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Tanytarsini (Diptera: Chironomidae) collected during Polish expeditions to North Korea

WOJCIECH GIŁKA[1,3,*] & PIOTR GADAWSKI[2,4]
[1]*University of Gdańsk, Faculty of Biology, Department of Invertebrate Zoology and Parasitology, Laboratory of Systematic Zoology; Wita Stwosza 59, 80–308 Gdańsk, Poland.*
[2]*University of Łódź, Faculty of Biology and Environmental Protection, Department of Invertebrate Zoology and Hydrobiology; Banacha 12/16, 90–237 Łódź, Poland.*
[3] *wojciech.gilka@ug.edu.pl; https://orcid.org/0000-0002-8403-5432*
[4] *piotr.gadawski@biol.uni.lodz.pl; https://orcid.org/0000-0001-9334-1960*
[*]*Corresponding author*

Abstract

This systematic review of non-biting midges of the tribe Tanytarsini is based on materials collected during Polish scientific expeditions to North Korea. *Stempellina radoszkowskii* **sp. nov.** is described. Brief illustrated redescriptions of adult males of further eight species, for the first time recorded from North Korea, are presented: *Cladotanytarsus* (*Cladotanytarsus*) *sinjongensis* Ree *et* Kim, 1988, *Micropsectra joganplumosa* Sasa *et* Okazawa, 1991, *M. jokatertia* Sasa *et* Ogata, 1999, *Tanytarsus iriolemeus* Sasa *et* Suzuki, 2000, *T. oyamai* Sasa, 1979, *T. takahashii* Kawai *et* Sasa, 1985, *T. tamadecimus* Sasa, 1980 and *T. tamaundecimus* Sasa, 1980. New synonyms are proposed: *Micropsectra tonewdeea* Sasa *et* Tanaka, 2002, **syn. nov.** [=*Micropsectra atrofasciata* (Kieffer, 1911)]; *Micropsectra tusimalemea* Sasa *et* Suzuki, 1999, **syn. nov.**, *M. tusimamenea* Sasa *et* Suzuki, 1999, **syn. nov.**, *M. tusimaquerea* Sasa *et* Suzuki, 1999, **syn. nov.** [=*Micropsectra joganplumosa* Sasa *et* Okazawa, 1991], and several further synonyms of the species reviewed are suggested. An annotated checklist of Tanytarsini so far reported from North Korea is given. A historical note on Polish scientific expeditions to Korea is also included.

Key words: Diptera, Chironomidae, Tanytarsini, systematics, new species, synonymy, North Korea

Introduction

Chironomidae (non-biting midges) is the largest family of aquatic insects. Nearly 7,500 species names grouped in 550 genera is a result of estimates that in fact may partly refer to synonyms and doubtful names (Pape *et al.* 2011); however, a number of further taxa described recently may point to a sum close to the aforementioned and indicate the Chironomidae as one of the largest dipteran families (Whitmore *et al.* 2021; Giłka *et al.* 2022; Gadawski *et al.*, in press). The Tanytarsini is one of the most diverse and species-rich chironomid tribes (nearly 700 species described), although the knowledge on these midges is uneven in different world regions, and some countries are only recently being explored (e.g. Giłka 2009, Giłka & Zakrzewska 2013, Giłka & Dobosz 2015, Dantas *et al.* 2022) or remain still uncharted. This pertains to Tanytarsini of the Democratic People's Republic of Korea (abbreviated as "North Korea" throughout this paper), from where only a few Tanytarsini records and just a couple of papers on Chironomidae have been published so far (Reiss 1980, Ekrem & Stur 2009, Giłka 2012, Makarchenko *et al*. 2016, Orel & Makarchenko 2016). These results contrast with the enormity of Tanytarsini names and data from Japan, mainly those by Sasa and coauthors, as well as with a number of species records from the Northeast China and the Russian Far East.

Our study is a systematic review of Tanytarsini recorded from North Korea, with an annotated checklist of all species reported from this country so far. The review includes 19 species recorded on the basis of the specimens collected during Polish scientific expeditions, 14 found in North Korea for the first time, including one new species described below. The study became also an opportunity to verify some names, here considered synonyms of the species reviewed.

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Material and methods

The examined specimens are adult males collected in years 1981 and 1992 from eight sites in North Korea (Fig. 1). The material was taken using a sweep net. Part of the individuals were slide-mounted in Canada balsam, the remaining determined specimens are preserved in 70% ethanol. Measurements are in micrometres (except for the body length, in milimetres); lengths of leg segments and palpomeres were rounded off to the nearest 5 and 1 micrometres respectively; the antennal and leg ratios (AR, LR) were calculated to the first and second decimal place respectively. The morphological terminology and abbreviations follow Sæther (1980). Photographs of type specimens of some species studied and referred to below are displayed on the website of the National Museum of Nature and Science, Tokyo, Japan (NMNS). The examined individuals are housed at the Laboratory of Systematic Zoology, Department of Invertebrate Zoology and Parasitology (LSZ DIZP), University of Gdańsk, Poland.

Results

Systematics

Family: Chironomidae Newman, 1834

Subfamily: Chironominae Newman, 1834

Tribe: Tanytarsini Zavřel, 1917

Subtribe: Tanytarsina Zavřel, 1917

Genus: *Cladotanytarsus* Kieffer, 1921

The genus *Cladotanytarsus* is divided into two subgenera: *Cladotanytarsus s. str*. Kieffer, 1921 and *Lenziella* Kieffer, 1922 (Giłka 2011b, Giłka & Spies 2012, Puchalski & Giłka 2017). Since no character typical of *Lenziella* (a globular basal swelling in the inferior volsella nor lobes of the mid and hind leg tibiae apices) has been found in *C. sinjongensis* males, we place the species in the subgenus *Cladotanytarsus s. str*. The genus is represented by nearly 80 species known from all continents except Antarctica (Puchalski *et al.* 2018). From North Korea, apart from *C. sinjongensis*, now found and redescribed below, two *Cladotanytarsus* species have so far been recorded by Reiss (1980), but determined to the genus level, as *Cladotanytarsus* sp. K1 and K2.

