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## REVIEW AND TAXONOMIC NOTES ON THE GENUS *DEROSTENUS* (HYMENOPTERA, EULOPHIDAE)

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**Review and Taxonomic Notes on the Genus *Derostenus* (Hymenoptera, Eulophidae).** Gumovsky A. V. — The genus *Derostenus* Westwood, 1833, is reviewed. 7 species are recognized for the genus, 2 of them described for a first time. These are: *D. gemmeus* Westwood (European), *D. punctiscuta* Thomson (European), *D. freemani* Yoshimoto (Nearctic), *D. persicus* sp. n. (Iran), *D. trjapitzini* sp. n. (described from the Russian Far-East), *D. sulciscuta* Hansson (Oriental, East Palearctic) and *D. japonicus* Hansson (Japan). The list of apomorphies of the genus *Derostenus* is supplemented by two characters: the anterior margin of each notaulus marked off by a drop-shape fissure, and the lateral panel of pronotum with a protruding flange. This flange is present as a stub-like process near the notaular fissure in the representatives of the *gemmeus* group, but being present as a plica in the *sulciscuta* group. Also, the representatives of the *sulciscuta* group have the dense brush of setae just in front of the notaular fissure. *D. gemmeus* recorded for a first time in Ukraine, *D. sulciscuta* recorded for a first time in the Russian Far-East (Primorye) and Kuril Archipelago, *D. freemani* recorded for a first time in Wisconsin state (USA). Table of characters distinguishing each species, is given.

**Key words:** Hymenoptera, Eulophidae, Entedoninae, *Derostenus*, morphology, distribution, taxonomy.

**Обзор и таксономические замечания по роду *Derostenus* (Hymenoptera, Eulophidae).** Гумовский А. В. — Проведен обзор рода *Derostenus* Westwood, 1833. 7 видов указывается для рода, 2 из которых описаны как новые: *D. gemmeus* Westwood (Европа), *D. punctiscuta* Thomson (Европа), *D. freemani* Yoshimoto (Неарктическая область), *D. persicus* sp. n. (Иран), *D. trjapitzini* sp. n. (Дальний Восток России), *D. sulciscuta* Hansson (Ориентальная область и Восточная Палеарктика) и *D. japonicus* Hansson (Япония). Список апоморфий рода *Derostenus* пополнен двумя признаками: внутренний край каждого нотаулюса представлен каплевидной щелью, боковая панель переднеспинки с выступающим козырьком. Этот козырек присутствует как короткий выступ около щели нотаулюса у представителей группы *gemmeus*, однако он присутствует как складка у представителей группы *sulciscuta*. При этом у представителей группы *sulciscuta* присутствует густой пучок щетинок напротив нотаулярной щели. *D. gemmeus* впервые указан для Украины, *D. sulciscuta* — для Приморья (Дальний Восток России) и Курильских островов, *D. freemani* — для штата Висконсин (США). В статье приведена таблица для определения видов рода.

**Ключевые слова:** Hymenoptera, Eulophidae, Entedoninae, *Derostenus*, морфология, распространение, таксономия.

### Preface

The genus *Derostenus* is one of the most recognizable genera of Entedoninae. This genus is recorded from the Holarctic and Oriental regions (Hansson, 1986). *Derostenus* is characterized by number of apomorphies, the main of which are: the anterior delimitation of the ocellar triangle and the dense pubescence of temples (Graham, 1959; Yoshimoto, 1973; Schauff, 1991). C. Hansson (1986) revised European, American and Asiatic species of *Derostenus*. He supplemented the generic diagnosis with some more characters, described two new species and proposed the subdivision of this genus in two species groups.

Our studies on World Entedoninae included a detail study on species of this genus. These studies have revealed some new species and some new diagnostic characters which may be interesting for further considerations on phylogeny and morphological variabilities of *Derostenus*.

### Terminology

The style of description follows C. Hansson (1986), with some corrections to morphological terms which generally follow G. Gibson et al. (Annotated..., 1997). The abbreviations used for the depositories are as follows: BMNH — The Natural History Museum, London, UK; SIZK — Schmalhausen Institute of Zoology of the National Academy of Sciences of Ukraine, Kyiv; TAMU — Texas A & M University, College Station, Texas, USA; USNM — National Museum of Natural History, Smithsonian Institution, Washington, D. C., USA; UWM — University of Wisconsin, Madison, USA; UM — Hope Entomological Collections, Oxford University Museum of Natural History, Oxford, UK; ZMUC — Zoological Museum, University of Copenhagen, Denmark; PU — the collection the University of Plovdiv "Paisii Hilendarski" (Plovdiv, Bulgaria).

### Genus *Derostenus* Westwood, 1833

Type species: *Derostenus gemmeus* Westwood, 1833: 496; by original designation.

Habitus. Resembles *Chrysocharis* and some bright-colored *Entedon* species (forms with elongate petiole, and pale subbasal pale spot on gaster in males).

Autapomorphies. Ocellar triangle encircled by a groove anteriorly and also often posteriorly (fig. 5, 8, octr), posteromedian vertex with a cavity, occipital margin with two strong carinae on sides of this cavity, temples densely pubescent with long setae; anterior margin of notaular depression marked off by distinctly margined fissure (fig. 15, 19, nf) anterior margin of lateral panel of pronotum sharply delimited as protruding flange (fig. 19, lf) or stub in area of prothoracic spiracle, and bearing a brush of setae (fig. 14, 15, 19, psb).

Shared characters with:

*Chrysocharis*: antenna with two discoid anelli and one large anellus which also often considered as the first flagellar segment; multidentate mandibles.

*Ionympha*: mouth cavity characteristic with an incision below compound eye.

Some *Entedon*, *Chrysocharis*: anterior margin of clypeus produced, rectangular; petiole slender, distinctly elongate; male gaster with a large pale subbasal spot.

*Pediobius*, some *Chrysocharis*: pronotal collar margined with a complete transverse carina.

Description. See C. Hansson (1986).

