7/10 of 1st segment of hind tarsus. Apical segments of antennae distinctly visible, 1.3 times as long as wide. Scutellum with very coarse, distinct, scattered punctation. Mesonotum with distinct aggregation of sculpture along notaulices and in front of scutellum. Hind femora and tegulae brownish yellow. Third abdominal tergite brownish yellow. Body 2.5. Southern Ukraine ..
- ..... **A. ukrainicus** Tobias, sp. n.
- Holotype: Female, "Ol'gopol' District, 4-8.IX.1898" (L.L. Katkov).
- 165 (158). Mesonotum in front of scutellum almost smooth, laterally and in middle with smooth sculpture, lustrous; scutellum smooth, flat. Tegulae, legs and underside of abdomen, sometimes middle tergite also yellow. Head (laterally) somewhat longer than high. Hind coxae mildly rough, without coarse punctation. Fig. 217: 4. Body 2.2-2.7. Parasite of *Helicoverpa armigera* Hb., *Mythimna pallens* L., *M. straminea* Treitschke (Noctuidae). Western Europe ..
- ..... **A. leucaniae** Wilk.
- 166 (157). Apical segments of antennae square or slightly longer than wide. Hind femora often darkly colored.
- 167 (170). Metacarpus 2-2.5 times as long as its distance from apex of radial cell. Mesonotum with distinct, denser punctation along notaulices and in front of scutellum. Hind coxae with very coarse punctation.
- 168 (169). Ovipositor slightly produced. Hind femora brownish, on inner side yellowish, in apical half darker or entirely black. Body 1.8-2.7. Parasite of *Autographa gamma* L., *Syngrapha circumflexa* L., *Agrotis segetum* Den. and Schiff., *Heliothis virespallata* Hfn., *Amathes c-nigrum* L., ?*Noctua pronuba* L. (Noctuidae). Northwest, west, center, south; Caucasus, Kazakhstan, Central Asia; Albania, Bulgaria.....
- ..... **A. telengai** Tobias (?*amabilis* Nixon)
- 169 (168). Ovipositor greatly produced (Fig. 230: 1). Hind femora black. Underside of mesothorax polished, intensely lustrous. Palps black. Body 3. Switzerland .....
- ..... **A. amesis** Nixon

- 170 (167). Metacarpus 3–3.5 times as long as its distance from apex of radial cell. Mesonotum uniformly, densely punctate. Hind coxae rough, weakly punctate. Hind femora black. Fig. 231: 8, 9. Body 2.2–2.7. Parasite of *Lycaena phlaeus* L., *L. helle* Den. and Schiff., *Plebejus argus* L., *Lampides baeticum* L. (Lycaenidae). West; Western Europe. (cf. also couplet 322) ..... **A. cupreus** Lyle
- 391 171 (124). Hind coxae faintly punctate, lustrous; if sometimes punctation very dense, then only in their upper or only in their lower part (and) mesonotum more faintly punctate, somewhat lustrous.
- 172 (235). Inner spur of hind tibiae longer than half of 1st segment of hind tarsus.
- 173 (180). First and 2nd abdominal tergites almost smooth.
- 392 174 (175). Antennae shorter than body, segments in apical third square or slightly longer than wide. First abdominal tergite distinctly narrowed toward base, with posterolateral angles almost not rounded, its length slightly less than width at apex. Second abdominal tergite with markedly widened, almost quadrangular, field. Mesonotum weakly punctate, lustrous. Hind femora yellowish brown or brown. Wings pale, veins on their middle part slightly pigmented, stigma light brown, at base paler. Body 2–2.2. Parasite of *Biston betularius* L. (Geometridae), *Carcharodus alceae* Esp. (Hesperiidae). Cocoons white, in loose clusters. South; Caucasus, Kazakhstan ..... **A. glabratus** Tel.
- Lectotype: Female, Dagestan, Derbent, 23.VII.1930. "ex *C. alceae*". Paralectotypes: 4 females, Sevastopol (V. Pli-ginskii) [without date].
- 393 175 (174). Antennae as long as body, segments in apical third 1.3–1.5 times or almost 2 times as long as wide. First abdominal tergite more slightly narrowed toward apex, with rounded posterolateral angles, its length slightly greater or equal to width at apex. Second abdominal tergite much less wide, with middle field almost triangular. Mesonotum densely punctate, slightly lustrous. Wings weakly, but distinctly darkened, veins in middle part brownish. Stigma brownish. Sixth abdominal sternite at apex blunt.
- 176 (179). Apical segment of antennae 1.3–1.5 times as long as wide.
- 177 (178). Hind femora black. Fifth segment of foretarsi with curved bristle. Body 2.3. Hosts found on hazel tree. Cocoons white. Caucasus ..... **A. corylicolus** Tobias, sp. n.

- Holotype: Female, Azerbaidzhan SSR, Zakataly, village Dzhinzhimosk, from hazel tree, 7.X.1976 (Z.A. Aliev). Paratypes: 3 females, same data.
- 178 (177). Hind femora yellowish, on upper and lower side at apex darkened. Fifth segments of foretarsi without curved bristle. Fig. 231: 5. Body 3. Parasite of *Stauropus fagi* L. (Notodontidae). Central Europe .....  
..... **A. gades** Nixon
- 179 (176). Apical segment of antennae almost 2 times as long as wide. Hind femora brownish yellow. Body 2.5. Parasite of *Drymonia ruficornis* Hfn., *Pheosia tremula* Cl., *Cerura vinula* L., *Notodonta dromedarius* L., *Odontosia ziczae* L. (Notodontidae), *Smerinthus ocellatus* L. (Sphingidae). Cocoons white or rosy, in clusters, usually found along sides of remnants of caterpillar. North; Western Europe .....  
..... **A. abjectus** Marsh.
- 180 (173). First and 2nd abdominal tergites rugose-punctate, matte or dimly lustrous.
- 181 (196). First abdominal tergite parallel-sided or slightly broadened toward apex, much longer than wide. Antennae as long as body; preapical segments 1.5–2 times as long as wide.
- 182 (183)<sup>1</sup>. Hind femora dark brown. Head behind eyes somewhat broadened. Mesonotum with very coarse, uniform and dense punctation. Scutellum finely punctate, lustrous. Propodeum with distinct longitudinal ridge. First abdominal tergite in basal half polished, in apical half with very large, but not deep punctation and with granulose sculpture, slightly lustrous, with longitudinal, more weakly sculptured elevation in middle. Second tergite with similar sculpture and longitudinal elevation, with shallow grooves near lateral margins, distinctly shorter than extremely smooth third tergite, latter with few hairs mainly in apical part. Metacarpus 2/5 as long as its distance from wing apex. Abdomen strongly compressed, with very large, somewhat slightly pointed 6th sternite. Ovipositor valves extending as much as length of 2nd segment of hind tarsus (Fig. 232: 6). Wings weakly but definitely darkened, with pigmented bristles and brownish veins and stigma. Body

<sup>1</sup> *A. chares* Nixon (cf. also couplet 26) also comes under this couplet, if it can be included in the group of *A. glomeratus*, distinguished by shorter metacarpus, developed bristle on 5th segment of hind tarsi, slightly produced ovipositor and other characters.

- 2.7. Parasite of *Orgyia* (?) *dubia* Tausch. (Lymantriidae). Southeast ..... **A. dzhanybeki** Tobias, sp. n.  
 Holotype: Female, Dzhanybek, parasite of steppe antique tussok moth, found on 17.V.1953 (Burnasheva). Paratype: 1 female (without antennae and abdomen), same data.
- 183 (182). Hind femora light colored, at most, somewhat darkened in apical half.
- 184 (189). Second abdominal tergite with field, distinctly striate by deep oblique grooves.
- 185 (186). Scutellum with large punctures. Hind tarsi (in lateral view) distinctly narrowed toward apex. Mesonotum lustrous, middle field of 2nd abdominal tergite with distinctly smooth sculpture. Third abdominal tergite glabrous. Basal antennal segment yellowish, flagellum pale from below, basal abdominal sternites yellow, upper side of abdomen brownish, tergites with dark apices. Body 2.7–3.2. Parasite of *Limenitis camilla* L. (Nymphalidae). Western Europe . . . . . **A. sibyllarum** Wilk.
- 186 (185). Scutellum faintly punctate. Hind tarsi not narrowed toward apex.
- 187 (188). Head and antennal bases entirely dark colored. Preapical segment of antennae less than 2 times as long as wide. Apical part of 1st abdominal tergite strongly sculptured. Apices of hind femora and tibiae deeply darkened. Fig. 225: 1, 10. Body 2–2.5. Parasite of *Procris pruni* Den. and Schiff., *P. geryon* Hb., *P. globulariae* Hb., *P. stances* L. (Zygaenidae). Cocoons in clusters. Western Europe . . . . . **A. geryonis** Marsh.
- 188 (187). Face in upper part, between antennal sockets and scape, yellow. Preapical segment of antennae longer than wide. Apical part of 1st abdominal tergite more weakly sculptured, with lustrous intervals between folds of sculpture. Apices of hind femora and tibiae slightly darkened. Apical segment of foretarsi with bristle (Fig. 230: 2). Body 3. Parasite of *Apeira syringaria* L. (Geometridae). Cocoons white, in clusters. England . . . . . **A. cleora** Nixon
- 189 (184). Second abdominal tergite with slightly noticeable grooves, shifted toward its lateral margins.
- 190 (191). Apical segment of foretarsi with curved bristle. Metacarpus 3 times as long as its distance from wing apex. First abdominal tergite wrinkled in apical part, middle field of 2nd tergite quadrangular, sculptured as also 1st tergite.

- Hind femora light colored. Figs. 227: 1, 7; 230: 3. Body 2.5–3. Parasite of *Abraxas grossulariata* L., *Calospilos sylvata* Scop. (Geometridae). Cocoons in clusters, white with lime color tinge. Center; Ciscaucasia; Western Europe ..  
 ..... **A. limbatus** Marsh.
- 191 (190). Apical segment of foretarsi without bristle.
- 192 (193). Preapical segment of antennae 2 times as long as wide. Hind femora along upper side at apex distinctly darkened. Apex of 1st abdominal tergite with areas of distinctly smooth sculpture (Fig. 225: 4). (cf. also couplet 131.) ...  
 ..... **A. ordinarius** Ratz.
- 395 193 (192). Preapical segment of antennae 1.5 times as long as wide. Hind femora almost entirely brownish yellow.
- 194 (195). Discoidal cell of forewing almost touching parastigma; metacarpus 4.5 times as long as its distance from apex of radial cell (Fig. 230: 4). Dorsal side of abdomen with reddish spots. Body 3. Parasite of *Calyptra thalictri* Bkh. (Noctuidae); cocoons in clusters. Yugoslavia .....  
 ..... **A. capucinae** Fi.
- 195 (194). Discoidal cell separated from parastigma by distinct section of basal vein; metacarpus shorter. Dorsal side of abdomen without reddish spots. Body 2.8. Parasite of *Philudoria potatoria* L. (Lasiocampidae); cocoons in clusters. England ..... **A. orestes** Nixon
- 196 (181). First abdominal tergite narrowed toward base, as long as or slightly longer than its width at apex.
- 197 (210). Hind femora yellowish brown, sometimes at apex darkened. Mesonotum densely punctate, matte.
- 198 (203). Groove in front of scutellum narrow, scutellum with faint transverse costulae, about 10 in number. Antennae as long as body, preapical segment not more than 1.5 times as long as wide. Propodeum not coarsely rugose-punctate, without coarse alveolar sculpture. Third abdominal tergite usually smooth. Wings weakly darkened, stigma brownish, veins light brown.
- 396 199 (200). Apical segment of antennae slightly longer than wide. Scutellum flat, perfectly smooth. Hind part of mesonotum, 1st and 2nd abdominal tergites with smooth sculpture, lustrous. Second abdominal tergite with distinct oblique grooves. Stigma often with faintly striate, pale basal spot. Body 2.3–2.5. Parasite of *Tethea* or Den. and Schiff., *Achlya flavicornis* L., *Cymatophorima diluta* Den. and Schiff.,



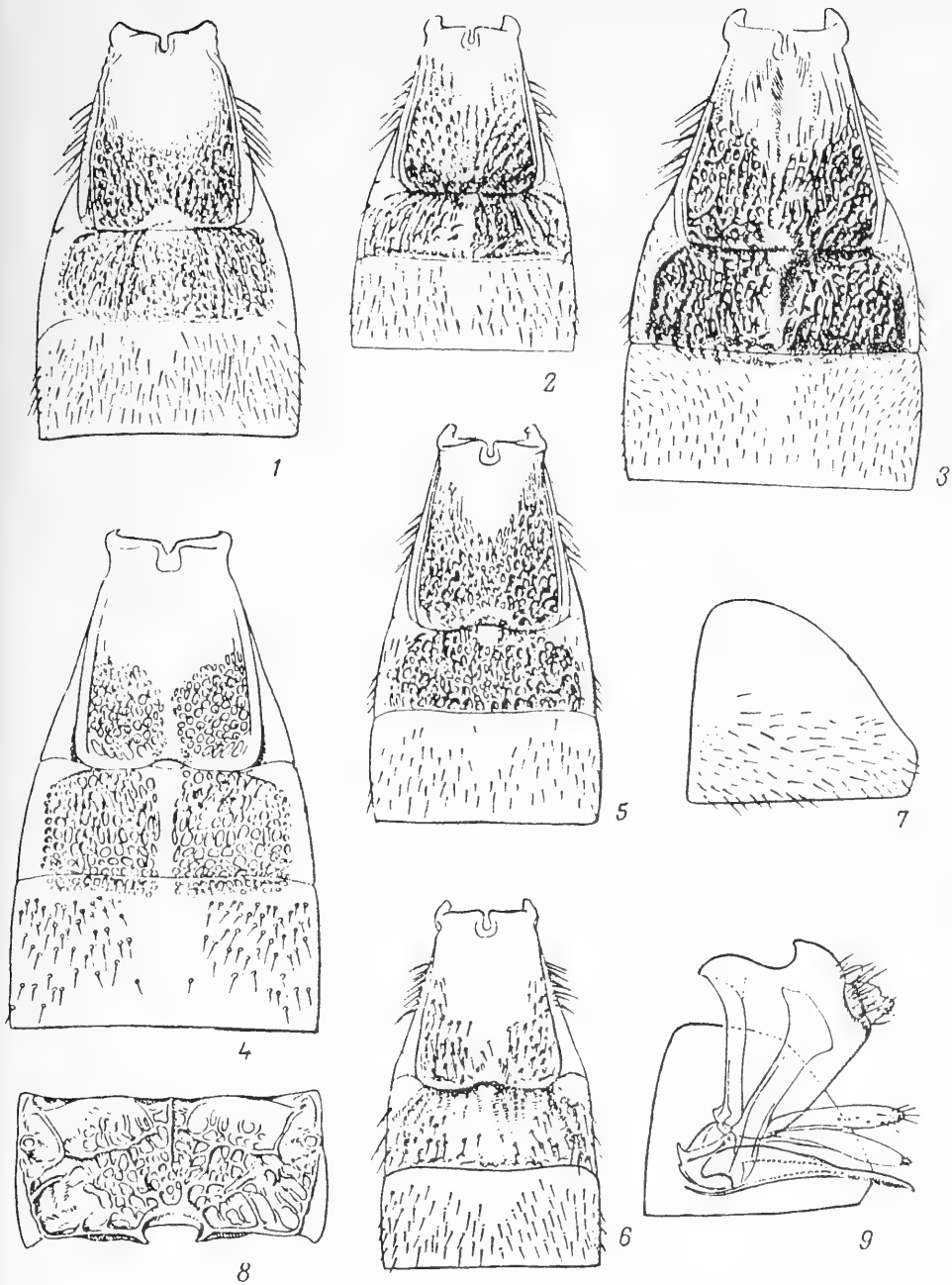
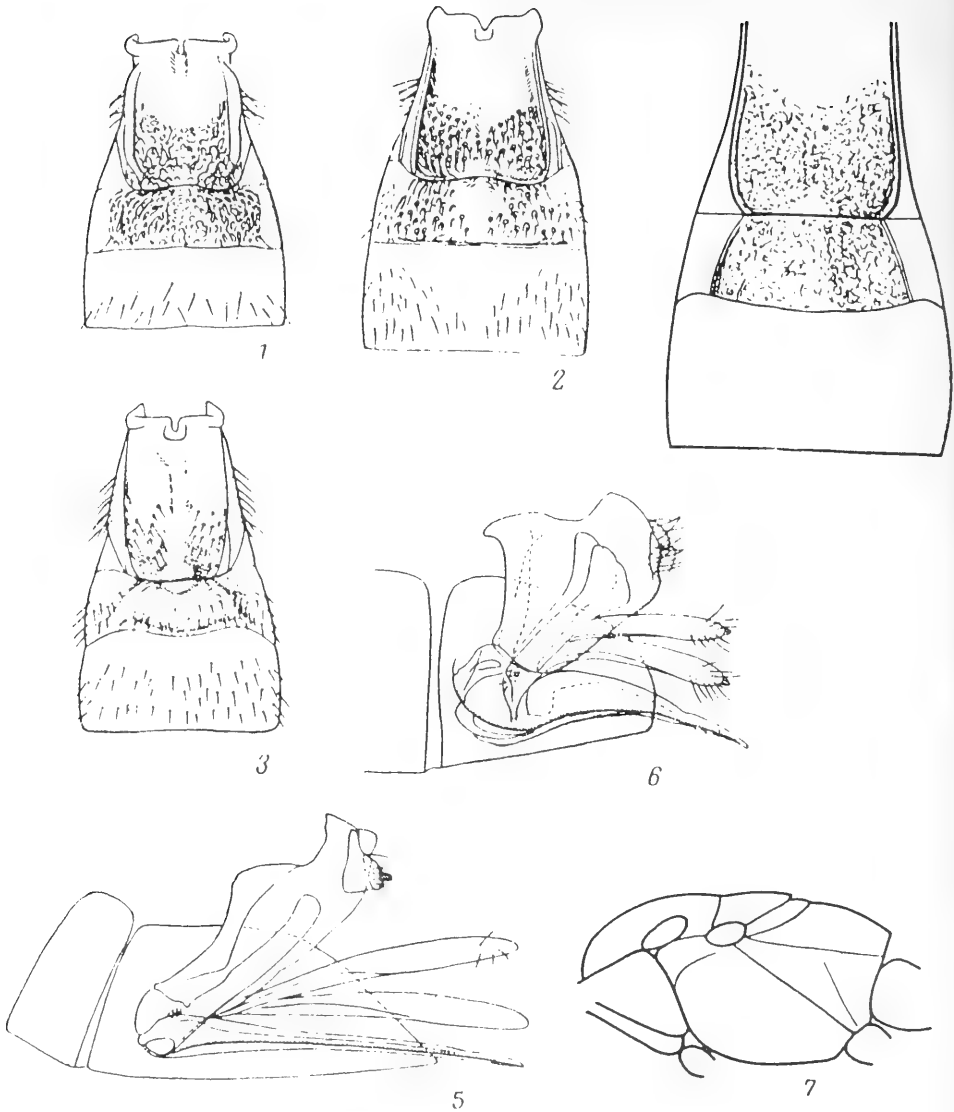


Fig. 227. Microgasterinae (from Wilkinson).

1—6—1st to 3rd abdominal tergites: 1—*Apanteles limbatus*, 2—*A. gastropachae*, 3—*A. rubecula*, 4—*A. rubripes*, 5—*A. zygaenarum*, 6—*A. spurius*; 7—*A. limbatus*, 6th abdominal sternite; 8—*A. rubripes*, propodeum; 9—*A. spurius*, 6th abdominal sternite and ovipositor.



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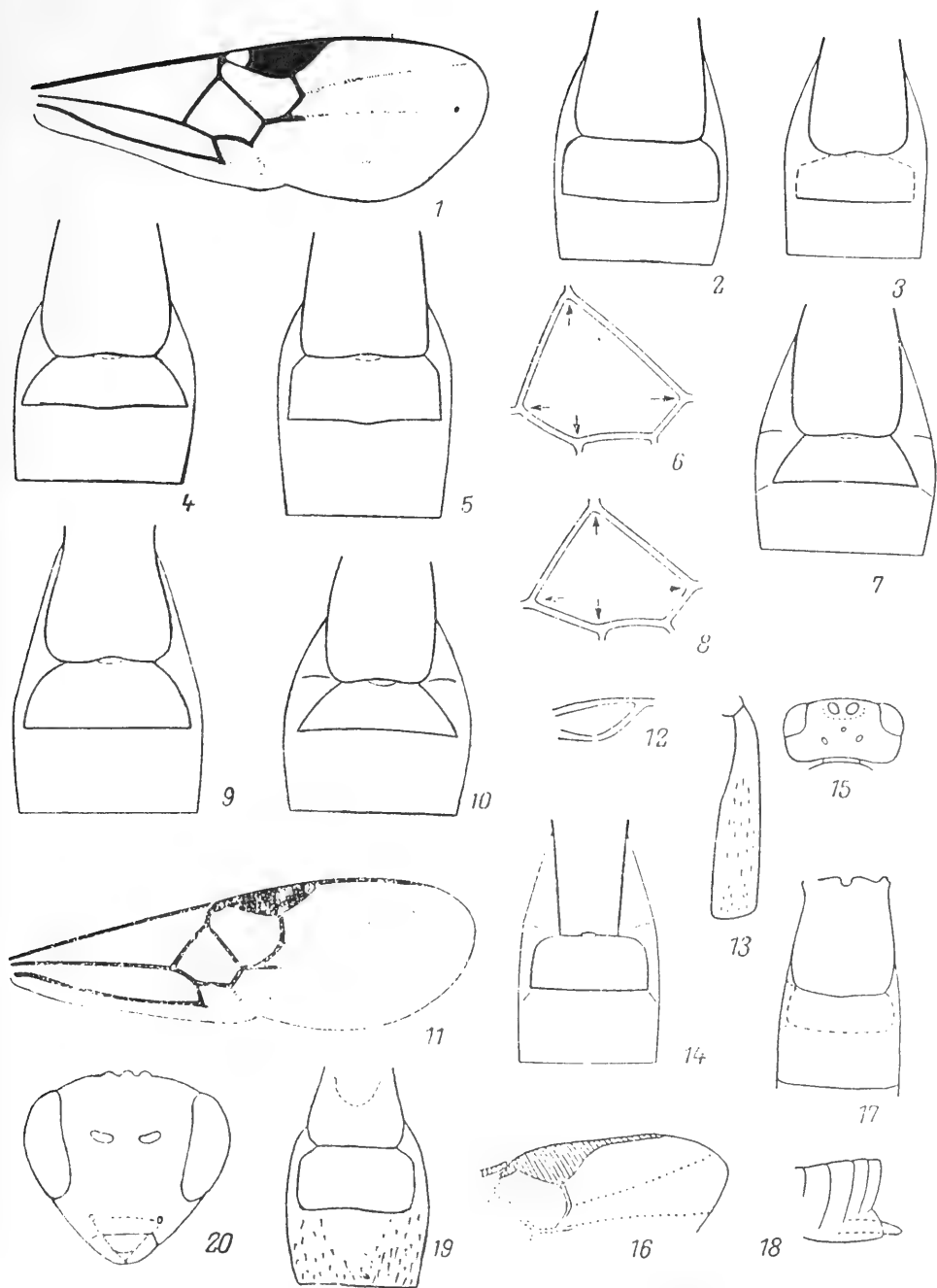
Fig. 228. Microgasterinae (from Wilkinson and Tobias).

1—4—1st to 3rd abdominal tergites: 1—*Apanteles acuminatus*, 2—*A. affinis*,  
3—*A. lineola*, 4—*A. depressithorax*; 5, 6—apical sternite of abdomen and ovipositor:  
5—*A. acuminatus*, 6—*A. affinis*; 7—*A. depressithorax*, thorax.

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Fig. 229. Microgasterinae (from Balevskii and Papp).

1, 2—*Apanteles internixtus*: 1—forewing, 2—1st to 3rd abdominal tergites; 3—5—1st  
to 3rd abdominal tergites: 3—*A. fluvialis*, 4—*A. subancilla*, 5—*A. melanoscelus*;



6, 7—*A. acutivalvis*: 6—discoidal cell, 7—1st to 3rd abdominal tergites; 8, 9—*A. saltatorius*: 8—discoidal cell, 9—1st to 3rd abdominal tergites; 10—*A. balcanicus*, 1st to 3rd abdominal tergites, 11—14—*A. tobiasi*: 11—forewing, 12—submedial cell of hind wing, 13—hind tibia, 14—1st to 3rd abdominal tergites; 15—18—*A. evagatus*: 15—head, 16—part of forewing, 17—1st to 3rd abdominal tergites, 18—abdominal apex; 19—*A. plutellae*, 1st to 3rd abdominal tergites; 20—*A. villanus*, head, frontal view.

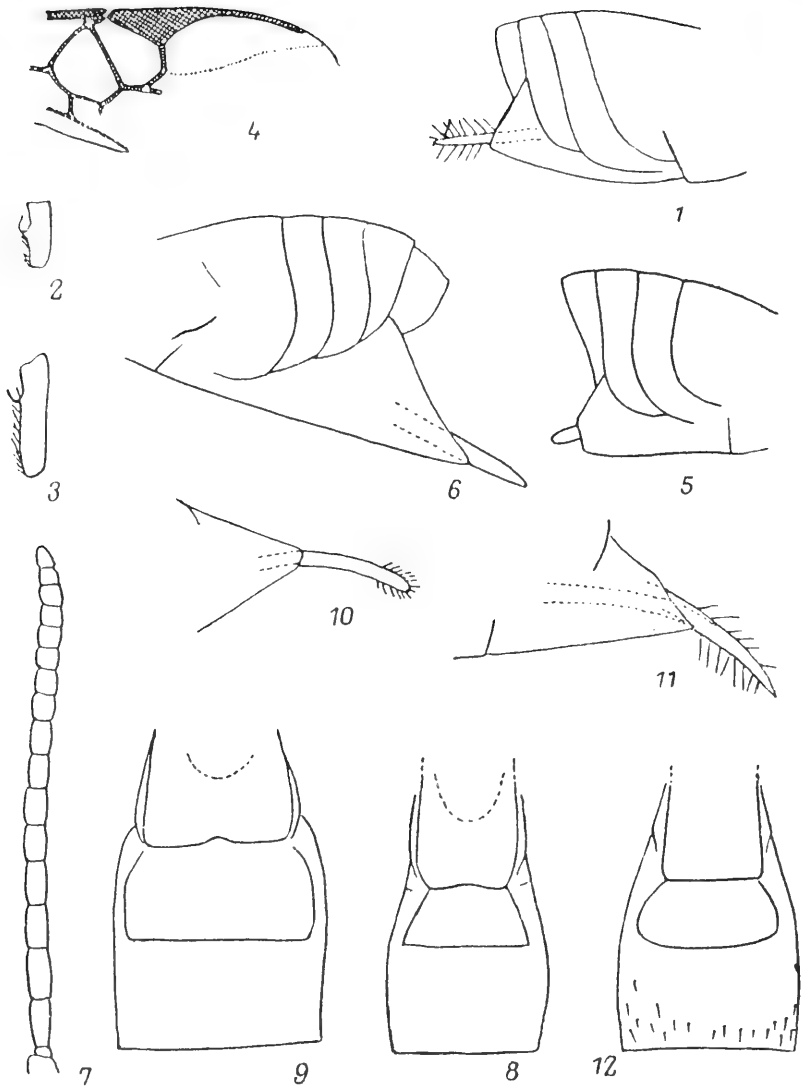


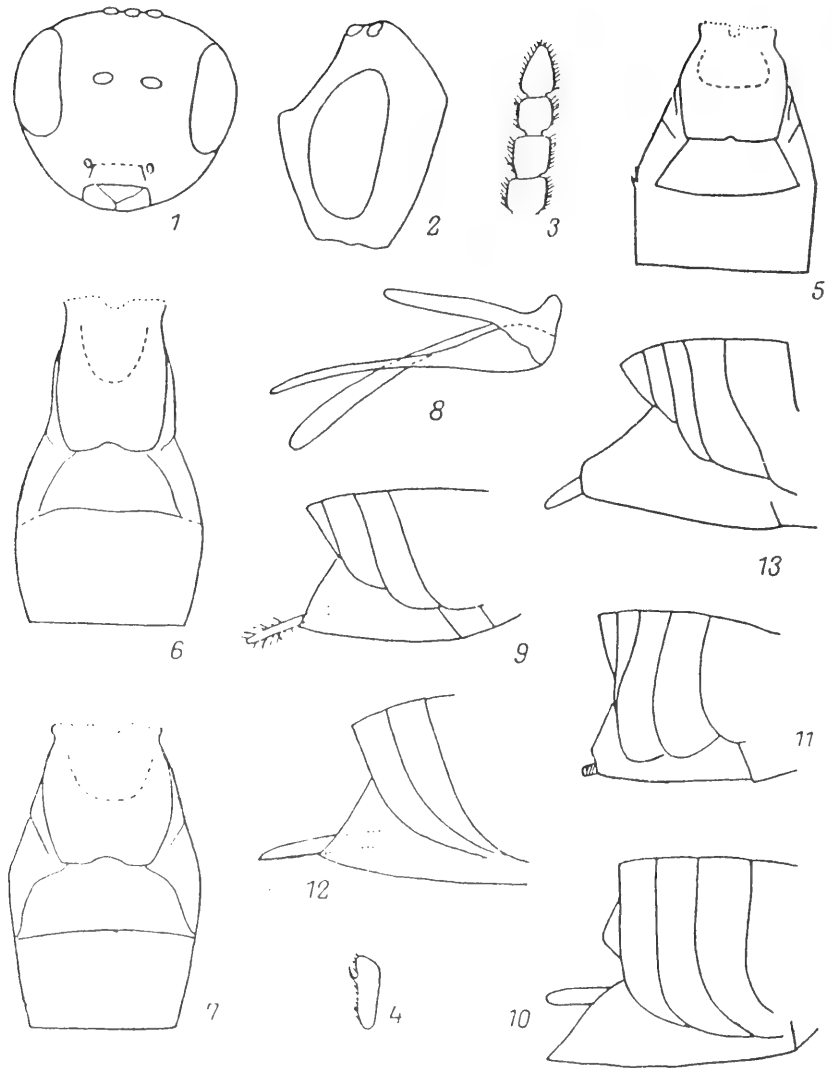
Fig. 230. Microgasterinae (from Nixon and original).

1—*Apanteles amesis*, abdominal apex; 2, 3—5th segment of foretarsus: 2—*A. cleora*, 3—*A. limbaus*; 4—*A. capucinae*, part of forewing; 5—*A. gastropachae*, abdominal apex; 6—*A. acuminatus*, abdomen; 7, 8—*A. praepotens*: 7—antenna, 8—1st to 3rd abdominal tergites; 9—*A. errator*, 1st to 3rd abdominal tergites; 10, 11—6th abdominal sternite: 10—*A. hyphantria*, 11—*A. scabriculus*; 12—*A. glomeratus*, 1st to 3rd abdominal tergites.

- Polyploca ridens* F. (Tetheidae). Cocoons in clusters. Western Europe ..... **A. isolde** Nixon
- 200 (199). Apical segment of antennae approximately 1.5 times as long as wide. Scutellum somewhat bulged, distinctly punctate.
- 201 (202). Sixth abdominal sternite small, at apex blunt. Propodeum without longitudinal ridge. Figs. 227: 2; 230: 5. Body 2–2.5. Parasite of *Malacosoma neustria* L., *Gastropacha quercifolia* L. (Lasiocampidae), *Lymantria dispar* L. (Lymantriidae). Cocoons rosy white, in loose clusters or isolated. Transpalearctic ..... **A. gastropachae** Bouché<sup>1</sup>
- 397 202 (201). Sixth abdominal sternite extremely large, at apex pointed. Propodeum with longitudinal ridge. Fig. 231: 10. Body 2–2.5. Parasite of *Arctia caja* L., *A. villica* L. (Arctiidae). Cocoons white, in loose clusters. Northwest, center, south; Caucasus, Far East; Western Europe. (cf. also couplet 229.) ..... **A. cajae** Bouché
- 203 (198). Groove in front of scutellum wide, about 1/5 scutellar length, with 5–7 coarse, transverse costulae.
- 204 (209). Antennae slightly longer than body, preapical segments 2 times or almost 2 times as long as wide. Sculpture on propodeum somewhat coarse, alveolar. Third abdominal tergite, especially in basal half, often sculptured. Wings darkened, stigma brown, veins brown. Sixth abdominal sternite at apex blunt.
- 205 (206). Apex of scutellum distinctly wrinkled, coarse fold under spiracle and transverse carina in upper part of propodeum slightly distinguished from folds below them. Spurs of hind tibiae reddish. Wings darkened. Membrane of wings above mediocubital vein with bristles. Abdominal tergite (in south) sometimes with somewhat developed red pattern. Fig. 227: 3. Body 2.8–3.5. Parasite of *Pieris rapae* L., *P. napi* L., *P. brassicae* L. (Pieridae); recorded also (possibly due to error in extraction from host) as parasite of *Plutella maculipennis* Curt. (Plutellidae), *Mamestra brassicae* L., *Autographa gamma* L. (Noctuidae). Cocoons isolated, white or yellowish. West, center, south; Caucasus, Siberia (Irkutsk, Khabarovsk), Pacific Coast, Sakhalin; Western Europe, North America..... **A. rubecula** Marsh.

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<sup>1</sup> See note to *A. spurius* Wesm.



1—*Apanteles arcticus*, head, frontal view; 2—*A. risilis*, head, lateral view; 3—*A. pilicomis*, antennal apex; 4—*A. jucundus*, 5th segment of foretarsus; 5—7—1st to 3rd abdominal tergites: 5—*A. gades*, 6—*A. numen*, 7—*A. gonopterygis*; 8—*A. cupreus*, ovipositor; 9—13—abdominal apex: 9—*A. cupreus*, 10—*A. cajae*, 11—*A. jucundus*, 12—*A. memnon*, 13—*A. pieridis*.

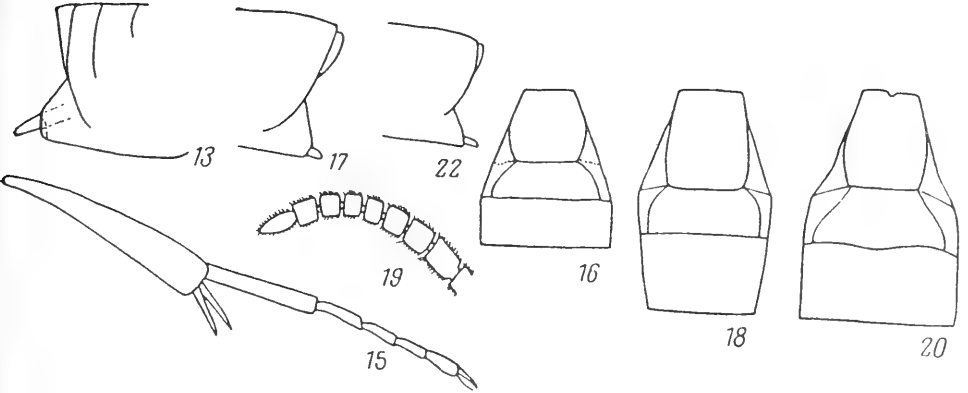
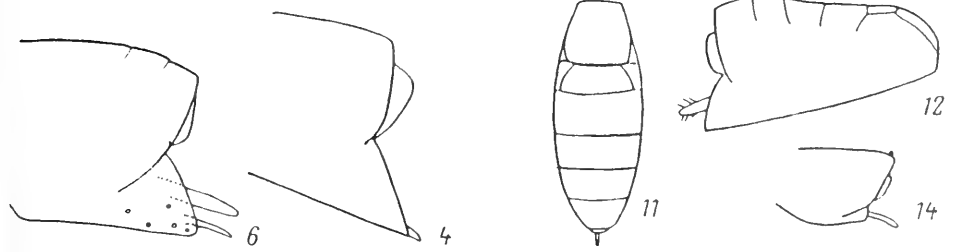
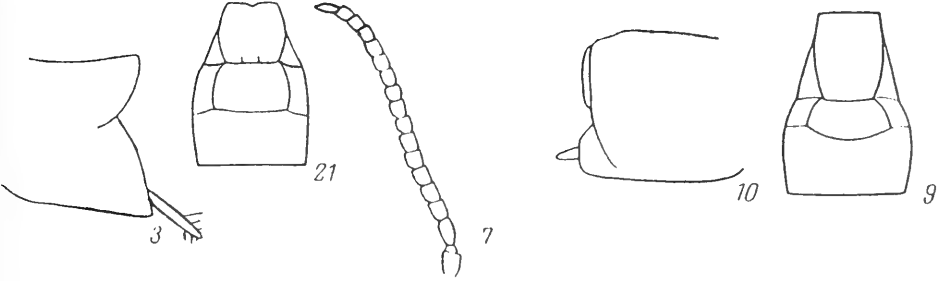
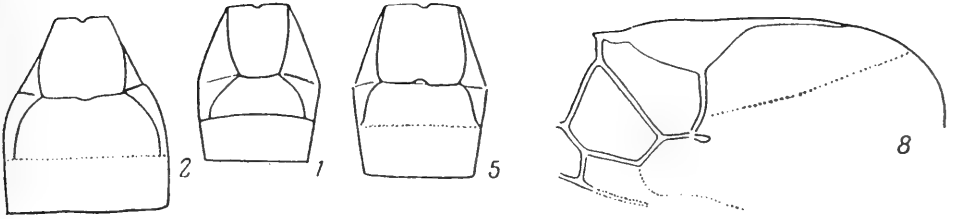
- 206 (205). Apex of scutellum not wrinkled (in *A. coryphe* sometimes weakly wrinkled). Sculpture of propodeum less rough, so that folds under spiracles and transverse carina on the top of propodeum noticeably distinguished from folds below them. Spurs on hind tibiae whitish. Wings pale.
- 207 (208). Wing membrane above mediocubital vein with bare strip devoid of bristles. (Wings in male also like those in female.) Fig. 227: 4, 8; Body 2.8–3.2. Parasite of *Geometra papilionaria* L. (Geometridae). Cocoons in clusters. Western Europe ..... **A. rubripes** Hal.<sup>1</sup>
- 208 (207). Wing membrane above mediocubital vein with bristles. (Wings in male hyaline-transparent.) Body 2.8–3.5. Parasite of *Hemarius fuciformis* L. (Sphingidae). Cocoons isolated. England ..... **A. coryphe** Nixon
- 209 (204). Antennae as long as body; preapical segment slightly longer than wide; propodeum softly rugosepunctate, without alveolar sculpture. Third abdominal tergite smooth, only with fine punctation due to numerous hairs. Wings slightly darkened, veins in middle of wings light brown; stigma, radial, radiomedial and 3rd section of medial veins brown. Hind femora in apical half and hind tibiae in apical third distinctly darkened. Head smooth with mild punctate face, noticeably wider and coarsely punctate mesonotum. First and 2nd abdominal tergites densely rugose-punctate. Underside of hind coxae densely and softly punctate, matte (apparently resembles *A. vanessae* in dark colored coxae, but distinguished by long spurs of hind tibiae, more strongly punctate face and almost dark hind tarsi). Body 2.3. Krasnodar Territory ..  
..... **A. nigriritibialis** Tobias, sp. n.  
Holotype: Female, Sochi (Lazarevskoe), terraced slopes, forest, 5.V.1979 (V. Tobias).
- 210 (197). Hind femora black or dark brown.
- 211 (228). Face slightly and sparsely punctate, lustrous.
- 212 (215). Third abdominal tergite in basal half finely and longitudinally striate. Metacarpus 2 times as long as its distance from apex of radial cell. Scutellum lustrous, smooth. Mesonotum lustrous in posterior half, with quite large, close punctation. Wings with somewhat brownish

<sup>1</sup>Data in literature regarding distribution of this species in the USSR pertains to *A. rubecula* Marsh.

- shading. Antennae shorter than body. Sixth abdominal sternite short, blunt.
- 213 (214). Antennae much longer than head and thorax together; two preapical segments slightly longer than wide. Underside and anterior part of sides of mesothorax with rough punctation. Mesonotum usually rough, matte along notaulices. Hind tibiae brown, at apex slightly darkened. Body 2. Parasite of *Nephoptyrx abductella* Fisher (Phycitidae), *Rhodaria aurata* Den. and Schiff. (Pylalidae). Cocoons white, in loose clusters. Moldavia; England..... **A. laverna** Nixon
- 214 (213). Antennae hardly longer than head and thorax together. Flagellar segments starting from 2nd wide (Fig. 232: 7). Underside and anterior part of sides of mesothorax with extremely soft punctation. Whole anterior half of mesonotum uniformly rough, matte, posterior half with distinct isolated punctation, lustrous. Hind tibiae brownish yellow, at apex quite contrastingly darkened. Body 1.6. Moldavia ..... **A. clepta** Tobias, sp. n.  
 Holotype: Female, Chumai, on slopes, 17.VIII.1967 (Talitskii).
- 215 (212). Third abdominal tergite without such sculpture.
- 216 (219). Metacarpus less than 2 times as long as its distance from apex of radial cell.
- 217 (218). Mesonotum with sparse punctation, lustrous. Scutellum smooth, without hairs. Wings slightly but distinctly darkened, with pigmented bristles. (cf. also couplets 226 and 308.) ..... **A. kurdjumovi** Tel.

1, 2—1st to 3rd abdominal tergites: 1—*Apanteles querceus* sp. n., 2—*A. khibinicus* sp. n.; 3—*A. tenuivalvis* sp. n., abdominal apex; 4, 5—*A. acuuulus*: 4—abdominal apex, 5—1st to 3rd abdominal tergites; 6—*A. dzhanybeki*, abdominal apex; 7—*A. clepta* sp. n., antenna; 8—10—*A. neustriae* sp. n.: 8—part of forewing, 9—1st to 3rd abdominal tergites, 10—abdominal apex; 11, 12—*A. mendicae* sp. n.: 11—abdomen, dorsal view, 12—abdomen, lateral view; 13—14—abdominal apex: 13—*A. viridanae* sp. n., 14—*A. microsomus* sp. n.; 15—17—*A. jaicus* sp. n.: 15—hind tibia and tarsus, 16—1st to 3rd abdominal tergites, 17—abdominal apex; 18—*A. beshtaii* sp. n., 1st to 3rd abdominal tergites; 19, 20—*A. piliflagellaris* sp. n.: 19—antennal apex, 20—1st to 3rd abdominal tergites; 21—22—*A. disparis* sp. n.: 21—1st to 3rd abdominal tergites, 22—abdominal apex.





- 218 (217). Mesonotum with dense punctation, almost matte, scutellum slightly but distinctly finely punctate, with hairs. Wings at least in basal half hyaline-transparent, with unpigmented bristles. Sixth abdominal sternite quite large, occupying about half abdominal length on ventral side, at apex widely blunt. Second abdominal tergite much shorter than 3rd, finely rugose-punctate, with somewhat lustrous, wide trapezoid middle field, smooth along sides. Hind tibiae brownish yellow, at apex darkened. Fig. 232: 8–10. Body 2.5. Parasite of *Malacosoma neustria* L., *M. castrensis* L. (Lasiocampidae), *Thaumetopoea processionea* L. (Thaumetopoeidae), *Lymantria dispar* L. (Lymantriidae). Cocoons white or pink, in loose cluster. Center, south, east. (cf. also couplets 299 and 347.) .....

..... **A. neustriae** Tobias, sp. n.

Holotype: Female, Kishinev, *M. neustria*, 26.V.1967 (Talitskii). Paratypes: 67 males and females, same data, 1.IV.1970, 13–16.V.1968; 25.V.1973; 29.V.1969, 1970, 1973; 1–5.VI., 10.VI.1969, 11.VI.1970, 25.VI.1969 (Talitskii); 3 females, 1 male, Bakhmut *M. neustria*, 25.V., 3.VI.1961 (Plugaru); 5 females, 2 males, Odessa, 91 males and females, Kherson, *M. neustria*, 4–14.VII.1967 (Talitskii); 5 females, 3 males, Volgograd Region. Kikvidze, oak, lackey moth, 11–17.V.1977 (Mukhin); 5 females, 2 males, Voronezh Region, Tellermanov forest zone, 8–16.VI.1958 (A. Moravskaya); 2 females, 1 male, Kharkov, 2.VII.1963 (Maksimova); 1 female, Ryazan Region, Shilov District, 10.VII.1959 (Minder); Western Kazakhstan, Dzhanybek, *M. castrensis*, 10.VI.1953 (Burnasheva); 7 males, Bashkiriya, Ufa, lackey moth, 20.V.1967 (Stepanova), 1 female, Novorosiisk forest zone, spiny silkworm, 3.VII.1977 (Zelenov); 2 females, 1 male, Krasnodar, *M. neustria*, 24.V.1976 (L. Anufriev); 2 females, 2 males, Krasnodar Territory, Shcherbinsk District, 9.V.1969 (L. Anufriev); 4 females, Gorki Region, Sergach, *M. neustria*, 8.VII.1967; 2 females, Moldavia, Onitskany, *T. processionea*, 21, 25.V.1970 (Talitskii), 2 females, Saratov Region, Karabulak, gypsy moth, 15.VI.1966 (P. Zubov).

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- 219 (216). Metacarpus not less than 2 times as long as its distance from apex of radial cell.

- 220 (227). Head slightly broader or slightly narrower than mesonotum. Wings distinctly darkened with pigmented veins and bristles.
- 221 (226). Antennae as long as body, apical segments noticeably longer than wide. Mesonotum densely punctate, almost matte. Ovipositor valves slightly produced, pointed toward apex.
- 222 (223). Second abdominal tergite slightly sculptured in middle, smooth along sides, with deep oblique grooves. Abdomen strongly compressed. Metacarpus  $2/5$  as long as its distance from apex of radial cell. Palps brownish, middle segments anteriorly yellow; hind tibiae brownish yellow, in apical half brownish. Basal abdominal sternites yellow or yellowish. Body 1.7–2. (cf. also couplets 337 and 355.) .....  
..... **A. mendicae** Tobias, sp. n.
- 223 (222). Second abdominal tergite rugose-punctate (in middle with smooth sculpture). Abdomen slightly compressed. Metacarpus 3 times as long as its distance from apex of radial cell.
- 224 (225). Wings slightly darkened, hind tarsi brownish, palps yellow, hind tibiae brownish yellow, in apical third brownish. Body 2.5. Parasite of *Anaitis efformata* Gueneé, *A. plagiata* L., *Biston betularius* L., *Boarmia* sp. (Geometridae), *Catocala fraxini* L. (Noctuidae). Cocoons isolated, yellowish white. West, center, south; France. (cf. also couplet 233.) .....  
..... **A. euryale** Nixon
- 225 (224). Wings darkened, hind tarsi brown, palps brownish yellow, in apical third brown (like tarsi). (cf. also couplet 234.) ..  
..... **A. spurium** Wesm.
- 225 (221). Antennae slightly longer than head and thorax together. Their apical segments slightly longer than wide. First abdominal tergite in length shorter than its apical width. Mesonotum with very sparse punctation, lustrous; second abdominal tergite in middle slightly sculptured, lustrous, along sides densely sculptured, with faint oblique grooves. Ovipositor valves produced as much as half of 1st segment of hind tarsus, somewhat parallel-sided. Abdomen not compressed. Metacarpus 1.5–2 times as long as its distance from apex of radial cell. Palps brownish; hind tibiae brownish yellow, at apex brownish. Body 2. Ukraine. (cf. also couplets 217 and 308.) ..... **A. kurdjumovi** Tel.

Lectotype: Female, "Poltava, Agricultural Experiment Station", 15.VII.1916. Paralectotype: 1 female (without abdomen), same data.

- 227 (220). Mesonotum much (1.3 times) broader than head. Antennae slightly shorter than body, tapering toward apex, preapical segment 1.5 times as long as wide. Mesonotum densely punctate, but lustrous. Second abdominal tergite rugose-punctate, matte. Sides of metathorax with deep, rough, wrinkled depression. Ovipositor valves slightly produced, narrowed toward apex. Wings hyaline-transparent with faintly pigmented veins and bristles. Metacarpus 2–2.5 times as long as its distance from apex of radial cell. Palps yellow. Hind tibiae brownish yellow, at apex quite contrastingly darkened, brown. Body 3.5–4. Parasite of *Anthocharis cardamines* L. (Pieridae), *Celerio euphorbiae* L. (Sphingidae). Cocoons isolated, yellow, wound in yellow filaments. South; Western Europe .... **A. saltator** Thunb.
- 228 (211). Face quite densely punctate (interpuncture distance not greater than puncture diameter), almost matte. Antennae as long as body, apical segments of flagellum 1.5–2 times as long as wide.
- 229 (230). Sixth abdominal sternite at apex pointed. (cf. also couplet 202.) ..... **A. cajae** Bouché
- 230 (229). Sixth abdominal sternite at apex blunt. Wings somewhat darkened, bristles pigmented, veins in middle of wings brownish.
- 231 (234). Apical segment of foretarsi without bristle. Mesonotum very coarse and extremely densely punctate, except dimly lustrous posterolateral angles, absolutely matte; propodeum with medial longitudinal ridge.
- 232 (233). Preapical segment of antennae 2 times as long as wide. Hind tibiae yellowish red, at most at apex slightly darkened. Fig. 227: 5. Body 2.5–3. Parasite of *Zygaena trifolii* Esp., *Z. filipendulae* L. (Zygaenidae). Cocoons yellowish, in clusters. Northwest, center, east, south; Caucasus; Western Europe. (cf. also couplets 137 and 351.) ..... **A. zygaenarum** Marsh.
- 233 (232). Preapical segment of antennae slightly longer than wide. Hind tibiae yellowish brown, in apical third distinctly darkened. (cf. also couplet 224.) ..... **A. euryale** Nixon

- 234 (231). Apical segment of foretarsi with curved bristle on lower side (cf. Fig. 218: 10). Mesonotum softly punctate, somewhat lustrous. Propodeum without or with very faint longitudinal ridge. Fig. 227: 6, 9. Body 2.2–3.3. Parasite of many lepidopterans from different families: *Iodis lactearia* L., *Selenia dentaria* F., *S. lunaria* Den. and Schiff., *Phigalia pilosaria* Den. and Schiff., *Cyclophora punctaria* L., *Ennomos quercinaria* Hfn., *E. alniaria* L., *Campaea margaritata* L., *Gonodontis bidentata* Cl., *Biston stratarius* Hfn., *B. betularius* L., *Operophtera brumata* L., *Lycia hirtarius* Cl., *Serraea punctinalis* Scop., *Boarmia roboraria* Den. and Schiff. (Geometridae), *Cerura vinula* L., *Diloba caeruleocephala* L. (Notodontidae), *Allophyes oxyacanthae* L., *Brachionycha sphinx* Hfn. (Noctuidae), *Macothylacia rubi* L., *Poecilocampa populi* L. (Lasiocampidae), *Lymantria dispar* L. (Lymantriidae).<sup>1</sup> Cocoons rosy, rarely white, in loose clusters. West, northwest, center, south; Caucasus, Kazakhstan, Siberia up to Far East; Western Europe. (cf. also couplet 225.).....  
 ..... **A. spurius** Wesm.<sup>1</sup>
- 235 (172). Inner spur of hind tibiae not longer than half of 1st segment of hind tarsus.
- 236 (239). Sixth abdominal sternite not extending far beyond abdominal apex, at apex pointed. First abdominal tergite almost parallel-sided, with rounded posterolateral angles, slightly longer than wide. Second tergite much shorter than 3rd, posteriorly straight. Large spur of hind tibiae slightly longer than 1/3rd of 1st segment of hind tarsus. Mesonotum densely punctate, matte. Wings weakly darkened, stigma and veins brown.
- 237 (238). Sixth sternite extremely large (Fig. 228: 5). Antennae as long as body, segments in apical third 1.5–2 times as long as wide. Coloration highly variable; coxae and abdomen black or yellowish brown, hind femora yellowish brown, at

<sup>1</sup> In the series extracted from *L. dispar* (11 females, 9 males, Sivkovo, Kaluzhskaya Region, 25.VI.1978, Khlopunov), the majority of specimens fully correspond with the description of *A. spurius*, but some females have different degrees of paleness of the hind femora to almost entirely brownish yellow. Such specimens are identical with *A. gastropachae*. The possibility of *A. spurius* being only a color variant of the latter is not excluded.