***Cladotanytarsus* (*Cladotanytarsus*) *sinjongensis* Ree *et* Kim, 1988**
Cladotanytarsus sinjongensis Ree *et* Kim, 1988: 19 (male, fig. 4a–c; South Korea).
(Fig. 2A–D)

Material examined. Phjŏngjang, 18 July 1981, 32 males; Sokam, 8 July 1981, 1 male; leg. W. Krzemiński.

Remarks. A set of subtle morphological differences used in diagnostics, often overlapped by intraspecific variations, make the determination of adult males of *Cladotanytarsus* one of the most difficult within Tanytarsini and Chironomidae. Accurately mounted and illustrated specimens, their precise measurements and appropriate interpretation of diagnostic features are thus decisive. In fact, determination of *Cladotanytarsus sinjongensis* may be a challenge when based on the illustrated original description, although several crucial characters indicate that the specimens presently examined are conspecific with those described from South Korea (Ree & Kim 1988). The males from North and South Korea compared here [data on the South Korean material, with remarks given in square brackets] are approximately of the same size, with the wing 1.18–1.45 mm long [1.2–1.3 mm], AR 0.90–1.03 [0.91–1.05], frontal tubercles 14–18 µm long [15–16 µm], similar lengths of palpomeres, leg ratios and the same body colouration. The hypopygial anal point is more or less lanceolate or tongue-shaped (Fig. 2A, B), 35–45 µm long [7–9 µm, inconsistency relative to the scaled fig. 4], the superior volsella is slender, narrowed at mid length, with the swollen and apically rounded distal part (Fig. 2A, C) [probably distorted during mounting], the stem of the median volsella is slightly curved, ~40 µm long [35–38 µm], with branched lamellae (Fig. 2A, D), as in all known *Cladotanytarsus* [the deep furcations overlooked].

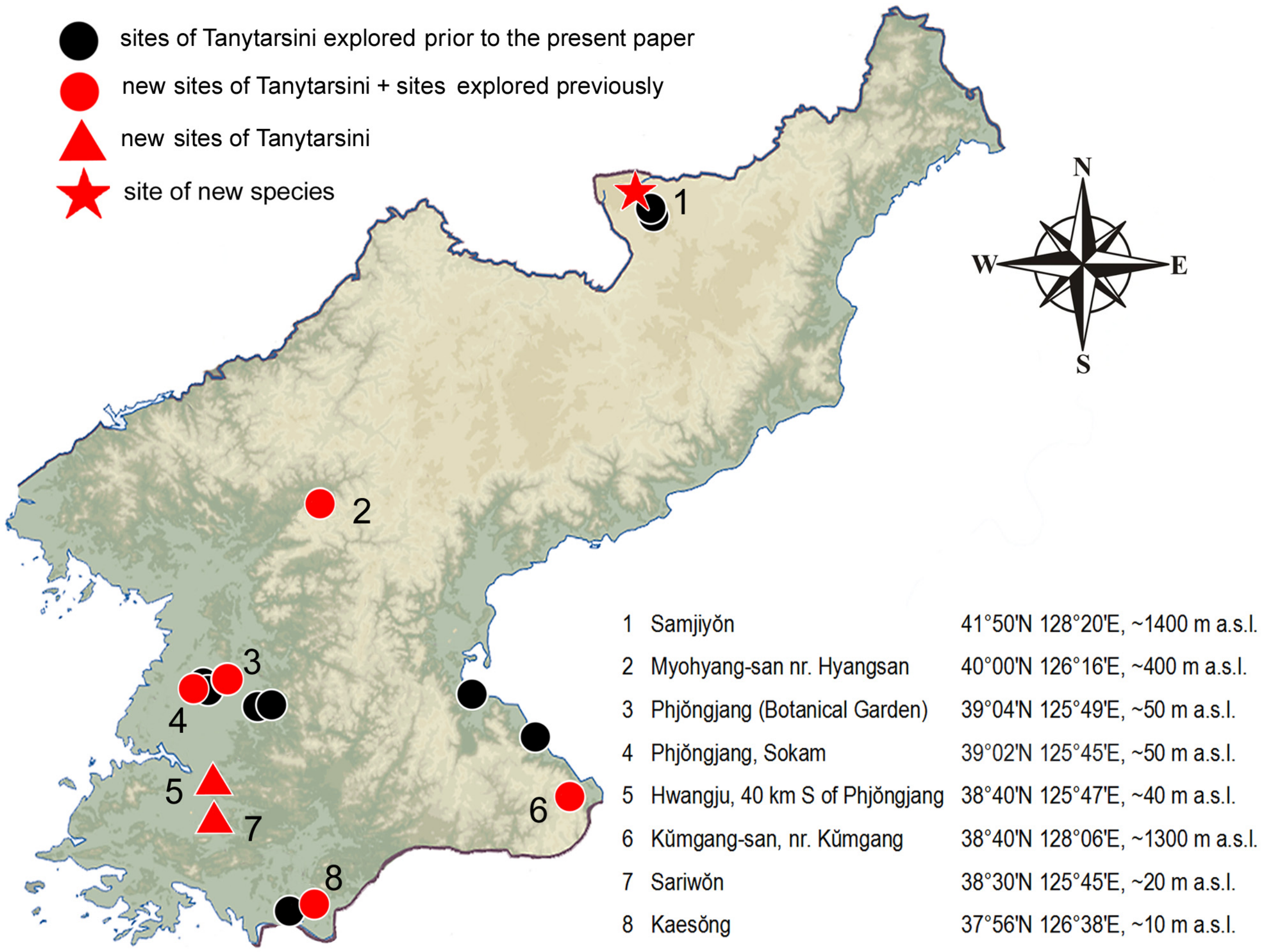

FIGURE 1. Sampling sites of Tanytarsini recorded in North Korea. For details see Mahunka and Steinmann (1971), Papp and Horvatovich (1972), Reiss (1980), Giłka (2012).

