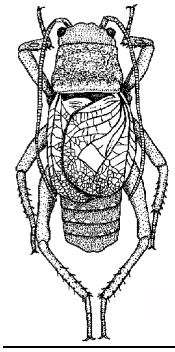

Far Eastern Entomologist

Дальневосточный энтомолог

Journal published by Far East Branch of the Russian Entomological Society and Laboratory of Entomology, Federal Scientific Center of the East Asia Terrestrial Biodiversity, Vladivostok

Number 331: 1-16 ISSN 1026-051X March 2017

http/urn:lsid:zoobank.org:pub:39FC2294-EED3-4369-AAFF-F2DF1F650435

NON-BITING MIDGES OF THE TRIBE CHIRONOMINI (DIPTERA: CHIRONOMINAE) FROM NORTH KOREA

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An annotated list of 41 chironomid species from 16 genera of tribe Chironomini (Diptera, Chironomidae) of North Korea is given. Ten species are recorded for the fauna of Korea for the first time. The main diagnostic characters and comments on taxonomy, systematics and distribution for these species are provided. New synonymy is proposed: *Cladopelma edwardsi* (Kruseman, 1933) = *Demicryptochironomus chuncheonensis* Ree et Jeong, 2010, **syn. n.**; *Harnischia japonica* Hashimoto, 1984 = *Harnischia gumrungenis* Ree, 2015, **syn. n.**; *Polypedilum* (*Polypedilum*) *nubeculosum* (Meigen, 1804) = *Polypedilum yongsanensis* Ree et Kim, 1981, **syn. n.**

KEY WORDS: Diptera, Chironomidae, taxonomy, new synonymy, fauna, Korea.

О. В. Орел[1)], Х. Ё. Кан[2)], Е. А. Макарченко[1)]. Комары-звонцы трибы Chironomini (Diptera: Chironominae) Северной Кореи // Дальневосточный энтомолог. 2017. N 331. С. 1-16.

Приведен аннотированный список 41 вида из 16 родов комаров-звонцов трибы Chironomini Северной Кореи. Впервые для Кореи указаны 10 видов, для которых приводятся сведения по диагностическим признакам, систематике и распространению. Устанавлена новая синонимия: *Cladopelma edwardsi* (Kruseman, 1933) = *Demicryptochironomus chuncheonensis* Ree et Jeong, 2010, **syn. n.**; *Harnischia japonica* Hashimoto, 1984 = *Harnischia gumrungenis* Ree, 2015, **syn. n.**; *Polypedilum* (*Polypedilum*) *nubeculosum* (Meigen, 1804) = *Polypedilum yongsanensis* Ree et Kim, 1981, **syn. n.**

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INTRODUCTION

Fauna of the non-biting midges of tribe Chironomini of North Korea is studied extremely insufficiently. A list of 43 species from 19 genera was published, but majority of the species names has not been given (Reiss, 1980). Four species of the genus *Stenochironomus* was recorded for North Korea by Borkent (1984). *Dicroendipes koreanus* Orel, 2016 was described recently from North Korea (Orel & Makarchenko, 2016). The redescriptions of two species of the tribe Tanytarsini of the same subfamily Chironominae, *Neozavrelia fengchengensis* Wang et Wang, 1996 and *N. tamanona* (Sasa, 1980), were given based on the material from North Korea (Giłka, 2012). Present paper is a continuation of a series of papers based on the material collected in Democratic People's Republic of Korea by the Polish Professor Wiesław Krzemiński in 1981. Material was fixed in 70% ethanol and mounted in Fora-Berlese solution. Morphological terminology and abbreviations follow O.A. Sæther (1980).

An annotated list of 41 species from 16 genera of tribe Chironomini (Chironomidae: Chironominae) from North Korea is given below. The species recorded for the first time for the fauna of Korea are asterisked (*).

LIST OF THE SPECIES FROM NORTH KOREA

Subfamily Chironomidae

Tribe Chironomini

***Benthalia carbonaria* (Meigen, 1804)**

MATERIAL. Phjongjang (Phenian), 18.VII 1981, 2 ♂; Sarivŏn, 18.VI 1981, 2 ♂.

DIAGNOSIS. Dark brown colors. Total length 5.6 mm. Wing length 2.8 mm. Frontal tubercles cylindrical-shaped, 68 μm long and 24 μm widths. AR 2.5. LR_{P1} 1.56. Ac 0, Dc 15–17, Pa 6, Su 1, Scts 25, sq 25–30. Anal point widest in apical 1/3. Superior volsella 109 μm long, with pad-shaped microtrichiose and setose base

(68 μm long) and digitiform extension (41 μm long) arising dorsomedially. Inferior volsella (170 μm long) elongate, more or less parallel-sided. Gonostylus widest in proximal 1/3, abruptly tapering to narrower apex.

DISTRIBUTION. Widespread Palaearctic species. Previously recorded from South Korea as *Einfeldia dissidens* (Walker, 1851) (Ree & Kim, 1981; Spies & Sæther, 2013).

**Chironomus* (*Chironomus*) *tentans* Fabricius, 1805

MATERIAL. Phjongjang (Phenian), 18.VII 1981, 1 ♂.

DIAGNOSIS. Yellowish brown colors. Total length 8.0 mm. Frontal tubercles cylindrical-shaped, 34 μm long and 20 μm widths. Ac 12, Dc 18–20, Pa 6, Scts 40, sq 25–28. Anal point short (153 μm) and wide (78 μm), with rectangular microtrichiose and setose lobes on each side. Superior volsella with triangular microtrichiose and setose base and digitiform extension arising dorsally at the base of superior volsella. Inferior volsella elongate, parallel-sided. Gonostylus (360 μm long) widest in proximal 1/3, gradually tapering to narrower apex (Fig. 1).

