



Research article

urn:lsid:zoobank.org:pub:C47F5484-764A-41E9-8913-3CCB0092B0DF

**West Palaearctic species of the genus *Diostracus* Loew, 1861
(Diptera: Dolichopodidae)**

Igor Ya. GRICHANOV

All-Russian Institute of Plant Protection, Podbelskogo 3, St.Petersburg, Pushkin, 196608, Russia

E-mail: grichanov@mail.ru

urn:lsid:zoobank.org:author:5320AD3A-92D8-4820-8091-24802F8C8C06

Abstract. A new status (as subgenera of *Diostracus* Loew, 1861) for *Sphyrotarsus* Mik, 1874, *Lagodechia* Negrobov & Tsurikov, 1996 and *Ozmena* Özdikmen, 2010 stat. nov. is proposed. A new species, *Diostracus (Sphyrotarsus) kustovi* sp. nov., is described from the Russian Caucasus. The following recombinations (comb. nov.) are also proposed: *Diostracus (Sphyrotarsus) argyrostomus* (Mik, 1874); *D. (S.) caucasicus* (Negrobov, 1965); *D. (S.) hervebazini* (Parent, 1914); *D. (S.) hessei* (Parent, 1914); *D. (S.) hygrophilus* (Becker, 1891); *D. (S.) leucostomus* (Loew, 1861); *D. (S.) parenti* (Hesse, 1933); *D. (Lagodechia) spinulifer* Negrobov & Tsurikov, 1988; and *D. (Ozmena) stackelbergi* (Negrobov, 1965). A key to ten *Diostracus* species inhabiting the West Palaearctic Region is provided.

Key words. Dolichopodidae, *Diostracus*, West Palaearctic, new species, key.

Grichanov I.Ya. 2013. West Palaearctic species of the genus *Diostracus* Loew, 1861 (Diptera: Dolichopodidae). *European Journal of Taxonomy* 61: 1-14. <http://dx.doi.org/10.5852/ejt.2013.61>

Introduction

Until the 1960s the genus *Diostracus* Loew, 1861, belonging to the subfamily Hydrophorinae, had long been supposed to be Nearctic in distribution, with three known species. In 1968 it was recorded from East Asia for the first time by Takagi (1968). To date, 85 species have been described from a vast territory of the East Palaearctic and Orient, from Buryatia and Sakhalin in the north to Nepal, Bhutan, Assam, NE Myanmar, Yunnan and Taiwan in the south (Grichanov 2003–2013). Negrobov (1978) placed the genus *Asphyrotarsus* Oldenberg, 1916 in synonymy with *Diostracus*, thus recording the genus in the West Palaearctic for the first time. In all, the Palaearctic Region is known to include 21 of the 88 known species of *Diostracus* (Grichanov *et al.* 2011b).

The adults are usually found on wet rocks in mountainous areas or on stones in streams and waterfalls at high altitude. A key to Palaearctic species of the genus was provided by Negrobov (1978). A key to 37 Nepalese species was given by Saigusa (1984), who proposed 12 species groups and subgroups. A key to 14 Japanese species was given by Masunaga (2000), who mentioned some more species groups. The last key to males of the 23 known Chinese species was published by Yang *et al.* (2011).

A new species, *Diostracus (Sphyrotarsus) kustovi* sp. nov., from the Russian Caucasus is here described and illustrated. The following recombinations (comb. nov.) are also proposed: *Diostracus (Sphyrotarsus)*

argyrostomus (Mik, 1874); *D. (S.) caucasicus* (Negrobov, 1965); *D. (S.) hervebazini* (Parent, 1914); *D. (S.) hessei* (Parent, 1914); *D. (S.) hygrophilus* (Becker, 1891); *D. (S.) leucostomus* (Loew, 1861); *D. (S.) parenti* (Hesse, 1933); *D. (Lagodechia) spinulifer* Negrobov & Tsurikov, 1988; and *D. (Ozmena) stackelbergi* (Negrobov, 1965). In addition, a key to males of West Palaearctic species is provided. With the new species described here, the West Palaearctic fauna of *Diostracus* now totals 10 species.

Material and Methods

The holotype and paratype of the new species as well as other material examined are housed at the Zoological Institute of the Russian Academy of Sciences, St Petersburg (ZIN).

Specimens were studied and photographed with a ZEISS Discovery V–12 stereo microscope and an AxioCam MRc5 camera. Morphological terminology and abbreviations follow Cumming & Wood (2009). The lengths of the podomeres are given in millimetres. Body length is measured from the base of the antenna to the tip of abdominal segment 7. Wing length is measured from the base to the wing apex. Male genitalia were macerated in 10% KOH. The figure showing the male genitalia in lateral view is oriented as they appear on the intact specimen, with the morphologically ventral surface of the genitalia facing up, dorsal surface down, anterior end facing right and posterior end facing left. Information on world distribution for known species follows Grichanov (2003–2013).

Results

Class Hexapoda Blainville, 1816
Order Diptera Linnaeus, 1758
Suborder Brachycera Schiner, 1862
Superfamily Empidoidea Latreille, 1804
Epifamily Dolichopodoidea Latreille, 1809
Family Dolichopodidae Latreille, 1809
Subfamily Hydrophorinae Lioy, 1864

Genus *Diostracus* Loew, 1861

Diagnosis

The genus is very polymorphic and characterized by the following combination of characters: body dark and stout, medium- to large-sized; palpus usually enlarged, loosely applied on proboscis; proboscis bulky; antennal scape glabrous or setose dorsally; arista-like stylus usually dorsal, sometimes basodorsal or subapical to apical; posterior mesonotum flattened; acrostichal setae absent; 4–6 dorsocentral bristles variable in length; sutural and postsutural, some notopleural, supra-alar and post-alar bristles sometimes absent or reduced; scutellum with 1–2 pairs of strong bristles and with some short lateral setae or hairs, sometimes with three pairs of long bristles; mid and hind coxae without bristle on the outer side; legs often modified; tarsi with more or less modified empodium and claws, usually without pulvilli; wing elongate and wide, sometimes modified in males; costa ended beyond tip of wing; crossvein dm-cu longer than distal section of CuA₁ vein, sometimes strongly sinuate; M₁₊₂ usually slightly convex anteriorly, often irregularly curved, more or less parallel to R₄₊₅, at least partly behind dm-cu.

