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Four new species of non-biting midges of the *Harnischia* complex (Diptera, Chironomidae, Chironominae) from Sakhalin Island (Russian Far East)

Четыре новых вида комаров-звонцов комплекса *Harnischia* (Diptera, Chironomidae, Chironominae) с острова Сахалин (российский Дальний Восток)

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Key words: Diptera, Chironomidae, *Cryptotendipes*, *Parachironomus, Paracladopelma, Rabackia,* new species, Sakhalin Island.

Ключевые слова: Diptera, Chironomidae, *Cryptotendipes, Parachironomus, Paracladopelma, Rabackia,* новые виды, остров Сахалин.

Abstract. Four new species of chironomids of the *Harnischia* complex, *Cryptotendipes secundus* **sp.n.**, *Parachironomus pseudovarus* **sp.n.**, *Paracladopelma jacksoni* **sp.n.** and *Rabackia aculeata* **sp.n.** are described, based on the morphology of adult males collected from Sakhalin Island of the Russian Far East.

Резюме. До настоящего исследования на острове Сахалин было отмечено 27 видов комаров–звонцов трибы Chironomini из 15 родов. В результате анализа имагинального материала, собранного и любезно предоставленного нам участниками Международного сахалинского проекта 2001–2002 гг. (ISIP–project), видовой состав Chironomini о. Сахалин увеличился до 88 видов, принадлежащих к 24 родам. Приведены иллюстрированные описания имаго самцов четырёх новых для науки видов из комплекса *Harnischia*: *Cryptotendipes secundus* **sp.n.**, *Parachironomus pseudovarus* **sp.n.**, *Paracladopelma jacksoni* **sp.n.**, *Rabackia aculeata* **sp.n.**, найденные нами в различных водоёмах и водотоках о. Сахалин.

To date, 27 species belonging to 15 genera of non-biting midges of the tribe Chironomini have been recorded from Sakhalin Island [Tokunaga, 1940; Makarchenko, Makarchenko, 1994, 1995; Zorina, 2002]. Analysis of the imagous material kindly collected for us by members of the ISIP–project 2001–2002, the number of Chironomini has been increased to 88 species in 24 genera; amongst these are four species of the genera *Cryptotendipes* Lenz, *Parachironomus* Lenz, *Paracladopelma* Harnisch and *Rabackia* Sæther new for science which are described only on the basis of adult male morphology.

Material was fixed in 70% ethanol and mounted in Fora-Berlese solution.

Morphological terminology and abbreviations are as described in Shilova [1976] and Sæther [1980].

Holotype and paratypes of new species are deposited in the Institute of Biology and Soil Sciences FEB RAS, Vladivostok, Russia.

Cryptotendipes secundus Zorina, **sp.n.**

Figs 1–2.

Material. Holotype: ♂, Russia, Sakhalin Island, Rybnoe lake near Nogliki village, 27.07.2002, E. Makarchenko.