Comments. As it was pointed out above, *Derostenus* is easy recognizable in the possession of the mentioned above apomorphies. The last character, the delimitation of the area of prothoracic spiracle, has not been reported earlier. The closeness of the fore prothoracic spiracle is one of the synapomorphies supporting monophyly of Entedoninae (Gumovsky, 2002). In all species of *Derostenus* the spiracle is hidden (as being typical for Entedoninae), but the anterior margin of the lateral panel of pronotum is forming an inflated, protruding laterally impression near the area of prothoracic spiracle. The peculiar structure of the prothoracic spiracular area is an autapomorphy of *Derostenus*, and also is present in two conditions supporting the species-group subdivision proposed by Hansson (1986). The first condition is the stub-shaped protrusion (clearly visible from above) bordered upon rather short brush; this form is peculiar to the *gemmeus* species group. The second condition is peculiar to the two known species of the *sulciscuta*-group, which possess the peculiar long brush of setae (fig. 14, 15, 19, psb) bordered upon the short plica of the prothoracic adspiracular area of the lateral panel of pronotum.

Phylogenetic relationships. Despite the morphological distinctness of *Derostenus*, its phylogenetic association is still obscure. The cladistic analysis of the available D2 28S rDNA sequences (Gumovsky, 2002) has not revealed any particular associations of this genus. The most probable proposition of phylogenetic relationships of *Derostenus*, is one of Ikeda (1997). Ikeda proposed that *Stigmella*-feeding species of *Chrysocharis* (*prodice*-group, *assis*-group and *amanus*-group) represent the basal lineage within this genus, and share a common ancestor with *Derostenus*. This assumption was made based on similarities in biology (association with Nepticulidae) and morphology (e. g. enlarged first anellus, narrow malar space, more transverse frontal sulcus, subtruncate forewings, pale subbasal spot on male gaster). Further studies are needed to verify this proposition, but it seems rather realistic up-to-day.

Hosts. Leaf-mining moths of the genus *Stigmella* (Nepticulidae).

Distribution. Holarctic and Oriental (Hansson, 1986).

#### Species group *gemmeus*

Diagnosis. Back of head with two arched carinae extending from occipital margin-carina down towards mouth opening, frons reticulate, at most with a shallow pit in front of front ocellus; scrobes not sutured; setae on temples directed backwards; pronotal collum raised, delimited by elevations throughout; postmarginal vein 1.1–1.5 times as long as stigmal vein; propodeum with raised carinae, anteromedian part never with a fovea, propodeal callus with 2 setae; area adjacent to prothoracic spiracle of lateral panel of pronotum delimited by a protruding stub, tuft of prothoracic spiracle not visible.

**Discussion.** The frontal sulcus (= frontal fork) mentioned by C. Hansson (1986) as diagnostic for this species group, varies as it is shown in the new species, *D. persicus*. Also, the postmarginal vein of *D. persicus* is shorter than in other representatives of this species group.

***Derostenus gemmeus* Westwood, 1833 (fig. 1, 2)**

*Derostenus gemmeus* Westwood, 1833: 496. For full list of synonymies see C. Hansson (1986).

Type material. Lectotype *D. gemmeus*, ♀, Westwood's collection (UM).

Material studied. 3 ♂, Denmark, "18/9 77" (?Schliek); slides: ♂, Denmark, Sunds, 25.08.1925 (Kryger); 2 ♂, Fortunens, Indelukke, 4.09.1959 (Bakkendorf) (ZMUC); ♂, Ukraine, Kyivska oblast, Dubrovske forestry, near Poroskotnya village, 10.08.1999 (Sviridov); 4 ♂, Zakarpatska oblast, Carpathian Biosphere Reserve, Mala & Velyka Uholka, 29.07.1995; 2 ♂, ibid., Kuziy range, h = 700 m, 12.08.1994; ♂, Rakhiv, 29.07.1994 (Simutnik) (SIZK); 3 ♂, Rhodope Mts, mountain hostel Chernatitsa, 1300 m, 18.06.2001, *Fagus* sp. crowns (Boyadzhiev); ♂, ibid., 05.07.2000; ♂, Novakovo, 08.07.1968 (Germanov); ♂, Strandzha Mt, Malko Trnovo, 500 m, 27.07.1999 (Petrov) (PU).

**Diagnosis.** See C. Hansson (1986).

**Biology.** Larval-pupal endoparasite of *Stigmella* spp. (Nepticulidae) (Hansson, 1986), other records concern some Diptera (Agromyzidae) and Lepidoptera (Heliozidae, Tortricidae) (Bouček, Askew, 1968), but these require a confirmation.

**Distribution.** Europe (Hansson, 1986), new for Ukraine.

***Derostenus punctiscuta* Thomson, 1878 (fig. 3)**

*Derostenus punctiscuta* Thomson, 1878: 261. For full list of synonymies see C. Hansson, 1986.

Material studied. 2 ♂, Denmark, Copenhagen, Fortunens, ex *Nepticula septembrella*, larva 7.10.1945 (Niels L. Wolff leg.) (ZMUC).

**Biology.** Larval-pupal endoparasite of *Stigmella* spp. (Nepticulidae) (Hansson, 1986).

**Distribution.** Europe (Hansson, 1986).

***Derostenus gemmeus* Hansson and *D. punctiscuta* Hansson (fig. 1)**

Material studied. 8 ♀, Denmark, "8/10 82" (Schliek); slides: ♀, Præstevænge, Hillerød, 10.09.1927 (Kryger); ♀, Lyngby, Ueterslev Mose lake, 20.09.1959 (Bakkendorf) (ZMUC); 2 ♀, Moldova, Brlju [Бельцы], forest-protecting stripe, 9.07.1962; ♀, Korneshty, 30.06.1961 (Bouček, Talitzki); ♀, Nisporeny [Ниспорены], orchard and forest, 622, 17.07.1958 (Talitzki) (ZISP).

**Discussion.** Hansson (1986) pointed out that *D. gemmeus* and *D. punctiscuta* are inseparable on females, whereas the males may be separable on the basis of the structure of antennae. The differences mentioned by Hansson are really present in the identified specimens studied by the author (fig. 2, 3, sc), so that I follow Hansson's concept of these two species. However, further studies (e. g. molecular or karyological research) are needed to clarify whether these are two different species.

