

UDC 773.1

NEW AND RARE SPECIES OF ORTHOCLADIINAE (DIPTERA, CHIRONOMIDAE) FROM THE CRIMEA, UKRAINE

V. A. Baranov

Department of Zoology and Animal Ecology
V. N. Karazin Kharkiv National University,
Svoboda Sq., 4, Kharkiv, Ukraine
E-mail: baranowiktor@gmail.com

Received 27 August 2011

Accepted 20 September 2011

New and Rare Species of Orthoclaadiinae (Diptera, Chironomidae) from the Crimea, Ukraine. Baranov V. A. — *Parorthocladus korneyevi* Baranov, sp. n. and *Prosmittia valentinae* Baranov, sp. n. from the Crimean Peninsula are described and illustrated. Three species of Orthoclaadiinae: *Bryophaenocladus akiensis* (Sasa, Shimomura et Matsuo, 1991), *Corynoneura lacustris* Edwards, 1924 and *Metriocnemus eurynotus* (Holmgren, 1883) are recorded for the first time from the Ukraine.

Key words: Chironomidae, Orthoclaadiinae, *Parorthocladus*, *Prosmittia*, new species, Crimean Peninsula.

Новые и редкие виды Orthoclaadiinae (Diptera, Chironomidae) из Крыма, Украина. Баранов В. А. — Даны иллюстрированные описания *Parorthocladus korneyevi* Baranov, sp. n. и *Prosmittia valentinae* Baranov, sp. n. с Крымского полуострова. Три вида Orthoclaadiinae: *Bryophaenocladus akiensis* (Sasa, Shimomura et Matsuo, 1991), *Corynoneura lacustris* Edwards, 1924 и *Metriocnemus eurynotus* (Holmgren, 1883), — указаны впервые для фауны Украины.

Ключевые слова: Chironomidae, Orthoclaadiinae, *Parorthocladus*, *Prosmittia*, новые виды, Крымский полуостров.

Introduction

The subfamily Orthoclaadiinae is one of the largest subfamilies of non-biting midges (Chironomidae) (Ashe, Cranston, 1990). Up to now only 91 species of Orthoclaadiinae were recorded from Ukraine (Baranov, 2011). Orthoclaadiinae play a major role in epi- and metharithral communities of mountain rivers in the Crimea (Prokopov, pers. comm.). However, no comprehensive overview of the taxonomic composition of the Crimean Orthoclaadiinae exists (Baranov, 2011).

Studies on the chironomids in Ukraine, and particularly on the Crimean Peninsula, revealed six species previously not known from the Ukraine, of which two species are new to science and are described below.

The new species were collected on the south shore of the Crimea (where a Mediterranean climate exists), in the Crimean Mountains, and in the city of Simferopol.

Material and methods

Adults were collected mainly by using sweep nets. The material was preserved in 70% ethanol and then mounted on slides in Berlese fluid and glycerol-gelatin. Morphological terminology follows Sæther (1980). The measurements are given as ranges. Holotypes of the new species are deposited in the collection of I. I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kyiv (SIZK); some paratypes and all other examined material are deposited in the private collection of the author (VAB).

Genus *Parorthocladus* Thienemann, 1935

Type species: *Dactylocladius nudipennis* Kieffer, 1908.

The genus includes six described species and occurs in the Holarctic, Oriental and Afrotropical Regions (Ashe, Cranston, 1990; Lui, Wang, 2005, Yamamoto, 2004, 2011).

Based on the material from China, Lui, Wang (2005) reviewed and keyed all known species of *Parorthocladus*. An additional species, *Parorthocladus negoroi* Yamamoto, 2011 was described recently (Yamamoto, 2011). There are also several undescribed species.

***Parorthocladius korneyevi* Baranov, sp. n. (fig. 1, A–C)**

Type material. Holotype male (slide-mounted in Berlese fluid), Ukraine: Crimean Peninsula, Simferopol, Salgir River, 44°96' N 34°09' E, stream shore, 29.12.2010, sweep net (Baranov) (SIZK). Paratype: 1 male (in glycerol-gelatin), same data as holotype (VAB).