DISTRIBUTION. Widespread Holarctic species. Known from the Russian Far East (Orel, 2016). For the fauna of Korea is recorded for the first time.

Chironomus (*Chironomus*) sp. 1

MATERIAL. Phjongjang (Phenian), 11.VI 1981, 5 ♂; Phjongjang (Phenian), 13.VI.1981, 1 ♂; Phjongjang (Phenian), 18.VII 1981, 3 ♂; Mjohjang-san near Hyichŏn, 22–25.VI 1981, 1 ♂; Kesŏng, 16.VII 1981, 8 ♂; Kymgang-san near Kymgang, 28.VI–02.VII 1981, 3 ♂; Kwail-Gun, 18–19.VI 1981, 1 ♂.

Chironomus (*Chironomus*) sp. 2

MATERIAL. Phjongjang (Phenian), 11.VI 1981, 9 ♂; Phjongjang (Phenian), 18.VII 1981, 6 ♂; Kwail-Gun, 18–19.VI 1981, 5 ♂; Soham Lake nr Phenian, 08.VII 1981, 6 ♂.

Chironomus (*Chironomus*) sp. 3

MATERIAL. Phjongjang (Phenian), 13.VI 1981, 2 ♂.

Cladopelma edwardsi (Kruseman, 1933)

Tendipes (Parachironomus) edwardsi Kruseman, 1933: 194 (type locality – The Netherlands: Valkenswaard).

Demicryptochironomus chuncheonensis Ree & Jeong, 2010: 117, fig. 1 (holotype – ♂, Korea: Gangwon-do, Chuncheon-si, Soyang River), **syn. n.**

MATERIAL. Sarivŏn, 18.VI 1981, 3 ♂.

DIAGNOSIS. Yellowish brown colors. Total length 3.1 mm. Wing length 1.5 mm. Frontal tubercles lightbulb-shaped, 27 μm long and 20 μm widths. AR 1.88. LR_{P1} 1.71. Aps 0–1, Ac 8, Dc 6–9, Pa 3, Su 1, Scts 7. Tergite IX dorsomedially with pair row of 4–5 setae and dorsolaterally 9–10 strong setae. Anal point expanded in the apical part (27 μm width). Superior volsella cylindrical-shaped (24 μm long), with 1 apical seta. Inner margin of gonostylus smoothly curved, not swollen basally.

REMARKS. Morphological characters and figure of hypopygium of *D. chuncheonensis* collected in Sinsau-dong, Chuncheon-si, Gangwon-do do not differ from diagnostic characters of *C. edwardsi* and here former is considered as a junior synonym of latter.

DISTRIBUTION. Widespread in Holarctic. Also known from the Russian Far East, Japan and China (Sasa & Kikuchi, 1995 as *C. viridulus*; Zorina, 2006; Yan *et al*., 2008).

******Cryptochironomus (Cryptochironomus) obreptans* **(Walker, 1856)**

MATERIAL. Phjongjang (Phenian), 13.VI 1981, 2 ♂; Sarivŏn, 18.VI 1981, 2 ♂.

DIAGNOSIS. Yellowish colors. Total length 6.0 mm. Wing length 2.32 mm. Frontal tubercles 24 μm long and 27 μm widths. LR_{P1} 1.53. Aps 9, Ac 19, Dc 15–16, Pa 7, Su 1–2, Scts 29, sq 18. Anal point parallel-sided (119 μm long, 14 μm width). Superior volsella pad-shaped (71 μm long), with 4 strong setae and with covered microtrichia. Inferior volsella digitalform (31 μm long), with 3 strong setae and without microtrichia or with several microtrichia on inner margin. Gonostylus (204 μm long, 92 μm width) approximately the same width at the proximal and distal parts, gradually narrowing to the top (Fig. 2).

REMARKS. *Cryptochironomus (Cryptochironomus) obreptans* (Walker, 1856) sensu Langton & Pinder, 2007.

DISTRIBUTION. Palaearctic species. Known from the Russian Far East (Orel, 2016). This species is firstly recorded here from Korea.

***Cryptochironomus* (*Cryptochironomus*) *rostratus* Kieffer, 1921**

MATERIAL. Phjongjang (Phenian), 11.VI 1981, 1 ♂; Kwail-Gun, 18–19.VI 1981, 1 ♂.

DISTRIBUTION. Widespread Palaearctic and Oriental species (Spies & Sæther, 2013).