Genus: *Micropsectra* Kieffer, 1909

One of the largest genera in the tribe Tanytarsini. Nearly 150 species names have been ascribed to *Micropsectra*, although many of them still require a redefinition or generic transfer. The genus is divided into several species groups. In the material analysed we found three species of the *atrofasciata*- and *notescens* groups.

Micropsectra atrofasciata (Kieffer, 1911)

Micropsectra atrofasciata (Kieffer, 1911): Stur & Ekrem 2006: 182 (male, pupa, larva, figs 3, 7; synonyms; Palaearctic).
Micropsectra tonewdeea Sasa *et* Tanaka, 2002: 34 (male, fig. 8a–m; Japan), **syn. nov.**

Material examined. Kŭmgang-san, 28 June – 2 July 1981, 1 male; Phjŏngjang, 18 July 1981, 3 males; leg. W. Krzemiński.

Remarks. *Micropsectra atrofasciata* is an eurytopic and one of the most common species within the genus and the tribe in Europe (Giłka 2011c), distributed across the Palaearctic region. The wide geographical range and distinct intraspecific variations in the body size and colouration, depending also on a generation (seasonal heteromorphism), as well as in the shape of some key structures of the hypopygium (cf. Giłka 2000, 2001a, 2011a; see also remarks to

Micropsectra joganplumosa and *Tanytarsus volgensis* below), were probably the reason for multiple descriptions of this species under different names. A redefinition of *M. atrofasciata* by Stur and Ekrem (2006) includes eight junior synonyms. Here, we analyzed another name, *Micropsectra tonewdeea* Sasa *et* Tanaka, 2002, based on description of the adult male and photographs of the holotype displayed on the website of the NMNS (405:070). A comparison of diagnostic characters shows that the type specimen described for this name falls within the wide range of morphological variability of *M. atrofasciata*. As far as we know, the name, treated as synonymous here, has not been used apart from the original description based on materials from *locus typicus* in Gunma Prefecture, Honshu (Sasa & Tanaka 2002).

Micropsectra joganplumosa Sasa *et* Okazawa, 1991

Micropsectra joganplumosa Sasa *et* Okazawa, 1991: 55 (male, fig. 1.1a–j; Japan).
Micropsectra tusimalemea Sasa *et* Suzuki, 1999: 17 (male, fig. 18a–g; Japan), **syn. nov.**
Micropsectra tusimamenea Sasa *et* Suzuki, 1999: 18 (male, fig. 19a–g; Japan), **syn. nov.**
Micropsectra tusimaquerea Sasa *et* Suzuki, 1999: 21 (male, fig. 23a–g; Japan), **syn. nov.**
(Fig. 3A–D)

Material examined. Myohyang-san, 22–25 June 1981, 1 male, leg. W. Krzemiński.

Remarks. As in the previous species, males of *Micropsectra joganplumosa* are variable in the body colouration and main metric characters that probably resulted in description of the species under a series of names, i.e. *Micropsectra tusimalemea*, *M. tusimamenea* and *M. tusimaquerea*. The specimens analyzed (Sasa & Suzuki 1999) were originally found as belonging to the species closely related to each other and/or to several further *Micropsectra* described in the same paper. However, the slight differences (scutum colouration, AR values, and length of digitus) are here defined as intraspecific variations. In fact, the drawings presented in original descriptions for all these names do not reflect shapes of the most important diagnostic structures, especially when compared with photographs of their type specimens (cf. Sasa & Okazawa 1991, fig. 1.1a–j + NMNS 217:029 and Sasa & Suzuki 1999, figs 18, 19 and 23 + NMNS 372:016, 372:018, 354:069). Some drawings presented under these names indicate a similar or identical shape of the same hypopygial structures (median and inferior volsellae); on the other hand, the same structure (anal point) nearly identical on photographs differs distinctly on the drawings. In case of such inconsistency, we assume that at least part of the drawings may have been mistakenly assigned to a specimen/name, thus the comparison of the diagnostic structures can only be based on photographs of the designated types. Despite of deformations of the holotypes on slides (hypopygia) some crucial characters indicate that they are conspecific. The characters best defining the species are: the shape of the anal point (Fig. 3A, B), the digitus and superior volsella, typical of the *Micropsectra notescens* species group (Fig. 3A, C), and the median volsella in shape of a hockey stick bearing numerous spoon-shaped lamellae (Fig. 3D). The species is known from the west of Japan: Toyama Prefecture in Honshu (as *M. joganplumosa*) and Tsushima Island, where specimens were collected at one locality, in the same time, using the same method (as *M. tusimalemea*, *M. tusimamenea* and *M. tusimaquerea*). Now *Micropsectra joganplumosa* is also recorded from central part of North Korea.

Micropsectra jokatertia Sasa *et* Ogata, 1999

Micropsectra jokatertia Sasa *et* Ogata, 1999: 92 (male, fig. 4a–n; Japan).
(Figs 4A, B; 5C, G)

Material examined. Kŭmgang-san, 28 June – 2 July 1981, 3 males, leg. W. Krzemiński.