- apex darkened. Figs. 228: 1, 5; 230: 6. Body 2–2.5. Parasite of species of genus *Melitaea* (Nymphalidae). Cocoons white, in loose clusters. South; Caucasus, Central Asia; Western Europe ..... **A. acuminatus** Reinh.
- 238 (237). Sixth abdominal sternite less large. Antennae slightly longer than head and thorax together. Segments in apical third of antennae square. Legs usually and abdomen yellowish brown. Body 2–2.3. Parasite of species of genus *Melitaea* and *Euphydryas aurinia* Rott. (Nymphalidae). Cocoons white, in clusters. South; Western Europe.....  
..... **A. bignelli** Marsh.
- 239 (236). Sixth abdominal sternite weakly developed, not produced beyond abdominal apex or only slightly. If large (*A. brevicornis*, *A. pieridis*), then at apex widely blunt.
- 240 (241). Mesonotum softly punctate, intensely lustrous, sometimes smooth in posterior part. Fore-, middle and often hind coxae also, usually 2nd and 3rd tergites, occasionally abdomen entirely, brownish yellow. First abdominal tergite broadened toward apex, its length equal to or slightly greater than its width at apex. Mesonotum 7/10th as long as its width. Antennae as long as body, flagellar segments in apical third 1.5 times as long as wide. Ovipositor short, straight. Fig. 228: 2, 6. Body 2.3–3.2. Parasite of *Cerura vinula* L. (Notodontidae). Cocoons white or slightly yellowish, in clusters. Transpalearctic .....  
..... **A. affinis** Nees (*harpyae* Niez.)
- 241 (240). Mesonotum more coarsely sculptured, matte or slightly lustrous. Coxae and abdominal tergites usually black. If mesonotum relatively weakly sculptured, then hind femora usually black, and flagella with short segments in apical part (*A. kazak*) or stylet of ovipositor extremely long, falciform.
- 242 (247). Antennae extremely short, much shorter than body; apical segments broad. Hind femora black or brown.
- 243 (244). Sixth abdominal sternite large, distinctly sclerotized, at apex broadly blunt. Abdomen strongly compressed. Length of 1st abdominal tergite greater than its width at apex. Sculptured part of 2nd tergite 1.5 times as wide as its length. Fig. 225: 2, 11. Body 2.2–2.7. Parasite of *Iteophaga viminalis* F., *Ipimorpha subtusa* Den. and Schiff., *Cirrhia citrigo* L. (Noctuidae), *Hydriomena furcata* Thunb. (Geometridae), *Syndemis musculana* Hb. (Tortricidae).

- Cocoons in loose clusters. Northwestern Europe.....  
 ..... **A. brevicornis** Wesm.
- 244 (243). Sixth abdominal sternite less large, weakly sclerotized, at apex slightly pointed. Abdomen slightly compressed.
- 245 (246). First abdominal tergite as long as its width at apex. Second tergite with grooves, parallel to its lateral margins. Anal lobe of hind wings with bristles along outer margin. Antennal segments slightly longer. Body 2.5. Parasite of *Rheumaptera hastata* L., *R. undulata* L. (Geometridae). Western Europe..... **A. eulipis** Nixon
- 246 (245). First abdominal tergite distinctly longer than its width at apex. Second tergite with diverging grooves. Anal lobe of hind wings without bristles on outer margin. Antennal segments shorter. Figs. 216: 11; 230: 7, 8. Body 2.7–3.2. Parasite of *Operophtera brumata* L., *Eupithecia succenturiata* L., *Erannis defoliaria* Cl. (Geometridae). Cocoons isolated, yellow. West, center, south; Caucasus, Central Asia; Western Europe. (cf. also couplet 317.).....  
 ..... **A. praepotens** Hal.<sup>1</sup>
- 401 247 (242). Antennae not shorter or slightly shorter than body; length of apical segments not shorter than width (except sometimes in *A. pilicornis*, which has antennae with long isolated hairs).
- 248 (259). Third abdominal tergite rugose-punctate, usually in major part somewhat matte. Hind femora often yellowish brown. First abdominal tergite widened toward apex, not as long as its width at apex.
- 249 (252). Apical segments of antennae 1.3 to 1.5 times as long as wide.
- 250 (251). Mesonotum softly punctate, scutellum weakly punctate, lustrous. Second abdominal tergite shorter than 3rd (Fig. 229: 5). Apical segment of foretarsi with curved bristle. Antennae black. Hind femora often at apex, sometimes on upper and lower sides and rarely (significantly more often in males than in females) entirely darkened. Body 2.5–3. Parasite of *Lymantria dispar* L., *L. monacha* L., *Leucoma salicis* L., *Euproctis chrysorrhoea* L., *Orgyia antiqua* L. (Lymantriidae), *Nycteola asiatica* Krul. (Noctuidae).

<sup>1</sup>*A. memnon* Nixon, described from England, differing only in thinner ovipositor (Fig. 231: 12), is extremely close to this species.

- Cocoons isolated, pale yellow or dirty white, often under remnants of caterpillars. Almost entire Palearctic, throughout European Part of the USSR; introduced into North America ..... **A. melanoscelus** Ratz. (*solitarius* Ratz., *creatus* Balevski, syn. n.)
- 251 (250). Mesonotum quite coarsely and densely punctate, scutellum densely and more coarsely punctate, slightly lustrous. Second abdominal tergite equal to 3rd. Basal half of antennae and hind femora entirely yellowish brown. Body 2. Parasite of *Lymantria dispar* L. (Lymantriidae). Cocoons white, in clusters. South..... **A. ocneriae** Ivanov
- 252 (249). Two preapical segments of antennae not longer or slightly longer than wide. Apical segment of foretarsi without bristle. Sixth abdominal sternite relatively short, at apex widely blunt. Second abdominal tergite shorter than 3rd. Mesonotum not coarsely but quite densely punctate, noticeably lustrous.
- 253 (258). Hind femora black, hind tibiae at apex darkened.
- 254 (255). Antennae much shorter than body, two preapical segments almost square. Abdomen narrower than thorax. Fig. 230: 9. Body 3.2. Lone parasite of *Eupithecia virgaureata* Doubleday (Geometridae). Northwest; England ..... **A. errator** Nixon
- 255 (254). Antennae slightly shorter than body, two preapical segments distinctly longer than wide. Abdomen slightly narrower than thorax.
- 256 (257). Metacarpus 4 times as long as its distance from apex. Body 2.8. Lone parasite of *Anarta myrtilli* L. (Noctuidae) on *Calluna*. Northwest; Western Europe ..... **A. callunae** Nixon
- 257 (256). Metacarpus 3 times as long as its distance from wing apex. (cf. also couplet 342.) ..... **A. ancilla** Nixon
- 258 (253). Hind femora and tibiae brownish yellow. Two preapical segments of antennae slightly longer than preceding ones, noticeably longer than their width. Metacarpus 3.5 times as long as its distance from wing apex. Basal half of wings hyaline-transparent, submedial cell with extremely rarefied bristles. Sixth abdominal sternite quite large, widely blunt (Fig. 232: 13). Form and sculpture of 1st to 3rd abdominal tergites like those in *A. melanoscelus*. Body 2.6. Parasite of *Tortrix viridana* L. (Tortricidae). Cocoons white, isolated. Center ..... **A. viridanae** Tobias, sp. n.
- Holotype: Female, Voronezh Protected Forest, extracted from *T. viridana*, 12.VI.1972 (G. Isaev).



- 259 (248). Third abdominal tergite smooth, rarely at base weakly sculptured. If distinctly sculptured, then ovipositor produced far beyond abdominal apex, curved.
- 260 (357). Head and thorax black, stigma brown.
- 261 (286). Hind femora yellowish brown, often at apex darkened.
- 262 (265). Ovipositor arcuate, valves produced far beyond apex of quite distinctly developed 6th abdominal sternite (up to 5/10th to 7/10th length of 1st segment of hind tarsus), directly, somewhat downward. Third abdominal tergite at least at base rugose-punctate. Metacarpus long, slightly short of reaching apex of radial cell. First abdominal tergite narrowed toward base, with slightly rounded posterolateral angles, as long as its width at apex. Second abdominal tergite, as 1st, densely rugose-punctate, without distinct oblique grooves. Mesonotum mildly sculptured, intensely lustrous.
- 263 (264). Ovipositor valves with dense hairs, concentrated at apex (Fig. 230: 10). Preapical segment of antennae 2 times as long as wide. Hind tibiae darkened at apex. Body 3.8. Parasite of *Hyphantria cunea* Drury (in North America) (Arctiidae), *Hemerocampa leucostigma* Abbot and Smith (Lymantriidae), *Cosmia trapezina* L., *Panolis flammea* Den. and Schiff., *Mamestra suasa* Den. and Schiff., *Orthosia miniosa* Den. and Schiff., *O. stabilis* Den. and Schiff. (Noctuidae). Moldavia, Ukraine (up to Kiev in North), Krasnodar Territory (Sochi); England, Czechoslovakia, Bulgaria, North America .....
- ..... **A. hyphantriae** Riley
- 264 (263). Ovipositor valves with sparse long hairs along entire length (Fig. 230: 11). Preapical segment of antennae 1.5 times as long as wide. Hind tibiae entirely reddish yellow. Body 2.8. Parasite of *Earias chlorana* L. (Noctuidae). Cocoons isolated. South; Armenia; Czechoslovakia .....
- ..... **A. scabriculus** Reinh.
- 265 (262). Ovipositor straight or slightly curved, valves shorter, less produced (in doubtful cases 3rd abdominal tergite smooth and metacarpus shorter).
- 266 (267). Two preapical segments of antennae square or slightly longer than wide. Body extremely small: 1.5. Head noticeably wider than mesonotum (33:28), face with noticeable elevated protuberance along its middle. First abdominal tergite slightly widened toward apex, almost parallel-sided,

with slightly rounded posterolateral angles, noticeably longer than its width at apex. Second abdominal tergite 10/13th of 3rd in length, with shallow, curved oblique grooves, densely and finely rugose-punctate as also apical half of 1st abdominal tergite. Sixth abdominal sternite short, rectangular. Ovipositor valves produced beyond abdominal apex by as much as length of 2nd segment of hind tarsus (Fig. 232: 14). Metacarpus 2 times as long as its distance from wing apex. Hind femora yellowish brown, hind tibiae brownish yellow, at apex brown. Parasite of *Callichystis rectangulata* L. (Geometridae).—Belorussia ..  
..... **A. microsomus** Tobias, sp. n.

Holotype: Female, Minsk, parasite of *C. rectangulata* L. 20.V.1968 (Lovninevich).

- 267 (266). Apical segment of antennae 1.5–2 times as long as wide. Body larger.
- 268 (269). Second and 3rd abdominal tergites, base of 1st tergite contrastingly paler than remaining part of abdomen, brownish red, coxae, except base of hind coxae brownish yellow. Antennae much longer than body, apical segments 2 times as long as wide. First abdominal tergite 1.3 times as long as its width at apex, narrowed toward base. Body 2.4. Caucasus (Azerbaijan)..... **A. rufiventris** Abidinb.
- 269 (268). Abdominal tergites and coxae, at least hind coxae, black or brown. Antennae not longer than body, apical segments often less than 1.5 times as long as wide.
- 270 (271). First abdominal tergite parallel-sided, 1.5 times as long as its width at apex. Apex of ovipositor directed downward. Anterior abdominal sternites bright yellow, hind femora brownish yellow, at apex with dark spot. Figs. 216: 7, 8; 230: 12. Body 2–3. Parasite of *Pieris brassicae* L., *P. rapae* L., *Aporia crataegi* L. (Pieridae). Cocoons yellow, in clusters. Throughout Palearctic..... **A. glomeratus** L.
- 271 (270). First abdominal tergite narrowed toward base, usually slightly longer than its width at apex (Fig. 216: 9).
- 272 (281). Tegulae black or brown.
- 273 (278). Metacarpus 1.5–2 times as long as its distance from apex of radial cell.
- 274 (277). Mesonotum densely punctate, matte.
- 275 (276). Hind femora brownish yellow, veins in middle of wings light yellow. Fig. 229: 15–18. Body 2.2. Central Asia.....  
..... **A. evagatus** Papp

- 276 (275). Hind femora yellowish brown in basal part, darkened toward apex, sometimes almost entirely dark colored; veins in middle of wings brown. Third abdominal tergite polished, with sparse hairs. Fig. 216: 9. Body 2–2.5. Parasite of *Vanessa atalanta* L., *Inachis io* L., *Cynthia cardui* L. (Nymphalidae), *Spodoptera exigua* Hb., *Mythimna littoralis* Curt., *Ochroleura praecox* L., *Dicestra trifolii* Hfn., *Apamea sordens* Hfn., *Autogapha gamma* L., *Syngrapha circumflexa* L., *Helicoverpa armigera* Hb., *Mamestra brassicae* L. (Noctuidae). Cocoons in compact clusters, wound in a common filament. Almost throughout Palearctic, throughout European part of the USSR, except north. (cf. also couplet 343.) ..... **A. vanessae** Reinh.
- 277 (274). Mesonotum with relatively sparse punctation, lustrous (on its lateral parts, interpuncture distance much greater than puncture diameter, in middle equal to puncture diameter). Apical segment of antennae 1.5 times as long as wide. Metacarpus 1.5 times as long as its distance from wing apex. Hind tarsi thin. First abdominal tergite slightly narrowed toward base, with rounded, posterolateral angles. Second tergite with oblique grooves, forming almost triangular field, slightly sculptured. Sixth sternite small, slightly pointed. Ovipositor slightly produced. Wings pale, with slightly pigmented bristles, veins brownish pale yellow. Hind femora yellowish brown, on upper side brown. Fig. 232: 15–17. Body 2.6. Western Kazakhstan .....  
..... **A. jaicus** Tobias, sp. n.  
Holotype: Female, Yanvartsevo, right bank of River Ural, floodplains, 14.VIII.1950 (Nikol'skaya).
- 278 (273). Metacarpus 3–5 times as long as its distance from apex of radial cell. Mesonotum mildly punctate, lustrous.
- 279 (280). Metacarpus 3 times as long as its distance from apex of radial cell. Wing membrane above mediocubital vein with bristles. Hind femora brownish yellow, only at apex darkened. Body 2.5. Host found on berberis. Switzerland .....  
..... **A. berberis** Nixon
- 280 (279). Metacarpus 4–5 times as long as its distance from apex of radial cell. Wing membrane above mediocubital vein without bristles. Hind femora darker, with dark strip on upper and lower sides. (cf. also couplet 330.) .....  
..... **A. jucundus** Marsh.
- 281 (272). Tegulae (also hind femora and tibiae) yellow.

- 282 (283). Metacarpus 2 times as long as its distance from apex of radial cell. First and 2nd abdominal tergites sculptured (but lustrous). (cf. also couplet 358.)..... *A. aururus* Tel.
- 283 (282). Metacarpus 4–5 times as long as its distance from wing apex. Mesonotum with soft uniform punctation, lustrous.
- 284 (285). First and 2nd abdominal tergites sculptured, matte. Face mildly punctate, lustrous. Hind coxae brownish, veins in middle of wings brownish. Body 1.9. Azerbaidzhan.....  
..... *A. satunini* Tobias, sp. n.  
Holotype: Female, Kumbashi, north Lenkoran, 4.VII.1910 (K. Satunin).
- 285 (284). First and 2nd abdominal tergites faintly sculptured, lustrous. Face smooth. Hind coxae brownish yellow, veins in middle of wings light yellow. Antennae brown. Body 2. Central Asia..... *A. bactrianus* Tel.  
Lectotype: Female, Bukhara, 16.VIII. [year not indicated] (Gerasimov). Paralectotypes: 3 females (1 female without abdomen, 1 female without antennae), same data.
- 403 286 (261). Hind femora black; if sometimes somewhat reddish, then (*A. onaspis*) antennae shorter than body and apical segments of flagellum square or (*A. jucundus*) stigma at base yellowish.
- 287 (288). Genae distinctly developed, half as high as longitudinal diameter of eye (Fig. 231: 1). Antennae shorter than body, apical segments of flagellum square or hardly longer than their width. First abdominal tergite slightly longer than its width at apex, slightly narrowed toward base. Body 2.5–2.8. Parasite of *Helicoverpa armigera* Hb. (Noctuidae). Cocoons white. Center, south; Caucasus, Kazakhstan, Central Asia; Western Europe .....  
..... *A. arcticus* Thoms.  
(*astrarches* Marsh., *genalis* Tobias, syn. n.)
- 288 (287). Genae much more weakly developed, not more than 1/3rd as high as longitudinal diameter of eye.
- 289 (328). Antennae shorter than body, apical segments not longer or slightly longer than wide.
- 290 (291). Thorax depressed, its height distinctly less than its width. Antennae much shorter than body, noticeably thickened in middle (segments 10 and 11 with maximum width, equal to their length). Face almost smooth. Mesonotum sparsely punctate (punctation denser along notaulices), lustrous. Scutellum smooth. Second abdominal tergite

- weakly wrinkled. Wings darkened. Fig. 228: 4, 7. Body 2. Kazakhstan ..... **A. depressithorax** Tobias
- 291 (290). Thorax not depressed, its height approximately same as its width.
- 292 (309). Face 1.3–1.5 times as wide as high.
- 293 (294). First abdominal tergite parallel-sided, at apex rounded, faintly sculptured, as also 2nd tergite. Second tergite with oblique grooves extending transversely in wide triangular field. Figs. 216: 10; 228: 3. Body 2–2.8. Parasite of *Evergestis forficalis* L., *E. pallidata* Hfn., *Ostrinia nubilalis* Hb. (Pyraustidae). Cocoons white, in clusters. Northwest, south; Caucasus (Armenia); Western Europe .....  
..... **A. lineola** Curt.  
(*gabrielis* Gautier and Riel, *picipes* auct.)
- 294 (293). First abdominal tergite narrowed toward base, its posterolateral angles somewhat rounded, not longer or slightly longer than wide. Apical half of 1st and 2nd abdominal tergites rugose-punctate, usually matte. Second tergite without distinct triangular field.
- 295 (308). Scutellum somewhat punctate.
- 296 (301). Metacarpus short, 1.5–2 times as long as its distance from apex of radial cell. Wings almost hyaline-transparent, bristles on them white. Two preapical segments of antennae square. First abdominal tergite narrowed toward base, slightly longer than its width at apex.
- 297 (300). Mesonotum densely and finely punctate.
- 298 (299). Sixth abdominal sternite relatively faintly sclerotized and not pubescent. Ovipositor produced by as much as length of 2nd segment of hind tarsus. Metacarpus longer than stigma. Hind tibiae at apex brown. Body 2. Parasite of *Lampides baeticum* L. (Lycaenidae). Western Europe....  
..... **A. tenebrosus** Wesm.
- 299 (298). Sixth abdominal sternite strongly sclerotized, with hairs. Ovipositor concealed or slightly produced. Metacarpus usually not longer than stigma. Hind tibiae at apex brownish. (cf. also couplets 218 and 347.) .....  
..... **A. neustriae** Tobias, sp. n.
- 300 (297). Mesonotum with quite coarse, distinct, round punctures. Hind tibiae brownish, only at base yellow. Body 2.2–2.3. Parasite of *Eriogaster lanestris* L. (Lasiocampidae). Altai territory; Sweden (cf. also couplet 320.) .....  
..... **A. calodetta** Nixon

- 301 (296). Metacarpus longer, not less than 2.5–3 times as long as its distance from apex of radial cell.
- 302 (303). Wings weakly, but definitely darkened, with pigmented bristles. Metacarpus 2.5–3 times as long as its distance from wing apex. Ovipositor valves thin, produced by as much as length of 2nd or 4th segment of hind tarsus. Body 2.2–2.5. (cf. also couplet 318.)..... **A. saltatorius** Balevski
- 303 (302). Wings pale, bristles in their basal half not pigmented.
- 304 (305). Forewings in front and behind mediocubital vein without bristles. Five preapical segments of antennae wide. Abdomen at apex compressed. Sixth sternite at apex widely blunt. First abdominal tergite not distinctly narrowed toward base, noticeably longer than its width at apex. Middle field of 2nd tergite trapezoid, separated from sides by deep oblique grooves (Fig. 232: 18). Hind tibiae brownish yellow, in apical third brown. Body 2.7. Caucasus .....  
..... **A. beshtai** Tobias, sp. n.  
Holotype: Female, Beshtau Peak, lakes, 7.VII. 1960 (Tanasiichuk).
- 305 (304). Forewings uniformly pubescent.
- 306 (307). Ovipositor valves thin, produced by as much as length of 2nd segment of hind tarsus. Mesonotum densely and finely punctate, with slight luster. Fig. 229: 10. Body 2.5. Parasite of *Mythimna unipuncta* Hw. (Noctuidae), *Aporia crataegi* L. (Pieridae). Cocoons white. South; Caucasus, Central Asia (Kirgizia), Pacific Coast; Bulgaria .....  
..... **A. balcanicus** Balevski (*sessilis* auct. part.)
- 307 (306). Ovipositor valves wide (of same width as 1st segment of hind tarsus), produced approximately by as much as 2/3rd length of 1st segment of hind tarsus. Mesonotum very finely and less densely punctate, lustrous. Body 3. Extracted from (? nest) spindle tree moth, *Yponomeuta cognatellus* Hb., in Azerbaidzhan (Zakatal' Protected Forest). Cocoons white. Azerbaidzhan; England .....  
..... **A. memnon** Nixon
- 404 308 (295). Scutellum smooth. Hind femora brownish. Body 2–2.3. (cf. also couplets 217 and 226.)..... **A. kurdjumovi** Tel.
- 309 (292). Face only somewhat (at most 1.2 times) as wide as high.
- 310 (327). Sternites in basal half of abdomen black or brown.
- 311 (324). First abdominal tergite in apical half and 2nd tergite strongly sculptured, matte. Mesonotum quite strongly, but softly punctate, slightly lustrous.

- 312 (313). Antennae with dense, darkly colored isolated hairs (Fig. 231: 3). Ovipositor valves produced beyond apex of 6th abdominal sternite by length of 2nd segment of hind tarsus. Inner spur of hind tibiae half as long as 1st segment of hind tarsus. Wings weakly darkened. Body 3–3.2. Parasite of *Epinotia nigricana* H.-Sch. (Tortricidae), *Amblyptilia punctidactyla* Hw., *A. acanthodactyla* Hb., *Platyptilia cosmодactyla* Hb. (Pterophoridae), *Perizoma alchemillata* L., *Eupithecia pulchellata* Steph. (Geometridae). Center, east, south; Caucasus (Sochi); Western Europe ..... **A. pilicornis** Thoms.
- 313 (312). Antennae with short and sparse, slightly noticeable light colored hairs.
- 314 (319). Apical segments of antennae square and wide. Third abdominal segment with hairs almost all over.
- 315 (318). First abdominal tergite slightly narrowed toward base, longer than its width at apex. Mesonotum with fine, shallow punctation (punctures slightly larger than those due to curled up hairs).
- 316 (317). Sixth abdominal sternite large, occupying half of abdominal length and in apical part about half its height. Ovipositor valves pointed toward apex, produced almost by length of 1st segment of hind tarsus. Fig. 229: 6, 7. Body 2.8–3. Bulgaria ..... **A. acutivalvis** Balévski
- 317 (316). Sixth abdominal sternite much shorter, at apex much less than half abdominal height. Ovipositor valves slightly produced. (cf. also couplet 246.) ..... **A. praepotens** Hal.
- 318 (315). First abdominal tergite distinctly narrowed at base, its length shorter than its width at apex. Mesonotum with less superficial, deeper punctation. Ovipositor valves produced by length of 2nd or 4th segment of hind tarsus. Fig. 229: 8, 9. Body 2.2–2.5. Bulgaria. (cf. also couplet 302.) ..... **A. saltatorius** Balevski
- 319 (314). Apical segments of antennae longer, only two preapical segments slightly longer than wide, others long.
- 320 (321). Third abdominal tergite with hairs only on its posterior margin. Mesonotum with relatively coarse and dense punctation. Body small, 2.2. (cf. also couplet 300.) ..... **A. calodetta** Nixon
- 321 (320). Third abdominal tergite with hairs not only on hind margin.

- 322 (323). First abdominal tergite narrowed toward base, its length shorter than its width at apex. Hind coxae quite strongly punctate, slightly lustrous. Ovipositor with quite thin, long and straight valves, usually greatly produced beyond abdominal apex (Fig. 231: 8, 9). Body 2.2–2.7. (cf. also couplet 170.) ..... **A. cupreus** Lyle
- 323 (322). First abdominal tergite slightly narrowed toward base, distinctly longer than its width at apex (Fig. 231: 6). Hind coxae smooth, lustrous. Ovipositor with shorter and less thin valves, slightly produced beyond abdominal apex (possibly only a variant of *A. praepotens*). Body 2.8–3.2. Lone parasite of *Eupithecia intricata arceuthata* Freyer, *E. nanata* Hb., *E. pimpinellata* Hb., *E. centaureata* Den. and Schiff. (Geometridae). Western Europe.....  
..... **A. numen** Nixon
- 324 (311). First and 2nd abdominal tergites, also mesonotum relatively weakly sculptured, lustrous. Wings hyaline-transparent. Large spur of hind tibiae much shorter than half of 1st tarsal segment. Face smooth. Hind tibiae in basal half brownish yellow, at apex brown. Abdomen compressed, with quite distinctly developed 6th sternite. Second abdominal tergite much shorter than 3rd.
- 325 (326). First abdominal tergite in basal half parallel-sided, in apical third noticeably narrowed toward apex. Segments of flagellum with short hairs. Propodeum without or with slightly developed longitudinal ridge. Metacarpus 2.5–3 times as long as its distance from apex of radial cell. Body 2.5–3.5. Parasite of *Helicoverpa armigera* Hb., *Heliothis peltigera* Den. and Schiff., *H. viriplaca* Hfn. (Noctuidae). South; Kazakhstan, Central Asia ..... **A. kazak** Tel.  
Lectotype: Female, Tadzhikistan, Kulyaba Region, 24.VII.1933 (B. Popov). Paralectotypes: 2 females, same data, 24 and 25.VII.1933; 2 females, 1 male, Rostov-on-Don, "R.-n.s.-kh (Rostov on Don Agricultural Research Center)". 27.III.1927 (1 female), 17.VIII.1927 (1 female), 18.VIII.1928 (1 male) (M.P. Strukova).
- 326 (325). First abdominal tergite narrowed toward base, in apical third parallel-sided. Segments of flagellum with long isolated hairs, almost half as long as width of segment. Propodeum with longitudinal ridge. Metacarpus 4 times as long as its distance from apex of radial cell. Fig. 232: 19, 20. Body 3.3. Moldavia..... **A. piliflagellaris** Tobias, sp. n.



Holotype: Female, Karmanovo, northern slope, 14.VI.1963 (Talitskii).

- 327 (310). Sternite in basal half of abdomen yellow. First and 2nd abdominal tergites with quite coarse, but not dense punctation, lustrous. Mesonotum densely punctate, matte. Wings weakly darkened. Large spur of hind tibiae much shorter than half of 1st segment of hind tarsus. Hind femora and often basal abdominal tergite somewhat reddish. Body 2.3–2.5. Parasite of *Platyptilia rhododactyla* L. (Pterophoridae). Armenia; England .....  
 ..... **A. onaspis** Nixon (*avetyanae* Tobias, syn. n.)
- 328 (289). Antennae usually as long as body. Apical segments of flagellum longer than their width. Apical part of 1st and 2nd abdominal tergites usually rugose-punctate, matte or slightly lustrous; mesonotum punctate, usually matte.
- 405 329 (344). Large spur of hind tibiae much shorter than half of 1st segment of hind tarsus, usually 1/3rd its length.
- 330 (331). Membrane of forewing in front and behind mediocubital vein without or almost without bristles. Wings in basal half hyaline-transparent, with unpigmented bristles. Stigma often with somewhat noticeable basal spot. Apical segment of foretarsi with bristle on lower side. Sixth abdominal sternite short, blunt. Coloration of hind femora variable. Fig. 231: 4, 11. Body 3. Parasite of *Cyclophora punctaria* L., *C. trilinearia* Bkh. (Armenian SSR), *C. ruficiliaria* H.-Sch., *Campaea margaritata* L., *Erannis defoliaria* Cl., *Operophtera brumata* L., *Eupithecia dodonaeata* Gueneé (Geometridae). Cocoons pale yellow, isolated. Moldavia, Armenia; Western Europe. (cf. also couplet 280.) ..... **A. juncundus** Marsh.
- 331 (330). Wing membrane around mediocubital vein distinctly pubescent. Usually wings in basal half somewhat darkened, with pigmented bristles.
- 332 (333). First abdominal tergite parallel-sided, at apex rounded, 1.5 times as long as wide in middle. Stigma brown, at base and apex lighter. Body 2.5. Caucasus (Azerbaijan) .....  
 ..... **A. shemachaensis** Tobias
- 333 (332). First abdominal tergite narrowed toward base, at apex not rounded or slightly rounded, as long as or slightly longer than its width at apex.
- 334 (343). Metacarpus 3–4 times as long as its distance from apex of radial cell. Mesonotum softly punctate, lustrous in

- posterior half; scutellum faint, but distinctly punctate. Hind tibiae brownish yellow, at apex darkened.
- 335 (340). First abdominal tergite with widely rounded posterolateral angles. Second abdominal tergite with deep, curved, oblique grooves.
- 336 (339). Body very small, 1.7–2. Posterolateral angles of 1st abdominal tergite slightly rounded. Sixth abdominal sternite slightly developed, almost rectangular.
- 337 (338). Second abdominal tergite extremely wide, its middle field, marked by oblique grooves, trapezoid, with posterior width 3 times its length. Mesonotum relatively (though not densely), contrastingly punctate compared to weakly sculptured scutellum. Apex of 1st and 2nd abdominal tergites more weakly sculptured, lustrous. Fig. 232: 11, 12. Parasite of *Spilosoma mendica* Cl. (Arctiidae). Cocoons white. Center; Western Kazakhstan. (cf. also couplets 222 and 355.) ..... **A. mendicae** Tobias, sp. n.  
 Holotype: Female, Voronezh Protected Forest, extracted from *S. mendica* Cl., 11.VIII.1975 (G. Isaev). Paratypes: 2 females, same data; 2 females (one without abdomen), Yanvartsevo, right bank of River Ural, from caterpillar of Arctiidae, 16.VI.1950 (Grunin).
- 338 (337). Second abdominal tergite much less wide, its middle field triangular, with posterior width 2 times its length. Mesonotum mildly and densely punctate, slightly more coarsely punctate than scutellum. Apex of 1st and 2nd abdominal tergites densely punctate, matte. Parasite of *Earophila badiata* Den. and Schiff., *Horisme vitalbata* Den. and Schiff. (Geometridae), *Mormo maura* L. (Noctuidae); cocoons in clusters. Northwestern Europe .....  
 ..... **A. nothus** Marsh.
- 339 (336). Body much larger, 2.8–3. Posterolateral angles of 1st abdominal tergite more distinctly rounded (Fig. 231: 7). Sixth abdominal sternite quite large, acute angled. Parasite of *Gonopteryx rhamni* L. (Pieridae). Cocoons orange-yellow, with fluff of filaments in middle. Western Europe .....  
 ..... **A. gonopterygis** Marsh.
- 340 (335). First abdominal tergite with almost rounded posterolateral angles. Second abdominal tergite with faint oblique grooves.
- 341 (342). Ovipositor valves extremely thin, almost narrower by half of 1st segment of hind tarsus, produced beyond abdominal

- apex by half of 1st segment of hind tarsus, their basal part visible through relatively weakly sculptured 6th sternite. Wings darkened, bristles in their basal half distinctly pigmented. Fig. 229: 4. Body 2.2. Bulgaria .....  
 ..... **A. subancilla** Balevski
- 342 (341). Ovipositor valves slightly produced, their basal part not visible through intensely sclerotized 6th sternite. Wings pale, bristles in their basal half not pigmented. Body 2.5. Parasite of *Colias chrysotheme* Esper, *C. hyale* L., *C. palaeno* L., *C. erate polygraphus* Motsch. (Pieridae). Cocoons white or yellowish, in clusters. Central Ural; Pacific Coastal Region; Central Europe. (cf. also couplet 257.) ..... **A. ancilla** Nixon
- 343 (334). Metacarpus 1.5–2 times as long as its distance from apex of radial cell. Mesonotum coarsely and relatively sparsely punctate, scutellum glabrous. (cf. also couplet 276.) .....  
 ..... **A. vanessae** Reinh.
- 344 (329). Large spur of hind tibiae half as long as 1st segment of hind tarsus or slightly shorter.
- 345 (348). Wings hyaline-transparent (at least in basal half). First and 2nd abdominal tergites mildly sculptured, lustrous.
- 346 (347). Sixth abdominal sternite large, produced beyond abdominal apex. Ovipositor usually produced beyond apex of 6th sternite by length of 2nd or 3rd segment of hind tarsus (Fig. 231: 13). Metacarpus 2.5 times as long as its distance from apex of radial cell. Body 2–2.5. Parasite of *Aporia crataegi* L. (Pieridae); cocoons white, in clusters. Center, south; Caucasus, Kazakhstan, Far East; Western Europe ..... **A. pieridis** Bouché
- 347 (346). Sixth abdominal sternite small, not produced beyond abdominal apex or only slightly. Ovipositor slightly produced beyond apex of 6th sternite. Metacarpus not more than 2 times as long as its distance from apex of radial cell. Preapical segments of antennae 1.5 times as long as wide. Mesonotum densely punctate, matte. (cf. also couplets 218 and 299.) ..... **A. neustriae** Tobias, sp. n.
- 406 348 (345). Wings distinctly darkened. First and 2nd abdominal tergites more coarsely sculptured.
- 349 (350). Temples slightly below upper margin of eye (in lateral view), angularly projecting (Fig. 231: 2). Antennae as long as body, two preapical segments 1.5–1.8 times as long as wide. Inner spur of hind tibiae half as long as 1st segment

- of hind tarsus (or slightly longer). First abdominal tergite distinctly broadened toward apex, wrinkled like 2nd; field of 2nd tergite occupying entire width. Sixth sternite short, at apex truncate. Hind femora with reddish tinge. Body 3.2–3.3. Parasite of *Gonopteryx rhamni* L. (Pieridae). Cocoons isolated, appearing as loose net. England .....
- ..... **A. risilis** Nixon
- 350 (349). Temples uniformly and slightly rounded.
- 351 (352). Apical segments of antennae 2 times or almost 2 times as long as wide. First and 2nd abdominal tergites densely rugose-punctate, matte. (cf. also couplets 137 and 232.) ..
- ..... **A. zygaenarum** Marsh.
- 352 (351). Apical segments of antennae slightly longer than their width.
- 353 (354). Hind legs very dark colored. Tibiae in basal half reddish brown, in apical half almost black. Mesonotum mildly punctate, with satiny sheen. First abdominal tergite almost parallel-sided. Second tergite densely rugose-punctate, with faint grooves along sides. Hairs on 3rd tergite not numerous, scattered all over tergite. Sixth sternite short, at apex blunt. Body 2.8. Parasite of *Thera juniperata* L., *Eupithecia intricata* Zett., *E. intricata arceuthata* Freyer, *E. egenaria* H.-Sch. (Geometridae). Western Europe.....
- ..... **A. juniperatae** Bouché
- 354 (353). Hind legs light colored; tibiae in basal half yellowish, at apex brownish. Mesonotum with quite coarse and dense punctation, without satiny sheen.
- 355 (356). First and 2nd abdominal tergites relatively weakly sculptured, lustrous; 2nd tergite much shorter than 3rd, with extremely wide triangular field (Fig. 232: 11). Face 1.3 times as wide as high. (cf. also couplets 222 and 337.).....
- ..... **A. mendicae** Tobias, sp. n.
- 356 (355). First and 2nd abdominal tergites densely rugose-punctate, matte; 2nd abdominal tergite slightly shorter than 3rd, with trapezoid field, much less wide (Fig. 232: 21). Mesonotum uniformly and densely punctate, matte; scutellum weakly punctate. Metacarpus 2.5–3 times as long as its distance from wing apex. Sixth abdominal sternite short. Ovipositor valves thin, slightly produced (Fig. 232: 22). Basal sternites of abdomen and palps yellow. Hind femora dark brown, with yellowish band in middle of basal half. Wings faintly darkened. Body 2–2.1. Parasite of *Lymantria*

*dispar* L. (Lymantriidae). Cocoons white. Caucasus (Azerbaijan) ..... **A. dispar** Tobias, sp. n.

Holotype: Female, "Yalama, extracted from caterpillars of gypsy moth". 22.III.1972 (Z. Mamedov). Paratypes: 2 females, same data.

357 (260). Head and thorax reddish brown; antennae brown; abdomen yellowish brown or entire body brown; stigma yellow. Antennae as long as body. Apical segments of flagellum 1.5 times as long as wide. First abdominal tergite narrowed toward base, as long as its width at apex. Second tergite not coarsely rugose-punctate, lustrous. Sculpture in apical half of 1st tergite coarser. Sixth abdominal sternite at apex blunt. Legs brownish yellow.

358 (359). Veins brownish yellow. Body 2.5. Orenburg Region. (cf. also couplet 282.) ..... **A. aururus** Tel.

Lectotype: Female, Veselyi kut, 25.VI.1931 (Molchanova). Paralectotypes: 2 females, same data.

359 (358). Veins almost unpigmented, whitish. Body 2.2. Central Asia ..... **A. turkestanicus** Tel.

Lectotype: Female "No. 49" from Plotnikovo (according to first description of the species: Tashkent). Paralectotype: 1 female (without head), 1 male (without abdomen), same data; whole material was mounted in alcohol, fixed crudely and preserved badly.

360 (121). Propodeum slightly sculptured. First abdominal tergite elongate (2 times as long as wide), faint, but distinctly narrowed from base to apex. Ovipositor valves (their broadened part as long as 1st segment of hind tarsus) distinctly broadened toward apex. Outer side of hind tibiae with numerous yellow, appressed hairs. Antennae longer than body. First and 2nd abdominal tergites not coarsely rugose-punctate, 3rd somewhat rough. Body black. Legs and basal abdominal sternites yellowish brown. Fig. 229: 11–14. Body 2.2–2.4. Bulgaria. (Group *A. tobiasi*.) ..... **A. tobiasi** Balevski

361 ( 24). Claws pectinate. Ovipositor valves 7/10th of hind tibia. Second radiomedial cell (usually open, but sometimes with traces of 2nd radiomedial vein) distinctly narrowed. Propodeum almost smooth. Antennae extremely hairy. Hind femora black, wings darkened. Fig. 223: 1–3. Body 4. England, Sweden. (Group *A. validus*.) ..... **A. validus** Thoms.

- 362 ( 23). Ovipositor valves as long as hind tibia curved sabre shaped. Male genitalia extremely large, with massive, broad parameres projecting far. First abdominal tergite very slightly narrowed toward apex, 2nd tergite separated from 3rd by distinctly arcuate suture, with widely spaced oblique grooves. Apical segments of antennae slightly longer than their width. Mesonotum not coarsely and densely punctate, lustrous. Propodeum punctate, slightly coarser, with transverse wrinkles. First tergite in apical part, 2nd near oblique grooves, sculptured. Legs, except coxae, yellowish red. Fig. 233: 4, 5. Body 3—4.5. Parasite of *Apamea monoglypha* Hfn. (Noctuidae). Cocoons white, in clusters parallel to each other. Entire Palearctic. (Group *A. falcatus*.)..... **A. falcatus** Nees (*gladiator* Szépl.)
- 407 363 ( 14). Sixth abdominal sternite more faintly sclerotized, usually longitudinally striate in basal part (with fine longitudinal folds; generally incurved at base. Fig. 240: 6—9). Ovipositor valves produced beyond 6th sternite by length usually greater than first two segments of hind tarsus (if sometimes valves shorter, then hairs present all along length). In doubtful cases (species of group *A. circumscriptus*) anterior margin of postscutellum with two small tubercles directed forward.
- 364 (375). Short process of 2nd radiomedial vein (Fig. 235: 6, 7), present at junction of sclerotized part of radial and radiomedial veins, directed outward. Propodeum (excluding *A. ciscaucasicus* and *A. tedellae*) with distinct medial longitudinal ridge. First abdominal tergite narrowed from base to apex (Fig. 234: 1—4). Second abdominal tergite short, approximately half as long as 3rd, with widely spaced oblique grooves. Ovipositor valves usually not shorter or slightly shorter than hind tibia. Mesonotum densely and quite coarsely punctate anteriorly, matte, very faintly punctate in posterior part, lustrous. Large spur of hind tibiae approximately half as long as 1st segment of hind tarsus. Legs, except coxae, and presternite of abdomen brownish yellow. Sylvatic species (Group *A. parasitellae*).
- 365 (370). First abdominal tergite distinctly narrowed toward apex, its width at apex less than or approximately equal to length of 2nd tergite (Fig. 234: 1, 2).
- 366 (367). Propodeum wrinkled in middle part, with distinct medial longitudinal ridge reaching up to its anterior margin.

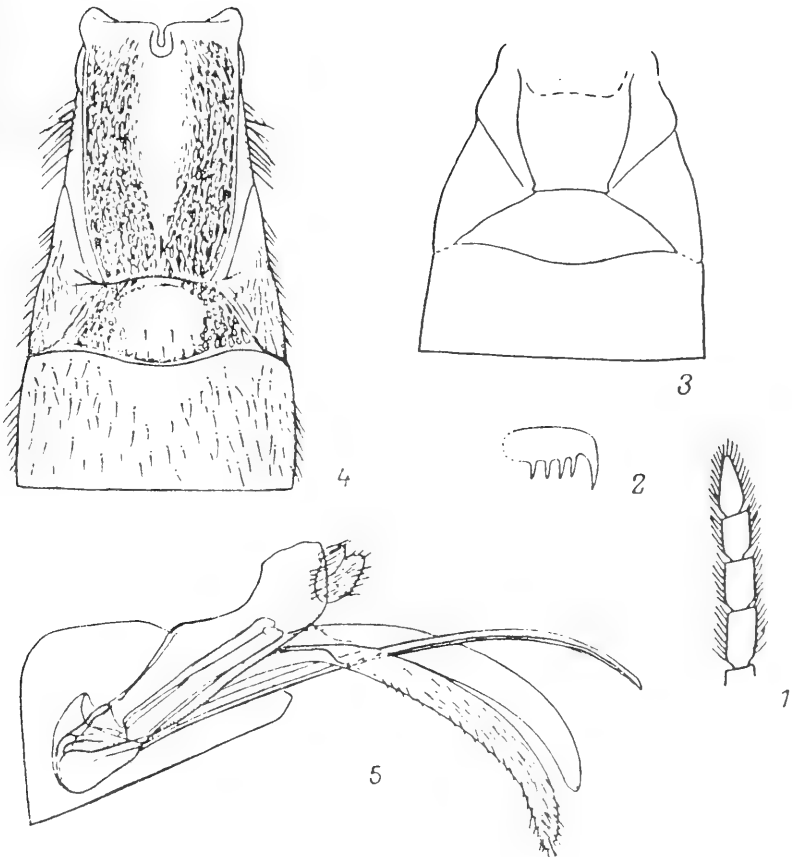


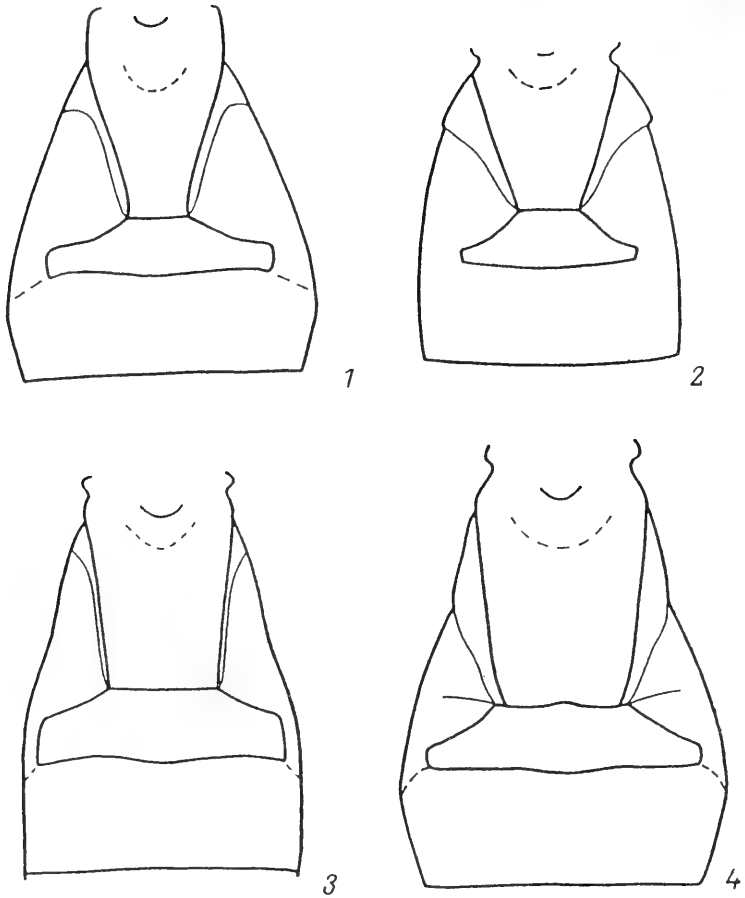
Fig. 233. Microgasterinae (from Wilkinson and Nixon).

1—3—*Apanteles validus*: 1—antennal apex, 2—hind claw, 3—1st to 3rd abdominal tergites; 4, 5—*A. falcaus*: 4—1st to 3rd abdominal tergites, 5—sixth abdominal sternite and ovipositor.

Antennae slightly thickened toward apex, dark yellowish; scape, pedicel and some apical segments usually somewhat darkened. First to 3rd abdominal tergites as in Fig. 234: 1. Ovipositor valves (Fig. 235: 3) somewhat shorter than hind tibia. Body 2.5—3. Central Zone, southwest, south; Georgia, Pacific Coastal Region; England, Netherlands, Central Europe, Romania ..... *A. hedymeles* Nixon

408 367 (366).

Propodeum with rugosity only near posterior margin, without longitudinal ridge in middle (if ridge faint, then not



408

Fig. 234. Microgasterinae (original).

1—4—1st to 3rd abdominal tergites: 1—*Apanteles hedymeles*, 2—*A. tedellae*, 3—*A. gnarus*,  
4—*A. arene*.

reaching up to anterior margin of propodeum). Antennae toward apex not thickened.

