

A review of species of the genera *Bostrichopyga* Becker, 1894 and *Paracosmetopus* Hackman, 1956 (Diptera: Scathophagidae)

Обзор видов родов *Bostrichopyga* Becker, 1894 и *Paracosmetopus* Hackman, 1956 (Diptera: Scathophagidae)

A.L. Ozerov¹, M.G. Krivosheina²
А.Л. Озеров¹, М.Г. Кривошеина²

¹Zoological Museum, Moscow Lomonosov State University, Bol'shaya Nikitskaya 6, Moscow 125009, Russia. E-mail: ozerov2455@rambler.ru

¹Зоологический музей, Московский государственный университет им. М.В. Ломоносова, Большая Никитская ул., 6, Москва 125009, Россия.

²A.N. Severtzov Institute of Ecology and Evolution, Russian Academy of Sciences, 119071 Moscow, Russia, e-mail: dipteramarina@rambler.ru

²Институт проблем экологии и эволюции им. А.Н.Северцова РАН, Ленинский проспект, 33, Москва 119071, Россия, e-mail: dipteramarina@rambler.ru

KEY WORDS: Diptera, Scathophagidae, *Bostrichopyga*, *Paracosmetopus*, new synonym.

КЛЮЧЕВЫЕ СЛОВА: Diptera, Scathophagidae, *Bostrichopyga*, *Paracosmetopus*, новый синоним.

ABSTRACT. Flies of the genera *Bostrichopyga* Becker, 1894 and *Paracosmetopus* Hackman, 1956 are reviewed. Genera diagnosis and redescriptions of species of both genera are given. *Bostrichopyga borealis* Hendel, 1903 is synonymised with *Bostrichopyga crassipes* (Zetterstedt, 1838). Description of female of *P. helleni* and photos of abdominal sternites and genitalia for *B. borealis* are given for the first time.

РЕЗЮМЕ. Дан обзор двукрылых родов *Bostrichopyga* Becker, 1894 и *Paracosmetopus* Hackman, 1956. Приведены диагнозы родов и переописаны виды для каждого рода. *Bostrichopyga borealis* Hendel, 1903 есть новый младший синоним *Bostrichopyga crassipes* (Zetterstedt, 1838). Впервые описана самка *P. helleni* и даны фотографии стернитов брюшка и гениталий самца *B. borealis*.

Introduction

Both *Bostrichopyga* Becker, 1894 and *Paracosmetopus* Hackman, 1956 are small Palaearctic genera within the family Scathophagidae.

Genus *Bostrichopyga* was described by Becker [1894] and primarily included only one species in the World — *Bostrichopyga crassipes* (Zetterstedt, 1838). The second species, *Bostrichopyga borealis* Hendel, 1903, was described by Hendel [1903] from Norway.

B. crassipes is a rare species, registered in Sweden and Finland [Hackman, 1956]. Gorodkov [1986] mentioned this species for Russia (without specifying the material), but no specimens were found in collection to confirm this. *B. borealis* was described on a single male specimen and after that no specimens were found.

Nothing is known about the biology of both species. Through the kindness of Dr. P. Vilkamaa (Helsinki) and Dr. P. Sehnal (Wien) we were able to examine one male of *B. crassipes* from Finland and the holotype of *B. borealis*.

Genus *Paracosmetopus* contains only a single species in the World — *P. helleni* Hackman, 1956, which was described from one male specimen from Kola Peninsula [Hackman, 1956] and after that no specimens were registered. Nothing is known about the biology of this species.

The genera diagnosis and redescriptions of species of both genera are given below. The description of the female of *P. helleni* and photos of abdominal sternites and genitalia for *B. borealis* are given for the first time.

Terminology follows McAlpine [1981], Cumming et al. [2009], and Stuckenberg [1999].