Diagnosis. This species can be distinguished by a combination of the following features:— uniserial scutellars, double inferior volsella, unusual triangular shape of the gonostylus, squama with many (38–40) biserial setae; 12–13 dorsocentrals, 7 prealars, 12 scutellars.

It is very similar to *Parorthocladius unicentrus* Lui and Wang, 2005 in the general shape of the hypopygium and the double inferior volsella, but it differs by having double tibial spurs on the mid and hind tibia and by the shape of the oral projection on the transverse sternapodeme. It differs from *P. nudipennis* by the biserial setae on the squama, the shape of the gonostylus and the oral projection on the transverse sternapodeme, but the virga and sternapodeme shape are very similar in both.

Description. Male adult (n = 2).

Total length 4.56 mm. Wing length 2.63 mm. Total length/wing length ratio 1.73.

Coloration. Head, thorax, abdominal segments and legs dark brown. Wings light brownish.

Head. Antenna with 13 flagellomeres. Length of flagellomeres (in μ , from 1st to 13th): 69 : 23 : 23 : 23 : 23 : 23 : 25 : 28 : 28 : 25 : 28 : 28 : 588. Terminal flagellomere without strong subapical seta. AR = 1.69. Temporal setae 15, including 7 inner verticals and

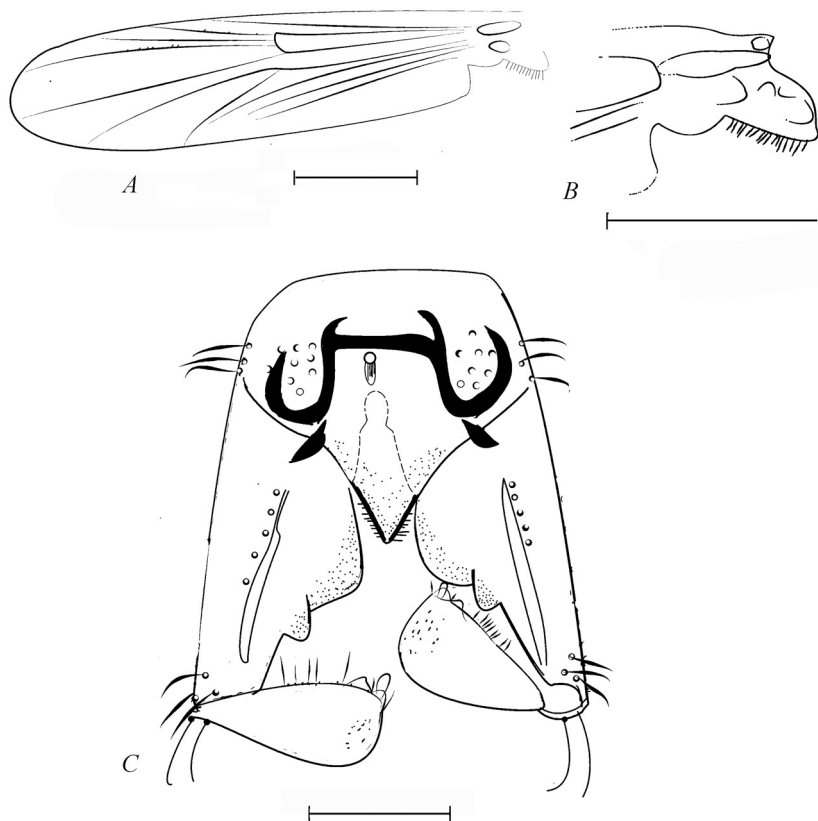


Fig. 1. *Parorthocladius korneyevi*: A — whole wing; B — wing base; C — hypopygium. Scale bars 50 μ m.

Рис. 1. *Parorthocladius korneyevi*: A — крыло, общий вид; B — основа крыла; C — гипопигий. Масштабные линейки 50 мкм.