Remarks

The genus *Sphyrotarsus* Mik, 1874 includes 5 species from the European Alps, one Caucasian species and one Pamiran species. It was diagnosed by scape glabrous dorsally; tarsi with reduced empodium and without pulvilli; M₁₊₂ and R₄₊₅ are not strictly parallel to each other (Parent 1938); scutellum with

3 pairs of bristles (Negrobov 1978). Furthermore, the Pamiran subgenus *Takagia* Negrobov, 1973 (of *Sphyrotarsus*), was diagnosed by elongated antennal postpedicel with arista apical, somewhat widened at apex in male; sutural bristle absent; one supra-alar bristle; scutellum with 2 pairs of bristles (Negrobov 1973, 1978). Nevertheless, all these characters are rather variable and can be found in East Asian species of *Diostracus*. The monotypic Caucasian genus *Lagodechia* Negrobov & Tsurikov, 1996 was diagnosed also by variable characters of face, mesonotal setation, wing venation and morphology of abdomen (Negrobov & Tsurikov 1996). In addition, some characters of *L. spinulifera* were incorrectly described, as follows from the illustrations published by Grichanov *et al.* (2011a, b). I think the diagnostic characters of these taxa have low generic significance and regard *Lagodechia*, *Sphyrotarsus* and *Takagia* (now *Ozmena* Özdikmen, 2010) as subgenera of *Diostracus*. Accepting a new concept of the genus, I associate 97 species with *Diostracus*, of which 64 occur in the Oriental Region, 30 in the Palearctic and 3 in the Nearctic Region. The flies of the genus are all torrenticolous in habitat.

Subgenus *Diostracus* Loew, 1861

Diostracus Loew, 1861a: 43; Takagi 1968: 35 (diagnosis), 51 (redescription of type species). — Grichanov *et al.* 2011b: 22 (diagnosis).

Asphyrotarsus Oldenberg, 1916: 193. — Negrobov 1978: 406 (synonym of *Diostracus* Loew, 1861). — Type species: *Liancalus leucostomus* Loew, 1861 (original designation).

Diagnosis

At present the nominotypical subgenus differs from other subgenera in having a dorsally setose antennal scape. It is worth noting that many Asian *Diostracus* species were described with a glabrous scape (e.g., Saigusa 1984, 1995; Saigusa *et al.* 1997; Yang *et al.* 2011).

Type species

Diostracus prasinus Loew, 1861 (by monotypy).

Diostracus (Diostracus) leucostomus (Loew, 1861)

Liancalus leucostomus Loew, 1861b: 348.

Thinophilus nigripes Strobl, 1898: 219. — Negrobov 1973: 1518 (synonym of *Asphyrotarsus leucostomus*, redescription of type). — Type locality: Styria, Sirbitzkogel, Austria.

Asphyrotarsus leucostomus – Oldenberg 1916: 193. — Parent 1938: 312.

Diostracus leucostomus – Negrobov 1978: 411.

Diostracus nigripes – Negrobov 1978: 411.

Type locality

Kärnten, Austria.

Distribution

Austria, France, Italy, Switzerland.

Subgenus *Lagodechia* Negrobov & Tsurikov, 1996, stat. nov.

Lagodechia Negrobov & Tsurikov [as Zurikov], 1996: 632. — Grichanov *et al.* 2011b: 23 (diagnosis).

Diagnosis

Describing a new genus, Negrobov & Tsurikov (1996) listed diagnostic characters that can be found in many *Diostracus* species (e.g., Saigusa 1984, 1995; Saigusa *et al.* 1997; Yang *et al.* 2011). The following characters of generic importance were listed in the original description of *Lagodechia*, but were not obvious on pictures made by O. Selivanova from type material (Grichanov *et al.* 2011a, b): antennal scape has dorsal projection; distance between scutellum and 1st tergum is 3 times as long as scutellum. Negrobov & Tsurikov (1996) also found important differences in the female oviscapt of *Lagodechia spinulifera* and *Diostracus subalpinus* (Negrobov, 1973). Unfortunately, *D. subalpinus* (described from the Baikal Lake environs) is the only *Diostracus* species with illustrated female genitalia. The status of *D. subalpinus* and *D. spinulifer* needs further clarification.

Type species

Diostracus spinulifer Negrobov & Tsurikov, 1988 (original designation).

Diostracus (Lagodechia) spinulifer Negrobov & Tsurikov, 1988, comb. nov.

Diostracus spinulifer Negrobov & Tsurikov [as Zuricov] in Negrobov *et al.*, 1988: 215.

Lagodechia spinulifer – Negrobov & Tsurikov 1996: 632.

Type locality

Lagodekhis-Khevi river, upper stream, Lagodekhi Reserve, Georgia.

Distribution

Georgia.

Subgenus *Ozmena* Özdikmen, 2010, stat. nov.

Ozmena Özdikmen, 2010: 265 (new name for *Takagia* Negrobov, 1973, not Matsumura, 1942) (as subgenus of *Sphyrotarsus* Mik, 1874).

Takagia Negrobov, 1973: 1520 (as subgenus of *Sphyrotarsus* Mik, 1874) (not Matsumura, 1942). — Negrobov 1978: pl. CLXI (as genus, in error). — Type species: *Sphyrotarsus stackelbergi* Negrobov, 1965 (original designation).