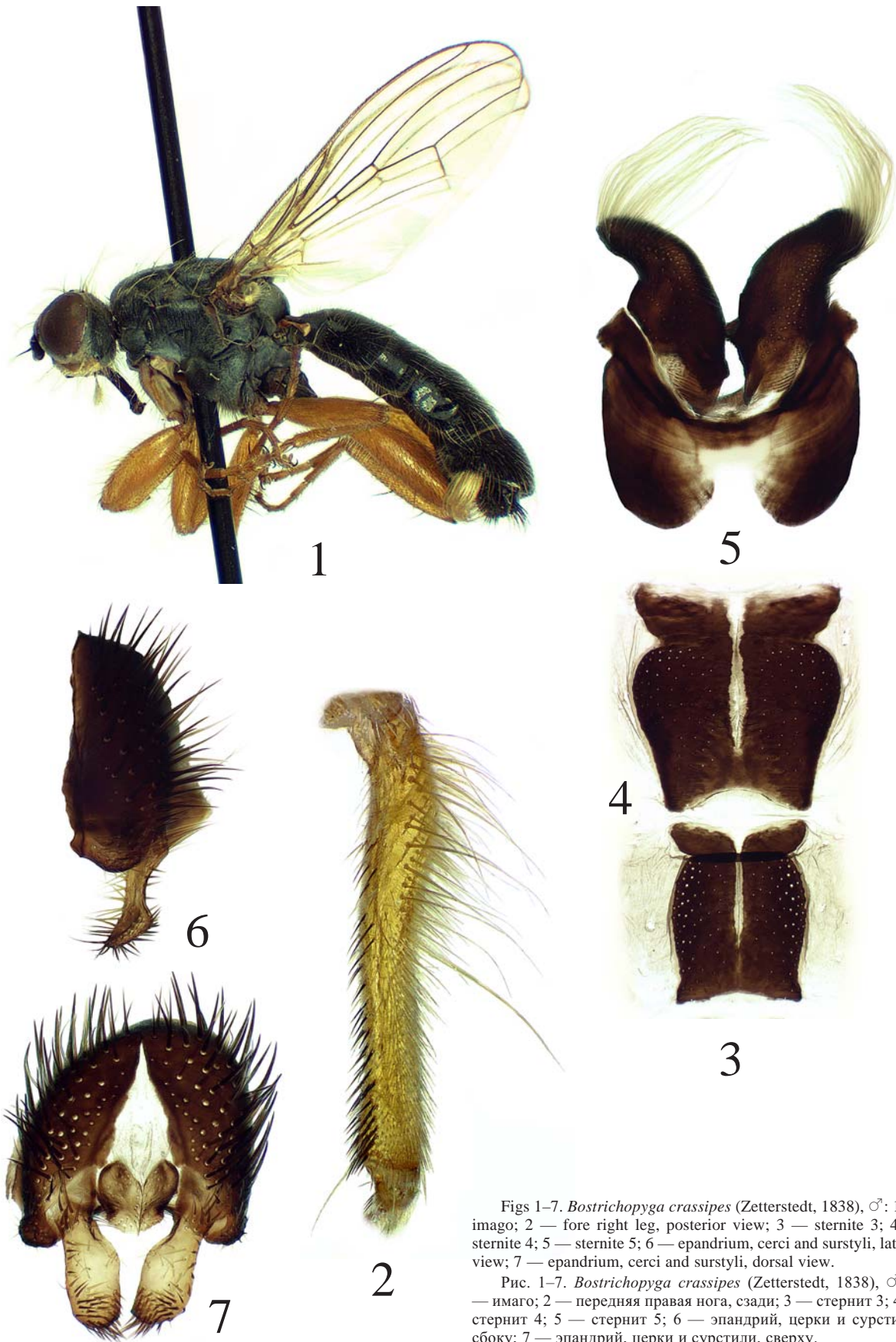
The following abbreviations are used for depositories of the studied specimens: MZH — Finnish Museum of Natural History, Helsinki, Finland; MZLU — Lund University, Lund, Sweden; NMW — Naturhistorisches Museum Wien, Wien, Austria; ZMUM — Zoological Museum, Moscow State University, Russia.

