

**REVISION OF THE *CYANELLUS* SPECIES GROUP OF  
*ENTEDON* DALMAN (HYMENOPTERA: EULOPHIDAE),  
WITH DESCRIPTIONS OF NEW SPECIES**

**Mikdat Doğanlar\* and Oğuzhan Doğanlar\*\***

\* Mustafa Kemal University, Faculty of Agriculture, Department of Plant Protection, TR-31034, Hatay, TURKEY. E-mail: doganlar@mku.edu.tr

\*\* Ağrı İbrahim Çeçen University, Science and Art Faculty, Department of Biology, 04200, Ağrı, TURKEY. E-mail: doganlar@yahoo.com.tr

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ABSTRACT: Eight species of the *cyanellus* species group of genus *Entedon* Dalman (Hymenoptera: Eulophidae: Entedoninae) were collected in Turkey: *E. cyanellus* Dalman, *E. biroi* Erdős, *E. parvicar* Thomson, *E. pallicrus* Erdős, and the four new species, *E. arabanensis* n. sp., *E. sarkislaensis* n. sp., *E. susuzensis* n. sp., *E. gumushanensis* n. sp. Hypopygia of the species, except *E. susuzensis* and *E. gumushanensis*, were studied. Identification keys to the Turkish species of the *cyanellus* species group of *Entedon* were provided.

KEY WORDS: Hymenoptera (Eulophidae), *cyanellus* species group of *Entedon*, Turkey.

The species group *cyanellus* was proposed by Graham (1963) for the association of *Entedon cyanellus* Dalman, 1820, *E. pallicrus* Erdős, 1944, *E. metatarsalis* Thomson, 1878, *E. subovatus* Thomson, 1878, and *E. parvicar* Thomson, 1878. Later Graham (1971) revised the species of the group, and include to the species group of *cyanellus* the following species: *Entedon subimpressus* Thomson, 1878, *E. cyanellus*, *E. pallicrus* Erdős, 1944, *E. subovatus*, *E. parvicar*, *E. biroi* Erdős, 1944 and *E. astragali* Erdős, 1944, and stated that the species sharing the characters as follow: missing frontal sulcus, oral fossa 2.5-4.5 times as long as malar space, anterior margin of clypeus produced forwards, fore tibia with two longitudinal white stripes, POL (post ocellar distance) nearly or quite twice OOL (ocello-ocular distance), hind ocelli separated by 1-1.75 times their own major diameter from eyes, fore wing speculum open below, basal vein normally bare, three segmented male funicle. Askew (1992) proposed some corrections to the species group structure, and to include *E. sylvestris* Szelenyi, 1981 in the species group *cyanellus* because of presence of two hardly discernible stripes on the fore tibia, while the rest have fore tibiae wholly darkened. Gumovsky (1999) studied the type series and numerous (about 1000) other specimens of *E. sylvestris* (HNHM), and placed it in the *costalis* species group of *Entedon*.

Gumovsky (1997, 1999) gave the following essential apomorphies of the species group *cyanellus*: missing frontal fork, anterior margin of clypeus produced forwards, fore tibia with two longitudinal white stripes, propodeum without true (complete, margined at both sides) lateral sulcus, and described of the group. Gumovsky (1999) stated that this group includes *E. angorensis* Gumovsky, 1999, *E. biroi*, *E. calvescentitus* Szelenyi, 1977, *E. cyanellus*, *E. ductus* Szelenyi, 1977, *E. intumescens* Szelenyi, 1977, *E. jozsefi* Gumovsky, 1999, *E. marusuki* Gumovsky, 1999, *E. levadae* Gumovsky, 1999, *E. pallicrus*, and *E. parvicar*.

In Turkey, Doğanlar (1985) recorded *E. biroi*, *E. parvicalcar*, and *E. pallierus* from the *cyanellus* species group and some other species of *Entedon* from the Eastern Anatolia. Gumovsky (1999) described *E. angorensis* from Ankara province, and Gumovsky & Boyadzhiev (2003) gave some species of the group from Bulgaria and Trace.

The morphology of hypopygia in the taxonomy of Pteromalidae (Hymenoptera: Chalcidoidea) has been studied for separating the species of *Mesopolobus* Westwood, 1833 by Graham (1969), for the species of *Pachyneuron* Walker, 1833 and *Euneura* Walker, 1844 by Doğanlar (1986) and for the species of *Dibrachys* Förster, 1856 by Doğanlar (1987). In the taxonomy of Eulophidae (Hymenoptera: Chalcidoidea) Graham (1987, 1991) used the morphology of hypopygia in the classification of species of some genera in Tetrastichinae, Doğanlar (1991a,b) for some species of Ormyridae, and Tarla et al. (2010) for species of genus *Oopristus* Steffan, 1968 in Monodontomerinae (Torymidae).

In this work the morphology of hypopygia and some other morphological characters of the species in the *cyanellus* species group of *Entedon* were treated as diagnostic characters for the systematic of the species from Turkey, and the new species were described. Aids of some morphological characters a new identification key was created for the species of the *cyanellus* species group of *Entedon* in Turkey.

## MATERIAL AND METHODS

This study is based upon examination and identification of the specimens collected from several parts of Turkey. The examined specimens were deposited in Insect Museum of Plant Protection Department, Agriculture Faculty, Mustafa Kemal University, Antakya, Hatay, Turkey (MKUI). Specimens were collected by sweeping and putting the whole contents of the swept materials directly in 96 % ethanol. After sorting the material, individuals were mounted on cards for further morphological studies. The species were identified by following the keys of Graham (1971), Gumovsky (1999) and Gumovsky & Boyadzhiev (2003). The hypopygia were separated from metasoma by dissecting and slide mounted in Canada balsam, the other parts of the metasoma were replaced on its own card near its mesosoma. Wings and antennae of some paratypes were slide-mounted in Canada balsam. Photographs of diagnostic characters of the genera were taken by using of Leica DM 5500 B microscope with a digital Leica DFC 295 camera attached to it.

### Terminology and abbreviations

Morphological terminology follows Graham (1969) in hypopygia as in Fig. 1, Gibson (1997) and Gumovsky & Boyadzhiev (2003). Abbreviations used in the key and descriptions are: OOL= shorter distance between ocello-ocular line POL= distance between posterior ocelli, F1-4= funicular segments. The name of some parts of hypopygium given in Fig. 1.

