

Systematic positions of some taxa in Ormyridae and descriptions of a new species in *Ormyrus* from Turkey and a new genus in the family (Hymenoptera, Chalcidoidea)

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Summary

In the family Ormyridae four distinct genera, *Ormyrus* Westwood, *Cyrtosoma* Perris, *Avrasyamyrus* gen. n., *Ormyrulus* Boucek, were established by using new characters found on gaster. *Cyrtosoma* is reestablished as a distinct genus in the family, and *Tribaeus* Foerster, *Monobaeus* Foerster and *Cyrtosoma* s. str. are regarded as subgenera of *Cyrtosoma* (new synonymy). From Turkey, a new species, *Ormyrus bingöelensis* is described.

Some species of Ormyridae are illustrated and available biological data of the species are provided.

Introduction

There are many taxonomic problems in the family i.e. status of the family, generic placements of the species. Some authors discussed that it is a family or a subfamily of Pteromalidae or Torymidae (Riek, 1970; Boucek *et al.*, 1981; Boucek, 1988). In the past, three different genera, *Monobaeus* Foerster, *Tribaeus* Foerster, *Ormyrus* Westwood, were included in the family by several authors (Erdoes, 1946; 1955; Peck *et al.*, 1964) in having different numbers of annelli in the genera, whilst some authors stated that the family contains only a single genus, *Ormyrus*, (Mayr, 1904; Nikolskaya, 1952) because of the species of *Monobaeus* and *Tribaeus* are indistinguishable from that of *Ormyrus* which have not distinct median carinae and deep foveolae on the gaster dorsally.

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Recently, Boucek (1986) described another genus, *Ormyrulus* Bck., from India by using the diagnostic characters in antenna and head. Boucek (1988) stated that the South African *Asparagobius* Mayr may also belong to Ormyridae instead of Pteromalidae, but the matter needs further study.

Erdoes (1955) gave a diagnostic key for 13 species from Europe under three genera, Nikolskaya (1952) stated that there are 30 species in the world and 10 of them from Europe under the genus *Ormyrus*. Peck (1963) listed 16 species under two genera from the Nearctics. Boucek (1970) added one more species to the European *Ormyrus*, and Boucek (1977) gave some biological informations for seven species from Yugoslavia and some synonymies to the species. Yasumatsu and Kamijo (1979) described a new species from Japan. Doğanlar (1984) reported four species of Ormyridae under *Ormyrus* from Eastern Anatolia and gave some biological informations about them. Wall (1984) gave a diagnostic key to ormyrid species under three genera and some distributional and biological data for 13 species in Europe. Boucek (1988) gave detailed informations on the taxonomy of the family, and some statements on the generic placements of the species, and he also stated that the family has 30 species in all continents, and 6 of them from Australia and one of them from South America.

Biology of the family : The species of the family are parasites on galls of Cynipidae (Hymenoptera) and Tephritidae (Diptera).

Material and Methods

Material included the specimens of some species of Ormyridae were reared from cynipid galls on *Quercus* spp. and from cynipid and tephritid galls on flower heads of Composite collected from some parts of Anatolia. In addition some specimens were swept from flowers of herbaceous plants.

In order to obtain the numbers of deep foveolae on gastral tergites, gasters of the species were dissected after boiling in water with 10% KOH for 5 minutes. All of the tergites were separated from each other, and stuck on a card for microscobic works. During those works hypopygia of females were placed on slides.

Some of important body parts were illustrated.

Results and Discussions

In this work four genera of Ormyridae were recognized. One of them, *Cyrtosoma* Perris, is reestablished, and *Avrasyamyrus* gen. n. is described. In the family 14 species, 5 of them new to science, were found in Turkey. Some of them were reared from their hosts and others were swept mainly from herbaceous plants. *Cyrtosoma* spp. will be published later.

By this work, it is found that the gaster of all species of Ormyridae has some of tergites with one to more rows of deep foveolae dorsally. By this characters the family Ormyridae is distinct from all other families of Chalcidoidea. The numbers of rows of deep foveolae on dorsum of tergites and their presence on some tergites vary between

genera. On the other hand, presence or absence of a median keel on female gaster and lateral carinae on male gaster and of micropilosity on male clava are also found as important characters for distinguishing the genera.

The species having 3.-5. gastral terga of female and 3.-4. terga of male with 2-7 rows of deep foveolae, and with a median keel on female gaster and lateral carinae on gaster of male, and with a distinct micropilosity on most male clava are regarded in the genus, *Ormyrus* Westwood, 1832 (Type species *O. punctiger* Westwood).

The species having 3.-5. gastral terga of male and 4.-5. terga of female with 2-4 rows of deep foveolae, and with a median keel on female gaster and lateral carinae on male gaster and male clava without micropilosity is regarded as belonging to a new genus, *Avrasyamyrus* (Type species *A. orientalis* (Walker)).