Diagnosis

The main diagnostic character of the subgenus is the elongate antennal postpedicel in both male and female, and the apical stylus (Negrobov 1973). Nevertheless, some Oriental *Diostracus* species also have an elongate postpedicel and an apical or subapical stylus (e.g., Saigusa 1984; Yang *et al.* 2011). Unfortunately, there are practically no publications with pictures of female antennae in *Diostracus* species.

Type species

Sphyrotarsus stackelbergi Negrobov, 1965 (by monotypy).

Diostracus (Ozmena) stackelbergi (Negrobov, 1965), comb. nov.

Sphyrotarsus stackelbergi Negrobov, 1965: 441.

Sphyrotarsus (Takagia) stackelbergi – Negrobov 1978: 405.

Sphyrotarsus (Ozmena) stackelbergi – Özdikmen 2010: 265.

Type locality

Gorno-Badakhshan region, Khorog, river Gunt, Shugnan, Tajikistan.

Distribution

Tajikistan (Pamir).

Subgenus *Sphyrotarsus* Mik, 1874, stat. nov.

Sphyrotarsus Mik, 1874: 342. — Grichanov *et al.* 2011b: 25 (diagnosis).

Diagnosis

As presently defined, the subgenus differs from other subgenera in the presence of 6 (vs. 2–4) long bristles on the scutellum in addition to the glabrous antennal scape (Negrobov 1973; Grichanov *et al.* 2011b). These characters are rather variable in Asian *Diostracus* species (e.g., Saigusa 1984, 1995; Saigusa *et al.* 1997; Yang *et al.* 2011). Parent (1938) also used variable male secondary sexual characters to distinguish *Sphyrotarsus* from *Asphyrotarsus* (= *Diostracus*).

Type species

Sphyrotarsus argyrostomus Mik, 1874 (by monotypy).

Diostracus (Sphyrotarsus) argyrostomus (Mik, 1874), comb. nov.

Sphyrotarsus argyrostomus Mik, 1874: 337. — Parent 1938: 298.

Sphyrotarsus (Sphyrotarsus) argyrostomus – Negrobov 1978: 402.

Type locality

Wildbadgastein, Austria.

Distribution

Austria, France, Italy, Switzerland.

Diostracus (Sphyrotarsus) caucasicus (Negrobov, 1965), comb. nov.

Sphyrotarsus caucasicus Negrobov, 1965: 440.

Sphyrotarsus (Sphyrotarsus) caucasicus – Negrobov 1978: 403.

Material

1♂, Adygea, Maikop distr., Caucasian Nature Reserve, Abago Mt, alpine belt, sweeping on grass at snowfield rivulet, 2100 m, 4 Aug. 2008, Volfov (ZIN).

Type locality

Caucasian Reserve, Cherkesskii Ridge, Russia.

Distribution

Russia (Adygea, Krasnodar).

Diostracus (Sphyrotarsus) hervebazini (Parent, 1914), comb. nov.

Sphyrotarsus hervebazini Parent, 1914: 85; 1938: 300.

Sphyrotarsus (Sphyrotarsus) hervebazini – Negrobov 1978: 403.

Sphryotarsus (Sphyrotarsus) hervibazini – Negrobov 1991: 42 (error for *hervebazini*).

Type locality

Saint-Pierre-de-Chartreuse, Isère, France.

Distribution

France, Switzerland.

Diostracus (Sphyrotarsus) hessei (Parent, 1914), comb. nov.

Sphyrotarsus hessei Parent, 1914: 108; 1938: 301.

Sphyrotarsus (Sphyrotarsus) hessei – Negrobov 1978: 403.

Type locality

Arras, France.

Distribution

France, Italy.

Diostracus (Sphyrotarsus) hygrophilus (Becker, 1891), comb. nov.

Sphyrotarsus hygrophilus Becker, 1891: 286. — Parent 1938: 303.

Sphyrotarsus (Sphyrotarsus) hygrophilus – Negrobov 1978: 404.

Sphyrotarsus (Sphyrotarsus) hydrophilus – Negrobov 1978: 404 (error for *hygrophilus*).

Type locality

Gesäuse bei Admont, Austria.

Distribution

Austria, France, Switzerland.

Diostracus (Sphyrotarsus) parenti (Hesse, 1933), comb. nov.

Sphyrotarsus parenti Hesse, 1933: 11. — Parent 1938: 305.

Sphyrotarsus (Sphyrotarsus) parenti – Negrobov 1978: 405.

Type locality

Col du Lautaret, France.

Distribution

France.

Diostracus (Sphyrotarsus) kustovi sp. nov.

(Figs 1A–E, 2, 3A, B)

[urn:lsid:zoobank.org:act:C06CA79F-16D5-45ED-8309-8BCD4613E37C](https://doi.org/10.3896/abris.urn:lsid:zoobank.org:act:C06CA79F-16D5-45ED-8309-8BCD4613E37C)

Diagnosis

Scutellum with 3 pairs of almost equally long bristles; antennal scape bare above; male and female postpedicel about as long as high, with dorsal stylus; male 2nd and 3rd abdominal sterna with strong black spines; male 4th abdominal sternum with bundle of setae; male with modified legs and simple wings.

Etymology

This species is named after the Russian dipterologist Dr. Semyon Kustov (Krasnodar).

Type material

Holotype

RUSSIA: ♂, Karachai-Cherkessia, Arkhyz env., Sofiiskie waterfalls, 43°26'09" N, 41°16'03" E, 2400 m, 03 Aug. 2012, S. Kustov (ZIN).

Paratype

RUSSIA: 1♀, same data as for holotype (ZIN).

Description

Male

LENGTH (mm). Body 9.4, wing 7.8, antenna 1.5, hypopygium 2.25.