Table 1. *P. korneyevi*. Lengths (μm) and ratios of leg segments (holotype σ)Таблица 1. *P. korneyevi*. Длины (мкм) и пропорции сегментов ног (голотип σ)

Leg	Fe	Ti	Ta1	Ta2	Ta3	Ta4	Ta5	LR
P1	947	815	676	316	263	158	132	0,82
P2	1078	999	526	263	210	132	118	0,52
P3	1052	1078	526	263	210	105	105	0,48

8 outer verticals. Clypeus with 18 setae. Cibarial pump with distinct cornua. Palpomere lengths (in μm , from P1 to P5) 92 : 73.6 : 103.5 : 87.4 : 115.

Thorax. Antepronotum with 5–6 lateral setae. Acrostichals absent. Dorsocentrals 12–13, prealars 7. Scutellum with 12 uniserial setae.

Wing (fig. 1, A, B). Anal lobe well developed. Costal extension 80.5 μm long. VR = 1.16 Brachiolum with 6 seta; R_{4+5} with 6 setae, R_1 with 3 setae, other veins bare. End of Cu_1 slightly recurved. Squama with 38–40 biserial setae, alula bare.

Legs. Mid and hind tibiae with double spurs but without denticles. Two pseudospurs present on tarsomere III of mid and hind legs (table 1):

Hypopygium (fig. 1, C). Anal point parallel-sided with blunt apex, 58.5 μm long, 46 μm wide at base, anal point length/width ratio 1.3, with 14–16 lateral setae. Gonocoxite with 16–18 long setae. Phallapodeme with hooked apex, 70 μm long; transverse sternapodeme arcuate, 100 μm long, with hooked oral projection. Laterosternite IX with 3 setae, tergite IX with 16 setae. Gonocoxite 304 μm long. Gonostylus triangular, 98 μm long, with triangular preapical crista and 10 setae on the inner side. Inferior volsella double, dorsal part triangular with numerous microtrichia, ventral part oval and with more than 35 long setae.

Female and immature stages. Unknown.

Distribution and ecology. The species is known only from the type locality and was collected by sweep net. Adult males were collected during the snowfall, from last year's grass at a spring shore, together with *Micropsectra atrofasciata* (Kieffer, 1911), air temperature +4°C.

Etymology. Named in honour of Valery A. Korneyev (I. I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kyiv), for his contribution to the study of Ukrainian Diptera.

Genus *Prosmittia* Brundin, 1956

Type species: *Pseudosmittia jemtlandica* Brundin, 1947

The genus *Prosmittia* includes 15 species (14 in the Palaearctic and one in the Nearctic) (Sæther et al., 2000; Yamamoto, 2004; P. Ashe, pers. comm.). The genus was recently reviewed by Makarchenko (2007). Since 2007 two additional species have been described, *P. verae* Krasheninnikov et Makarchenko, 2008 from the Caucasus (Krasheninnikov, Makarchenko, 2008) and *P. anyuica* Makarchenko and Makarchenko, 2009 from the Russian Far East (Makarchenko, Makarchenko, 2009). Most species of the genus have been described from Japan and only three species, *P. jemtlandica*, *P. rectangularis* Tuiskunen, 1985 and *P. verae* are known from Europe. Based on material from southern Crimea (Yalta) a new species of *Prosmittia* is described below.

Prosmittia valentinae Baranov, sp. n. (fig. 2, A–C)

Type material. Holotype male, slide mounted in glycerol-gelatin. Ukraine: Crimean Peninsula, Yalta, mouth of the Ucahnsu River, 44°49' N 34°16' E, 8.05.2011, sweep net, (Baranov) (SIZK). Paratypes: 3 males, same data as the holotype (VAB).

Diagnosis. This species is similar to *Prosmittia kamiyarta* (Sasa, Hirabayashi, 1991) in having a triangular anal point and in the general shape of the gonocoxite, but differs

in having an apically wide gonostylus, and with the crista and the ventral part of the inferior volsella being very small and membranous.

Description. Total length 2.5–3.02 mm. Wing length 1.84 mm. Total length/wing length ratio 1.35.