The species having 3.-5. gastral terga of male and 4.-5. terga of female with only one row of deep foveolae, and without any median keel and lateral carinae on gaster and any micropilosity on clava are regarded as belonging to newly reestablished genus, *Cyrtosoma* Perris, 1840 (Type species *C. papaveris* Perris). Available generic names for the species group are *Siphonura* Nees, 1834 (*S. punctulata* Ratz. = *S. diffinis* (Fonsc.); *Cyrtosoma* Perris, 1840 (*C. papaveris* Perr.); *Tribaeus* Foerster, 1860 (*T. diffinis* (Fonsc.); *Monobaeus* Foerster, 1860 (*M. cingulatus* Foerster); *Ormyrus* Westwood, 1832 (*O. punctiger* Westw. (Type species); *O. whactli* Mayr, 1904; *O. speculifer* Erdoes, 1955; *O. langlandi* Girault, 1920; *O. longicornis* Boucek). In those names, the oldest available generic name for them is *Cyrtosoma* Perris which is reestablished as valid generic name, because the type species of *Siphonura* (*S. variolosa* Nees designated by Gahan and Fagan (1923) was synonymized with *Ormyrus nitidulus* (F.) which belongs to another genus by Nikolskaya (1952). *Tribaeus* Foerster, *Monobaeus* Foerster and *Cyrtosoma* s. str. are regarded as subgenera of *Cyrtosoma*, the species of which will be treated in a separate paper.

Key to genera of Ormyridae

1. Gaster of female with median keel; clava of male with or without micropilosity; antennae with two annelli 2
- Gaster of female without median keel; clava of male without micropilosity; antennae with several numbers of annelli 3
2. 4.-5. terga of female and 3.-5. terga of male with 2-4 rows of deep foveolae; clava of male without micropilosity; parasite of Tephritidae on lower plants *Avrasyamyrus* gen. n.
- 3.-5. terga of female and 3.-4. terga of male 2-7 rows of deep foveolae; clava of male with large area of micropilosity; associated with cynipid galls on *Quercus* spp. *Ormyrus* Westwood
3. 4.-5. terga of female and 3.-5. terga of male with only one row of deep foveolae covered by preceding tergum; antennae with 1-3 annelli; associated with cynipid galls on lower plants *Cyrtosoma* Perris
- 2.-3. terga of female with 3-4 rows, 4. tergum with an incomplete row and 4. tergum of male with two rows of deep foveolae; most of the foveolae partly or completely exposed; antennae with 4 annelli; associated with gall midges (Diptera, Cecidomyiidae) on mango trees..... *Ormyrus* Boucek

Genus *Ormyrus* Westwood

(Figs. 1-30)

Ormyrus Westwood, 1832, *Phil. Mag.*, 1, 127.

Type: *Ormyrus punctiger* Westwood, Monobasic.

Periglyphus Boheman, 1833, *Svensk. Vet. - Akad. Handl.*, 54, 378.

Type: (*Periglyphus gastris* Boheman) = *Ormyrus punctiger* Westw. Monobasic.

Siphonura Nees, 1834, *Hym. Ichneum. Affin. Monog.*, 2, 81.

Type: *Siphonura variolosa* Nees, Designated by Gahan and Fagan, 1923.

The genus, *Ormyrus* Westwood, is recognized mainly in having gaster of female with a distinct median keel dorsally and that of male with a lateral carinae; 3.-5. terga of female and 3.-4. terga of male with 2-7 rows of deep foveolae; clava of male with distinct micropilosity.

Biology: The species of the genus were reared mainly from the galls of Cynipidae on broad-leaved trees or shrubs, except only *O. rufimanus* which is sometimes reared from cynipid galls on herbaceous plants.

Distribution: All continents.

Palaearctic species of *Ormyrus*:

aerosus Foerster - *Ormyrus aerosus* Foerster, 1860, 104. Europe.

bingoeliensis n.sp. - Holotype (Female), Turkey, Bingöl, Genç, 13. VIII. 1975, ex cynipid oak gall (Doğanlar); Paratype (female), 13.II.1975, laboratory reared from galls of Cynipidae on oak tree.

cosmozonus Foerster, - *Ormyrus cosmozonus* Foerster, 1860, 98. Europe.

flavitibialis Yasumatsu and Kamijo - *Ormyrus flavitibialis* Yasumatsu and Kamijo, 1979, 103-105. Japan, Korea. Reared from *Dryocosmus kuriphilus* and from galls of *Trichagalma serratae*, *Neuroterus* sp. on *Quercus serrata*.