HEAD (Figs 1A, B). Bluish-greenish black, pollinose; clypeus shining green, weakly pollinose, 1/3 as wide as head; face about 1/5 as wide as head, almost as long as wide; ocellar bristles strong, vertical and postvertical bristles about 1/2 as long as ocellar bristle; postocular ciliation black, strong, nearly as long as postvertical on upper 1/2, finer and yellowish below; ventral 1/2 of postcranium clothed with many long yellow hairs, some of which as thick as vertical bristle; antenna with bare vase-like scape; pedicel with ring of short setae; postpedicel as long as high, rounded distally, with middorsal simple arista-like stylus; length (mm) of scape to pedicel to postpedicel to stylus (1st and 2nd segments), 0.16-0.11-0.2-0.13-0.85; palpus ovate, 1.6 times as long as wide, 1/3 as long as eye height, slightly dilated at middle; palpus black in ground colour, glittering silvery by pollinosity, bearing short black setae on outer side and along margin; proboscis moderately large for the genus.

THORAX. Greenish black, with washed pollinosity; mesonotum with pair of blackish longitudinal stripes; acrostichals absent; 5–6 asymmetrical dorsocentrals; 1 humeral with 1-2 short setae in front, 1 posthumeral, 2 notopleurals, 1 sutural, 1 postsutural, 1 supra-alar, 1 postalar; scutellum with 3 pairs of strong scutellars, of which outer pair 2/3 length of median 4 bristles; proepisternum with about 10 yellow setae on its lower portion and with about 6 similar seta on its upper portion; scutellum about 3 times wider than long; postscutellum about 3 times as long as scutellum (similar to that in *D. leucostomus*).

LEGS. Rather long, black with slight greenish or bluish tinge on coxae and femora; fore coxa concave on anterior surface towards tip, there clothed with short, fine hairs, also with row of short, black, blunt setae on anterodistal margin; fore femur moderately thick, strongly curved at basal 1/3, with very short, fine hairs; fore tibia slightly thickened, bearing 4 dorsal bristles, 2 posterodorsals at base, 1 long curled posterodorsal bristle at apex, 1/3 as long as tibia, and with double row of short, erect ventral setae; fore basitarsus (Fig. 1C) constricted and almost bare in 1st quarter, thickened in 2nd quarter, densely short setose; its thickening

bearing 3 long, curled dorsal bristles, half as long as basitarsus, and row of 12 short blunt spinules; 2nd to 4th tarsomeres simple, bearing elongate setae dorsally; 4th tarsomere with strong apicoventral seta; 5th segment flattened dorsoventrally; pulvillus reduced, empodium spicular, claws strong, about half as long as 5th segment; mid coxa covered with short fine white hairs anteriorly, bearing 3–4 strong apical dirty yellow bristles forming some kind of spine; mid femur (Fig. 1D) slightly curved, distinctly emarginated dorsally along basal half or more, with rather long yellow hairs and setae on anterior, dorsal and ventral surfaces