- 368 (369). Ovipositor valves half as long as hind tibia. First abdominal tergite distinctly narrowed toward apex, cuneate, 3 times as long as width in middle (Fig. 235: 9). Body 2.5. Ciscaucasus ..... **A. ciscaucasicus** Tobias
- 369 (368). Ovipositor valves (Fig. 235: 4) slightly shorter than hind tibia. First abdominal tergite less narrowed toward apex, 2



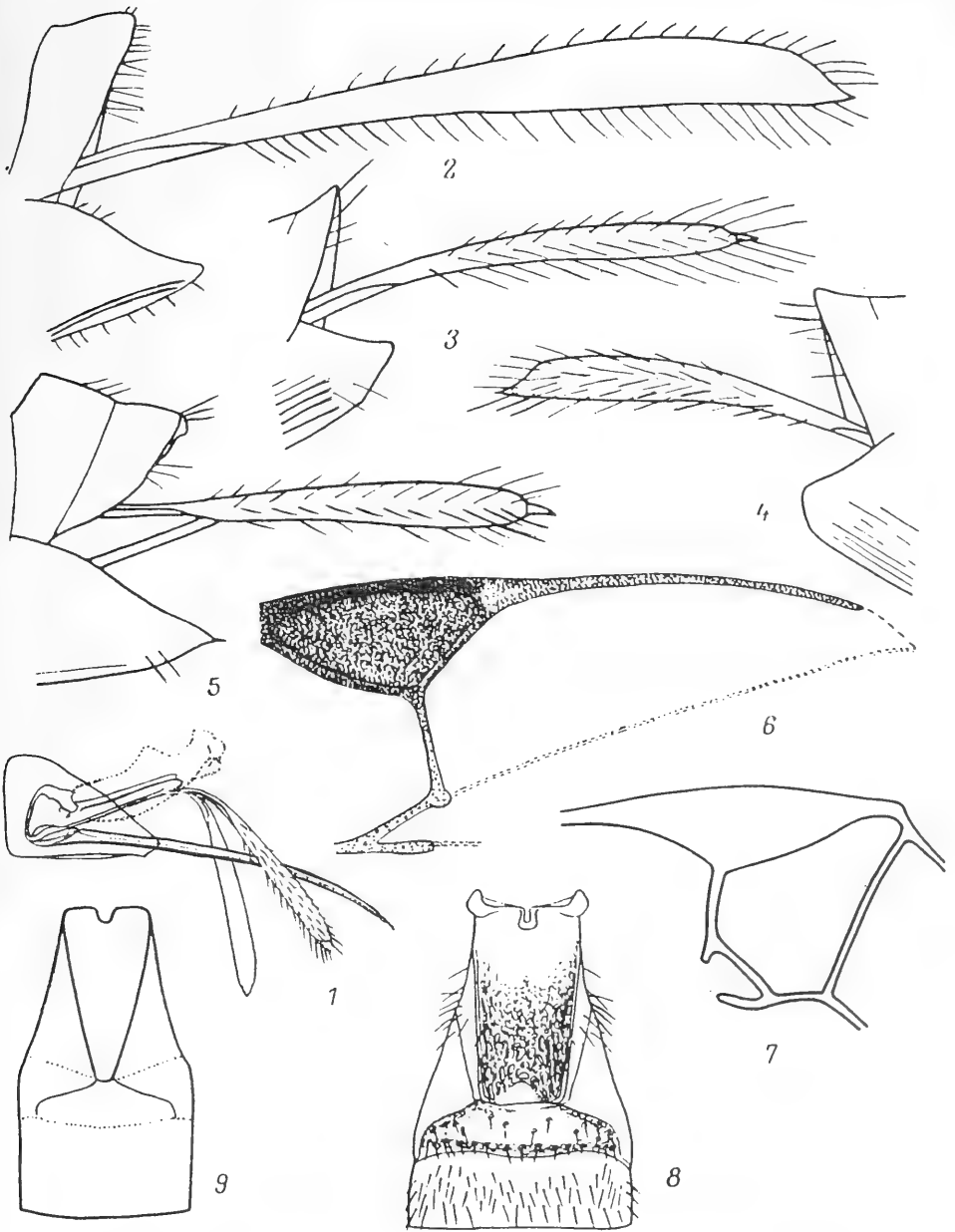


Fig. 235. Microgasterinae (from Tobias, Wilkinson and original).

1—*Apanteles parasitellae*, 6th abdominal sternite and ovipositor; 2—5—abdominal apex: 2—*A. gnarus*, 3—*A. hedymeles*, 4—*A. tedellae*, 5—*A. arene*; 6, 7—part of forewing: 6—*A. gnarus*, 7—*A. ciscaucasicus*; 8, 9—1st to 3rd abdominal tergites: 8—*A. parasitellae*, 9—*A. ciscaucasicus*.

- times as long as width in middle (Fig. 234: 2). Body 2.5–2.8. Parasite of *Epinotia tedella* Cl. (Tortricidae). Southwest, center; England, Sweden, Central Europe .....
- ..... **A. tedellae** Nixon (*epinotiae* Fi., *epinoticida* Fi.)
- 370 (365). First abdominal tergite less narrowed toward apex, its width at apex noticeably greater than length of 2nd tergite (Figs. 234: 3, 4; 235: 8).
- 371 (372). Sixth abdominal sternite more sclerotized, almost completely (except extremely narrow pale band along middle line, not reaching up to apex) dark brown, at apex pointed. Apical width of 1st abdominal tergite usually more than 2 times length of 2nd tergite (Fig. 234: 4). Preapical segment of antennae noticeably longer than wide. Ovipositor valves (Fig. 235: 5) as long as tibia. Body 3.5–4. Parasite of *Adaina microdactyla* Hb. (Pterophoridae). South (Lower Dnepr Region); Kunashir Island, England, Central Europe .....
- ..... **A. arene** Nixon
- 372 (371). Sixth abdominal sternite less sclerotized, with wide, pale, semitransparent area along middle line, at apex blunt (Fig. 235: 2). First abdominal tergite at apex not more, usually less than 2 times wider than length of 2nd tergite. Preapical segment of antennae square, rarely its length slightly exceeds its width.
- 373 (374). Ovipositor valves noticeably widened toward apex, slightly longer than hind tibia (Fig. 235: 2). Face with large uniform punctation, less lustrous. Figs. 234: 3; 235: 6. Body 2.7–3. Central zone, south .....
- ..... **A. gnarus** Tobias and Kotenko
- 409 374 (373). Ovipositor valves slightly widened toward apex (Fig. 235: 1), not longer than hind tibia. Face more softly punctate, more lustrous. Body 2.5–3.5. Parasite of *Triaxomera parasitella* Hb., *Nemapogon granellus* L., *N. cloacellus* Hw. (Tineidae). Transpalearctic .....
- ..... **A. parasitellae** Bouché
- 375 (364). Second radiomedial vein not developed, radial and 1st radiomedial veins form arcuate line or broken from above by angle (if sometimes, in place of break, some sort of process present, then combination of remaining characters different). Propodeum (except some species of group *A. suevus*) without longitudinal ridge in middle.
- 376 (489). First abdominal tergite usually distinctly narrowed toward apex (Figs. 236: 3; 240: 3). Middle field of 2nd abdominal

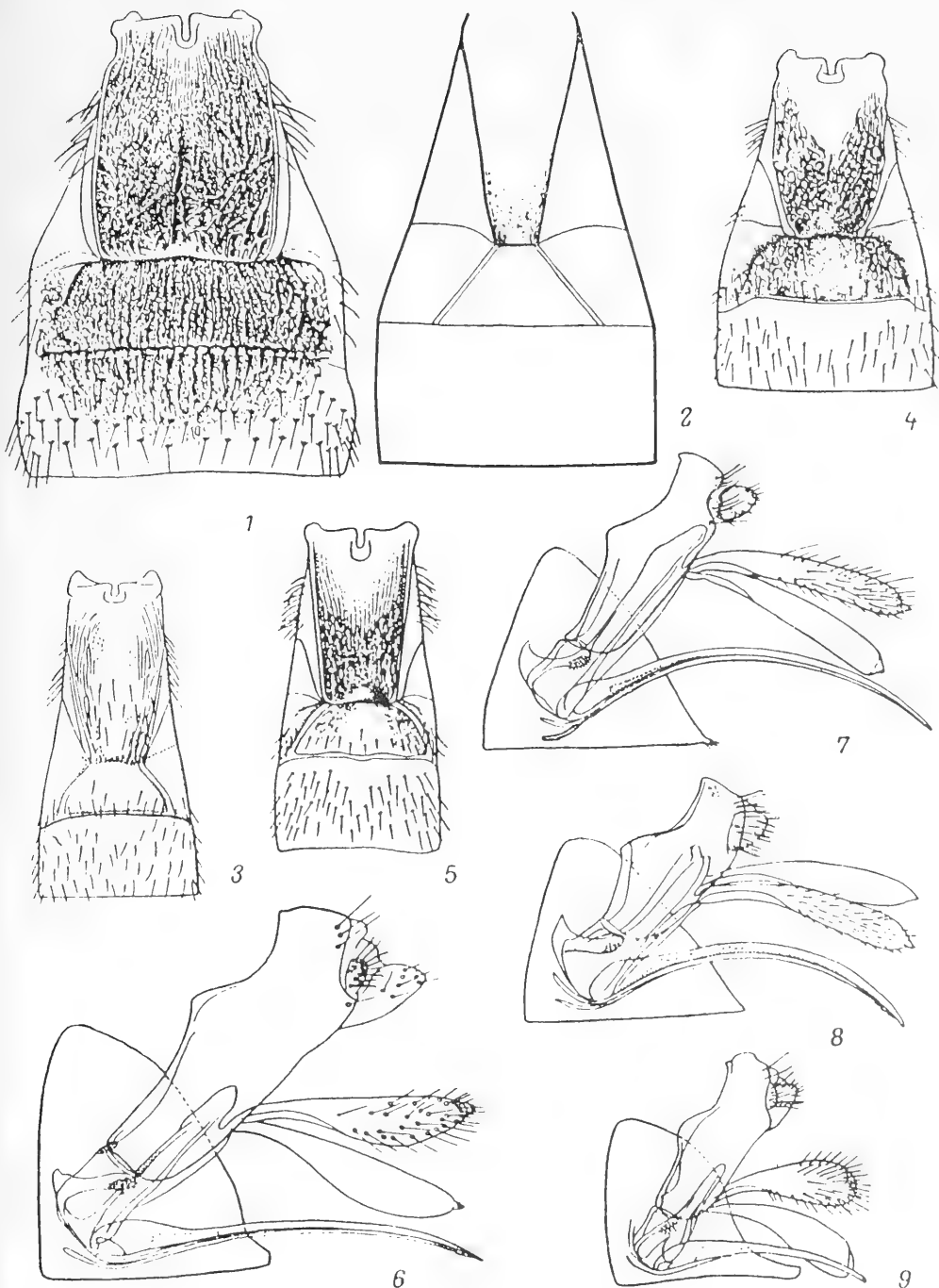
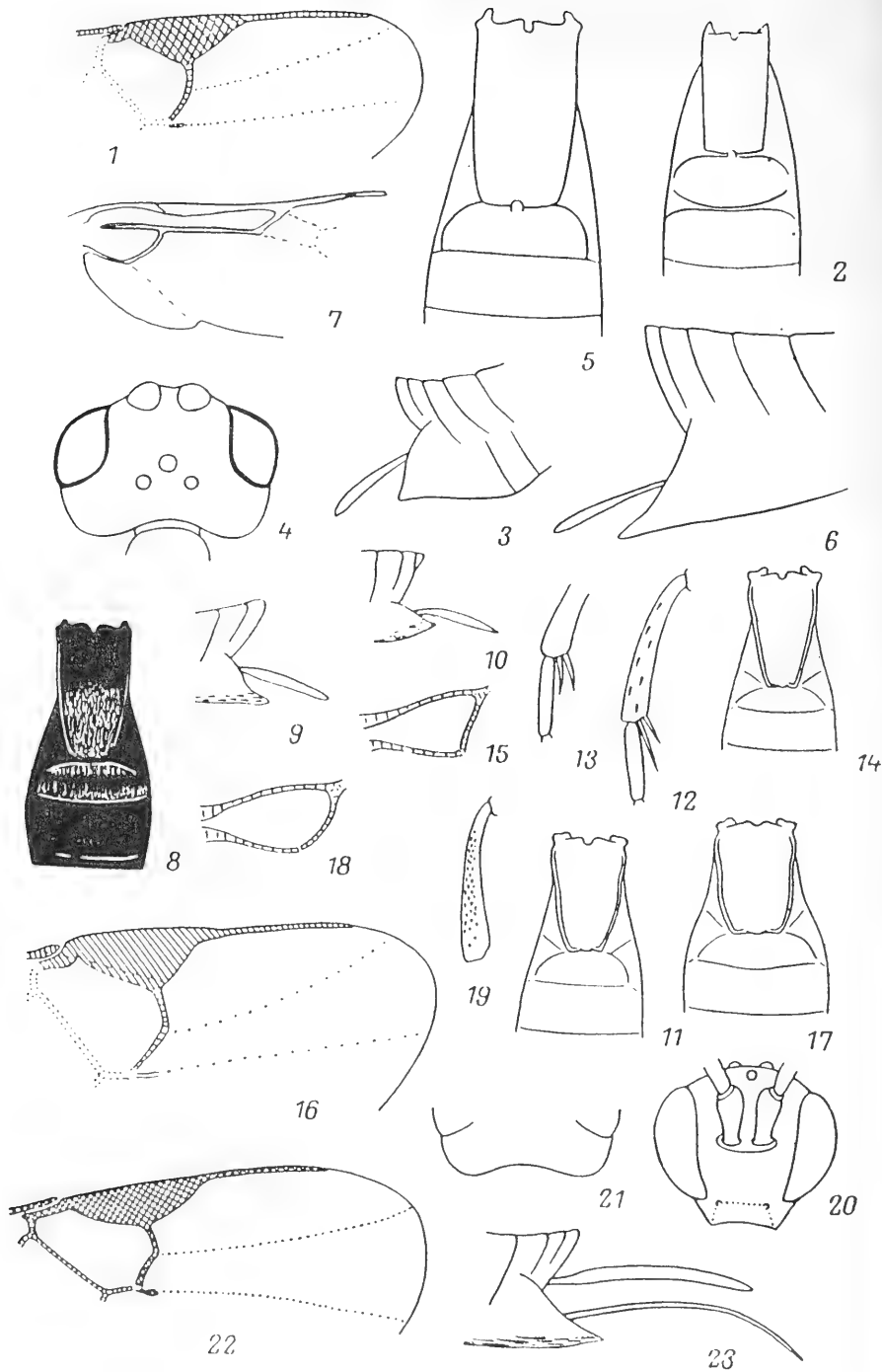


Fig. 236. Microgasterinae (from Wilkinson and Tobias).

1—5—1st to 3rd abdominal tergites: 1—*Apanoteles mariiimus*, 2—*A. ingenuus*, 3—*A. circumscriptus*, 4—*A. laetus*, 5—*A. viminetorum*; 6—9—6th abdominal sternite and ovipositor: 6—*A. mariiimus*, 7—*A. laetus*, 8—*A. circumscriptus*, 9—*A. viminetorum*.

- tergite between oblique grooves somewhat triangular. Ovipositor valves (Figs. 236: 8; 240: 7) usually shorter than hind tibia.
- 411 377 (400). First abdominal tergite gradually narrowing from base to apex, its length usually 3 times its width in middle (Fig. 236: 1, 5). Ovipositor valves not longer than half of hind tibia. Metacarpus except in *A. bicolor*, *A. ingenuus* not shortened. Body mostly small (rarely longer than 2.5), mainly parasitizing miner insects. (Group *A. circumscriptus*.)
- 378 (381). Metacarpus short, not longer than stigma, not more than 1.5 times as long as its distance from wing apex. Antennae approximately as long as body, their preapical segment usually slightly elongate, sometimes almost square. Mesonotum with satiny sheen, often dim. Propodeum almost absolutely smooth, lustrous. First abdominal tergite smooth, or slightly sculptured in apical part. Wings somewhat smoky.
- 379 (380). Hind femora and often coxae also yellow. Stigma pale yellow. Basal segments of abdomen often yellow, rarely their tergites dark. Metacarpus distinctly longer than its distance from wing apex. Body 1.5–2. Parasite of *Lithocolletis corylifoliella* Hw., *L. populifoliella* Tr., *L. kleemannella* F., *L. blancardella* F., *L. comparella* Z. (Gracillariidae). Cocoons isolated, brown. Northwest, west, center, south; Caucasus, Central Asia; Western Europe .....  
..... *A. bicolor* Nees (*pedius* Nixon)
- 380 (379). Hind femora and coxae black, stigma brown, often with somewhat distinct pale spot at base or pale in middle. Basal segments of abdomen (Fig. 236: 2) dark colored. Metacarpus shorter than its distance from wing apex. Body 1.7–2.3. Kazakhstan ..... *A. ingenuus* Tobias
- 381 (378). Metacarpus much longer, longer than stigma, not less than 3–4 times its distance from wing apex (Fig. 237: 1).
- 382 (383). Ovipositor valves rarely distinctly widened toward apex (Fig. 236: 9). Antennae longer than body. Mesonotum with quite intense sheen, rarely almost matte. Propodeum somewhat mildly sculptured, sometimes with hardly noticeable, wide areola. First abdominal tergite (Fig. 236: 5) relatively slightly narrowed toward apex, densely rugose-punctate in apical part, matte. Stigma dark brown. Hind femora black or dark brown; hind tibia brownish yellow,

- sometimes intensely darkened. Inner spur or hind tibiae almost as long as outer. Body 2.5. Parasite of *Cosmiotes freyerella* Hb., *Elachista albifrontella* Hb., *E. apicipunctella* Stt., *E. bifasciella* Tr., *E. cerusella* Hb., *E. humilis* Z., and other species of genus *Elachista* (Elachistidae) Entire Palearctic ..... **A. viminetorum** Wesm.
- 383 (382). Ovipositor valves very slightly widened toward apex (Figs. 236: 6, 8; 237: 3).
- 384 (385). Inner spur of hind tibiae not longer or slightly longer than outer. Mesonotum with slight satin sheen, almost matte. Stigma pale brown. Hind tibiae and hind femora completely darkened. First abdominal tergite (Fig. 236: 1) almost parallel-sided, its apical half and middle field of 2nd abdominal tergite densely and not coarsely sculptured, matte. Body 2–2.5. Parasite of *Bucculatrix maritima* Stt. (Bucculatricidae). England, Denmark, Hungary ..... **A. maritimus** Wilk.
- 385 (384). Inner spur of hind tibiae distinctly longer than outer.
- 386 (387). Third abdominal tergite (at least in basal half) wrinkled almost like middle field of 2nd abdominal tergite. First abdominal tergite less narrowed toward apex (Fig. 237: 2). Antennae longer than body. Mesonotum with satiny sheen. Propodeum softly sculptured, posterolaterally almost smooth, somewhat lustrous. Hind coxae black. Hind femora reddish. Body 2–2.2. Parasite of *Coleophora lithargyrinella* Z. (Coleophoridae), *Lithocolletis rajella alpina* Frey, *L. dubitella*, H.-S., *L. kleemannella* F., *L. muelleriella* Z., *L. salicicolella* Sircom, *L. spinolella* Dup., *L. ulmifoliella* Hb., *L. viminiella* Sircom (Gracillariidae), *Nepticula tiliae* Frey (Nepticulidae). England, Finland, Poland, Czechoslovakia, Austria ..... **A. nanus** Reinh. (*szoecsi* Papp)
- 387 (386). Third abdominal tergite smooth; 1st abdominal tergite toward apex usually more narrow.
- 388 (389). Middle field of 2nd abdominal tergite nearly rectangular (Fig. 236: 4), somewhat wrinkled, dull. Antennae slightly longer than body, brownish, preapical segment 1.5 times as long as wide. Palps whitish. Mesonotum with quite bright satiny sheen. Stigma and legs, including hind coxae for most part, yellow. Apical half of 1st abdominal tergite densely wrinkled, dull. Ovipositor valves (Fig. 236: 7) hardly longer than 1st segment of hind tarsus. Body 2.5.



Parasite of *Caloptilia semifascia* Hw., *Lithocolletis rajella* L., *L. platani* Stgr., *L. sylvella* Hw. (Gracillariidae). West; Western Europe.....

- ..... **A. laetus** Marsh. (*metallicus* Jakim.)
- 389 (388). Middle field of 2nd abdominal tergite nearly triangular, usually smooth, lustrous; if sometimes nearly rectangular (*A. errans*), then head unusually large (Fig. 237: 4).
- 390 (391). Head unusually large, appears slightly broad dorsally (Fig. 237: 4), 1.5 times as wide as long. Three preapical segments of antennae almost square. Large spur of hind tibiae distinctly shorter than half of 1st segment of hind tarsus. Ovipositor almost straight. Stigma extremely pale, almost colorless. Hind femora yellow. Middle field of 2nd abdominal tergite and apical part of 1st abdominal tergite (Fig. 237: 5) softly wrinkled, dull. Ovipositor valves produced beyond abdominal apex by 7/10th length of 1st segment of hind tarsus (Fig. 237: 6). Body 2.3. Parasite of *Elachista* sp. (Elachistidae). England, Hungary.....
- ..... **A. errans** Nixon (*arenicola* Papp)
- 391 (390). Head less large, wider, 1.5 times as wide as long. Preapical segment of antennae distinctly elongate. Large spur of hind tibiae slightly shorter or not shorter than 1st segment of hind tarsus. Ovipositor more curved.
- 413 392 (395). Apical part of 1st abdominal tergite and middle field of 2nd abdominal tergite smooth or almost smooth, brilliantly lustrous.
- 393 (394). Hind femora black or dark brown. Thorax longer in side view, not less than 1.5 times as long as high. Antennae slightly shorter than body, preapical segment approximately 1.3 times as long as wide. Ovipositor valves

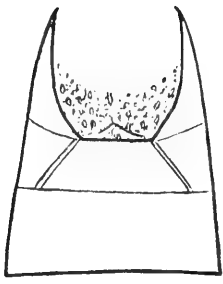
1-3—*Apanteles nanus*: 1—part of forewing, 2—1st to 3rd abdominal tergites, 3—abdominal apex; 4-6—*A. errans*: 4—head, dorsal view, 5—1st to 3rd abdominal tergites, 6—abdominal apex; 7—*A. circumscriptus*, part of hind wing; 8, 9—*A. hemerobiellidica*: 8—1st to 3rd abdominal sternites, 9—abdominal apex; 10-12—*A. longicalcar*: 10—abdominal apex, 11—1st to 3rd abdominal tergites, 12—part of hind leg; 13-16—*A. tersus*: 13—part of hind leg, 14—1st to 3rd abdominal tergites, 15—submedial cell of hind wing, 16—part of forewing; 17, 18—*A. piraticus*: 17—1st to 3rd abdominal tergites, 18—submedial cell of hind wing; 19—*A. corvinus*, hind tibia; 20-23—*A. bajariae*: 20—head, frontal view, 21—temples, dorsal view, 22—part of forewing, 23—abdominal apex, lateral view.

- shorter than 1st segment of hind tarsus. Body 2.2–2.4. Parasite of *Coleophora serratella* L. (Coleophoridae), *Elachista cingillella* H.-S., *E. subnigrella* Dougl. (Elachistidae), *Calybites auroguttella* Stph., *Lithocolletis blancardella* F., *L. comparella* Z. (Gracillariidae). Caucasus; Western Europe, Mongolia .....
- ..... **A. elpis** Nixon (? *girkanus* Tobias)<sup>1</sup>
- 394 (393). Hind femora yellow. Thorax shorter. Basal segment of abdomen usually yellow or reddish yellow. Middle field of 2nd abdominal tergite nearly equilateral triangle. Nervellus arcuate (Fig. 237: 7). Body 1.8–2.2. Parasite of *Elachista gangabella* Z., *E. gleichenella* F., *E. humilis* Z., *E. luticomella* Z. (Elachistidae), *Lithocolletis blancardella* F., *L. cavella* Z., *L. cerasicolella* H.-S., *L. emberizaepennella* Bouché, *L. junoniella* Z., *L. lantanella* Schr., *L. lautella* Z., *L. mespilella* Hb., *L. messaniella* Z., *L. nigrescentella* Logan, *L. populifoliella* Tr., *L. pomonella* Z., *L. quercifoliella* Z., *L. rajella* L., *L. scabiosella* Dougl., *L. tenerella* Joannis (Gracillariidae). Cocoons white, semi-transparent. Entire Palearctic .....
- ..... **A. circumscriptus** Nees
- 395 (392). Apical part of 1st abdominal tergite and middle field of 2nd abdominal tergite densely wrinkled; if sometimes (in some specimens of *A. arisba*) rugosity slight, then middle field of 2nd abdominal tergite distinctly wide and its length in middle much less than width along margin.
- 396 (397). Middle field of 2nd abdominal tergite wider, its length half width along posterior margin. Hind coxae usually completely darkened. Antennae longer than body. Mesonotum with fine punctation and satiny sheen. First abdominal tergite and middle field of 2nd abdominal tergite blackish. Body 2.2. Parasite of *Stephensia brunnichella* L. (Elachistidae), *Lithocolletis blancardella* F., *L. comparella* Z. (Gracillariidae). Western Europe, North Africa (Egypt) .....
- ..... **A. arisba** Nixon
- 397 (396). Middle field of 2nd abdominal tergite much less wide. Hind coxae, often largely yellow.

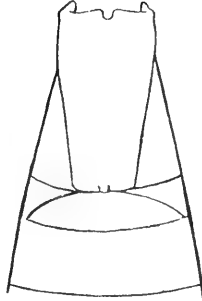
<sup>1</sup> Papp (1983) mentions *A. girkanus* Tobias as recent synonym of *A. elpis* Nixon. However, questions of their synonymy should not be regarded as solved. Female type series of *A. girkanus* are distinguished from the description by Nixon (1973) by longer antennae (longer than body), longer preapical segment of antennae (1.5 times as long as wide), and longer ovipositor valves (as long as 1st segment of hind tarsus).



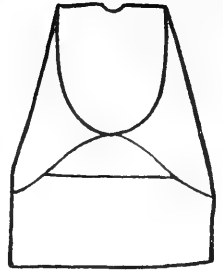
- 398 (399). First abdominal tergite less narrowed toward apex, its apical part and middle field of 2nd abdominal tergite noticeably more coarsely wrinkled. Wings wider. Ovipositor more distinctly curved downward. Body 2.8. Parasite of *Lithocolletis junoniella* Z. (Gracillariidae). Center; England, Norway, Finland ..... **A. exiguus** Hal.
- 399 (398). First abdominal tergite more distinctly narrowed toward apex, its apical part and middle field of 2nd abdominal tergite softly wrinkled. Wings narrower. Ovipositor significantly less curved. Antennae approximately as long as body, preapical segment 1.3–1.5 times as long as wide. Stigma light brown or yellowish. Hind coxae often almost totally yellow. Body 2.5. Parasite of *Elachista albifrontella* Hb., *E. poae* Stt. (Elachistidae). Western Europe (to Bulgaria and Romania in south)..... **A. phaetusa** Nixon
- 400 (377). First abdominal tergite narrowed posteriorly, only from middle shorter (Fig. 238: 1). Ovipositor valves usually longer than half of hind tibia. Metacarpus usually shortened (Fig. 238: 13). (Group *A. metacarpalis*.)
- 401 (442). Metacarpus short, its length not more than 2 times its distance from wing apex (Figs. 237: 22; 238: 13).
- 402 (403). Sixth abdominal sternite extremely short, widely rounded at apex, quite distinctly sclerotized, without folds along middle line. Preapical segment of antennae hardly longer than wide. Metacarpus 1.5–2 times as long as its distance from wing apex. Color of legs varies from yellow to light brown. Hind femora at base sometimes darkened. Apical part of 1st abdominal tergite distinctly wrinkled, matte. Body 2.5. Parasite of *Coleophora vestianella* L. (Coleophoridae), *Lobesia littoralis* Westw. and Humphrey (Tortricidae). England ..... **A. bres** Nixon
- 403 (402). Sixth abdominal sternite longer; when viewed from side, appears pointed at apex or forms distinct angle, usually slightly sclerotized, with folds along middle line (Fig. 238: 9, 10).
- 404 (417). Stigma weakly pigmented, light yellow or whitish, usually with darker margin.
- 405 (412). Metacarpus distinctly shorter than its distance from wing apex (Fig. 239: 1).
- 406 (407). Middle field of 2nd abdominal tergite extremely small, nearly equilateral triangle. Wings weakly darkened.



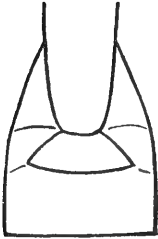
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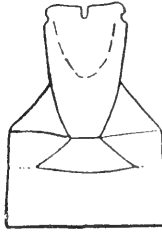
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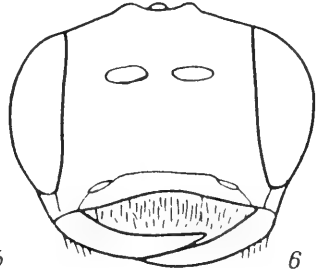
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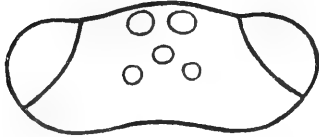
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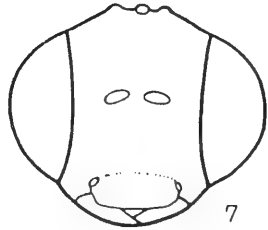
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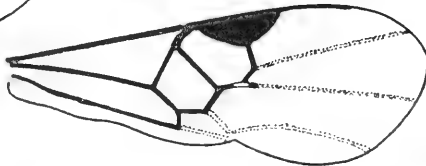
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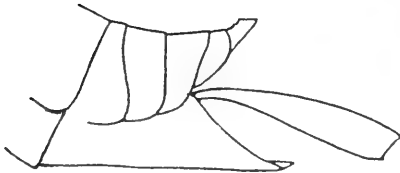
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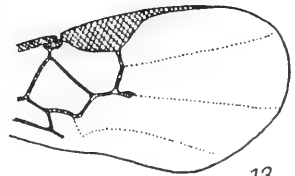
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Ovipositor valves as long as hind tibia or slightly shorter.  
Body 2.5. Italy..... **A. pelopea** Nixon

407 (406). Middle field of 2nd abdominal tergite larger, distinctly wide. Antennae shorter than body. Legs light colored.

408 (409). Eyes extremely large (Fig. 242: 9, 10). Eyes laterally more than 3 times as long as temple. Metacarpus unusually short, 1/4th as long as its distance from wing apex and approximately equal to radiomedial vein. Ovipositor valves slightly longer than hind tibia. (cf. also couplet 510.) ....

..... **A. oculatus** Tobias

409 (408). Eyes less large. Eyes laterally much less than 3 times as long as temple. Metacarpus only 2/3rd to 1/2 as long as its distance from wing apex, distinctly longer than radiomedial vein (Fig. 239: 1). Ovipositor valves shorter than hind tibia.

410 (411). Mesonotum matte. Preapical segment of antennae square or slightly elongate. Head less than 2 times as wide as long. Outer margin of anal lobe of hind wing slightly produced. Ovipositor valves much shorter than hind tibia, distinctly widened beyond middle. Body 2.9—3.1. (cf. also couplet 740.). Kazakhstan, Central Asia ..... **A. pilosus** Tel.

Lectotype: Female, Turkmenia, village Dzhebel, 17.XI.1934 (Popov).

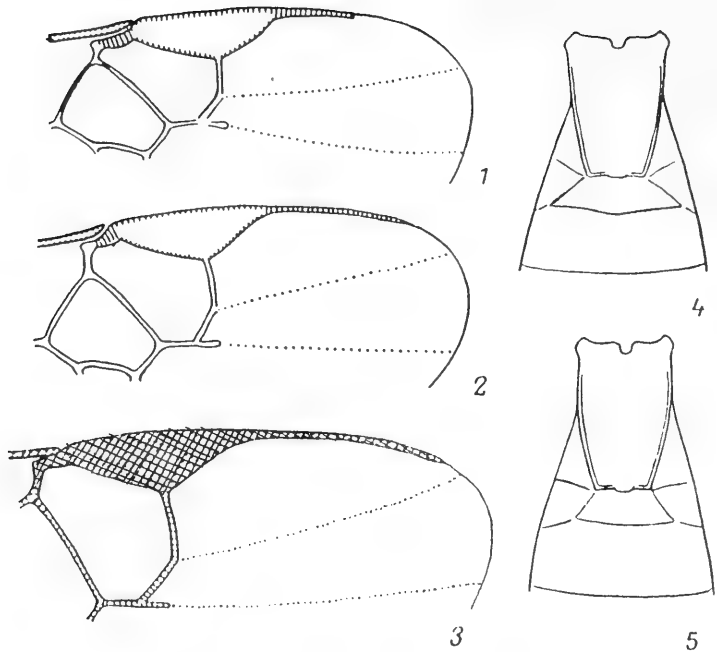
415 411 (410). Mesonotum brilliantly lustrous. Preapical segment of antennae 1.4 times as long as wide. Head 2 times as wide as long. Outer margin of anal lobe of hind wing straight. First abdominal tergite in apical part softly wrinkled. Second abdominal tergite less sculptured than 1st, 5/11th to 10/23rd of 3rd tergite (Fig. 239: 5). All abdominal tergites brilliantly lustrous. Ovipositor valves quite wide. Body 3—3.2. Romania. (cf. also couplet 741.)..... **A. nagy**i Papp

412 (405). Metacarpus not shorter than its distance from wing apex.

413 (414). Ovipositor valves extremely short, their broadened part equal to half of hind tibia. Mesonotum extremely softly punctate, lustrous. Metacarpus 1.5 times as long as its

414 Fig. 238. Microgasterinae (from Tobias, Balevskii and Tobias, Nixon and Papp).

1—5—1st to 3rd abdominal tergites: 1—*Apanteles albinervis*, 2—*A. erdoesi*, 3—*A. aragatzi*, 4—*A. brevivalvatus*, 5—*A. metacarpalis*; 6—8—Head: 6—*A. metaclypealis* sp. n., 7—*A. znoikoi*, 8—*A. erdoesi*; 9, 10—abdominal apex: 9—*A. subfirmus*, 10—*A. metacarpalis*; 11, 12—*A. brevivalvatus*: 11—forewing, 12—submedial cell of hind wing; 13—*A. metacarpalis*, part of forewing.



415

Fig. 239. Microgasterinae (from Papp).

1—3—part of forewing: 1—*Apanteles nagyi*, 2—*A. albinervis*, 3—*A. petrovae*; 4, 5—1st to 3rd abdominal tergites: 4—*A. albinervis*, 5—*A. nagyi*.

- distance from wing apex. Body 1.8. Parasite of case-bearer found on peach tree. (cf. also couplet 744.). Armenia....  
 ..... **A. frater** Tobias
- 414 (413). Ovipositor valves approximately as long as hind tibia.
- 415 (416). Lateral angles of middle field of 2nd abdominal tergite extremely acute, elongate (cf. Fig. 257: 6) (cf. also couplet 746.) ..... **A. subcamilla** Tobias
- 416 (415). Lateral angles of middle field of 2nd abdominal tergite much less sharp and shorter. (cf. also couplet 747.) .....  
 ..... **A. verae** Tobias
- 417 (404). Stigma somewhat dark colored, usually with pale spot at base.
- 418 (431). Metacarpus not longer than its distance from wing apex (Fig. 238: 11, 13).
- 419 (420). Ovipositor valves noticeably longer than hind tibia, narrow, straight, gradually and slightly tapering toward apex.

- Preapical segment of antennae 1.5 times as long as wide. Clypeus slightly isolated from face, protuberant along anterior margin, half height of face (Fig. 238: 7). Mesonotum mildly and not densely punctate, brilliantly lustrous. Hind femora 3.5–4 times as long as wide. Wings smoky. Abdomen as long as thorax and head together. Second abdominal tergite markedly wide, 1/3rd of 3rd, separated from it by suture, slightly curved outward. Ovipositor almost straight. Body 2.5–3. Nakhichevan ASSR ..... **A. znoikoi** Tobias
- 420 (419). Ovipositor valves not longer than hind tibia. Preapical segment of antennae usually shorter.
- 421 (424). Tegulae yellow or yellowish brown. Mesonotum lustrous. Ovipositor valves (Fig. 238: 9) broadened toward apex, slightly shorter than hind tibia or equal to it.
- 422 (423). Apical half of 1st and 2nd abdominal tergites softly rugose-punctate and slightly lustrous. Propodeum rugose-punctate in posterior half. Segments of antennae long, 12th segment 2 times as long as wide. Stigma with small yellow spot at base. Hind femora black. Body 3.5. Azerbaidzhan .....  
..... **A. subfirmus** Abidinb.
- 416 423 (422). First and 2nd abdominal tergites (Fig. 238: 5) smooth, sometimes apical part of 1st tergite weakly sculptured. Propodeum smooth or extremely faintly sculptured. Segments of antennae shorter, 12th segment 1.5 times as long as wide. (cf. also couplet 429.) .... **A. metacarpalis** Thoms.
- 424 (421). Tegulae black. Antennae shorter than body.
- 425 (426). Clypeus extremely narrow, curved inward on lower side so that wide deep cavity is formed between it and mandibles. Proboscis not developed. Two preapical segments of antennae square. Wings pale, stigma light brown. Ovipositor valves as long as 7/10th of hind femora, noticeably narrowed toward apex. South .....  
..... **A. metaclypealis** Tobias and Kontenko, sp. n.  
Holotype: Female, Melitopol' ("Melitopol' District"). 29.VIII.1898 (M. Katkov). Paratypes: 2 females and 12 males, same place, 29–31.VIII.1898 (M. Katkov)<sup>1</sup>
- 426 (425). Clypeus wider, not curved inward on lower side or slightly curved, narrow slit between it and mandibles.

<sup>1</sup> Material of type series was identified earlier by Tobias (Braconidae of Caucasus, 1976) as *A. metacarpalis* Thoms.

- 427 (430). Two preapical segments of antennae square. Middle field of 2nd abdominal tergite less broad (Fig. 238: 4, 5). Ovipositor valves distinctly shorter than hind tibia.
- 428 (429). Mesonotum matte or faintly lustrous. Nervellus straight (Fig. 238: 12). Ovipositor valves shorter, almost parallel-sided, their broadened part equal to 1/3rd hind tibia. Wings smoky. First abdominal tergite (Fig. 238: 4) in apical third faintly sculptured. Body 2–2.2. Bulgaria .....  
..... **A. brevivalvatus** Balevski and Tobias
- 429 (428). Mesonotum lustrous. Nervellus curved. Ovipositor valves longer, noticeably broadened toward apex (Fig. 238: 10). Wings pale. First abdominal tergite smooth or only with traces of sculpture in apical part. Body 2.3–3.3. Parasite of *Coleophora* sp. (Coleophoridae), many species of genus *Scrobipalpa* (Gelechiidae), *Caloptilia semifascia* Hw. (Gracillariidae). Center, southwest, south, southeast; Caucasus; Western Europe .....  
..... **A. metacarpalis** Thoms. (*firmus* Tel.)
- 430 (427). Two preapical segments of antennae elongate. Middle field of 2nd abdominal tergite much wider (Fig. 240: 3). Ovipositor valves as long as hind tibia. Mesonotum sparsely and softly punctate, lustrous. Radial and radiomedial veins distinctly sclerotized, merging, forming sharply curved line. Wings smoky. Hind femora brown or reddish brown, 4 times as long as wide. Inner spur of hind tibiae not longer or slightly longer than outer, slightly shorter than half of hind tarsus. First abdominal tergite with traces of rugosity along sides in apical part, lustrous. Body 2.5–3.3. Central Asia .....  
..... **A. floralis** Tobias
- 431 (418). Metacarpus distinctly longer than its distance from wing apex.
- 432 (435). Fifteenth antennal segment square or hardly longer than wide. Antennae shorter than body.
- 433 (434). Ovipositor valves approximately 1/2 as long as hind tibia. Length of radial and radiomedial veins approximately same. Claws of hind tarsi quite smoothly curved. Antennae 8/10th of body. (cf. also couplet 516.)
- 434 (433). Ovipositor valves 2/3rd as long as hind tibia. Radial vein shorter than radiomedial vein. Claws of hind tarsi curved sharply almost at right angle and bearing two to three thin denticles. Antennae longer. Metacarpus 1.3 times as long as its distance from wing apex. Nervellus curved. Body

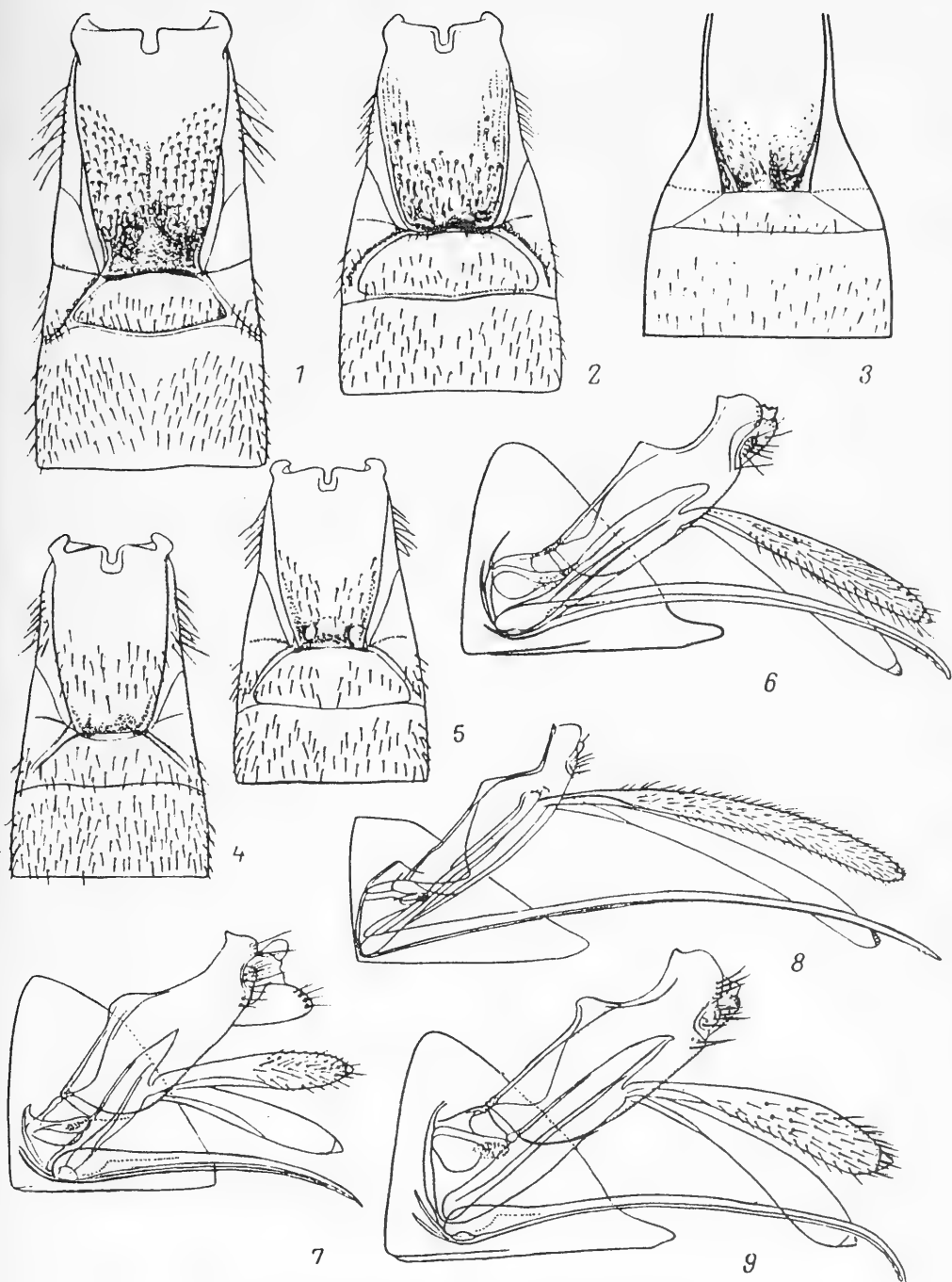


Fig. 240. Microgasterinae (from Wilkinson and Tobias).

1-5—1st to 3rd abdominal tergites: 1—*Apanteles petrovae*, 2—*A. coniferae*, 3—*A. floralis*, 4—*A. laevissimus*, 5—*A. corvinus*; 6-9—6th abdominal tergite and ovipositor: 6—*A. corvinus*, 7—*A. coniferae*, 8—*A. petrovae*, 9—*A. laevissimus*.

3. Parasite of *Momphe nodicolella* Fuchs, *M. propinguella* Stt., *Psacaphora locupletella* Den. and Schiff. (Mompidae). England, Denmark ..... **A. atreus** Nixon
- 435 (432). Fifteenth antennal segment 1.5–2 times as long as wide. Antennae not shorter than body.
- 436 (437). Ovipositor valves only slightly shorter than hind tibia, wider, their width almost equal to width of hind tibia. Mesonotum with dull satiny sheen. Nervellus arcuate; radial and radiomedial veins forming slightly broken line. Wings smoky. Palps and legs dark colored. First abdominal tergite (Fig. 238: 3) rough in apical third, almost matte. Body 2.7. Krasnodar Territory, Armenia ..... **A. aragatzi** Tobias
- 437 (436). Ovipositor valves approximately half as long as hind tibia, much narrower.
- 438 (439). Nervellus straight. Fifteenth antennal segment approximately 2 times as long as wide. Body 2.5–3. Parasite of *Aspilapteris tringipennella* Z. (Gracillariidae). England ...  
..... **A. chrysis** Nixon
- 439 (438). Nervellus arcuate. Fifteenth antennal segment short. Wings smoky.
- 440 (441). Inner spur of hind tibiae distinctly longer than outer, half as long as 1st segment of hind tarsus. Antennae longer than body. Radial vein originates from middle of stigma (Fig. 237: 22). Ovipositor valves weakly narrowed from base to apex (Fig. 237: 23). Eyes slightly proximate on lower side. Temples roundly narrowed (Fig. 237: 21). Body 2. Hungary ..... **A. bajariae** Papp
- 441 (440). Inner spur of hind tibiae not longer than outer, shorter than half of 1st segment of hind tarsus. Antennae as long as body. Radial vein originates from stigma somewhat closer to its apex. Ovipositor valves noticeably broadened toward apex. Body 2.4. Hungary ..... **A. szelenyii** Papp
- 442 (401). Metacarpus distinctly longer than its distance from wing apex (Figs. 237: 16; 239: 2).
- 443 (456). Stigma light colored, whitish or yellowish, usually with darker margin.
- 444 (449). Ovipositor valves distinctly longer than hind tibia.
- 445 (446). Ovipositor valves almost 2 times as long as hind tibia. Head not noticeably extended downward frontally (Fig. 252: 3). (cf. also couplet 583.) ..... **A. britannicus** Wilk.
- 446 (445). Ovipositor valves not more than 1.5 times as long as hind tibia. Head anteriorly slightly broader than high.



- 447 (448). Nervellus straight. Inner spur of hind tibiae half as long as 1st segment of hind tarsus. Ovipositor valves 1.5 times as long as hind tibia. (cf. also couplet 750.) .....  
 ..... **A. laspeyresiella** Papp
- 448 (447). Nervellus arcuate. Inner spur of hind tibiae shorter than half of 1st segment of hind tarsus. Ovipositor valves 1.2–1.3 times as long as hind tibia. Mesonotum densely punctate, dull. Propodeum somewhat wrinkled. First abdominal tergite sculptured in apical part, matte. Body 3.5. Hungary. (cf. also couplet 751.) .....  
 ..... **A. nephus** Papp
- 449 (444). Ovipositor valves not longer than hind tibia.
- 450 (451). Hind tibiae and tegulae yellow. Ovipositor valves short, not longer than 1st segment of hind tarsus, distinctly broadened from basal third to apex (Fig. 240: 7). (cf. also couplet 464) ..... **A. coniferae** Hal.
- 451 (450). Combination of characters different.
- 452 (453). Middle field of 2nd abdominal tergite wider, 4 times as wide as long (Fig. 257: 7). Preapical segment of antennae hardly longer than wide. Nervellus straight. (cf. also couplet 753.) ..... **A. argante** Nixon
- 453 (452). Middle field of 2nd abdominal tergite usually less than 3 times as wide as long (Fig. 239: 4). Preapical segment of antennae 1.5 times or slightly less as long as wide. Nervellus arcuate.
- 454 (455). Ovipositor valves as long as hind tibia or slightly shorter. Metacarpus approximately 3 times as long as its distance from wing apex. (cf. also couplet 754.) .....  
 ..... **A. albinervis** Tobias
- 455 (454). Ovipositor valves only slightly longer than half of hind tibia. Metacarpus much longer. (cf. also couplet 480.) ...  
 ..... **A. corvinus** Reinh.
- 456 (443). Stigma brown or dark brown, usually with pale spot at base.
- 457 (460). Ovipositor valves longer than hind tibia.
- 458 (459). Hind femora yellow or reddish yellow. Head behind eyes sharply narrowed (Fig. 238: 8). Distance between posterior ocelli half that between them and eye. Ovipositor valves 1.5 times as long as hind tibia. Length of 1st abdominal tergite 2 times its width in middle (Fig. 238: 2). Body 2.8. Azerbaidzhan; Hungary .....  
 ..... **A. erdoesi** Papp (*negativus* Tobias, syn. n.)

- 459 (458). Hind femora black. Head behind eyes not sharply narrowed. Distance between posterior ocelli equal to that between them and eye. Ovipositor valves 1.3 times as long as hind tibia (Fig. 240: 8). Length of 1st abdominal tergite 2 times its width in middle (Fig. 240: 1). Metacarpus extremely long (Fig. 239: 3). Body 3–4. Parasite of *Blastotere illuminatella* Z. (Argyresthiidae), *Dioryctria peyerimhoffi* de Joannis, *D. abietella* Den. and Schiff. (Phycitidae), *Choristoneura murinana* Hb. (Tortricidae). West, northwest, center; Western Europe, Mongolia, North America .....  
 ..... **A. petrovae** Walley (*dioryctriae* Wilk., *magnus* Tel., *murinanae* Čapek and Zwölfer)
- 460 (457). Ovipositor valves not longer than hind tibia.
- 461 (462). Hind femora reddish yellow. Two preapical segments of antennae square or almost square. Mesonotum lustrous. Propodeum wrinkled in middle, on sides somewhat smooth. Inner spur of hind tibiae equal to half of 1st segment of hind tarsus. Stigma 2.3 times as long as wide. First abdominal tergite quite wrinkled in apical part. Body 4. Central Europe ..... **A. adjunctus** Nees
- 462 (461). Hind femora black or dark brown.
- 463 (466). Hind tibiae almost completely yellow. Part of ovipositor covered with hairs 8/10th as long as 1st segment of hind tarsus.
- 464 (465). Tegulae yellow. Vertex behind ocelli dull. Mesonotum with distinct satiny sheen, quite dim. Apical abdominal sternite less developed, somewhat uniformly sclerotized, making an angle of approximately 60° in side view (Fig. 240: 7). Preapical segment of antennae 1.5 times as long as wide. Propodeum matte. Fig. 240: 2. Body 2.2–2.8. Parasite of *Paraswammerdamia lutarea* Hw. (Yponomeutidae). Azerbaidzhan, Central Asia; Western Europe. (cf. also couplet 450.) ..... **A. coniferae** Hal.
- 465 (464). Tegulae dark brown. Vertex behind ocelli smooth, lustrous. Mesonotum brilliantly lustrous, without satiny sheen. Sixth abdominal sternite more developed. Preapical segment of antennae more than 2 times as long as wide. Propodeum lustrous. Apical part of 1st abdominal tergite quite coarsely wrinkled. Body 3.2. England, Sweden .....  
 ..... **A. ate** Nixon
- 466 (463). Hind tibiae somewhat darkened, if sometimes almost entirely yellow, then ovipositor valves longer.