Remarks. The enormity of names coming from Japan pertain also to a series of *Micropsectra* (Sasa 1984, 1993; Sasa & Okazawa 1994; Sasa & Suzuki 1999; Sasa *et al.* 2001) of which specimens described under six names at least have to be compared with *M. jokatertia*. They are: *M. chuzelonga* Sasa, 1984, *M. inamenea* Sasa, Kitami *et* Suzuki, 2001, *M. inaneoa* Sasa, Kitami *et* Suzuki, 2001, *M. johanaprima* Sasa et Okazawa, 1994, *M. tomoprima* Sasa, 1993, and *M. tusimaneoa* Sasa *et* Suzuki, 1999. Based on more or less distinct characters given in original descriptions and observable on photographs of type specimens (cf. NMNS 051:011, 398:015, 402:023, 250:078, 244:001, 356:017, respectively to the above list of names), *M. jokatertia* (NMNS 352:051) differs from them in having a slender gonostylus (Fig. 4A vs. *M. chuzelonga*, *M. inamenea*), a longer and/or more slender anal point and its crest (Fig. 4A vs. *M. chuzelonga*, *M. inaneoa*, *M. johanaprima*, *M. tomoprima*, *M. tusimaneoa*), a longer or more slender digitus (Figs 4A & 5G vs. *M. chuzelonga*, *M. johanaprima*, *M. tusimaneoa*), and a lower number of spoon-shaped lamellae of the median volsella (Figs 4B & 5C vs. *M. inamenea*). Consequently, we refrain from synonymization of *M. jokatertia*, although synonymy within the compared names (excl. *M. jokatertia*) is highly probable.

Micropsectra jokatertia fits well the concept of the *notescens* group analysed on the basis of key structures of the hypopygium (Giłka 2001b). When *M. jokatertia* is included to a comparison of several well-defined species, it places between *M. rilensis* Giłka, 2001 and *M. recurvata* Goetghebuer, 1928 in this series (Fig. 5).

Genus: *Neozavrelia* Goetghebuer in Goetghebuer *et* Thienemann, 1941

Over 30 described species belong to *Neozavrelia*, although many of them still remain in wrong combinations, while some names require revision as potential synonyms. Two species have so far been recorded from North Korea (Giłka 2012).

***Neozavrelia fengchengensis* Wang *et* Wang, 1996**

Neozavrelia fengchengensis Wang *et* Wang, 1996: 121 (male, fig. 1; China); Guo & Wang 2005: 189 (male, in key; China); Makarchenko *et al.* 2005: 414 (Russia); Giłka 2012: 35 (male, figs 1–4; North Korea); Orel 2021: 254 (male, figs 1–8; Russia).

Material examined. Myohyang-san, 22–25 June 1981, 2 males, leg. W. Krzemiński.

Remarks. An illustrated diagnostic description of the adult male, based on the material examined here, provided Giłka (2012). The species has been recently analysed also for intraspecific variations (Orel 2021), however, with data referred to the present material erroneously given to be from South Korea. To our knowledge, *Neozavrelia fengchengensis* has so far been recorded from the Northeast China (Liaoning Province), East Siberia (Chita Region), several other sites in the Russian Far East, and from North Korea.

***Neozavrelia tamanona* (Sasa, 1980)**

Tanytarsus tamanonus Sasa, 1980: 25 (male, figs 26a–e, 27a–h; Japan).

Neozavrelia tamanona (Sasa, 1980): Sasa & Kawai 1987: 30 (combination; Japan); Guo & Wang 2005: 195 (male, figs 10–11; China); Giłka 2012: 36 (male, figs 5–6; North Korea).

Material examined. Kŭmgang-san, 28 June – 2 July 1981, 1 male, leg. W. Krzemiński.

Remarks. An illustrated redescription of the species with notes on systematics and possible synonymy have been based on the presently examined material (Giłka 2012).

Genus: *Paratanytarsus* Thienemann *et* Bause in Bause, 1913

Nearly 70 described species belong to *Paratanytarsus*, including several species still being incorrectly ascribed to other genera. At least three species have been recorded in North Korea; apart from the below species, Reiss (1980) recorded one more, determined as *Paratanytarsus* sp. K1.

***Paratanytarsus dissimilis* (Johannsen, 1905) or *P. inopertus* (Walker, 1856)**

Paratanytarsus confusus Palmen or *inopertus* (Walk.): Reiss 1980: 149 (North Korea).

Paratanytarsus dissimilis (Johannsen, 1905): Langton *et al*. 1988: 319 (=*confusus* Palmén, 1960). *Paratanytarsus dissimilis* (Johannsen, 1905) & *Paratanytarsus inopertus* (Walker, 1856): Giłka 2011a: 39, 40 (males in key, figs 122–131).

Remarks. The two specific names, including *Paratanytarsus confusus*, were alternatively mentioned by Reiss (1980), thus we assume that at least one species has been found in North Korea. Later synonymization of *P. confusus* with *P. dissimilis* enabled a clear definition of this species (Langton *et al.* 1988). Diagnostic characters for adult males of the two sibling species, *P. dissimilis* and *P. inopertus*, compared Giłka (2011a) in the couplet 6 of the key for *Paratanytarsus*. Though both are eurytopic and widespread in the Holarctic (Giłka 2011c), none has been confirmed in the presently examined material.

FIGURE 2. *Cladotanytarsus sinjongensis* Ree *et* Kim, 1988, male. **A**: hypopygium; **B**: anal point, variations; **C**: superior volsella and digitus, variations; **D**: median volsella (B–D magnified × 1.5–2 relative to A).

FIGURE 3. *Micropsectra joganplumosa* Sasa *et* Okazawa, 1991, male. **A**: hypopygium, **B**: anal point, **C**: superior volsella and digitus, **D**: median volsella (B–D magnified × 2 relative to A).

FIGURE 4. *Micropsectra jokatertia* Sasa *et* Ogata, 1999, male. **A**: hypopygium; **B**: median volsella, distal part (B magnified × 2 relative to A).