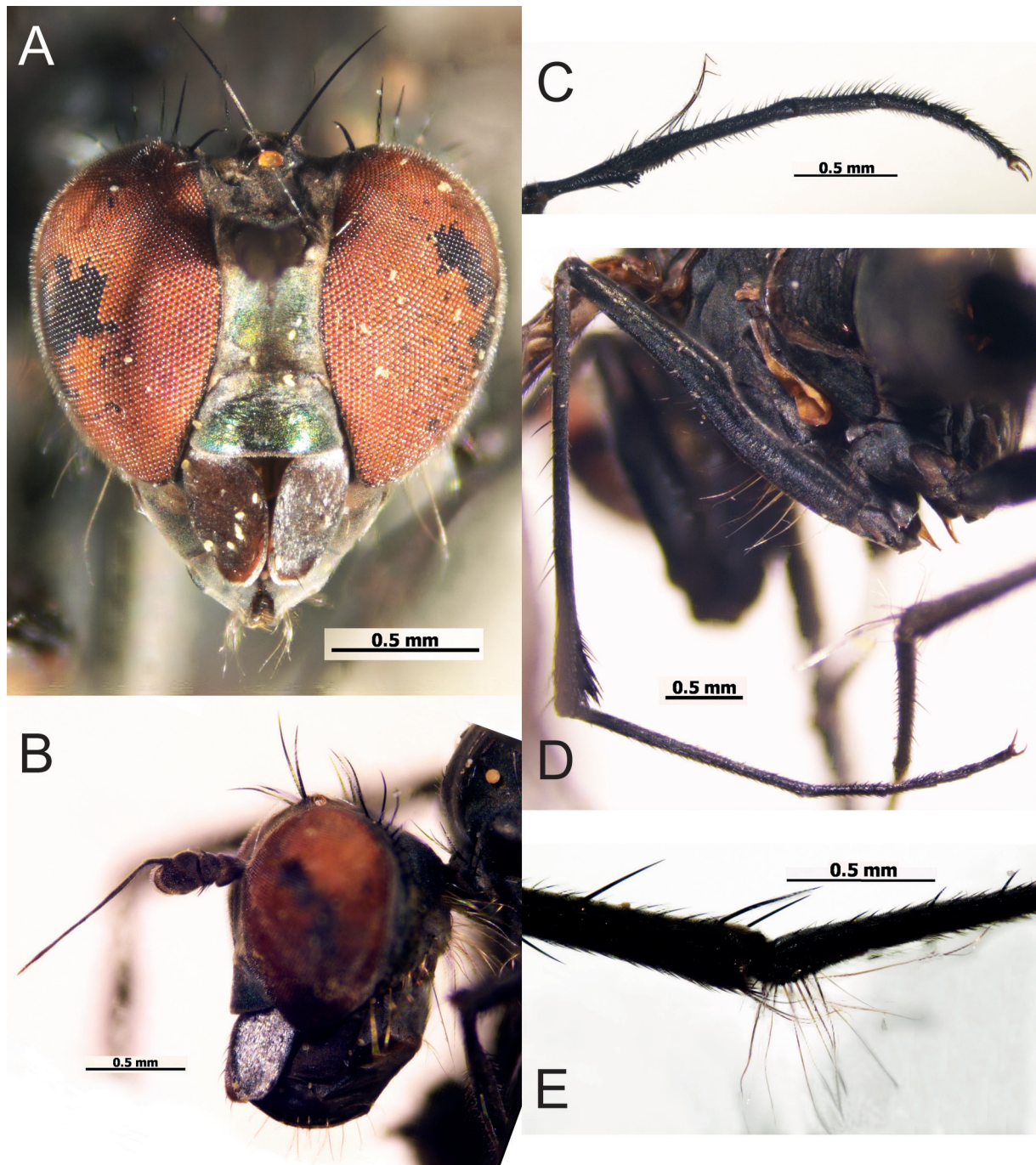


Fig. 1. *Diostracus (Sphyrotarsus) kustovi* sp. nov. Male holotype. **A.** Head in anterior view. **B.** Head in lateral view. **C.** Fore tarsus. **D.** Mid leg. **E.** Hind tibia in apical view and basitarsus.

of its basal 1/2, the vestiture slightly darker on dorsal surface; the longest setae twice as long as femur diameter; apical 1/2 of mid femur almost bare and bearing 2–3 anteroventral and 2–3 posteroventral short bristles; mid tibia straight, subapically thickened, short setose, with several anterodorsal and posterodorsal bristles and subapical ventral fringe of strong black bristles longer than tibia thickness; mid tarsus slender, simple and short setose, with reduced pulvillus and empodium; hind coxa bearing sparse short, yellow hairs outside; hind femur long and simple, only slightly curved, with about 6 fine anteroventral black setae in distal 1/2, not longer than femur diameter, with long, fine, subapical anterior bristle; hind tibia slender, bearing several longish bristles on anterodorsal and posterodorsal surfaces and shorter ones on anteroventral and posteroventral surfaces, with about 5 long blackish-brown apicoventral bristles, of which longest bristle reaching middle of basitarsus; hind basitarsus (Fig. 1E) slightly swollen at base, with 4 short dorsal setae, with about 10 long blackish and brownish fine bristles at base ventrally and anteriorly, longest seta more than half as long as basitarsus; next tarsomeres slender and simple; pulvillus and empodium reduced. Fore podomere length (from femur to tarsomere 5, mm): 1.77-1.96-1.37-0.40-0.27-0.18-0.29 (0.45 with claws); mid leg: 2.86-2.95-1.65-0.54-0.33-0.23-0.33 (0.49 with claws); hind leg: 3.00-3.52-1.38-0.72-0.43-0.25-0.29 (0.40 with claws).

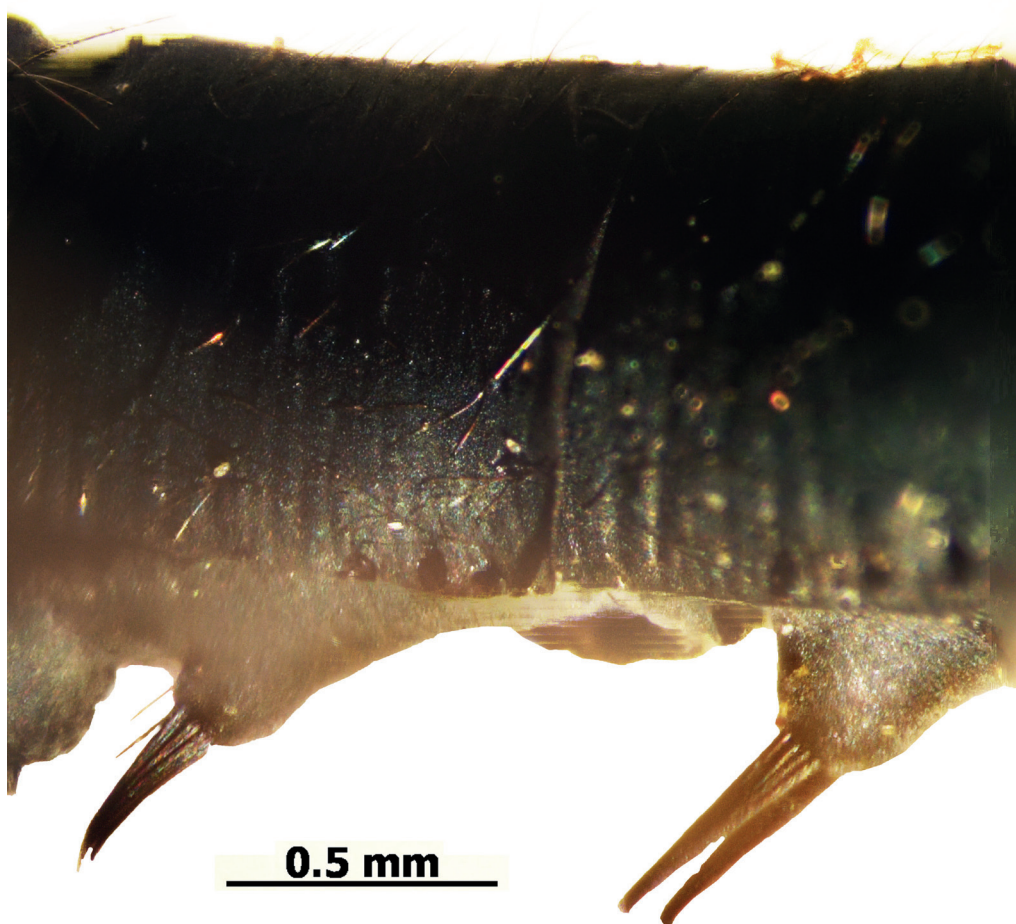


Fig. 2. *Diostracus (Sphyrotarsus) kustovi* sp. nov. Male holotype. Abdominal segments 2 and 3.