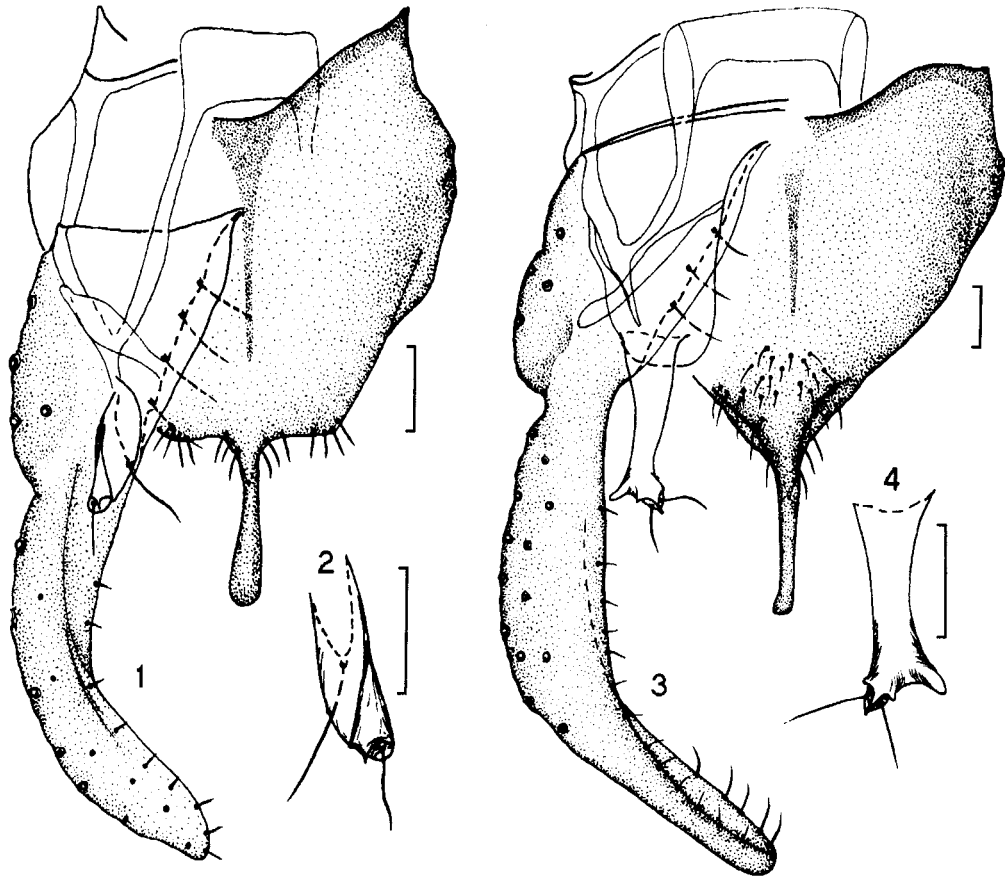
Description. *Imago, male.* Coloration of surface yellowish, total length 3.5 mm; total length/wing length ratio 1.89.

Head with 11–15 temporal and 6 clypeal setae, frontal tubercles lacking; maxillary palp brown, lengths of four anterior palpal segments: 55, 121, 132 and 165 μm. Palp length/head width ratio 0.78. Scapus yellowish, flagellomeres 1–11 — dark brown, 1210 μm long. AR 1.89. Antenna length/palp length ratio 2.55.

Thorax. Background colour of scutum pale yellow, mesonotal strips yellow. Aps 0–1, Ac 0, Dc 5–7, Pa 2–3, Su 1. Scutellum pale yellow, with 7 setae. Postnotum in distal 2/3rds dark brown.

Wing length 1.85 mm. Squama with 5 setae. R, R_1 without setae, R_{4+5} with 2 setae. VR 1.11. Halters pale yellow.

Legs pale yellow, with the exception of distal end f_1, proximal 1/3rd and distal end t_1, distal 1/3rd ta_1, ta_{2-5} brown. P_2 and P_3 yellowish, with the exception of brown ta_5.



Figs 1–4. Male imago *Cryptotendipes secundus* sp.n. (1–2) and *Parachironomus pseudovarus* sp.n. (3–4): 1, 3 — total view of hypopygium; 2, 4 — superior volsella. Scale bars 50 μm

Рис. 1–4. Имаго, самец *Cryptotendipes secundus* sp.n (1–2) и *Parachironomus pseudovarus* sp.n. (3–4): 1, 3 — общий вид гипопигия; 2, 4 — верхний придаток. Масштабные линейки 50 мкм

Table 1. Length (μm) and proportions of legs of the male *Cryptotendipes secundus* sp.n.
Таблица 1. Длина члеников ног (мкм) и их индексы у самца *Cryptotendipes secundus* sp.n.

P	f	t	ta_1	ta_2	ta_3	ta_4	ta_5	LR	SV	BV
P_1	1012	748	1170	561	418	275	176	1.56	1.50	2.05
P_2	858	847	407	242	198	132	132	0.48	4.19	3.0
P_3	1122	1122	660	407	330	220	165	0.59	3.40	2.59

Terminal combs of t_2 and t_3 with spurs 28 μm long. BR_1 3.18, BR_2 3.31, BR_3 3.57. Length and proportions of legs see Table 1.