## RESULTS AND DISCUSSION

### Key to female of the species of the *cyanellus* species group of *Entedon*

- 1- Mid and hind tibiae wholly pale (mostly white) (Fig. 4b,c); eye height 4.2 times as long as malar space; antenna (Fig. 4a) with scape 5.6 times as long as broad; metasoma 1.3 times as long as broad; hypopygium (Fig. 4d,e) with median area circular, with median sclerotized line complete.....*Entedon pallierus* Erdős  
 - Mid and hind tibiae at least with narrow basal dark band; other characters variable.....2

- 2- Mid and hind tibiae at least their distal third pale (Figs. 5b,c; 6b,c; 7b,c; 8b,c).....3  
 - Mid and hind tibiae at most their distal quarter or less pale (Figs. 9b,c; 10b,c; 11b,c).....6  
 3- Mid and hind tibiae with basal dark band almost margined at both ends, covering 1/4 of total length of tibiae (Fig. 5b,c); eye height 5.5 times as long as malar space. Antenna (Fig. 5a) with scape 3.5-3.75 times as long as broad. Metasoma ovate, slightly longer than broad; hypopygium (Fig. 5d,e) with median area quadrangular, median sclerotized line medially almost absent.....*Entedon biroi* Erdős  
 - Mid and hind tibiae with basal dark band at least covering their basal 1/3, lower margin of this dark band washed out; other characters variable.....4  
 4- Basal dark band of mid tibia longer than the band of hind tibia (Fig. 6b,c); eye height 4.8-5.67 times as long as malar space; antenna (Fig. 6a) with scape 3.14-3.43 times as long as broad. Metasoma 1.73 times as long as broad; hypopygium (Fig. 6d,e) with median area circular, median sclerotized line complete.....*Entedon arabanensis* n. sp.  
 - Basal dark band of mid and hind tibiae almost equal in breadth (about 1/3-2/3 of length of the tibia), or hind band somewhat broader than mid one (Figs. 7b,c; 8b,c); other characters variable.....5  
 5- Head in frontal view 1.4 times as broad as high; POL 2.1-2.4 OOL; breadth of oral fossa about 5.0 times as long as malar space; Antenna (Fig. 7a) with scape 6 times as long as broad; pedicel 2.0 times as long as broad, 0.6-0.8 times as long as F1; the latter 2.0-2.25 times as long as broad, and 1.14-1.3 times as long as F2; F2 almost twice as long as broad, F3 1.3 times as long as broad. Metasoma ovate, slightly shorter than broad; hypopygium as in Fig. 7d,e.....*Entedon parvicar* Thomson  
 -Head in frontal view 1.32 times as broad as high; POL 3.33 OOL; breadth of oral fossa about 8.0 times as long as malar space. Antenna (Fig. 8a) with scape 2.75 times as long as broad, pedicel 1.66 times as long as broad, almost as long as F1; the latter 1.5 times as long as broad, and 1.8 times as long as F2; F2 and F3 subquadrate. Metasoma long-ovate, about 1.5 times longer than broad; hypopygium as in Fig. 8e.....*Entedon sarkislaensis* n. sp.  
 6- Forewing with fumation below marginal vein (Fig. 9d); clypeus almost smooth; head in frontal view 1.4 times as broad as high. Breadth of oral fossa about 5.67 times as long as malar space. Eye height 3.57 times as long as malar space. Combined length of pedicel and flagellum 0.9 times as long as breadth of head. Antenna (Fig. 9a) with scape 5.7 times as long as broad, 0.76 times as long as eye height; pedicel 2.4 times as long as broad, 0.67 as long as F1; the latter twice as long as broad, and 1.38 times as long as F2; F2 1.85 times, and F3 1.3 times as long as broad; clava twice as long as broad. Metasoma long, about 1.9 times longer than broad.....*Entedon susuzensis* n. sp.  
 -Forewing hyaline, without fumation below marginal vein; clypeus reticulate; other characters variable.....7  
 7-Eye height 3.6-4.6 times as long as malar space. Antenna (Fig. 10a) with scape 5.0-6.25 times as long as broad; pedicel about 0.4-0.75 as long as F1; the latter 1.83-5.0 times as long as broad, clava 1.66-3.25 times as long as broad. Hypopygium (Figs. 11d,e) with anterior median incision broadly C-shaped, basally straight, antero-lateral angle with tip tapering, towards median incision slightly concaved; anterior lobe much narrower than posterior lobe which is distally circular, median area distinctly longer than broad, posterior median incision as in Fig. 10e.....*Entedon cyanellus* Dalman  
 - Eye height 5.0 times as long as malar space. Antenna (Fig. 11a) with scape 3.14-3.27 times as long as broad; pedicel about 1.14-1.16 as long as F1; the latter about 1.3-1.55; clava about 1.25-1.4 times longer than broad. Hypopygium (Fig. 11d,e) with anterior median incision broadly U-shaped, anterior lobe circular, antero-lateral angle towards median incision almost straight; posterior lobe distally circular, but narrowing towards median incision; median area and posterior median incision as in Fig. 11e.....*Entedon gumushanensis* n. sp.

### Key to male of the species of the *cyanellus* species group of *Entedon*

- 1- Mid and hind tibiae wholly pale (mostly white); antennae (Fig. 2c) with scape 3.25 times as long as broad, F2 1.33 times as long as broad, F3 almost quadrate. Metasoma long-ovate, about 1.73 times longer than broad.....*Entedon palli* Erdős

- Mid and hind tibiae at least with narrow basal dark band; other characters variable.....2
- 2- Antennae (Fig. 3c) with scape 5.0-6.25 times as long as broad, F2 1.6-3.6 times, and F3 1.2-1.8 times as long as broad. Metasoma long-ovate, about 1.2 times longer than broad.....*Entedon cyanellus* Dalman
- Mid and hind tibiae at least their distal third pale; other characters variable.....3
- 3- Mid and hind tibiae with basal dark band almost margined at both ends, covering 1/4 of total length of tibiae; antennae (Fig. 2a) with scape 2.6 times as long as broad, pedicel 2.17 times as long as broad, 0.8 times as long as F1; the latter twice as long as broad, F2 and F3 almost quadrate; clava including spicula 2.3 times as long as broad.....*Entedon biroï* Erdős
- Mid and hind tibiae with basal dark band at least covering their basal 1/3, lower margin of this dark band washed out; other characters variable.....4
- 4- Basal dark band of mid tibia longer than the band of hind tibia; antennae (Fig. 2b) with scape about twice as long as broad, pedicel almost quadrate, 0.83 times as long as F1; the latter 1.33 times as long as broad, F2 1.25 times as long as broad, clava including spicula 2.86 times as long as broad.....*Entedon arabanensis* n. sp.
- Basal dark band of mid and hind tibiae almost equal in breadth (about 1/3-2/3 of length of the tibia), or hind band somewhat broader than mid one; other characters variable.....5
- 5- Antennae (Fig. 3a) with scape 6 times as long as broad, pedicel 2.0 times as long as broad, 0.66 times as long as F1; the latter 2.25 times as long as broad, and 1.2-1.3 times as long as F2; F2 twice as long as broad, F3 subquadrate; clava 1.6-1.9 times as long as broad. Metasoma almost ovate, 1.25 times as long as broad.....*Entedon parvicar* Thomson
- Antennae (Fig. 3b) with scape 2.75 times as long as broad, pedicel 1.66 times as long as broad, almost as long as F1; the latter 1.5 times as long as broad, and 1.8 times as long as F2; F2 subquadrate. Metasoma long-ovate, about 1.62 times longer than broad.....*Entedon sarkislaensis* n. sp.

### ***Entedon pallicrus* Erdős**

(Figs. 4a-e; 2c)

*Entedon pallicrus* Erdős, 1944: 52. ♀♀, ♂♂,

*Entedon pallicrus* Erdős: Graham, 1963: 193; Graham, 1971: 341; Gumovsky, 1999: 170-172.

**Type material:** given by Gumovsky (1999).

**Material examined:** Turkey: Ağrı, Tahir kav., 1♀, 18.vii. 2012, swept from pasture (O. & M. Doğanlar); Erzurum, 1♀, 2♂♂, 26.vi.-25.vii. 1976, 1♂, 22.vi. 1980, swept from *Medicago sativa* field (H. Özbek); Tokat, Taşçiftlik, 1♂, 29.viii. 1986, 1♀, 02.viii. 1989, swept from pasture (H.Çam); Sivas, cent. Keçili vil. 1♂, 19.vi. 2003 (O. Doğanlar). Ukraine: Kiev, Lubitika, 1♂, 27.vii. 2008, swept from pasture (M. Doğanlar); Pekari vil. 1♂, 03.vii. 2008, swept from pasture (M. Doğanlar); Crimtia: Karadağ, 1♂, 19.viii. 2008, swept from pasture on river side (M. Doğanlar).