- 418 467 (468). Antennal segments 15th to 17th square, antennae short, appear thick. Face, mesonotum and propodeum intensely lustrous. Metacarpus 3–4 times as long as its distance from wing apex. Middle field of 2nd abdominal tergite triangular, not very wide. Sixth abdominal sternite short, slightly produced beyond abdomen. Ovipositor valves narrow, parallel-sided in apical part, quite distinctly curved. Body 2.5. Parasite of *Blastotere glabratella* Z., *B. laevigatella* H.-S. (Argyresthiidae). Northwest; England, Central Europe ..... **A. credne** Nixon
- 468 (467). Antennal segments 15th to 17th somewhat elongate.
- 469 (470). Hind femora, as major part of legs, brown. Inner spur of hind tibiae almost half as long as 1st segment of hind tarsus. Length of 1st abdominal tergite 2 times its width at base (Fig. 237: 8). Apical half of 1st abdominal tergite wrinkled. Second abdominal tergite distinctly sculptured. Ovipositor valves parallel-sided, almost straight, 8/10th length of hind tibia (Fig. 237: 9). Body 2.7. Austria ..... **A. hemerobiellida** Fi.
- 470 (469). Hind femora black; if sometimes (as in *A. submarginatus*) brown, then 2nd abdominal tergite smooth or almost smooth, lustrous.
- 471 (478). Inner spur of hind tibiae approximately as long as outer. Ovipositor valves gradually broadening toward apex.
- 472 (475). Apical half of 1st abdominal tergite with distinct rugosity.
- 473 (474). Bristles on outer side of hind tibiae all of same shape, thin. Outer spur of middle tibiae distinctly shorter than inner. Metacarpus less than 5 times as long as its distance from wing apex. Preapical segment of antennae slightly longer than wide. Length of 1st abdominal tergite 1.3 times its width at base. Second abdominal tergite only slightly shorter than 3rd (Fig. 237: 17). Nervellus arcuate (Fig. 237: 18). Body 3. Hungary ..... **A. piraticus** Papp
- 474 (473). Bristles on outer side of hind tibiae of two types—thick and thin. Outer spur of middle tibiae not shorter than inner. Metacarpus approximately 3.5 times as long as its distance from wing apex. Preapical segment of antennae 1.5 times as long as wide. Mesonotum intensely lustrous, with faint satiny sheen. Propodeum almost smooth, lustrous. Outer margin of anal lobe of hind wing with distinct velvet hairs beyond its widest part. Ovipositor valves 8/10th as long as hind tibia. Body 2.2. England ..... **A. myron** Nixon

- 475 (472). Apical half of 1st abdominal tergite smooth.
- 476 (477). Radial and radiomedial veins forming gradual and very slightly curved line. Wings almost milky white, veins faintly pigmented, whitish or brownish. Middle field of 2nd abdominal tergite wider (Fig. 240: 4). Outer margin of anal lobe of hind wing with velvet hairs beyond its widest part. Nervellus straight or almost straight. Ovipositor valves covered with hairs (Fig. 240: 9), 8/10th as long as hind tibia. Body 2.5–2.7. Parasite of *Clavigesta sylvestrana* Curt. (Tortricidae). England, France ..... **A. laevis** Ratz.
- 477 (476). Radial and radiomedial veins forming sharp angle, slightly more than 90°. Wings distinctly darkened, veins brown. Middle field of 2nd abdominal tergite less wide. Nervellus arcuate. Body lustrous. Sixth abdominal sternite very slightly developed. Body 3.7. Central Asia ..... **A. piliventris** Tobias
- 478 (471). Inner spur of hind tibiae distinctly longer than outer; if not, then ovipositor valves parallel-sided.
- 479 (482). Hind tibiae with quite numerous, dense and thick bristles on outer side (Fig. 237: 19). Preapical segment of antennae 1.5 times as long as wide. Nervellus originates approximately from middle of discoidal cell.
- 480 (481). Ovipositor valves (Fig. 240: 6) somewhat longer, part covered with hairs as long as 1st and 2nd segments of hind tarsus together. Body 2.5. Fig. 240: 5. Parasite of *Coleophora serratella* L., *C. coracipennella* Hb. (Coleophoridae), *Lyonetia klerckella* L. (Lyonetiidae), *Hedya nubiferana* Hw. (Tortricidae), *Paraswammerdamia lutarea* Hw. (Yponomeutidae). Cocoons white, while parasitizing *Coleophora*, found inside cover of host. Center, southwest, south, southeast; Caucasus; Western Europe. (cf. also couplet 455.) .... **A. corvinus** Reinh. (*aptus* Papp)
- 481 (480). Ovipositor valves shorter, not longer than 1st segment of hind tarsus. Thorax 1.6 times as long as high. Discoidal cell almost 1.5 times as wide as high. Nervellus arcuate. Body 2.3–2.5. Hungary..... **A. coniferoides** Papp
- 482 (479). Thick bristles on outer side of hind tibiae much less numerous, sparser.
- 483 (484). Inner spur of hind tibiae distinctly longer than half of 1st segment of hind tarsus (Fig. 237: 12). Part of ovipositor valves covered with hairs (Fig. 237: 10) as long as first segment of hind tarsus. Fig. 237: 11. Body 2.5–3. England,

- Sweden, Hungary, Korean Peninsula .....  
 ..... **A. longicalcar** Thoms.
- 484 (483). Inner spur of hind tibiae not longer than half of 1st segment of hind tarsus (Fig. 237: 13).
- 485 (486). 16th and 17th antennal segments 2 times as long as wide. Antennae distinctly longer than body. Body 2. Sweden ..  
 ..... **A. trogos** Nixon
- 486 (485). 16th and 17th antennal segments much shorter.
- 487 (488). Ovipositor valves not longer than half of hind tibia, relatively narrow. Preapical segment of antennae 1.5 times as long as wide. Nervellus straight (Fig. 237: 15). Ocelli in markedly obtuse-angled triangle, tangent to anterior margin of posterior ocelli cuts posterior margin of anterior ocellus. Length of 1st abdominal tergite 1.6–1.7 times its width at base. Fig. 237: 13–16. Body 2.2–2.8. Hungary ..  
 ..... **A. tersus** Papp
- 488 (487). Ovipositor valves only slightly shorter than hind tibia. Preapical segment of antennae slightly longer than wide. Nervellus slightly arcuate. Mesonotum dull. Body 2.5. Caucasus ..... **A. submarginatus** Abdinb.
- 489 (376). First abdominal tergite parallel-sided or narrowed toward base, rarely slightly narrowed toward apex. Oblique grooves of 2nd abdominal tergite widely situated, middle field between them broad and trapezoid.
- 490 (537). Metacarpus short, as long as stigma or slightly less. Propodeum, usually 1st and 2nd abdominal tergites also, densely and uniformly rugose-punctate; if sculpture on propodeum faint, then 1st abdominal tergite at apex narrowed and eyes often distinctly proximate on lower side.
- 420
- 491 (492). Basal segment of antennae strongly compressed: anteriorly its width 1/3rd its length, on sides slightly longer than 1st abdominal tergite (Fig. 242: 1), with deep longitudinal depression in middle. Radial and radiomedial veins forming slightly curved arch (Fig. 242: 2). Nervulus originates far from middle of discoidal cell and divides its lower side into sections, basal of which half of outer. Head frontally triangular; proboscis developed. Tangent to anterior margin of posterior ocelli cuts hind margin of anterior ocellus. Mesonotum coarsely punctate, lustrous between punctures. Scutellum, as compared to mesonotum, weakly but in middle part sparsely punctate, lustrous. Propodeum coarsely rugose-punctate, dull. Ovipositor

- valves (Fig. 242: 3) slightly longer than half of hind tibia. Body 3.5. Dagestan. (Group *A. planiscapus*, nov.) .....
- ..... **A. planiscapus** Tobias
- 492 (491). Basal segment of antennae slightly compressed. First abdominal tergite without depression or with slight depression in middle. Radial or radiomedial vein usually forming sharp angle (Fig. 242: 6). Nervulus usually (in species of group *A. butalidis*) originates near middle of discoidal cell.
- 421 493 (502). First abdominal tergite short (as long as its width or slightly less), distinctly broadened from base to apex. Sixth abdominal sternite short, terminating long before abdominal apex. Ovipositor valves (except *A. subversor*) gradually narrowing toward apex. Nervulus originates far from middle of discoidal cell and divides its lower side into sections, basal of which half of outer. Mesonotum and scutellum with dense and soft punctation, slightly lustrous or almost matte. Propodeum always coarsely wrinkled, sometimes with median longitudinal ridge in anterior part. Wings smoky. Stigma brown. Forewing not longer, usually shorter than thorax and abdomen together. Nervellus straight or almost straight. (Group *A. suevus*.)
- 494 (501). Body black. Third abdominal tergite usually with reddish brown pattern. Sternites at abdominal base usually brown.
- 495 (496). Legs entirely reddish brown. Propodeum with median longitudinal ridge. Mesonotum slightly lustrous. Third abdominal tergite (Fig. 241: 2) with reddish brown pattern. Hind femora 3.5 times as long as wide. Body 3.5–4. Kazakhstan .....
- 422 ..... **A. suspicax** Tobias
- 496 (495). At least hind coxae or hind femora black or dark brown. Propodeum usually without median longitudinal ridge.
- 497 (498). Hind coxae reddish, contrast with hind femora in much darker color. Mesonotum slightly lustrous or matte. Propodeum in anterior part sometimes with weak median longitudinal ridge. Hind femora 3.8–4 times as long as wide. Fig. 241: 3. Parasite of *Epichnopterix* sp. (Psychidae). Body 2.6–3. South; Armenia; Western Europe .....
- ..... **A. suevus** Reinh. (*dion* Nixon)
- 498 (497). Hind coxae black, not contrasting in color with hind femora.
- 499 (500). Ovipositor valves 8/10th as long as hind tibia, gradually broadening from base to apex. Antennae thinner, their thickness in middle not exceeding width of 1st segment of

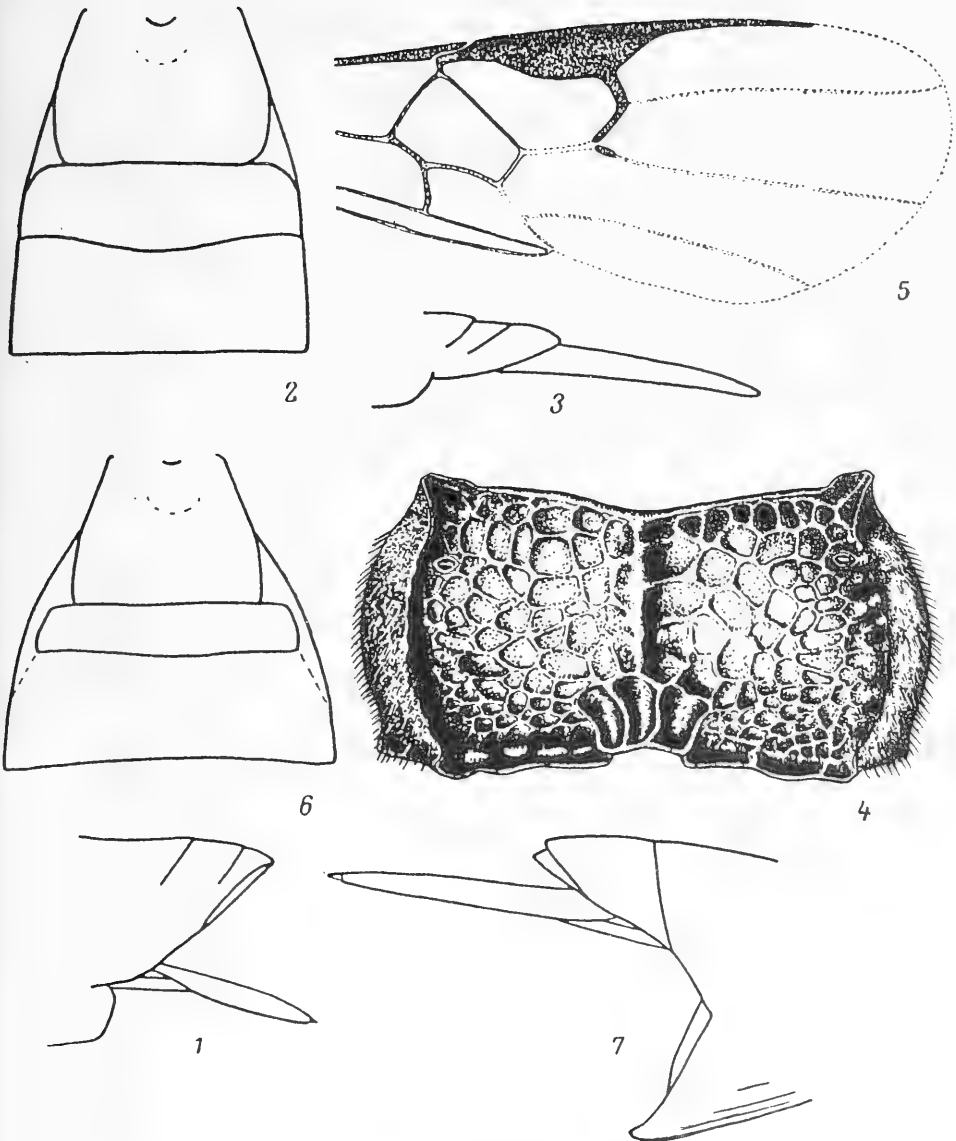


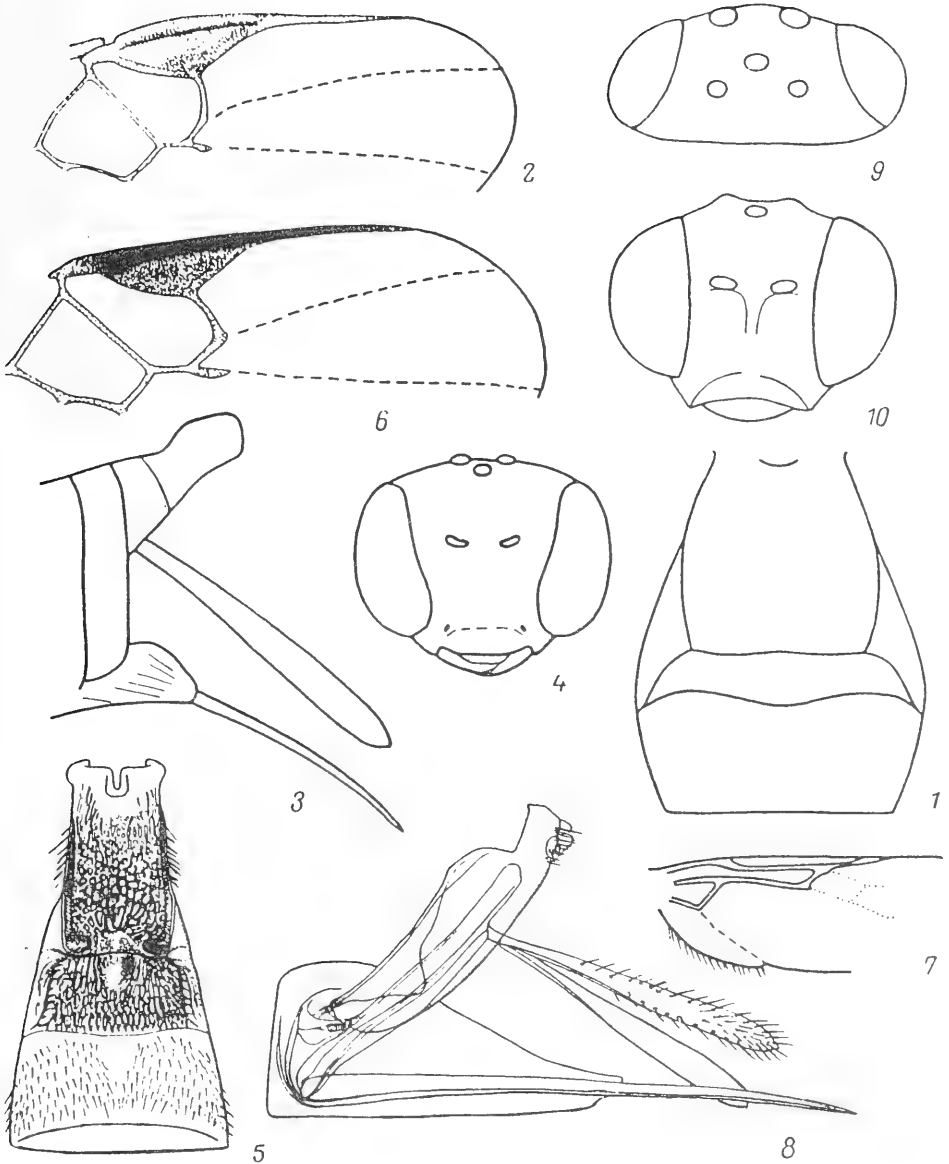
Fig. 241. Microgasterinae (original).

1—*Apanteles brevisternis*, abdominal apex; 2—*A. suspicax*, 1st to 3rd abdominal tergites; 3—*A. suevus*, abdominal apex, lateral view; 4—7—*A. suffecus*: 4—propodeum, 5—forewing, 6—1st to 3rd abdominal tergites, 7—abdominal apex.

- hind tarsus. Stigma with large pale spot in middle. Mesonotum with more noticeable and conspicuous hairs. Body larger, 4.5. Novosibirsk Region.....
- .....**A. subversor** Tobias and Kotenko
- 500 (499). Ovipositor valves slightly longer than half of hind tibia, narrowing toward apex (Fig. 241: 1). Antennae thicker, their thickness in middle exceeding width of 1st segment of hind tarsus. Stigma without pale spot in middle. Mesonotum with less conspicuous hairs. Body smaller, 2.8–3. Kazakhstan..... **A. brevisternis** Tobias
- 501 (495). Body reddish brown. Thorax with black pattern. Apical half of antennae, last 2 to 3 abdominal tergites and ovipositor valves intensely darkened. Preapical segment of antennae 1.5–1.6 times as long as wide. Propodeum with generally clear median longitudinal ridge (Fig. 241: 4). Sclerotized section of radial vein noticeably shorter than radiomedial vein (Fig. 241: 5). Length of 1st abdominal tergite (Fig. 241: 6) less than its maximum width or equal to it. Second abdominal tergite 5/9th to 1/2 of 3rd. Ovipositor valves (Fig. 241: 7) 8/10th as long as hind tibia. Body 3.5–3.9. Kazakhstan..... **A. suffectus** Tobias and Kotenko
- 502 (493). First abdominal tergite longer than its maximum width, somewhat narrowed toward apex. Sixth abdominal sternite long, reaching abdominal apex or extending beyond it. Ovipositor valves somewhat broadened toward apex or parallel-sided. Nervulus originates usually close to middle of discoidal cell. (Group *A. butalidis*)<sup>1</sup>.
- 503 (508). Ocelli in markedly obtuse-angled triangle (Fig. 243: 9b). Tangent to anterior margin of posterior ocelli cuts hind margin of anterior ocellus. Propodeum weakly sculptured, usually lustrous. Ovipositor valves approximately as long as hind tibia.
- 504 (507). Body black. Head (Fig. 243: 7B), distinctly produced downward, its height greater than width, proboscis distinctly developed. Mesonotum and scutellum densely punctate, matte. Stigma longer than metacarpus, yellowish brown with darker margin, usually with pale spot at base. Tegulae

<sup>1</sup> From European species of *A. butalidis* group, species *A. sesostris* Nixon, described by Nixon (1976) on the basis of males from England, has not been included in the key. Females of this species are so far not known, though E. Papp (1981) also mentions *A. sesostris* from Central Europe and Bulgaria.





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Fig. 242. Microgasterinae (from Wilkinson, Nixon and original).

1-3—*Apanteles planiscapus*: 1—1st to 3rd abdominal tergites, 2—part of forewing, 3—abdominal apex; 4-8—*A. butalidis*: 4—head, 5—1st to 3rd abdominal tergites, 6—part of forewing, 7—part of hind wing, 8—6th abdominal sternite and ovipositor; 9-10—*A. oculus*: 9—head, dorsal view, 10—head, frontal view.

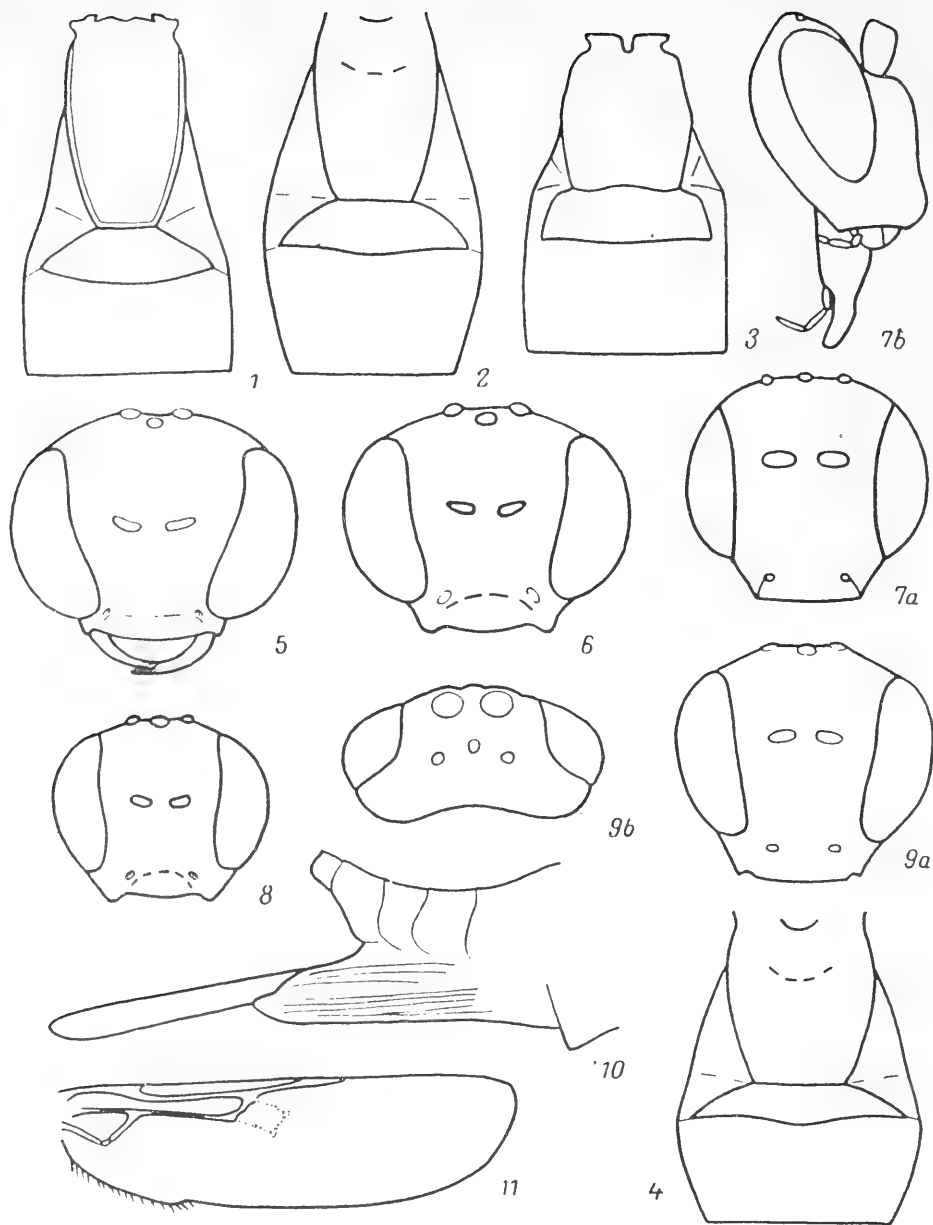


Fig. 243. Microgasterinae (from Nixon, Tobias, Papp and original).

1—4—1st to 3rd abdominal tergites: 1—*Apanteles biroicus*, 2—*A. contortus*, 3—*A. cloelia*, 4—*A. kosylevi*; 5—9—head: 5—*A. urgo*, 6—*A. electilis*, 7—*A. rostratus* (a—frontal view, b—lateral view), 8—*A. contortus*, 9—*A. mutabilis* (a—frontal view, b—lateral view); 10—*A. urgo*, abdominal apex; 11—*A. cloelia*, hind wing.

- yellow. Hind femora dark brown or black. Apical half of 1st abdominal tergite densely rugose-punctate, matte and dimly lustrous.
- 505 (506). Propodeum slightly sculptured, lustrous. Face narrower toward lower side (Fig. 243: 9a), its lower width  $\frac{5}{6}$ th of upper. Middle field of 2nd abdominal tergite shorter, its length  $\frac{1}{4}$ th its width. Body 2.5–3. Parasite of *Etiella zinkenella* Tr. (Phycitidae); cocoons rosy, isolated. Southwest, south, southeast; Georgia, Hungary, Austria, Bulgaria ..... **A. mutabilis** Tel. (*szaboi* Papp, syn. n.)
- 506 (505). Propodeum somewhat more sculptured, matte. Face slightly narrowed toward lower side, its lower width  $\frac{10}{11}$ th of upper (Fig. 243: 7a). Middle of 2nd abdominal tergite longer, its length  $\frac{1}{3}$ rd its width. Body 2.6. Caucasus (Gelendzhik) .....  
..... **A. rostratus** Tobias
- 507 (504). Body brownish red. Head not produced downward, its height less than width, proboscis not developed. Eyes hardly proximate on lower side. Antennae slightly shorter than body, preapical segment longer than wide. Mesonotum densely punctate, dull. Scutellum, propodeum, 1st and 2nd abdominal tergites somewhat lustrous. First abdominal tergite 1.5 times as long as its maximum width. Second abdominal tergite 4.5 times as wide as long, slightly more than half of 3rd abdominal tergite. Stigma light yellow, longer than metacarpus. Body 2.8. Tadzhikistan .....  
..... **A. blandus** Tobias and Kotenko
- 508 (503). Ocelli in less obtuse-angled triangle, tangent to anterior margin of posterior ocelli does not cut hind margin of anterior ocellus.
- 509 (520). Propodeum smooth or almost smooth, lustrous.
- 510 (511). Metacarpus unusually short,  $\frac{1}{4}$ th as long as its distance from wing apex. Eyes very large. In lateral view, length of eye 3 times length of temple. Eyes hardly proximate on lower side. Antennae, abdomen and legs reddish. Preapical segment of antennae longer than wide. Mesonotum brilliantly lustrous. Tegulae yellow. First abdominal tergite almost smooth, mildly sculptured only in apical quarter, as other abdominal tergites lustrous. Ovipositor valves slightly longer than hind tibia. Body 2.6–2.8. Central Asia. (Cf. also couplet 408.) ..... **A. oculatus** Tobias
- 511 (510). Metacarpus much longer. Eyes less large.

- 512 (515). Tegulae yellow or brownish yellow. Hind femora brownish yellow or brown. Eyes noticeably proximate on lower side (Fig. 243: 5, 6).
- 423 513 (514). Hind coxae black or dark brown. Smooth surface of posterolateral part of scutellum interrupted in middle by dull wrinkled region. Mesonotum and scutellum less lustrous, sometimes almost matte. Second abdominal tergite with dense, soft punctation, slightly lustrous. Eyes slightly proximate on lower side (Fig. 243: 6). Ovipositor valves shorter than hind tibia. Body 2–2.5. Southwest, south; Kazakhstan; Hungary, Yugoslavia ..... **A. electilis** Tobias
- 514 (513). Hind coxae yellowish. Posterolateral part of scutellum entirely smooth, not interrupted in middle by dull wrinkled region. Mesonotum and scutellum more lustrous. Second abdominal tergite almost smooth, lustrous. Eyes markedly proximate toward lower side (Fig. 243: 5). Ovipositor valves (Fig. 243: 10) as long as hind tibia. Body 2.2–2.7. South; Azerbaidzhan; Crete, Hungary, Mongolia .....  
..... **A. urgo** Nixon
- 424 515 (512). Tegulae black or dark brown. Hind femora black or almost black. Eyes usually slightly or not at all proximate on lower side.
- 516 (517). Ovipositor valves approximately half as long as hind tibia. Antennae extremely short, shorter than thorax and abdomen together, preapical segment square. Mesonotum lustrous. First abdominal tergite (Fig. 243: 1) slightly sculptured in apical half, somewhat lustrous. Body 2.1–2.3. Hungary. (cf. also couplet 433.) ..... **A. biroicus** Papp
- 517 (516). Ovipositor valves not shorter or slightly shorter than hind tibia. Antennae longer, not shorter than thorax and abdomen together, preapical segment distinctly elongate. Mesonotum slightly lustrous, usually almost matte. First abdominal tergite more sculptured in apical half, matte. Wings smoky. Stigma dark brown. Metacarpus longer than its distance from wing apex.
- 518 (519). Palps brown. Ovipositor valves distinctly shorter than hind tibia. Hind tibiae at base light colored up to more than 1/3rd length. Body smaller, 2.1–2.5. Stigma usually with small, faint pale spot at base. First to 3rd abdominal tergites as in Fig. 243: 4. South ..... **A. kostylevi** Kotenko
- 519 (518). Palps blackish. Ovipositor valves as long as hind tibia or slightly longer. Hind tibiae light colored for less than 1/3rd

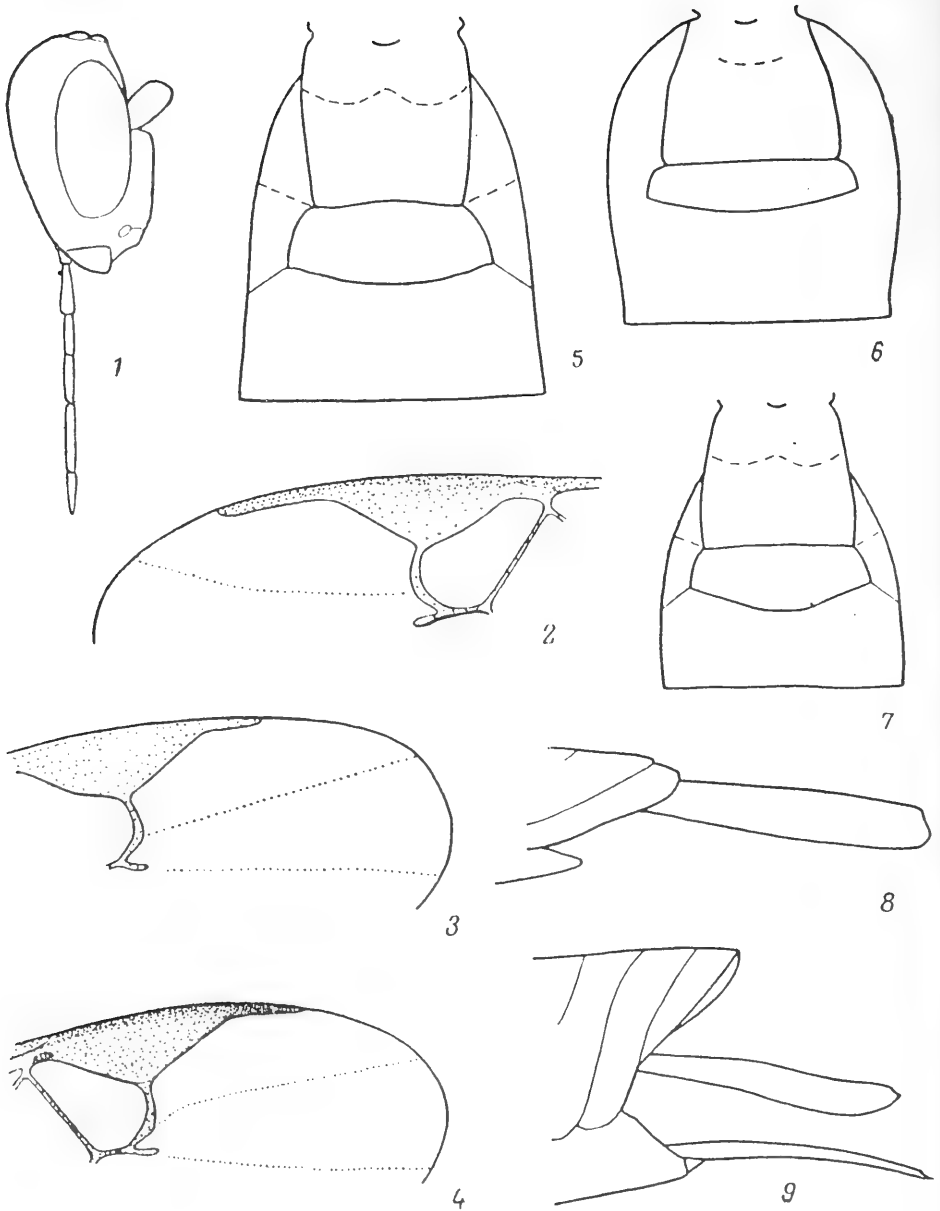
- length, almost entirely dark colored. Body larger, 3.3–3.4. Central Asia ..... **A. tigris** Kotenko
- 520 (509). Propodeum entirely with dense sculpture, matte.
- 521 (524). Eyes markedly proximate on lower side (Fig. 242: 4). Genae very short. Forewing as in Fig. 242: 6.
- 522 (523). First abdominal tergite longer and narrower, its length more than 1.5 times its maximum width. Second abdominal tergite almost as long as 3rd (Fig. 242: 5). Face relatively narrow, its maximum width approximately equal to its height (Fig. 242: 4). Mesonotum more coarsely punctate, matte. Ovipositor valves (Fig. 242: 8) shorter than hind tibia. Nervellus straight (Fig. 242: 7). Body 2.1–3. Parasite of *Scythris fuscoaenea* Hw., *S. picaepennis* Hw. (Scythrididae). Center, southwest; Crimea; Western Europe, Tunis ..... **A. butalidis** Marsh.
- 523 (522). First abdominal tergite shorter and wider, its length 1.2–1.3 times its maximum width. Second abdominal tergite shorter than 3rd. Face wider, its maximum width much greater than its height. Mesonotum more softly punctate, somewhat lustrous. Body 3. Hungary ..... **A. splendidus** Papp
- 524 (521). Eyes not or only slightly proximate on lower side (Fig. 243: 8). Genae usually longer.
- 525 (526). Eyes larger, in side view appear much more than 2 times as long as temple. Head distinctly wider than mesonotum. First abdominal tergite slightly narrowed posteriorly, 1.3–1.4 times as long as its maximum width. Ovipositor valves as long as hind tibia. Body 2.8–3. South; Italy, Hungary, Bulgaria ..... **A. sophrosine** Nixon
- 526 (525). Eyes smaller, in side view not more than 2 times as long as temple.
- 527 (528). Hind femora reddish yellow. Eyes slightly proximate on lower side. Antennae as long as body, preapical segment elongate. Mesonotum densely punctate, almost matte. Tegulae blackish. Stigma brown with large pale spot from base to beyond middle. First abdominal tergite wide, its length slightly more than its maximum width. Ovipositor valves slightly shorter than hind tibia. Body 1.9–2.2. Kazakhstan ..... **A. nigritegula** Tobias and Kotenko<sup>1</sup>

<sup>1</sup> This species was earlier (Tobias, 1964. *Tr. Zool. In-ta*, 34: 177–234) regarded as a variety of *A. electilis* Tobias.

- 528 (527). Hind femora black, rarely dark brown.
- 529 (534). Middle field of 2nd abdominal tergite less narrowed toward base, its posterolateral angles almost straight. First abdominal tergite shorter and wide, usually less narrowed toward apex (Fig. 243: 3). Wings smoky. Ovipositor valves slightly shorter than hind tibia.
- 530 (531). Hind tibia entirely black or dark brown. Antennae very thick. First and 2nd abdominal tergites (Fig. 243: 3) quite coarsely sculptured. Mesonotum with fine punctation, slightly lustrous. Outer margin of anal lobe of hind wing (Fig. 243: 11) almost straight, but with distinct fringe of hairs. Body 2.2–2.8. Northern Caucasus; Switzerland, Austria, Hungary, Yugoslavia.....  
..... **A. cloelia** Nixon
- 531 (530). Hind tibiae light colored for not less than 1/3rd length. Antennae not appearing thick. First and 2nd abdominal tergites markedly less sculptured, usually finely rugose.
- 532 (533). Mesonotum with thin, dense and quite distinct punctation, somewhat lustrous. Hind tibiae reddish for 1/3rd to 2/5th length, darkened in apical part. Stigma brown, without pale spot at base. Body 2.9–3.3. Parasite of *Aphelia stigmatana* Ev. (Tortricidae). Cocoons isolated, white. Altai .....  
..... **A. kostjuki** Kotenko
- 533 (532). Mesonotum finely rugose, without distinct punctation, matte. Hind tibiae reddish in basal third, dark brown in remaining part. Stigma dark brown, with small pale spot at base. Body 2.4. South .....  
..... **A. buteonis** Kotenko
- 534 (539). Middle field of 2nd abdominal tergite distinctly narrowed toward base, its posterolateral angles distinctly acute. First abdominal tergite longer and narrower, usually distinctly narrowed toward apex (Fig. 243: 2).
- 535 (536). Mesonotum somewhat lustrous. Middle field of 2nd abdominal tergite (Fig. 243: 2) not less or slightly less sculptured than apical half of 1st abdominal tergite. Antennae as long as body or slightly shorter, preapical segment distinctly elongate. Hind tibiae reddish, darkened usually in apical third, rarely in apical half. Ovipositor valves approximately as long as hind tibia. Body 2.5–3. Center, southwest, south; Caucasus, Kazakhstan, Central Asia; Western Europe, Turkey, Mongolia, Korean Peninsula ..

- ..... **A. contortus** Tobias<sup>1</sup>  
 (*cranior* Nixon, *evander* Nixon, *coresia* Nixon)
- 536 (535). Mesonotum matte. Middle field of 2nd abdominal tergite much less sculptured than apical half of 1st abdominal tergite. Stigma from brownish yellow to light brown. Hind femora 3.3–3.5 times longer than wide. Ovipositor valves 7/10th to 8/10th as long as hind tibia. Body 2.6–2.8. Parasite of *Phthorimaea operculella* Z. (Gelechiidae). Introduced into Bulgaria, Hungary, India, Australia and some other countries from the USA ..... **A. scutellaris** Mues.
- 537 (490). Metacarpus long, usually much longer than stigma; if shorter, then (as with long metacarpus) propodeum and also 1st and 2nd abdominal tergites smooth or very weakly sculptured and 1st abdominal tergite parallel-sided (rarely slightly widened or slightly narrowed in apical part). (Group *A. laevigatus*.)
- 538 (573). Metacarpus shortened, its length not exceeding its distance from wing apex by more than 1/3rd (Figs. 244: 2; 245: 5).
- 539 (542). Maxillary palps distinctly elongate, approximately as long as height of head (Fig. 244: 1). Head slightly narrower than mesonotum. Antennae shorter than body, preapical segment square or slightly elongate. Ocelli in a marked obtuse-angled triangle. Mesonotum with fine dense punctation, more densely punctate compared to scutellum, less lustrous. First abdominal tergite (Fig. 244: 6) slightly broadened from base to apex, its length slightly greater than its maximum width. Ovipositor valves (Fig. 244: 9) slightly shorter than hind tibia.
- 540 (541). Body, except dark colored head, reddish yellow. Spurs of hind tibiae longer, almost reaching half of 1st segment of hind tarsus. Body 2.5–3. Kazakhstan. (cf. also Couplet 726.) ..... **A. pulcher** Tel.
- 541 (540). Body black. Spurs of hind tibiae shorter. Body 2.9. Tadzhikistan. (cf. also couplet 727.) ..... **A. palpator** Tobias
- 542 (539). Maxillar palps not elongate, their length much less than height of head.

<sup>1</sup> Papp (1981) regards *A. contortus* Tobias as a recent synonym of *A. naso* Marsh. Because the latter was described on the basis of a male, and that identification of the species of genus *Apanteles* on the basis of a male has not been adequately worked out and is usually less reliable, we consider that synonymizing *A. contortus* Tobias with *A. naso* Marsh. is not entirely justified.



1—*Apanteles palpator*. head; 2—4—part of forewing: 2—*A. pulcher*, 3—*A. sagus*,  
 4—*A. gobustanicus*; 5—7—1st to 3rd abdominal tergites: 5—*A. midas*, 6—*A. pulcher*,  
 7—*A. graus*; 8, 9—abdominal apex: 8—*A. midas*, 9—*A. palpator*.



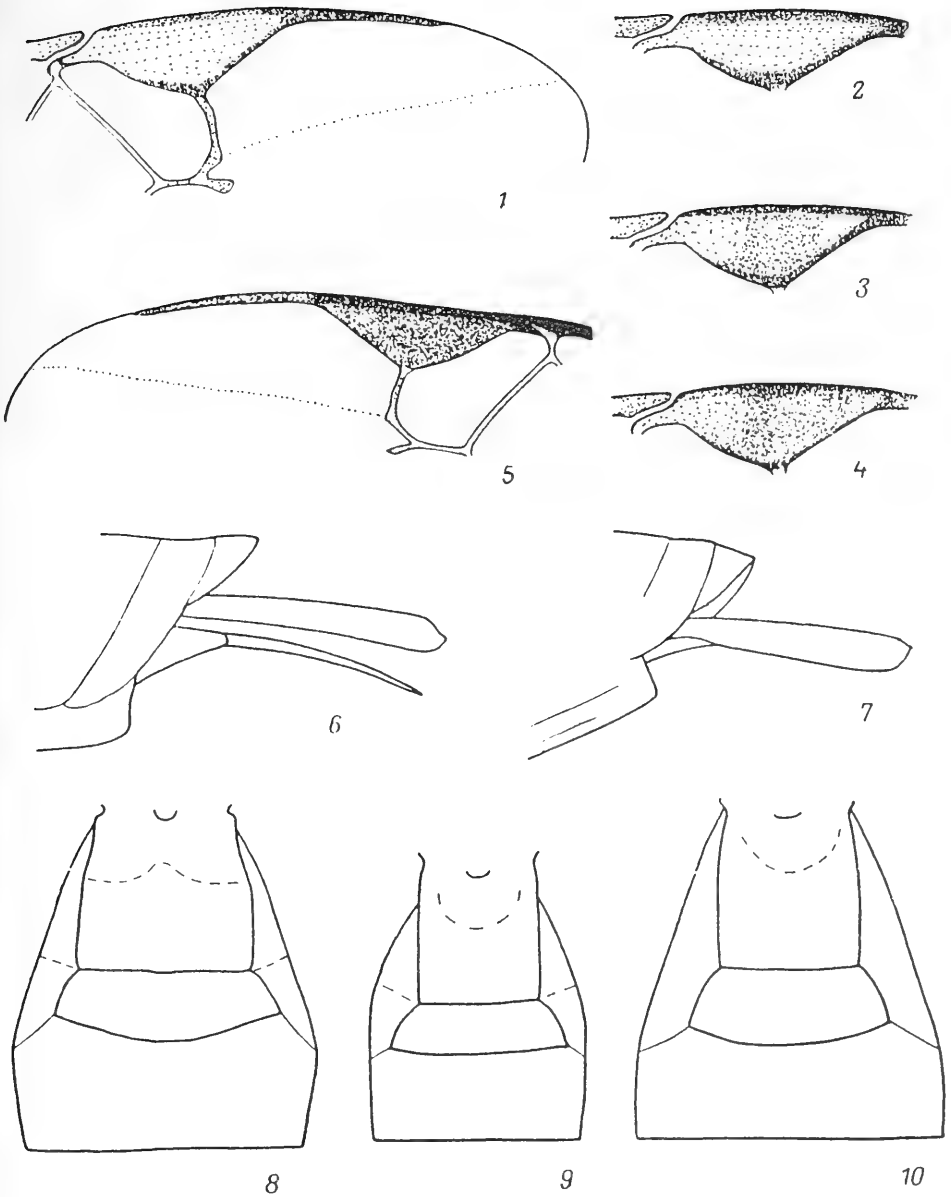


Fig. 245. Microgasterinae (original).

1-4—*Apanteles appellator*: 1—part of forewing; 2-4—color variation of stigma; 5, 6—*A. nixosiris*: 5—part of forewing, 6—abdominal apex; 7—*A. renatus*, abdominal apex; 8-10—1st to 3rd abdominal tergites: 8—*A. appellator*, 9—*A. lissonotus*, 10—*A. renatus*.

- 543 (554). Stigma entirely brown. Tegulae black or dark brown.
- 544 (545). Ovipositor valves (Fig. 244: 8) as long as hind tibia. Mesonotum with distinct punctation, lustrous. Scutellum with rare (denser along sides) punctation. First abdominal tergite slightly narrowed toward apex (Fig. 244: 5), smooth, brilliantly lustrous. Body 2.8–3. Finland, Hungary, Mongolia ..... **A. midas** Nixon
- 545 (544). Ovipositor valves not more than 8/10th as long as hind tibia.
- 546 (547). First abdominal tergite noticeably narrowed toward base and apex, on sides bulged. Sixteenth and 17th segments of antennae square or almost square. Inner spur of hind tibiae slightly longer than outer or equal to it, shorter than half 1st segment of hind tarsus. Bristles on outer side of hind tibiae thick and quite dense. Ovipositor valves slightly longer than half of hind tibia. Body 2.5–2.8. Hungary ...  
..... **A. impurus** Nees
- 547 (546). First abdominal tergite parallel-sided or somewhat widened at apex.
- 548 (549). Mesonotum slightly narrower than head, comparatively dull. Wings distinctly smoky. Antennae as long as body, preapical segment slightly longer than wide. First abdominal tergite (Fig. 244: 7) somewhat widened toward apex, its horizontal part densely sculptured, almost matte. Body 2–2.1. Crimea ..... **A. gratus** Kotenko
- 549 (548). Mesonotum not narrower than head, lustrous. Wings pale, occasionally slightly smoky. First abdominal tergite parallel-sided or slightly broadened toward apex.
- 550 (551). Body smaller, 2.2. First abdominal tergite 1.5 times as long as its width at apex. Kazakhstan, Mongolia .....  
..... **A. obstans** Papp
- 551 (550). Body larger, 2.4–4.1. First abdominal tergite relatively shorter (Fig. 245: 9). Antennae shorter than body.
- 552 (553). Mesonotum softly punctate, brilliantly lustrous. Antennae shorter than thorax and abdomen together. Body larger, 2.9–3.3. Kazakhstan. (cf. also couplet 569.) .....  
..... **A. lissonotus** Tobias<sup>1</sup>

<sup>1</sup> Papp (1978) regards *A. lissonotus* Tobias as a recent synonym of *A. lacteipennis* Curt. However, the matter is not clear. *A. lacteipennis* was described on the basis of a male. Identification of *Apanteles* on the basis of a male, as observed above, is not always reliable. Moreover, a male of *A. lissonotus* is not known.

- 553 (552). Mesonotum more coarsely punctate, less lustrous. Antennae not shorter than thorax and abdomen together. Body smaller, 2.4–2.7. Fig. 245: 5, 6. Parasite of *Pyrausta sticticalis* L. (Pyraustidae). Cocoons isolated, white. Novosibirsk Region, Turkmenia; Finland, Hungary, Mongolia . . . . .  
 . . . . . **A. nixosiris** Papp (*osiris* Nixon)
- 554 (543). Stigma light yellow or brown, with distinctly pale spot at base. Tegulae usually yellow.
- 426 555 (562). Metacarpus markedly shortened, not less than 2/3rd as long as its distance from wing apex (Fig. 244: 3, 4). Head slightly broader than mesonotum between tegulae. Antennae shorter than body, grayish brown, occasionally brown; preapical segments longer than wide, approximately by 1/3rd length. Mesonotum with soft, dense punctation, lustrous. Propodeum near apical depression (except in *A. turcmenicus*) with short wrinkles. First abdominal tergite slightly broadened toward posterior side or parallel-sided, its length equal to maximum width or slightly more.
- 556 (557). Ovipositor valves short, slightly longer than half of hind tibia, produced beyond abdominal apex by 1/2 to 7/10th length of 1st segment of hind tarsus. Head 1.7–1.8 times as wide as long. Stigma yellow with brownish anterior margin. Metacarpus darkened (Fig. 244: 4). Hind femora grayish brown or with reddish brown or brown apex. Azerbaidzhan . . . . . **A. gobustanicus** Kotenko
- 427 557 (556). Ovipositor valves longer, equal to or slightly shorter than hind tibia, markedly produced beyond abdominal apex.
- 558 (559). Stigma brown with pale spot at base or pale middle portion. Body larger, 3.3–4. Kazakhstan; Iran; Mongolia . . . . .  
 . . . . . **A. iranicus** Tel.
- 559 (558). Stigma light yellow. Body smaller, 2.1–2.5.
- 560 (561). Metacarpus not darkened, not darker than anterior margin of stigma, approximately 1/3rd as long as its distance from wing apex (Fig. 244: 3). Antennae significantly more lightly colored, reddishbrown or reddish yellow. Propodeum with short wrinkles near apical depression. Ovipositor valves not shorter than hind tibia. Hind femora reddish yellow, entirely or in basal half darkened. Body 2.1–2.5. Parasite of *Coleophora tshogoni* Flkv. (Coleophoridae). Turkmenia . . . . .  
 . . . . . **A. sagus** Kotenko
- 428 561 (560). Metacarpus darkened, darker than anterior margin of stigma, not less than 1/2 its distance from wing apex.

- Antennae more darkly colored, grayish brown. Propodeum without short wrinkles near apical depression. Ovipositor valves slightly shorter than hind tibia. Hind femora grayish brown with yellow apex. Body 2.3–2.5. Central Asia ..... **A. turcmenicus** Tobias<sup>1</sup>
- 562 (555). Metacarpus not shorter, or more than 2/3rd as long as its distance from wing apex.
- 563 (566). Hind femora reddish yellow. First abdominal tergite in apical half smooth, usually with sparse, fine punctation. Stigma light yellow. Antennae slightly shorter than body, grayish brown. Mesonotum with dense fine punctation, lustrous. Propodeum smooth, brilliantly lustrous. Ovipositor valves as long as hind tibia.
- 564 (565). Second abdominal tergite wider (Fig. 247: 3); first abdominal tergite slightly widened toward apex. Propodeum usually with short, not coarse wrinkles anterior to apical depression. Scutellum with fine, very dense, uniform punctation. Metacarpus slightly longer than its distance from wing apex or equal to it. Body 2.1–2.8. Azerbaidzhan, Central Asia ..... **A. alarius** Kotenko
- 565 (564). Second abdominal tergite less broad (Fig. 247: 2); first abdominal tergite almost parallel-sided. Propodeum without wrinkles anterior to apical depression. Scutellum, at least in middle part, smooth. Metacarpus slightly shorter than its distance from wing apex. Body 2.5–2.8. Armenia, Central Asia; Jordan ..... **A. turkmenus** Tel.
- 566 (563). Hind femora black or dark brown. First abdominal tergite usually somewhat sculptured in apical half. Stigma brown with pale spot at base or pale in middle (Fig. 245: 2–4). Occasionally, in some specimens of *A. appellator*, it is almost entirely pale. Propodeum largely smooth with short wrinkles near apical depression.
- 567 (570). Mesonotum distinctly wider than head.
- 568 (569). Stigma with large pale spot at base, occupying from 1/3rd to 1/2 its area; usually stigma pale also in apical part. First abdominal tergite parallel-sided, its length 1.5 times its width. Antennae shorter than body, preapical segments almost square. Body 3–3.2. Hungary .... **A. probatus** Papp

<sup>1</sup> Information regarding synonymy of *A. turcmenicus* Tobias with *A. turkmenus* Tel. (Papp, 1978) is not sufficient.