Coloration. Thorax and abdominal tergites dark brown, sternites of abdomen yellow, legs light-brown.

Head. All specimens lacking antenna, after preservation in alcohol, except holotype, with badly preserved antenna. That is why accurate antenna description impossible. AR = 1.33. Apex of the last flagellomere of antenna cardiform. Eyes bare, without dorsomedial extension. Palpomere lengths (in μm , P1 to P5) : 26 : 92 : 98 : 100 : 117.

Thorax. Anteprepronotum with 4 lateral setae. Acrostichal setae absent. Dorsocentral setae 12, prealar setae 6.

Legs. Mid and hind tibia with single tibial spur; no denticles. Tibial comb of mid and hind legs with 9 setae. Lengths (μm) and proportions of legs as in table 2.

Hypopygium (fig. 2, A, B). Anal point triangular, with dense microtrichia, in middle of tergite, not extended beyond posterior margin of tergite IX. Total length of anal point from 30 to 49 μm . Anal point width 30 μm ; length to width ratio = 1.6. Laterosternite IX with 3 setae, tergite IX bare. Phallapodeme 46 μm long; transverse sternapodeme arcuate, without oral projection. Gonocoxite 147–176 μm long. Gonostylus with distinct crista, 69–79 μm long, with 2 setae on inner side, near apex. Inferior volsella double, dorsal part triangular with numerous microtrichia, ventral part indistinct, membranous.

Female and immature stages. Unknown.

Distribution and ecology. This species is known only from the type locality and was collected using a sweep net. Adult males were collected near the river mouth,

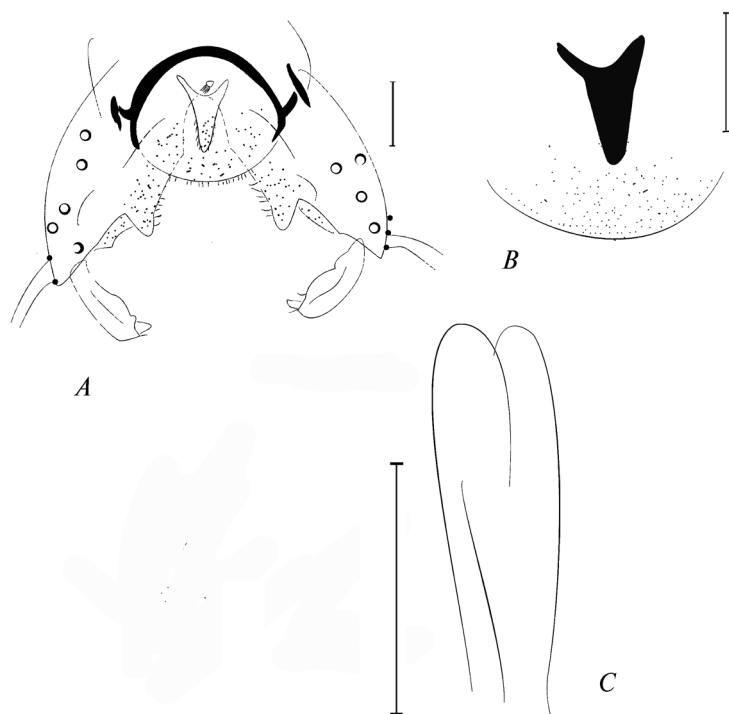


Fig. 2. *Prosmittia valentinae*: A — hypopygium; B — Anal point and tergite X; C — apex of antenna. Scale bars 50 μm .

Рис. 2. *Prosmittia valentinae*: A — гіпопігій; B — анальний отросток и тергит X; C — верхина антени. Масштабні лінійки 50 мкм.

Table 2. *P. valentinae*. Lengths (μm) and ratios of leg segments (4 σ measured)Таблица 2. *P. valentinae*. Длины (мкм) и пропорции сегментов ног (измерены 4 σ)

Leg	Fe	Ti	Ta1	Ta2	Ta3	Ta4	Ta5	LR
P1	294–394	578–637	294–368	159–167	98–132	49–79	39–52.6	0.46–0.63
P2	510–526	526–588	263–294	147–157	98–131	69–80	78–105	0.5
P3	578–588	526–637	263–343	132–188	105–147	78–79	53–59	0.5–0.53

at the sea shore, while swarming above the water. They were collected together with specimens of *Brillia bifida* (Kieffer, 1909) and *Paramerina* sp.