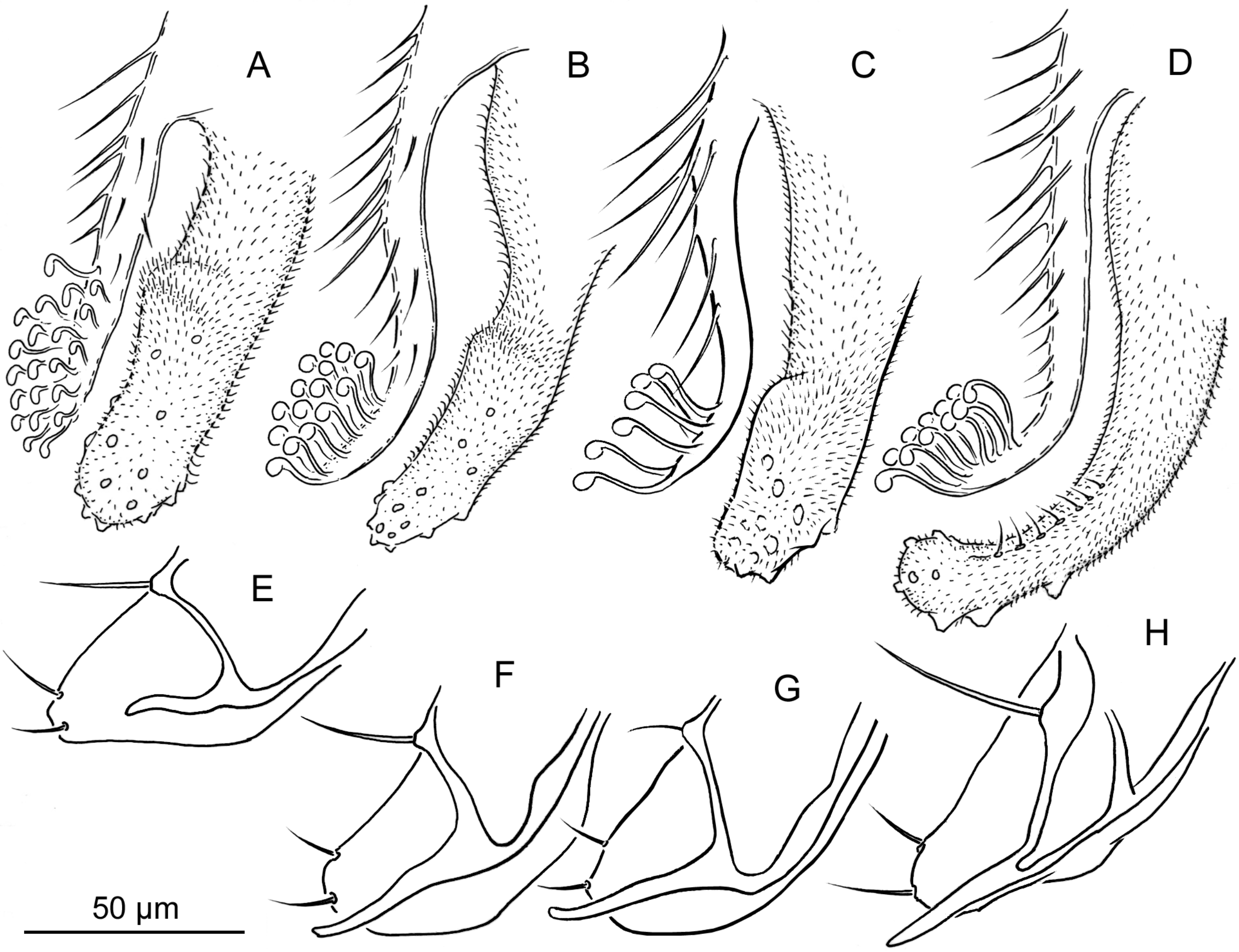

FIGURE 5. *Micropsectra jokatertia* Sasa *et* Ogata, 1999 and closely related species of the *Micropsectra notescens* species group; males, hypopygial diagnostic structures. **A**, **E**: *M. junci* (Meigen, 1818); **B**, **F**: *M. rilensis* Giłka, 2001; **C**, **G**: *M. jokatertia*; **D**, **H**: *M. recurvata* Goetghebuer, 1928. **A**–**D**: median and inferior volsellae, **E**–**H**: superior volsella and digitus.

***Paratanytarsus laccophilus* (Edwards, 1929)**

Tanytarsus (*Lundstroemia*) *laccophilus* Edwards, 1929: 409 (male, fig. 14c; UK).
Paratanytarsus laccophilus (Edwards, 1929): Reiss 1980: 149 (North Korea); Reiss & Säwedal 1981: 101 (male, pupa, figs, in keys).

Remarks. The adult male of *Paratanytarsus laccophilus* is clearly defined and easily separable even from its closest relative, *P. paralaccophilus* Giłka *et* Paasivirta, 2008 known from Lapland (Giłka & Paasivirta 2008). In North Korea, the species was recorded by Reiss (1980) but not confirmed in the material presently analyzed.

Genus: *Rheotanytarsus* Thienemann *et* Bause in Bause, 1913

The genus includes nearly 100 species distributed worldwide. Some names, especially those coming from east and south of Asia, still require a revision (potential synonyms, incorrect combinations). In the material presently examined we found one species.

***Rheotanytarsus tusimatfegeus* (Sasa *et* Suzuki, 1999)**

Tanytarsus tusimatfegeus Sasa *et* Suzuki, 1999: 27 (male, fig. 31a–e; Japan).
R. ? *tusimatfegeus* Sasa *et* Suzuki, 1999: Makarchenko *et al.* 2005: 415 (Russia).

Material examined. Myohyang-san, 22–25 June 1981, 3 males, leg. W. Krzemiński.

Remarks. Neither the original description, based on simple schematic drawings, nor the photographs of the *Rheotanytarsus tusimatfegeus* holotype, not very successfully slide-mounted (NMNS 371:001), allow for an unambiguous definition of this species when each of the characters' source taken separately, but both in combination indicate the species analyzed here. North Korean males are slightly smaller and have a proportionally lower AR than those from Japan (wing length 1.60–1.70 vs 1.80–1.96, AR ~ 0.65 vs 0.76–0.88), while other characters are conspecific. *Rh. tusimatfegeus* has so far been reported from the Sea of Japan region, in Tsushima (Sasa & Suzuki 1999) and most likely in Russia (Makarchenko *et al*. 2005). Now recorded for the first time in North Korea.