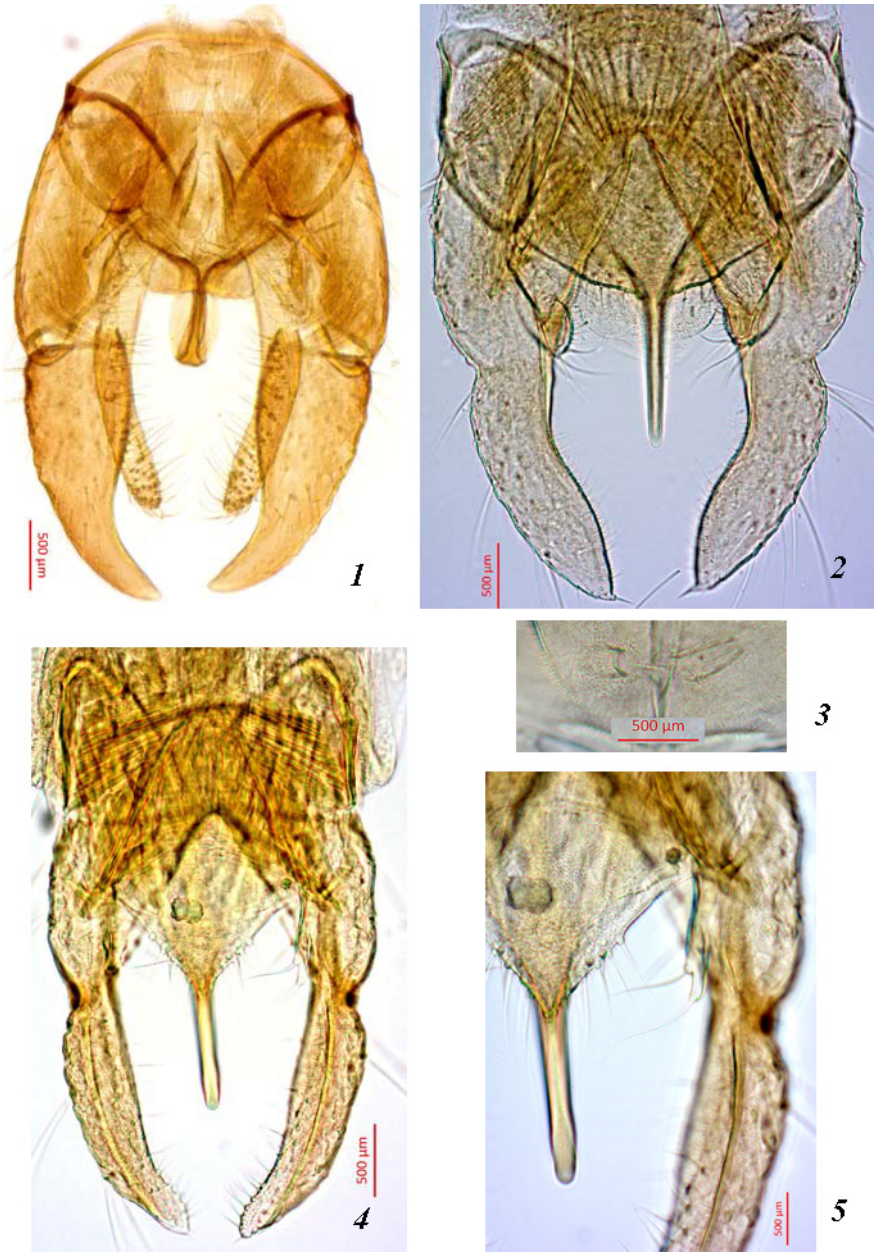
***Demicryptochironomus* (*Demicryptochironomus*) *chuzequartus* Sasa, 1984**

MATERIAL. Kymgang-san nr Kymgang, 28.VI–02.VII 1981, 1 ♂.

DISTRIBUTION. East Palearctic species. Known from Japan, Korea and Russian Far East (Sasa & Kikuchi, 1995; Ree, 2015; Orel, 2016).

******Demicryptochironomus* **(*Demicryptochironomus*) *inawabeceus* Sasa, Kitami et Suzuki, 1999**

MATERIAL. Kymgang-san near Kymgang, 28.VI–02.VII 1981, 1 ♂.



Figs 1–5. Adult males of Chironomini. 1 – *Chironomus tentans*, hypopygium; 2 – *Cryptochironomus obreptans*, hypopygium; 3–5 – *Demicryptochironomus inawabeceus*: 3 – frontal tubercles; 4, 5 – hypopygium. Scale bar 500 µm.

DIAGNOSIS. Yellowish brown colors. Total length 4.0 mm. Wing length 2.24 mm. Frontal tubercles cylindrical-shaped, 20 μm long and 10 μm width. AR 1.80. LR_{P1} 1.38. Aps 6, Ac 14, Dc 10, Pa 4–5, Su 1, Scts 14, sq 9. Anal point parallel-sided (85 μm long, 12 μm width). Superior volsella digitalform (34 μm long), with 2 setae and with microtrichia on the base on inner margin. Inferior volsella is reduced, in the form of a small tubercle, without setae. Gonostylus 184 μm long, widest in proximal 1/3, curved in distal 1/3 (Figs 3–5).

DISTRIBUTION. East Palearctic species. Known from Japan (Sasa & Kikuchi, 1995). Here it is recorded for the first time for the fauna of Korea.

***Dicrotendipes pelochloris* (Kieffer, 1921)**

MATERIAL. Phjongjang (Phenian), 13.VI 1981, 2 ♂; Kesŏng, 16.VII 1981, 1 ♂.

DISTRIBUTION. Widespread species throughout the East Palaearctic, Oriental and Australian regions (Epler, 1988).

***Dicrotendipes septemmaculatus* (Becker, 1908)**

MATERIAL. Phjongjang (Phenian), 13.VI 1981, 1 ♂.

DISTRIBUTION. East and South Palaearctic, Oriental, Afro-tropical and Australian regions (Epler, 1988)

***Dicrotendipes nervosus* (Staeger, 1839)**

MATERIAL. Phjongjang (Phenian), 13.VI 1981, 3 ♂; Phjongjang (Phenian), 18.VII 1981, 6 ♂; Sarivŏn, 18.VI 1981, 1 ♂.

DISTRIBUTION. Widespread in Holarctic and Oriental regions (Spies & Sæther, 2013).

***Dicrotendipes koreanus* Orel, 2016**

MATERIAL. Phjongjang (Phenian), 18.VII 1981, 1 ♂.

DIAGNOSIS. Frontal tubercles minute. Wing length 2.70 mm. AR 3.0. Tergite IX with 25 median setae situated within two oval areas; anal point in dorsal view bare, short and wide; superior volsella with oval apical part bearing 7–8 ventral setae and low and wide basal part; inferior volsella with simple apex; gonostylus straight, massive in the proximal 2/3 and abruptly narrowed to the top in the distal third; HR 1.36.

DISTRIBUTION. This species is known only from the type locality (North Korea: Phjongjang).