nitidulus (Fabricius) - *Chalcis nitidula* Fabricius, 1804, 163. North Africa, Europe, Turkey; = *Cynips tubulosus* Fonscolombe, 1832, 290; *Siphonura variolosa* Nees, 1834, 82; = *Siphonura chalibae* Ratzeburg, 1844, 207; = *Siphonura schmidtii* Nees, 1851, 52; = *Ormyrus violaceus* Foerster, 1860, 105. All of the names were transferred to genus *Ormyrus* as synonyms of *tubulosus* by Mayr (1904, 571) and it was accepted by Nikolskaya (1952, 151) and by Erdoes (1955, 246). Later, Boucek (1977) synonymized *tubulosus* with *nitidulus*. Reared from galls of many species of Cynipidae on *Quercus* spp. and *Diplolepis rosae* on *Rosa canina* (Györfi, 1962; Nikolskaya, 1952; Boucek, 1977; Doğanlar, 1984; Wall, 1984), 4 females, 2 males, Muş, Kızılağaç, 25.I.-18.II.1975 (Lab reared); 9 females, 4 males, Hakkari, Şemdinli, 20.I.-13.II.1975

(Lab reared); 2 females, Tokat, Almus, 25.IV.1990 (Lab reared). All of them were reared from various cynipid galls on *Quercus*.

punctiger Westwood - *Ormyrus punctiger* Westwood, 1832, 127. Europe, Japan, Korea. =*Periglyphus gastris* Boheman, 1833, 379; =*Siphonura brevicauda* Nees, 1834, 83; =*Siphonura sericea* Nees, 1834, 83; =*Siphonura cyanotetheus* Walker, 1847, 227; =*Ormyrus viridanus* Foerster, 1860, 100; =*Ormyrus prodigus* Foerster, 1860, 101; =*Ormyrus placidus* Foerster, 1860, 102; =*Ormyrus blandus* Foerster, 1860, 104; =*Siphonura gallae - quercus* Dufour, 1864, 214; =*Ormyrus aeneicinctus* Rondani, 1877, 191-192. All of the names were synonymized by Mayr (1904) and those synonymies were confirmed by Nikolskaya (1952). Reared from galls of many species of Cynipidae on *Quercus* spp. (Nikolskaya, 1952; Erdoes, 1955; Boucek, 1977; Yasumatsu and Kamijo, 1979; Wall, 1984); 10 females, 14 males, Almus, Tokat, 20.III.-5.IX.1989 (Çam); 8 females, 11 males, Almus, Tokat, 19.IV.-8.V.1990 (Doğanlar) ex *Neuroterus macropterus* on oak trees.

rufimanus Mayr - *Ormyrus punctiger* var. *rufimanus* Mayr, 1904, 579. Europe. Erdoes (1955) elevated it as species of *Ormyrus*. Later, Wall (1984) gave the species under this name. Reared from galls of *Diastrophus rubi* on *Rubus*, *D. mayri* and *Xestophanes potentillae* on *Potentilla* spp. (Erdoes, 1955; Wall, 1984). 1 female, Taşlıçiftlik, Tokat, 24.VIII.1989 (Çam). Swept from herbaceous plants.

viridiaeneus (Ratzeburg) - *Siphonura viridiaeneus* Ratzeburg, 1944, 207. Europe. Synonymized with *O. punctiger* by Mayr (1904, 575) and accepted by Nikolskaya (1952, 150-151). Later, Erdoes (1955, 246) stated that it is a distinct species of *Ormyrus*. Reared from various cynipid galls on *Quercus* spp. (Erdoes, 1955; Wall, 1984). BadSoden-Salmünster, 3 females, 7 males, 27. VII. 1983 (Doğanlar); 1 female, Göhrenberg, 20. VII. 1983, 1 male, Gührde, 24.VI.1983, 2 females, 3 males, Nikalausberg, 7.VII.-28.VIII.1983, (Doğanlar). Swept from *Quercus*.

Key to the species of *Ormyrus* from Turkey

1. Female : epipygium longer than height at anterior margin (figs. 4, 5, 9, 10); first two funicular segments distinctly longer than broad (figs 1,7). Male : scape 5 times as long as broad(fig. 2) 2
- Female : epipygium shorter than height or at most as long as height (figs. 13, 14, 18, 19, 25, 26); first two funicular segments quadrate or transverse (figs. 11, 15, 22). Male : scape at most 4 times as long as broad (figs. 16, 23) 3
2. Female : antennae (fig. 1) with funicular segments 3.-6. subquadrate or quadrate; funicular segments with two rows of sensillae; epipygium (figs. 4, 5) 1.2 times as long as height; forewing (fig. 3) speculum closed below, bare on both sides; marginal vein 4 times as long as postmarginal vein; hind tibia fuscous or at most testaceous; gaster 1.5 times as long as head plus thorax combined. Male: funicular segments (fig.2) with one row of sensillae; clava with a large areae of micropilosity *Ormyrus nitidulus* (Fabricius)