Other abbreviations used: *a* — anterior; *d* — dorsal; *p* — posterior; *v* — ventral, and combinations of these latter four, all used for leg chaetotaxy.

Taxonomic part

Bostrichopyga Becker, 1894

Bostrichopyga Becker, 1894: 142. Gender: feminine. Type-species: *Cordylura crassipes* Zetterstedt, 1838, by original designation.



Figs 1–7. *Bostrichopyga crassipes* (Zetterstedt, 1838), ♂: 1 — imago; 2 — fore right leg, posterior view; 3 — sternite 3; 4 — sternite 4; 5 — sternite 5; 6 — epandrium, cerci and surstyli, lateral view; 7 — epandrium, cerci and surstyli, dorsal view.

Рис. 1–7. *Bostrichopyga crassipes* (Zetterstedt, 1838), ♂: 1 — имаго; 2 — передняя правая нога, сзади; 3 — стернит 3; 4 — стернит 4; 5 — стернит 5; 6 — эпандрий, церки и сурстили, сбоку; 7 — эпандрий, церки и сурстили, сверху.

DIAGNOSIS (for male only, female unknown). Postpedicel with roundish apical corner. Arista bare. Palpus distinctly spatulate. Proepisternum covered with hairs. Anepisternum covered with hairs along dorsal margin and in posterior part only. Anepimeron bare. Katepisternum with 1 strong seta in posterodorsal corner. All head's and thoracic setae yellow. Postmetacoxal bridge absent. Scutellum with two pairs of strong setae: basal and apical. Fore tibia with posteroventral rows of short setae (Fig. 2). Wing tinged with brownish, veins blackish. R_1 bare.

Male sternites 3 and 4 (Figs 3–4). Male sternite 5 symmetrical (Fig. 5). Cerci simple, symmetrical (Fig. 7); surstyli symmetrical (Figs 6–7).

Bostrichopyga crassipes (Zetterstedt, 1838)

Figs 1–7.

crassipes Zetterstedt, 1838: 734 (*Cordylura*). Type-locality: "Dalekarlia" (Dalarna, Sweden); HT ♂, in MZLU.

borealis Hendel, 1903: 385 (*Bostrichopyga*). Type-locality: Austad (58.0903N 7.0442E, Norway); HT ♂, in NMW — **syn.n.**

TYPE MATERIAL. *Bostrichopyga borealis* Hendel: holotype ♂ labelled: "Austad [58.0903°N 7.0442°E, Norway] (Sæt.) Strand", "*Bostrichopyga* n.sp.", "type" [red label], "*Bostrichopyga borealis* H.", "Mus. Cæs. Vindobon." The holotype is with wrinkled legs and light coloration and we can suppose that it was collected in a short time after the emergence.

OTHER MATERIAL EXAMINED. *Bostrichopyga crassipes* (Zetterstedt): FINLAND: Om, Larsmo (63.7525N 22.7461E), 21.VI.1950, leg. Storå (1 ♂, in MZH).

NOTE. Holotype of *B. borealis* Hendel has yellow face and gena, though specimen of *B. crassipes* from Finland has black face and gena. Differences in coloration are possibly connected with stage of sclerotization of just emerged holotype specimen. It is possible that coloration of face and gena vary in specimens. Such differ is known for the species of close genus *Microprosopa* Becker, 1894, for example for *M. pallidicauda* (Zetterstedt, 1838). All the other characters are identical. The number of orbital setae (3 setae) are identical in both specimens, however number of frontal setae vary from 1 to 3. Frontal setae as strong as orbitals. Hendel [1903] summarized orbital and frontal setae in the description and because of this he wrote about 5–6 setae. So we consider the name *B. borealis* Hendel to be the junior synonym of *B. crassipes* Zetterstedt.

REDESCRIPTION. Length of body 5.9–6.2 mm. Length of wing 5.6–5.7 mm. All setae and hairs on head and body yellowish, except black setae on male abdominal sternite 6 and epandrium.