**Diagnosis:** Both sexes: Mid and hind tibiae wholly pale (mostly white) (Fig. 4b,c); Female; head in dorsal view 2.26 times as broad as long, in frontal view 1.45 times as broad as high; POL 2.2 OOL; breadth of oral fossa 5.0 times as long as malar space; eye height 4.2 times as long as malar space; combined length of pedicel and flagellum 0.66 times as long as breadth of head; antenna (Fig. 4a) with scape 5.6 times as long as broad; pedicel 2.25, F1 1.66, F2 and F3 1.2-1.3, times as long as broad, clava 1.76 as long as broad; metasoma 1.3 times as long as broad; hypopygium (Fig. 4d,e) with anterior median incision broad; anterior lobe circular, anterior lateral angle distinct medially, median area circular, with median sclerotized line complete. Male: antennae (Fig. 2c) with scape 3.25 times as long as broad, pedicel 1.7 times as long as broad, 0.75 times as long as F1; the latter 2.2 times as long as broad, 1.37 times as long as F2; F2 1.33 times as long as broad, F3 almost quadrate, clava two-segmented including spicula 2.67 times as long as broad; Metasoma long-ovate, about 1.73 times longer than broad.

**Description:** given by Gumovsky (1999).

**Biology:** Host: *Apion trifolii* L., *A. apricans* Herbst, *A. pavidum* Germar (Coleoptera, Curculionidae) (Bouček, 1968). Associated with *Trifolium pratense*, *Coronilla varia*, *Lotus corniculatus* (Erdős, 1944; Gumovsky, 1999), *Melilotus* spp. (Graham, 1963).

**Distribution:** Great Britain (Graham, 1963, 1971), Czech Republic, Slovak Republic, Moldova (Bouček & Askew, 1968), Hungary (Erdős, 1944, 1954), Turkey (Doğanlar, 1985). Ukraine, Greece, France, Kazakhstan, Uzbekistan (Gumovsky, 1999).

### *Entedon biroi* Erdős

(Figs. 5a-e; 2a)

*Entedon biroi* Erdős, 1944: 53.

*Entedon biroi* Erdős: Gumovsky, 1999: 174-176.

**Type material:** given by Gumovsky (1999).

**Material examined:** Turkey: Erzurum, 1♀, 1♂, 08.viii. 1976 (M. Doğanlar); 4 ♀♀, 2 ♂♂, 20. VIII.-08.ix. 1978 (H. Özbek, M. Doğanlar); 9 ♀♀, 31 ♂♂, 20-26. vi. 1979 (H. Özbek, M. Doğanlar); 3 ♀♀, 18.vi. 1982 (M. Doğanlar); 6 ♀♀, 3 ♂♂, 12. vi. – 20.vii. 1984 (M. Doğanlar); Ardahan, 2 ♂♂, 15. vii. 1990 (M. Doğanlar); 1♀, 2♂♂, Niğde, Ulukışla, 19. v. 2006 (M. Doğanlar); 2 ♀♀, Nevşehir, 19.v. 2009 (O. Doğanlar); 1♀, Gaziantep, Nizip, Sekili village, 28. iv. 2012 (M. Doğanlar).

**Diagnosis:** Both sexes: Mid and hind tibiae with basal dark band almost margined at both ends, covering 1/4 of total length of tibiae (Fig. 5b,c); Female: antennae (Fig. 5a) with scape 2.6 times as long as broad, pedicel 2.17times as long as broad, 0.8 times as long as F1; the latter twice as long as broad, F2 and F3 almost quadrate; clava including spicula 2.3 times as long as broad; Metasoma long-ovate, about 1.7times longer than broad. Hypopygium (Fig. 5d,e) with anterior median incision broadly C-shaped; anterior and posterior lobes circular; median area quadrangular, median sclerotized line medially almost absent. Male: antennae (Fig. 2a) with scape 2.6 times as long as broad, pedicel 2.17times as long as broad, 0.8 times as long as F1; the latter twice as long as broad, F2 and F3 almost quadrate; clava including spicula 2.3 times as long as broad; Metasoma long-ovate, about 1.7times longer than broad.

**Description:** given by Gumovsky (1999).

**Biology:** Host unknown, associated with fabaceous plants (Gumovsky, 1999).

**Distribution:** Czech Republic, Slovak Republic, Moldova, Hungary (Bouček & Askew, 1968), Erzurum, Turkey (Doğanlar, 1985). Ukraine, Russia, Iran, Uzbekistan (Gumovsky, 1999).

### *Entedon arabanensis* n. sp.

(Figs. 6a-e)

**Diagnosis.** Hypopygium (Fig. 6d,e) with anterior median incision broadly U-shaped, antero-lateral angle straight; posterior lobe distally circular, but narrowing towards median incision, median sclerotized line reaching to anterior median incision of hypopygium, median sclerotized area almost circular; posterior median incision as in Fig. 7e. Metasoma almost as long as head plus mesosoma, about 1.73 times as long as broad; penultimate tergite of metasoma 0.44 times as long as broad, last tergite 0.44 times as long as broad; antenna (Fig. 6a) with scape of female 3.14-3.43 times as long as broad; pedicel about 2.02-2.4 times as long as broad; F1 about 1.14-1.6, F2 1.0-1.3, F3 1.0-1.2 times as long as broad; clava two-segmented, about 1.85-2.17 times longer than broad, twice longer than the preceding segment; eye height 5.5 times as long as malar space; breadth of breadth of oral fossa 4.8-5.67 times as long as malar space; fore wing

2.06 times as long as broad, apical margin with fringe; fore tibiae 1.36, mid tibiae about 1.45 and hind tibia about 1.9 times as long as their tarsi.

### **Description:**

Female. Body length 1.5-2.1 mm. Color of body metallic dark blue, frons with weak greenish tint. Entire antennae dark. Legs (Figs. 6b,c) dark, except knees, 2/5 of distal ends of mid tibiae and 1/2 of hind tibiae, the first three tarsomeres of mid and hind legs, which are pale. Dorsal and ventral pale longitudinal stripes on fore tibia discernible along entire tibia.