- Female : antennae (fig. 7) with funicular segments longer than broad, at most only sixth segment quadrate; 1.-5. funicular segments with three rows of sensillae; epipygium (figs. 9, 10) 1.8 times as long as height; forewing (fig. 8) with speculum open below, with some hairs on under side; marginal vein 3.3 times as long as postmarginal vein; hind tibiae yellow; gaster almost twice as long as head plus thorax combined; hypopygium as seen fig. 6. Male unknown *Ormyrus bingoeliensis* n. sp.
- 3. Tibiae testaceous; forewing of female (fig. 12) with speculum closed below; apex of scutellum almost bifid (fig. 28); gaster (figs. 13,14) 1.5 times as long as head plus thorax combined; in female : 3th tergum with 2; 4th tergum with 3; 5th tergum with 4-5 rows of deep foveolae; hypopygium as seen fig. 21 *Ormyrus rufimanus* Mayr
- Tibiae black, at most brownish; forewing of female (figs. 17,24) with speculum open below; apex of scutellum (figs. 29, 30) rounded; gaster at most 1.4 times as long as head plus thorax combined; terga with several numbers of deep foveolae 4
- 4. Female : gaster (figs. 18, 19) with 3th tergum with 1; 4th and 5th terga with 3 rows of deep foveolae; in male : 3th tergum with 2; 4th tergum with 5 rows of deep foveolae; apex of scutellum (fig. 29) narrowly rounded; scutellum 1.15 times as long as broad; forewing of female (fig. 17) on lower surface of speculum with some hairs; hypopygium as seen fig. 20 *Ormyrus viridiaeneus* (Ratzeburg)
- Female : gaster (figs. 25, 26) with 3th tergum with 2; 4th tergum with 4; 5th tergum with 5 rows of deep foveolae; in male : 3th tergum with 3; 4th tergum with 4 rows of deep foveolae; apex of scutellum broadly rounded; scutellum as long as to only slightly longer than broad; forewing of female (fig.24) on lower surface of speculum almost bare or at most with only a few hairs; hypopygium as seen fig. 27 *Ormyrus punctiger* Westwood

Ormyrus bingoeliensis n.sp.

(Figs. 6-10)

Female : Length of body (including ovipositor sheaths) 6.0-6.5 mm. Body black with metallic blueish-green reflection; antennae brown; tibiae testaceous, tarsi basally pale yellow, apically testaceous, pretarsi apically brown; wings hyaline, venation yellow.

Head minutely reticulated, except sides of frons with some rugae, and face transversely striated. Relative measurements : width of head 34; height 22; length 14; width of frons 18; OOL 3; POL 7; eye 15:12; malar space 7; mouth opening 14; length of scapus 14 (this reaching slightly above level of median ocellus); flagellum plus pedicellus 34. Head strongly transverse, 2.5-2.6 times as wide as long; antennae (fig.7) with pedicellus in lateral view 2.66 times as long as broad; annelli 1.4 times as broad as long; second annellus slightly wider and longer than the first; funicular segments subequal in length and breadth, except sixth which is slightly shorter, first five funicular segments longer than broad, with at least three rows of sensillae; clava about twice as long as broad.

Thorax strongly convex, densely and transversely striated, 1.37 times as long as broad; scutellum slightly longer than broad, with truncate apex which is distinctly jutting above dorsellum, the latter longitudinally and minutely striated, one-third as long as propodeum in middle; propodeum longitudinally striated, middle one-third flat, distinctly elevated, sides of this part with distinct carinae; distance between spiracles 3.3 times the

length of propodeum in middle. Forewing (fig.8) with basal cell bare, only a few hairs on cubital hair line distally; speculum open below, with some hairs on the lower surface of the wing; marginal vein 3.3 times as long as postmarginal vein, the latter twice as long as stigmal vein; submarginal vein twice as long as marginal vein.

Gaster (figs. 9, 10) slightly shorter than twice as long as head plus thorax combined; gastral dorsum with distinct median carina; first tergite with basal fovae occupying one-third of the tergite, tergite minutely but distinctly reticulated, except around the fovae which is smooth; second tergum very short dorsally; third and fourth terga about equal in length dorsally; fifth about as long as third and fourth terga combined; third to fifth terga with a row of longitudinal tubercles, elevated from minutely reticulated surfaces of the terga, tips of the tubercles with long hair; 3rd tergum with 2; 4th and 5th terga with 4 rows of deep foveolae; sixth tergum on basal half with three irregular rows of short triangular tubercles, tip of which with long hair, apical half of the tergite almost smooth, only weakly reticulated; epipygium long, about 1.8 times as long as height in lateral view; ovipositor sheaths about two-third as long as epipygium dorsally; hypopygium as seen fig. 6.