Etymology. Named in honour of Valentina V. Inshina, whose assistance and support made this study possible.

Along with the two new species described above, three species of Orthoclaadiine not previously known to occur in the Ukraine (all collected in the Crimea) are recorded here for the first time.

Bryophaenocladus akiensis (Sasa, Shimomura et Matsuo, 1991) (fig. 3)

Material. Ukraine: Crimean Peninsula, Yalta, Uchansu River, near Uchansu waterfall, 44°49' N 34°09' E, 8.05.2011, sweep net, 10 males; Yalta, "Mys Martyan" Nature Reserve, 44°50' N 34° 24' E, 9.05.2011, sweep net, 1 male (Baranov) (VAB).

Remarks. Specimens were collected in a wide range of conditions, from a wet forest at the base of a waterfall to dry Mediterranean shrub at the sea shore.

Description. European Russia, doubtful in Madeira, Japan and the Russian Far East (Yamamoto, 2004; Makarchenko, 2006, 2007; Sæther, Spies, 2011). The first record from Ukraine.

Corynoneura lacustris Edwards, 1924

Material. Ukraine: Crimean Peninsula, Alma River, Partyzans'ke Reservoir, 44°82' N 34°16' E, 26.03.2011, on snow, sweep net, 2 males (Prokopov) (VAB).

Distribution. It is widespread in western Europe but also occurs in then Near East, North Africa, the Nearctic Region and the Russian Far East (Ashe, Cranston 1990; Makarchenko, 2006; P. Ashe, pers. comm.). The first record from Ukraine.

Metriocnemus eurynotus (Holmgren, 1883)

Material. Ukraine: Crimean Peninsula, Alma River near the village of Novopavlivka, 44°82' N 33°95' E, 19.03.2011, sweep net, 4 males (Prokopov); Kharkiv Region, Kharkiv, Sharzhinka River in the Central City Park, 50°01' N 36°13' E, 2.05.2011, sweep net, 5 males (Baranov) (VAB).

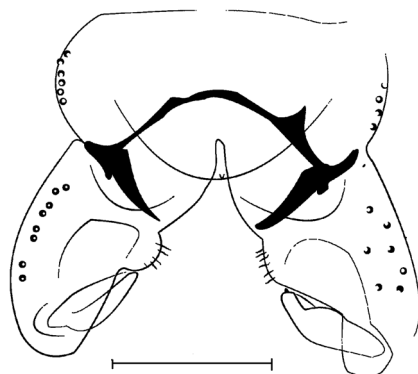


Fig. 3. *Bryophaenocladus akiensis*: Нуропыгий. Scale bar 50 μm .

Рис. 3. *Bryophaenocladus akiensis*: Гипопигий. Масштабная линейка 50 мкм.

Remarks. In the Crimea, the specimens were collected on snow, in Kharkiv, at the shore of a cold spring (summer temperature up to 9°C).

Description. It is widespread in the western Palaearctic but also occurs in Asiatic Russia (East Siberia, Far East), China, Japan as well as the Nearctic and Oriental Regions (Ashe, Cranston, 1990; Makarchenko, 2006; P. Ashe, pers. comm.). The first record from Ukraine.

I wish to express my sincere thanks to Valery A. Korneyev (I. I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kyiv, Ukraine) and Humberto F. Mendes (University of Bergen, Norway) for reading early versions of this manuscript and for useful critical comments on the text and figures. I thank two anonymous referees for carefully reading the manuscript and for constructive criticism. Some specimens used in this study were borrowed through the kindness of Grigory A. Prokopov (V. I. Vernadsky National University of Tavrida, Ukraine). I also wish to thank Andrei Krashennikov (Perm State University, Russia) and Masaru Yamamoto (Kankyō-kagaku kabushiki-gaishya, Japan), who sent me copies of papers important for this study.