Genus: *Tanytarsus* van der Wulp, 1874

With nearly 400 described species, *Tanytarsus* is the largest genus in the tribe and the second most diverse genus of the family Chironomidae (cf. Dantas *et al.* 2022). At least 11 species of *Tanytarsus* have been recorded from North Korea. The review comprises 3 species found previously (Reiss 1980, apart form 6 species ascribed to *Tanytarsus* as “sp. K1–6”) and 8 species here recorded for the first time from North Korea (Table 2).

Tanytarsus chinyensis Goetghebuer, 1934

Tanytarsus chinyensis Goetghebuer: Reiss & Fittkau 1971: 99, 169 (male, fig. 6, systematics); Giłka & Paasivirta 2009: 32, 40 (male, fig. 28, systematics); Lin *et al*. 2018a: 330, 387 (systematics); Lin *et al*. 2018b: 10, 11 (systematics).

Material examined. Phjŏngjang, 18 July 1981, 1 male, leg. W. Krzemiński.

Remarks. Reiss and Fittkau (1971) indicated this species as representative of the *chinyensis* group. The concept was recently refuted, and the former *chinyensis* group was proposed to be split into several unrelated clusters/groups (Lin *et al*. 2018a, b). Alternatively, the group was postulated to be reduced. However, *Tanytarsus chinyensis* was not included in the analyses (op. cit.), thus according to this concept, the group name-bearing species is unplaced in any of the species groups proposed, apparently, except for the *chinyensis* group (see also remarks to *T. tamadecimus* below). In the material analysed, we found a single male collected in the Botanical Garden in Phjŏngjang.

Tanytarsus heusdensis Goetghebuer, 1923

Tanytarsus heusdensis Goetghebuer: Reiss & Fittkau 1971: 101, 170 (male, figs 8, 9a–c, systematics); Reiss 1980: 149 (North Korea); Giłka & Paasivirta 2009: 40 (male, fig. 30, systematics); Lin *et al*. 2018a: 375 (male, fig. 29a–d, systematics); Lin *et al*. 2018b: 10, 11 (fig. 1, systematics).

Remarks. *Tanytarsus heusdensis* was ascribed to the *chinyensis* species group (Reiss & Fittkau 1971); recently proposed to be excluded into the separate *heusdensis* complex/group (Lin *et al*. 2018a, b). The species was recorded from North Korea by Reiss (1980), but not confirmed in our material.

Tanytarsus iriolemeus Sasa *et* Suzuki, 2000

Tanytarsus iriolemeus Sasa *et* Suzuki, 2000: 20 (male, fig. 21 a–n; Japan).
(Fig. 6A–D)

Material examined. Kŭmgang-san, 28 June – 2 July 1981, 1 male; Myohyang-san, 22–25 June 1981, 2 males; leg. W. Krzemiński.

Remarks. The North Korean specimens fit well the original description of *Tanytarsus iriolemeus* (Sasa & Suzuki 2000) except for one character crucial in species group concepts for *Tanytarsus* - the strong bristle-like median setae placed in a roundish field of the hypopygial anal tergite. This structure is omitted in the original description but present in the holotype specimen (slightly beyond the range of sharpness on the photo presented at NMNS website, 385:035). This character combined with the anal point elongate, bearing a few spinulae (Fig. 6A, B; cf. also *Tanytarsus innarensis* Brundin 1947), the superior volsella roundish, medially excavated, with a well-protruded posteromedian corner, the digitus long apically rounded (Fig. 6C), and the shape of the median volsella (Fig. 6D) may indicate that *T. iriolemeus* belongs to the *verralli* species group. In the analyses by Lin *et al*. (2018b), *T. iriolemeus* falls in the *tamakutibasi* cluster that together with the *aterrimus*+*chinyensis*+*curticornis* groups is sister to a clade comprising the Holarctic *excavatus*, *recurvatus*, and *verralli* groups.

Tanytarsus occultus Brundin, 1949

Tanytarsus holochlorus Edw.: Brundin 1947: 67 (male, fig. 100; Sweden).

Tanytarsus occultus Brundin, 1949: 847 (male, Sweden); Reiss & Fittkau 1971: 89, 123 (male, fig. 35a–c, in key); Ekrem *et al.* 2003: 315 (male, pupa, figs 248–250; Europe, North America); Ekrem 2004: 137 (pupa, figs 183–187); Giłka & Paasivirta 2007: 107–110 (male, figs 2–4, 13, 16; Fennoscandia); Giłka *et al.* 2018: 573–576 (male, diagnostics, barcoding, phylogeny).

Material examined. Phjŏngjang, 13 June 1981, 2 males; Sokam, 8 July 1981, 3 males; leg. W. Krzemiński.

Remarks. A diagnostic character of the *Tanytarsus occultus* male is the hypopygial anal point, usually with a square or concave apex, which the shape, however, may be affected by strong intraspecific variations. *T. occultus* was described on the basis of a males' series by Brundin (1949), who referred the description to his illustration of a specimen's hypopygium presented two years earlier [Brundin 1947, originally erroneously as *Tanytarsus holochlorus* (=*T. mendax* Kieffer, 1925)]. The illustration was apparently based on a specimen with a hypopygial anal point of a structure rarely observed in *T. occultus*. That choice could lead to confusion until Reiss & Fittkau (1971) redescribed the male on the basis of Brundin's series, indicating variations in the shape of the anal point, thus stabilizing the status of the species. Recently, one more close species was described, *Tanytarsus latens* Giłka, Paasivirta, Gadawski *et* Grabowski, 2018, in which the anal point is similar or nearly identical (variable) to that illustrated from the atypical specimen of *T. occultus* by Brundin (1947). In case of these two species, the anal point structure can be thus critically misleading in their delimitation. The characters best separating males of the two species is the shape/length of the superior volsella and the digitus, and the arrangement of anal tergite bands (cf. Giłka *et al.* 2018). *T. occultus* is one of the best-defined species in the genus in term of morphological variability and diagnostics supported by molecular analyses (Reiss & Fittkau 1971; Ekrem *et al.* 2003, Ekrem 2004; Giłka & Paasivirta 2007, Giłka *et al*. 2018). Only now recorded from North Korea.