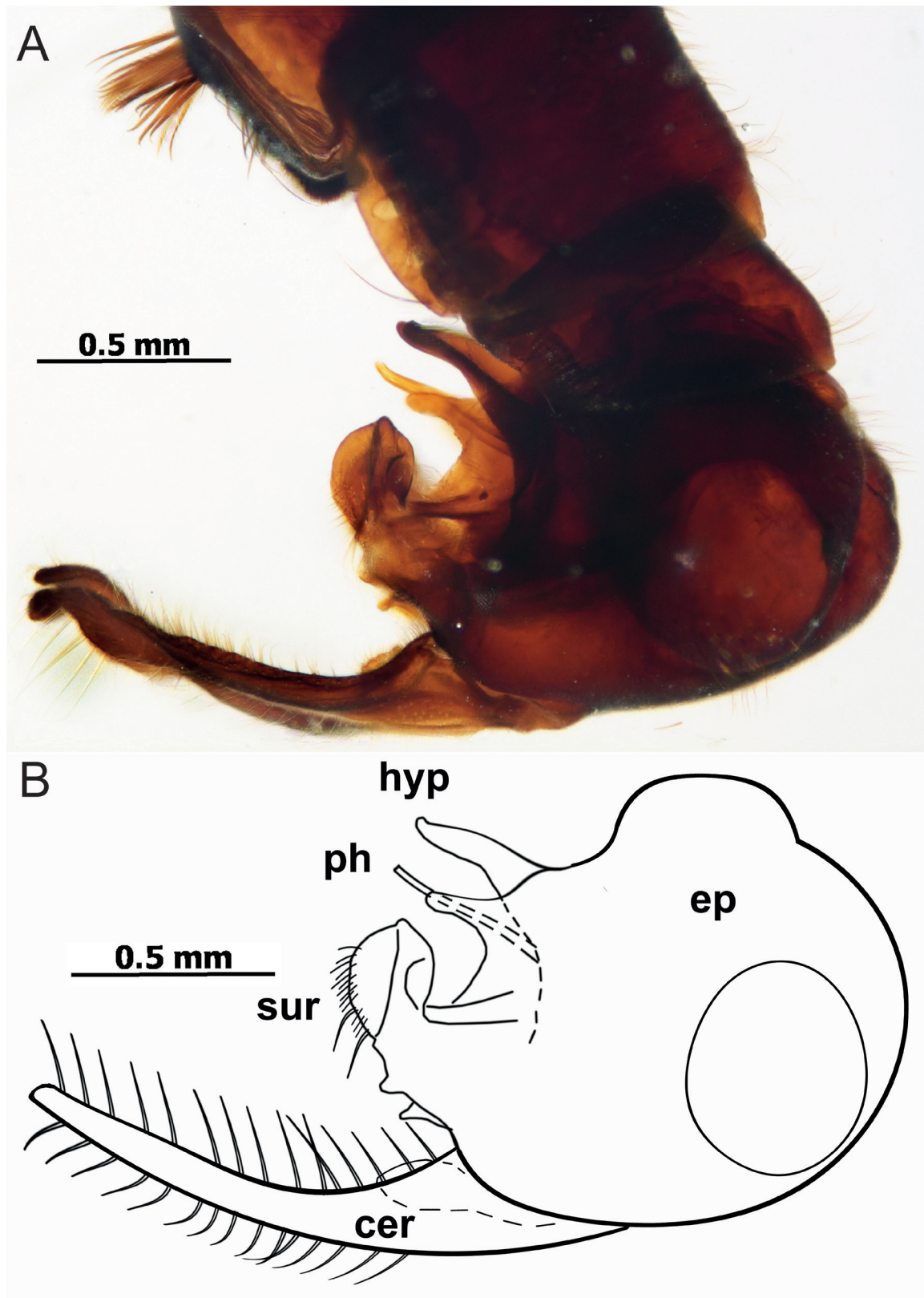


Fig. 3. *Diostracus (Sphyrotarsus) kustovi* sp. nov. Male holotype. **A.** Apex of abdomen and hypopygium. **B.** Hypopygium. Abbreviations: cer – cercus, ep – epandrium, hyp – hypandrium, ph – phallus, sur – surstylus.

WING. Simple, almost hyaline, with simple veins; Sc developed; R_{2+3} and R_{4+5} weakly convex anteriorly; R_{4+5} and M_{1+2} almost straight and parallel behind level of *dm-cu*; M_{1+2} weakly sinuate; ratio of part of costa between R_{2+3} and R_{4+5} to that between R_{4+5} and $M_{1+2} = 73/57$; ratio of cross-vein *dm-cu* to distal part of $CuA_1 = 84/47$; *dm-cu* perpendicular to both longitudinal veins; calypter blackish, with pale cilia; halter orange yellow.

ABDOMEN. Black, with washed pollinosity, with short black setae; 1st tergum with long brownish setae and ciliated with long black bristles on posterior margin; 1st sternum projected, with shallow transverse furrow anteriorly; 2nd sternum (Fig. 2) with medial bulb at anterior 1/3, bearing 2 adjacent black spines formed of long glued setae and directed anteriorly; 3rd sternum (Fig. 2) with twice as large bulb bearing 2 diverging black spines formed of long glued setae and directed anteriorly; 4th sternum (Fig. 3A) with 2 median bunches of erect brownish setae on low convection, with posterior margin somewhat projecting and covered with short hairs; hypopygium (Fig. 3B) black, moderately large, with posterodorsal portion moderately produced and rounded; hypandrium subtriangular, narrow distally and bifurcated at apex; phallus simple; epandrial lobe short and narrow; surstylus brown, almost semicircular, with short hairs dorsally; cercus distinctly longer than epandrium, slightly swollen at base, band-like, simple, densely ciliated with long yellow setae.