***Glyptotendipes* (*Glyptotendipes*) *tokunagai* Sasa, 1979**

MATERIAL. Phjongjang (Phenian), 11.VI 1981, 1 ♂; Soham Lake near Phenian, 08.VII 1981, 1 ♂.

DISTRIBUTION. East Palearctic species (Ree & Kim, 1981; Sasa & Kikuchi, 1995; Orel, 2016).

***Glyptotendipes* (*Glyptotendipes*) sp.**

MATERIAL. Phjongjang (Phenian), 18.VII 1981, 1 ♂.

DIAGNOSIS. Brown color. Total length 7.0 mm. Frontal tubercles cylindrical form (length 17 µm, wide 6.8 µm). AR 4.07. Ac 29, Dc 28/32, Pa 7/8, Scts 43, Sq 23. Tarsal segments on fore legs lost. Anal point length 88 µm expanded in apical 1/3 (wide 24 µm). Superior volsellae length 120 µm; wide of base 72 µm and height 44 µm, with 9/10 setae. Inferior volsellae length 200 µm, with 34/35 dorsal and 10 ventral setae. Gonostylus massive, length 224 µm, wide 96 µm.

REMARKS. By the structure of hypopygium this adult male is similar to *G.* (*G.*) *barbipes* (Staeger, 1839), but due to loss of tarsal segments of forelegs reliably identify male impossible.

***Harnischia japonica* Hashimoto, 1984**

Harnischia japonica Hashimoto, 1984: 262 (type locality – Japan: Katayama, Shizuoka).

Harnischia gumrungenis Ree, 2015: 232, fig. 4 (holotype – ♂, Korea: Chungcheongbuk-do, Chunggju-si, Gumreung-dong), **syn. n.**

MATERIAL. Phjongjang (Phenian), 11.VI 1981, 1 ♂; Kwail-Gun, 18–19.VI 1981, 1 ♂; Kymgang-san near Kymgang, 28.VI–02.VII 1981, 1 ♂.

REMARKS. Ree (2015) described a new species based on the presence a pair of sharply pointed projections on apical margin of tergite IX. We believe that this proctiger (caudal lobe of tergite IX) which crawled out from under tergite IX is a result of pressure on the cover glass hypopygium and propose new synonymy.

DISTRIBUTION. Widespread in East Palearctic (Sasa & Kikuchi, 1995; Ree, 2015; Orel, 2016; Yan *et al*., 2016).

***Lipiniella moderata* Kalugina, 1970**

MATERIAL. Phjongjang (Phenian), 11.VI 1981, 1 ♂.

DISTRIBUTION. Palaearctic species. Recorded from Japan and Korea as *Glyptotendipes goryoensis* Ree et Kim, 1981 and *Chironomus fujiprimus* Sasa, 1985 and from the Russian Far East (Ree & Kim, 1981; Na *et al*., 2010; Ree, 2014; Spies & Sæther, 2013; Orel, 2016).

***Microchironomus tener* (Kieffer, 1918)**

MATERIAL. Phjongjang (Phenian), 13.VI 1981, 7 ♂; Sarivŏn, 18.VI 1981, 5 ♂.

DISTRIBUTION. Widespread in Afro-tropical, Australian, Palearctic and Oreintal regions (Spies & Sæther, 2013).

****Microtendipes* ? *pedellus* (De Geer, 1776)**

MATERIAL. Mjohjang-san near Hyichŏn, 22–25.VI 1981, 1 ♂.

DIAGNOSIS. Total length 5.2 mm. Frontal tubercles absent. AR 2.2. Aps 4/5, Ac 10 (in apical part), Dc 9/10, Pa 4/4, Scts 27, Sq 18. Tarsal segments on fore legs lost. Anal point length 78 μm gradually narrowing to apex. Superior volsellae curved, with 6/6 dorsal setae, 1 ventral seta, and microtrichia between dorsal setae. Median volsella with 1–3 setae. Inferior volsellae with 27/30 dorsal setae. Gonostylus length 170 μm, wide 54 μm (Figs 6–7).

REMARKS. Coloration of male pale due to the long keeping in alcohol. But on the base of diagnostic characteristics and structure of the hypopygium male is most similar to *M. pedellus*.

DISTRIBUTION. Widespread in Holarctic and Oriental regions. Known from China, Russian Far East (Qi & Wang, 2006; Orel, 2016). For Korea it is recorded for the first time.

***Microtendipes truncatus* Kawai et Sasa, 1985**

Microtendipes rydalensis (Edwards, 1929): Makarchenko *et al.,* 2005: 410; Zorina, 2006: 402, fig. 273, *6–8*; Orel, 2016: 189 (misidentification).

MATERIAL. Kymgang-san near Kymgang, 28.VI–02.VII 1981, 4 ♂.

REMARKS. Early the specimens of this species from Korea and Russian Far East were mistakenly identified as *Microtendipes rydalensis.*

DISTRIBUTION. East Palaearctic species. Known from Korea, China, Japan and Russian Far East (Na *et al*., 2010; Sasa & Kikuchi, 1995; Qi & Wang, 2006; Orel, 2016).

***Parachironomus gracilior* Kieffer 1918**

MATERIAL. Phjongjang (Phenian), 11.VI 1981, 2 ♂; Phjongjang (Phenian), 13.VI 1981, 2 ♂; Sarivŏn, 18.VI 1981, 1 ♂.

DISTRIBUTION. Widespread in Palaearctic and Oriental regions (Spies & Sæther, 2013).