Tanytarsus oscillans Johannsen, 1932

Tanytarsus oscillans Johannsen, 1932: Ekrem 2002: 24 (male, figs 34, 35; Indonesia; =*Tanytarsus cultellus* Chaudhuri *et* Datta, 1992, =*Tanytarsus sibafegeus* Sasa, Sumita *et* Suzuki, 1999).

Material examined. Kaesŏng, 16 July 1981, 4 males; Sokam, 8 July 1981, 3 males; leg. W. Krzemiński. Comparative material. *Tanytarsus smolandicus*: Sweden, Nedre Dalälven, 11 August 2003, 1 male, Storsjön, 18 July 2003, 20 males; leg. W. Giłka.

Remarks. Ekrem (2002) redescribed the male of *Tanytarsus oscillans* based on the holotype specimen. In remarks on its close relatives, *T. smolandicus* Brundin, 1947 (*terra typica* in Sweden) and *T. unagiseptimus* Sasa, 1985 (Japan), selected diagnostic characters were indicated to separate these species. It seems, however, that these features (number of median setae, length of frontal tubercles, AR value, presence/absence of microtrichia between anal point crests and slight differences in shape of inferior volsella), in part at least, may be within the morphological variability of *T. oscillans* and/or *T. smolandicus*. According to the concept by Lin *et. al*. (2018b), *T. oscillans* and *T. unagiseptimus* are sister species (not ascribed to any group analyzed) while *T. smolandicus* has not been included. Interestingly, a concept of possible synonymy between the abovementioned names has been raised recently, when DNA sequences from specimens sampled in Fennoscandia and Japan, determined as *T. oscillans* or *T. unagiseptimus*, have been compared that resulted in ~97–98% of DNA sequence compatibility (Paasivirta, pers. comm.). Unfortunately, our specimens collected decades ago (kept in denatured ethanol or slide-mounted in Canada balsam) do not give a chance to be analyzed molecularly for supporting this concept.