- 569 (568). Pale spot at base of stigma small (Fig. 247: 10). First abdominal tergite shorter. (cf. also couplet 552.) .....  
 ..... **A. lissonotus** Tobias
- 570 (567). Mesonotum not wider than head. Metacarpus longer than its distance from wing apex.
- 571 (572). Ovipositor valves short, not longer than 7/10th hind tibia (Fig. 245: 7). Scutellum densely and coarsely punctate, matte or slightly lustrous. First abdominal tergite parallel-sided, 1.3–1.4 times as long as wide. Second abdominal tergite less wide, 2.4–2.5 times as wide as long (Fig. 245: 10). Body 2.3–2.5. Tadjikistan ..... **A. renatus** Kotenko
- 572 (571). Ovipositor valves longer, as long as hind tibia or slightly shorter. Scutellum sparsely and softly punctate, lustrous. First abdominal tergite slightly broadened from base to apex, usually almost parallel-sided, its length 1.2–1.3 times its maximum width. Second abdominal tergite wider, 2.8–3 times as wide as long (Fig. 245: 8). Bristles on outer side of hind tibiae thick and quite sparse (Fig. 252: 22). Figs. 245: 1–4; 246. Body 1.9–2.7. Parasite of *Phthorimaea operculella* Z., *Scrobipalpa* sp. (Gelechiidae), *Etiella zinckenella* Tr. (Phycitidae), *Plutella maculipennis* Curt. (Plutellidae). Cocoons white, isolated. Northwest, southwest, center, south (massive), southeast; Caucasus, Central Asia, Hungary, Cyprus, Cape Verde Island, Egypt, Mongolia, Northern China .....  
 ..... **A. appellator** Tel. (*litae* Nixon, *salverdensis* Hedqv.)
- 573 (538). Metacarpus not shortened, in any case, longer by more than 1/3rd its distance from wing apex (Fig. 247: 11).
- 574 (585). Stigma light colored (whitish or yellowish), usually with somewhat darkened margin.
- 575 (582). Hind femora yellow or brownish yellow, sometimes with blackish pattern.
- 576 (579). Ovipositor valves 1.3–1.4 times as long as hind tibia.
- 577 (578). First abdominal tergite distinctly narrowed from base to apex. (cf. also couplet 669.) ..... **A. lineipes** Wesm.
- 578 (577). First abdominal tergite parallel-sided or rarely slightly narrowed toward apex. (cf. also couplet 670.) .....  
 ..... **A. decorus** Hal.
- 579 (576). Ovipositor valves as long as hind tibia or slightly shorter (Fig. 254: 12). Antennae as long as body, preapical segment 1.5 times as long as wide. Ocelli in triangle, quite high. Mesonotum densely and softly punctate, largely lustrous.



Fig. 246. Microgasterinae (original).

*Apanteles appellator* Tel.

Metacarpus 5—7 times as long as its distance from wing apex.

- 580 (581). Spurs of hind tibiae longer, large spur reaching half of 1st segment of hind tarsus. Apex of hind tibiae and hind tarsi darkened. Prescutellar groove extremely narrow, with slight notch. Scutellum less wide (Fig. 248: 12). First abdominal tergite (Fig. 254: 8) and propodeum almost absolutely smooth. Length of radial and radiomedial veins approximately same (Fig. 254: 5). Nervellus almost straight (Fig. 252: 16). Body 2.3—3. Parasite of *Exoteleia*

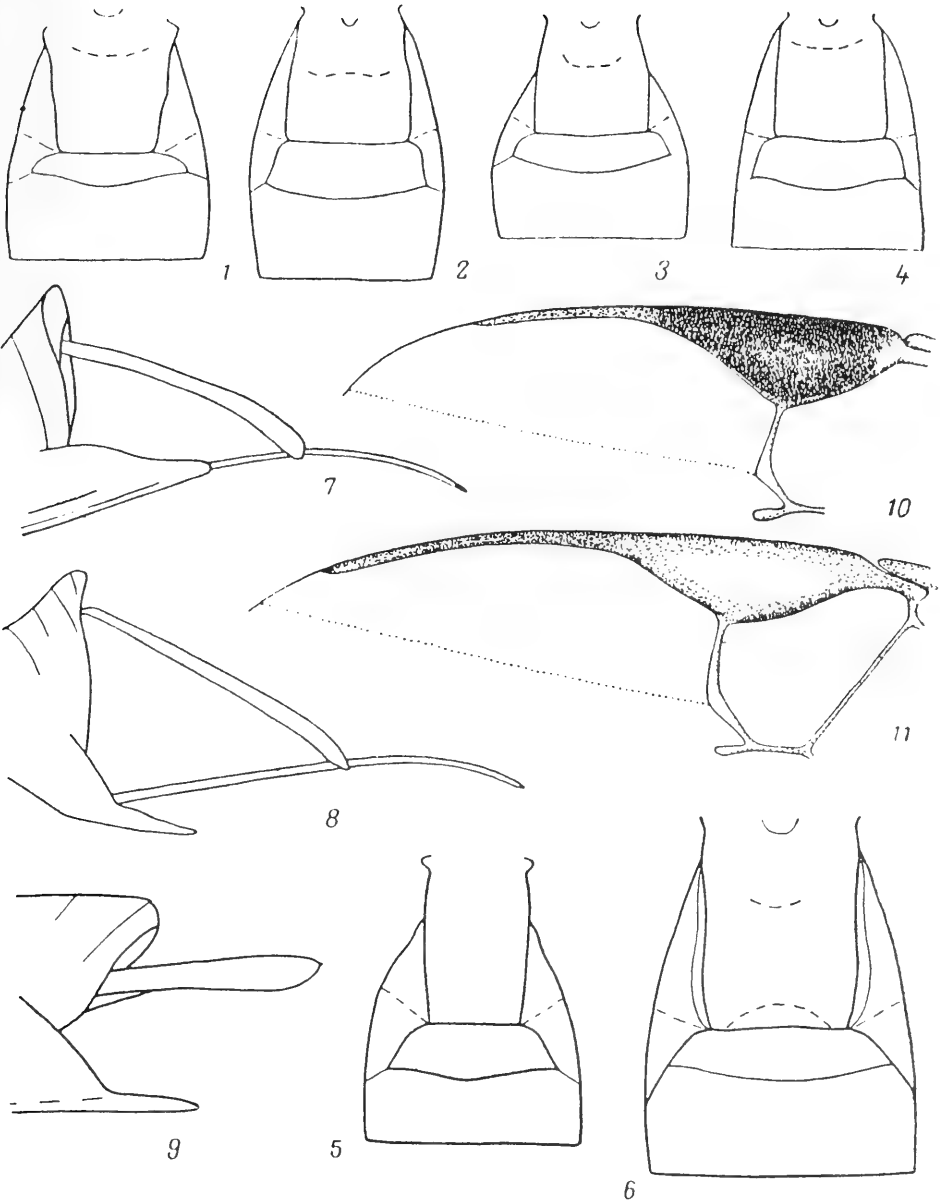


Fig. 247. Microgasterinae (original).

1-6—1st to 3rd abdominal tergites: 1—*Apanteles britannicus*, 2—*A. turkmenus*, 3—*A. alarius*, 4—*A. colchicus*, 5—*A. punctiger*, 6—*A. faucula*; 7-9—abdominal apex: 7—*A. faucula*, 8—*A. britannicus*, 9—*A. punctiger*; 10, 11—part of forewing: 10—*A. lissonotus*, 11—*A. britannicus*.

- dodecella* L. (Gelechiidae), *Aphelia paleana* Hb. (Tortricidae). Czechoslovakia ..... **A. lemariiei** Nixon
- 581 (580). Spurs of hind tibiae shorter, large spur not reaching half of 1st segment of hind tarsus. Hind tibiae and tarsi brownish yellow, not darkened. Prescutellar groove somewhat wider, with more conspicuous notch. Scutellum wider (Fig. 248: 11). Propodeum in middle and in posterolateral angles softly wrinkled. First abdominal tergite (Fig. 247: 4), slightly rugose-punctate. Body 2.3–2.4. Parasite of *Grapholitha molesta* Busck. (Tortricidae). Georgia ..... **A. colchicus** Tobias
- 582 (575). Hind femora black.
- 583 (584). Ovipositor valves (Fig. 247: 8) 1.9–2 times as long as hind tibia. Head narrower than mesonotum, frontally appears elongate, its height greater than width (Fig. 252: 3). Mesonotum softly punctate, lustrous. Propodeum and 1st abdominal tergite (Fig. 247: 1) very faintly sculptured, lustrous. Body 2.8–3. Parasite of *Ptocheuusa inopella* Z. (Gelechiidae). Ukraine (forest steppe, steppe), Armenia, Tadzhikistan; England, Hungary. (cf. also couplet 445.) ..  
..... **A. britannicus** Wilk.
- 584 (583). Ovipositor valves approximately as long as hind tibia. Head not narrower than mesonotum, frontally slightly broad. Mesonotum coarsely punctate, usually dull. Propodeum and 1st abdominal tergite not coarsely but densely wrinkled, slightly lustrous or matte. (cf. also couplet 792.) ..  
..... **A. xanthostigma** Hal.
- 585 (574). Stigma entirely dark or at base with pale spot, rarely light colored at base and at apex.
- 586 (587). Discoidal cell not pedunculate (thickening at fusion of basal and medial veins; Fig. 248: 1). Antennae shorter than body, preapical segment hardly longer than wide. Mesonotum with distinct and quite large punctation, lustrous. Stigma brown with slightly pale spot at base. Legs dark colored. Ovipositor valves approximately 2 times as long as hind tibia. Body 2.3–2.9. Parasite of *Goniodoma limoniella* Stt. (Coleophoridae). England..... **A. victor** Wilk.
- 587 (586). Discoidal cell distinctly pedunculate (Fig. 253: 9, 20).
- 430 588 (661). Stigma with distinct pale spot at base.
- 589 (608). Hind femora yellow, yellowish brown or brown, rarely black with noticeable reddish brown spot (usually along middle line or in apical half).



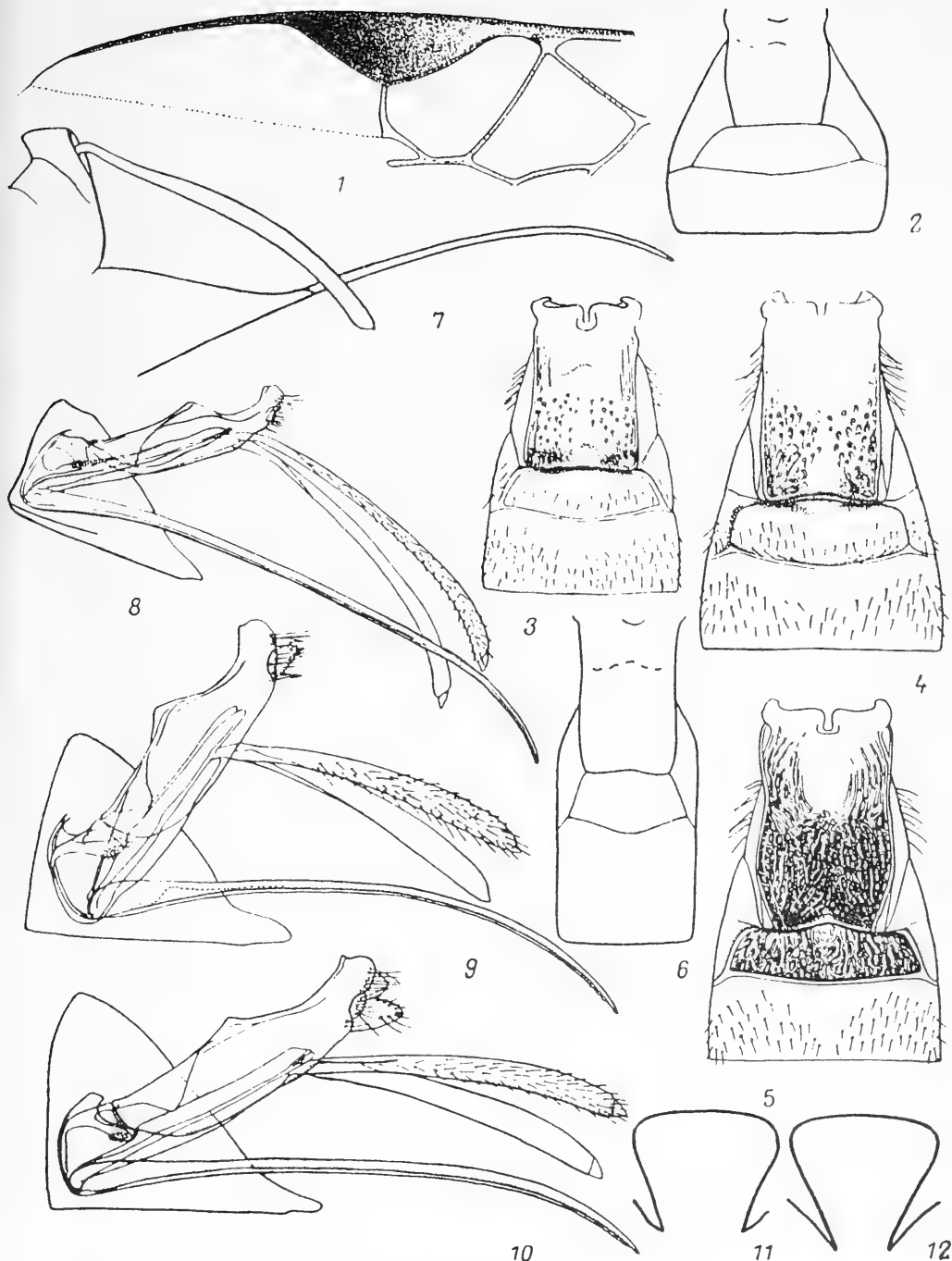


Fig. 248. Microgasterinae (from Wilkinson and original).

1—*Apanteles victor*, part of forewing; 2—6—1st to 3rd abdominal tergites: 2—*A. varifemur*, 3—*A. laevigatus*, 4—*A. brevisventris*, 5—*A. dilectus*, 6—*A. cytherea*; 7—*A. evonymellae*, abdominal apex; 8—10—6th abdominal sternite and ovipositor valves: 8—*A. laevigatus*, 9—*A. dilectus*, 10—*A. brevisventris*; 11, 12—scutellum: 11—*A. colchicus*, 12—*A. lemariiei*.

- 590 (597). Ovipositor valves distinctly longer than hind tibia.
- 591 (592). First abdominal tergite elongate, approximately 2 times as long as its width at apex. Mesonotum with distinct punctation, lustrous. Preapical segment of antennae slightly elongate. Inner spur of hind tibiae almost as long as outer, reaching half of 1st segment of hind tarsus. Ovipositor valves 1.4–1.5 times longer than hind tibia. Body 3. Central Europe ..... **A. immissus** Papp
- 432 592 (591). First abdominal tergite shorter, its length much less than 2 times its width at apex. Mesonotum with fine, faint punctation, lustrous.
- 593 (594). Ovipositor valves shorter, only 1.2 times as long as hind tibia (Fig. 247: 7). Hind femora yellowish brown with distinctly developed black pattern, usually with pale spot only in middle. Tegulae usually black or dark brown. Suture between 2nd and 3rd abdominal tergites hardly noticeable.
- 433 First abdominal tergite 1.3–1.4 times as long as its width at apex (Fig. 247: 6). Propodeum with faint wrinkles (usually soft, transverse) in middle depression. Inner spur of hind tibiae distinctly longer than outer, reaching half length of 1st segment of hind tarsus. Body 3.5–3.8. Parasite of *Lampronia tenuicornis* Stt. (Incurvariidae). Center; England, Hungary ..... **A. faucula** Nixon
- 594 (593). Ovipositor valves longer, 1.4–1.7 times as long as hind tibia. Hind femora entirely reddish or brownish yellow, sometimes slightly darkened only at base. Tegulae usually yellow. Suture between 2nd and 3rd abdominal tergites, as a rule, distinct.
- 595 (596). Ovipositor thicker, gradually curved posteriorly (Fig. 248: 7). Spurs of hind tibiae relatively shorter. Medial cell of forewing with sparser and paler bristles. Tegulae always yellow. Body larger, 3–4. Parasite of *Aegeria tipuliformis* Cl. (Sesiidae), *Tortrix viridana* L. (Tortricidae). Center, south, southeast; Armenia, Azerbaidzhan; Portugal, Central Europe, Italy, Yugoslavia .....  
..... **A. evonymellae** Bouché (*iarbas* Nixon)
- 596 (595). Ovipositor thinner, quite sparsely curved in apical part (Fig. 248: 8). Spurs of hind tibiae longer. Medial cell of forewing with denser and darker bristles. Tegulae yellow or brownish yellow. First to 3rd abdominal tergites as in Fig. 248: 3. Body smaller, 2.5–3. Parasite of *Anacamptis populella* Cl. (Gelechiidae), *Tortrix viridana* L.

- (Tortricidae). Entire Palearctic.....  
 ..... **A. laevigatus** Ratz. (*hoplites* Ratz.)
- 597 (590). Ovipositor valves not longer than hind tibia.
- 598 (601). Antennae slightly longer than body, 14th segment distinctly 2 times as long as its width, preapical segment 1.3–1.5 times longer than its width (Fig. 252: 9). Mesonotum quite coarsely punctate, lustrous. Ovipositor valves shorter than hind tibia.
- 599 (600). Wings darkened. Hind femora brown with yellowish apex or yellowish also in middle of apical half. Ovipositor valves markedly broadened, wider than 1st segment of hind tarsus. Scutellum smooth, lustrous. Propodeum, except smooth posterolateral angles, apical half of 1st and 2nd abdominal tergites softly sculptured, somewhat lustrous. Propodeum in middle with quite wide longitudinal depression. First abdominal tergite slightly narrowed posteriorly. Body 2.6–2.8. Western Caucasus.....  
 ..... **A. praetorius** Tobias<sup>1</sup>
- 600 (599). Wings pale. Hind femora, usually, entirely brownish yellow or yellow. Ovipositor valves (Fig. 248: 10) less broadened, not wider than 1st segment of hind tarsus. First abdominal tergite (Fig. 248: 4) 1.5–1.8 times as long as wide. Coloration variable; anterior sternites of abdomen brownish, or brownish yellow, sometimes abdomen almost completely, except apex, brownish yellow, sometimes basal segment of antennae and coxae of same color. Body 2.3–3. Parasite of species of genus *Coleophora* (Coleophoridae). Pupates in cover of host. Throughout; Western Europe ..  
 ... **A. breviventris** Ratz. (*mesoxanthus* Ruschka, *nilae* Tel.)
- 601 (598). Antennae not longer than body, 14th segment shorter, preapical segment square or slightly elongate (Fig. 252: 8, 11).
- 602 (603). Four to six, sometimes more apical segments of antennae distinctly yellow; as a rule much lighter than remaining segments of flagellum. Hind coxae, at least their apical part, yellow. Hind femora without traces of darkening. Third abdominal tergite with somewhat developed pale pattern. Mesonotum quite coarsely and densely punctate, matte.

<sup>1</sup>*A. praetorius* Tobias, undoubtedly, is not a synonym of *A. propinquus* Papp, as regarded by Papp (1978). Such an assertion is based on a comparison of holotype of *A. praetorius* with the original description of *A. propinquus*.

- Scutellum, compared to mesonotum, sparsely punctate, more lustrous, flattened. Propodeum with noticeable areola, open anteriorly and usually with traces of transverse ridge. First abdominal tergite (Fig. 247: 5) slightly narrowed posteriorly. Sixth abdominal sternite (Fig. 247: 9) at apex pointed. Body 2.8–3.2. Sylvatic species. Central zone, southwest, south, southeast; Western Europe. (cf. also couplet 816.) ..... **A. punctiger** Wesm. (*itea* Nixon)
- 603 (602). Apical segments of antennae darker, not lighter than remaining segments of flagellum. Hind coxae black or dark brown, sometimes with brown apex. Hind femora often with blackish pattern. Third abdominal tergite usually entirely black.
- 604 (605). First abdominal tergite (Fig. 248: 2) faintly sculptured in apical half while mesonotum brilliantly lustrous. Body 2.5–2.8. Azerbaidzhan ..... **A. varifemur** Abdinb.
- 605 (604). First abdominal tergite quite densely wrinkled, matte. Mesonotum usually dull.
- 606 (607). First abdominal tergite distinctly broadened. Second abdominal tergite smooth or slightly sculptured. Mesonotum more softly punctate. Pale spot at base of stigma small. Hind femora with distinctly developed blackish pattern. Ovipositor valves slightly longer than half of hind tibia. Body 2.5–2.7. Belgium, Hungary, Yugoslavia, Mongolia ..  
..... **A. cinerosus** Papp
- 607 (606). First abdominal tergite slightly narrowed toward apex or almost parallel-sided (Fig. 248: 5). Second abdominal tergite more sculptured, mildly wrinkled. Mesonotum with coarser punctation. Pale spot at base of stigma larger, distinct. Hind femora usually without blackish pattern, entirely brownish yellow. Ovipositor valves (Fig. 248: 9) usually almost equal to length of hind tibia. Body 2.3–2.8. Parasite of *Caloptilia syringella* F., *C. betulicola* Hering, *C. roscipennella* Hb. (Gracillariidae), *Tortrix viridana* L., *Grapholitha inopinata* Heinrich, *Hedya pruniana* Hb., *Zeiraphera rufimitrana* H.-S., *Parasyndemis histriionana* Fröl., *Choristoneura murinana* Hb. (Tortricidae), *Yponomeuta cognatellus* Hb., *Y. padellus* L. (Yponomeutidae) and other lepidopterans. Cocoons white, isolated. Transpalearctic .....  
..... **A. dilectus** Hal. (*femoralis* Bouché)
- 608 (589). Hind femora entirely black.

- 609 (610). First abdominal tergite distinctly elongate, 2 times as long as its apical width (Fig. 248: 6). Body elongate. Antennae approximately as long as thorax and abdomen together, preapical segment slightly elongate. Mesonotum lustrous. Ovipositor valves almost 2 times as long as hind tibia. Body 2.8–3.6. Southwest; England, Mongolia .....  
 ..... **A. cytherea** Nixon
- 610 (609). First abdominal tergite much shorter, less than 2 times as long as its apical width.
- 611 (612). Apical segment of labial palps unusually long, noticeably longer than apical segment of maxillary palp (Fig. 253: 10). Body stout. Head (Fig. 252: 2) slightly narrower than mesonotum. Antennae as long as body, preapical segment 1.2–1.3 times as long as wide. Mesonotum with dense and quite large punctation, somewhat lustrous. Second abdominal tergite distinctly broadened (Fig. 253: 11). Hind tibiae brownish yellow with distinctly darkened apical half. Ovipositor valves curved in apical third, 1.3–1.5 times as long as hind tibia. Wings as in Fig. 253: 9. Body 3–3.2. Parasite of *Eucosma aemulana* Schläg., *E. tripoliana* Barr. (Tortricidae). England ..... **A. marica** Nixon
- 612 (611). Apical segment of labial palps of usual shape, not longer than apical segment of maxillary palp.
- 437 613 (620). Thickened bristles on outer side of hind tibiae much more numerous and dense (Figs. 252: 20; 253: 16).
- 614 (615). Ovipositor valves distinctly shorter than hind tibia, gradually expanding slightly toward apex and somewhat curved (Fig. 255: 8). Antennae as long as body, preapical segment 1.3 times as long as wide. Ocelli in extremely obtuse-angled triangle. Mesonotum with dense punctation, dull. First abdominal tergite (Fig. 255: 7) very weakly sculptured. Middle field of 2nd abdominal tergite smooth or almost smooth. Body 3. Sweden, Finland, Hungary ..... **A. cheles** Nixon
- 615 (614). Ovipositor valves not shorter, often noticeably longer than hind tibia. Antennae shorter than body.
- 616 (617). Hind tibiae light colored (reddish) for not less than 7/10th length. Ovipositor valves (Fig. 253: 15) 1.3 to 1.4 times as long as hind tibia. First abdominal tergite (Fig. 253: 18) almost smooth, lustrous. Radial and radiomedial veins merging with each other, forming a distinctly curved line (Fig. 253: 17). Body 2.5–2.7. South; Northern Italy, Hungary. (cf. also couplet 702.) ..... **A. soikai** Nixon

- 617 (616). Hind tibiae light colored up to not more than middle, usually up to 1/3rd length.
- 618 (619). Ovipositor valves 1.6–1.7 times as long as hind tibia, narrow and distinctly curved downward in apical 1/3rd. Body very slender, scutellum punctate. (cf. also couplet 634.) . . . . . **A. victoriatuŝ** Kotoenko
- 619 (618). Ovipositor valves not more than 1.2 times as long as hind tibia, wider and straight. Body stouter. Scutellum smooth. Head frontally slightly produced downward (Fig. 252: 5). Mesonotum with distinct and more discrete punctation in posterior third; brilliantly lustrous. First abdominal tergite with faint traces of rugosity, brilliantly lustrous. Middle field of 2nd abdominal tergite smooth. Parasite of *Coleophora lutipennella* Z., *C. virgaureae* Stt. (Coleophoridae). South; England, Hungary, Romania. (cf. also couplet 698.) . . . . . **A. princeps** Wilk.
- 620 (613). Thickened bristles on outer side of hind tibiae less numerous and more sparse (Figs. 252: 19; 253: 2).
- 621 (626). Segments in apical part of antennae much smoother, more lustrous than at base. Antennae shorter than body.
- 622 (623). Antennae unusually thin, setaceous, 16th and 17th segments 1.5–2 times as long as wide. Ovipositor valves usually slightly longer than hind tibia. Mesonotum densely punctate, dull. Propodeum mildly wrinkled. Stigma quite wide, 2.1–2.2 times as long as wide (Fig. 253: 5). Tegulae yellow. Inner spur of hind tibiae slightly longer than outer. First abdominal tergite slightly narrowed toward apex (Fig. 253: 4). Body 2.8–3. Parasite of *Cnephasia chrysantheana* Dup., *C. incertana* Tr., *C. longana* Hw., *C. virgaureana* Tr. (Tortricidae). Center, south; Transbaikal; Western Europe. . . . . **A. annularis** Hal.
- 623 (622). Antennae thicker, 16th and 17th segments not more, usually less than 1.3 times as long as wide.
- 624 (625). Head behind eyes sharply narrowed (Fig. 255: 3). Ovipositor valves distinctly shorter than hind tibia. Stigma narrower, 2.5 times as long as wide (Fig. 255: 1). First abdominal tergite 1.6 times longer than its width at apex (Fig. 255: 2). Mesonotum with fine superficial punctation, lustrous. Body 3. Azerbaidzhan; Hungary. . . . .
- . . . . . **A. furtim** Papp
- 625 (624). Head rounded behind eyes. Ovipositor valves as long as hind tibia or somewhat longer. Stigma relatively wide,

only 2 times as long as wide (Fig. 253: 3). First abdominal tergite 1.4–1.5 times longer than its width at apex (Fig. 253: 1). Propodeum largely wrinkled. Body 2.8–3. Parasite of *Sophronia* sp. (Gelechiidae), *Agonopterix alstroemeriana* Cl., *A. atomella* Den. and Schiff., *A. propinquella* Tr., *A. arenella* Den. and Schiff., *Depressaria chaerophylli* Z., *D. pastinacella* Dup. (Oecophoridae), *Choristoneura diversana* Hb., *Cnephasia stephensiana* Dbld., *Croesia forskaleana* L., *Laspeyresia pomonella* L., *Parasyndemis histrionana* Fröl. (Tortricidae). Cocoons isolated, white. Transpalearctic. (cf. also couplets 638 and 660.) ..

.....**A. emarginatus** Nees

626 (621). Segments in apical third of antennae not distinguished or occasionally only slightly distinguished from segments in basal half in sculpture and luster.

627 (644). Ovipositor valves distinctly longer than hind tibia.

628 (629). Inner spur of hind tibiae very distinctly longer than outer (Fig. 253: 12), only shorter by 1/3rd of 1st segment of hind tarsus. Preapical segment of antennae longer than wide. Mesonotum with dense, distinct punctation, with somewhat clear satiny sheen. Bristles on wings dark, veins on forewing brownish. Hind tibiae reddish brown, distinctly darkened in apical third. Second abdominal tergite (Fig. 253: 13) smooth in anterior third, densely and softly sculptured in remaining part. Ovipositor valves approximately 1.5 times as long as hind tibia. Body 3.3–3.6. Parasite of *Blastesthia mughiana* Z., *B. posticana* Zett., *B. turionella* L. (Tortricidae). Cocoons white, isolated. Ukraine (Carpathians); Austria ..... **A. turionellae** Nixon

629 (628). Inner spur of hind tibiae distinct, usually hardly longer than outer, not longer than half of 1st segment of hind tarsus.

630 (633). Two preapical segments of antennae slightly broad or square (Fig. 252: 10).

631 (632). Head much narrower than mesonotum (Fig. 252: 18). Mesonotum brilliantly lustrous, more sparsely and deeply punctate in posterior part. First abdominal tergite slightly longer than its maximum width, brilliantly lustrous. Antennae shorter than body. Ovipositor valves almost straight, gradually broadening from base, 1.3–1.5 times as long as hind tibia. Body 3–3.5. South (steppe-forest of Ukraine); England, Hungary, Bulgaria, Mongolia .....

.....**A. drusilla** Nixon

- 632 (631). Head not narrower than mesonotum. Mesonotum slightly less lustrous. First abdominal tergite much longer (Fig. 253: 19). Nervellus distinctly arcuate. Hind tibiae light colored (yellowish) at base up to 1/3rd length. Ovipositor valves usually slightly longer than hind tibia, occasionally equal to it or slightly shorter. Body 2.5–3. Parasite of *Fumea betulina* Z., *Selenobia inconspicuella* Stt. (Psychidae). South; England, Central Europe. (cf. also couplet 655.) ..... **A. laevigatoides** Nixon
- 441 633 (630). Two preapical segments of antennae distinctly elongate, 1.2–1.5 times as long as wide.
- 634 (635). Thorax 1.6–1.7 times as long as high. First abdominal tergite noticeably more than 1.5 times as long as its width in middle. Body lustrous. Antennae shorter than thorax and abdomen together. Stigma narrow, pale spot at its base small. Body 2.5–2.8. South. (cf. also couplet 618.) .....  
.....**A. victoriatius** Kotenko sp. n.  
Holotype: Female, Ukrainian SSR, Kherson Region, Biryuchii Island, 27.VIII.1983 (V. Tolkanits). Paratypes: 6 females, same data.
- 635 (634). Thorax less than 1.6 times as long as high. First abdominal tergite not more, usually less, than 1.5 times as long as its width in middle.
- 636 (639). First abdominal tergite somewhat narrowed toward apex.
- 637 (638). Head frontally distinctly produced downward. Antennae thin, preapical segment approximately 1.5 times as long as wide. Mesonotum brilliantly lustrous, with sparser punctation. Propodeum smooth, brilliantly lustrous. First abdominal tergite narrowing approximately from middle. Ovipositor valves 1.6–1.8 times as long as hind tibia. Body 2.4–2.6. South..... **A. borysthenicus** Kotenko
- 638 (637). Head produced downward. Antennae thicker, preapical segment noticeably shorter. Mesonotum slightly lustrous, quite densely punctate. Propodeum almost entirely sculptured, less lustrous. First abdominal tergite narrowed only in apical part. Ovipositor valves distinctly shorter. (cf. also couplets 625 and 660.) .....**A. emarginatus** Nees
- 639 (636). First abdominal tergite parallel-sided or slightly broadened toward apex. Ovipositor valves 1.4–1.6 times as long as hind tibia.
- 640 (641). First abdominal tergite approximately 1.5 times as long as its width at apex (Fig. 253: 6). Ovipositor valves curved,



- parallel-sided. Ocelli in high triangle. Stigma 2.3 times as long as wide. Body 2.6–3. Hungary .....
- ..... **A. interpolatus** Papp
- 641 (640). First abdominal tergite shorter, 1.2–1.3 times longer than its width at apex. Ovipositor valves almost straight or curved only in apical third, broadened distinctly toward apex. Mesonotum quite dull. Nervellus slightly arcuate (Fig. 253: 26).
- 642 (643). Inner margins of eyes distinct, but not clearly proximate on lower side. Wings milky white. Ovipositor almost straight. Body 3–3.3. South; England, Hungary, Corsica Island, Turkey, Mongolia. .... **A. albipennis** Nees
- 643 (642). Inner margins of eyes parallel. Wings pale, not milky white. Ovipositor valves more curved (Fig. 249: 7). Discoidal cell of forewing wider than high (Fig. 253: 27). First abdominal tergite parallel-sided (Fig. 249: 2), almost smooth in apical half, with somewhat clear satiny sheen. Body 2.8–3.2. Parasite of *Aethes smeathmanniana* F. (Tortricidae). Except north; Caucasus; Western Europe. ....
- ..... **A. phaloniae** Wilk.
- 644 (627). Ovipositor valves not longer than hind tibia.
- 645 (656). Ovipositor valves distinctly shorter than hind tibia, straight, distinctly broadened in apical half (Figs. 250: 4; 253: 25). Antennae shorter than body, usually very short.
- 646 (647). Fourteenth to 16th antennal segments distinctly elongate (Fig. 252: 7). Wings darkened. Body large, 3.5–4. Mesonotum softly punctate, lustrous. Anal vein of forewing sharply curved in middle. Second abdominal tergite (Fig. 250: 1) almost smooth, lustrous. Sixth abdominal sternite (Fig. 250: 7) distinctly developed, with far produced apex. Parasite of *Eucosma aemulana* Schlág. (Tortricidae). Center; Caucasus; England, Sweden, Finland, Hungary. ...
- ..... **A. praetor** Marsh.
- 647 (646). Fourteenth to 16th antennal segments square or slightly broadened (Fig. 252: 6). Wings pale. Body smaller, 2.5–3.
- 648 (649). Mesonotum lustrous. First abdominal tergite parallel-sided. Second abdominal tergite smooth, lustrous. Body 2.8–3. Center; Finland, Central Europe, Bulgaria. ....
- ..... **A. helleni** Nixon
- 649 (648). Mesonotum matte, first abdominal tergite with somewhat curved lateral margins (Fig. 253: 23). Second abdominal tergite delicately sculptured, dull. Pale spot at base

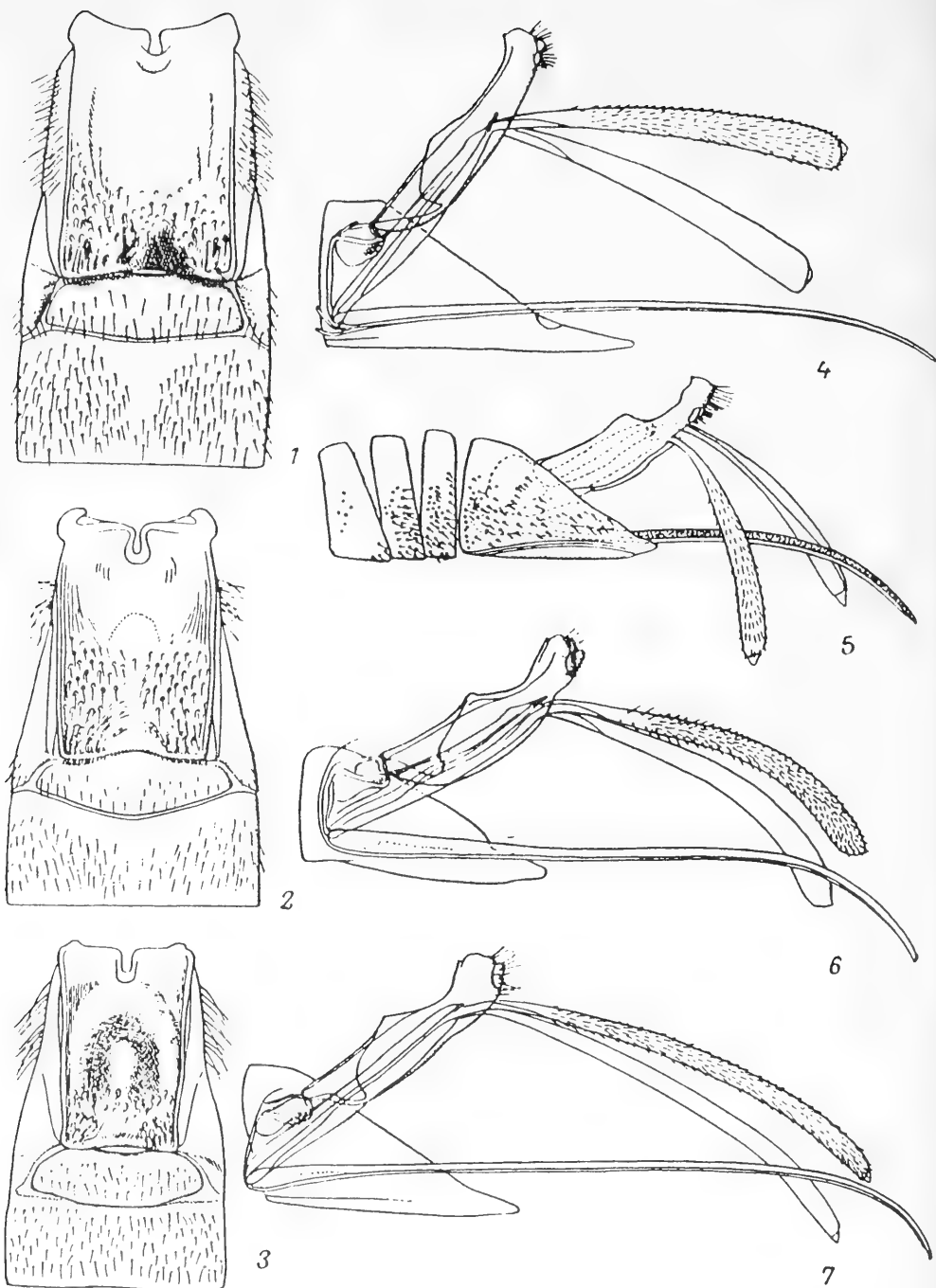


Fig. 249. Microgasterinae (from Wilkinson).

1—3—1st to 3rd abdominal tergites: 1—*Apanteles gagates*, 2—*A. phaloniae*, 3—*A. longicauda*; 4—7—apical abdominal sternite and ovipositor: 4—*A. gagates*, 5—*A. longicauda*, 6—*A. halidayi*, 7—*A. phaloniae*.

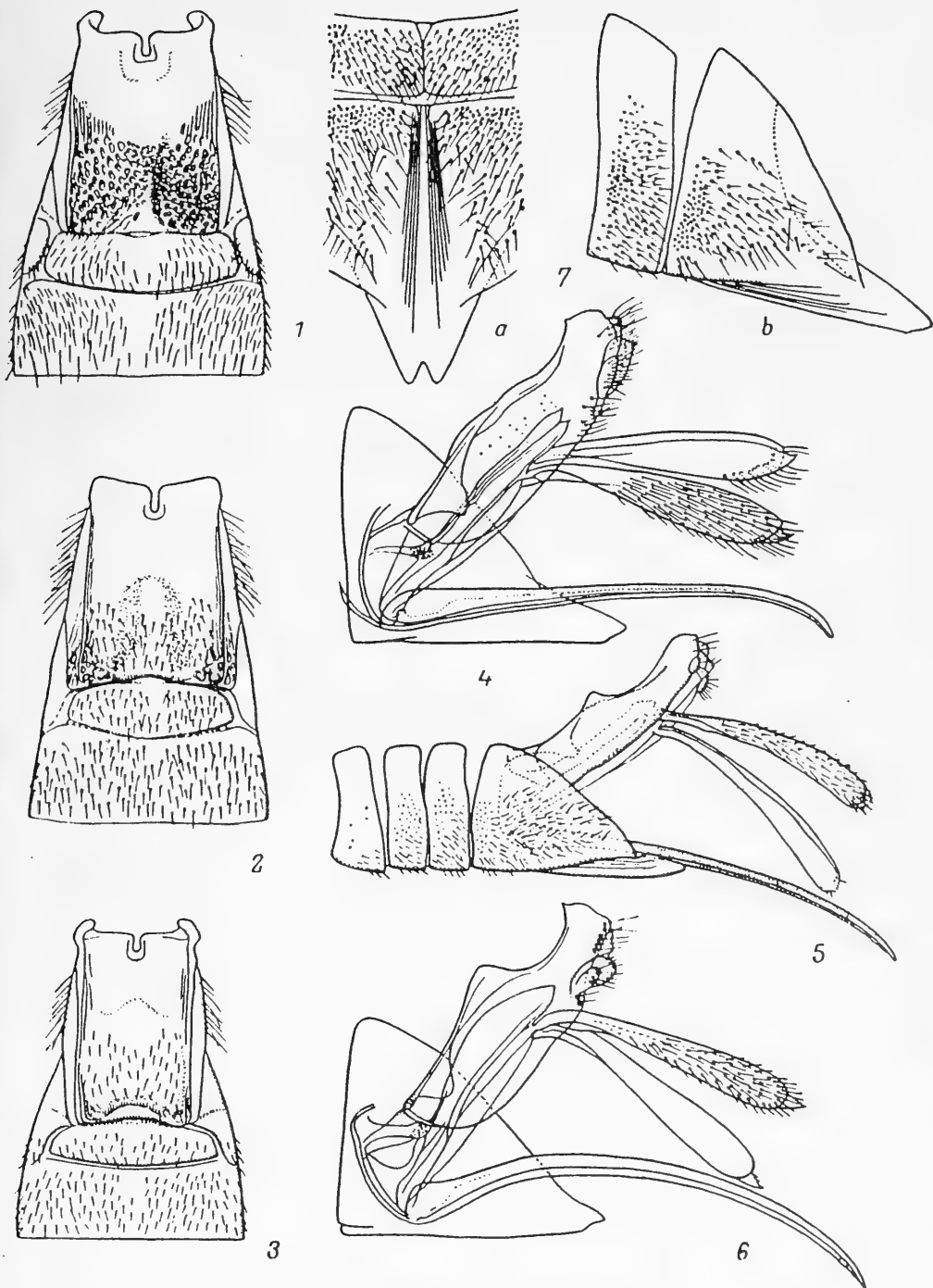
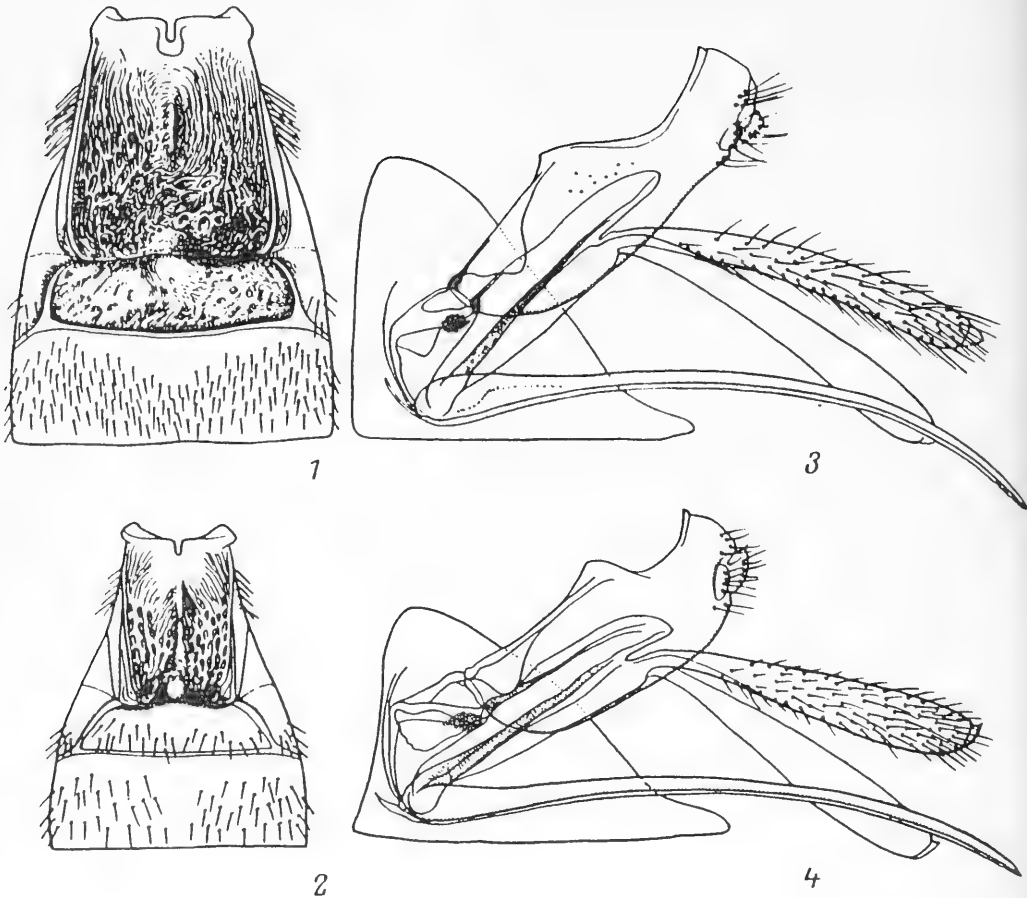


Fig. 250. Microgasterinae (from Wilkinson).

1-3—1st to 3rd abdominal tergites: 1—*Apanteles praetor*, 2—*A. sicarius*, 3—*A. gracilariae*; 4-6—apical abdominal sternite and ovipositor: 4—*A. praetor*, 5—*A. sicarius*, 6—*A. gracilariae*; 7—*A. praetor*, 5th to 6th abdominal sternites (a—ventral view, b—lateral view).



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Fig. 251. Microgasterinae (from Wilkinson).

1, 2—1st to 3rd abdominal tergites: 1—*Apanteles imperator*, 2—*A. infimus*; 3, 4—6th abdominal sternite and ovipositor: 3—*A. imperator*, 4—*A. infimus*.