***Paratendipes albimanus* (Meigen, 1818)**

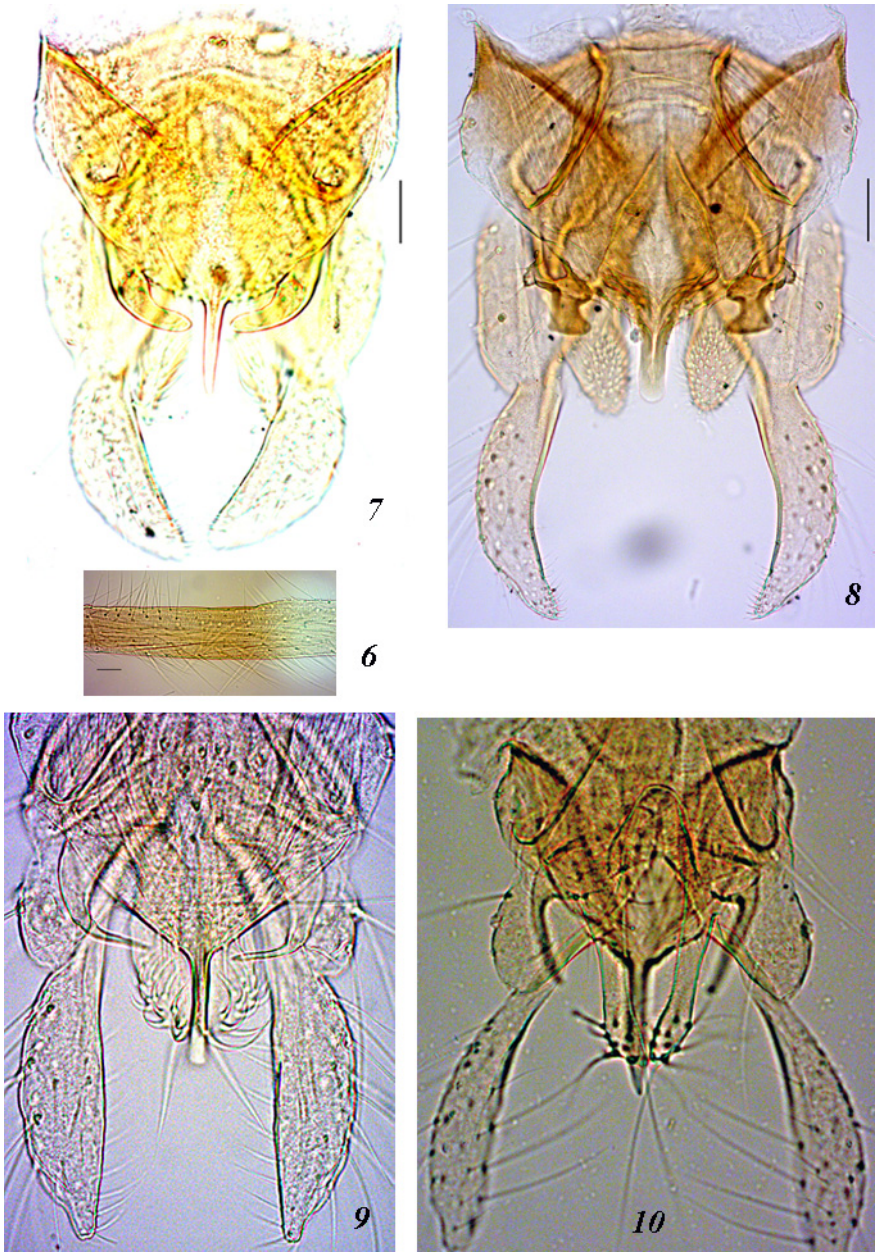
MATERIAL. Kesŏng, 16.VII 1981, 1 ♂.

DISTRIBUTION. This species is widespread in Palaearctic and Oriental regions (Spies & Sæther, 2013).

***Paratendipes laticollus* Zorina, 2004**

MATERIAL. Mjohjang-san near Hyichŏn, 22–25.VII 1981, 2 ♂.

DIAGNOSIS. Total length 5.0–6.5 mm. Frontal tubercles absent. AR 1.7. Aps 1–3, Ac 2 (in apical part), Dc 11–13, Pa 3, Scts 20–2, Sq 10–17. Tarsal segments on fore legs lost. Anal point length 58 μm expanded medially (wide 24 μm). Superior volsellae length 68 μm; wide of base 58 μm; wide "neck" 20 μm, wide apical part 41 μm; with 2–3 ventrolateral setae and microtrichia, and 6–7 dorsolateral setae and microtrichia distributed on the tubercle. Gonostylus length 194 μm, wide 58 μm (Fig. 8).



Figs. 6–10. Adult males of Chironomini. 6, 7 – *Microtendipes* ? *pedellus*: 6 – fore femur; 7 – hypopygium; 8 – *Paratendipes laticollus*, hypopygium; 9 – *Polypedilum takaoense*, hypopygium; 10 – *P. tamanigrum*, hypopygium. Scale bar 500 µm.

REMARKS. In Korean specimens dorsolateral setae on the tubercle, whereas males described from the Russian Far East dorsolateral setae are arranged directly on the superior volsellae (Zorina, 2004, figs. 1–3).

DISTRIBUTION. East Palaearctic species. Known from the Russian Far East and Korea (Kang & Bae, 2015; Orel, 2016).

******Polypedilum* **(***Polypedilum***)** ***albicorne*** **(Meigen, 1838)**

MATERIAL. Phjongjang (Phenian), 13.VI 1981, 1 ♂.

DIAGNOSIS. Brownish yellow colors. Total length 3.2 mm. Wing length 2.04 mm. AR 1.8. Aps 3, Ac 11, H 3, Dc 17–20, Pa 10–12, Scts 14, sq 12. Foretibial apical scale with spine. Anal point (85 μm long) tapered to apex. Superior volsella long and thin (95 μm long), with 1–2 setae on the base and 1 lateral seta, SVoR 0.40. Inferior volsella generally straight, distally expanded. Gonostylus (204 μm long) straight or sometimes slightly concave, widest medially.