Male (Fig. 1). **Head.** Fronal vitta black in upper half, but yellow in lower half, matt. Fronto-orbital plate and ocellar triangle black, greyish microtrichose. Parafacial and face from yellow to black, gena yellow, all with white microtrichia. Postcranium black, greyish microtrichose, covered with setae and hairs. Setae: 3 orbitals, 1–3 frontals, 1 ocellar, 1 postocellar (weak, convergent), 1 inner vertical, 1 outer vertical; 2 pairs of strong vibrissae and several pairs of short subvibrissae

present. Antenna black, postpedicel rounded apically, approximately 1.5 times as long as wide. Arista bare. Palpus yellow, distinctly spatulate. Clypeus and proboscis black.

Thorax black, densely grey microtrichose. Scutum with following setae: 2 postpronotals, 2 notopleurals, 1+1 intra-alars, 1+1 supra-alars, 1 postalar, and 2+3 dorsocentrals; acrostichal setulae short, in two rows. Proepisternum and proepimeron with several hairs. Anepisternum covered with hairs in posterior half and with a row of setae along posterior margin. Katepisternum with 1 strong seta in posterodorsal corner. Anepimeron bare. Scutellum with 2 pairs of strong setae.

Legs yellow, only mid and hind coxae black. Forefemur with row of thin yellow *pv*. Foretibia (Fig. 2) with irregular rows of small setae ventrally, with yellow hairs in basal half posteriorly, 1 long yellow *ad* and apicals *d* and *p*. Midfemur with yellow hairs posteriorly, 3–4 black *pv* in apical half, and 1 yellow preapical *pd*. Midtibia with 1 black *ad*, and ring of apical setae. Hindfemur slightly thickened, curved in basal half, with row of yellow *ad* and 2–4 yellow *av* in apical half and yellow hairs posteroventrally. Hindtibia with 2 *ad*, 1 *pd*, 1 preapical *d*, and apical *av*.

Wing tinged with brownish, veins blackish. R_1 bare. Calypteres, including margins, and halteres yellowish.

Abdomen black, subshining, covered with hairs. Syntergite 1+2 with several setulae at sides. Tergites 3–6 each with row of marginal setulae. Male sternites 3–5 as in Figs 3–5. Epandrium, cerci and surstyli as in Figs 6–7. Surstyli symmetrical.

Female unknown.

DISTRIBUTION. **Palearctic.** — **Europe:** Finland, Norway, Sweden.