***Derostenus persicus* Gymovsky, sp. n. (fig. 8–10)**

Type material. Holotype ♀, Iran, Dasht-e-Arzan [Dasht-Arjan], Zagros Mountains, *Quercus persica*, 22.10.1977 (Kozlov) (ZISP).

**Diagnosis.** Frontal sulcus missing, last anellus much smaller than the following 3 funicular segments, two apical flagellar segments fused, frontal lobes protrude over the level of the eye orbits in dorsal view, lateral edges of pronotum nearly abruptly cut off, petiole short-robust (2.3 times as long as broad).

**Description.** Length of body 1.4 mm.

**Color.** Body mostly bright green, scutellum dark-violet, genae black; antennal scape entirely pale, pedicel and flagellum dark; fore coxae brownish, hind coxae metallic green, rather reticulate, mid coxa entirely pale; fore wing transparent.

Head in dorsal view 1.5 times as broad as long medially. Frontal lobes protrude over the level of the eye orbits in dorsal view (fig. 8). Back of head with two arched carinae extending from occipital margin-carina down towards mouth cavity. Antennal scape (fig. 9) 6.5 times as long as broad. Last anellus much smaller than the following

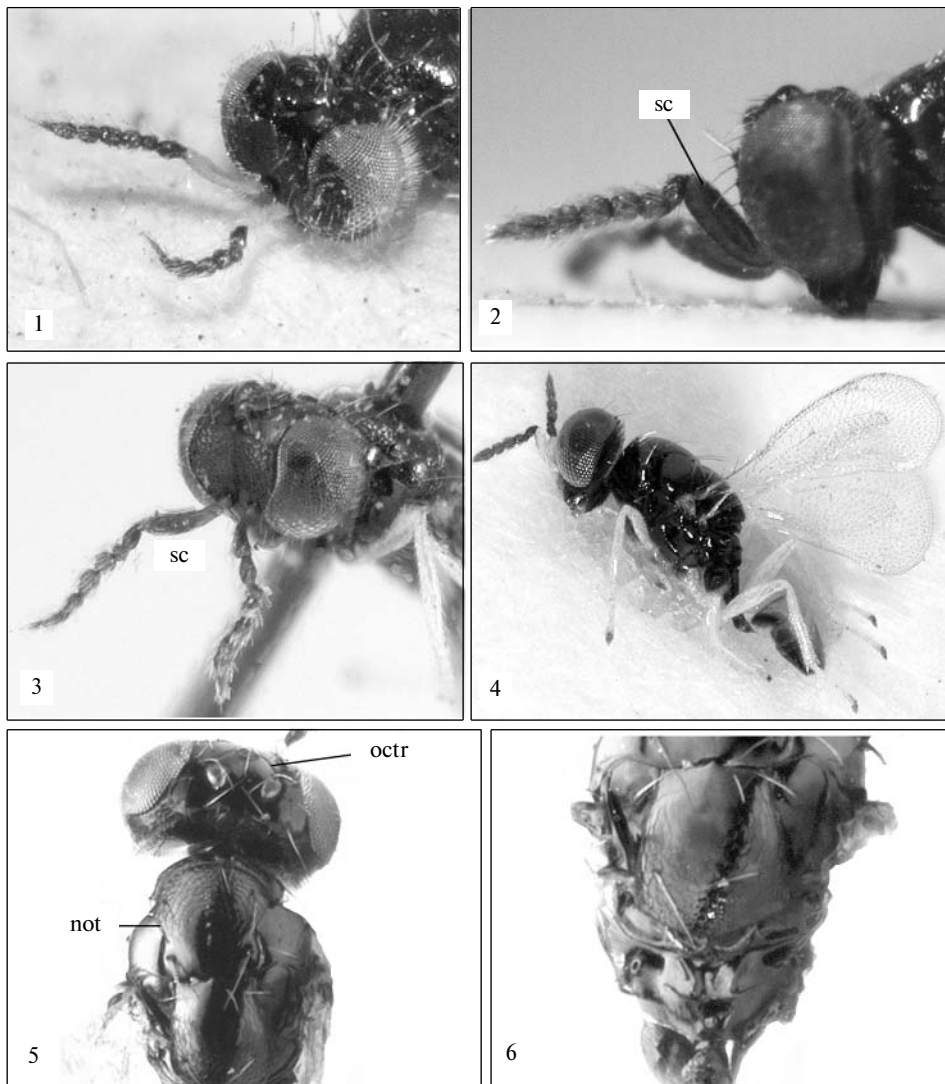


Fig. 1–6. 1 — *Derostenus gemmeus/punctiscuta*, ♀, head in dorsal view; 2 — *D. gemmeus*, ♂; 3 — *D. punctiscuta*, ♂; 4–6 — *D. freemani*: 4 — habitus in lateral view; 5 — head and mesosoma; 6 — scutellum, propodeum and petiole; sc — antennal scape; not — notaulus; octr — ocellar triangle.

Рис. 1–6. 1 — *Derostenus gemmeus/punctiscuta*, ♀, голова, вид сверху; 2 — *D. gemmeus*, ♂; 3 — *D. punctiscuta*, ♂; 4–6 — *D. freemani*: 4 — габитус, вид сбоку; 5 — голова и мезосома; 6 — скутеллум, пропodeум и стебелек; sc — скапус; not — нотаулюс; octr — глазковый треугольник.

3 funicular segments, two apical flagellar segments fused. Pedicel about twice longer than broad, last anellus about 1/3 as long as pedicel, F1–F3 of the same width and length, about 1.5 times as long as broad. Ratios height of eye : malar space : mouth cavity 21 : 1.0 : 11. Malar space about 1/2 as wide as width of scapus. Frontal sulcus totally missing, scrobes depressed, not sutured. Dorsal head smooth, face alutaceous. POL twice OOL. Head as wide as mesoscutum across shoulders.