Male : unknown.

Biology : reared from cynipid galls on oak.

Holotype (female), Turkey, Bingöl, Genç, 13. VIII. 1975. ex cynipid gall on *Quercus* sp. (Doğanlar), deposited in the Museum of Plant Protection Department, Tokat Agriculture Faculty.

Paratype : 1 female, 13.II.1975. (Lab reared), same locality and host as the holotype.

Ormyrus bingoeliensis n.sp. closes to *O. nitidulus* (F.) and *O. flavitibialis* Yasumatsu and Kamijo. The new species differs from the both species in having the funicular segments with at least three rows of short sensillae; speculum open below; epipygium 1.8 times as long as height laterally (in the both species funicular segments with at most two rows of long sensillae (figs. 1, 2), speculum closed below (fig. 2)); epipygium as long as or only slightly longer than height laterally (figs. 4, 5 and figs. 6-9 of Yasumatsu and Kamijo, 1979), and some more characters mentioned in the key.

Avrasyamyrus gen. n

(Figs. 31-37)

Type species: *Ormyrus orientalis* Walker

Name from Avrasya=Euroasia in Turkish and *Ormyrus*; masculine gender.

Body black with metallic bluish-green reflection, head strongly reticulated, with some punctations on vertex; antennae with two annelli and six funicular segments; clava of both sexes without micropilosity; antennae inserted only slightly above level of vent-

ral edge of eyes; scapus not reaching above the level of median ocellus; occiput with distinct carinae, transversely striated.

Thorax strongly convex; mesoscutum and scutellum transversely and finely reticulated, with some piliferous punctures; apex of scutellum distinctly jutting above dorsellum, broadly truncate (fig. 34).

Gaster sesile, first tergum covering almost one-third of the gaster, completely reticulated; gaster with a median keel on dorsum of 3rd to 5th terga of female; 4th tergum with two rows and 5th tergum with 4 rows of deep foveolae, between foveolae and longitudinal tubercles on the terga with some rugosities and reticulations; in male : gaster laterally margined and tips of terga concealed each other ventrally, 3rd tergum with 2 rows, 4th and 5th terga with 3 rows of deep foveolae (figs. 35, 36). Forewing and hypopygium as seen figs. 33 and 37 respectively.

Avrasyamyrus belongs to Ormyridae. Up to now, in the family, only number of annelli was used for separating the genera or the species groups of *Ormyrus* Westwood which has been regarded as a single distinctive genus of the family. By this study, it is found that the characters on the gaster i. e. presence or absence of a median keel in female and lateral carinae in male, and of deep foveolae on tergites are very important in order to distinguish the genera of the family, as seen in the key.

The new genus differs from all of the other genera by the presence of median keel on dorsum of female gaster and lateral carinae on that of male; in having 4th tergum with two and 5th tergum with four rows of deep foveole in females, and 3rd tergum with 2; 4th and 5th terga with 3 rows of deep foveolae in male, and some more characters as seen in the key.

Avrasyamyrus orientalis (Walker) comb. n. Europe, Near East, Oriental Region. =*Ormyrus orientalis* Walker 1871, 65; =*Ormyrus hungaricus* Erdoes 1946, 75-81, synonymized by Bouček (1977). Parasite in galls of Trypetidae on Compositae (Bouček, 1977). Collected from flowerhead of *Centaurea sadleriana*, *C. pannonica* and *Carduus acanthoides* (Erdoes, 1955; Wall, 1984); swept from fields of *Medicago sativa* (Doğanlar, 1984); 5 females, 6 males, Adana, 25. VII.-22.VIII.1983 (Doğanlar), 25 females, 32 males, Tokat, 4. IV.-20.IX.1989 (Çam), all swept from flowerheads of *Centaurea iberica*; 2 female, Antalya, August, 1987, reared from flowerheads of *Echinops* and *Cirsium* (Alp).

Özet

Ormyrus cinsinden yeni bir tür ve Ormyridae familyasından yeni bir cinsin deskripsiyonu ile bu familyanın bazı taksonlarının sistematik durumları.