- of stigma large (Fig. 253: 24). Body 2.5–2.7. Southwest, south; Georgia, Armenia; Hungary.....*A. sophiae* Papp 650 (645). Ovipositor valves approximately as long as hind tibia, if short, then distinctly narrower.
- 651 (656). Fifteenth to 17th antennal segments square or almost square. First abdominal tergite parallel-sided.
- 652 (653). Hind femora slightly flattened, short, less than 3 times as long as wide (Fig. 253: 8). First abdominal tergite shorter,

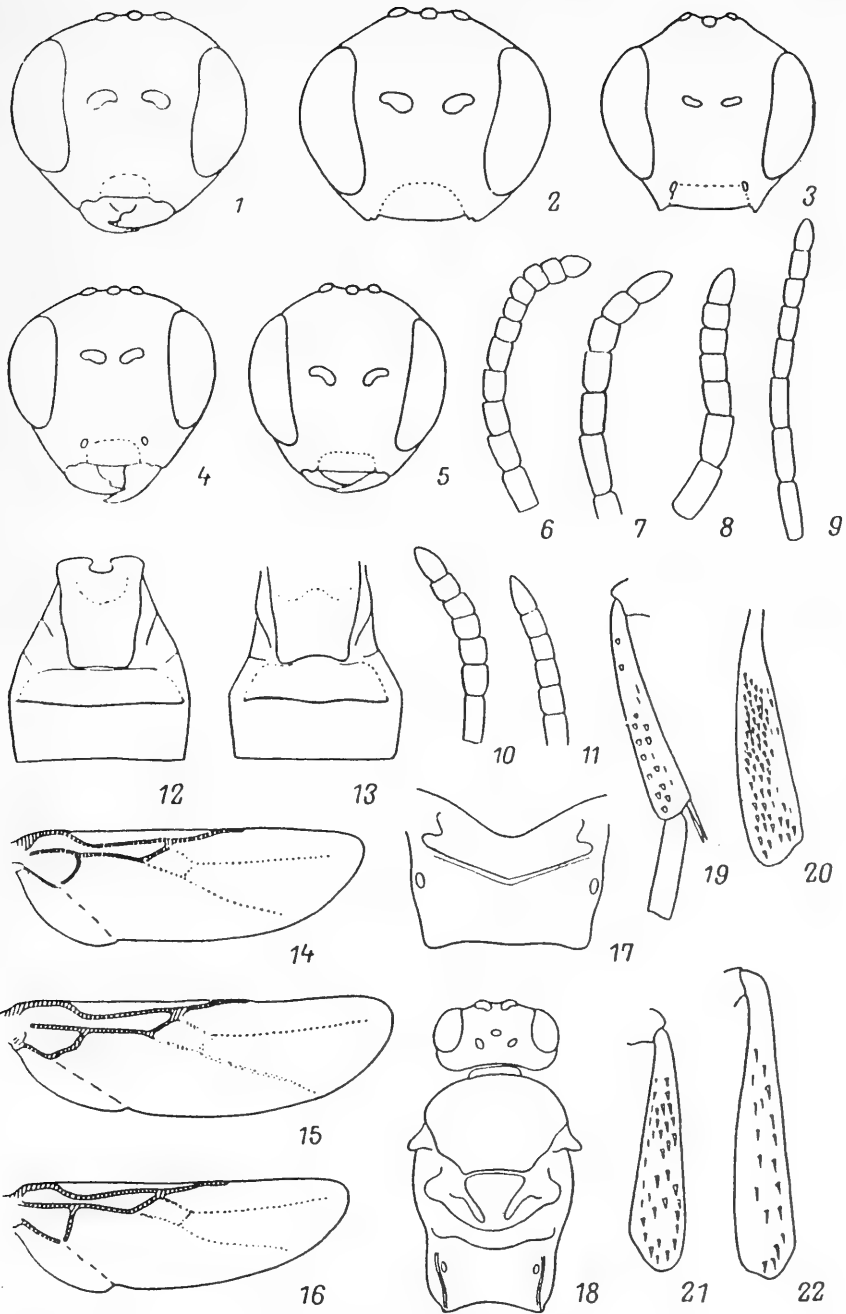
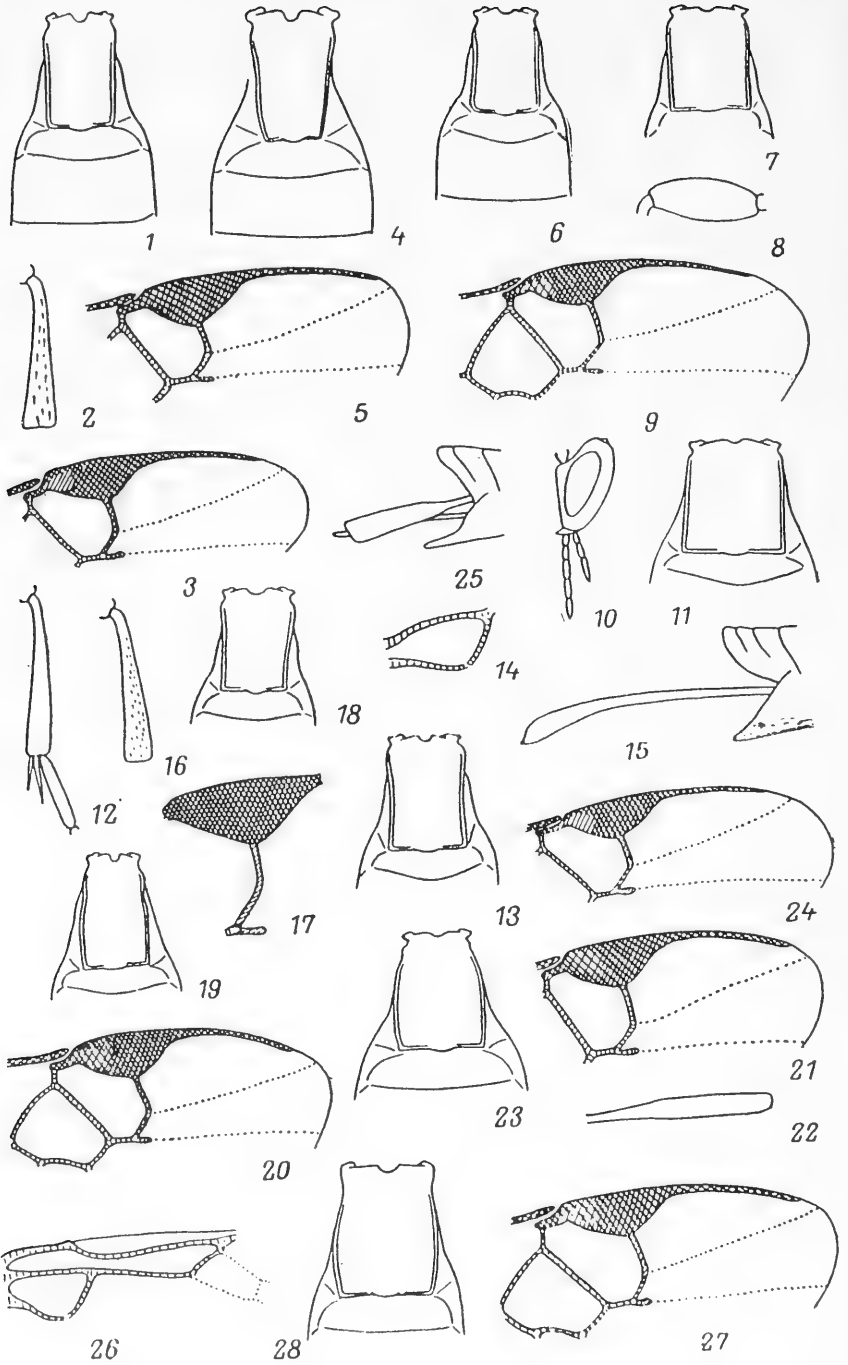


Fig. 252. Microgasterinae (from Nixon).

1-5—head, frontal view: 1—*Apanteles sicarius*, 2—*A. marica*, 3—*A. britannicus*, 4—*A. luctificus*, 5—*A. princeps*; 6-11—apical part of antenna: 6—*A. helleni*, 7—*A. praetor*, 8—*A. punctiger*, 9—*A. breviventris*, 10—*A. laevigatoides*, 11—*A. dilectus*; 12, 13—1st to 3rd abdominal tergites: 12—*A. phaola*, 13—*A. luctificus*; 14-16—hind wing: 14—*A. gracilariae*, 15—*A. gagates*, 16—*A. lemariei*; 17—*A. imperator*, propodeum; 18—*A. drusilla*, head and thorax; 19-22—hind tibia: 19—*A. infimus*, 20—*A. princeps*, 21—*A. luctificus*, 22—*A. appellator*.

- 1.2 times as long as its width at apex (Fig. 253: 7). Stigma besides distinct spot at base, with faint spot in apical part. Face wider, 1.4 times as wide as high. Light colored part of leg with clearer whitish tinge. Mesonotum densely punctate, lustrous. Propodeum lustrous, somewhat wrinkled in middle with discrete punctation, smooth posteriorly. Ovipositor valves as long as hind tibia. Body 2.8. Parasite of *Spilonota ocellana* F. (Tortricidae). Hungary .....
- ..... **A. reicharti** Papp
- 442 653 (652). Hind femora not flattened, not less than 3 times as long as wide. First abdominal tergite 1.4–1.6 times as long as its width at apex. Stigma with pale spot at base. Face broad, 1.2–1.3 times as wide as high. Light colored part of leg with less whitish tinge.
- 654 (655). Discoidal cell of forewing wider, its width slightly less than length (Fig. 254: 1). Face softly rugose-punctate. First abdominal tergite 1.4 times as long as its width at apex (Fig. 254: 7). Inner spur of hind tibiae half as long as 1st segment of hind tarsus. Wings pale. Ovipositor valves distinctly shorter than hind tibia. Body larger, 3.4. Hungary .....
- ..... **A. propinquus** Papp
- 655 (654). Discoidal cell less wide, its width approximately 10/13th its length (Fig. 253: 20). Face with fine punctation. First abdominal tergite 1.6 times as long as its width at apex (Fig. 253: 19). Inner spur of hind tibiae shorter than half length of 1st segment of hind tarsus. Wings usually slightly smoky. Ovipositor valves, as a rule, not shorter than hind tibia. Body small, 2.5–3. (cf. also couplet 632.) ..
- ..... **A. laevigatoides** Nixon
- 656 (651). Fifteenth to 17th antennal segments distinctly elongate. First abdominal tergite usually slightly narrowed toward apex.
- 657 (658). Pubescence of antennae with unusually long hairs, their length on apical segment half of segmental width. Stigma short and wide, 2 times as long as wide (Fig. 253: 21). Mesonotum with soft punctation, brilliantly lustrous. Apical half of 1st abdominal tergite densely and quite coarsely wrinkled. Ovipositor straight and relatively wide (Fig. 253: 22), as long as hind tibia or slightly shorter. Body 3.3–3.4. Parasite of *Phtheochroa rugosana* Hb. (Tortricidae). England .....
- ..... **A. sisenna** Nixon

- 658 (657). Pubescence of antennae of much shorter hairs. Stigma longer and narrower. Ovipositor valves as long as hind tibia.
- 659 (660). Head behind eyes distinctly narrowed. First abdominal tergite narrowing gradually from base to apex. Mesonotum dull in anterior part, lustrous near scutellum. Propodeum somewhat wrinkled, dull. Stigma slightly more than 2 times as long as wide. Metacarpus slightly paler than stigma. Nervellus markedly curved. Ovipositor valves curving downward gradually from middle, in middle parallel-sided. Body 3. Hungary ..... **A. flavostriatus** Papp
- 660 (659). Head behind eyes rounded. First abdominal tergite slightly narrowed only in apical part. (cf. also couplets 625 and 638.) ..... **A. emarginatus** Nees
- 661 (588). Stigma brown or dark brown, without distinct pale spot at base.
- 662 (671). Hind femora yellow or reddish yellow, sometimes with well-developed blackish pattern.
- 663 (666). Tegulae yellow.
- 664 (665). Ovipositor valves shorter than hind tibia, distinctly broadened toward apex (Fig. 255: 18). First abdominal tergite noticeably broadened, short, as long as its maximum width (Fig. 255: 19). Metacarpus slightly longer than stigma, approximately 2.5 times as long as its distance from wing apex. Hind femora completely reddish yellow. Body 2.8–3. Moldavia; Hungary.....
- ..... **A. mimi** Papp
- 665 (664). Ovipositor valves slightly longer than hind tibia, narrow. First abdominal tergite slightly narrowed in apical part, longer. Metacarpus 5 times as long as its distance from wing apex. Hind femora dark brown with yellowish apex. Mesonotum with metallic sheen. Body 2.2–2.4. Armenia. (cf. also couplet 704.) ..... **A. eleagnellae** Tobias
- 666 (663). Tegulae black or dark brown. First abdominal tergite parallel-sided or slightly narrowed toward apex. Ovipositor valves distinctly longer than hind tibia.
- 667 (668). Head wider, 2 times as wide as long. Ocelli in low triangle. Stigma narrow, its width  $\frac{2}{5}$ th its length. Nervellus slightly arcuate. Inner spur of hind tibiae usually slightly longer than outer. Antennae as long as body or slightly shorter. Mesonotum lustrous with metallic tint. Propodeum slightly sculptured, lustrous. First abdominal





tergite almost smooth, lustrous, 1.4–1.5 times as long as its width at apex. Hind femora usually with black pattern. Ovipositor valves narrow, distinctly curved, 1.2–1.4 times as long as hind tibia. Body 2.7–3.3. South .....

..... **A. azovicus** Kotenko, sp. n.

Holotype: Female, Ukrainian SSR, Kherson Region, Arbatskaya Railway Point, 29.VI.1979 (A. Kotenko).

Paratype: 7 females, same data, and 8 females, Ukrainian SSR, Zaporozhre Region. Pacific Coastal Region, Obitochnaya Sand bar, 27.VI.1979 (A. Kotenko).

668 (667). Head less wide, less than 2 times as wide as long. Ocelli in high triangle, large, distance between anterior and posterior ocelli less than ocellar diameter. Stigma wider. Nervellus distinctly arcuate. Inner spur of hind tibiae distinctly longer than outer. Ovipositor valves 1.3–1.4 times as long as hind tibia.

669 (670). First abdominal tergite distinctly, but not severely narrowing from base to apex. Mesonotum quite dull. Ovipositor valves curving downward approximately from apical third. Body 2.5–3. Parasite of *Argyresthia goedartella* L. (*Argyresthiidae*), *Caloptilia semifascia* Hw. (*Gracillariidae*), *Clavigesta sylvestrana* Curt., *Croesia bergmanniana* L., *Epinotia pygmaeana* Hb., *E. sordidana* Hb., *E. trimaculana* Don., *Rhyacionia pinivorana* Z., *R. buoliana* Den. and Schiff., *Tortrix viridana* L., *Zeiraphera griseana* Hb. (*Tortricidae*). Northwest; Western Europe. (cf. also couplet 577.) ..... **A. lineipes** Wesm.

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Fig. 253. Microgasterinae (from Papp).

1–3—*Apanteles emarginatus*: 1—1st to 3rd abdominal tergites, 2—hind tibia, 3—part of forewing; 4, 5—*A. annularis*: 4—1st to 3rd abdominal tergites, 5—part of forewing; 6—*A. interpolatus*, 1st to 3rd abdominal tergites; 7, 8—*A. reicharti*: 7—1st abdominal tergite, 8—hind femur; 9–11—*A. marica*: 9—part of forewing, 10—head, lateral view, 11—1st and 2nd abdominal tergites; 12, 13—*A. turionellae*: 12—part of hind leg, 13—1st and 2nd abdominal tergites; 14–18—*A. soikai*: 14—submedial cell of hind wing, 15—abdominal apex, 16—hind tibia, 17—part of forewing, 18—1st and 2nd abdominal tergites; 19, 20—*A. laevigatoides*: 19—1st and 2nd abdominal tergites, 20—part of forewing; 21, 22—*A. sisenna*: 21—part of forewing, 22—ovipositor valve; 23–25—*A. sophiae*: 23—1st and 2nd abdominal tergites, 24—part of forewing, 25—abdominal apex; 26—*A. albipennis*, part of hind wing; 27—*A. phaloniae*, part of forewing; 28—*A. agilla*, 1st and 2nd abdominal tergites.

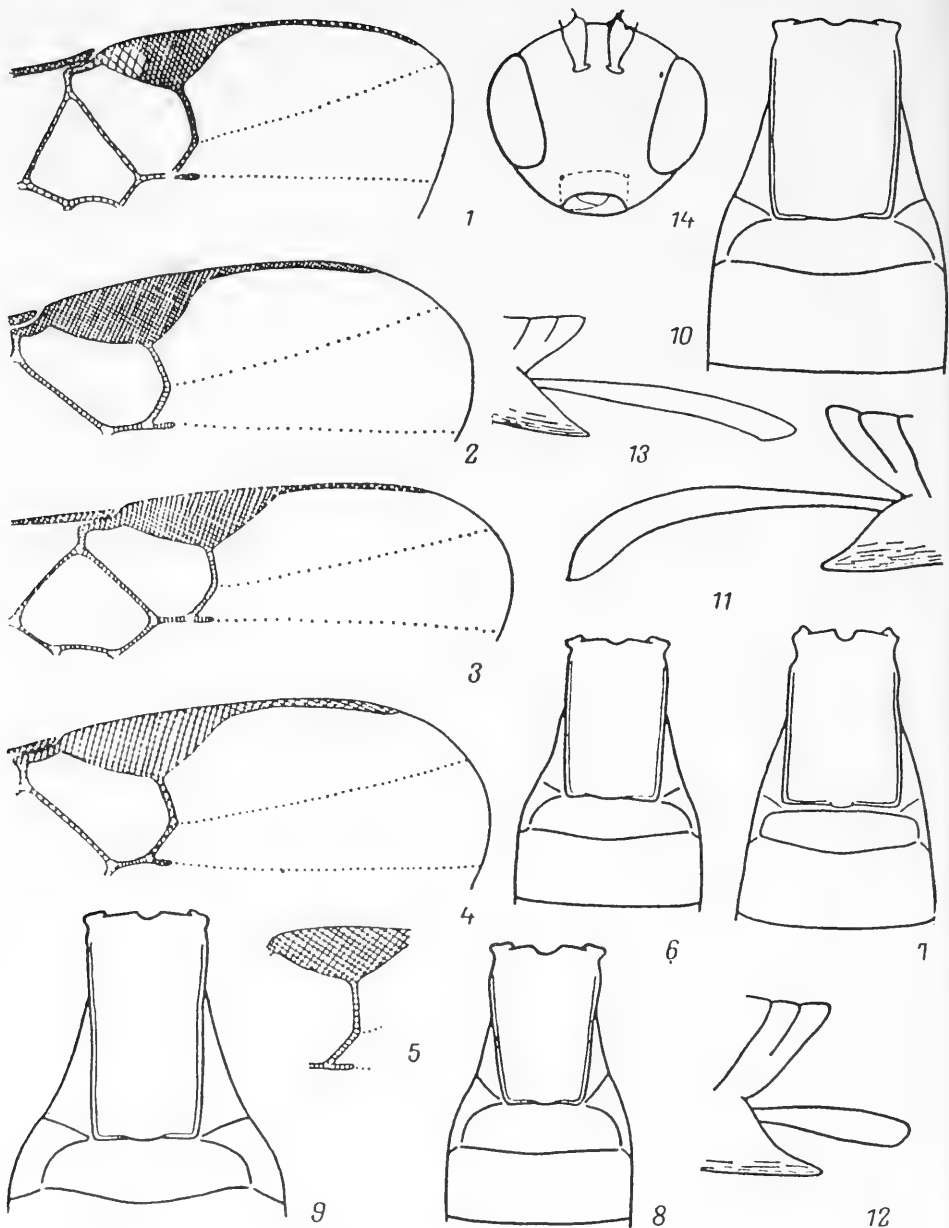
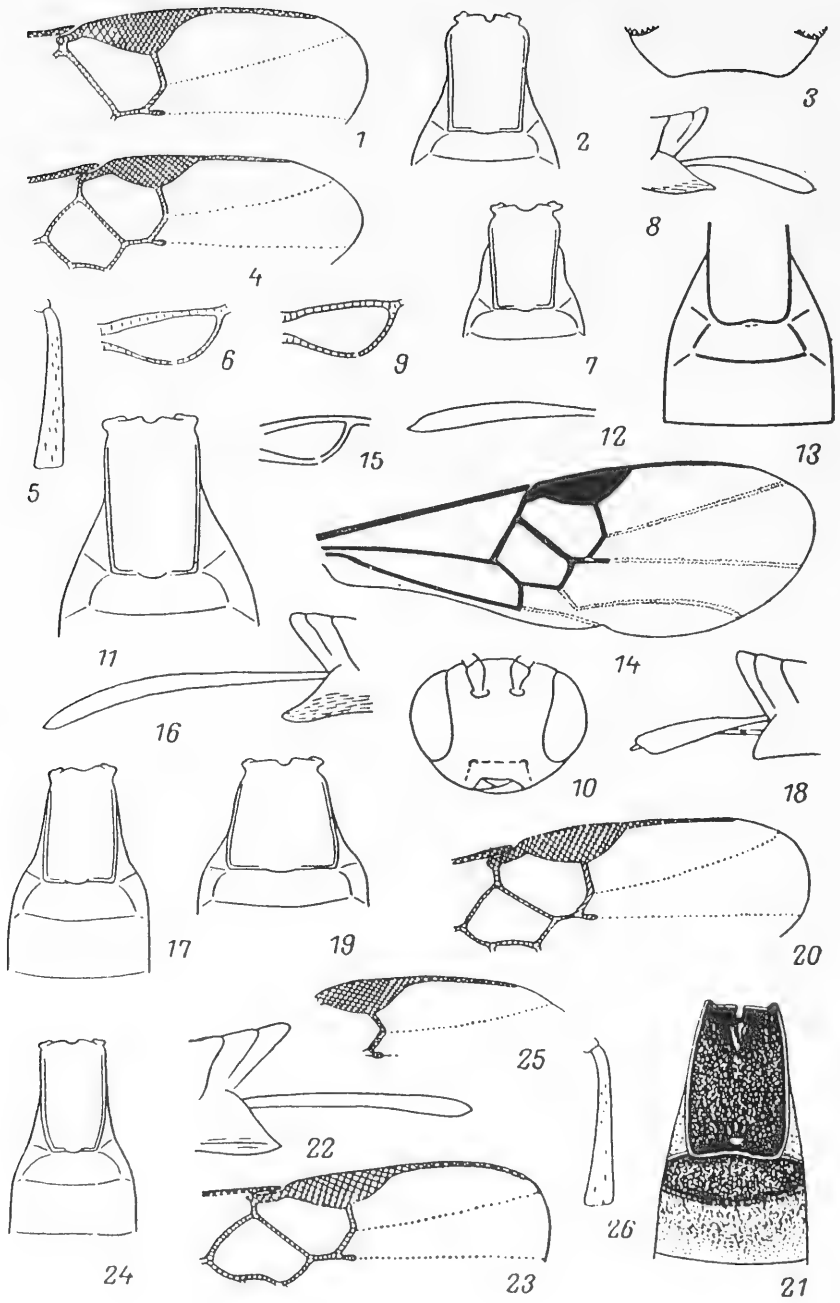


Fig. 254. Microgasterinae (from Papp).

1-5—part of forewing: 1—*Apanteles propinquus*, 2—*A. gagates*, 3—*A. halidayi*,  
 4—*A. luctificus*, 5—*A. lemariiei*; 6-10—1st to 3rd abdominal tergites: 6—*A. celsus*,  
 7—*A. propinquus*, 8—*A. lemariiei*, 9—*A. mirus*, 10—*A. erasmi*; 11-13—abdominal apex:  
 11—*A. erasmi*, 12—*A. lemariiei*, 13—*A. oehlkei*; 14—*A. erasmi*, head.

- 670 (669). First abdominal tergite parallel-sided or occasionally slightly narrowed toward apex (Fig. 255: 17). Mesonotum lustrous. Ovipositor valves curving downward approximately from middle and usually appear curved (Fig. 255: 16). Stigma 2 times as long as wide. Body 3–3.2. Parasite of *Gypsonoma minutana* Hb., *Rhyacionia duplana* Hb. (Tortricidae). Cocoons isolated, white. Transpalearctic. (cf. also couplet 578.). .....  
 ..... **A. decorus** Hal. (*lineatus* Reinh.)
- 671 (662). Hind femora black.
- 672 (673). First abdominal tergite with clearly curved lateral sides, distinctly narrowed toward base and apex (Fig. 253: 28), 1.3 times as long as its maximum width. Head frontally appears wide. Preapical segment of antennae 1.3 times as long as wide. Mesonotum with fine punctation, lustrous. Propodeum short, almost smooth in anterior half, somewhat densely wrinkled in posterior. Stigma quite wide, 2 times as long as wide. Wings smoky, ovipositor valves 1/4th as long as hind tibia. Body 3.5. Finland, Mongolia. ....  
 ..... **A. agilla** Nixon
- 673 (672). First abdominal tergite of different shape (parallel-sided, slightly narrowed toward base or toward apex).
- 674 (681). First abdominal tergite distinctly narrowed toward apex (Figs. 252: 12, 13; 255: 24). Mesonotum lustrous.
- 675 (676). Ovipositor valves 1.5 times as long as hind tibia. Body lustrous. Head distinctly produced downward, slightly higher than wide. Mesonotum with discrete punctation in posterior half. Scutellum with extremely sparse punctation. Propodeum with short, radially diverging wrinkles near apical depression, smooth in posterolateral angles, somewhat densely punctate in remaining part. Wings darkened. Stigma 2.6–2.8 times as long as wide. Metacarpus 5 times as long as its distance from wing apex. Outer margin of anal lobe of hind wing straight, without clear fringe of hairs. Nervellus almost straight. First abdominal tergite in apical third softly, quite densely sculptured, remaining ones smooth. Legs darkly colored. Outer side of hind tibiae with numerous, densely arranged ochre colored bristles. Inner spur of hind tibiae slightly longer than outer, shorter than half of 1st segment of hind tarsus. Body 2.6. Crimea. ....  
 ..... **A. benkevitshi** Kotenko, sp. n.



Holotype: Female, Angar Pass, deciduous forest, 11.VII.1979 (A. Kotenko).

- 676 (675). Ovipositor valves shorter than hind tibia.
- 677 (678). Metacarpus approximately 2 times as long as its distance from wing apex. Ovipositor valves shorter, part covered with hairs slightly longer than half of hind tibia. Head frontally noticeably produced downward, appears triangular (Fig. 252: 4). Antennae shorter than body, preapical segment 1.3 times as long as wide. Propodeum slightly sculptured. Width of discoidal cell of forewing only slightly shorter than its length (Fig. 254: 4). Outer side of hind tibiae with quite numerous, thickened bristles (Fig. 252: 21). Horizontal surface of 1st abdominal tergite softly and densely wrinkled, matte. Second abdominal tergite slightly less sculptured than 1st tergite. Body 2.5–3. Finland, Hungary, Yugoslavia, Mongolia. ....  
 ..... **A. luctificus** Papp (*anfursion* Nixon)
- 678 (677). Metacarpus 5–7 times as long as its distance from wing apex. Ovipositor valves longer, somewhat shorter than hind tibia. Head broader.
- 679 (680). Discoidal cell of forewing much less wide, its width 10/13th its length (Fig. 255: 23). Antennae slightly longer than body, preapical segment 1.3–1.5 times as long as wide. Inner spur of hind tibiae hardly longer than outer. Ovipositor valves almost straight, relatively narrow (Fig. 255: 22). Body 2–2.5. Sweden, Hungary, Bulgaria. ....  
 ..... **A. mycale** Nixon
- 680 (679). Discoidal cell of forewing wider, its width not more than 1/4th its length. Antennae distinctly shorter than body,

1–3—*Apanteles furtim*: 1—part of forewing, 2—1st and 2nd abdominal tergites, 3—temples, dorsal view; 4–6—*A. sicarius*: 4—part of forewing, 5—hind tibia, 6—submedial cell of hind wing; 7, 8—*A. cheles*: 7—1st and 2nd abdominal tergites, 8—abdominal apex; 9–12—*A. szalayii*: 9—submedial cell of hind wing, 10—head, 11—1st and 2nd abdominal tergites, 12—ovipositor valve; 13–15—*A. alutaceus*: 13—1st to 3rd abdominal tergites, 14—forewing, 15—submedial cell of hind wing; 16–17—*A. decorus*: 16—abdominal apex, 17—1st to 3rd abdominal tergites; 18, 19—*A. mimi*: 18—abdominal apex, 19—1st and 2nd abdominal tergites; 20, 21—*A. artissimus*: 20—part of forewing, 21—1st to 3rd abdominal tergites; 22–24—*A. mycale*: 22—abdominal apex, 23—part of forewing, 24—1st to 3rd abdominal tergites; 25, 26—*A. seriphia*: 25—part of forewing, 26—hind tibia.

- preapical segment 1.2–1.3 times as long as wide. Mesonotum lustrous. Propodeum largely smooth, lustrous. Horizontal surface of 1st abdominal tergite distinctly wrinkled. Middle field of 2nd abdominal tergite smooth, lustrous. Body 2.5–2.8. Sweden, England, Hungary. ....  
 ..... **A. phaoia** Nixon
- 681 (674). First abdominal tergite parallel-sided or somewhat broadened toward apex.
- 682 (691). First abdominal tergite slightly but distinctly broadened from base to apex (Figs. 251: 1; 255: 21).
- 683 (684). Width of discoidal cell 10/13th its length. Antennae longer than body, preapical segment almost 2 times as long as wide. Scutellum flattened, punctate. Posterior angle of postscutellum jutting quite far into propodeum (cf. Fig. 252: 17). Metacarpus slightly longer than stigma (Fig. 255: 20). First abdominal tergite densely and softly wrinkled, matte. Middle field of 2nd abdominal tergite less sculptured than 1st tergite. Ovipositor valves short, as long as 1st segment of hind tarsus. Body 2.8–3. England, Sweden, Central Europe, Mongolia. ....  
 ..... **A. artissimus** Papp (*abila* Nixon)
- 444 684 (683). Discoidal cell slightly wider than long. In doubtful cases, combination of other characters different.
- 685 (686). Posterior angle of postscutellum jutting far into propodeum (Fig. 252: 17). Mesonotum brilliantly lustrous, with pale satiny sheen. Antennae shorter than body, preapical segment 1.3 times as long as wide. Propodeum entirely sculptured. Wings smoky. Stigma wide, 2 times or slightly more longer than its width. First abdominal tergite wrinkled (Fig. 251: 1). Ovipositor valves (Fig. 251: 3) shorter than hind tibia by 1/3rd its length. Body 2.5–3. Parasite of *Acrolepia pygmeana* Hw. (Acrolepiidae), *Epermenia chaerophyllella* Goeze, *E. aequidentella* Hofm. (Epermeniidae), *Agonopterix assimilella* Tr., *A. heracleana* L. (Oecophoridae), *Plutella porrectella* L. (Plutellidae). Cocoons isolated, white. Throughout; Caucasus, Central Asia; Western Europe. .... **A. imperator** Wilk.
- 686 (685). Postscutellum not or only slightly jutting into propodeum. Mesonotum duller, often matte.
- 687 (690). Ovipositor valves hardly longer than half of hind tibia. Antennae as long as body. Metacarpus approximately 3 times as long as its distance from wing apex (Fig. 255: 14,

- 25). Outer side of hind tibiae with very small number of thickened bristles (Fig. 255: 26).
- 688 (689). Preapical segment of antennae 1.5–1.7 times as long as wide. Nervellus almost straight. Body 2.4–2.6. South; Central Europe. .... **A. seriphia** Nixon
- 689 (688). Preapical segment of antennae, at most, 1.2 times as long as wide. Nervellus distinctly arcuate (Fig. 255: 15). Mesonotum and scutellum with dense, fine punctation, matte. First abdominal tergite (Fig. 255: 13) softly and densely rugose-punctate in apical half. Second abdominal tergite very mildly sculptured, matte. Body 1.8–2. Bulgaria. .... **A. alutaceus** Balevski
- 690 (687). Ovipositor valves (Fig. 250: 5) very rarely slightly shorter than hind tibia, usually equal to it or slightly longer. Antennae shorter than body, not longer than thorax and abdomen together. Metacarpus 2.5–3 times as long as its distance from wing apex (Fig. 255: 4). Outer side of hind tibiae with more numerous bristles (Fig. 255: 5). Head as in Fig. 252: 1. Nervellus distinctly arcuate (Fig. 255: 6). Apical half of 1st abdominal tergite (Fig. 250: 2) weakly sculptured, dull. Body 3–3.5. Parasite of *Acrolepia pygmaeana* Hw. (Acrolepiidae), *Pexicopia malvella* Hb., *Isophrictis anthemidella* Wck. (Gelechiidae), *Mompha nodicolella* Fuchs. (Momphidae), *Agonopterix arenella* Den. and Schiff. (Oecophoridae), *Etiella zinckenella* Tr. (Phycitidae), *Plutella maculipennis* Curt., *P. porrectella* L. (Plutellidae), *Aethes francillana* F., *Ancylis laetana* F., *Cochylis posterana* Z., *Eucosma aemulana* Schlag., *Stenodes straminea* Hw. (Tortricidae) and other lepidoptera. Cocoons isolated, white. Transpalearctic. ....  
 .... **A. sicarius** Marsh. (*crudelis* Papp)
- 691 (682). First abdominal tergite somewhat parallel-sided.
- 692 (703). Outer side of hind tibiae with extremely numerous, dense, thickened bristles (Fig. 252: 20).
- 693 (696). Discoidal cell of forewing less wide, its width 1/3rd its length. Mesonotum lustrous.
- 694 (695). Ovipositor valves distinctly shorter than hind tibia. First abdominal tergite 2 times as long as its width at apex (Fig. 254: 9). Preapical segment of antennae 2 times as long as wide. Propodeum wrinkled in middle. Nervellus less arcuate, almost straight. Body 2.3. Hungary. ....  
 .... **A. mirus** Papp

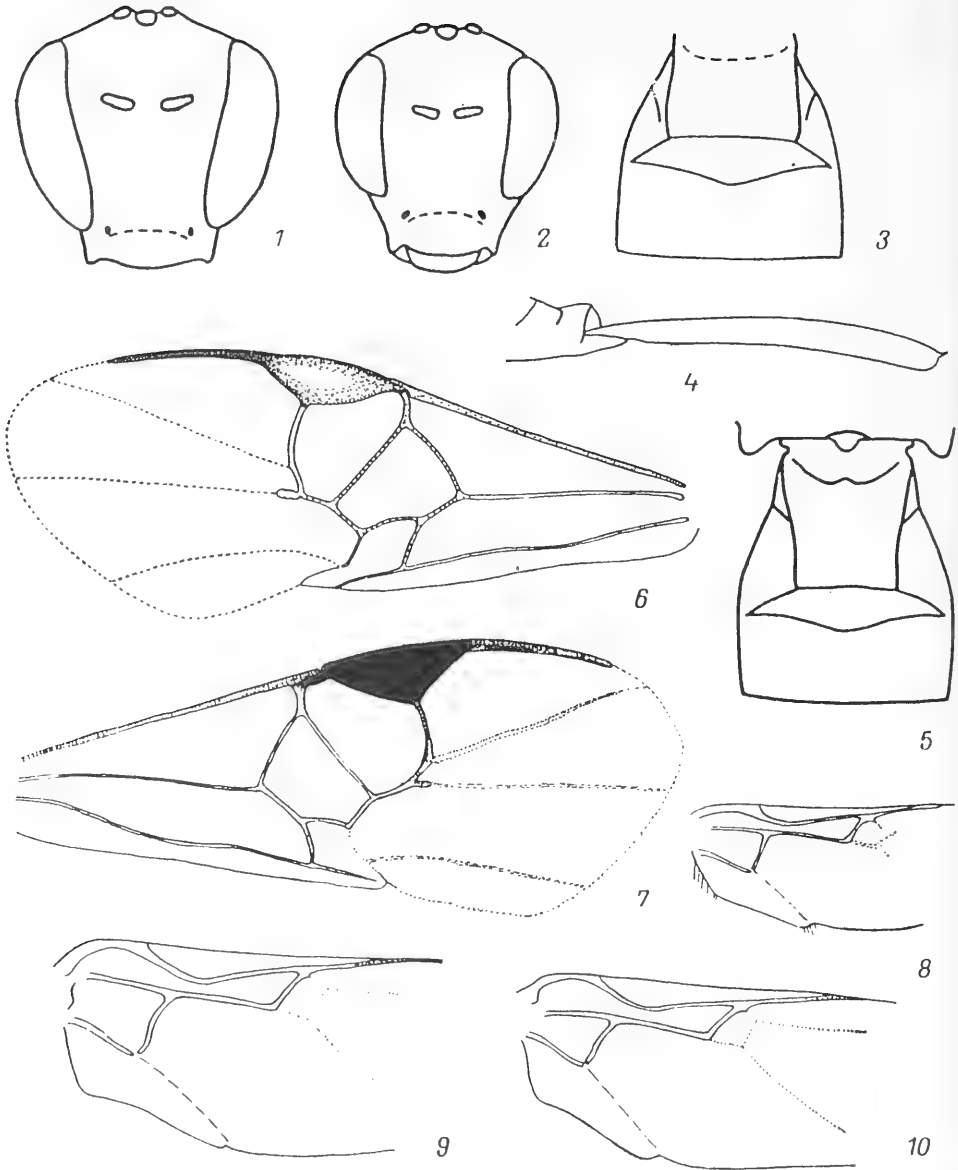
- 695 (694). Ovipositor valves approximately 1.3 times as long as hind tibia. First abdominal tergite 1.5 times as long as its width at apex. Preapical segment of antennae square or hardly elongate. Propodeum almost smooth. Nervellus distinctly arcuate. Body 2–2.3. Hungary. .... **A. purdus** Papp
- 696 (693). Discoidal cell of forewing wider, its width slightly less than its length.
- 697 (700). Head frontally not appearing wide, its width not greater than its height (Figs. 252: 4; 254: 14).
- 698 (699). Ovipositor valves straight, nervellus arcuate. Mesonotum with more distinct and deep punctation. (cf. also couplet 619.). .... **A. princeps** Wilk.
- 699 (698). Ovipositor valves distinctly and quite typically curved (Fig. 254: 11). Nervellus straight. Mesonotum with weaker punctation. Preapical segment of antennae not more than 1.3 times as long as wide. First abdominal tergite (Fig. 254: 10) 1.7 times as long as its width at apex. Palps and legs dark. Body 2.3–2.5. Central Europe. ....  
..... **A. erasmi** Nixon
- 700 (697). Head frontally appears distinctly wide, its width clearly greater than its height (Fig. 255: 10).
- 701 (702). Ovipositor valves (Fig. 255: 12) distinctly shorter than hind tibia. Preapical segment of antennae 1.5 times as long as wide. First abdominal tergite 1.8 times as long as its width at apex (Fig. 255: 11). Nervellus distinctly arcuate (Fig. 255: 9). Mesonotum densely punctate, slightly lustrous. Body 2.4–2.5. Hungary. .... **A. szalayi** Papp
- 702 (701). Ovipositor valves (Fig. 253: 15) 1.3–1.5 times as long as hind tibia. Preapical segment of antennae slightly elongate. First abdominal tergite 1.3–1.4 times as long as its width at apex (Fig. 253: 18). Nervellus slightly arcuate (Fig. 253: 14). (cf. also couplet 616.). .... **A. soikai** Nixon
- 445 703 (692). Thickened bristles on outer side of hind tibiae much less numerous and dense.
- 704 (705). Tegulae yellow. (cf. also couplet 665.). ....  
..... **A. eleagnellae** Tobias
- 705 (704). Tegulae black or brown.
- 706 (711). Discoidal cell of forewing less wide, its length exceeds its width by 1/3.
- 707 (708). Preapical segment of antennae 1.3–1.5 times as long as wide. Ovipositor valves approximately 1.5-times as long as hind tibia, slightly curved from middle to apex, almost



- straight. Mesonotum densely punctate, dull. First abdominal tergite (Fig. 254: 6) almost smooth in apical part, 1.4–1.6 times as long as its width at apex. Body 2.5–2.7. Hungary..... **A. celsus** Papp
- 708 (707). Preapical segment of antennae square or slightly wide. Ovipositor valves much shorter or distinctly and typically downcurved from middle (Fig. 249: 6). Legs extremely dark.
- 709 (710). Ovipositor valves 1.5 times as long as hind tibia, distinctly curved downward (Fig. 249: 6). Metacarpus 2–2.5 times as long as its distance from wing apex (Fig. 254: 3). Mesonotum with fine punctation, dull. First abdominal tergite shorter, 1.3 times as long as its width at apex. Body 2.3–2.8. Sweden, England, Hungary..... **A. halidayi** Marsh.
- 710 (709). Ovipositor valves approximately as long as hind tibia, quite broad and almost straight (Fig. 251: 4). Metacarpus approximately 4 times as long as its distance from wing apex. Mesonotum with extremely fine punctation, lustrous. First abdominal tergite 1.4–1.5 times as long as its width at apex. Apical half of 1st abdominal tergite (Fig. 251: 2) rugose-punctate, usually with smooth longitudinal groove in middle. Second abdominal tergite almost completely smooth, brilliantly lustrous. Body 2–3.5. Parasite of species of genus *Coleophora* (Coleophoridae). Throughout; Caucasus, Kazakhstan, Eastern Siberia; Western Europe. ....  
.....**A. infimus** Hal.
- 711 (706). Discoidal cell of forewings wider, its length hardly exceeds its width.
- 712 (713). Wings intensely smoky. Sixteenth and 17th segments of antennae square or slightly wider. Nervellus typically arcuate (Fig. 252: 15). Mesonotum weakly punctate, lustrous. Metacarpus 2.5–3 times as long as its distance from wing apex (Fig. 254: 2). Inner spur of hind tibiae slightly shorter than outer. Legs very dark. First abdominal tergite (Fig. 249: 1) densely, but softly rugose-punctate in apical third, 1.3–1.5 times as long as its width at apex. Ovipositor valves slightly longer than hind tibia, almost straight, quite wide (Fig. 249: 4). Body 2.8–3.5. Parasite of *Abraxas grossulariata* L. (Geometridae), *Pandemis heparana* Den. and Schiff., *Spilonota ocellana* F. (Tortricidae). Northwest, central belt, south; Caucasus; Western Europe. ....  
..... **A. gagates** Nees

- 713 (712). Wings pale, at most, slightly smoky. Sixteenth and 17th segments of antennae elongate. Nervellus of different form.
- 714 (715). Ovipositor valves (Fig. 250: 6) approximately 1/3rd as long as hind tibia. Ocelli in low obtuse-angled triangle. Tangent to anterior margin of posterior ocelli cuts posterior margin of anterior ocellus. Mesonotum brilliantly lustrous with pale satiny sheen. Propodeum largely smooth. Nervellus arcuate (Fig. 252: 14). First abdominal tergite (Fig. 250: 3) completely smooth, lustrous. Body 2.5–3. Parasite of *Caloptilia syringella* F. (Gracillariidae). Cocoons isolated, white. Central zone, southwest, south; Caucasus, Kazakhstan; Western Europe.....  
..... **A. graciliariae** Wilk.
- 715 (714). Ovipositor valves longer than hind tibia.
- 716 (717). Metacarpus much shorter, its length only 2 times its distance from wing apex. Ovipositor valves distinctly broadened toward apex (Fig. 254: 13). Body 3.5. East Germany. .... **A. oehlkei** Papp
- 717 (716). Metacarpus longer, not less than 3.5 times as long as its distance from wing apex. Ovipositor valves much less broadened (Fig. 249: 5).
- 718 (719). Mesonotum and apical half of 1st abdominal tergite matte. Radial vein of forewing as long as radiomedial vein. First abdominal tergite 1.6–1.7 times as long as its width at apex. Hind femora grayish brown. Body 3. Central Europe.....  
..... **A. ensiformis** Ratz.
- 719 (718). Mesonotum and apical half of 1st abdominal tergite lustrous. Radial vein of forewing usually distinctly longer than radiomedial vein. Abdominal tergite 1.7–1.8 times as long as its width at apex (Fig. 249: 3). Hind femora black. Body 2.5–3.6. Parasite of *Bucculatrix cristatella* Z. (Bucculatricidae), *Choreutis nemorana* Hb., *C. pariana* Cl. (Choreutidae), *Anarsia eleagnella* Kuzn., *A. lineatella* Z., *Pseudotelphusa proximella* Hb. (Gelechiidae), *Blastodacna atra* Hw. (Mompidae), *Agonopterix ocellana* F., *Carcina quercana* F. (Oecophoridae), *Etiella zinckenella* Tr. (Phycitidae), *Plutella maculipennis* Curt. (Plutellidae), *Acleris quercinana* Z., *Archips rosana* L., *Hedia pruniana* Hb., *Pandemis chondrillana* H.-S., *Tortrix viridana* L. (Tortricidae), *Paraswammerdamia caesiella* Hb., *P. lutarea* Hw. (Yponomeutidae) and other lepidopterans. Cocoons isolated, white. Transpalearctic. .... **A. longicauda** Wesm.

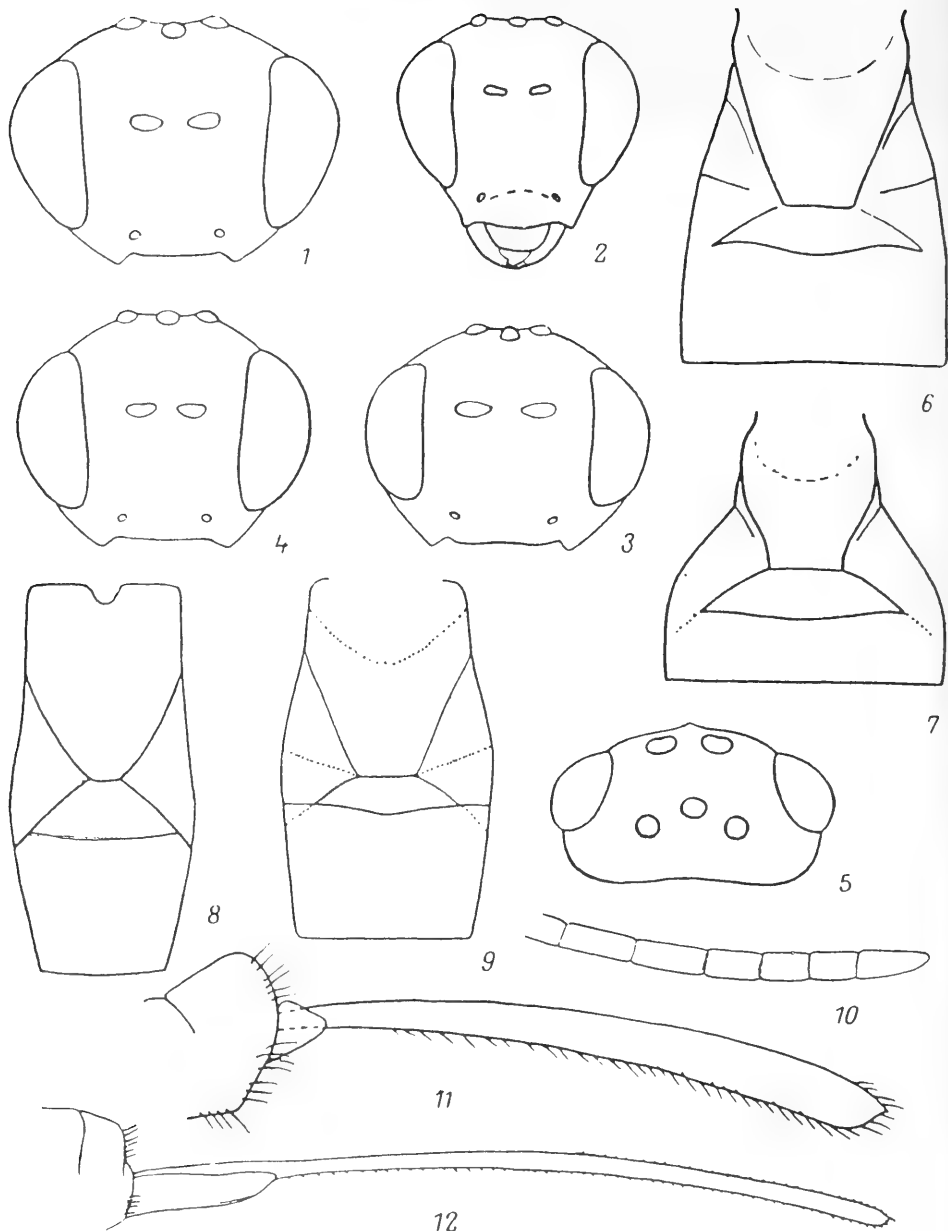
- 720 ( 13). Labio-maxillary complex produced into proboscis. Head with distinctly developed genae, linearly narrowed downward, in frontal view triangular (Fig. 256: 1, 2). Maxillary palps very highly elongate, their length approximately equal to height of head; if normally developed (*A. vipio*), then propodeum with median longitudinal ridge and large spur of hind tibiae much longer than half of 1st segment of hind tarsus. First and 2nd abdominal tergites smooth or weakly sculptured, lustrous.
- 446 721 (728). Maxillary palps highly elongate (Fig. 244: 1). Propodeum without median longitudinal ridge. Spur on hind tibiae light colored, large spur not longer than 1st segment of hind tarsus. Wings pale. First abdominal tergite not narrowed or slightly narrowed posteriorly. Mesonotum mildly punctate, lustrous.
- 722 (725). Metacarpus much longer than stigma, 5–6 times as long as its distance from wing apex. Stigma brown or dark brown, usually with small, pale spot at base. Palps very darkened. First abdominal tergite slightly narrowed toward apex (Fig. 256: 5). Ovipositor valves 1.4–1.6 times as long as hind tibia. Body black. (Group *A. longipalpis*.)
- 723 (724). Head broader, ratio of its width to length 2.4:1. Tangent to anterior margin of posterior ocelli touches posterior margin of anterior ocellus. Thorax 1.3–1.4 times as long as high. First abdominal tergite almost square, slightly longer than wide at base. Larger spur of middle tibiae slightly longer than half of 1st segment of middle tarsus. Propodeum with wrinkled, rounded depression in middle, lustrous. Body 3–4. Parasite of *Epichnopteryx pula* Esp., *Rebelia plumella* Ochs. (Psychidae). South; Caucasus, Central Asia; Western Europe. .... **A. longipalpis** Reinh. (*tadzhicus* Tel.)
- 447 724 (723). Head less broad, ratio of width to length 2:1. Tangent to anterior margin of posterior ocelli cuts posterior margin of anterior ocellus. Thorax 1.6 times as long as high. First abdominal tergite much longer than its width at base. Large spur of middle tibiae slightly shorter than half of 1st segment of middle tarsus. Body 3.6. Finland. .... **A. glaber** Papp
- 725 (722). Metacarpus shorter than stigma, as long as its distance from wing apex or slightly longer. Stigma yellow. Palps not darkened or slightly darkened only at base. First abdominal



1—*Apanteles vipio*, head; 2—4—*A. lacteus*: 2—head, 3—1st to 3rd abdominal tergites, 4—abdominal apex; 5—*A. longipalpis*, 1st to 3rd abdominal tergites; 6, 7—forewing: 6—*A. meratus*, 7—*A. vindicius*; 8—10—part of hind wing: 8—*A. merula*, 9—*A. myloenta*, 10—*A. isus*.

- tergite not narrowed posteriorly. Ovipositor valves noticeably shorter than hind tibia. Body black or reddish yellow.
- 726 (727). Thorax, abdomen and legs reddish yellow (in male, thorax and abdomen with dark pattern). Head, antennae and ovipositor valves dark colored, almost black. (cf. also couplet 540.) ..... **A. pulcher** Tel.
- 727 (726). Body black, legs largely dark colored. (cf. also couplet 541.) ..... **A. palpator** Tobias
- 728 (721). Maxillary palps short. Propodeum with median longitudinal ridge, wrinkled. Spurs of hind tibiae blackish, large spur 3/4th length of hind tarsus. Wings greatly darkened. First abdominal tergite distinctly narrowed toward posterior side. Eyes distinctly proximate on lower side (Fig. 256: 1). Basal segment of antennae almost 2 times as long as wide. Mesonotum intensely lustrous. Ovipositor valves 1/3rd length of hind tibia. Body 3–3.5. Parasite of *Scythris knochella* F. (Scythrididae). Central Europe, Turkey. (Group *A. vipio*). ..... **A. vipio** Reinh.<sup>1</sup>
- 729 ( 12). Outer margin of anal lobe of hind wing concave, always without fringe of bristles (Fig. 256: 9); if occasionally straight, then 1st abdominal tergite relatively short and wide, distinctly narrowing from middle to apex (Fig. 257: 7); middle field of 2nd abdominal tergite trapezoid. Stigma yellow with darker margin (in color, contrasts with dark metacarpus). Propodeum usually smooth, lustrous, often with median longitudinal ridge.
- 730 (731). First abdominal tergite almost parallel-sided (Fig. 256: 3). Genae very distinctly developed, vertically produced downward (Fig. 256: 2). Median longitudinal ridge on propodeum absent. Outer margin of anal lobe of hind wing distinctly concave. Mesonotum quite coarsely punctate, slightly lustrous. Stigma pale yellow, semitransparent, with darker margin. Metacarpus brown, 2.5–3 times as long as its distance from wing apex. Propodeum punctate in anterior part, quite dull, smooth in posterior part, more lustrous, somewhat wrinkled in middle part, often with anteriorly open areola. Ovipositor valves 1.5 times as long as hind tibia (Fig. 256: 4). Parasite of *Dioryctria*

<sup>1</sup> *A. rhamphus* Marsh. (Papp, 1981) known by the male from Spain, also belongs to this group. It is distinguished from *A. vipio* primarily by smooth propodeum without median longitudinal ridge and short 1st abdominal tergite.