Mesosoma 1.33 times as long as broad. Pronotum carinate, lateral edges nearly abruptly cut off. Mesoscutum twice as broad as long, weakly reticulate, notauli indicated as narrow sutures anteriorly, and continued as wide depressions posteriorly. Scutellum weakly reticulate, as long as broad and as mesoscutum. Axilla alutaceous, with 1 setae. Transepimeral sulcus distinctly indicated, nearly straight. Fore wing 1.7 times as long as broad, speculum closed, costal cell bare, subcosta with 2 dorsal setae. Ratios length of marginal : postmarginal : stigmal veins 24 : 6 : 5. Dorsellum narrow,

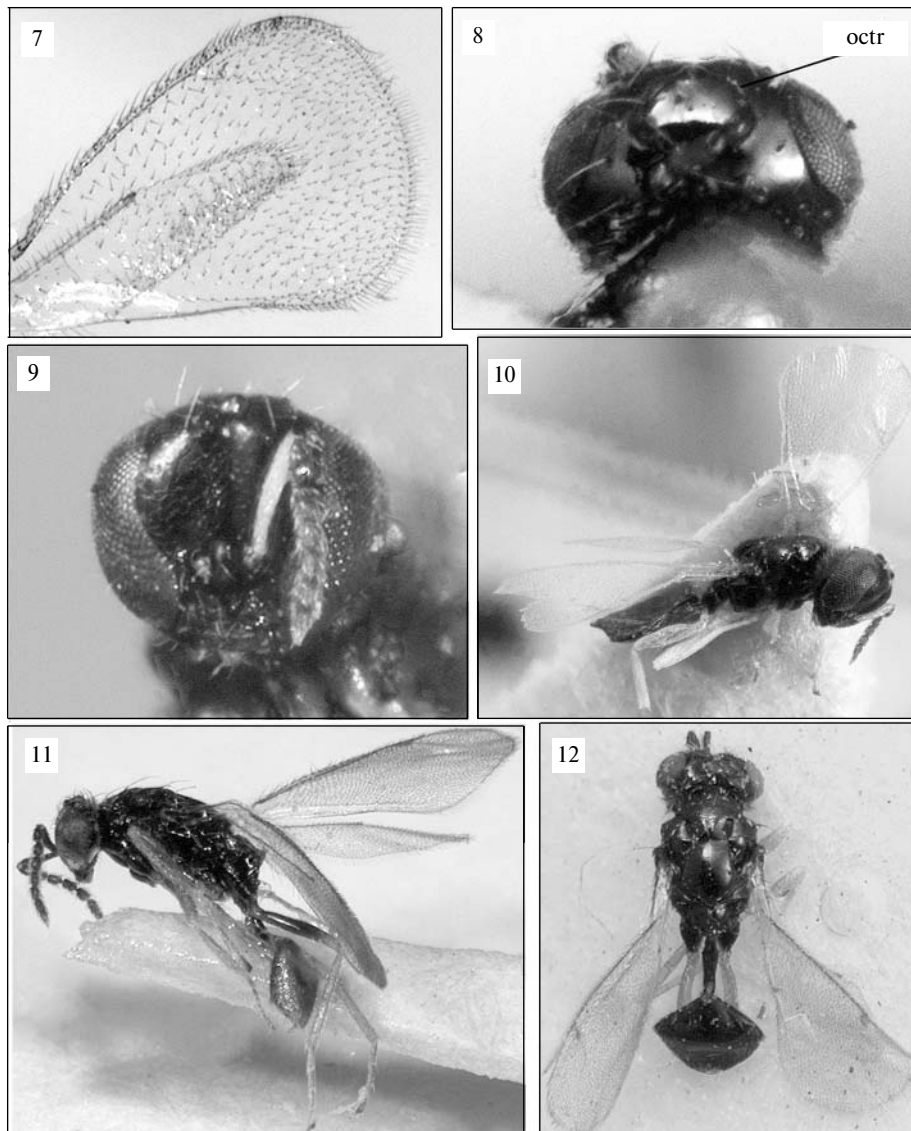


Fig. 7–12. 7 — *Derostenus freemani*, ♂, wings; 8–10 — *D. persicus*, ♀ (8 — head in dorsal view; 9 — head in frontal view; 10 — habitus in lateral view); 11 — *D. sulciscuta*, ♂ holotype, habitus in lateral view; 12 — *D. japonicus*, holotype, habitus in dorsal view; octr, ocellar triangle.

Рис. 7–12. 7 — *Derostenus freemani*, ♂, крылья; 8–10 — *D. persicus*, ♀ (8 — голова, вид сверху; 9 — голова, вид спереди; 10 — габитус, вид сбоку); 11 — *D. sulciscuta*, ♂ голотип, вид сбоку; 12 — *D. japonicus*, голотип, габитус, вид сверху; octr, глазковый треугольник.

with two distinct foveae. Anteromedian part of propodeum with anchor-shaped median carina, without lateral plicae, its surface coriaceous. Propodeal callus with 2 setae. Petiolar foramen not marked off.

**Metasoma.** Petiole 2.33 times as long as broad, with anterior expansion ended laterally by wide spines. Gaster circular, ratio length of mesosoma : length of gaster 40 : 34.

**Discussion.** This species is rather recognizable within the *gemmeus* group of *Derostenus* by the lack of the frontal sulcus and in having the robust petiole.

**Biology.** Unknown.

**Distribution.** South of Iran, Dasht-e-Arzhan.

**Etymology.** The specific name is a Latin adjective for Persia, the ancient name of Iran.

***Derostenus freemani* Yoshimoto, 1973 (fig. 4–7)**

*Derostenus freemani* Yoshimoto, 1973: 1055; *Derostenus albipes* Yoshimoto, 1973: 1056.

Material studied. ♀, USA, Wisconsin, T6N, R6W, S17, 16–23.09.1975, Gypsy Mouth–M. T; ♀, *ibid.*, 9–16.08.1976; ♀, Richland Co., Wis. 22, 18.08.1949 (McNeel) (UWM); ♀, Iowa, Palisades, 04.08.1948 (ZMUC).