Female

LENGTH (mm). Body 7.0, wing 8.0, antenna 1.4.

Similar to male except lacking male secondary sexual characters, otherwise as follows: 6 dorsocentrals of irregular length in left row and 8 dorsocentrals in right row; palpus not glittering silvery; legs and abdominal sterna simple; 6th and 5th terga and genital plates densely covered with fine long setae; no acanthophorites.

Remarks

Having bulbs on 2nd and 3rd sterna and bearing strong ventral spines or bunches on abdomen, the new species distinctly differs from other species of the subgenus *Sphyrotarsus* (see key below). *D. (L.) spinulifer* males also have a setose venter, but not bearing bulbs and thick spines. Some Chinese and Nepalese species of *Diostracus* were also described with male sterna ornamented with bunches of setae, spines or projections (e.g., Saigusa 1984; Yang *et al.* 2011), but strongly differing in many other characters.

Ecology

Both types of *D. (S.) kustovi* were collected together on stones at a stream (S. Kustov, pers. comm.) in high mountains at 2400 m above sea level.

Key to West Palaearctic species of the genus *Diostracus* (males)

Note: Partially based on previous keys to species of the former genus *Sphyrotarsus* (Parent 1938; Negrobov 1978).

1. Scutellum with 1–2 pairs of long bristles and with some short lateral setae or hairs2
- Scutellum with 3 pairs of almost equally long bristles (subgenus *Sphyrotarsus*)4
2. Scape with hairs above; 4.5–5.1 mm*D. (Diostracus) leucostomus* (Loew, 1861)
- Scape bare above3

3. Male and female postpedicel elongate-ovate, 1.5–2 times longer than high, with apical stylus; male abdominal sternites without strong spines; body 5 mm long*D. (Takagia) stackelbergi* (Negrobov, 1965)
 - Postpedicel about as long as high, with dorsal stylus; male 2nd to 4th abdominal sternites with strong black spines; body 5–6.5 mm long*D. (Lagodechia) spinulifer* Negrobov & Zurikov, 1988
4. Male 2nd and 3rd abdominal sternites with strong black spines; body 7.0 mm (female) to 9.4 mm (male) long*D. (S.) kustovi* sp. nov.
 - Male abdominal sternites without strong spines5
5. Male cercus shorter than epandrium; body 6 mm long*D. (S.) caucasicus* (Negrobov, 1965)
 - Male cercus longer than epandrium6
6. All tarsi with empodium scaly in male, as long as claws; mid basitarsus thin, longer than rest of tarsomeres combined; body 6.5 mm long*D. (S.) hygrophilus* (Becker, 1891)
 - Tarsi with reduced empodium; mid basitarsus shorter than rest of tarsomeres combined7
7. Male cercus bifurcated between base and middle; mid basitarsus thickened at middle and at apex8
 - Male cercus bifurcated at apex only; mid basitarsus simple or thickened at base9
8. Outer arm of cercus long and narrow; body 5.2–6 mm long*D. (S.) argyrostomus* (Mik, 1874)
 - Outer arm of cercus short, broad, subtriangular; body 7 mm long*D. (S.) parenti* (Hesse, 1933)
9. Palpus bare; proboscis as long as head; body 5.2 long*D. (S.) hessei* (Parent, 1914)
 - Palpus covered with black hairs; proboscis half as long as head; body 6–6.5 mm long*D. (S.) hervebazini* (Parent, 1914)

Discussion

The subgenera of the genus *Diostracus* are relatively well defined in the West Palaearctic Region. In the Nearctic, *D. mchughi* Harmston, 1966 differs from *D. prasinus* and *D. olga* Aldrich, 1911 in its bare antennal scape and can be associated with the subgenus *Sphyrotarsus*, although bearing only two, rather than three pairs of long setae on the scutellum. The borders of the West Palaearctic subgenera become rather obscure in the East Palaearctic and Orient. Saigusa (1984) supposed that most of the species groups proposed in his paper could be raised to the subgeneric rank if a phylogenetic analysis based on all known species were to be carried out. They could have a common ancestor, which is close to *Diostracus* or *Sphyrotarsus*, and their real degree of separation (or similarity) may require molecular investigation. Increased sampling effort should provide specimens that are appropriate for future studies of these flies.

Regarding the new species described here, it seems that *D. (S.) kustovi* sp. nov. is one of the largest hydrophorine species in the Palaearctic Region (see Negrobov 1977–1979). The male body is somewhat longer than the female body (9.4 vs. 7.0 mm), while wings are approximately equal in length in the two sexes (about 8 mm).

Acknowledgments

The author expresses sincere gratitude to Drs. E.P. Nartshuk and L.A. Kuznetsova (ZIN) for their kindness in furnishing an opportunity to study the collections of their museum. This work was partly supported by grant N 11-04-01051-a from the Russian Foundation for Basic Research to Oleg P. Negrobov.