Abdomen pale yellow.

Hypopygium (Figs 1–2). Anal tergite bands Y-type. Anal point (length 98 μm) wide at about apical 1/3rd, apically rounded. Anterior margin of tergite IX with caudolateral shoulders bearing four setae. Gonocoxite 182 μm long. Inner margin of gonocoxite with 5–6 setae. Superior volsella (length 73 μm) sclerotized, without microtrichia, bearing apical seta (length 45 μm) and ventral seta (length 110 μm). Gonostylus 224 μm long, curved medially. Inner margin of gonostylus without basal projection. HR 0.81.

Female, pupa and larva are unknown.

Differential diagnosis. Male of *Cryptotendipes secundus* can be distinguished from all known species of genus by having sclerotized superior volsella bearing apical and ventral setae, and by the absence of acrostichals.

Etymology. From Latin *secundus* = second, the second new species of the genus *Cryptotendipes* Lenz described from the Russian Far East.

Distribution. Known only from the type locality — Rybnoe Lake (Sakhalin).

Parachironomus pseudovarus Zorina, **sp.n.**
Figs 3–4.

Material. Holotype: ♂, Russia, Sakhalin Island, Maloe lake, 24.08.2001, T. Tiunova. Paratypes: 8♂♂, the same data as holotype.

Description. *Imago, male* (n=2). General colour yellowish-brown. Total length 4.8–5.5 mm; total length/wing length ratio 1.43–1.60.

Head. Frontal tubercles very small. Temporal setae 30–35. Clypeus with 21–28 setae. Maxillary palp brown, lengths of last 4 palpal segments: 110, 308, 308 and 375 μm. Palp length/head width ratio 1.11. Scapus, flagellomeres 1–11 — dark brown, 2240 μm long. AR 3.12. Antenna length/palp length ratio 2.04.

Thorax. Ground colour of scutum pale yellow, mesonotal strips brown or only apex dorsal mesonotal strips brown. Aps 10, Ac 29–30, Dc 33–38, Pa 14–15, Su 3–4. Scutellum pale yellow, with 44–47 setae. Postnotum in distal 2/3rds brown.

Wing length 3.0–3.5 mm. Squama with 23–32 setae; brachiolum with 2–3 setae. R, R_1 with 57–64, R_{4+5} with 26–38 setae. VR 1.05–1.07. Halters pale yellow.

Legs yellowish, with the exception of dark brown distal end t_1, distal 1/3rd ta_1, slightly brownish proximal and distal ends ta_2, ta_{3-5}. P_2 and P_3 yellowish, ta_{1-5} gradually darkled to the end. Terminal combs of t_2 with spurs long 48 μm and t_3 with spurs long 36 μm. BR_1 2.5, BR_2 4.5, BR_3 5.3. Length and proportions of legs see Table 2.

Abdomen yellowish-brown.

Hypopygium (Figs 3–4). Anal tergite bands not connected medially, longitudinal band weak. Anal point (length 176–286 μm) parallel side apically rounded. Base of anal point triangular with 14–16 median setae. Gonocoxite 220–275 μm long. Inner margin of gonocoxite with 4–5 setae. Superior volsella (length 165–187 μm) rod-shaped, with apicolateral projection and two setae arising from opposite pits. Gonostylus 429–440 μm long widest in proximal 1/3rd, constricted and curved in distal part. Inner margin of gonostylus with 5–6 apical setae. HR 0.50–0.64.

Female, pupa and larva are unknown.

Differential diagnosis. New species is close related by structures of superior volsella to *Parachironomus varus* (Goetghebuer, 1921), but is distinguished from latter by following features: — *P. varus* (Goetgh.) [Townes, 1945; Lehmann, 1970]: length wing 2.4–2.5 mm; ta_2P_1 brown or yellow except for light brown distal end; gonostylus widest in the middle; — *P. pseudovarus* sp.n.: length wing 3.0–3.5 mm; ta_2P_1 pale yellow except for light brown proximal and distal ends; gonostylus widest in the proximal 1/3rd.