**Diagnosis.** Last anellus about twice shorter and narrower than F1; frontal sulcus traceable as an abrupt borderline between smooth vertex and reticulate face, posterior part of mesoscutum and anterior part of scutellum; axillae smooth; antero-median part of mesoscutum and posterior part of scutellum lightly reticulate; shoulders of mesoscutum evenly rounded, just insertion points of setae slightly raised (fig. 5, 6); propodeum with deep sunken median area, with or without incomplete anchor-shaped carina, without lateral plicae (fig. 6); propodeal callus with 2 setae, petiole 3.33 times as long as broad.

**Discussion.** Both, Yoshimoto (1973) and Hansson (1986) mentioned the presence of the median carina on propodeum of *D. freemani*. This carina was illustrated by Hansson (1986) in his figure 3, however, no such carina is visible in Yoshimoto (1973). Moreover, Schauff (1991: fig. 46) presented a SEM photo of the median propodeum of a *Derostenus* species (which is likely *D. freemani*) showing the propodeal pattern with deep median depression delimited by subcircular carinulae, and without the carina. This pattern is peculiar to most specimens of *D. freemani* studied by the author. However, the tiny, anchor-shaped median carina (? carinula) is present in some Nearctic specimens of *Derostenus*, which are also treated as *D. freemani*. Nevertheless, in these specimens the median carina is hardly reaching the anterior margin of propodeum. Despite this difference, I treat both forms (with and without the median carina) conspecific.

**Hosts.** *Stigmella* sp. (Nepticulidae) (Yoshimoto, 1973). The association with *Lymantria dispar* (Linnaeus) (gypsy moth) fixed in the labels of the two specimens from Wisconsin, is doubtful and being likely resultant from an artifact of rearing conditions.

**Distribution.** USA (many states), Canada (Yoshimoto, 1973; Hansson, 1986); new for Wisconsin.

***Derostenus trjapitzini* Gymovsky, sp. n.**

Type material. ♀, Russian Far-East, Vladivostok vicinity, Ugolnaya, 07.1961 (Trjapitzin); original label: “Угольная, окр. Владивостока, Тряпицын, 07.1961, с деревьев и кустарн” (ZISP).

**Diagnosis.** Pronotum with sharp protruding lateral shoulders (fig. 20, prsh); brush of prothoracic spiracle short, but delimited, visible from above; median mesoscutum with fine sculpture, scapulae smooth, sidelobes of mesoscutum with protruding shoulders (fig. 20, mssh); scutellum smooth medially, horizontal line of frontal sulcus distinct, weakly raised; dorsal head smooth; face with fine meshes of reticulation; propodeum with characteristic pattern of anterior foveae, anchor-shaped carina continued laterally into complete lateral plicae, wide delimited area on nucha, and wide supracoxal flange; propodeal callus with 2 setae; petiole elongate, with two lateral spines anteriorly.

**Description.** Length of body 1.5 mm.

**Color.** Body dark green, black in places; antennal scape entirely pale, pedicel and flagellum dark; fore and hind coxae metallic green, rather reticulate, mid coxa entirely pale, smooth; fore wing transparent.

Head in dorsal view 1.75 times as broad as long medially. Frontal lobes just weakly protrude over the level of the eye orbits in dorsal view. Back of head with two arched carinae extending from occipital margin–carina down towards mouth cavity. Antennal scape 4.33 times as long as broad. Last anellus much smaller than the following 3 funicular segments, two apical flagellar segments fused. Pedicel 2.5 times longer than broad, last anellus about 1/3 as long as pedicel, F1–F3 of the same width and length, subquadrate (somewhat flattened resulting from air-drying). Ratios height of eye : malar space : mouth cavity 23 : 1.0 : 11. Malar space about 1/3 as wide as width of scapus. Frontal sulcus traceable as short convex flange above long scrobal depressions which not sutured. Dorsal head smooth, face alutaceous, with two rows along eye orbits. POL 1.25 OOL. Breadth of head and width of mesoscutum across shoulders in ratio 35 : 30.

Mesosoma 1.5 times as long as broad. Pronotum carinate, with protruding lateral edges. Mesoscutum nearly twice as broad as long, finely reticulate, notauli indicated as distinct but broad depressions, delimiting somewhat weaker reticulate scapulae which bear protruding shoulders anteriorly. Scutellum finely reticulate except for median area, slightly longer than broad and than mesoscutum. Axillae alutaceous, each with 1 seta. Transepimeral sulcus distinctly indicated, nearly straight. Fore wing nearly twice as long as broad, speculum closed, costal cell bare, subcosta with 2 dorsal setae, intercubital vein present. Ratios length of marginal : postmarginal : stigmal veins 23 : 8 : 5. Dorsellum narrow, with two distinct foveae. Propodeum with two lateral foveae and median part with anchor-shaped median carina continued laterally to lateral plicae. Supracoxal flange wide, as wide as spiracular elevation. Propodeal callus with 2 setae. Petiolar foramen marked off by wide, delimited coriaceous nucha.

Metasoma. Petiole about 2.5 times as long as broad, 1.75 times as long as median propodeum, with anterior expansion ended laterally by wide spines. Gaster 1.6 times as long as broad, ratio length of mesosoma : length of gaster 45 : 35.

Discussion. This species is the most close to the Nearctic *D. freemani* in having the combination of the characters which are diagnostic to the *gemmeus* group, and also in having smooth anterior part of the scutellum. However, *D. trjapitzini* distinctly differs from *D. freemani* (and from all other known species of *Derostenus*) in having the sharp protruding lateral shoulders of pronotum. Also, *D. trjapitzini* distinctly differs from *D. freemani* in having smooth median part of scutellum (the anterior part of scutellum is smooth in the latter species).

Biology. Unknown.

Distribution. Russian Far-East.

Etymology. The name “*trjapitzini*” is a patronym in honour of Dr V. A. Trjapitzin, the collector of the holotype.

### Species-group *sulciscuta*

Diagnosis. Back of head without carinae, frontal sulcus missing, head smooth, scrobal grooves sutured and ended by a deep pit just in front of anterior ocellus, setae on temples curved outwards; mesoscutum and scutellum largely smooth (fig. 15, 16, 18); pronotal collum evenly sloping; postmarginal vein nearly twice as long as stigmal vein; anteromedian part of propodeum with a triangular fovea bordered by an edge, propodeal callus with 6 setae; area adjacent to prothoracic spiracle of lateral panel of pronotum with a small flange (fig. 19, lf) and distinct tuft of setae (brush) above (fig. 19, psb).