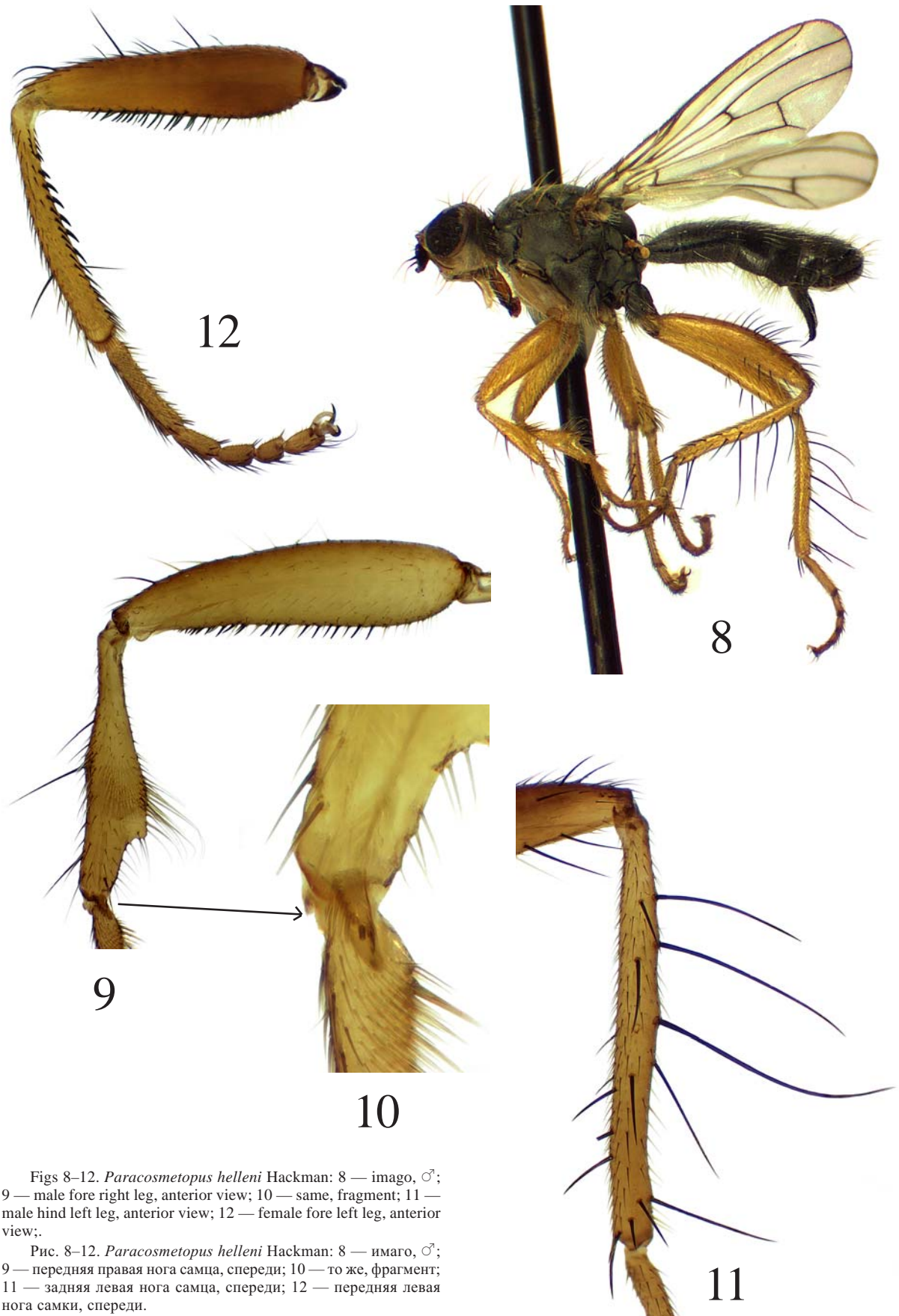
Paracosmetopus Hackman, 1956

Paracosmetopus Hackman, 1956: 26. Gender: masculine. Type-species: *Paracosmetopus helleni* Hackman, 1956, by original designation.

DIAGNOSIS. Postpedicel with slightly acute upper apical corner. Arista bare. Palpus distinctly spatulate. Proepisternum covered with hairs. Anepisternum covered with hairs along dorsal margin and in posterior part only. Anepimeron bare. Katepisternum with 1 strong seta in posterodorsal corner. All head's and thoracic setae yellow. Postmetacoxal bridge absent. Scutellum with pair of apical setae only. Male foretibia modified (Figs 9–10), with flat light tubercle apically, female foretibia with posteroventral rows of short setae (Fig. 12). Wing tinged with brownish, veins brownish. R_1 bare. Crossveins *r-m* and *dm-cu* slightly darkened.