Special thanks are due to Alexandr G. Vasenko (Ukrainian Scientific Research Institute of Ecological Problems, Kharkiv, Ukraine) for access to laboratory facilities, and my wife, Valentina V. Inshina, for her constant support, assistance and inspiration for my research on chironomids.

- Ashe P., Cranston P. S. Family Chironomidae // Catalogue of Palaearctic Diptera. Volume 2. Psychodidae—Chironomidae / Eds Á. Soós, L. Papp. — Amsterdam : Elsevier, 1990. — P. 1–499.
- Baranov V. A. A preliminary annotated checklist of non-biting midges (Diptera, Chironomidae) of Ukraine // Ukrainska Entomofaunistyka. — 2011. — 2, N 1. — P. 7–24. — Ukrainian : Баранов В. О. Попередній анований список комарів-дзвінців (Diptera, Chironomidae) України.
- Brundin L. Zur Systematik der Orthoclaadiinae (Diptera, Chironomidae) // Rep. Inst. Freshwater Res. Drottningholm. — 1956. — N 37. — P. 5–185.
- Krashennikov A. B., Makarchenko E. A. Prosmittia verae sp. n. — a new chironomid species (Diptera: Chironomidae: Orthoclaadiinae) from the environs of Sochi Town (the northern Caucasus) // Caucasian Entomological Bulletin. — 2008. — 4, N 3. — P. 359–361. — Russian : Крашенинников А. Б., Макаренко Е. А. Prosmittia verae sp.n. — новый вид комаров-звонцов (Diptera, Chironomidae) из окрестностей Сочи (Северный Кавказ).
- Lui Y., Wang X. A review of the genus Parorthocladus Thienemann from China (Diptera: Chironomidae: Orthoclaadiinae) // Zootaxa. — 2005. — N 802. — P. 1–8.
- Makarchenko E. A., Makarchenko M. A. Subfamily Orthoclaadiinae // Key to the insects of Russian Far East. Vol. 6. Diptera and Siphonaptera. Part 4 / Ed. A. S. Lelei. — Vladivostok : Dal'nauka, 2006. — P. 280–671. — Russian : Макаренко Е. А., Макаренко М. А. Подсем. Orthoclaadiinae.
- Makarchenko E. A., Makarchenko M. A. Chironomids of Prosmittia Brundin (Diptera: Chironomidae: Orthoclaadiinae) from the Russian Far East // Russian Entomological J. — 2007. — 16, N 1. — P. 122.
- Makarchenko E. A., Makarchenko M. A. New findings of chironomids (Diptera, Chironomidae) in Far East and bordering territories // Eurasian Entomological J. — 2009. — 8, N 1. — P. 117–124.
- Sæther O. A. Glossary of chironomid morphology terminology (Chironomidae, Diptera) // Entomologica Scandinavica. — 1980. — Suppl. 14. — P. 1–51.
- Sæther O. A., Ashe P., Murray D. A. Family Chironomidae // Contributions to a Manual of Palaearctic Diptera (with special reference to the flies of economic importance) / Eds L. Papp, B. Darvas. — Budapest : Science Herald, 2000. — Vol. 4, A. 6. — P. 113–334.
- Sæther O. A., Spies M. Fauna Europaea: Chironomidae // Fauna Europaea: Diptera Nematocera. Fauna Europaea, version 2.2 / Ed. H. de Jong. — 2011. — <http://www.faunaeur.org>. — Accessed 20.09.2011.
- Yamamoto M. A catalog of Japanese Orthoclaadiinae (Diptera, Chironomidae) // Makunagi (Acta Dipterologica). — 2004. — 21. — P. 1–121.
- Yamamoto M. A new species of Parorthocladus Thienemann (Diptera: Chironomidae) from Toyama Prefecture, Honshu, Japan, with distributional data of some chironomid species // Bulletin of the Toyama Science Museum. — 2011. — N 34. — P. 31–36.