Head in dorsal view 2.13 times as broad as long; POL 2.12 OOL. Occipital margin sharp. Eyes sparsely setose, with short setae, eye height 5.5 times as long as malar space. Head in front view 1.25-1.33 times as broad as long. Interocular distance 2.1 times as long as eye breadth. Malar sulcus indicated by a line. Breadth of breadth of oral fossa 5.67-6.67 times as long as malar space. Clypeus reticulate, its anterior margin produced forward. Antennae (Fig. 6a) inserted slightly above the level of ventral eye margin. Pedicel plus flagellum 0.71-0.78 times broad of head. Antennal scape of female 3.14-3.43 times as long as broad; pedicel about 2.02-2.4 times as long as broad, almost as long as F1; F1 about 1.14-1.6, F2 1.0-1.3, F3 1.0-1.2 times as long as broad; clava two-segmented, about 1.85-2.17 times longer than broad, twice longer than the preceding segment; Mesosoma 1.4 times as long as broad. Pronotal collar hardly traceable, posterolateral corners of pronotum evenly rounded. Mesoscutum 1.9 times as broad as long, notauli traceable anteriorly as very fine sutures, posteriorly as shallow depressions; scutellum as long as broad and 1.2 times as long as mesoscutum. Propodeal surface finely reticulate, median carina complete, lateral sulcus incomplete; paraspiracular sulcus deep, complete; supracoxal flange moderate; spiracular elevation with blunt projection below, propodeal callus with 2 long, 4 short setae. Hind coxa reticulate dorsally. Fore femur about 4.1 times as long as broad, fore tibia 5.0 times as long as broad, about 0.9 times as long as its femur; mid femur 3.5 times as long as broad; mid tibia 7.2 times as long as broad, spur of mid tibia 1.33 times as long as breadth of tibia, 1.14 as long as dorsal margin of mid basitarsus; hind femur about 2.6 times as long as broad, hind tibia about 6.7 times as long as broad, spur of hind tibia about 0.71 times as long as breadth of its tibia, and 0.83 times as long as dorsal margin of hind basitarsus. Fore tibiae 1.36, mid tibiae about 1.45 and hind tibia about 1.9 times as long as their tarsi.

Forewing 2.06 times as long as broad; costal cell bare, comparatively wide, 6.67 times as long as broad, 0.9 times as long as marginal vein; subcosta of submarginal vein with 2 dorsal setae, postmarginal vein slightly shorter than stigma vein; speculum open below; apical margin with fringe. Hind wing 4.23 times as long as broad.

Petiole reduced, strongly transverse. Metasoma almost as long as head plus mesosoma, about 1.73 times as long as broad; penultimate tergite of metasoma 0.44 times as long as broad, last tergite 0.44 times as long as broad; Hypopygium (Fig. 6d,e) with anterior median incision broadly C-shaped, antero-lateral angle circular, towards median incision slightly concaved; posterior lobe distally circular, but narrowing towards median incision, median sclerotized line reaching almost middle of hypopygium, posterior median incision as in Fig. 6d,e.

**Type materials.** Holotype, ♀, Turkey: Gaziantep, 2.v. 2008, swept from lent field (M. Doğanlar). Paratypes: 10 ♀♀, 2 ♂♂, same data as Holotype; 2 ♀♀, 1 ♂, Diyarbakır, 3 km to Hilvan, 26. Iv. 2007, swept from *Vicia* sp. Field (M. & O. Doğanlar); 1 ♀, Gaziantep, 5 km from Nizip, side of Nizip-Karkamış road, 17.iv. 2010, (M. Doğanlar); 1 ♀, Şanlıurfa, 15 km to Suruç, side of Nizip-Suruç road, 17.iv. 2010, swept from lent field (M. Doğanlar); 1 ♀, Adıyaman, near Atatürk Barage,

24.iv. 2008, swept from pasture (M. Doğanlar); 1♀, Erzincan, Kemaliye, Yuva village, 18.vi.1982, swept from pasture (M. Doğanlar). All of the types were deposited in MKUI.

**Discussion:** *Entedon arabanensis* n. sp. is similar to *E. angorensis* Gumovsky and *E. calvescentitus* Szelenyi in having mid tibiae with their distal 2/5 and hind tibiae with their distal half pale (Figs. 3b,c); but it differs from the both species in having head in dorsal view 2.13 times as broad as long; POL 2.12 OOL, eye height 5.5 times as long as malar space; breadth of breadth of oral fossa 5.67-6.67 times as long as malar space; antennal scape of female 3.14-3.43 times as long as broad; F1 about 1.14-1.6, F2 1.0-1.3 (in the both species head in dorsal view 2.3-2.5 times as broad as long; POL at least 2.4 OOL; eye height at most 4.66 times as long as malar space; breadth of oral fossa 5 times as long as malar space in *E. calvescentitus*, and 4.6 times in *E. angorensis*; scape at least 5.5 times as long as broad; F1 1.77, F2 1.65 times as long as broad in *E. calvescentitus*, and F1 2.25, F2 1.77, F3 1.2 times as long as broad in *E. angorensis*).

### *Entedon palvicalcar* Thomson

(Fig. 7a-e; 3a)

*Entedon palvicalcar* Thomson, 1878: 244.

*Entedon subovatus* Thomson, 1878: 243; Gumovsky, 1999: 164-167.

*Entedon parvicalcar* Thomson: Erdős, 1944: 51; Graham, 1963: 193-194; Graham, 1971: 341; Gumovsky, 1999: 144-167.

*Entedon subovatus* Thomson: Graham, 1971: 341. ♀♀, ♂♂,

**Type material:** given by Gumovsky (1999).

**Material examined:** Turkey: Erzurum, 1♀, 28.vi. 1976 (H. Özbek); 24 ♀♀, 13 ♂♂, 23. vi.-28. vii. 1978 (H. Özbek.); 7 ♀♀, 3 ♂♂, 24. vii.-08.ix. 1979 (H. Özbek); Sivas, Centrum, Keçili vil., 1♀, 03.vii.2005 (O. Doğanlar); Taşlıdere, 1♀, 1♂, 03.vii. 2005 (O. Doğanlar); Kangal, Tahtalı vil., 1 ♀, 03. vii. 2005 (O. Doğanlar); Kayseri, Pınarbaşı, 1♀, 07. vii. 2005 (O. Doğanlar); Ukraine: Turu, nr. Kaniv, Pishaltniski, 08 ♀♀, 3 ♂♂, (M. Doğanlar).

**Diagnosis:** Both sexes: Basal dark band of mid and hind tibiae almost equal in breadth (about 1/3-2/3 of length of the tibia), or hind band somewhat broader than mid one (Figs. 7b,c). Female: Head in dorsal view 2.0-2.25 times as long as broad; POL 2.1-2.4 OOL; Head in frontal view 1.4 times as broad as high; breadth of oral fossa about 5.0 times as long as malar space; eye height 5.5 times as long as malar space. Combined length of pedicel and flagellum 0.72 times as long as breadth of head. Antenna (Fig. 7a) with scape 6 times as long as broad, 0.6-0.7 times as long as eye height; pedicel 2.0 times as long as broad, 0.6-0.8 times as long as F1; the latter 2.0-2.25 times as long as broad, and 1.14-1.3 times as long as F2; F2 almost twice as long as broad, F3 1.3 times as long as broad; clava 1.6-2.1 times as long as broad. Metasoma ovate, slightly shorter than broad; hypopygium (Figs. 7d,e) with anterior median incision broadly C-shaped, antero-lateral angle circular, towards median incision slightly concaved; posterior lobe distally circular, median sclerotized line reaching to anterior median incision of hypopygium, posterior median incision as in Fig. 8d,e. Male: Antennae (Fig. 3a) with scape 6 times as long as broad, 0.6-0.7 times as long as eye height; pedicel 2.0 times as long as broad, 0.66 times as long as F1; the latter 2.25 times as long as broad, and 1.2-1.3 times as long as F2; F2 twice as long as broad, F3 subquadrate; clava 1.6-1.9 times as long as broad. Metasoma almost ovate, 1.25 times as long as broad.

**Description:** given by Gumovsky (1999).

**Biology:** Host unknown. associated with fabaceous plant.

**Distribution:** Britain, Sweden, Czech Republic, Slovak Republic, Moldova, Hungary, former Yugoslavia (Boucek & Askew, 1968), Turkey (Doğanlar, 1985), Ukraine, Russia (European part, the Caucasus, Siberia), Kazakhstan (Gumovsky, 1999).