Etymology. Name expresses the species' similarity to *P. varus* (Goetghebuer).

Distribution. Known only from the type locality — Maloe Lake (Sakhalin).

Paracladopelma jacksoni Zorina, **sp.n.**
Figs 5–6.

Material. Holotype: ♂, Russia, Sakhalin Island, Tym river at about 12 km from Nogliki village, 30–31.07.2002, E. Makarchenko. Paratypes: 6♂♂, the same data as holotype; ♂, Russia, Sakhalin Island, Piltun river near railway bridge, 20.08.2001, T. Tiunova.

Description. *Imago, male* (n=3). General colour yellowish-brown. Total length 4.7–5.0 mm; total length/wing length ratio 1.85–1.88.

Head. Frontal tubercles (length 28 μm, width 11.2 μm) consist of three semiglobular parts. Temporal setae 19. Clypeus with 13–19 setae. Maxillary palp dark brown, lengths of last 4 palpal segments: 110–132, 209–275, 242–297 & 330–385 μm. Palp length/head width ratio 1.13–1.50. Scapus — yellow, flagellomeres 1–11 — dark brown, 1984–2016 μm long. AR 2.32–2.44. Antenna length/palp length ratio 2.07–2.24.

Thorax. Ground colour of scutum pale yellow, mesonotal strips yellow. Aps 10–19, Ac 16–19, Dc 14–16, Pa 4–7, Su 1. Scutellum pale yellow, with 22–25 setae. Postnotum in distal 2/3rds brown.

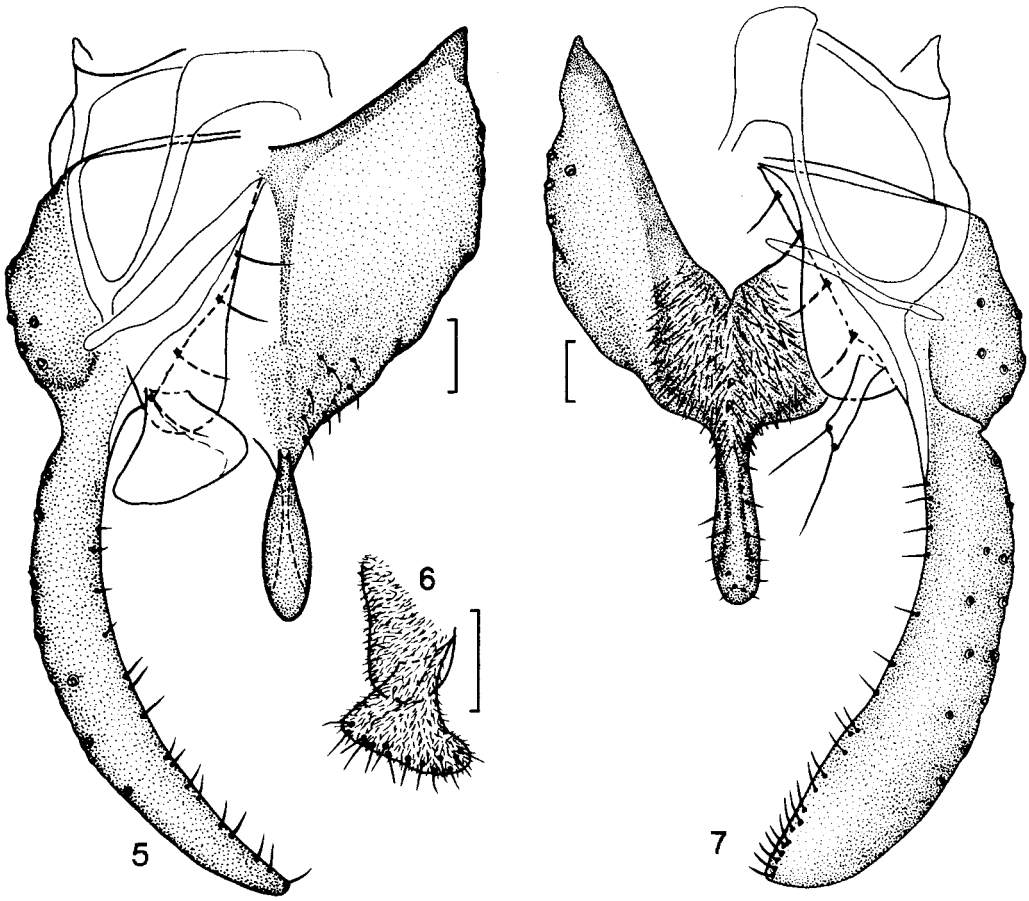
Wing length 2.5–2.9 mm. Squama with 21 setae; brachiolum with 2–3 setae. R, R_1 with 28–42, R_{4+5} with 26–33 setae. VR 1.09–1.12. Halters pale yellow.