Discussion. The last character, a small flange on the lateral panel of pronotum, with protruding brush above, has not been mentioned earlier. It represents an unique character-state within Entedoninae, and differs from that of *gemmeus* group. However, the polarity of these characters (i. e. which condition is primitive and which is derived) is not yet recognizable.

Another character, re-defined in the species-group diagnosis above, is the shape of the scrobal grooves. These grooves were recorded as “raised” (Hansson, 1986), however, the convexity degrees of the interscrobles is not much different in the representatives of *gemmeus* group in comparison with species of *sulciscuta* group. However, the scrobal grooves are present as prolonged sutures in *D. sulciscuta* and *D. japonicus*, whereas they are present just as shallow depressions in the representatives of the *gemmeus* group.

The two species included in the *sulciscuta* group, *D. sulciscuta* and *D. japonicus* (fig. 11, 12), differ rather poorly from each other. Only two characters of four mentioned by Hansson (1986) for the separation of these species, prove to be stable within larger series of specimens (see below). These are: the median carina (present in *D. sulciscuta*, absent in *D. japonicus*) and the lateral plicae (present in *D. sulciscuta*, absent in *D. japonicus*). Despite I recognize these characters as signals for the separation of these species for the time being, it is very possible that *D. sulciscuta* and *D. japonicus* represent one and the same species, but the holotype of *D. japonicus* is just a somewhat less sculptured specimen.

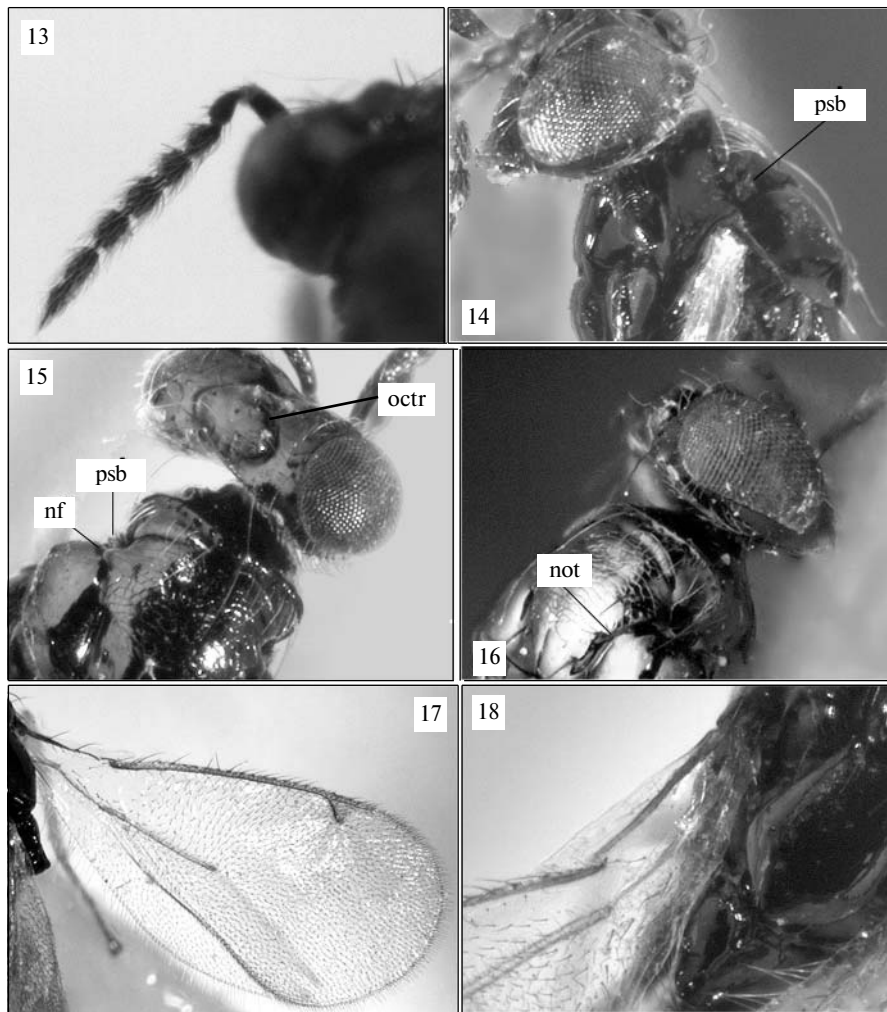


Fig. 13–18. *Derostenus sulciscuta*, ♂ holotype: 13 — pedicel and flagellum; 14 — head and anterior part of mesostoma in lateral view; 15 — head and anterior part of mesostoma in dorsal view; 16 — head and anterior part of mesostoma in dorso-lateral view; 17 — wings; 18 — basal sector of fore wing, scutellum and propodeum; psb — prothoracic brush; nf — notaular fissure; not — notaulus; octr — ocellar triangle.

Рис. 13–18. *Derostenus sulciscuta*, ♂ голотип: 13 — педицеллюс и флагеллум; 14 — голова и передняя часть мезосомы, вид сбоку; 15 — голова и передняя часть мезосомы, вид сверху; 16 — голова и передняя часть мезосомы, дорсолатеральная проекция; 17 — крылья; 18 — основание переднего крыла, скутеллум и прополеум; psb — пучок щетинок около переднегрудного дыхальца; nf — щелевидное образование на переднем конце нотаулюса; not — нотаулюс; octr — глазковый треугольник.

***Derostenus sulciscuta* Hansson, 1986 (fig. 11, 13–19)**

*Derostenus sulciscuta* Hansson, 1986: 320.

Type material. Holotype ♂, “Mixed plants by cliff in a deep river gorge, c 5200'22. xi. 1961”, “Taplejung distr., between Sangu and Tamrang”, “Brit. Mus. Nepal Exp. 1961–62 R. L. Coe coll. B. M. 1962–177” (BMNH).