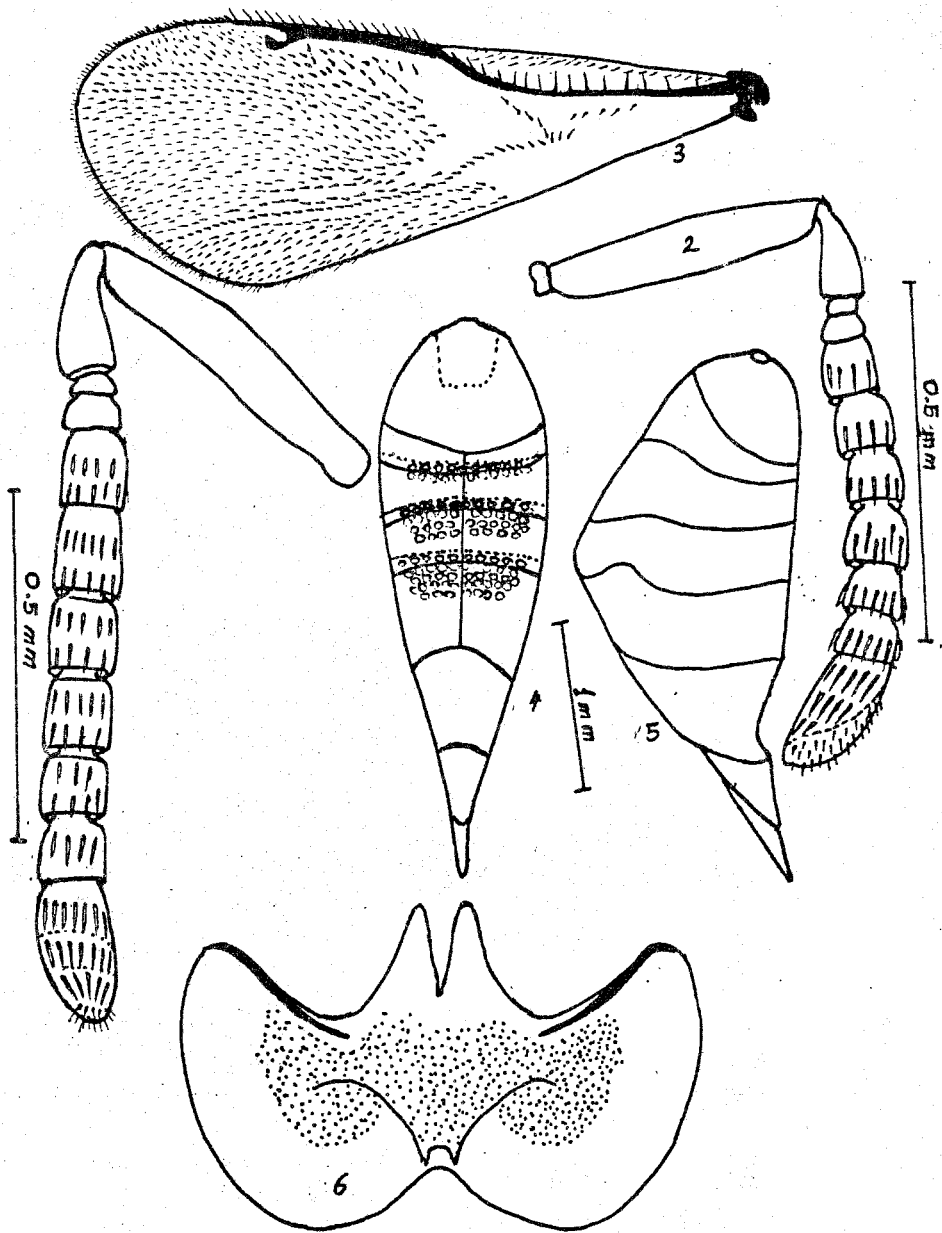
Bu çalışmada Ormyridae familyasına bağlı *Avrasyamyrus* gen. n. ve *Ormyrus bingoliensis* sp.n. taksonlarının deskripsiyonları yapılmakta, ayrıca bu familyaya bağlı bazı taksonlar ele alınarak sistematik durumları tartışılmaktadır.