Table 2. Length (μm) and proportions of legs of the male *Parachironomus pseudovarus* sp.n.
Таблица 2. Длина члеников ног (мкм) и их индексы у самца *Parachironomus pseudovarus* sp.n.

P	f	t	ta_1	ta_2	ta_3	ta_4	ta_5	LR	SV	BV
P_1	1696	1536	2080	1120	960	640	320	1.35	1.55	2.21
P_2	1856	1600	896	480	384	256	224	0.56	3.86	3.24
P_3	2048	2240	1440	864	640	384	256	0.64	2.98	2.67

Table 3. Length (μm) and proportions of legs of the male *Paracladopelma jacksoni* sp.n.
Таблица 3. Длина члеников ног (мкм) и их индексы у самца *Paracladopelma jacksoni* sp.n.

P	f	t	ta_1	ta_2	ta_3	ta_4	ta_5	LR	SV	BV
P_1	1504-1664	1216-1344	1952-1984	960	800	640-672	320	1.61-1.63	1.37-1.39	1.70-1.73
P_2	1472-1664	1504-1376	832-864	448-480	320-352	192-224	160-192	0.57-0.60	3.42-3.67	3.23-3.29
P_3	1692-1888	1692-1888	1184-1376	672-800	512-576	272-352	160-224	0.70-0.73	2.74-2.86	2.64-2.83



Figs 5–7. Male imago *Paracladopelma jacksoni* sp.n. (5–6) and *Rabackia aculeata* sp.n. (7): 5, 6 — total view of hypopygium; 7 — superior volsella. Scale bars 50 μm.

Рис. 5–7. Имаго, самец *Paracladopelma jacksoni* sp.n. (5–6) и *Parachironomus pseudovarus* sp.n. (7): 5, 6 — общий вид гипопигия, 7 — верхний придаток. Масштабные линейки 50 мкм.

Legs yellowish, with the exception of distal end f_1, t_1, distal half or 2/3rds ta_1, ta_{2-5} which are brown. P_2 yellowish, with the exception of brown distal end f_2, proximal 1/3rd t_2, ta_{1-5} gradually darkened to the end. P_3 coloured as P_2. Terminal combs of t_2 and t_3 with two spurs long 34–48 μm. BR_1 2.75, BR_2 3.2–3.4, BR_3 2.83–2.86. Length and proportions of legs see Table 3.

Abdomen tergites I–V yellowish-brown, VI–VIII and hypopygium brown or all tergites brown. Hypopygium (Figs 5–6). Anal tergite bands Y-type. Anal point (length 143–176 μm, width 33 μm) widest medially, rounded apically. Gonocoxite 187–220 μm long. Inner margin of gonocoxite with 4–5 setae. Superior volsella pad-shaped, 88–99 μm long, 94–110 μm wide. Inferior volsella apically rounded. Gonostylus 297–341 μm long, curved, with pointed apex, widest at about middle. Inner margin of gonostylus with 8–15 setae. HR 0.59–0.67.