DISTRIBUTION. Widespread in Holarctic (Spies & Sæther, 2013). For the fauna of Korea it is recorded for the first time.

***Polypedilum* (*Polypedilum*) *edensis* Ree et Kim, 1981**

MATERIAL. Phjongjang (Phenian), 13.VI 1981, 1 ♂; Phjongjang (Phenian), 13.VI 1981, 1 ♂; Kwail-Gun, 18–19.VI 1981, 1 ♂; Kesŏng, 16.VII 1981, 2 ♂; Kymgang-san near Kymgang, 28.VI–02.VII 1981, 4 ♂; Soham Lake near Phenian, 08.VII 1981, 7 ♂.

DISTRIBUTION. East Palaearctic. Known from Korea only (Ree & Kim, 1981).

***Polypedilum* (*Polypedilum*) *nubeculosum* (Meigen, 1804)**

Chironomus nubeculosus Meigen, 1804: 18 (type locality – not given).

Polypedilum yongsanensis Ree & Kim, 1981: 162, Plate 19 (holotype – ♂, Korea: Seoul, Yangsan-gu, Ichon-dong), **syn. n.**

MATERIAL. Phjongjang (Phenian), 11.VI 1981, 8 ♂; Phjongjang (Phenian), 13.VI 1981, 3 ♂; Phjongjang (Phenian), 18.VII 1981, 16 ♂; Kwail-Gun, 18–19.VI 1981, 1 ♂; Sarivŏn, 18.VI 1981, 2 ♂; Kesŏng, 16.VII 1981, 1 ♂; Soham Lake near Phenian, 08.VII 1981, 20 ♂.

DIAGNOSIS. Dark brown colors. Total length 3.0–4.9 mm. Wing length 1.8–2.4 mm. AR 1.64. Aps 3, Ac 20, Dc 35, Pa 12–13, Scts 25, sq 25. Wing without spots. Foretibial apical scale with spine. Anal point long and straight (102 μm long) tapered to apex. Superior volsella long (88 μm), with 3 setae on the base and 1 lateral seta, SVoR 0.65. Inferior volsella long, broadened and rounded apically. Gonostylus (221 μm long, 75 μm width) clavate-shaped, apically rounded, widest medially, with long setae along the inner margin.

REMARKS. When comparing morphometric characteristics and structure of the male hypopygium of *Polypedilum yongsanensis* described Ree & Kim (1981), with the males of *P. nubeculosum* from the studied material we don't found a clear difference between the two species. Wherefore we considers that *P. yongsanensis* is a junior synonym of *P. nubeculosum*.

DISTRIBUTION. Widespread in Holarctic (Spies & Sæther, 2013).

***Polypedilum* (*Polypedilum*) *pedestre* (Meigen, 1830)**

MATERIAL. Mjohjang-san near Hyichŏn, 22–25.VI 1981, 1 ♂; Kymgang-san near Kymgang, 28.VI–02.VII 1981, 3 ♂.

DISTRIBUTION. Widespread in Palaearctic (Spies & Sæther, 2013).

****Polypedilum* (*Polypedilum*) *takaoense* Sasa, 1980**

MATERIAL. Kymgang-san near Kymgang, 28.VI–02.VII 1981, 1 ♂.

DIAGNOSIS. Total length 3.0 mm. Frontal tubercles absent. AR 1.3. Ac 15, Dc 13, Pa 4, Scts 16, sq 7/9. Foretibial apical scale with rounded scale. Anal point parallel-side (length 65 μm, wide 10 μm). Superior volsella length 65 μm, strongly curved near the middle, with high and wide base without setae and microtrichia, and narrow apical part, RSVo 0.79. Inferior volsella length 119 μm, with 16 setae. Gonostylus length 136 μm, wide 44 μm, widest medially (Fig. 9).

DISTRIBUTION. This species was known from Japan only (Sasa & Kikuchi, 1995). For the fauna of Korea it is recorded for the first time.

****Polypedilum* (*Polypedilum*) *tamanigrum* Sasa, 1983**

MATERIAL. Mjohjang-san near Hyichŏn, 22–25.VI 1981, 1 ♂; Kymgang-san near Kymgang, 28.VI–02.VII 1981, 50 ♂.

DIAGNOSIS. Total length 2.25–2.80 mm. Frontal tubercles absent. AR 0.63–0.77. Ac 16, Dc 12–17, H 2–3, Pa 5–6, Scts 10–15, sq 9–10. Foretibial apical scale with sharpened scale. Anal point parallel-sided, gradually tapered to apex (length 78 μm). Superior volsella length 78–82 μm, with low base bearing 2 setae and microtrichia, RSVo 0.60–0.77. Inferior volsella length 92–102 μm, with 10–11 setae. Gonostylus length 160–170 μm, wide 34–41 μm, widest at apical third (Fig. 10).