***Entedon sarkislaensis* n.sp.**

(Figs. 8a-e; 3b)

**Diagnosis.** Hypopygium (Fig. 8d,e) with anterior median incision broadly U-shaped, antero-lateral angle straight; posterior lobe distally circular, but narrowing towards median incision, median sclerotized line reaching to anterior median incision of hypopygium, median sclerotized area almost circular; posterior median incision as in Fig. 8e. Metasoma almost as long as head plus mesosoma, about 1.73 times as long as broad; penultimate tergite of metasoma 0.44 times as long as broad, last tergite 0.44 times as long as broad; antenna (Fig. 8a) with scape of female 3.14-3.43 times as long as broad; pedicel about 2.02-2.4 times as long as broad; F1 about 1.14-1.6, F2 1.0-1.3, F3 1.0-1.2 times as long as broad; clava two-segmented, about 1.85-2.17 times longer than broad, twice longer than the preceding segment; eye height 5.5 times as long as malar space; breadth of breadth of oral fossa 4.8-5.67 times as long as malar space; fore wing 2.06 times as long as broad, apical margin with fringe; fore tibiae 1.36, mid tibiae about 1.45 and hind tibia about 1.9 times as long as their tarsi.

**Description:**

Female. Body length 1.5-2.1 mm. Colour of body metallic dark blue, frons with weak greenish tint. Entire antennae dark. Legs (Figs. 8b,c) dark, except knees, 2/5 of distal ends of mid tibiae and 1/2 of hind tibiae, the first three tarsomeres of mid and hind legs, which are pale. Dorsal and ventral pale longitudinal stripes on fore tibia discernible along entire tibia.

Head in dorsal view 2.13 times as broad as long; POL 2.12 OOL. Occipital margin sharp. Eyes sparsely setose, with short setae, eye height 5.5 times as long as malar space. Head in front view 1.25-1.33 times as broad as long. Interocular distance 2.1 times as long as eye breadth. Malar sulcus indicated by a line. Breadth of breadth of oral fossa 5.67-6.67 times as long as malar space. Clypeus reticulate, its anterior margin produced forward. Antennae (Fig. 8a) inserted slightly above the level of ventral eye margin. Pedicel plus flagellum 0.71-0.78 times broad of head. antennal scape of female 3.14-3.43 times as long as broad; pedicel about 2.02-2.4 times as long as broad, almost as long as F1; F1 about 1.14-1.6, F2 1.0-1.3, F3 1.0-1.2 times as long as broad; clava two-segmented, about 1.85-2.17 times longer than broad, twice longer than the preceding segment; Mesosoma 1.4 times as long as broad. Pronotal collar hardly traceable, postero-lateral corners of pronotum evenly rounded. Mesoscutum 1.9 times as broad as long, notauli traceable anteriorly as very fine sutures, posteriorly as shallow depressions; scutellum as long as broad and 1.2 times as long as mesoscutum. Propodeal surface finely reticulate, median carina complete, lateral sulcus incomplete; paraspicular sulcus deep, complete; supracoxal flange moderate; spiracular elevation with blunt projection below, propodeal callus with 2 long, 4 short setae. Hind coxa reticulate dorsally. Fore femur about 4.1 times as long as broad, fore tibia 5.0 times as long as broad, about 0.9 times as long as its femur; mid femur 3.5 times as long as broad; mid tibia 7.2 times as long as broad, spur of mid tibia 1.33 times as long as breadth of tibia, 1.14 as long as dorsal margin of mid basitarsus; hind femur about 2.6 times as long as broad, hind tibia about 6.7 times as long as broad, spur of hind tibia about 0.71 times as long as breadth of its



tibia, and 0.83 times as long as dorsal margin of hind basitarsus. Fore tibiae 1.36, mid tibiae about 1.45 and hind tibia about 1.9 times as long as their tarsi.

Fore wing 2.06 times as long as broad; costal cell bare, comparatively wide, 6.67 times as long as broad, 0.9 times as long as marginal vein; subcosta of submarginal vein with 2 dorsal setae, postmarginal vein slightly shorter than stigmal; speculum open below; apical margin with fringe. Hind wing 4.23 times as long as broad.

Petiole reduced, strongly transverse. Metasoma almost as long as head plus mesosoma, about 1.73 times as long as broad; penultimate tergite of metasoma 0.44 times as long as broad, last tergite 0.44 times as long as broad; Hypopygium (Fig. 8d,e) with anterior median incision broadly C-shaped, antero-lateral angle circular, towards median incision slightly concaved; posterior lobe distally circular, but narrowing towards median incision, median sclerotized line reaching almost middle of hypopygium, posterior median incision as in Fig. 8d,e.

**Type material.** Holotype, ♀, Turkey: Sivas, Şarkışla, Tavladeresi vil.19.vi. 2003, swept from pasture (O. Doğanlar). Paratypes: 2♀♀, 2♂♂, same data as Holotype; Sivas, Centrum, Gökçekent, Sökün vil. 1♀, 17.vi.2003, swept from pasture (O. Doğanlar); Kayseri, Pınarbaşı, Çukuryurt vil. 2♀♀, 2♂♂, 19.vi.2003, swept from pasture (O. Doğanlar); Erzurum, Kandilli, 2♀♀, 12.vi.1982, swept from pasture (M. Doğanlar); Horasan, Karaçuha, 2♀♀, 2♂♂, 30.v.- 10.vi.1980, swept from pasture (M. Doğanlar); Hatay, Yayladağ, Ayışığı vil.13.iv. 2008, swept from *Vicia sativa* field (M. Doğanlar); Adıyaman, Dut, 1♀, 11.v.2008, swept from *Onobrycis* sp. field (M. Doğanlar); Gaziantep, Nizip, Arat Mnt. 1♀, 04.v. 2006, swept from Lent field (M. Doğanlar); Nurdag, 1100 m, 06.v. 2006, swept from Lent field (M. Doğanlar); From Kahramanmaraş to Gölbaşı Road, Araban turn, 1♀, 02.v. 2008, swept from Lent field (M. Doğanlar). All of the types were deposited in MKUI.

**Discussion:** *Entedon arabanensis* n. sp. is similar to *E. angorensis* Gumovsky and *E. calvescentitus* Szelenyi in having mid tibiae with their distal 2/5 and hind tibiae with their distal half pale (Figs. 3b,c); but it differs from the both species in having head in dorsal view 2.13 times as broad as long; POL 2.12 OOL, eye height 5.5 times as long as malar space; breadth of breadth of oral fossa 5.67-6.67 times as long as malar space; antennal scape of female 3.14-3.43 times as long as broad; F1 about 1.14-1.6, F2 1.0-1.3 (in the both species head in dorsal view 2.3-2.5 times as broad as long; POL at least 2.4 OOL; eye height at most 4.66 times as long as malar space; breadth of oral fossa 5 times as long as malar space in *E. calvescentitus*; and 4.6 times in *E. angorensis*; scape at least 5.5 times as long as broad; F1 1.77, F2 1.65 times as long as broad in *E. calvescentitus*, and F1 2.25, F2 1.77, F3 1.2 times as long as broad in *E. angorensis*).