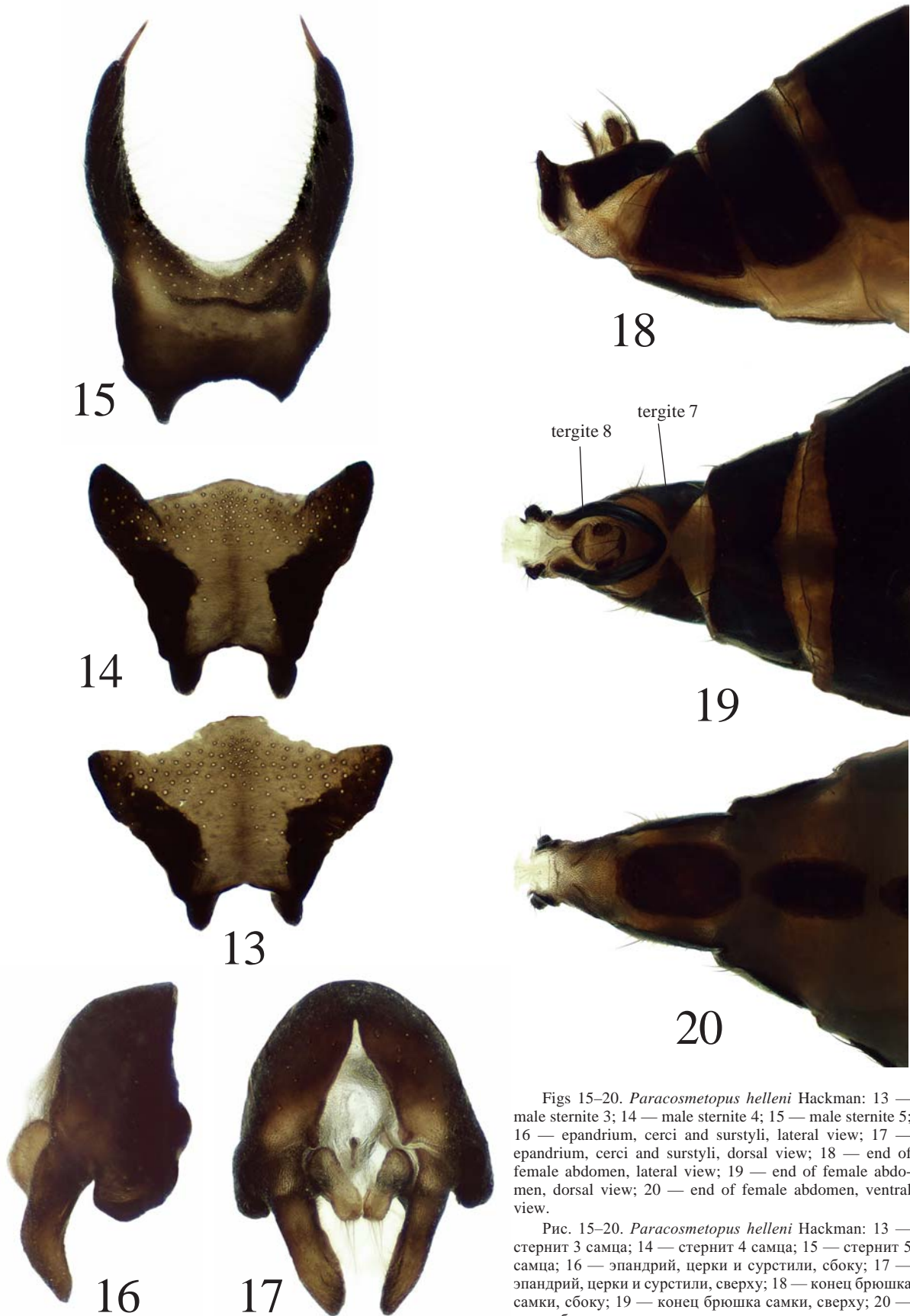
Male sternites 3 and 4 (Figs 13–14). Male sternite 5 symmetrical (Fig. 15). Cerci simple, symmetrical (Figs 13, 20); surstyli symmetrical (Figs 16–17).

Ovipositor short and compact, more or less cylindrical; proctiger shifted dorsally (Fig. 18). Tergite 7 with membranous area dividing it medially (Fig. 19) into two triangular sclerites (Fig. 18). Tergite 8 narrow, unbroken (Fig. 19).



Figs 8–12. *Paracosmetopus helleni* Hackman: 8 — imago, ♂; 9 — male fore right leg, anterior view; 10 — same, fragment; 11 — male hind left leg, anterior view; 12 — female fore left leg, anterior view;.