Material studied. ♀, Russian Far-East, Primorskiy Kray, 37 km SEE Chuguyevka, 25.07.1975 (Storozheva); ♀, Primorskiy Kray, 15 km W Spassk, Hanka Lake coast, 22.08.1985 (Storozheva) (SIZK); ♀, Sakhalin Island, 5 km W Ozersk, 12.08.1981 (Belokobylsky) (ZISP); 4 ♂, Kuril Archipelago, Matua Island, inland of Dvoynaya Bay, 48°04.15'N; 153°15.83'E, 03.08.1999 (Benett — MA-99-DJB-046); 2 ♀, 3 ♂, *ibid.*, 48°04.06'N; 153°14.94'E, 14.08.1996 (TAMU); ♀, Kunashir Island, CW shore, Krugly Cape, 44°00.28'N; 145°39.38'E, *varia* (from cape to Hwy), 2.09.1997 (Marusik) (TAMU).

Male. Body size 1.9–2.2 mm. Last anellus of the same size and length as F1 (funicle 4 segmented); frontal sulcus missing; posterior part of mesoscutum (incl. scapulae), entire scutellum and axillae, smooth; shoulders of mesoscutum evenly rounded, just



insertion points of setae slightly raised; propodeum with distinctly margined triangular fovea (basal cup) anteriorly, which continues into raised median area posteriorly, the latter then transiting to outstanding flange which continued laterally into raised lateral plicae stretching nearly up to anterior margin of propodeum; propodeal callus with 6 setae, costal cell of fore wing with 2–3 setae on underside; petiole 6 times as long as broad, with moderately acute lateral spines; gaster with wide subbasal spot.

**Diagnosis of female** (not known before). Similar to male. Sublateral grooves on scutellum situated inward to outer margin of scutellum and stretch in about 2/3 of its length, or situated directly on this margin, and then shorter. Petiole with small, but notable spines, gaster circular.

**Biology.** Unknown.

**Distribution.** Nepal (Hansson, 1986), new for Russian Far-East (Primorskiy krai), and for the Kuril Archipelago (Matua Is., Kunashir Is.).

***Derostenus japonicus* Hansson, 1986** (fig. 12)

*Derostenus sulciscuta* Hansson, 1986: 320.

**Type material.** Holotype ♂, "Japan, Cmp Fuji 24 IX P W Oman 52" (USNM).

**Diagnosis.** See C. Hansson (1986).

**Discussion.** As it was mentioned above, *D. japonicus* and *D. sulciscuta* are rather similar and the only differences concern the structure of the median propodeum. However, it is very possible that these sculptural features are just intraspecific variations. This is even more possible, because the similar variations (median carina absent or present) occur in some other species (e. g. *D. freemani*).

**Biology.** Unknown.

**Distribution.** Japan (Hansson, 1986).

**Other species referred to *Derostenus* but doubtfully belonging to this genus**

***Derostenus albipes* Zehntner, 1898**

*Derostenus albipes* Zehntner, 1898: 8.

**Discussion.** This species was described by L. Zehntner from Java (Indonesia), and its type specimen must be considered lost in fire (W. Hogenes, pers. comm.).

Dr. L. Zehntner was in service of the Dutch government from 1894 till 1905. From 1894–1901 he worked on the pests of sugarcane in Pasaruan (Java) and from 1901–1905 in Salatiga on the pests of sugarcane and

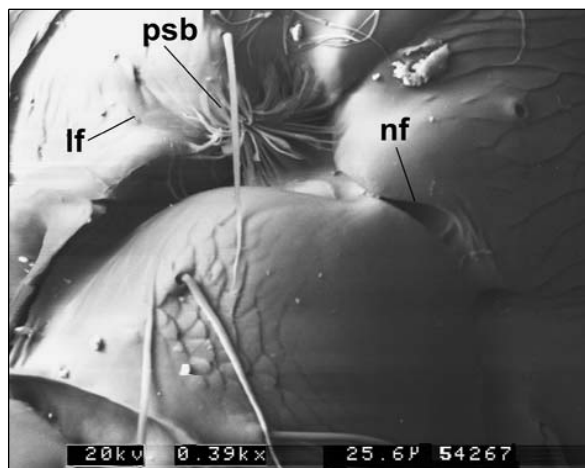


Fig. 19. *Derostenus sulciscuta*, ♂: psb — prothoracic adspiracular brush; nf — notaular fissure; lf — lateral flange on the lateral panel of pronotum.

Рис. 19. *Derostenus sulciscuta*, ♂: psb — пучок щетинок около переднегрудного дыхальца; nf — щель на переднем конце нотаулюса; lf — латеральный козырек боковой панели переднеспинки.

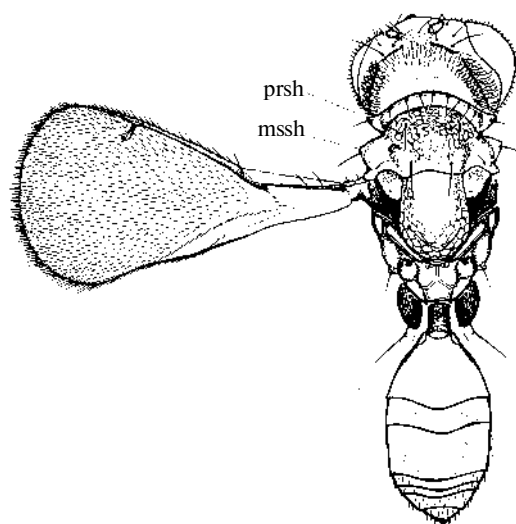


Fig. 20. *Derostenus trjapitzini*, ♀ habitus: prsh — pronotal shoulder; mssh — mesoscutal shoulder.

Рис. 20. *Derostenus trjapitzini*, ♀ габитус: prsh — плечо переднеспинки; mssh — плечо мезоскутума.