### ***Entedon susuzensis* n. sp.**

(Figs. 9a-d)

**Diagnosis.** Forewing with fumation below marginal vein (Fig. 9d); clypeus almost smooth; POL 1.5 OOL. head in frontal view 1.4 times as broad as high. Breadth of oral fossa about 5.67 times as long as malar space. Eye height 3.57 times as long as malar space. Combined length of pedicel and flagellum 0.9 times as long as breadth of head. Antenna (Fig. 9a) with scape 5.7 times as long as broad, 0.76 times as long as eye height; pedicel 2.4 times as long as broad, 0.67 as long as F1; the latter twice as long as broad, and 1.38 times as long as F2; F2 1.85 times, and F3 1.3 times as long as broad; clava twice as long as broad, almost twice longer than the preceding segment; fore wing 2.22 times as long as broad, apical margin with fringe. Metasoma long, about 1.9 times as long as broad;

penultimate tergite of metasoma 0.45 times as long as broad, last tergite 0.63 times as long as broad.

### **Description:**

Female. Body length 3.5 mm. Color: head, mesosoma and first tergite of metasoma metallic dark green, rest of metasoma dark blue. Entire antennae dark blue. Legs (Figs. 9b,c) dark, except knees, 1/5 of distal ends of mid and hind tibiae, the first two tarsomeres of mid and hind legs, which are pale. Dorsal and ventral pale longitudinal stripes on fore tibia discernible along entire tibia, fore tarsi dark, forewing (Fig. 9d) with fumation below marginal vein.

Head in dorsal view 2.3 times as broad as long; POL 1.5 OOL. Occipital margin sharp medially. Eyes sparsely setose, with short setae, eye height 3.7 times as long as malar space. Head in front view 1.4 times as broad as long. Interocular distance 3.5 times as long as eye breadth. Malar sulcus indicated by a line. Breadth of breadth of oral fossa 5.67 times as long as malar space. Area between antennal toruli and clypeus almost smooth, anterior margin of clypeus produced forward. Antennae inserted slightly above the level of ventral eye margin. Combined length of pedicel and flagellum 0.9 times as long as breadth of head. Antenna (Fig. 9a) with scape 5.7 times as long as broad, 0.76 times as long as eye height; pedicel 2.4 times as long as broad, 0.67 as long as F<sub>1</sub>; the latter twice as long as broad, and 1.38 times as long as F<sub>2</sub>; F<sub>2</sub> 1.85 times, and F<sub>3</sub> 1.3 times as long as broad; clava twice as long as broad, almost twice longer than the preceding segment.

Mesosoma 1.32 times as long as broad. Pronotal collar hardly traceable, postero-lateral corners of pronotum evenly rounded. Mesoscutum 2.2 times as broad as long, notauli traceable anteriorly as very fine sutures, posteriorly as shallow depressions; scutellum as long as broad and 1.32 times as long as mesoscutum. Propodeal surface almost smooth, median carina complete, lateral sulcus incomplete; paraspiracular sulcus deep, complete; supracoxal flange moderate; spiracular elevation with blunt projection below, propodeal callus with 2 long, setae. Hind coxae reticulate dorsally. Fore femur about 3.3 times as long as broad, fore tibia 8.5 times as long as broad, about as long as its femur, 1.26 times as long as its tarsi; mid femur 3.8 times as long as broad; mid tibia 9.6 times as long as broad, about 1.4 times as long as its tarsi, spur of mid tibia 1.16 times as long as breadth of tibia, as long as dorsal margin of mid basitarsus; hind femur about 3.0 times as long as broad, hind tibia about 6.3 times as long as broad, about 1.5 times as long as its tarsi, spur of hind tibia about 0.63 times as long as breadth of its tibia, and as long as dorsal margin of hind basitarsus.

Fore wing 2.22 times as long as broad; costal cell bare, comparatively wide, 8.0 times as long as broad, about as long as marginal vein; subcosta of submarginal vein with 2 dorsal setae, postmarginal vein slightly shorter than stigmal; speculum open below; apical margin with fringe. Hind wing 3.6 times as long as broad.

Petiole reduced, strongly transverse. Metasoma almost 1.3 times as long as head plus mesosoma, long, about 1.9 times as long as broad; penultimate tergite of metasoma 0.45 times as long as broad, last tergite 0.63 times as long as broad.

**Type material.** Holotype, ♀, Turkey: Kars, Susuz, 12. vii. 2012, swept from *Onobrychis sativa* field (M. Doğanlar). The type was deposited in MKUI.

**Discussion:** *Entedon susuzensis* n. sp. is similar to *E. cyanellus* Dalman and to *E. procioni* Erdős, 1944 of the *hercynia* group of *Entedon* in having mid and hind tibiae with their distal 1/5 pale (Figs. 9b,c), and to *E. procioni* in having forewing infumate, but it differs from *E. cyanellus* in having forewing with fumation below marginal vein (Fig. 9d); clypeus almost smooth; POL 1.5 OOL; pedicel 2.4 times as long as broad; metasoma long, about 1.9 times longer than broad (in *E.*

*cyanellus* forewing hyaline; clypeus reticulated; POL 1.87-2.2 OOL; pedicel 1.77-2.0 times as long as broad; Metasoma long-ovate, about 1.3-1.6 times longer than broad). It differs from *E. procioni* in having clypeus distinctly produced forwards; breadth of breadth of oral fossa 5.67 times as long as malar space; POL 1.5 OOL (in *E. procioni* clypeus with apical margin truncate; breadth of breadth of oral fossa at most 2.4 times as long as malar space; POL at least 2.5 OOL).

### ***Entedon cyanellus* Dalman**

(Figs. 10 a-e)

*Entedon cyanellus* Dalman, 1820: Table VIII.

*Entedon subimpressus* Thomson, 1878: 243 (Gumovsky, 1999)

*Entedon nubilatus* Erdős, 1944: 25 (Gumovsky, 1999)

*Entedon astragali* Erdős, 1951: 225 (Gumovsky, 1999)

*Entedon erdoesi* Szelenyi, 1957 (nec Delucchi, 1954) (Gumovsky, 1999: 151, 155).

**Type material:** given by (Gumovsky, 1999).

**Material examined:** Turkey: Sivas, Taşlıdere, 1♀, 1♂, 03.vii.2005, swept from pasture (O. Doğanlar); Kayseri, Erciyes Mt. 1♀, 07.vii.2005, swept from pasture (O. Doğanlar); Ağrı, Tutak, 1♀, 04.vii.2010, swept from pasture (O. Doğanlar). Ukraine: Kaniv, U-turn to Pschalniy., 5 ♀♀, 1♂, 04.vii.2008 swept from pasture (M. Doğanlar).

**Description:** given by (Gumovsky, 1999).

**Biology:** Solitary parasite of larvae. emergence in early spring from earth cells of the host (Boucek & Askew, 1968). Host: *Tychius quinquepunctatus* L. (Col. Curculionidae) (Szelenyi, 1961; Boucek & Askew, 1968; Gumovsky, 1999), also probably *Apion* sp. (Col. Curculionidae) associated with *Astragallus austriacus*, *A. anobrychidis*, *A. cicer* and *Vicia silvestris* (Gumovsky, 1999).

**Distribution:** Holarctic: Sweden, Hungary (Dalman, 1820; Erdős, 1944, 1951; Boucek & Askew, 1968; Gumovsky, 1999), Mongolia (Szelenyi, 1977; Gumovsky, 1999); Lithuania, Ukraine, Moldova, Kazakhstan, Russia (Siberia), USA: Montana, Colorado (Gumovsky, 1999); Turkey (new record).