Female, pupa and larva are unknown.

Differential diagnosis. New species is closely related by structures of hypopygium to *Paracladopelma nais* (Townes, 1945), but is distinguished from latter by following features: — *P. nais* (Townes, 1945) [Jackson, 1977]: totally dark brown; terminal combs of t_2 and t_3 with single spur; Aps 4–11, Ac 8–12, Scts 13–16; tergite IX with weak longitudinal ridge; anal point widest in apical 1/3rd; — *P. jacksoni* sp.n.: totally yellowish-brown; terminal combs of t_2 and t_3 with two spurs; Aps 10–19, Ac 16–19, Scts 22–25; anal tergite bands Y-type; anal point widest at about middle.

Etymology. The species is named after Dr G.A. Jackson, systematist of the genus *Paracladopelma* Harnisch.

Distribution. Known only from the Tym and Piltun rivers (Sakhalin).

Rabackia aculeata Zorina, **sp.n.**
Fig. 7.

Material. Holotype ♂, Russia, Sakhalin Island, Tym river at about 20 km from Nogliki village, 30.07.2002, V. Teslenko.

Description. *Imago, male.* General colour yellow-brown. Total length 5.0 mm; total length/wing length ratio 1.85.

Head. Frontal tubercles absent. Temporal setae 16. Clypeus with 14 setae. Maxillary palp brown, lengths of last 4 palpal segments: 132, 297, 242 and 352 μm. Palp length/head width ratio 1.10. Inner part of scapus

Table 4. Length (μm) and proportions of legs of the male *Robackia aculeata* sp.n.
Таблица 4. Длина члеников ног (мкм) и их индексы у самца *Robackia aculeata* sp.n.

P	f	t	ta_1	ta_2	ta_3	ta_4	ta_5	LR	SV	BV
P_1	1440	1120	-	-	-	-	-	-	-	-
P_2	1408	1280	800	384	288	160	128	0.63	3.36	3.63
P_3	1504	1728	1504	608	448	256	160	0.87	2.15	3.22

yellowish-brown, outer part dark brown, flagellomeres 1–11 — dark brown. Antenna 2080 μm long. AR 2.42. Antenna length/palp length ratio 2.03.

Thorax. Ground colour of scutum pale yellow, mesonotal strips yellow. Aps 3, Ac 15, Dc 11–14, Pa 5, Su 1. Scutellum pale yellow, with 22 setae. Postnotum in proximal 1/3rd yellow, in distal 2/3 dark brown.

Wing length 2.7 mm. Squama with 16 setae; brachiolum with 2 setae. R with 10 setae, R_1 without setae, R_{4+5} with 2 apical setae. VR 1.11. Halters pale yellow.

Legs yellowish, with the exception of brown proximal 1/3rd and distal ends f_1 and t_1. P_2 yellowish, with the exception of brown distal 2/3rds f_2, t_2, $ta_{1\ 5}$. P_3 yellowish, with the exception of brown f_3, proximal and distal ends t_3, distal 2/3rds ta_1, $ta_{2\ 5}$. Terminal combs of t_2 and t_3 with two spurs long 36.4 mm. BR_2 3.8, BR_3 5.6. Length and proportions of legs see Table 4.

Abdomen dark brown. Hypopygium (Fig. 7). Anal point (length 132 μm, width 38.5 μm) widest in apical 1/3rd, rounded apically, with 11 weak ventral setae. Tergite IX with 2 spines at the base of anal point. Gonocoxite 165 μm long. Inner margin of gonocoxite with 4 setae. Superior volsella (88–99 μm length) rod-shaped, with 2 apical setae. Inferior volsella apically rounded. Gonostylus 341 μm long, clavate, slightly curved. HR 0.48.

Female, pupa and larva are unknown.

Differential diagnosis. New species differs from other species of *Rabackia* by the form of the superior volsella and presence of two spines at the base of anal point.

Etymology. From Latin *aculeata* = spiny, referring to the base of anal point.

Distribution. Known only from the type locality — Tym river (Sakhalin).

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