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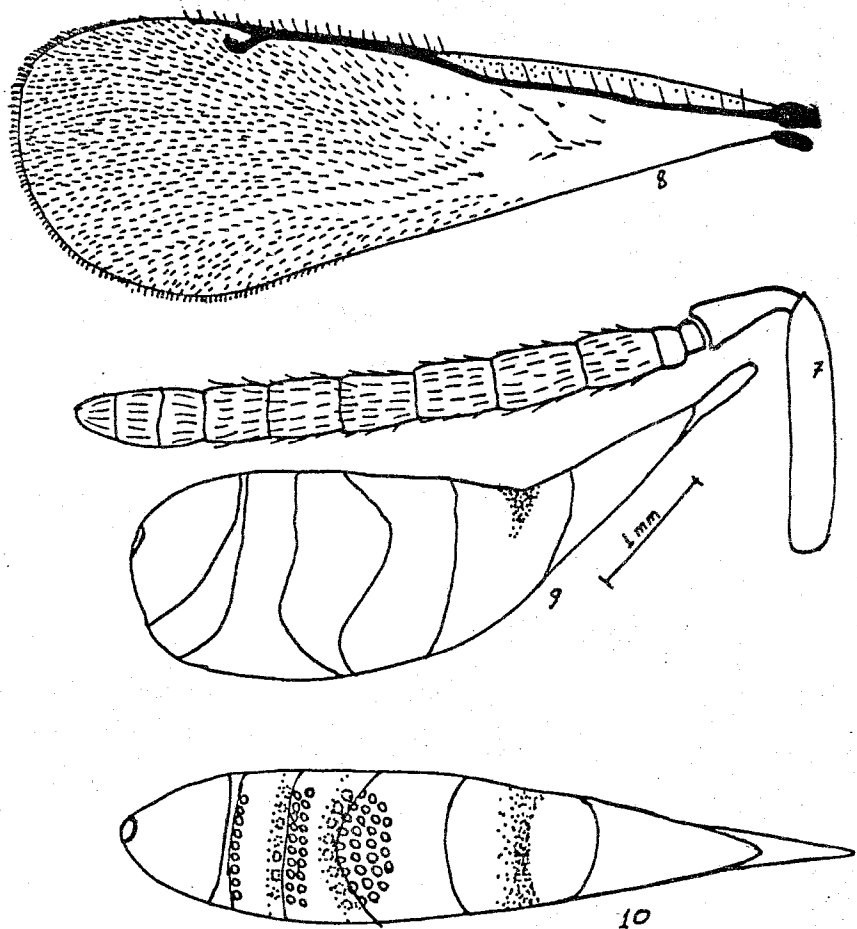
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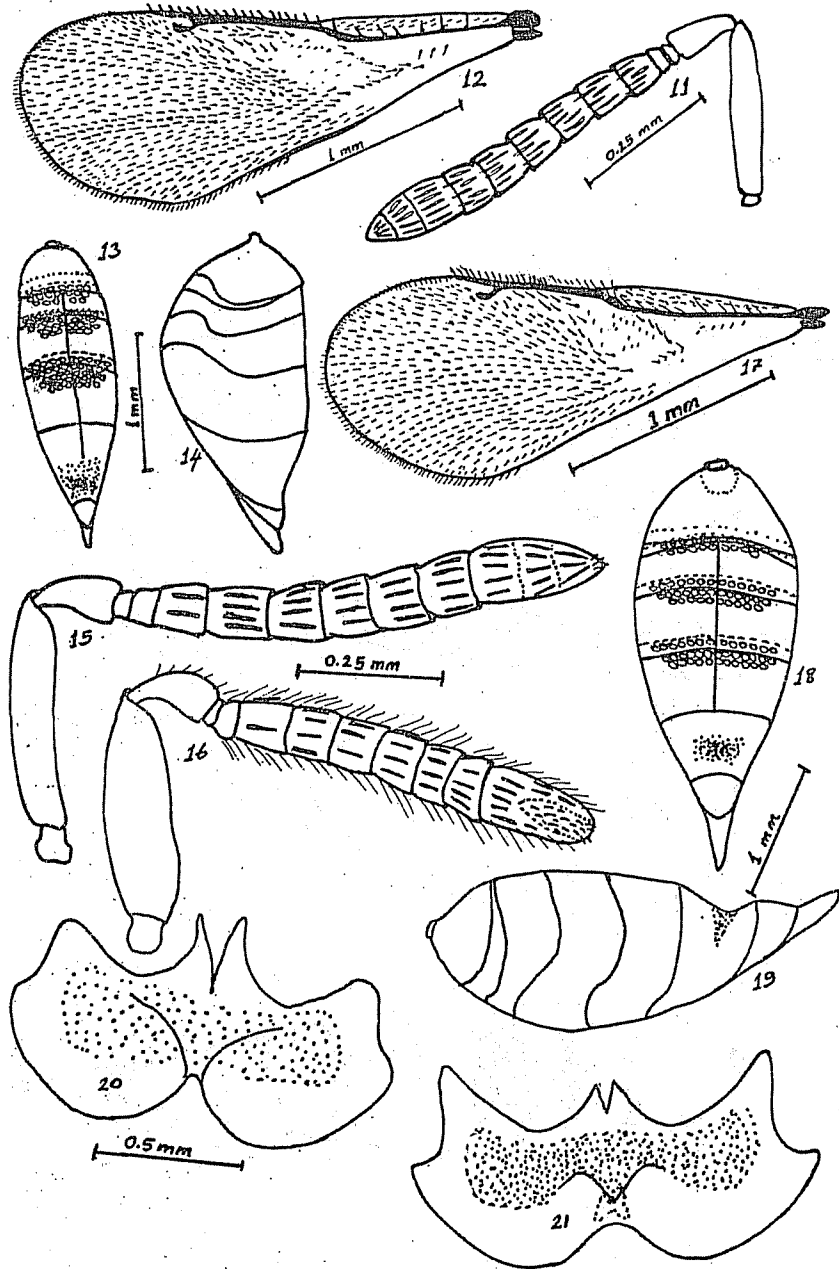
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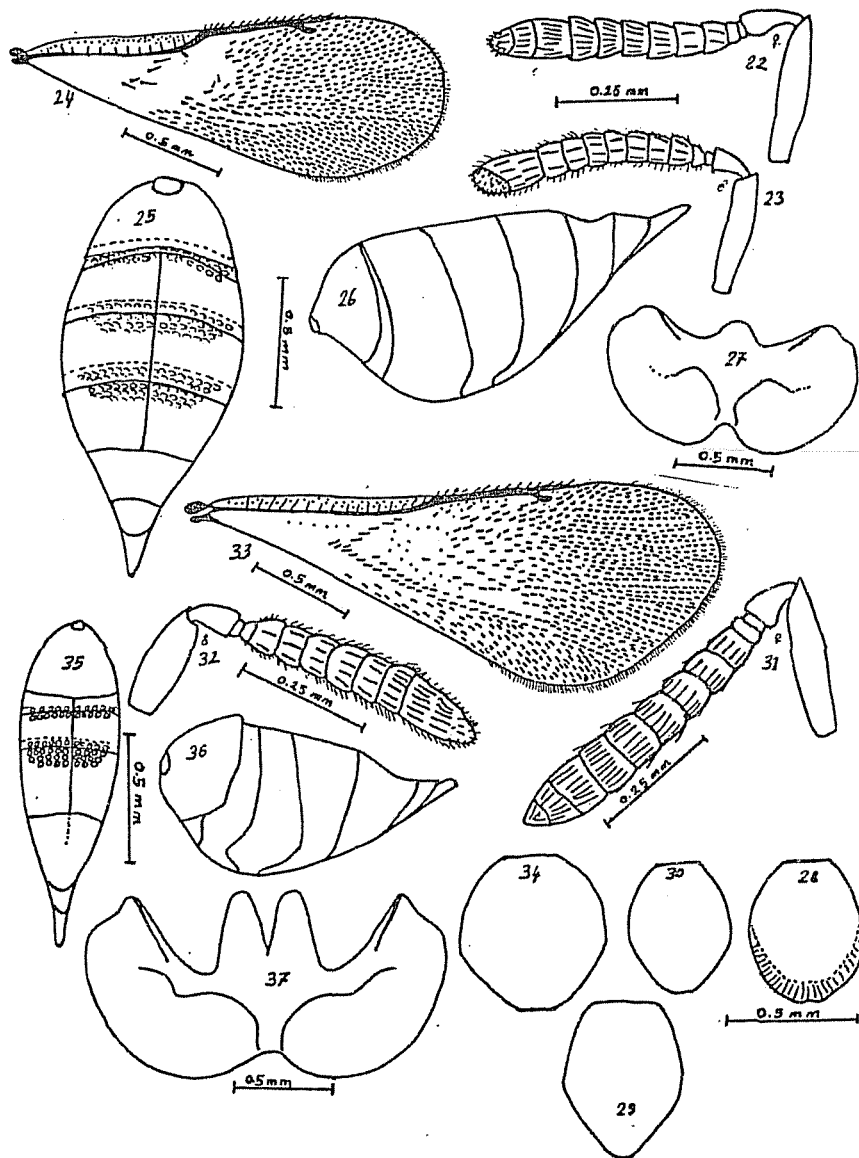
Figs. 1-5, *Ormyrus nitidulus* (F.). 1-2, antennae, 1, female; 2, male; 3, female forewing; 4-5, gaster (in dorsal and lateral view); 6, *Ormyrus bingoeliensis* n. sp., hypopygium



Figs. 7-10, *Ormyrus bingoliensis* n.sp., female, 7, antenna; 8, forewing; 9-10, gaster (in lateral and dorsal view)



Figs. 11-14, *Ormyrus rufimanus* (Mayer), female, 11, antenna; 12, forewing; 13-14, gaster (in dorsal and lateral view); 15-20, *Ormyrus viridiaeneus* (Ratzeburg), 15-16, antennae, 15, female; 16, male; 17, female forewing; 18-19, gaster (in dorsal and lateral view); 20 hypopygium; 21, *O. rufimanus*, hypopygium



Figs. 22-27, *Ormyrus punctiger* Westwood, 22-23, antennae, 22, female; 23, male; 24, female forewing; 25-26, gaster (in dorsal and lateral view); 27, hypopygium; 28-30, scutellum, 28, *O. rufimanus*; 29, *O. viridiaeneus*; 30, *O. punctiger*; 31-37, *Avrasyamyrus orientalis* (Walker), 31-32, antennae, 31, female; 32, male; 33, female forewing; 34, scutellum; 35-36, gaster (in dorsal and lateral view); 37, hypopygium