### ***Entedon gumushanensis* n. sp.**

(Figs. 11a-e)

**Diagnosis.** Hypopygium (Fig. 12d,e) with anterior median incision broadly U-shaped, anterior lobe circular, antero-lateral angle towards median incision almost straight; posterior lobe distally circular, but narrowing towards median incision, median sclerotized line reaching at most middle of hypopygium; median area and posterior median incision as in Fig. 12 e. Metasoma almost as long as mesosoma, about 1.4 times as long as broad; penultimate tergite of metasoma 0.37 times as long as broad, last tergite 0.4 times as long as broad; Antenna (Fig. 11a) scape of female 3.14-3.27 times as long as broad; pedicel about 1.75 times as long as broad; pedicel 1.14-1.16 as long as F1; F1 about 1.3-1.55, F2 and F3 almost quadrate; clava two-segmented, about 1.25-1.4 times longer than broad, twice longer than the preceding segment; eye height 5.0 times as long as malar space; breadth of mouth opening 4.86-5.4 times as long as malar space; fore wing twice as long as broad, apical margin with fringe; fore tibiae 1.34 and mid tibiae about 1.25 times and hind tibia about 1.07 times as long as their tarsi.

#### **Description:**

Female. Body length 1.3-1.5 mm. Colour of body metallic dark blue, frons with weak greenish tint. Entire antennae dark. Legs (Figs. 11b,c) dark, except knees, 1/5 of distal ends of tibiae and first three tarsomeres of mid and hind legs, which are pale. Dorsal and ventral pale longitudinal stripes on fore tibia discernible along entire tibia.

Head in dorsal view 2.08-2.25 times as broad as long; POL 2.1 OOL. Eye height 5.0 times as long as malar space. Head in front view 1.4-1.57 times as broad as long. Interocular distance 2.9 times as long as eye breadth. Malar sulcus indicated by a line. Breadth of mouth opening 5.33 times as long as malar space. Clypeus reticulate, its anterior margin moderately produced forward. Antennae inserted slightly above the level of ventral eye margin. Pedicel plus flagellum as long as broad of head. Antenna (Fig. 11a) with scape of female 3.14-3.27 times as long as broad; pedicel about 1.75 times as long as broad; pedicel 1.14-1.16 as long as F1; F1 about 1.3-1.55, F2 and F3 almost quadrate; clava two-segmented, about 1.25-1.4 times longer than broad, twice longer than the preceding segment.

Mesosoma almost 1.24 times as long as broad. Pronotal collar broad, carinated, only postero-lateral corners of pronotum rounded. Mesoscutum twice as broad as long, notauli traceable anteriorly as very fine sutures, posteriorly as shallow depressions; scutellum slightly longer than broad and 1.32 times as long as mesoscutum. Propodeal surface finely reticulate, median carina complete, lateral sulcus incomplete; paraspicular sulcus deep, complete; supracoxal flange moderate; spiracular elevation with blunt projection below, propodeal callus with 2 long 4short setae. Hind coxae reticulate dorsally. Fore femur about 3.4 times as long as broad, fore tibia 6.4 times as long as broad, about as long as its femur, 1.34 times as long as its tarsi; mid femur 4.3 times as long as broad; mid tibia 6.66 times as long as broad, about 1.25 times as long as its tarsi, spur of mid tibia as long as breadth of tibia, dorsal margin of mid basitarsus; hind femur about 3.33 times as long as broad, hind tibia about 5.4 times as long as broad, about 1.07 times as long as its tarsi, spur of hind tibia about 0.75 times as long as breadth of its tibia, and 1.5 times as long as dorsal margin of hind basitarsus.

Fore wing twice as long as broad; costal cell bare, comparatively wide, 8.4 times as long as broad, about as long as marginal vein; subcosta of submarginal vein with 2 dorsal setae, postmarginal vein slightly longer than stigmal; speculum open below; apical margin with fringe. Hind wing 3.1 times as long as broad.

Petiole reduced, strongly transverse. Metasoma almost as long as mesosoma, about 1.4 times as long as broad; penultimate tergite of metasoma 0.37 times as long as broad, last tergite 0.4 times as long as broad; Hypopygium (Fig. 11d,e) with anterior median incision broadly U-shaped, anterior lobe circular, anterolateral angle towards median incision almost straight; posterior lobe distally circular, but narrowing towards median incision, median sclerotized line reaching anterior median incision of hypopygium; median area and posterior median incision as in Fig. 11e.

**Type material.** Holotype, ♀, Turkey: Gümüşhane, 17.vi. 2003, swept from pasture (O. Doğanlar). Paratype: 1♀, same data as holotype. All of the types were deposited in MKUI.

**Discussion:** *Entedon gumushanensis* n. sp. is similar to *E. molybdaenus* Erdős and *E. cyanellus* and *E. susuzensis* n. sp. of the *cyanellus* group of *Entedon* in having mid and hind tibiae at most their distal quarter or less pale (Figs. 11b,c); but it differs from *E. susuzensis* in having forewing hyaline (in *susuzensis* forewing distinctly infumate). It differs from *E. cyanellus* in having head in dorsal view 2.08-2.25 times as broad as long, in frontal view 1.4-1.57 times as broad as high; antennae with scape 3.14-3.27 times as long as broad, pedicel 1.14-1.16 as long as F1; the latter 1.5-1.55 times as long as broad, F2 1.0-1.2 times, F3 1.0 times as long as broad; clava 1.25-1.4 times as long as broad; hypopygium with median sclerotized line reaching at most middle of hypopygium (in *E. cyanellus* head in dorsal view 2.4-2.44 times as broad as long, in frontal view 1.28-1.39 times as broad as high; antennae with scape 5.0-6.25 times as long as broad, pedicel 0.4-

0.75 as long as F1; the latter 1.83-5.0 times as long as broad, F2 1.6-3.6 times, and F3 1.2-1.8 times as long as broad; clava 1.66-3.25 times as long as broad; hypopygium with median sclerotized line almost reaching to anterior median incision of hypopygium).

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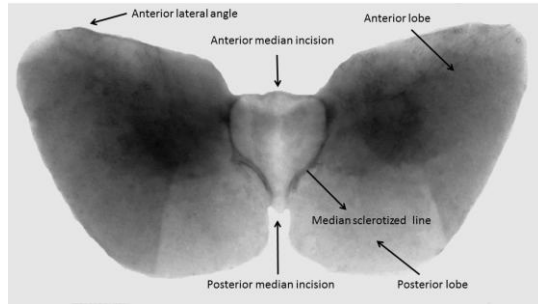


Figure 1. Hypopygium of *Entedon cyanellus* Dalman.

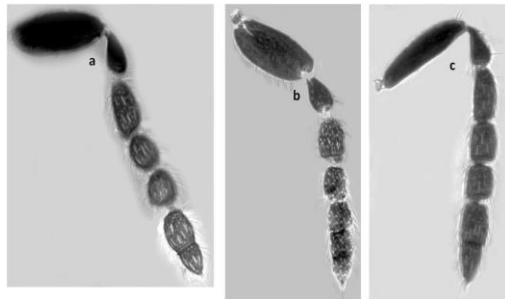


Figure 2. Male antennae. a. *Entedon biroi* Erdős; b. *E. arabanensis* n. sp. c. *E. pallicrus* Erdős.