Рис. 8–12. *Paracosmetopus helleni* Hackman: 8 — имаго, ♂; 9 — передняя правая нога самца, спереди; 10 — то же, фрагмент; 11 — задняя левая нога самца, спереди; 12 — передняя левая нога самки, спереди.



Figs 15–20. *Paracosmetopus helleni* Hackman: 13 — male sternite 3; 14 — male sternite 4; 15 — male sternite 5; 16 — epandrium, cerci and surstyli, lateral view; 17 — epandrium, cerci and surstyli, dorsal view; 18 — end of female abdomen, lateral view; 19 — end of female abdomen, dorsal view; 20 — end of female abdomen, ventral view.

Рис. 15–20. *Paracosmetopus helleni* Hackman: 13 — стернит 3 самца; 14 — стернит 4 самца; 15 — стернит 5 самца; 16 — эпандрий, церки и сурстили, сбоку; 17 — эпандрий, церки и сурстили, сверху; 18 — конец брюшка самки, сбоку; 19 — конец брюшка самки, сверху; 20 — конец брюшка самки, снизу.

Paracosmetopus helleni Hackman, 1956
Figs 8–20.

helleni Hackman, 1956: 24 (*Paracosmetopus*). Type-locality: “Kola Peninsula, Lv: Kusomen” (Kuzomen, Murmanskaya Oblast’, Russia); HT ♂, in MZH.

MATERIAL EXAMINED. RUSSIA: Komi, *Vorkuta* (67.5°N 64.0°E), 19–25.VII.2010, N. Vikhrev (4 ♂♂, in ZMUM); Komi, *Seida* (67.05°N 63.09°E), 23.VII.2010, N. Vikhrev (2 ♂♂, in ZMUM); Krasnoyarskiy Kray, Taimyr, Taimyr Biosphere Reserve, Ary-Mas field station (72.5°N, 101.94°E), 14 m, 9–11.VII.2010, A. Barkalov [labels on Russian] (14 ♂♂, 6 ♀♀, in ZMUM and ISEA).

REDESCRIPTION. Length of body 5.5–5.8 mm. Length of wing 4.0–4.3 mm. All setae and hairs on head and body yellowish, except black setae on male abdominal sternite 6 and epandrium.

Male (Fig. 8). *Head*. Fronal vitta yellow, matt. Fronto-orbital plate and ocellar triangle black, greyish microtrichose. Parafacial and gena yellow, face yellow to black, all with white microtrichia. Postcranium black, but in lower margin yellow, greyish microtrichose, covered with setae and hairs. Setae: 3 orbitals, 3–4 frontals, 1 ocellar, 1 postocellar (weak, convergent), 1 inner vertical, 1 outer vertical; 1–2 pairs of strong vibrissae and several pairs of short subvibrissae present. Scape and pedicel yellow to black, postpedicel black, with slightly acute upper apical corner, approximately 1.5 times as long as wide. Arista bare. Palpus yellow, distinctly spatulate. Clypeus black, prementum of proboscis yellowish.

Thorax black, densely grey microtrichose. Scutum with following setae: 2 postpronotals, 2 notopleurals, 1+1 supra-alars, (0–1)+(0–1) intra-alars, 2 postalars, and 2+3 dorsocentrals; acrostichal setulae short, in two rows. Proepisternum and proepimeron each with seta near lower margin and with several hairs. Anepisternum covered with hairs in posterior half and row of setae along posterior margin. Katepisternum covered with hairs in posterior half and with 1 strong seta in posterodorsal corner. Anepimeron bare. Scutellum with 1 pair of strong apical setae.