1-4—head, frontal view: 1—*Apeneles myeloenta*, 2—*A. lacteoides*, 3—*A. aeolus*, 4—*A. meraus*; 5—*A. meraus*, head, dorsal view; 6-9—1st to 3rd abdominal tergites: 6—*A. aeolus*, 7—*A. argante*, 8—*A. masallensis*, 9—*A. meratus*; 10—*A. lacteoides*, apical part of antenna; 11, 12—abdominal apex: 11—*A. vindicius*; 12—*A. meraus*.

- abietella* F., *Homoeosoma nebulellum* Hb., *H. nimbellum* Dup. (Phycitidae). Southwest, south, southeast; Caucasus, Kazakhstan, Central Asia; Western Europe. (Group *A. lacteus*). . . . . **A. lacteus** Nees
- 731 (730). First abdominal tergite distinctly narrowed posteriorly (Fig. 257: 7). Genae slightly developed and if sometimes quite long, then directed obliquely downward (Fig. 257: 2). Propodeum usually with median longitudinal ridge. Outer margin of anal lobe of hind wing not always distinctly concave, may be slightly concave or straight. (Group *A. merula*.)
- 732 (737). Stigma brown, sometimes with pale spot at base. Propodeum always with median longitudinal ridge.
- 733 (734). Stigma entirely brown. Propodeum quite coarsely wrinkled in anterior half. Metacarpus approximately 4 times as long as its distance from wing apex (Fig. 256: 7). Ovipositor valves slightly shorter than hind tibia, slightly curved downward, gradually widening toward apex (Fig. 257: 11). Body 3.2–3.6. Georgia, Dagestan; Italy, Bulgaria, Hungary. . . . . **A. vindicius** Nixon
- 734 (733). Stigma with small pale spot at base. Propodeum weakly sculptured in anterior part. Metacarpus less than 4 times as long as its distance from wing apex.
- 735 (736). Metacarpus 2.5 times as long as its distance from wing apex. Sixteenth and 17th segments of antennae square or hardly elongate. Nervellus forming straight angle with anal vein of hind wing (Fig. 256: 8). Body 3–3.2. Crimea; Western Europe. . . . . **A. merula** Reinh.
- 736 (735). Metacarpus slightly more than 3 times as long as its distance from wing apex. Sixteenth and 17th segments of antennae distinctly elongate, their length exceeds width by 1/3. Body 3. Parasite of *Lobesia botrana* Den. and Schiff. (Tortricidae). Romania, Turkey, Jordan. . . . . **A. meruloides** Nixon
- 737 (732). Stigma yellow or brownish yellow, with somewhat darkened margin. Median longitudinal ridge on propodeum may be absent.
- 738 (755). Propodeum without median longitudinal ridge. Outer margin of anal lobe of hind wing usually straight or slightly concave.
- 739 (742). Metacarpus very short, distinctly shorter than its distance from wing apex.

- 448 740 (741). Mesonotum matte. Preapical segment of antennae square or slightly elongate. (cf. also couplet 410.) . . . . **A. pilosus** Tel.
- 741 (740). Mesonotum intensely lustrous. Preapical segment of antennae 1.4 times as long as wide. (cf. also couplet 411.) . . . . . **A. nagy** Papp
- 742 (739). Metacarpus distinctly longer than its distance from wing apex.
- 743 (748). Metacarpus less than 2 times as long as its distance from wing apex.
- 744 (745). Ovipositor valves extremely short, their widened part half as long as hind tibia. (cf. also couplet 413.) . . . . **A. frater** Tobias
- 745 (744). Ovipositor valves approximately as long as hind tibia. Head behind eyes quite abruptly roundly narrowed. Antennae shorter than body, preapical segment almost square. Ocelli in a low triangle; tangent to anterior margin of hind ocelli cuts posterior margin of anterior ocellus. Mesonotum densely and softly punctate, matte. Propodeum somewhat densely punctate. Hind femora and hind tibiae dark brown. Hind tibiae at base up to 1/4th length yellow.
- 449 746 (747). Lateral angles of middle field of 2nd abdominal tergite extremely acute, elongate (cf. Fig. 257: 6). Apical part of 1st abdominal tergite somewhat more densely sculptured, matte. Body 2.5. (cf. also couplet 415.) . . . . . **A. subcamilla** Tobias
- 747 (746). Lateral angles of middle field of 2nd abdominal tergite much less acute, short (cf. Fig. 257: 8). Apical part of 1st abdominal tergite less densely sculptured, slightly lustrous. Body 2.5. (cf. also couplet 416.) Armenia. . . . . **A. verae** Tobias
- 748 (743). Metacarpus longer, not less than 2.5 times as long as its distance from wing apex.
- 749 (752). Ovipositor valves distinctly longer than hind tibia.
- 750 (751). Inner spur of hind tibiae half as long as 1st segment of hind tarsus. Nervellus straight. Ovipositor valves 1.5 times as long as hind tibia. Mesonotum softly and quite densely punctate, slightly lustrous. Scutellum flattened; metacarpus 5–6 times as long as its distance from wing apex. Body 3–3.5. Parasite of *Grapholitha funebrana* Tr. (Tortricidae). Hungary, Austria, Bulgaria. (cf. also couplet 447.) . . . . . **A. laspeyresiella** Papp
- 751 (750). Inner spur of hind tibiae less than half as long as 1st segment of hind tarsus. Nervellus arcuate. Ovipositor valves shorter. (cf. also couplet 448.) . . . . . **A. nephus** Papp

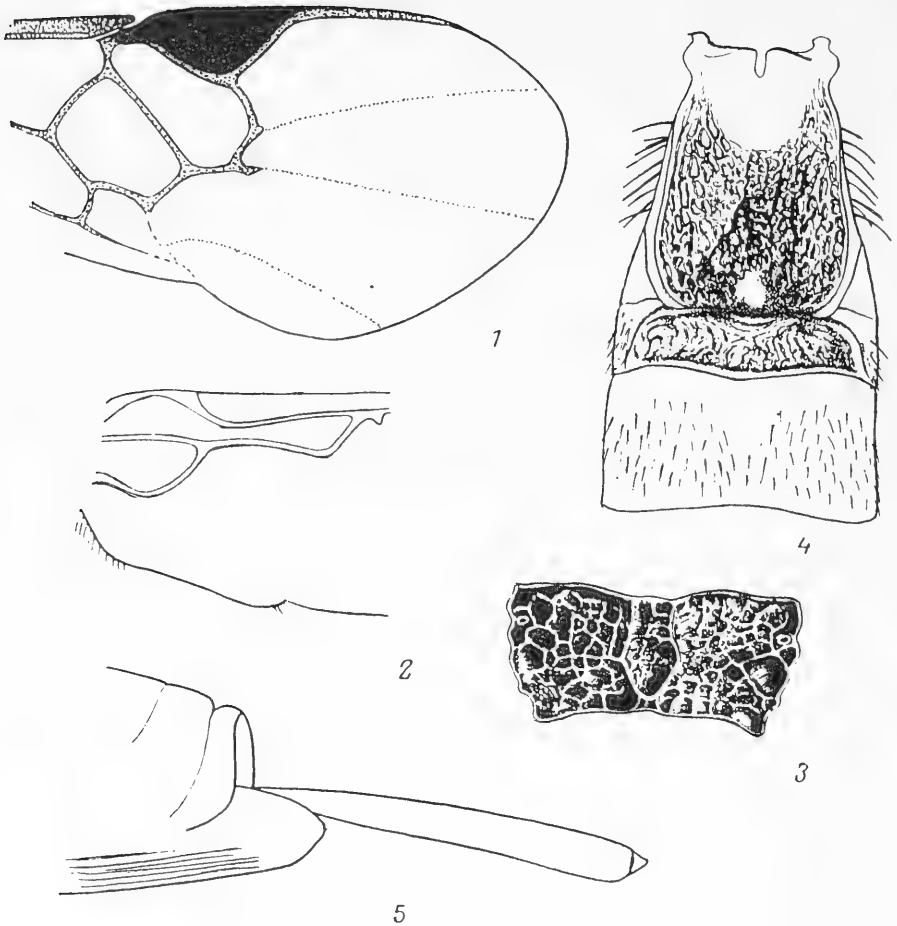


- 752 (749). Ovipositor valves not longer than hind tibia. Mesonotum brilliantly lustrous. Scutellum quite flattened.
- 753 (754). Metacarpus longer, approximately 5 times as long as its distance from wing apex. First abdominal tergite (Fig. 257: 7) almost smooth in apical part. Body 3—3.3. Finland. (cf. also couplet 452.) ..... **A. argante** Nixon
- 754 (753). Metacarpus shorter, approximately 3 times as long as its distance from wing apex. First abdominal tergite mildly sculptured in apical part. Figs. 238: 1; 239: 2, 4. Body 2.9—3. Kazakhstan; Hungary. (cf. also couplet 454.) .....  
..... **A. albinervis** Tobias
- 755 (738). Propodeum with median longitudinal ridge. Outer margin of anal lobe of hind wing usually distinctly concave (Fig. 256: 9, 10).
- 756 (759). Ovipositor valves not less than 2 times as long as hind tibia (Fig. 257: 12).
- 757 (758). Mesonotum densely and quite coarsely punctate, matte. Propodeum largely sculptured, less lustrous. Head frontally distinctly broad (Fig. 257: 1). Face with faint satiny sheen. Metacarpus not less than 3 times as long as its distance from wing apex. Nervellus arcuate (Fig. 256: 9). Body 3.8—4. Parasite of *Ectomyelois ceratoniae* Z. (Phycitidae). Cyprus, Turkey. .... **A. myeloenta** Wilk.
- 758 (757). Mesonotum more softly punctate, lustrous. Propodeum largely smooth, shining. Head frontally broad (Fig. 257: 4). Face more lustrous. Metacarpus approximately 2.5 times as long as its distance from wing apex (Fig. 256: 6). Ocelli in low triangle (Fig. 257: 5). Body 3—3.5. South. ....  
..... **A. meratus** Kolenko
- 759 (756). Ovipositor valves much less than 2 times as long as hind tibia.
- 760 (767). Head linearly narrowed downward, triangular (Fig. 257: 2).
- 761 (764). Ovipositor valves 1.5—1.8 times as long as hind tibia. Metacarpus 2—2.5 times as long as its distance from wing apex. Mesonotum softly punctate, lustrous. Face slightly punctate, lustrous. First abdominal tergite almost smooth.
- 762 (763). Body large, 3—4.5. Propodeum with sharp median longitudinal ridge. First abdominal tergite less narrowed toward apex, its width at apex 10/19th to 10/23 its length. Segments in apical part of antennae long (Fig. 257: 10). Parasite of *Homoeosoma nebulellum* Hb. (Phycitidae).

- Southwest, south, southeast; Caucasus, Central Asia; Western Europe. ....
- ..... **A. lacteoides** Nixon (*memorabilis* Alexeev)
- 763 (762). Body smaller, 2.7. Propodeum with slighter median longitudinal ridge. First abdominal tergite distinctly narrowed toward apex, its width at apex 2/5th its length (Fig. 257: 8). Azerbaidzhan. .... **A. masallensis** Abdinb.
- 764 (761). Ovipositor valves not longer or slightly longer than hind tibia. Metacarpus approximately 1.5 times as long as its distance from wing apex.
- 765 (766). Ovipositor valves slightly longer than hind tibia. Mesonotum lustrous. Body 3.2. Kazakhstan. ....
- ..... **A. rudolphae** Kotenko
- 766 (765). Ovipositor valves slightly shorter than hind tibia. Mesonotum dull. Body 3.3. Uzbekistan. ....
- ..... **A. fedtschenkoi** Kotenko
- 767 (760). Head roundly narrowed downward (Fig. 257: 3). Mesonotum and face softly sculptured, lustrous.
- 768 (769). Metacarpus shorter than stigma, slightly longer than its distance from wing apex. Propodeum with weaker median longitudinal ridge. First abdominal tergite smooth, lustrous. Body 2.5–2.6. Turkmenia, Tadzhikistan. ....
- ..... **A. turanicus** Tel. (*subtilis* Alexeev)
- 769 (768). Metacarpus not shorter than stigma, 2.5–3 times as long as its distance from wing apex. Propodeum with sharper median longitudinal ridge. First abdominal tergite in apical half somewhat sculptured.
- 770 (771). Metacarpus 3 times as long as its distance from wing apex. Ovipositor valves slightly longer than hind tibia. Fifteenth segment of antennae approximately 1.5 times as long as wide. First to 3rd abdominal tergite as in Fig. 257: 6. Body 3.8–4. Parasite of *Metriostola betulae* Goeze (Phycitidae).  
450 C cocoons isolated, white. Center, south; Armenia; Central Europe. .... **A. aeolus** Nixon
- 771 (770). Metacarpus up to 2.5 times as long as its distance from wing apex. Ovipositor valves approximately 1.3 times as long as hind tibia. Fifteenth segment of antennae slightly longer than wide. Body 3–3.5. Parasite of *Etiella zinckenella* Tr. (Phycitidae). South; Armenia, Uzbekistan; Hungary. .... **A. isus** Nixon
- 772 ( 1). Propodeum with sharply striate areola and with distinct transverse ridge (Fig. 261: 2). If transverse ridge not

developed, then outer margin of anal lobe of hind wing, as a rule, concave or straight, without fringe of bristles (Fig. 261: 6) and propodeum with rare exception, coarsely wrinkled.

- 773 (776). Metacarpus short (Fig. 258: 1), not more than 2 times as long as its distance from wing apex. Stigma always dark brown. Antennae shorter than body. Wings darkened. Outer margin of anal lobe of hind wing without fringe of bristles, slightly concave or straight (in males of *A. obscurus*, often slightly bulged, with hardly noticeable bristles). Propodeum (Fig. 258: 3) coarsely wrinkled, its areola with smoothed sculpture. Inner spur of hind tibiae longer than half of 1st segment of hind tarsus. First abdominal tergite with coarse sculpture and quite distinctly rounded posterolateral angles (Fig. 258: 4). Ovipositor valves (Fig. 258: 5) approximately as long as hind tibia. (Group *A. obscurus*.)
- 451 774 (775). Mesonotum, except more densely punctate matte lines of notaulices, brilliantly lustrous (hardly distinguished from scutellum with respect to sheen), with coarser punctation. Body 3—4.5. Parasite of *Eurrhyncha terrealis* Tr. (Pyralidae), *Udea ferrugalis* Hb., *Ebulea crocealis* Hb. (Pyraustidae), *Clepsis strigana* Hb. (Tortricidae). Cocoons white. Transpalearctic . . . . . **A. obscurus** Nees (*arenarius* Hal.)
- 775 (774). Mesonotum matte or slightly lustrous (much duller than scutellum), with more uniform and somewhat less coarse punctation. Body 3—3.5. Parasite of *Salebria semirubella* Scop. (Phycitidae), *Argyroploce arbutella* L. (Tortricidae). Central zone; Pacific Coastal Region; Western Europe . . . . . **A. lenea** Nixon
- 776 (773). Metacarpus longer, not less than 2.5 times as long as its distance from wing apex (Fig. 259: 1); if sometimes short (*A. audens*), then stigma pale yellow or yellow and tegulae light colored.
- 777 (812). Outer margin of anal lobe of hind wing distinctly concave, rarely straight, without fringe of bristles (Fig. 260: 8); if (very rarely) slightly bulged, then fringe of bristles absent or bristles sparse and short and hardly distinguishable. Propodeum coarsely sculptured, often without transverse ridge. (Group *A. ater*.)
- 778 (793). Stigma light colored, pale yellow or yellow, usually with darker margin.



450

Fig. 258. Microgasterinae (from Wilkinson and original).

1—5—*Apanteles obscurus*: 1—part of forewing, 2—part of hind wing, 3—propodeum, 4—1st to 3rd abdominal tergites, 5—abdominal apex.

779 (782). Ovipositor valves short, not longer than half of hind tibia. Tegulae yellow or yellowish brown.

780 (781). First abdominal tergite distinctly narrowed from middle to apex (Fig. 259: 5). Mesonotum matte. Metacarpus more than 3 times as long as its distance from wing apex (Fig. 259: 4). Outer margin of anal lobe of hind wing

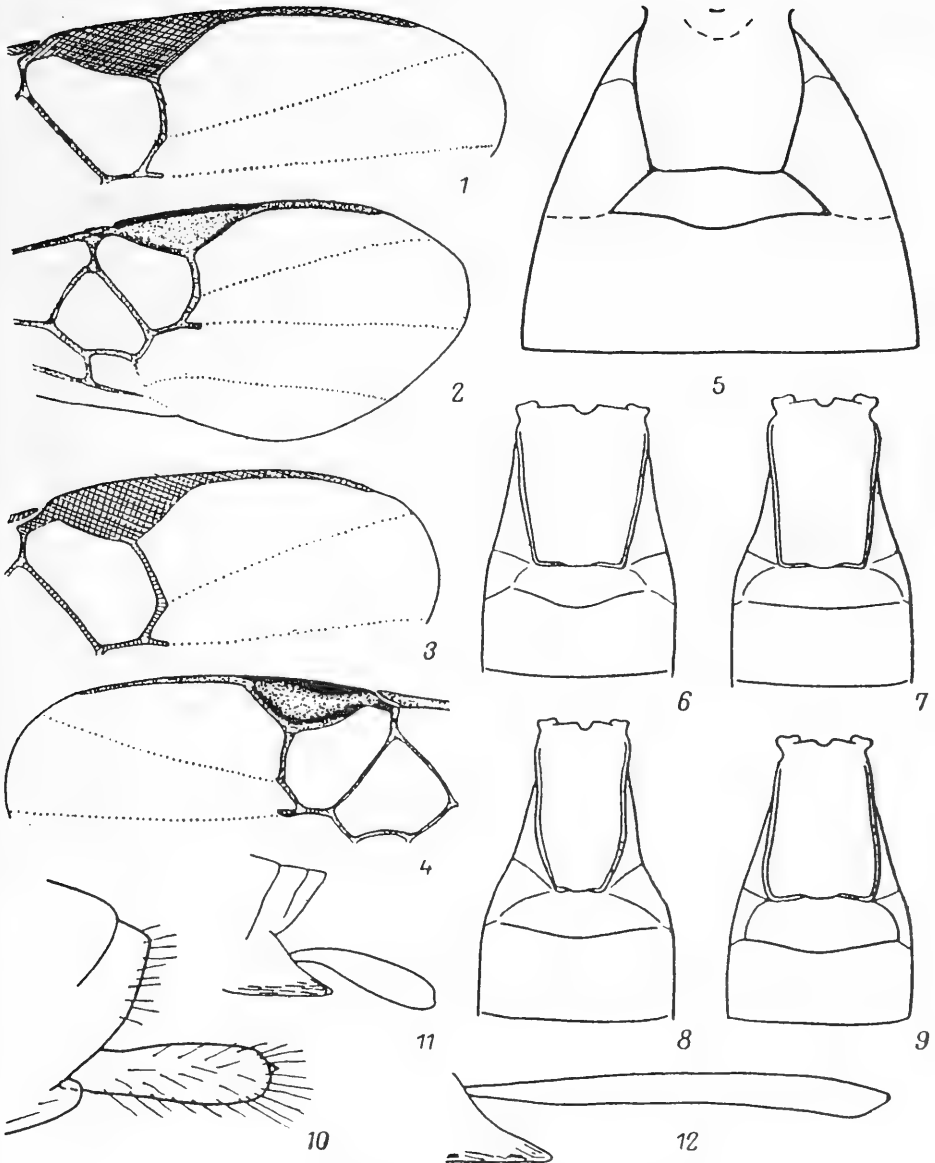


Fig. 259. Microgasterinae (from Papp and original).

1-4—part of forewing: 1—*Apanteles lectus*, 2—*A. audens*, 3—*A. galleriae*, 4—*A. evanidus*; 5-9—1st to 3rd abdominal tergites: 5—*A. evanidus*, 6—*A. miramis*, 7—*A. peridoneus*, 8—*A. galleriae*, 9—*A. contaminatus*; 10-12—abdominal apex: 10—*A. evanidus*, 11—*A. contaminatus*, 12—*A. miramis*.

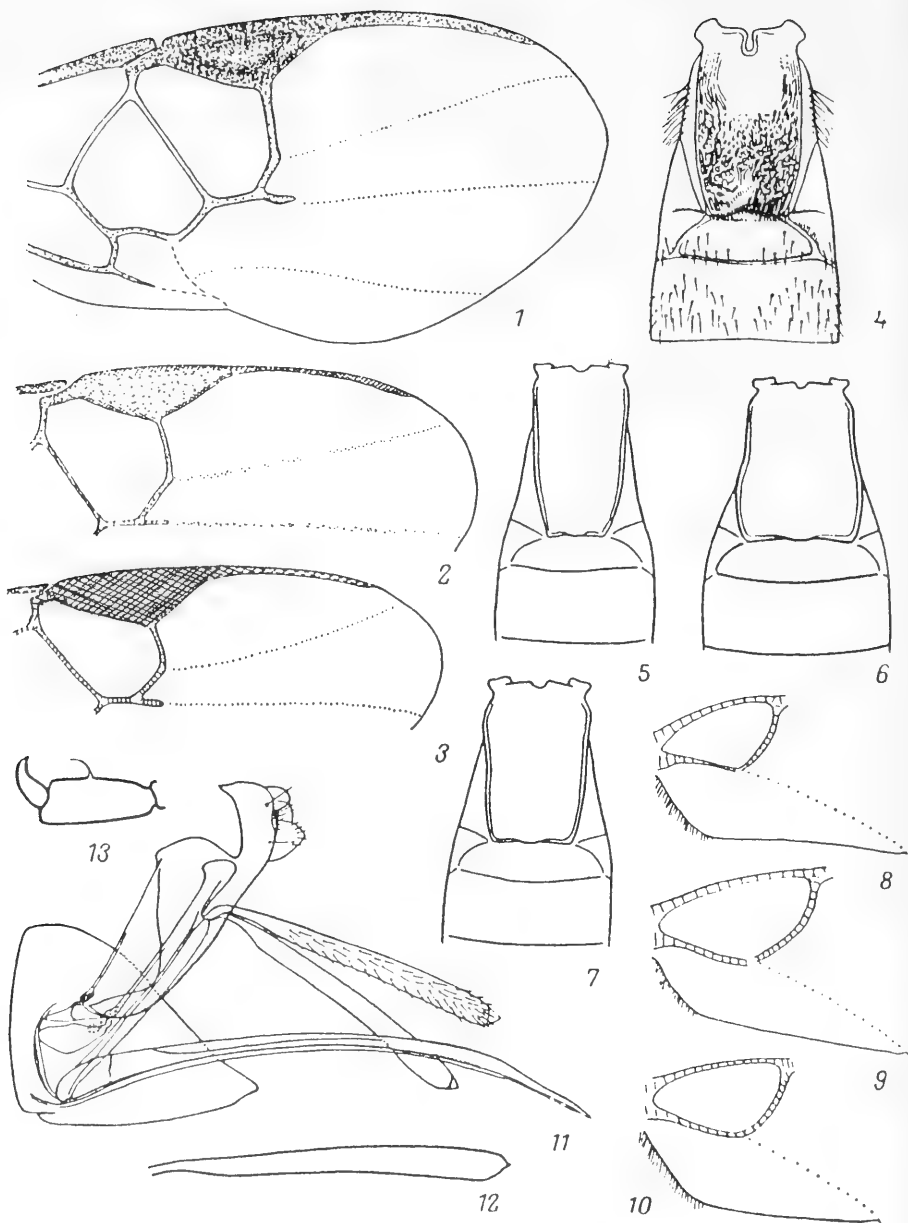


Fig. 260. Microgasterinae (from Papp, Wilkinson and original).

1-3—part of forewing: 1—*Apanteles ater*, 2—*A. xanthostigma*, 3—*A. brunnistigma*;  
 4-7—1st to 3rd abdominal tergites: 4—*A. ater*, 5—*A. kubensis*, 6—*A. brunnistigma*.  
 7—*A. xanthostigma*; 8-10—part of hindwing: 8—*A. kubensis*, 9—*A. xanthostigma*,  
 10—*A. brunnistigma*; 11—*A. ater*, 6th abdominal sternite and ovipositor; 12—*A. brunnistigma*,  
 ovipositor valve; 13—*A. ater*, apical segment of foretarsus.

- concave, without fringe of bristles. Ovipositor valves less broadened (Fig. 259: 10). Body 2.8–3. Southern Ukraine; Sweden, Hungary .... **A. evanidus** Papp (*calpurnia* Nixon)
- 781 (780). First abdominal tergite broadening from middle to apex (Fig. 259: 9). Mesonotum noticeably lustrous. Metacarpus 3 times as long as its distance from wing apex. Outer margin of anal lobe of hind wing slightly bulged, with fringe of bristles. Ovipositor valves broader (Fig. 259: 11). Body 3–3.3. Parasite of moths of family Nepticulidae. Ireland, England, Holland ..... **A. contaminatus** Hal.
- 782 (779). Ovipositor valves distinctly longer than half of hind tibia.
- 783 (784). Metacarpus shorter, 2–2.5 times as long as its distance from wing apex (Fig. 259: 2). Tegulae yellow. Antennae slightly shorter than body, preapical segment longer than wide. Mesonotum densely punctate with satiny sheen, sometimes almost matte. Propodeum without transverse ridge, largely smooth, lustrous, areola open, delicately wrinkled. First abdominal tergite narrowed toward apex, weakly sculptured. Ovipositor valves slightly shorter than hind tibia. Body 2.2–2.5. Georgia .... **A. audens** Kolenko
- 784 (783). Metacarpus longer, not less than 3 times as long as its distance from wing apex (Fig. 260: 2). Tegulae black or brown, if sometimes brownish yellow then propodeum largely wrinkled, matte and outer margin of anal lobe of hind wing slightly bulged.
- 785 (786). Tegulae brownish yellow. Outer margin of anal lobe of hind wing slightly bulged, almost straight, with slightly noticeable fringe of short bristles (Fig. 261: 13). Preapical segment of antennae 2 times as long as wide. Mesonotum densely punctate with satiny sheen. Scutellum with relatively sparse punctation, lustrous. Areola of propodeum with smooth sculpture. First and 2nd abdominal tergites (Fig. 259: 7) sculptured, with faint sheen. Body 3.7. Hungary. (cf. also couplet 804.) ..... **A. peridoneus** Papp
- 786 (785). Tegulae black or dark brown. Outer margin of anal lobe of hind wing concave or straight, without fringe of bristles. Preapical segment of antennae not more than 1.5 times as long as wide.
- 787 (788). Ovipositor valves (Fig. 259: 12) 1/3rd as long as hind tibia. Mesonotum lustrous. First abdominal tergite (Fig. 259: 6) less than 1.5 times as long as its maximum width. Body 3.2–3.3. England ..... **A. miramis** Nixon

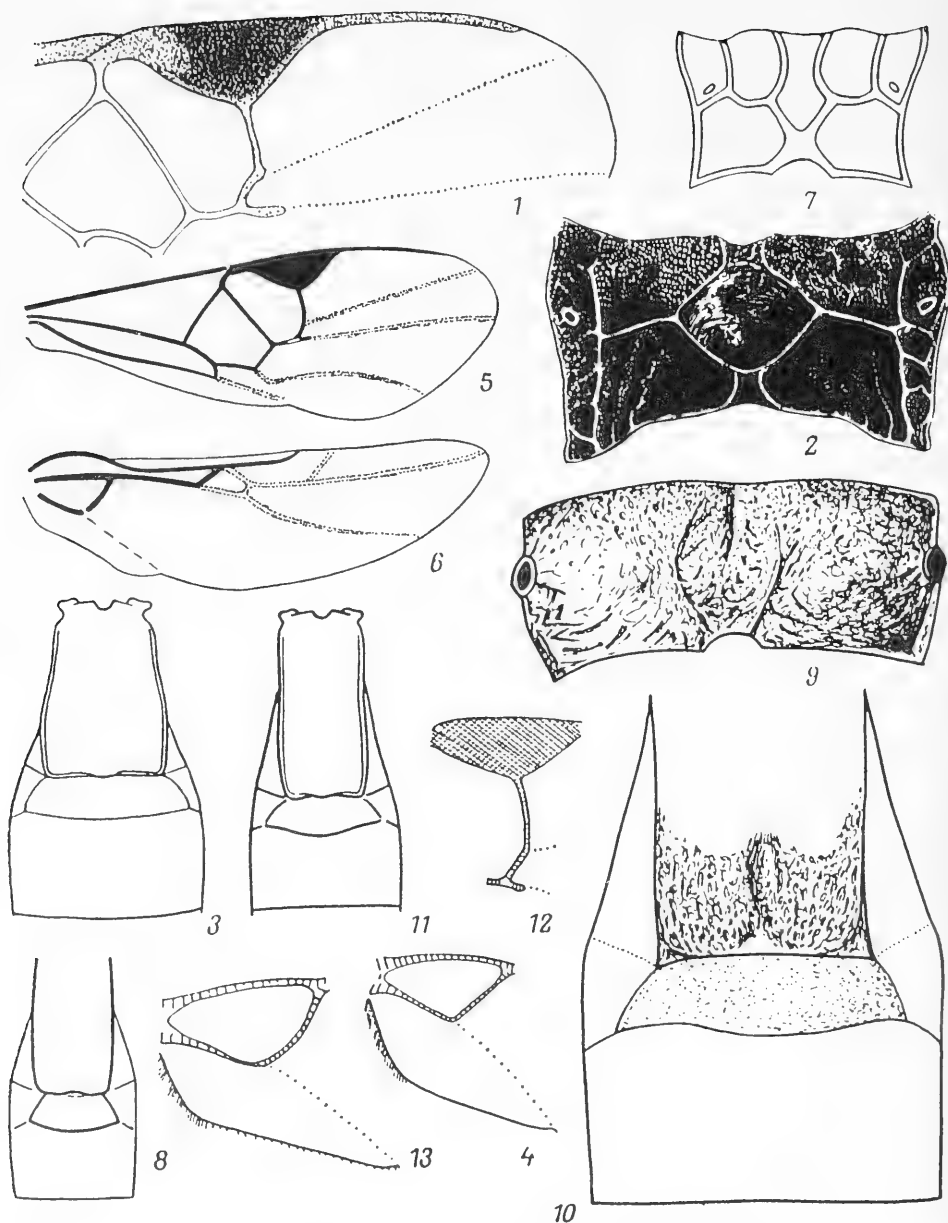


Fig. 261. Microgasterinae (from Tobias, Balevskii, Papp and original).

1-4—*Apanteles carpatus*: 1—part of forewing, 2—propodeum, 3—1st to 3rd abdominal tergites, 4—part of hind wing; 5-8—*A. bulgaricus*: 5—forewing, 6—hind wing, 7—propodeum, 8—1st to 3rd abdominal tergites; 9, 10—*A. lectus*: 9—propodeum, 10—1st to 3rd abdominal tergites; 11, 12—*A. hemara*: 11—1st to 3rd abdominal tergites; 12—part of forewing; 13—*A. peridoneus*, part of hind wing.



- 788 (787). Ovipositor valves not longer or slightly (less than 1/3) longer than hind tibia. Mesonotum matte or with satiny sheen. First abdominal tergite not less than 1.5 times as long as its maximum width.
- 789 (792). Areola of propodeum smooth or slightly wrinkled, somewhat lustrous, not as deep longitudinal groove. Propodeum densely wrinkled in anterior half, matte, almost smooth in posterior half, lustrous, sometimes with faint transverse ridge. Outer margin of anal lobe of hind wing usually distinctly concave. Antennae relatively shorter and thicker. First abdominal tergite more distinctly narrowed toward apex.
- 790 (791). Ovipositor valves (Fig. 260: 11) as long as hind tibia or slightly shorter. Nervellus almost straight. Apical segment of foretarsi thickened with thin, curved bristle (Fig. 260: 13). Propodeum often with weak transverse ridge, its areola as in Fig. 260: 1. Body 2.2–2.7. Parasite of *Operophtera brumata* L. (Geometridae), *Archips rosana* L., *A. crataegana* Hb., *A. xylosteana* L., *A. podana* Scop., *Laspeyresia pomonella* L., *Grapholitha funebrana* Tr., *G. janthinan* Dup., *Pandemis heparana* Den. and Schiff., *Spilonota ocellana* F. (Tortricidae) and other lepidopterans. Cocoons white, in clusters. Transpalearctic ..... **A. ater** Ratz.
- 791 (790). Ovipositor valves slightly longer than hind tibia. Nervellus curved (Fig. 260: 8). Apical segment of foretarsi not thickened, without curved bristle. Propodeum without transverse ridge, its areola closed from front. Apical segment of abdomen distinctly compressed (abdominal tergites, starting from 4th curved along median line to form an acute angle). Mesonotum matte or with satiny sheen. Second abdominal tergite (Fig. 260: 5) somewhat sculptured. Body 2.5–3. Southwest, south; Caucasus; Hungary ..... **A. kubensis** Abdinb.
- 452 792 (789). Areola of propodeum wrinkled, dull, usually as deep longitudinal groove. Propodeum uniformly sculptured, somewhat lustrous or matte, without transverse ridge. Outer margin of anal lobe of hind wing straight (Fig. 260: 9). Antennae somewhat longer and thinner. First abdominal tergite (Fig. 260: 7) slightly narrowed toward apex. Fig. 260: 2. Body 2–3. Parasite of *Parornix betulae* Stt. (Gracillariidae), *Tortrix viridana* L., *Archips rosana* L.,

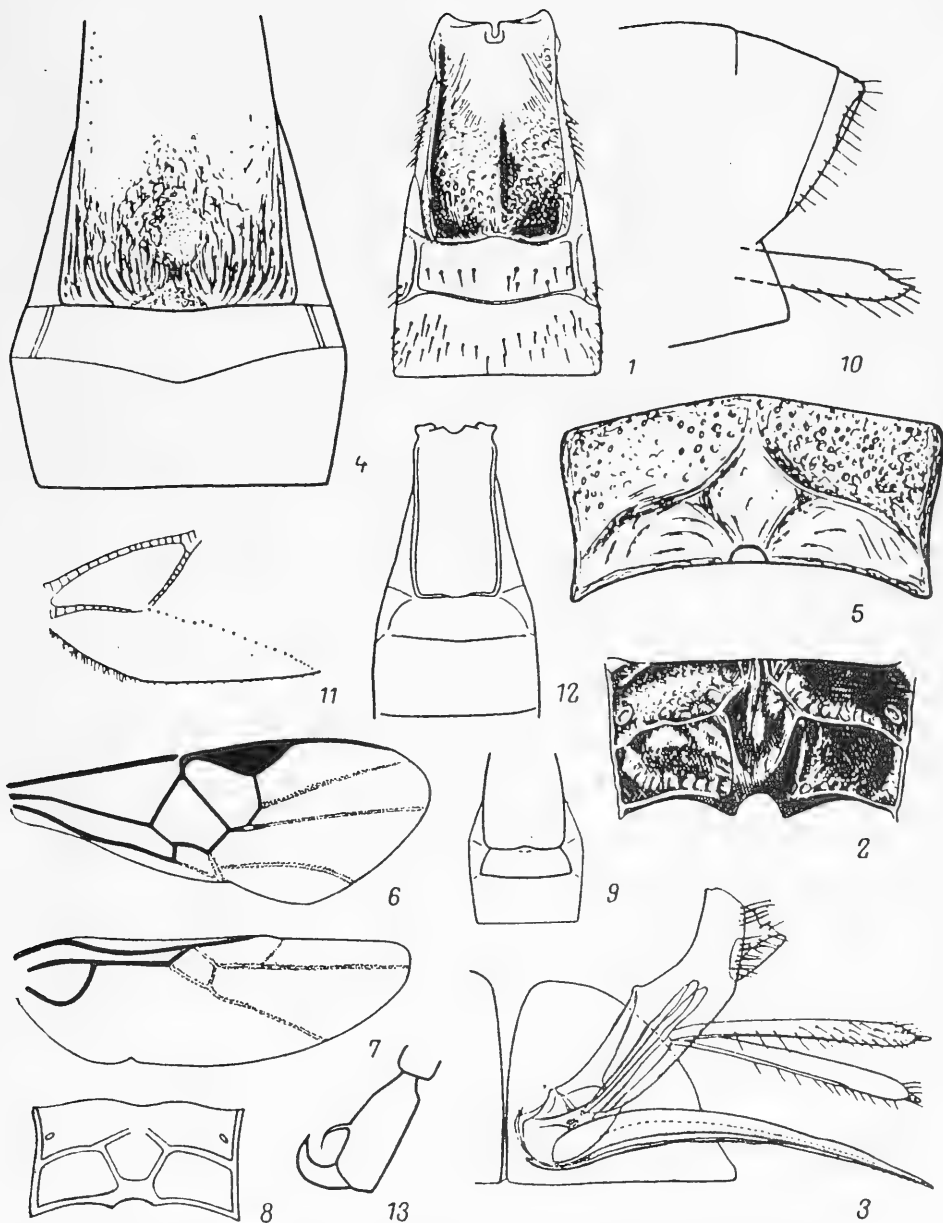
*Gypsonoma minutana* Hb., *Hedya pruniana* Hb., *Ancylis achatana* Den. and Schiff. (Tortricidae), *Paraswammerdamia lutarea* Hw., *P. caesiella* Hb. (Yponomeutidae) and other lepidopterans. Cocoons white, isolated. Transpalearctic. (cf. also couplet 584.) .....

- ..... **A. xanthostigma** Hal.
- 793 (778). Stigma brown or dark brown, sometimes with pale spot at base.
- 794 (797). Scutellum and outside of hind coxae densely rugose-punctate, matte. Metacarpus approximately 4 times as long as its distance from wing apex. Radial and radio-medial veins fusing with each other, form quite smoothly curved line (Fig. 261: 5, 12). Mesonotum densely rugose-punctate, matte. Propodeum with distinct transverse ridge. Basal half of hind tibiae yellowish. First abdominal tergite elongate, not less than 2 times as long as its width at apex (Fig. 261: 8, 11).
- 454 795 (796). Eyes noticeably proximate on lower side. Antennae not longer than body. Ovipositor valves slightly longer than hind tibia. Body 3–3.5. Parasite of caterpillars of family Pyralidae. Italy, Cyprus, ?Bulgaria<sup>1</sup>, Africa, India, Australia .....
- ..... **A. hemara** Nixon
- 796 (795). Eyes not proximate on lower side. Antennae longer than body. Ovipositor valves slightly shorter than hind tibia. Areola of propodeum elongate, open anteriorly (Fig. 261: 7). First abdominal tergite (Fig. 261: 8) slightly narrowed toward base. Body 2.6–3. Bulgaria .....
- ..... **A. bulgaricus** Balevski and Tobias
- 455 797 (794). Scutellum completely smooth or with sparse punctation, lustrous; outer side of hind coxae smooth or punctate, somewhat lustrous.
- 798 (801). First abdominal tergite quite distinctly narrowed in apical half (Fig. 259: 8). Stigma broad (Fig. 259: 3), often with small pale spot at base. Hind femora dark brown or reddish gray-brown; hind tibiae reddish brown, with lighter, often yellowish base, usually at apex slightly darkened.
- 799 (800). Middle field of 2nd abdominal tergite wider (Fig. 259: 8). Preapical segment of antennae square. Ovipositor valves

<sup>1</sup>The specimen preserved in the Zoological Institute of the Academy of Sciences of the USSR, from Bulgaria was identified as *A. hemara* Nixon by E. Papp, but actually it belongs to *A. bulgaricus* Balevski and Tobias.

- broader (in apical part not narrower than basal segment of hind tarsus), approximately as long as hind tibia. Mesonotum more coarsely punctate, with slight luster, almost matte. Body 2.5–3. Parasite of *Galleria mellonella* L. (Galleriidae). Ciscaucasus, Armenia; France, Hungary, India, Mauritius, USA, Argentina .....  
 ..... **A. galleriae** Wilk.
- 800 (799). Middle field of 2nd abdominal tergite less wide. Preapical segment of antennae noticeably longer than wide. Ovipositor valves relatively narrower (slightly narrower than basal segment of hind tarsus), slightly longer than hind tibia. Mesonotum softly punctate, lustrous. Body 2.5–2.6. Caucasus (Azerbaijan) .....  
 ..... **A. samedovi** Abdinb. (*lencoranus* Abdinb.)
- 801 (798). First abdominal tergite not narrowed in apical half (Figs. 260: 6; 261: 3); if noticeably narrowed, then stigma not wide.
- 802 (805). Tegulae yellow or brownish yellow.
- 803 (804). Antennae much shorter than body, preapical segment almost square. Stigma wide, usually with pale spot at base (Fig. 261: 1). Nervellus straight or almost straight (Fig. 261: 4). Propodeum smooth in posterior half, lustrous, areola wide (Fig. 261: 2). Hind femora yellowish or reddish brown, occasionally black. Ovipositor valves as long as hind tibia or slightly longer. Body 2.5–3. Parasite of *Tineola biselliella* Hum., *Niditinea fuscipunctella* Hw. (Tineidae), *Grapholitha molesta* Busck., *Sparganothis pilleriana* Den. and Schiff. (Tortricidae) and other lepidopterans, often found in domestic premises and storehouses. Cosmopolitan species. (cf. also couplet 820.) .....  
 ..... **A. carpatius** Say (*fuscicornis* Cam., *hawaiiensis* Ashm., *igae* Wat., *sarcitorius* Tel., *ultericus* Tel.)
- 804 (803). Antennae as long as body, preapical segment 2 times as long as wide. Stigma not wide, without pale spot at base; nervellus arcuate (Fig. 261: 13). Propodeum, except areola, densely wrinkled, matte; areola longer than wide. Hind femora black with brownish yellow apex. (cf. also couplet 785.) ..... **A. peridoneus** Papp
- 805 (802). Tegulae black or dark grayish brown.
- 806 (807). First abdominal tergite narrower and longer (Fig. 260: 4), 2 times as long as wide. Ocelli in narrower triangle. (cf. also couplet 790.) ..... **A. ater** Ratz.

- 807 (806). First abdominal tergite shorter and wider, 1.5 times as long as wide. Ocelli in a wider triangle.
- 808 (811). Mesonotum matte or dimly lustrous, luster in region of middle line much fainter than on scutellum. Frons behind antennal sockets usually with delicate transverse wrinkles, slightly lustrous, often dull.
- 809 (810). Ovipositor valves (Fig. 260: 12) as long as hind tibia or slightly longer, narrower. Nervellus less arcuate (Fig. 260: 10); metacarpus not less than 4 times as long as its distance from wing apex (Fig. 260: 3). Coloration of hind tibiae varies from reddish yellow with darkened apex to almost black. Body 2.5–3. Parasite of *Agonopterix ultimella* Stt. (Oecophoridae), *Archips rosana* L., *Aphelia viburnana* Den. and Schiff., *Eucosma catoprana* Rbl., *Phalonidia vectisana* Westw. and Humphrey (Tortricidae). Central belt; Caucasus, Western Siberia; England, Hungary, Italy, Bulgaria . . . . .  
 . . . . . **A. brunnistigma** Abdinb. (*sotades* Nixon)
- 810 (809). Ovipositor valves noticeably shorter than hind tibia, wider. Nervellus distinctly arcuate, metacarpus less than 4 times as long as its distance from wing apex. Hind tibia reddish yellow, somewhat darkened in apical half. Body 2.5–3. South . . . . . **A. horaeus** Kotenko
- 811 (808). Mesonotum somewhat lustrous, luster in region of midline not fainter or slightly fainter than on scutellum. Frons behind antennal sockets not wrinkled, lustrous. Propodeum (Fig. 261: 9) rugosepunctate, matte in anterior part, with smooth sculpture along sides of areola, somewhat lustrous. First abdominal tergite (Fig. 261: 10) softly rugose-punctate, slightly lustrous, with median longitudinal depression in posterior half. Wings as in Fig. 259: 1. Body 2.5–3.5. South; Kazakhstan; Mongolia . . . . . **A. lectus** Tobias
- 812 (777). Outer margin of anal lobe of hind wing bulged, with distinct fringe of bristles (Fig. 262: 7). Propodeum, as a rule, with clearly noticeable transverse ridge (Fig. 262: 2). First abdominal tergite usually parallel-sided or slightly widened posteriorly (Fig. 262: 1). (Group *A. ultor*.)
- 813 (824). Hind femora yellow or brownish yellow, occasionally reddish brown.
- 814 (817). Ovipositor valves much shorter than hind tibia.
- 815 (816). Sixteenth and 17th segments of antennae 1.3–1.5 times as long as wide. Propodeum with sharply developed areola



456 Fig. 262. Microgasterinae (from Wilkinson, Tobias, Balevski, Papp and original).

1-3—*Apanteles ultor*: 1—1st to 3rd abdominal tergites, 2—propodeum, 3—6th abdominal sternite and ovipositor; 4, 5—*A. pallidatus*: 4—1st to 3rd abdominal tergites, 5—propodeum; 6-10—*A. cerialis*: 6—forewing, 7—hind wing, 8—propodeum, 9—1st to 3rd abdominal tergites, 10—abdominal apex; 11, 12—*A. trachalus*: 11—part of hind wing, 12—1st to 3rd abdominal tergites; 13—*A. lacteicolor*, apical segment of foretarsus.

- 456 and transverse ridge (Fig. 262: 2). Inner spur of hind tibiae shorter than half of 1st segment of hind tarsus. Sixth abdominal sternite (Fig. 262: 3) less developed, without pointed apex. Mesonotum slightly lustrous. Stigma light brown, usually with faint, pale spot at base. Metacarpus long, almost reaching wing apex. Middle field of 2nd abdominal tergite (Fig. 262: 1) smooth. Body 2.5–2.8. Parasite of *Malacosoma neustria* L. (Lasiocampidae), *Euproctis chryorrhoea* L., *E. similis* Fuessly, *Orgyia antiqua* L. (Lymantriidae). Cocoons white. Southwest, south; Caucasus; Western Europe..... **A. ultor** Reinh.
- 816 (815). Sixteenth and 17th segments of antennae square or almost square (Fig. 252: 8). Areola on propodeum slightly developed, ridge usually absent. Inner spur of hind tibiae distinctly longer than half of 1st segment of hind tarsus. Sixth abdominal sternite distinctly developed, with acuminate apex (Fig. 247: 9). (cf. also couplet 602.)..... **A. punctiger** Wesm.
- 457 817 (814). Ovipositor valves not shorter than hind tibia. Tegulae yellow or brownish yellow.
- 818 (819). Stigma light yellow, transparent, as long as metacarpus. Preapical segment of antennae noticeably longer than wide. Ovipositor valves distinctly curved. First abdominal tergite and propodeum (Fig. 262: 4, 5) softly sculptured, lustrous. Body 2.3–2.6. Parasite of *Anarsia eleagnella* Kuzn., *A. lineatella* Z. (Gelechiidae). South (Kherson Region); Kazakhstan..... **A. pallidalatus** Tobias
- 819 (818). Stigma brown or light brown, not transparent, noticeably shorter than metacarpus (Fig. 262: 6). Preapical segment of antennae square or slightly longer than wide. Ovipositor valves almost straight.
- 820 (821). Stigma wide (Fig. 261: 1), brown, usually with pale spot at base. Second abdominal tergite densely rugose-punctate, matte or slightly lustrous. (cf. also couplet 803.)..... **A. carpatius** Say
- 821 (820). Stigma not wide, entirely light brown or with pale spot at base. Second abdominal tergite smooth or wrinkled only in posterior half, lustrous.
- 822 (823). Eyes usually narrow, noticeably narrower than temple. Large spur of hind tibiae not less than half as long as 1st segment of tarsus. Stigma without pale spot at base. Nervellus almost straight (Fig. 262: 11). Ovipositor valves

- as long as tibia. First to 3rd abdominal tergites as in Fig. 262: 12. Body 2.8–3. Parasite of *Hofmannophila pseudopretella* Stt., *Endrosis sarcitrella* L. (Oecophoridae), *Ephestia kuehniella* Z., *Plodia interpunctella* Hb. (Phycitidae). England, Hungary.....
- ..... **A. trachalus** Nixon (*sovocatus* Papp)
- 823 (822). Eyes broader than temple. Large spur of hind tibiae less than half as long as 1st segment of tarsus. Stigma with pale spot at base. Propodeum slightly sculptured in lower half, densely rugose-punctate, as also 1st abdominal tergite in upper half, slightly lustrous. Body 2.3–2.7. Parasite of *Gypsonoma minutana* Hb. (Tortricidae). Southeast; Armenia .....
- ..... **A. jaroshevskyi** Tobias
- 824 (813). Hind femora black or brown.
- 825 (834). Scutellum smooth or sparsely punctate, brilliantly lustrous.
- 826 (827). First abdominal tergite almost smooth, brilliantly lustrous. Propodeum mildly rugose-punctate in anterior half, in posterior half smooth, areola open anteriorly, transverse ridge sharply developed. Stigma brown, with pale spot at base. Ovipositor valves noticeably shorter than hind tibia. Body 2.2–2.3. Parasite of *Gypsonoma* sp. (Tortricidae). Caucasus (Armenia) .....
- ..... **A. erevanicus** Tobias
- 827 (826). First abdominal tergite wrinkled, dull or slightly lustrous.
- 828 (829). Ovipositor valves noticeably longer than hind tibia. Mesonotum densely punctate, dull; propodeum with areola open anteriorly and sharp transverse ridge, entirely faintly sculptured, lustrous. Stigma brown, paler in middle part or only at base. Apical segment of foretarsi with bristle; large spur of hind tibiae less than half as long as 1st segment of hind tarsus. First abdominal tergite less than 1.5 times as long as wide. Second abdominal tergite softly wrinkled, sometimes almost smooth. Body 2.3–2.5. Southwest; Crimea .....
- ..... **A. ultimus** Kotenko
- 829 (828). Ovipositor valves not longer than hind tibia.
- 830 (831). Second abdominal tergite (Fig. 263: 1) wrinkled, similar to posterior half of 1st tergite in sculpture. Propodeum (Fig. 263: 4) with sharply developed areola and transverse ridge, largely smooth. Stigma dark brown or brown, rarely with small pale spot at base, in male usually yellow, transparent in middle. Body 2.5–3. Parasite of *Hyphantria cunea* Drury (Arctiidae), *Malacosoma neustria* L. (Lasiocampidae), *Euproctis chrysorrhoe* L., *E. similis* Fuessly, *Lymantria*

- dispar* L., *Orgiia antiqua* L. (Lymantriidae), *Cerura vinula* L., *Exaereta ulmi* Den. and Schiff. (Notodontidae) and other lepidopterans. Cocoons white, isolated. Transpalearctic. (cf. also couplet 837.)..... **A. lacteicolor** Vier.
- 831 (830). Second abdominal tergite smooth, rarely very slightly wrinkled in posterior half.
- 832 (833). First abdominal tergite not less than 1.5 times as long as its maximum width at apex, slightly widened posteriorly (Fig. 263: 3). Ovipositor valves (Fig. 263: 9) as long as hind tibia or somewhat shorter. Stigma light brown, sometimes with faint pale spot at base, usually yellow or colorless in middle part. Propodeum in anterior half punctate, in posterior smooth, areola open anteriorly (Fig. 263: 6). Body 2–2.7. Parasite of *Coleophora serratella* L. (Coleophoridae) and other species of this genus. Cocoons white, inside cover of host. Center, southwest, south; Caucasus, Central Asia; Western Europe ..... **A. coleophorae** Wilk.
- 833 (832). First abdominal tergite 1.2–1.3 times as long as its maximum width at apex, distinctly broadened posteriorly. Ovipositor valves 8/10th length of hind tibia. Stigma brownish yellow, with pale spot at base. Preapical segment of antennae approximately 1.5 times as long as wide. Mesonotum slightly lustrous. Areola of propodeum almost smooth, lustrous. Body 2.8–3. Italy ..... **A. benevolens** Papp
- 834 (825). Scutellum densely punctate, matte or with satiny sheen, sometimes more lustrous in middle part.
- 835 (836). Ovipositor valves (Fig. 263: 8) much longer than hind tibia. Scutellum flattened. Areola of propodeum usually completely closed, longitudinal ridge anterior to it (Fig. 263: 5). Stigma yellowish brown, usually almost colorless in middle.
- 458 Apical part of foretarsi without bristle. Second abdominal tergite (Fig. 263: 2) sculptured. Mesonotum matte. Body 2.5–3. Parasite of *Anarsia lineatella* Z. (Gelechiidae), *Grapholitha molesta* Busck (Tortricidae). Cocoons white, extremely thin. Southwest, south; Caucasus; Western Europe..... **A. anarsiae** Faure and Alabouvette
- 836 (835). Ovipositor valves shorter than hind tibia. Scutellum not flattened, areola of propodeum anteriorly open, longitudinal ridge anterior to it absent. Stigma brown or dark brown. Apical segment of foretarsi with bristle (Fig. 262: 13).