Table 1. Character matrix

Таблица 1. Матрица признаков

Characters	<i>Derostenus</i>		
	<i>gemmeus</i>	<i>punctiscuta</i>	<i>freemani</i>
Posterior occipital carinae	present	present	present
Last anellus (male)	enlarged, as long as F1	twice shorter and narrower than F1	about twice shorter and narrower than F1
Last anellus (female)	much smaller than F1	much smaller than F1	slightly narrower than F1
Color of female scape	pale	pale	pale
Color of male scape	dark	dark	pale
Shape of male scape	evenly expanded	narrower basally	narrower basally
Frontal sulcus	marked off	marked off	marked off
Lateral edges of pronotum	merely protruding	merely protruding	merely protruding
Area adjacent to prothoracic spiracle of lateral panel of pronotum	delimited by a protruding stub	delimited by a protruding stub	delimited by a protruding stub
Margins of scapulae (edges of mesoscutum)	evenly rounded	evenly rounded	evenly rounded
Sculpture of mesoscutum	evenly finely reticulate	evenly finely reticulate	anterior part (incl. scapulae) smooth
Sculpture of scutellum	evenly finely reticulate	evenly finely reticulate	smooth in about anterior 4/5
Median propodeum	anchor-shaped carina	anchor-shaped carina	median area sunken, with or without incomplete anchor-shaped carina
Lateral plicae of propodeum	not distinct	not distinct	absent
Nucha	widely margined	widely margined	widely margined
Petiole	slender	slender	slender
Teeth on petiole	short blunt	short blunt	weakly acute anterior expansion
Notauli	anterior fissure continued to narrow suture, and then to wide non-delimited depression	anterior fissure continued to narrow suture, and then to wide non-delimited depression	anterior fissure continued to narrow suture, and then to wide non-delimited depression

caaco. In the end of 1902 the experimental station in Salatiga was destroyed by fire. With that fire also the entomological notes and collections of Zehntner were destroyed. From 1906–1920 he worked in Brazil and in 1920 he returned to Switzerland where he died in April 1961.

The type specimen of *D. albipes* very likely also was destroyed in the fire in Salatiga in 1902. There was a very small possibility that there is some material of Zehntner in the collection of the Wageningen University (Wageningen, Netherlands), but nothing was found so far (Yde Jongema, pers. comm.).

Also, it is hardly possible that the species described by Zehntner actually belonged to *Derostenus*. Otherwise, the illustration of the two-segmented funicle and three-segmented clava, rather suggests that this is a species of *Closterocerus* or *Chrysonotomyia*, or another genus, but not *Derostenus*.

Two other species were described under the name of *albipes* in *Derostenus*: *D. albipes* Nees, 1834 (a junior synonym of *D. gemmeus*) and *D. albipes* Yoshimoto, 1973 (a junior synonym of *D. freemani*). So that the name *D. albipes* Zehntner is not valid, but a proposition of a replacing name is problematic in view of the lack of the type.

### *Derostenus alcetas* Walker, 1843

*Derostenus alcetas* Walker, 1843: 31.

**Discussion.** This species was described by F. Walker from Chile. The type specimen is lost (LaSalle, Schauff, 1992), and original description is insufficient for its proper generic placement. However, this species doubtfully belongs to *Derostenus*, because this genus has not been reported from the Neotropical region.

Continuation table 1

Characters	<i>Derostenus</i>			
	<i>persicus</i>	<i>trjapitzini</i>	<i>sulciscuta</i>	<i>japonicus</i>
Posterior occipital carinae	present	present	absent	absent
Last anellus (male)	?	?	enlarged, as long as F1	?
Last anellus (female)	notably smaller than F1	notably smaller than F1	enlarged, as long as F1	enlarged, as long as F1
Color of female scape	pale	pale	dark	dark
Color of male scape	?	?	dark	?
Shape of male scape	?	?	narrower basally	?
Frontal sulcus	missing	marked off	missing	missing
Lateral edges of pronotum	nearly abruptly cut	sharply acute and notably protruding	nearly abruptly cut	merely protruding
Area adjacent to prothoracic spiracle of lateral panel of pronotum	delimited by a short stub (plica)	delimited by a protruding stub	small flange with distinct brush above	small flange with distinct brush above
Margins of scapulae (edges of mesoscutum)	evenly rounded	protruding laterally	evenly rounded, just the insertion points of setae raised	evenly rounded
Sculpture of mesoscutum	finely reticulate throughout	mostly reticulate, just anterior scapulae smooth	midlobe reticulate, just scapulae entirely smooth	reticulate anteriorly, smooth posteriorly (incl. scapulae)
Sculpture of scutellum	finely reticulate throughout	widely reticulate, just median area smooth	smooth with two fine sublateral grooves	wholly smooth, sublateral grooves less distinct
Median propodeum	anchor-shaped carina	anchor-shaped carina continued laterally into plicae	with basal triangular depression continued posteriorly by a carina	with basal triangular depression
Lateral plicae of propodeum	absent	present	present	absent
Nucha	poorly margined	widely margined	marked off by outstanding flange	marked off by outstanding flange
Petiole	robust	± slender	slender	slender
Teeth on petiole	acute	blunt	tiny	acute
Notauli	anterior fissure continued to narrow suture, and then to wide non-delimited depression	anterior fissure continued to shallow groove, and then to wide depression which delimited just anteriorly	anterior fissure continued to narrow groove, and then to narrow channel surrounded by a wide depression	anterior fissure continued to narrow groove, and then to narrow channel surrounded by a wide depression

***Derostenus antiopae* (Packard, 1881)**

*Entedon antiopae* Packard, 1881: 36; — *antiopae* Packard (*Derostenus*), Howard, 1889: 1891.

**Discussion.** The type materials of this species is unavailable, so that it is hard to conclude whether it belongs to *Derostenus* or not. However, from the viewpoint of the biology of this species (the host is nymphalid *Euvanessa antiopa*), the affiliation to *Derostenus* is doubtful, since the species of this genus are generally parasitoids of the leaf-mining Nepticullidae (chiefly *Stigmella* species).

***Derostenus leucopus* Ashmead, 1888**

*Derostenus leucopus* Ashmead, 1888: i-viii.

**Discussion.** The type materials of this species is lost, so that it is not clear whether this species belongs to *Derostenus* or not.

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