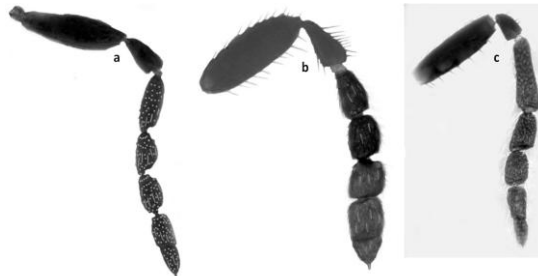


Figure 3. Male antennae. a. *Entedon parvicar* Thomson; b. *E. sarkislanensis* n. sp. c. *E. cyanellus* Dalman.

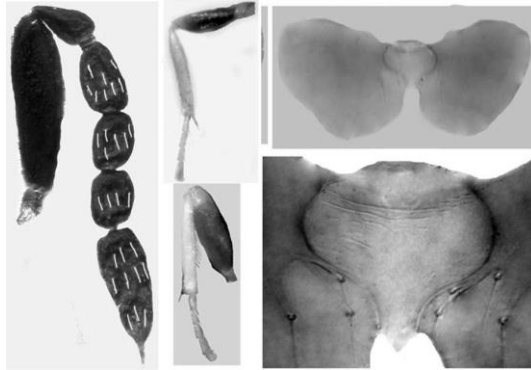


Figure 4. *Entedon palliocrus* Dalman. Female. a. antenna; b. mid leg; c. hind leg; d. hypopygium; e. median area of hypopygium.

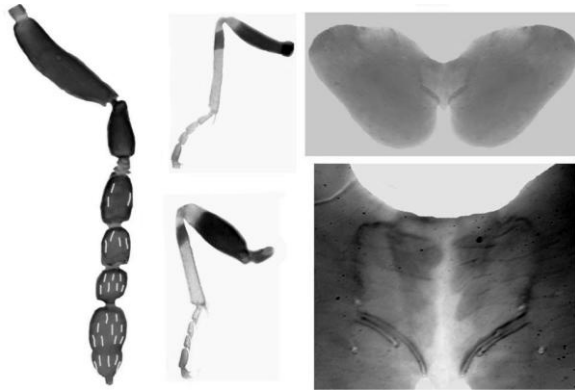


Figure 5. *Entedon biroi* Erdős. Female. a. antenna; b. mid leg; c. hind leg; d. hypopygium; e. median area of hypopygium.

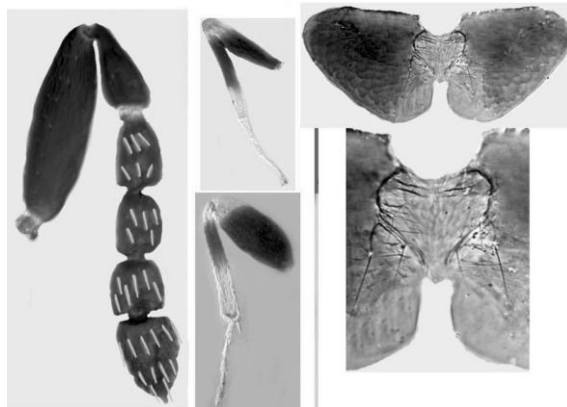


Figure 6. *Entedon arabanensis* n. sp. Female. a. antenna; b. mid leg; c. hind leg; d. hypopygium; e. median area of hypopygium.

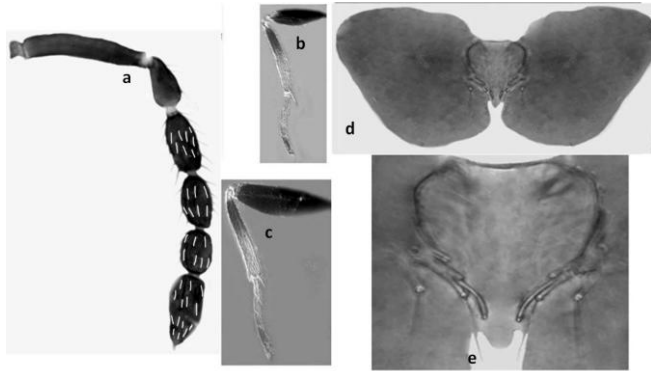


Figure 7. *Entedon parvicarcar* Thomson. Female. a. antenna; b. mid leg; c. hind leg; d. hypopygium; e. median area of hypopygium.

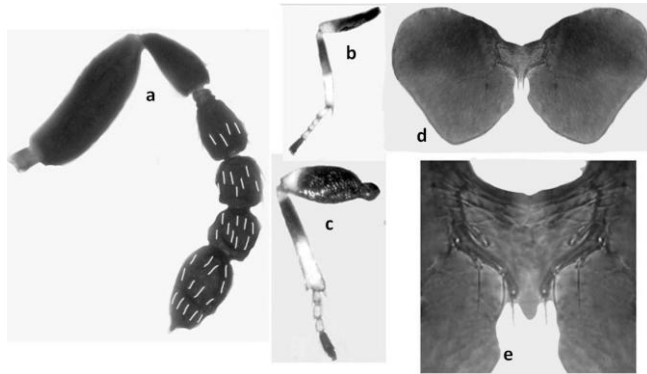


Figure 8. *Entedon sarkislanensis* n.sp. Female. a. antenna; b. mid leg; c. hind leg; d. hypopygium; e. median area of hypopygium.

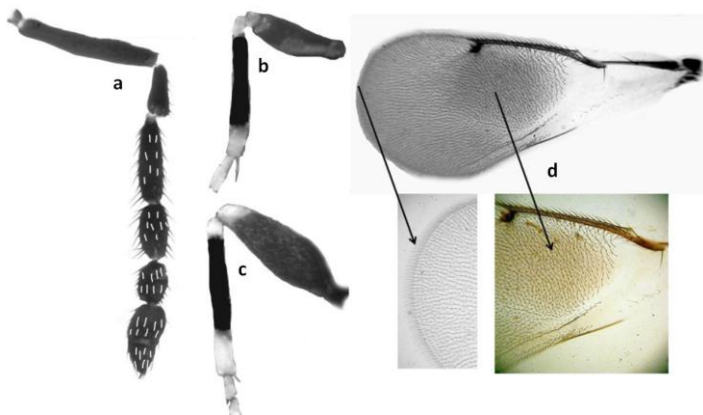


Figure 9. *Entedon susuzensis* n. sp. Female. a. antenna; b. mid leg; c. hind leg; d. forewing.



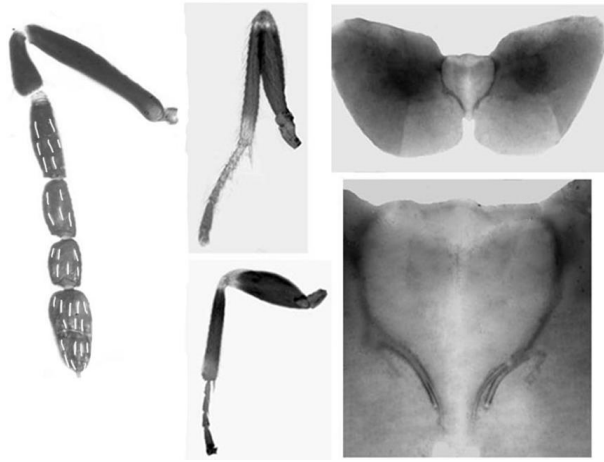


Figure 10. *Entedon cyanellus* Dalman. Female. a. antenna; b. mid leg; c. hind leg; d. hypopygium; e. median area of hypopygium.



Figure 11. *Entedon gumushanensis* n. sp. Female. a. antenna; b. mid leg; c. hind leg; d. hypopygium; e. median area of hypopygium.