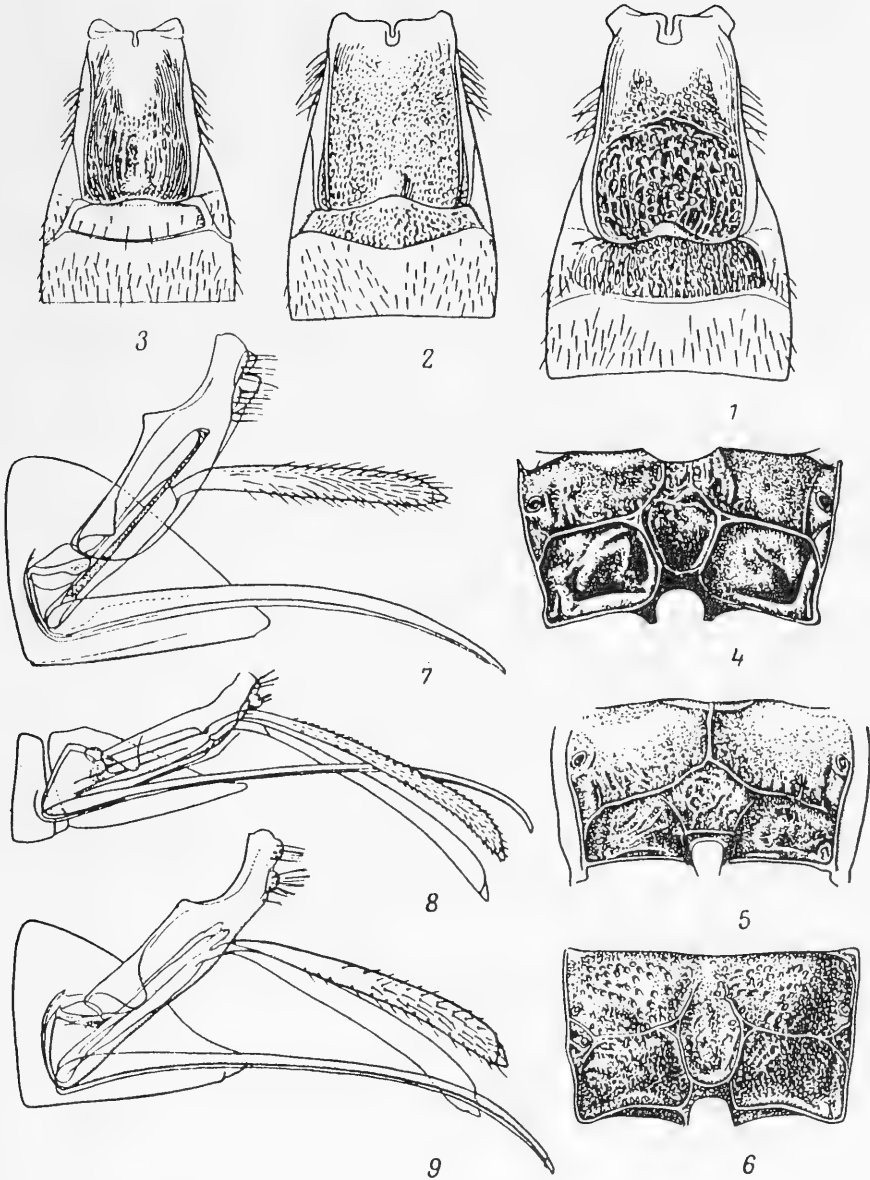


Fig. 263. Microgasterinae (from Wilkinson).

1—3—1st to 3rd abdominal tergites: 1—*A. lacticolor*, 2—*A. anarsiae*, 3—*A. coleophorae*;  
 4—6—Propodeum: 4—*A. lacticolor*, 5—*A. anarsiae*, 6—*A. coleophorae*; 7—9—6th  
 abdominal sternite and ovipositor: 7—*A. lacticolor*, 8—*A. anarsiae*, 9—*A. coleophorae*.

- 837 (838). Second abdominal tergite (Fig. 263: 1) wrinkled. Ovipositor valves (Fig. 263: 7) longer, 8/10th length of hind tibia. Mesonotum slightly lustrous. Stigma usually without pale spot at base. (cf. also couplet 830.) .... **A. lacticolor** Vier.
- 838 (837). Second abdominal tergite (Fig. 262: 9) smooth. Ovipositor valves (Fig. 262: 10) unusually short, less than half as long as hind tibia. Mesonotum matte. Stigma usually with pale spot at base. Propodeum largely smooth, lustrous, areola (Fig. 262: 8) broad, somewhat wrinkled. Nervellus arcuate (Fig. 262: 7). Wings as in Fig. 262: 6. Body 2.3–2.8. Parasite of *Boarmia selenaria* Den. and Schiff. (Geometridae). Cocoons white, isolated. Southwest; Italy, Hungary, Bulgaria, Israel .....  
 459 ... **A. cerialis** Nixon (*areolaris* Balevski and Tobias, syn. n.)

## 20. Subfamily Miracinae<sup>1</sup>

Small insects with distinctly reduced venation in apical half of wings, compact body and distinctly desclerotized margin of basal abdominal tergite. Ovipositor short. Hosts: caterpillars of lepidopteran leaf-miners. Six genera, very profusely represented in New World, three genera in Palearctic.

### Key to Genera

- 1 (2). Neither radiomedial vein developed; basal vein before parastigma angularly arcuate. Antennae approximately 20-segmented ..... 163. **Oligoneurus**
- 2 (1). First radiomedial vein developed. Basal vein straight or slightly arcuate.
- 3 (4). First section of radial vein of forewing well-developed. Antennae 21-segmented. Large spur of hind tibiae more than half as long as 1st segment of hind tarsus ..... 164. **Dirrhope**
- 4 (3). First section of radial vein of forewing not clear, radial and radiomedial veins originating from one point of stigma (Fig. 7: 7). Large spur of hind tibiae less than half as long as 1st segment of hind tarsus ..... 165. **Mirax**

163. **Oligoneurus** Szépligeti, 1902.—One Far Eastern species, *O. inopinatus* Tobias and Belok in Palearctic. One more species known from Brazil.

<sup>1</sup> Treatment by V.I. Tobias.

164. **Dirrhope** Förster, 1851.—2 species; one Neopalaearctic, the other Palearctic.

- 1 (1). Body yellowish brown with granulose sculpture. Head transversely striate on dorsal side. Propodeum with fields. Body 2–2.3. Northwest, southwest; Pacific Coastal Region; Western Europe ..... **D. rufa** Först.

165. **Mirax** Haliday, 1833.—Fifteen species described: Of these, 3 species in Palearctic. However, Palearctic species distinguish themselves by widely variable features (sculpture of propodeum, coloration) and apparently represent variations of a single species.

- 1 (1). Propodeum smooth or somewhat transversely wrinkled in lower half. Coloration variable: usually body dark colored, head somewhat reddish, basal part of abdomen yellowish, legs brownish yellow or somewhat darkened; rarely body entirely brownish yellow. Body 1.2–2. Parasite of miners from genus *Nepticula* (Nepticulidae). South, center; Caucasus; Western Europe ....  
 ..... **M. rufilabris** Hal. (? *dryochares* Marsh., ? *nanivora* Fi.)



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<sup>1</sup>Taxa above the rank of genus are printed in boldface; synonyms and page numbers with illustrations are given in italics; species new to science are marked with an asterisk (\*) sign.

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## ADDENDA

494 After the conclusion of work on the *Keys* ... several publications appeared, which could not be considered or were considered only partially. Among these were the redescribed genera and species which could not be included in the *Keys* without substantial revision as well as the newly confirmed hosts of many braconid species. These addenda aim at providing information about these braconids and about newly reported hosts.

### BRACONIDAE

#### Subfamily Doryctinae

*Colastes magdalenae* Sterzynski.—*Pol. pis. entomol.*, 1983, 53, 1–2: 143–146. It is closer to *C. hungaricus* Szépl. (cf. couplet 3 of genus *Colastes*); it differs from the latter by the almost interstitial nervulus (in *C. hungaricus*, like in other species of this genus, it is noticeably postfurcal), dense granulose sculpture of the mesonotum (in *C. hungaricus* it is smooth), absence of pits at the base of the 1st abdominal tergite (in *C. hungaricus* these pits are well developed), and posteriorly smooth notaulices.

*Dendrosotinus titubatus* Papp. *Ann. hist. natur. Mus. nat. hung.* 1985, 77: 217–226. It is closer to *D. anthaxiae* Belok; it differs in the ocelli in the equilateral triangle (in *D. anthaxiae*, ocelli are in obtuse-angled triangle), longer ovipositor which is  $10/13$ – $5/8$  as long as the abdomen (in *D. anthaxiae* the ovipositor is  $2/5$  as long as the abdomen) entirely shagreen 2nd abdominal tergite (in *D. anthaxiae* the 2nd abdominal tergite is weakly rugose only at base).

*Doryctosoma paradoxum* Picard.—After submitting the manuscript of *The Keys* for publication, it was possible to examine the lectotype of *Doryctosoma paradoxum* Pic.—“St. Guilhem. Hérault” “Coll. F. Picard (Coll. Lichtenstein), Mus. Paris, 1939”, “Type”, “Lectotypus, female, *Doryctosoma paradoxum* Picard, 1938, Papp, 1983”—type species of the genus *Doryctosoma* Pic. It seemed

closest to *D. hungaricum* Szépl. The differences between these two species can be outlined as under:

*D. hungaricum* Szépl.

1. Vertex in middle (seen laterally) with distinct break, anteriorly and posteriorly straight, truncate.
2. Longitudinal diameter of eye 2 times height of gena.
3. Mesonotum distinctly and sharply, almost perpendicularly, raised above pronotum, its middle lobe with transverse wrinkles.
4. Sternauli smooth.
5. Second radiomedial vein never developed.
6. Suture between 2nd and 3rd abdominal tergites twinned.
7. Second abdominal tergite with median field, bordered on sides by depressions.
8. Areolae on propodeum distinct.

*D. paradoxum* Pic.

1. Vertex in middle (seen laterally) without break, uniformly and slightly rounded anteriorly and posteriorly.
2. Longitudinal diameter of eye 3 times height of gena.
3. Mesonotum less distinctly and roundly raised above pronotum, its middle lobe granulose.
4. Sternauli crenulate.
5. Second radiomedial vein often developed.
6. Suture between 2nd and 3rd abdominal tergites not twinned.
7. Second abdominal tergite lacking median field.
8. Areolae not developed on propodeum.

*Ratzsynodus* Papp.—*Folia entomol. hung.*, 1984, 45, 1: 173–185. Type species *Heterospilus incompletus* Ratz. appears to be the same for subgenus *Caenophanes* Först. (cf. genus *Dendrosotinus*). Consequently, (*Ratzsynodus* Papp) = *Caenophanes* Först. (syn. n.).

Papp considers the subgenus separated by him within the scope of the genus *Heterospilus*. Its diagnostic character is the absence of transverse furrows on abdominal tergites. However, this character is expressed to a varying extent: sometimes we come across individuals of species characterized by the presence of furrows (cf. couplets 24–29 of genus *Heterospilus*); it can hardly be used as a subgeneric criterion.



### Subfamily Braconinae

495 *Pigeria* Acht.—Two species. This genus was separated from *Bracon* (van Achterberg, 1985. *Zool. Meded.*, 59, 15: 168–174) on the basis of the wide, laterally bordered depression on the prothorax and the conical apical process on the forecoxae (the third character listed by Achterberg, the slightly postfurcal nervulus, is not valid since it varies and is found in some additional species of *Bracon*). One of the species (*P. piger* Wesm.—type species of the genus) differs from the other (*P. wolschrijni* Acht. from the Netherlands) by even longer ovipositor (0.4–0.5 and 0.65, respectively, of length of forewing), slightly darkened basal half of wing, longer 2nd radiomedial cell (2–2.3 and 2.5–3 times, respectively, as long as 2nd radiomedial vein), body size (2.5–4.1 and 2.2–2.6 mm, respectively), number of antennal segments (28–33 and 23, respectively). All these species characters in *Bracon* are widely variable and in the present case their use as species criteria need further confirmation.

### Subfamily Euphorinae

*Perilitus areolaris* Hedqv.—Gerdin and Hedqvist, 1985, *Entomol. Scan.*, 15, 3: 363–369. According to the key for genus *Perilitus* (page 399) it agrees with couplet 6. It differs from *P. kokujevi* sp. n. described in this couplet by the more transverse face (height of face much less than its width) and more coarsely alveolately sculptured propodeum. Described from Sweden. Parasite of *Hylobius abietis* L.

### Subfamily Macrocentrinae

*Macrocentrus grandii* Goidanich, 1937.—Synonymized (van Achterberg and Haeselbarth, 1983. *Entomophauna*, 4, 2: 37–59) with *M. cingulum* Reinhard, 1882, considering it as nomen nudum (Shenefelt, 1969: 149). However, the arguments advanced by Achterberg and Haeselbarth in support of their case are not convincing. Even if the specimens from which they separated the lectotype actually belonged to these to which Reinhard assigned the name (which is doubtful since the label was not written by Reinhard), we cannot accept as description a mention in the work of Brischke (1982. *Schr. naturf. Ges. Danzig*, (N.F.), 5, 4: 97–124) about “green larva and clustered dark brown cocoons”, since these “characters” could be attributed to any species of the subgenus *Amicroplus*. (Unfortunately, if we were to accept this information for the description then even the species should be attributed to Brischke and not to Reinhard.) For these reasons we have retained the earlier name—*M. grandii*—in the key.

### Subfamily Orgilinae

*Kerorgilus* Acht.—Two species. The genus was separated from *Orgilus* (van Achterberg. 1985. *Zool. Meded.*, 59, 15: 163–167) on the basis of the presence of a pair of unique short projections on the sides of clypeus covering ventrally the tentorial pits. One of the species (*K. zonator* Szépl.—type species of the genus) differs from the other (*K. longicaudis* Acht. from Turkey) by the shorter ovipositor, 1st abdominal tergite and thorax—1.7–1.8 and 1.2–1.3 times, respectively, as long as the forewing 1.6–1.7 and 1.3 times, respectively, as long as the width of the 1st tergite at the apex, and 1.8–1.9 and 1.6–1.7 times, respectively, as long as the height of the thorax.

### Subfamily Cheloninae

The species of *Ascogaster* have been described and revised by Huddleston (1984. *Bull. Brit. Mus. (Nat. Hist.)* 49, 5: 341–392).

*Ascogaster albitarsus* Reinh.—It is closer to *A. bidentula* Wesm., from which according to Huddleston and our Key (couplet 22; if 2 denticles developed on clypeus) it differs by an elongate (2 times as long as wide) abdominal plate (in *A. bidentula* it is 1.5 times as long as wide). With the smoothed denticles according to our key it may be closer to *A. magnidentis* sp. n. (couplet 53), from which it differs by the head which is not broadened behind the eyes, dense reticulate-rugose sculpture of the scutellum and a larger number of antennal segments (37–39). It is known from Ireland, Sweden and Poland.

*A. consobrina* Curtis.—Related by Huddleston to the preceding species; differs from it by a distinct pubescent base of the abdomen below the lateral projections on the sides and its softer rugose nature, smaller number of antennal segments (33–34) and light colored hind legs. According to our key it is closer to couplet 53—*A. magnidentis*; it differs from it by the abdominal plate which is broadened in the apical third, the presence of lateral projections at its base, head not broadened behind eyes, longer antennal segments (except transverse) and light colored legs. Known from Western Europe and Japan.

*A. reticulata* Wat.—It is closer to *A. quadridentata* Wesm. from which it differs by a transverse depression at the apex of the clypeus and the absence of denticles in the middle of its anterior margin, punctate and usually light colored (and not transverse, rugose above and usually dark colored) hind coxae, a yellow girdle in the middle of the hind tibia. Known from Czechoslovakia and Japan.

### Subfamily Microgasterinae

Species of *Microgaster* have been described and revised by Papp (1983. *Entomol. Abh. Mus. Tierk. Dresden*, 47, 7: 96–140).

*Microgaster coacta* Lundbeck.—Closer to *M. heterocera* Ruthe. Differs from it by smaller body size (2.8–3 mm) longer stigma (2.3–2.4 times as long as wide; in *M. heterocera* 2 times as long), longer 1st flagellar segment (2 times as long as wide; in *M. heterocera* 1.7–1.8 times as long) and importantly parallel-sided and longer (2 times as long as wide) 1st abdominal tergite. By the latter character, according to our Key, *M. coacta* is closer to *M. trochanterata*—couplets 14(15) and 36(37); the differences from it are not clear.

*M. combinata* Papp.—Resembles our couplet 36(37) relating to *M. trochanterata* Thoms., introduced by Papp (*Ibid.* p. 138) in synonymy of *M. tuberculifer* Wesm. (obviously justifiable, since the characters by which *M. trochanterata* differs from *M. tuberculifer*—parallel-sided and not apically narrowed 1st abdominal tergite—are variable. In the series of *M. tuberculifer* there are specimens which are difficult to distinguish by the shape of the 1st tergite and other characters from *M. trochanterata*). In the key prepared by Papp, *M. combinata* differs from *M. tuberculifer* by shorter segments in the apical part of the antennae (1.5–1.6 times as long as wide) and the metacarpus ( $2/3$  as long as stigma); in *M. tuberculifer*, correspondingly, the length is 1.5–1.9 times its width while the metacarpus is roughly as long as the stigma. However, these characters are also variable and in the series of *M. tuberculifer* it is not uncommon to come across individuals with characters of *M. combinata*. Described from Austria.

*M. decipiens* Prell.—According to our key it resembles couplet 78(79), that is, *M. vidua* Ruthe. According to Papp's key, it differs from this species by dense shagreen sculpture (without wrinkles) of the lateral lobes of the mesonotum and relatively large (width more than 1st section of radial vein) 2nd radiomedial cell.

*M. improvisa* Papp.—It is closer to *M. fulvicornis* Wesm.—couplet 15(14) from which it differs by the head which is noticeably broadened behind the eyes, a shorter obtuse 6th abdominal sternite, longer apical antennal segments (preapical segments 3 times as long as wide). Described from the Netherlands.

*M. malimba* Papp.—It is closer to *M. fulvicornis* Wesm. and *M. improvisa* Papp—couplet 15(14)—from which it differs by the almost straight nervellus, the relatively shorter 1st section of the cubital vein, which in the limits of the discoidal cell, up to the nervulus

is half as long as the 2nd (in these species the nervellus is more or less distinctly S-shaped and the 1st section of the cubital vein is noticeably short, less than half as long as the 2nd), dark colored (at least in basal part) and the hind coxae are not reddish yellow. Described from the Netherlands.

*M. necopinata* Papp.—Papp considers it closer to *M. ratzeburgi* Ruthe and *M. tuberculata* Bouché which, in our key couplet 54(59), contrasts with *M. xanthopus* Ruthe, characterized by the same couplet 59(54) characters as *M. necopinata*. According to Papp it differs from the first two named species by the smooth sculpture in the anterior part of the scutellum, and from *M. xanthopus* by the somewhat darkened hind tarsi (according to the description, 2 to 3 apical segments are darkened). Described from Finland.

*M. retenta* Papp.—It is closer to *M. idia* Nixon from which, according to Papp, it differs by characters indicated in our Key, couplet 88(87) (the presence of the carinate projection the hind femora is not considered by Papp) as well as the large discoidal cell which is much longer than wide (in *M. idia* it is almost equal in length and width). According to our Key, it may be closer to *M. vidua* Ruthe—couplet 89(90). Unfortunately, Papp's description does not mention the type of pubescence of the antennae in *M. retenta*. Described from France.

*M. serotina* Papp.—It is closer to *M. stigmatica* Ratz.—couplet 33(32) of our Key. From the latter it differs by a better proportioned body (thorax 1.5 times as long as high; in *M. stigmatica* it is 1.2–1.3 times as long), the almost perpendicular anterior margin of the stigma, the 1st section of the radial vein originating from it (in *M. stigmatica* it is oblique and originates posterior to the middle of the stigma), head somewhat broadened behind eyes, almost smooth 1st abdominal tergite, yellowish tegulae, dark brown and only basally yellow hind tibiae (in *M. stigmatica*, the tegulae are dark brown while the hind tibiae are yellow).

### Subfamily Miracinae

#### *Mirax* Hal.<sup>1</sup>

This genus was recently revised by Papp (1984. *Folia entomologica*, 45, 1: 167). He separates 3 species in Europe (one more described by him from Afghanistan), which differ by characters listed below in the Key.

<sup>1</sup> Our entire material comprised *M. rufilabris* Hal.

- 1 (4). Head behind eyes roundly narrowed, temples somewhat shorter than eye. Discoidal cell almost square.
- 2 (3). Head 1.7–1.75 times as wide as long. Two to three preapical antennal segments 1.8–2.1 times as long as wide. Basal abdominal tergites colored as apical. East Germany, Czechoslovakia, Hungary ..... **M. dryochares** Marsh.
- 3 (2). Head 1.9–2.1 times as wide as long. Two to three preapical antennal segments 2–2.3 times as long as wide. Basal abdominal tergites light colored and apical tergites dark colored. Throughout Europe ..... **M. rufilabris** Hal.
- 4 (1). Head behind eyes distinctly narrowed, temples 1/2–1/3 as long as eye. Discoidal cell with distinctly pointed anterobasal angle. Preapical antennal segments 2.5 times as long as wide. Hungary ..... **M. repertus** Papp

## HOSTS

## Subfamily Doryctinae

- Clinocentrus excubitor* Hal.—*Parornix scoticella* Staint. (Gracillariidae), *Pandemis corylana* F., *Eucosmomorpha albersana* Hb. (Tortricidae), Czechoslovakia (Čapek).<sup>1</sup>
- C. stigmaticus* Marsh.—*Epermenia illigerella* Hb. (Epermeniidae), Lithuania (Jakimavicius)<sup>2</sup>.
- Colastes braconius* Hal.—*Tischeria heinemanni* Wocke, *Antispila* sp. (Tischeriidae), *Lithocolletis nigrescentella* Logan, *L. faginella* Zell., *L. emberizaepennella* Bouché (Gracillariidae), *Pempelia subornatella* Dup. (Phycitidae), *Liriomyza variegata* Mg. (Agromyzidae), Czechoslovakia (Čapek).
- Dendrosoter protuberans* Nees—*Anthaxia hackeri* Friw. (Buprestidae), *Phymatodes alni* L., *Exocentrus lusitanus* L. (Cerambycidae), *Pteleobius kraaczi* Eichh., *Phloesinus thujae* Perr., *Xyleborus dispar* F. (Scolytidae), Czechoslovakia (Čapek).
- Doryctes heydeni* Reinh.—*Lioderus kollari* Redtb. (Cerambycidae), *Anthaxia aurulenta* F., *A. manca* L. (Buprestidae), Czechoslovakia (Čapek).

<sup>1</sup>Čapek, Hladil and Šedivý. 1982. *Entomol. Probl.* (Bratislava), 17: 325–371 (braconids identified by M. Čapek).

<sup>2</sup>Jakimavicius and Ivaniskiuc. 1983. *Acta entomol. Lithuanica*, 6: 76–86 (braconids identified by A.B. Jakimavicius).

- D. leucogaster* Nees—*Anthaxia aurulenta* F., *A. manca* L. (Buprestidae), Czechoslovakia (Čapek).
- D. mutilator* Thunb.—*Anthaxia quadripunctata* L. (Buprestidae), *Semanotus undatus* L. (Cerambycidae), Czechoslovakia (Čapek).
- D. undulatus* Ratz.—*Anthaxia tuerki* Gylb., *Agrilus convexicollis* Redtb. (Buprestidae), *Grammoptera ruficornis* F., *Pogonocherus decoratus* Fairm. (Cerambycidae), Czechoslovakia (Čapek).
- Ecphyllus silesiacus* Ratz.—*Trypophloeus asperatus* Gyll. (Scolytidae), Czechoslovakia (Čapek).
- Histeromerus mistacinus* Wesm.—*Saphanus piceus* Laich. (Cerambycidae), Czechoslovakia (Čapek).
- Hormius moniliatus* Nees—*Depressaria pulcherrimella* Staint. *Agonopterix assimilella* Tr. (Oecophoridae), Czechoslovakia (Čapek).
- Monolexis foersteri* Marsh.—*Anthaxia hackeri* Friw., *A. manca* L., *A. tuerki* Gylb. (Buprestidae), Czechoslovakia (Čapek).
- Oncophanes laevigatus* Ratz.—*Swammerdamia pyrella* Vill. (Yponomeutidae), Moldavia (Kuslitskii and Maevskaia). *Nepticula microtheriella* Staint. (Nepticulidae), Czechoslovakia (Čapek).
- Argyroplote lacunana* Den. and Schiff. (Tortricidae), Lithuania; *Anchinia daphnella* Hb. (Oecophoridae), Lithuania (Jakimavicius).
- Ontsira antica* Woll.—*Melasis buprestoides* L. (Eucnemidae), *Agrilus viridis* L. (Buprestidae), *Ptilinus pectinicornis* L. (Anobiidae), *Pogonocherus hispidus* Pill. (Cerambycidae), *Scolytus pygmaeus* F., *S. rugulosus* Ratz. (Scolytidae), Czechoslovakia (Čapek). *Exocentrus punctipennis* Muls.—(Cerambycidae), Italy (Haes).<sup>1</sup>
- O. imperator* Hal.—*Pogonocherus hispidus* Pill., *Anisarhron barbipes* Schr. (Cerambycidae), Czechoslovakia (Čapek).
- Pareucorystes depressus* Fi.—*Agrilus convexicollis* Redtb., *A. auricollis* Kiesw. (Buprestidae), Czechoslovakia (Čapek).
- Polystenus rugosus* Först.—*Agrilus auricollis* Kiesw.; Czechoslovakia (Čapek).
- Rhysipolis decorator* Hal.—*Athrips* (= *Epithectis*) sp., Czechoslovakia (Čapek).
- Spathius dentatus* Tel.—*Buprestis novemaculata* L. (Buprestidae), Czechoslovakia (Čapek).
- S. exarator* L.—*Agrilus ater* L., Czechoslovakia (Čapek).

<sup>1</sup> Haeselbarth. 1983. *Bull. Sect. Reg. Ouest Pallearctique*, 6, 1: 1–49.

*S. rubidus* Rossi—*Agrilus auricollis* Kiesw., *A. convexicollis* Redtb.,  
*A. laiticornis* Ill. (Buprestidae), Czechoslovakia (Čapek).

#### Subfamily Rogadinae

*Rogas rossicus* Kok. (*testaceus* auct.)—*Conistra vaccinii* L., *Orthosia stabilis* Den. and Schiff. (Noctuidae), Czechoslovakia (Čapek).

#### Subfamily Braconinae

- Atanycolus fulviceps* Kriechb.—*Lampra rutilans* F. (Buprestidae), Czechoslovakia (Čapek).  
*A. genalis* Thoms.—*Acanthocinus reticulatus* Ratz. (Cerambycidae), Czechoslovakia (Čapek). *Lioderes kollari* Redtb. (Cerambycidae), Italy (Haes.).  
*Baryproctus hungaricus* Szépl.—*Platycephala planifrons* E. (Chloropiidae), Czechoslovakia (Čapek).  
498 *Bracon immutator* Nees—*Cryptorrhynchidius lapathi* L. (Curculionidae), Czechoslovakia (Čapek).  
*B. mediator* Nees—*Chamaesphacia bibioniformis* Esp. (Sesiidae), Czechoslovakia (Čapek).  
*B. pineti* Thoms.—*Thera variata* Den. and Schiff. (Geometridae), Czechoslovakia (Čapek).  
*B. stabilis* Wesm.—*Euproctis chrysorrhoea* L. (Lymantriidae), Turkey (Haes.).

#### Subfamily Helconinae

- Aspicolpus carinator* Nees—*Xylotrechus rusticus* L., *X. capricornis* Gebl., *Chytus tropicus* Panz., *Plagionotus arcuatus* L., *Saperda punctata* L. (Cerambycidae), Czechoslovakia (Čapek).  
*A. maximus* Szépl.—*Obrium cantharinum* L., *Exacentrus punctipennis* Muls. (Cerambycidae), Czechoslovakia (Čapek).  
*Baeacis abietis* Ratz.—*Xestobium plumbeum* Ill. (Anobiidae), Czechoslovakia (Čapek).  
*Cenocoelius analis* Nees—*Agrilus convexicollis* Redtb. (Buprestidae), *Tetrops starki* Cheur. (Cerambycidae), Czechoslovakia (Čapek).  
*C. secalis* L.—*Pogonocherus decoratus* Fairm. (Cerambycidae), Czechoslovakia (Čapek).  
*Helcon redactor* Thunb.—*Plagionotus arcuatus* L., *Saperda perforata* Pall. (Cerambycidae), Czechoslovakia (Čapek).

- H. tardator* Nees—*Lioderes kollari* Redtb., *Clytus lama* Muls. (Cerambycidae), Czechoslovakia (Čapek).  
*Wroughtonia ruspator* L.—*Xylotrechus capricornis* Gebl. (Cerambycidae), Czechoslovakia (Čapek).

#### Subfamily Brachistinae

- Eubazus articornis* Ratz.—*Acanthocinus reticulatus* Ratz. (Cerambycidae), Czechoslovakia (Čapek).  
*E. exsertor* Ruthe.—*Exocentrus lusitanus* L. (Cerambycidae), Czechoslovakia (Čapek).  
*Triaspis aciculatus* Ratz.—*Anthaxia quadripunctata* L. (Buprestidae), Czechoslovakia (Čapek).  
*T. conjugens* Šnofl.—borers (Buprestidae) on *Juniperus*, France (Haes.).  
*T. obscurellus* Nees—*Phytonomus variabilis* Hbst. or *Apion pisi* F. (Curculionidae) on *Medicago sativa*, Greece (Haes.).  
*Schizoprymnus hilaris* H.-Sch.—? *Mordellistena* sp. (Mordellidae), France (Haes.).

#### Subfamily Euphorinae

- Allurus muricatus* Hal.—*Sitona humeralis* Steph. (Curculionidae), Italy (Haes.).  
*Blacometeorus intermedius* Tobias—From gall of *Andricus quercuscalicis* Burgsd. (Cynipidae), Czechoslovakia (Čapek).  
*Meteoris affinis* Wesm.—*Fumea casta* Pall., *Solenobia* sp. (Psychidae), Czechoslovakia (Čapek).  
*M. corax* Marsh.—*Lioderes kollari* Redtb. (Cerambycidae), Italy (Haes.).  
*M. gyrator* Thunb.—*Thera variata* Den. and Schiff. (Geometridae), Czechoslovakia (Čapek).  
*M. jaculator* Hal.—*Nemapogon granellus* L. (Tineidae), Czechoslovakia (Čapek).  
*M. pallipes* Wesm.—*Pandemis cerasana* Hb. (Tortricidae), Czechoslovakia (Čapek).  
*M. pulchricornis* Wesm.—*Conistra vaccinii* L. (Noctuidae), Czechoslovakia (Čapek).  
*M. rubens* Nees—*Scotia segetum* Den. and Schiff. (Noctuidae), Czechoslovakia (Čapek).  
*M. versicolor* Wesm.—*Clostera anastomosis* L. (Notodontidae), *Orthosia miniosa* Den. and Schiff. (Noctuidae), Czechoslovakia (Čapek).



- Perilitus rutilus* Nees—*Hylobius abietis* L. (Curculionidae), Czechoslovakia (Čapek).  
*Zebe albiditarsus* Curt.—*Orthosia cruda* Den. and Schiff., *O. stabilis* Den. and Schiff. (Noctuidae), *Alispa angustella* Hb. (Phycitidae), Czechoslovakia (Čapek).  
*Z. chlorophthalmus* Spin.—*Eurrhyncha hortulata* L. (Pyraustidae), *Eurhodope advenella* Z., *Udea prunalis* Den. and Schiff. (Phycitidae), Lithuania (Jakimavicius).

#### Subfamily Macrocentrinae

- Macrocentrus bicolor* Curt.—*Agonopteryx applana* F. (Oecophoridae), *Pandemis cinnomoniana* Tr., *Archips rosana* L., *A. xylosteana* L., *Tortricodes tortricella* Hb. (Tortricidae), Czechoslovakia (Čapek).  
*M. equalis* Lyle.—*Notocelia uddmanniana* L. (Tortricidae), Lithuania (Jakimavicius).  
*M. kurnakovi* Tobias—*Nemapogon laterellus* Thunb. (Tineidae), Czechoslovakia (Čapek).  
*M. linearis* Nees—*Anacampsis populella* Cl. (Gelechiidae), *Aleimma loeflingiana* L. (Tortricidae), Czechoslovakia (Čapek). *Zeiraphera griseana* Hb. (Tortricidae), Eastern Siberia (Pleshanov).  
*M. marginator* Nees—*Archips xylosteana* L. (Tortricidae), Czechoslovakia (Čapek).  
499 *M. pallipes* Nees—*Mompha* sp. (Mompidae), *Agonopteryx liturella* Hb. (Oecophoridae), *Aphelia paleana* Hb., *Cnephasia* sp. (Tortricidae), Czechoslovakia (Čapek). *Hedia ?nubiferana* Hw., *Acleris variegana* Den. and Schiff. (Tortricidae), Lithuania (Jakimavicius).  
*M. thoracicus* Nees—*Cheimophila salicella* Hb. (Ypomeutidae), Moldavia (Kuslitskii and Maevskaya).

#### Subfamily Homolobinae

- Homolobus annulicornis* Nees—*Dichonia convergens* Den. and Schiff., *Dryobotodes protea* Den. and Schiff. (Noctuidae), Czechoslovakia (Čapek).  
*H. discolor* Wesm.—*Cabera exanthemata* Scop. (Geometridae), Czechoslovakia (Čapek).  
*H. infumator* L.—*Ematurga atomaria* L. (Geometridae), West Germany (Haes.).

### Subfamily Orgilinae

- Orgilius pimpinellae* Niez.—*Scrobipalpa ocellatella* Boyd. (Gelechiidae), Czechoslovakia (Čapek).  
*O. punctulator* Nees—*Psyche viciella* Den. and Schiff. (Psychidae), Czechoslovakia (Čapek).  
*O. rubrator* Ratz.—*Depressaria* sp. (Oecophoridae), Czechoslovakia (Čapek).  
*O. rugosus* Nees—*Coleophora nigricella* Steph. (Coleophoridae), Lithuania (Jakimavicius).  
*Charmon extensor* L.—*Chelasia hubnerella* Don. (Gelechiidae), Czechoslovakia (Čapek).  
*Microtypus wesmaelii* Ratz.—*Acrobasis tumidana* Den. and Schiff. (Phycitidae), Czechoslovakia (Čapek).

### Subfamily Sigalphinae

- Acampsis alternipes* Nees—*Alsophila quadripunctata* Esp., *A. aescularia* Den. and Schiff., *Operophtera brumata* L. (Geometridae), Czechoslovakia (Čapek).

### Subfamily Agathidinae

- Baeognatha armeniaca* Tel.—*Recurvaria leucatella* Cl. (Gelechiidae), Moldavia (Kuslitskii and Maevskaya).  
*Microdus pumilus* Ratz.—*Coleophora dahurica* (Coleophoridae), Eastern Siberia (Pleshanov).  
*M. tumidulus* Nees—*Grapholitha sinana* Feld. (Tortricidae), Czechoslovakia (Čapek).  
*Earinus nitidulus* Nees—*Orthosia stabilis* Den. and Schiff. (Noctuidae), Czechoslovakia (Čapek).

### Subfamily Cheloninae

- Ascogaster annularis* Nees—*Coleophora lutipennella* Zell. (Coleophoridae), Czechoslovakia (Čapek).  
*A. quadridentata* Wesm.—*Recurvaria leucatella* Cl. (Gelechiidae), *Grapholitha sinana* Feld. (Tortricidae), Czechoslovakia (Čapek), *Gypsonoma dealbana* Fröl. (Tortricidae), Lithuania (Jakimavicius).  
*A. rufidens* Wesm.—*Eudemis profundana* Den. and Schiff. (Tortricidae), Czechoslovakia (Čapek).

- Chelonus corvulus* Marsh.—*Dichrorampha simpliciana* Hw. (Tortricidae), Lithuania (Jakimavicius).  
*Microchelonus contractus* Nees—*Gelechia malinella* Zell. (Gelechiidae), Czechoslovakia (Čapek).  
*M. starki* Tel.—*Chamaesphacia bibioniformis* Esp. (Sesiidae), Czechoslovakia (Čapek).  
*Phanerotoma minor* Šnofl.—*Rhodophaea advenella* Germ. and Zinck. (Phycitidae), Czechoslovakia (Čapek). *Gelechia turpella* Den. and Schiff. (Gelechiidae), Lithuania (Jakimavicius).

#### Subfamily Microgasterinae

- Apanteles andromica* Nixon—*Cosymbia punctaria* L., *Operophtera brumata* L., *Erannis defoliaria* Cl., *Apocheima hispidaria* Den. and Schiff. (Geometridae), Czechoslovakia (Čapek).  
*A. caberae* Marsh.—*Alsophila aescularia* Den. and Schiff. (Geometridae), Czechoslovakia (Čapek).  
*A. cajae* Bouché—*Hyphantria cunea* Drury (Arctiidae), Czechoslovakia (Čapek).  
*A. callimome* Nixon—*Panaxia dominula* L. (Arctiidae), Czechoslovakia (Čapek).  
*A. circumscriptus* Nees—*Argyrestia mendica* Haw. (Yponomeutidae), *Lithocolletis lautella* Zell., *L. spinocolella* Zell., *L. klemannella* F. (Gracillariidae), *Coleophora glitzella* Hofm. (Coleophoridae), Czechoslovakia (Čapek). *Callisto denticulella* Thnb. (Gracillariidae), Lithuania (Jakimavicius).  
*A. coleophorae* Wilk.—*Coleophora ibipennella* Zell. (Coleophoridae), Czechoslovakia (Čapek), *C. dahurica* Flkv., Khabarovsk Territory (E'pova).  
*A. corvinus* Reinh.—*Bucculatrix crataegi* L. (Bucculatricidae), Lithuania (Jakimavicius).  
*A. cytherea* Nixon—*Ypsolophus alpellus* Den. and Schiff. (Plutellidae), Czechoslovakia (Čapek).  
*A. fausta* Nixon—*Phiaris siderana* Tr. (Tortricidae), Czechoslovakia (Čapek).  
*A. gastropachae* Bouché—*Macrothylacia rubi* L. (Lasiocampidae), Lithuania (Jakimavicius).  
500 *A. immunis* Hal.—*Eupithecia vulgata* Haw., *Erannis leucophaeria* Den. and Schiff. (Geometridae), Czechoslovakia (Čapek).  
*A. isolde* Nixon—*Achlya ridens* F., *A. diluta* Den. and Schiff., *A. ruficollis* F. (Tetheidae), Czechoslovakia (Čapek).

- A. jucundus* Marsh.—*Phigalia pedaria* F. (Geometridae), Czechoslovakia (Čapek).
- A. laevigatoides* Nixon—*Solenobia neckerli* Hein., *S. peneti* Zett. (Psychidae), Czechoslovakia (Čapek). *Fumea casta* Pallas (Psychidae), West Germany (Haes.).
- A. laevigatus* Ratz.—*Croesia bergmanniana* L., *C. forscaleana* L., *Gypsonoma minutana* Hb. (Tortricidae), *Gelechia sestertiella* H.-S. (Gelechiidae), Lithuania (Jakimavicius).
- A. lineipes* Wesm.—*Argyrestia conjugella* Zell. (Argyrestidae), *Anchinia daphnella* Hb. (Oecophoridae), Czechoslovakia (Čapek).
- A. longicauda* Wesm.—*Atemelia torquatella* Zell. (Plutellidae), Czechoslovakia (Čapek), *Cheimophila salicella* Hb. (Oecophoridae), *Recurvaria leucatella* Cl., *Dichomeris fasciella* Hb. (Gelechiidae), Moldavia (Kullitskii and Maevskaia).
- A. maritimus* Wilk.—*Lithocolletis* sp. (Gracillariidae), Czechoslovakia (Čapek).
- A. moldavicus* Tobias—*Bucculatrix boyerella* Dup. (Bucculatricidae), Czechoslovakia (Čapek).
- A. nanus* Reinh.—*Lithocolletis stringulatella* Zell., *L. salictella* Zell., *L. connexella* Zell. (Gracillariidae), Czechoslovakia (Čapek).
- A. obscurus* Nees—*Argyroploce arbutella* L. (Tortricidae), Czechoslovakia (Čapek).
- A. pilicornis* Thoms.—*Capperia trichodactyla* Hb. (Pterophoridae), Czechoslovakia (Čapek).
- A. plutellae* Kurd.—*Chrysodeisis chalcites* Esp. (Noctuidae), Uzbekistan, Leningrad (Z. Radzhabova).
- A. praepotens* Hal.—*Operophtera fagata* Scharf., *Erannis aurantiaria* Esp., *E. bajaria* Den. and Schiff., *E. leucophaearia* Den. and Schiff. (Geometridae), Czechoslovakia (Čapek).
- A. sicarius* Marsh.—*Grapholitha delineana* Wlk. (Tortricidae), Czechoslovakia (Čapek).
- A. spurius* Wesm.—*Phigalia pedaria* F. (Geometridae), Czechoslovakia (Čapek).
- A. suevii* Reinh.—*Syngrapha ein* Hochu (Noctuidae), Irkutsk (Pleshanov).
- A. tedellae* Nixon—*Epinotia pinicola* Vl. Kunz. (Tortricidae), Baikal Region (V. Fedotova).
- A. tibialis* Curt.—*Eurois occulta* L. (Noctuidae), Czechoslovakia (Čapek), *Inachis io* L. (Nymphalidae), Greece (Haes.).

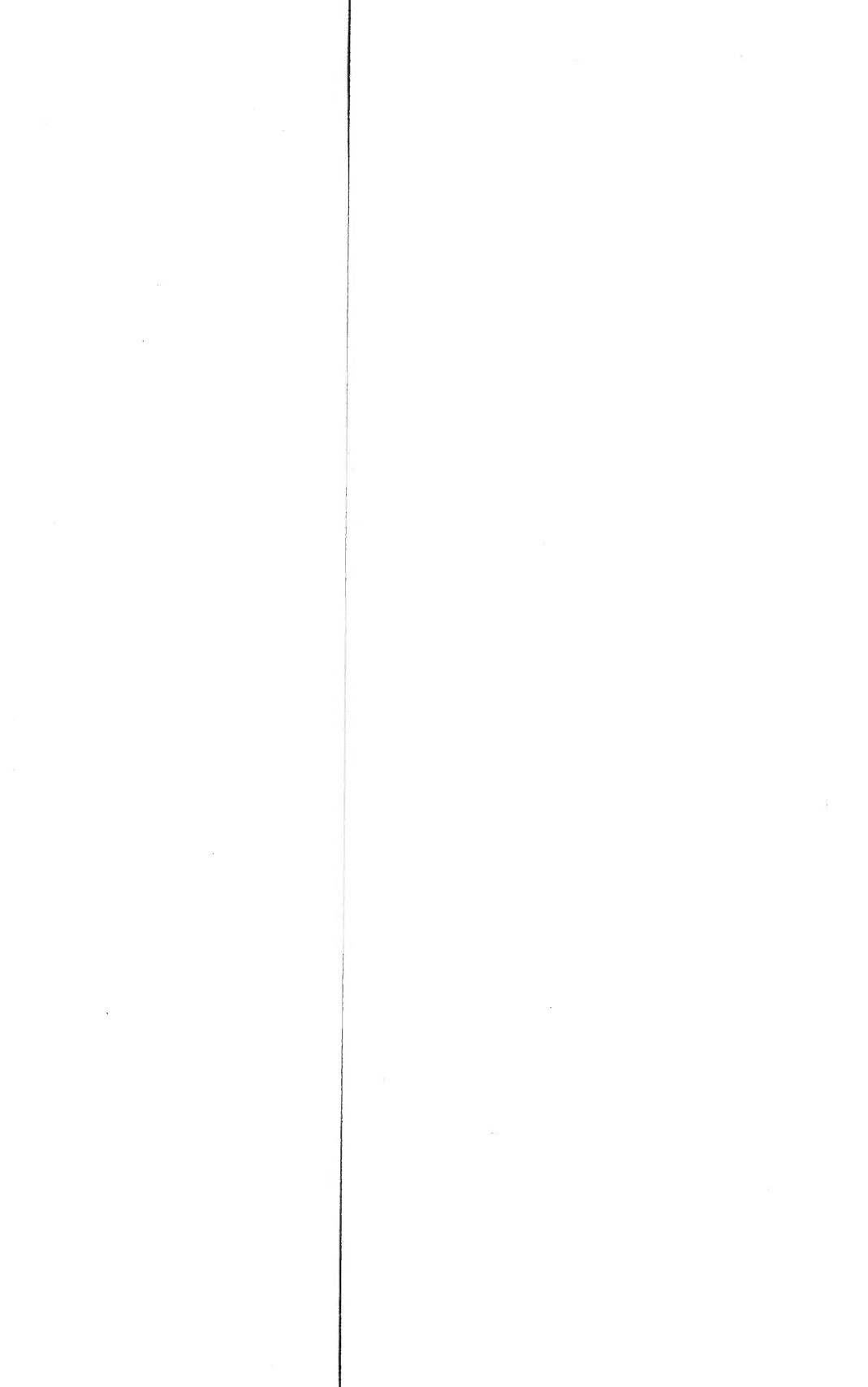
- A. xanthostigma* Hal.—*Laspeyresia pomonella* Hal. (Tortricidae), Czechoslovakia (Čapek), *Swammerdamia pyrella* Vill. (Yponomeutidae), Moldavia (Kuslitskii and Maevskaya), *Hedya nubiferana* Hb., *Spilonota ocellana* F. (Tortricidae), *Choreutis pariana* Cl. (Choreutidae), *Callisto denticulella* Thunb., *Lithocolletis blanchardella* F. (Gracillariidae), *Operophtera brumata* L. (Geometridae), Lithuania (Jakimavicius).
- A. zyaenarum* Marsh.—*Zygaena meliloti* Esp. (Zygaenidae), West Germany (Haes.).
- Choeras suffolciensis* Morley—*Cacoecimorpha pronubana* Hb. (Tortricidae), Spain (Haes.).
- Diolcogaster spreta* Marsh.—*Acrobasis tumidella* Germ. and Zinck. (Phycitidae), Czechoslovakia (Čapek).
- Lissogaster alebion* Nixon—*Cynthia cardui* L. (Nymphalidae), West Germany (Haes.).
- L. caris* Nixon—*Anacampsis populella* Cl. (Gelechiidae), Czechoslovakia (Čapek).
- L. globata* L.—*Hedya pruniana* Hb. (Tortricidae), Czechoslovakia (Čapek). *Ancylis apicella* Den. and Schiff. (Tortricidae), *Anacampsis populella* Cl. (Gelechiidae), Lithuania (Jakimavicius).
- L. grandis* Thoms.—*Dichomeris fasciella* Hb. (Gelechiidae), Moldavia (Kuslitskii and Maevskaya).
- L. hospes* Marsh.—*Anacampsis populella* Cl. (Gelechiidae), Lithuania (Jakimavicius).
- L. nobilis* Reinh.—*Carcharodus* sp. (Hesperidae) on *Marrubium vulgare*, France (Haes.).
- L. parvistriga* Thoms.—*Swammerdamia heroldella* Tr. (Yponomeutidae), Czechoslovakia (Čapek).
- L. tibialis* Nees—*Pelatea klugiana* Freyer (Tortricidae), Italy (Haes.).
- Microgaster impressa* Wesm.—*Orthosia cruda* Den. and Schiff. (Noctuidae), Czechoslovakia (Čapek).
- M. mandibularis* Thoms.—*Cirrhia ocellaris* Bkh. (Noctuidae), Czechoslovakia (Čapek).
- M. naenia* Nixon—*Orthosia stabilis* Den. and Schiff., *Conistra vaccinii* L. (Noctuidae), Czechoslovakia (Čapek).
- M. tuberculifer* Wesm.—*Orthosia miniosa* Den. and Schiff., *O. munda* Den. and Schiff., Czechoslovakia (Čapek).



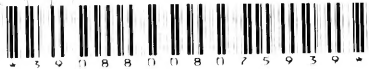








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