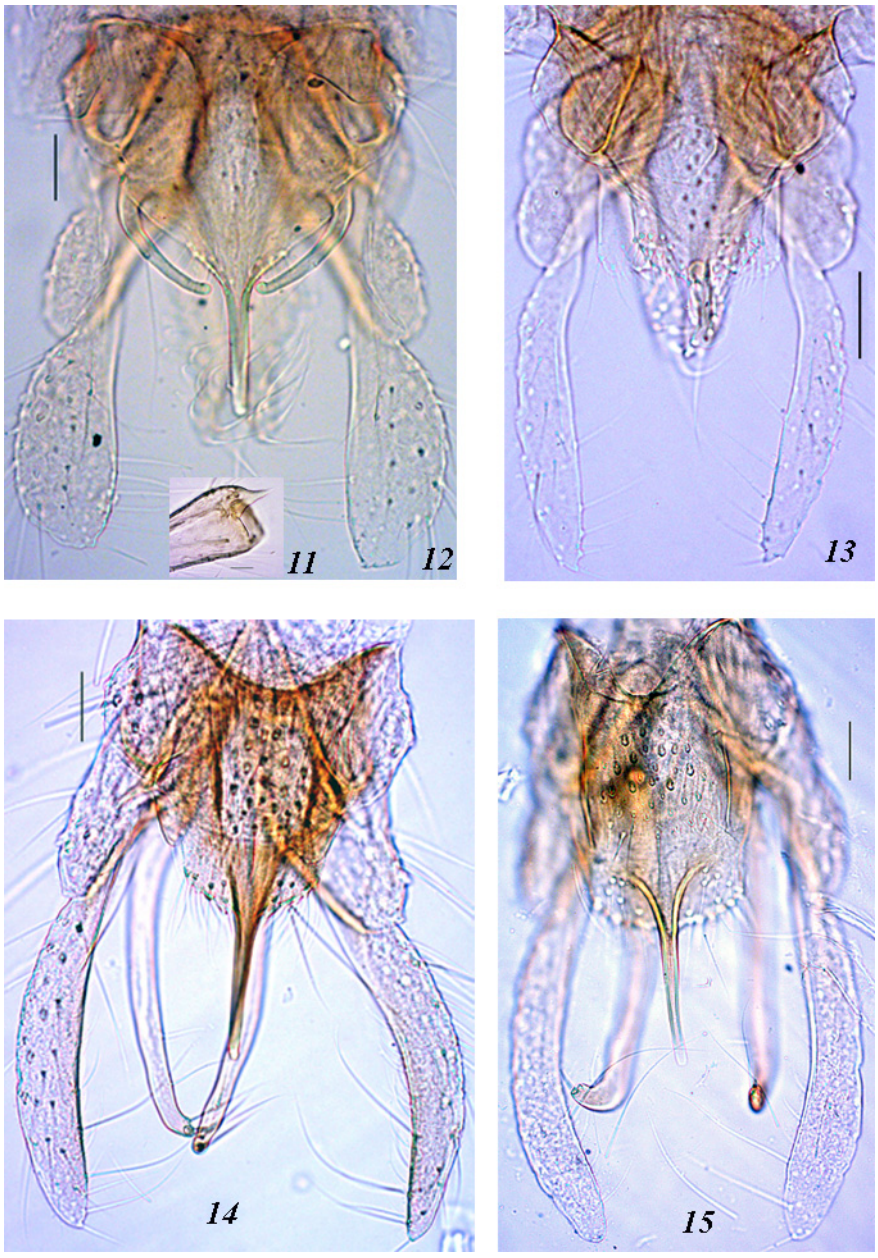
DISTRIBUTION. East Palaearctic. Known from Japan and Russian Far East (Sasa & Kikuchi, 1995; Orel, 2016). Here it is recorded for the first time for the fauna of Korea.

***Polypedilum* (*Polypedilum* ?) sp.**

MATERIAL. Mjohjang-san near Hyichŏn, 22–25.VI 1981, 2 ♂.

DIAGNOSIS. The adult male differs from other species of *Polypedilum* by following combination features: total length 4.2 mm, wing length 2.5 mm; frontal tubercles absent; AR 0.98; ac 20, Dc 20/21, H 3/4, Pa 8/8, Scts 18, Sq 22; front edge of tergite IX triangular, anal point parallel-side (length 109 μm), slightly narrowed to the apex (wide 12 μm); superior volsellae directed to the base of the anal point, length 109 μm, RSVo 0.88/0.94, very low base, covered microtrichia and bears 1–2 setae; inferior volsellae length 204 μm, with 22 setae; gonostylys massive, length 180 μm and wide 78 μm (Figs 11–12).

REMARKS. The specimen differs from all known species of the genus *Polypedilum* by very massive gonostylus. Perhaps this is a new species. But the adult male lost the original color as a result of long storage in alcohol. The wings are covered by foreign particles and so it is not visible there are setae on the surface of the wing or not. Therefore, the correct identification of this specimen is impossible.



Figs 11–15. Adult males of Chironomini. 11, 12 – *Polypedilum* (?*Polypedilum*) sp.: 11 – apex of fore tibia; 12 – hypopygium; 13 – *P.* (*Tripodura*) *tetracrenatum*, hypopygium; 14 – *Stenochironomus nubilipennis*, hypopygium; 15 – *Stenochironomus* sp., hypopygium. Scale bar 500 μm.

***Polypedilum* (*Tripodura*) ? *japonicum* (Tokunaga, 1938)**

MATERIAL. Kesŏng, 16.VII 1981, 1 ♂.

REMARKS. This specimen is very similar to *P.* (*T.*) *japonicum* on the base of structure of hypopygium. But the male lost the original color as a result of long storage in alcohol. Colour of the wings and legs not visible. Whereas we can not be completely sure in the correct definition.

DISTRIBUTION. Widespread in East Palaearctic (Sasa & Kikuchi, 1995; Wang, 2000; Ree *et al.*, 2010; Orel, 2016).

******Polypedilum* (*Tripodura*) ? *miyakoensis* Hasegawa et Sasa, 1987**

MATERIAL. Kesŏng, 16.VII 1981, 1 ♂.

DIAGNOSIS. Total length 2.3 mm. Frontal tubercles absent. AR 0.88. Ac 13, Dc 10/11, Pa 3/4, Scts 11, sq 6/7. Foretibial apical scale with sharpened scale. Tergite IX with 6 median setae and lateral tubercles (height 14 μm) on the base of anal point. Anal point narrow length 51 μm. Superior volsella pad-shaped (length and width 37 μm), with 3 strong setae on inner margin, and with covered by long microtrichia. Inferior volsella length 65 μm, with 20/23 setae. Gonostylus length 119 μm, width 20 μm, widest at about middle.