References

- Becker T. 1891. Neues aus Süd-Tirol und Steiermark. Ein dipterologischer Beitrag. *Wiener Entomologische Zeitung* 10: 281-288. <http://www.biodiversitylibrary.org/page/11976154#page/305/mode/1up>
- Cumming J.M. & Wood D.M. 2009. Chapter 2. Adult morphology and terminology. In: Brown B.V., Borkent A., Cumming J.M., Wood D.M., Woodley N.E. & Zumbado M.A. (eds) *Manual of Central American Diptera*. Vol. 1: 19-50. Ottawa, NRC Research Press.
- Grichanov I.Ya. 2003–2013. A checklist of species of the family Dolichopodidae (Diptera) of the World arranged by alphabetic list of generic names [online database]. Available from <http://dolicho.narod.ru/Genera3.htm> [accessed 20 October 2013]
- Grichanov I.Ya., Negrobov O.P. & Selivanova O.V. 2011a. Keys to Palaearctic subfamilies and genera of the family Dolichopodidae (Diptera). *CESA News* 62: 13-46.
- Grichanov I.Ya., Selivanova O.V. & Negrobov O.P. 2011b. A brief synopsis of Palaearctic genera of the family Dolichopodidae (Diptera). *Ukrainska Entomofaunistyka* 2 (2): 11-40.
- Hesse E. 1933. *Sphyrotarsus Parenti* n. sp. et les *Sphyrotarsus* (Diptères – Dolichopodidae) des Alpes françaises. *Bulletin Scientifique de Bourgogne* 2: 11-20.
- Loew H. 1861a. Neue Beiträge zur Kenntnis der Dipteren. Achter Beitrag. Die nordamerikanischen Dolichopodiden. *Programme der Königlichen Realschule zu Meseritz* 1861: 1-60.
- Loew H. 1861b. Beschreibungen einiger neuer europäischer Dipteren. *Wiener Entomologische Monatschrift* 5 (11): 348-351. <http://www.biodiversitylibrary.org/item/98657#page/362/mode/1up>
- Masunaga K. 2000. Two new species of the torrenticolous genus *Diostracus* Loew (Diptera: Dolichopodidae), with biogeographical notes on the Japanese fauna. *Entomological Science* 3 (4): 675-685.
- Mik J. 1874. Beitrag zur Dipterenfauna Österreichs. *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien* 24: 329-354.
- Negrobov O.P. 1965. New and little-known species of Dolichopodidae (Diptera) in the fauna of the Soviet Union. *Entomologicheskoe Obozrenie* 44 (2): 438-446 (in Russian).
- Negrobov O.P. 1973. Genera and subgenera of the subfamily Hydrophorinae (Diptera Dolichopodidae) of Holarctic. *Zoologicheskii Zhurnal* 52 (10): 1514-1520 (in Russian).
- Negrobov O.P. 1977–1979. 29. Dolichopodidae, Unterfamilie Hydrophorinae, Unterfamilie Rhapsiinae. In: Lindner E. (ed.) *Die Fliegen der Palaearktischen Region* 4 (5): 354-530. [29, 316 (1977), 319 (1978), 321-322 (1979): 354-530.]
- Negrobov O.P. 1991. Family Dolichopodidae. In: Sóos Á. & Papp L. (eds) *Catalogue of Palaearctic Diptera*. Vol. 7. *Dolichopodidae–Platypozidae*: 11-139. Budapest, Akadémiai Kiadó. <http://dx.doi.org/10.1016/B978-0-444-98731-0.50008-9>
- Negrobov O.P. & Tsurikov M.N. 1996. A new genus of the family Dolichopodidae (Diptera) from the Caucasus. *Zoologicheskii Zhurnal* 75 (4): 632-634 (in Russian).
- Negrobov O.P., Tsurikov M.N. & Dzhavelidze I.G. 1988. Materials on the fauna of the family Dolichopodidae (Diptera) of the Lagodekhi nature reserve. In: *Voprosy Zashchity Gornyykh Lesov [Problems of Mountain Forest Protection]* 7: 213-223 (in Russian). Tbilisi, Institute of Mountain Forestry.

- Oldenberg L. 1916. Einige Dolichopodiden meiner Ausbeute (Dipt.). *Entomologische Mitteilungen* 5 (5/8): 187-198. <http://www.biodiversitylibrary.org/item/38722#page/217/mode/1up>
- Özdikmen H. 2010. Substitute names for three Palaeartic fly genus group names (Diptera: Limoniidae and Dolichopodidae). *Munis Entomology & Zoology* 5 (1): 262-265.
- Parent O. 1914. Description de deux Diptères nouveaux du groupe des Dolichopodides. *La Feuille des Jeunes Naturalistes* 44: 85–86, 108-112. <http://www.biodiversitylibrary.org/item/29383#page/605/mode/1up>
- Parent O. 1938. Diptères Dolichopodidés. *Faune de France* 35: 1-720. Paris, L'Académie des Sciences de Paris.
- Saigusa T. 1984. The genus *Diostracus* from Nepal (Diptera, Dolichopodidae). *Bulletin of the Kitakyushu Museum of Natural History* 5: 1-74.
- Saigusa T. 1995. New species of the genus *Diostracus* from Eastern Asia (Insecta, Diptera, Dolichopodidae). *Bulletin of the Graduate School of Social and Cultural Studies, Kyushu University* 1: 73-85.
- Saigusa T., Masunaga K. & Lee C.E. 1997. The genus *Diostracus* Loew from Korea (Diptera, Dolichopodidae). *Esakia* 37: 135-140.
- Strobl G. 1898. Die Dipteren von Steiermark. IV. Theil. Nachträge zum III. Theil. *Mittheilungen des Naturwissenschaftlichen Vereines für Steiermark* 34 (for 1897): 192-298. <http://www.biodiversitylibrary.org/item/45394#page/308/mode/1up>
- Takagi S. 1968. The Dipterous genus *Diostracus* (Dolichopodidae). *Insecta Matsumurana* 31: 35-62.
- Yang D., Zhang L., Wang M. & Zhu Y. 2011. Dolichopodidae. *Fauna Sinica, Insecta* 53: 1-1912 (in Chinese, with English summary). Beijing, Science Press.

Manuscript received: 28 March 2013

Manuscript accepted: 5 August 2013

Published on: 30 October 2013

Topic editor: Koen Martens

Desk editor: Danny Eibye-Jacobsen

Printed versions of all papers are also deposited in the libraries of the institutes that are members of the *EJT* consortium: Muséum National d'Histoire Naturelle, Paris, France; National Botanic Garden of Belgium, Meise, Belgium; Royal Museum for Central Africa, Tervuren, Belgium; National History Museum, London, United Kingdom; Royal Belgian Institute of Natural Sciences, Brussels, Belgium; Natural History Museum of Denmark, Copenhagen, Denmark.