Legs yellow, only mid and hind coxae black. Forefemur with rows of *av* (Fig. 9). Foretibia modified, as in Fig. 9, with flat light tubercle apically (Fig. 10). Midfemur with row of *a*, row of *pv*, 3–4 *av* in apical half, and 4–5 preapical *p*. Midtibia with 3–4 *d*, 3–4 *ad*, and apical *ad*, *av*, and *p*. Hindfemur with row of *ad*, with 3–4 *d*, 3–4 *a* and 3–4 *av* in apical half. Hindtibia (Fig. 11) with 6–7 long *d*, 6–7 *ad*, 3–4 *p* in apical half, and apical *ad*, *a*, and *av*.

Wing tinged with brownish, veins brownish. R₁ bare. Crossveins *r-m* and *dm-cu* slightly darkened. Calypteres, including margins, and halteres yellowish.

Abdomen black, grey microtrichose, covered with yellow hairs. Tergite 7 with row of marginal setae. Sternites 3 and 4 (Figs 13–14); sternite 5 symmetrical (Fig. 15). Epandrium, and surstyli (Figs 16–17); cerci simple, symmetrical, surstyli symmetrical.

Female. Similar to male. *Legs*. Fore leg as in Fig. 12: forefemur with irregular rows of short setae ventrally, foretibia simple, with two rows of short spinules ventrally, with 1 *p* and 1 *ad* at middle, and 1 preapical *d*. Midfemur with preapical *a* and *p*, with irregular rows of short *av* and *pv* setae. Midtibia with 1 *ad*, 1 *pd*, and ring of apical setae. Hindfemur with row of *ad*, and 3–4 *av* in apical half. Hindtibia with 1 *d*, 1 *a*, 1 preapical *d*, and apical *ad*, and *a*.

Abdomen black, grey microtrichose, covered with blackish hairs, tergite 7 with row of marginal setae. Ovipositor short and compact, more or less cylindrical (Figs 18–20); proctiger shifted dorsally (Fig. 18). Tergite 7 with membranous area dividing it medially (Fig. 19) into two triangular sclerites (Fig. 18). Tergite 8 narrow, unbroken (Fig. 19).

DISTRIBUTION. **Palaeartic**. — **Europe**: Russia (Murmanskaya Oblast’, Komi) **Asia**: Russia (Krasnoyarskiy Kray).

ACKNOWLEDGMENTS. We are very grateful to Dr. P. Viikmaa (Helsinki) and Dr. P. Sehnal (Wien) for loans of material including type.

References

- Becker T. 1894. Dipterologische Studien. I. Scatomyzidae // Berliner Entomologische Zeitschrift. Bd.39. H.1. S.77–196.
- Cumming J.M., Wood D.M. 2009. Adult morphology and terminology // Brown B.V., Borkent A., Cumming J.M., Wood D.M., Woodley N.E., Zumbado M. (eds.). Manual of Central American Diptera. Vol.1. National Research Council Press, Ottawa. P.9–50.
- Gorodkov K.B. 1986. Family Scathophagidae // Soós Á, Papp L. (eds.). Catalogue of Palaeartic Diptera. Vol.11. Scathophagidae-Hypodermatidae. Budapest: Akadémiai Kiadó. P.11–41.
- Hackman W. 1956. The Scatophagidae (Dipt.) of Eastern Fennoscandia // Societas pro Fauna et Flora Fennica. Fauna Fennica II. Helsingforsiae. 67 pp.
- Hendel F. 1903. Drei neue boreale Musidae alypytratae // Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien. Bd.53. S.383–385.
- McAlpine J.F. 1981. Morphology and terminology-adults // McAlpine J.F., Peterson B.V., Shewell G.E., Teskey H.J., Vokeroth J.R., Wood D.M. (coord.). Manual of Nearctic Diptera. Vol.2. Research Branch. Agriculture Canada. Monograph 27. Ottawa. P.9–63.
- Stuckenberg B.R. 1999. Antennal evolution in the Brachycera (Diptera), with a reassessment of terminology relating to the flagellum // Studia Dipterologica. Vol.6. S.33–48.
- Zetterstedt J.W. [1838]. Sectio tertia. Diptera // Insecta Lapponica. ‘1840’, Leopold Voss, Lipsiae [= Leipzig]. P.477–868