REMARKS. This specimen is very similar to *P.* (*T.*) *miyakoensis* on the base of structure of hypopygium. But the male lost the original color as a result of long storage in alcohol. Colour of the wings and legs not visible. Whereas we can not be completely sure in the correct determination.

DISTRIBUTION. East Palaearctic species. Known from Japan (Sasa & Kikuchi, 1995). For the fauna of Korea it is recorded for the first time.

******Polypedilum* (*Tripodura*) *tetracrenatum* Hirvenoja, 1962**

MATERIAL. Phjongjang (Phenian), 13.VI 1981, 2 ♂.

DIAGNOSIS. Total length 2.90 mm. Frontal tubercles small (length and wide 6.8 μm). AR 1.50. Ac 16, Dc 15/16, Pa 5, Scts 14, sq 5/7. Foretibial apical scale with sharpened scale. Tergite IX with 14 median setae and lateral tubercles (height 14 μm) on the base of anal point. Anal point length 58 μm, with rounded apex and lateral lobes. Superior volsella pad-shaped (length 68 μm, width 34 μm), with 3 long dorsal setae and 5 strong setae on inner margin, and with covered by long microtrichia. Inferior volsella length 106 μm, with 13 setae. Gonostylus length 177 μm, width 31 μm, widest at about middle (Fig. 13).

DISTRIBUTION. Palaearctic species. Known from the Russian Far East (Spies & Sæther, 2013; Orel, 2016). This species is recorded from Korea for the first time.

***Polypedilum* (*Tripodura*) *pullum* (Zetterstedt, 1838)**

MATERIAL. Phjongjang (Phenian), 11.VI 1981, 1 ♂.

DISTRIBUTION. Palaearctic species. Known from the Russian Far East, Korea and China (Wang, 2000; Ree *et al*., 2010; Orel, 2016).

***Polypedilum* (*Uresipedilum*) *cultellatum* Goetghebuer, 1931**

MATERIAL. Phjongjang (Phenian), 13.VI 1981, 1 ♂.

DISTRIBUTION. Widespread in East Palaearctic region (Sasa & Kikuchi, 1995; Wang, 2000; Ree & Kim, 1981; Orel, 2016).

***Stenochironomus gibbus* (Fabricius, 1794)**

MATERIAL. Kesŏng, 16.VII 1981, 3 ♂.

DISTRIBUTION. Widespread in Palaearctic (Spies & Sæther, 2013).

****Stenochironomus nubilipennis* Yamamoto, 1981**

MATERIAL. Kymgang-san near Kymgang, 28.VI–02.VII 1981, 3 ♂.

DIAGNOSIS. Total length 3.8 mm. Mesonotum yellowish without brown spots, postnotum brown with pale anteromedial part. All femora and tibia brown, with the exception of pale apical half part of middle tibia. AR 1.52. Ac 23, Dc 23/24, Pa 8/11, Scts 19. Foretibial apical scale with a spinule. Tergite IX with 25 median setae. Anal point (length 109 μm) parallel-sided, gradually narrowing to the apex. Superior volsella length 34/41 μm, width 24/37 μm, with 3–5 setae. Inferior volsella length 245 μm, with long seta length 58 μm and 3–5 setae. Gonostylus length 289 μm, width 44 μm, slightly widened in apical third (Fig. 14).

REMARKS. Coloration of wing obscure.

DISTRIBUTION. This species is known from the Russian Far East, Japan and China (Wang, 2000; Sasa & Kikuchi, 1995; Orel, 2016) and here firstly recorded from Korea.

***Stenochironomus recticaudatus* Borkent, 1984**

MATERIAL. Kesŏng, 16.VII 1981, 30 ♂.

DISTRIBUTION. Known only from North Korea (Borkent, 1984).

***Stenochironomus* sp.**

MATERIAL. Mjohjang-san near Hyichŏn, 22–25.VI 1981, 16 ♂.

DIAGNOSIS. Total length 5.0 mm. Thorax, wings and legs pale (probably discolored due to long-term storage of alcohol). AR 1.83. Ac 20, Dc 25/26, Pa 8. Foretibial apical scale with a spinule. Tergite IX with 40 median setae, its posterior margin rectangular. Anal point parallel-sided, length 119 μm, width 6.8 μm. Superior volsella length 68 μm, width 24 μm), with 5 setae. Inferior volsella length 289 μm, with spine length 24 μm and 4 setae. Gonostylus length 289 μm, width 44 μm, slightly widened in apical third (Fig. 15).

REMARKS. This specimens are similar to *S. gibbus* (Fabricius, 1794) in the structure of hypopygium, but differs from latter by the paralell-sided anal point. Whereas anal point of *S. gibbus* expanded in the apical part (Borkent, 1984). The males lost the original color as a result of long storage in alcohol. Colour of the wings and legs not visible. Whereas we can not be completely sure in correct determination od these specimens.

***Stictochironomus* sp.**

MATERIAL. Phjongjang (Phenian), 18.VII 1981, 1 ♂.

REMARKS. The male lost the original color as a result of long storage in alcohol. Colour of the wings and legs not visible. Whereas we can not be completely sure of the correct definition.

ACKNOWLEDGEMENTS

Authors are grateful to Dr. Gilka (Department of Invertebrate Zoology, University of Gdańsk, Poland) for providing of material collected by Dr. Krzemiński W. in the Northern Korea. This work was supported by a grant from the National Institute of Biological Resources (NIBR), funded by the Ministry of Environment (MOE) of the Republic of Korea (NIBR201601203).

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© **Far Eastern entomologist (Far East. entomol.)** Journal published since October 1994.

Editor-in-Chief: S.Yu. Storozhenko

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