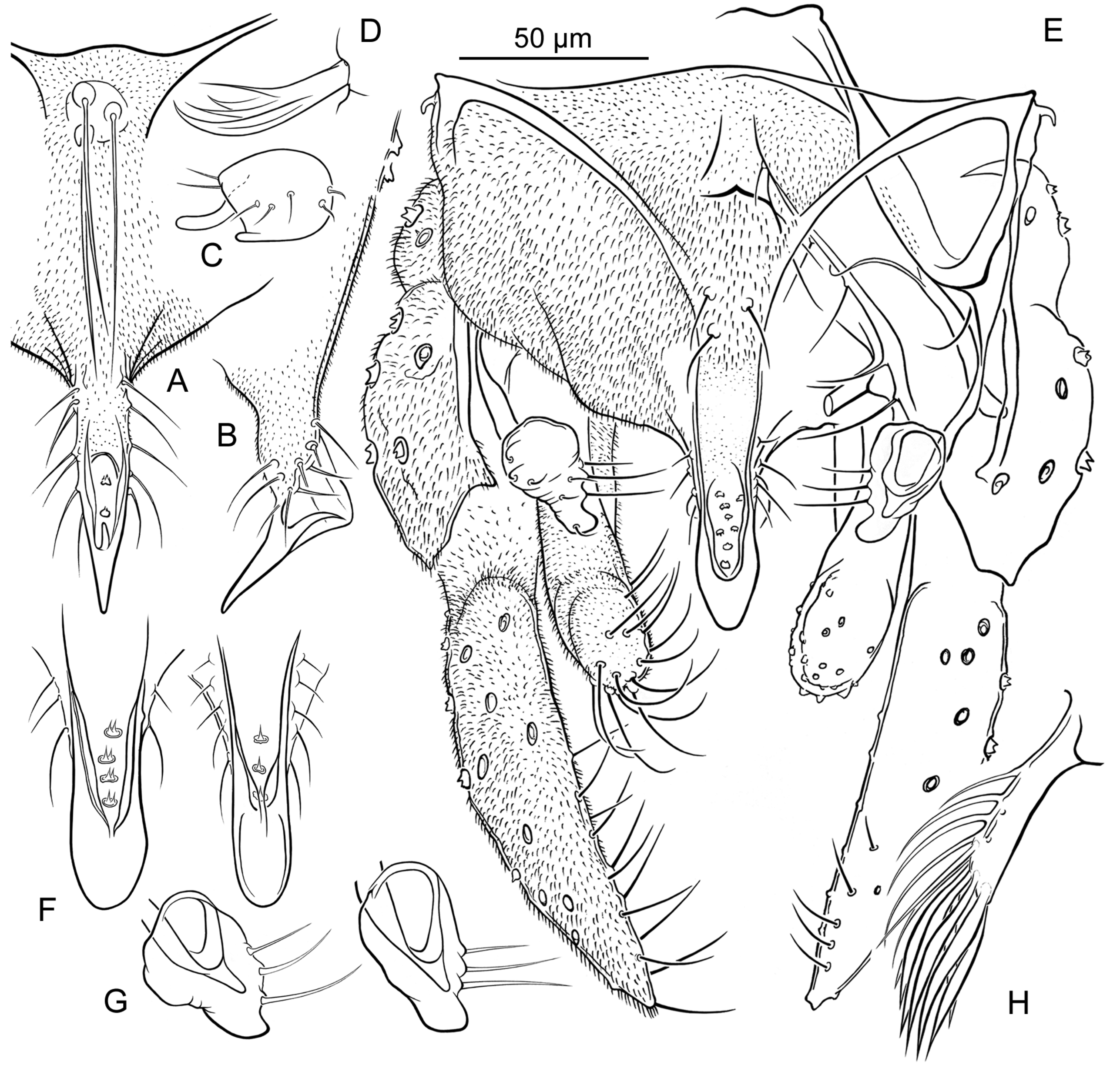

FIGURE 6. *Tanytarsus iriolemeus* Sasa *et* Suzuki, 2000 (**A**–**D**) and *T. oyamai* Sasa, 1979 (**E**–**H**), males. **A**, **F**: anal tergite and anal point in dorsal view, variations; **B**: anal tergite, lateral view; **C**, **G**: superior volsella and digitus, variations; **D**, **H**: median volsella; **E**: hypopygium (F–H magnified × 1.5 relative to E).

Tanytarsus oyamai Sasa, 1979

Tanytarsus oyamai Sasa, 1979: 3 (male, figs 5–7; Japan); Ekrem 2002: 26 (male, pupa, larva, figs 32, 33, 63, 70, 78, 89, 94, 99, 104, 108 + references therein; Japan).

(Fig. 6E–H)

Material examined. Kaesŏng, 16 July 1981, 1 male; Phjŏngjang, 13 June 1981, 7 males, 18 July 1981, 1 male; Sariwŏn, 18 June 1981, 3 males; Sokam, 8 July 1981, 2 males; leg. W. Krzemiński.

Remarks. *Tanytarsus oyamai* is probably one of the most common Tanytarsini in the southern part of the Sea of Japan basin; also frequent in North Korea - collected from half of the explored sites. The adult male is well-defined, thus only several illustrations are attached to show variations of the most important diagnostic structures (Fig. 6E–H).

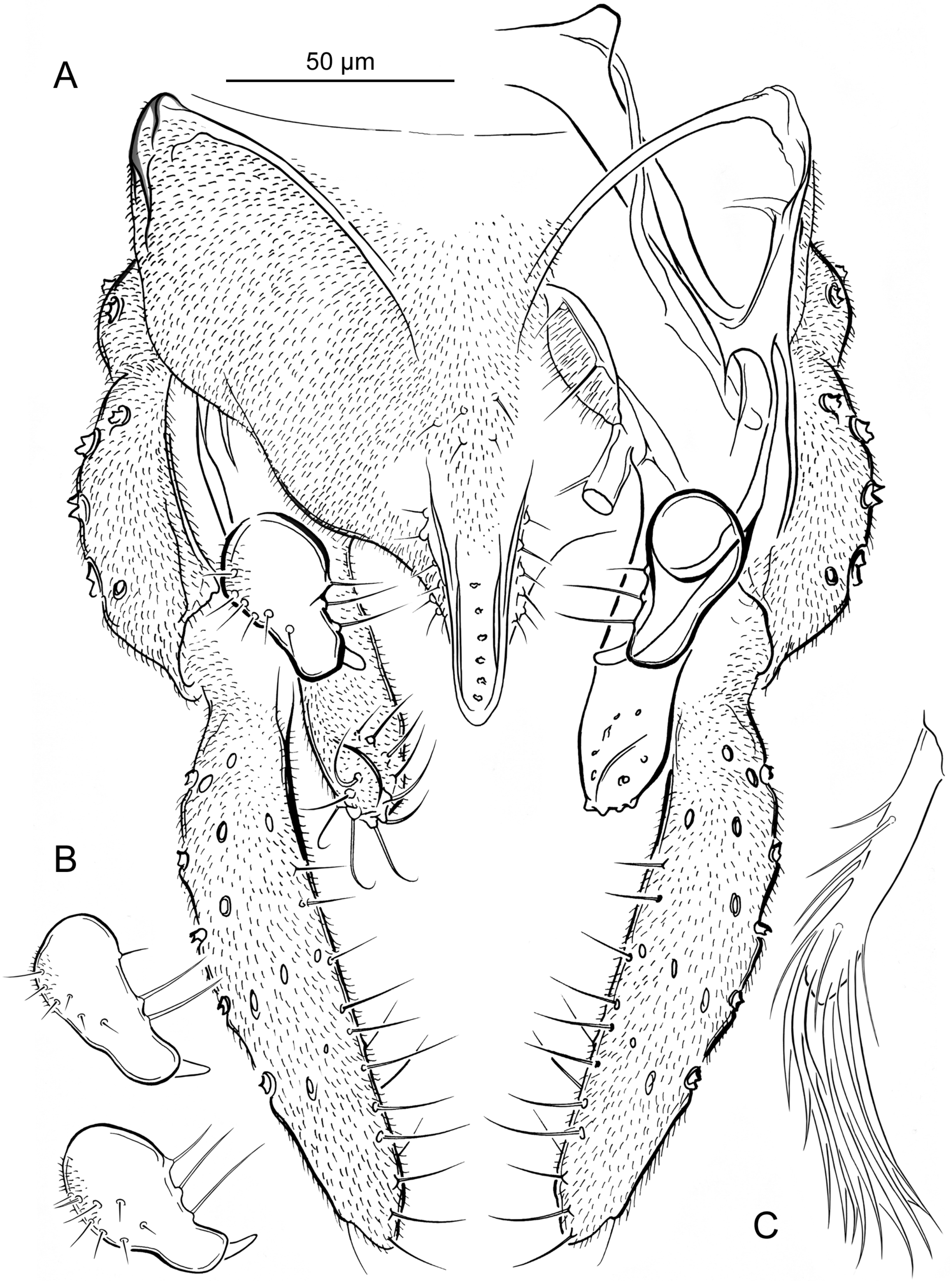

FIGURE 7. *Tanytarsus takahashii* Kawai *et* Sasa, 1985, male. **A**: hypopygium; **B**: superior volsella and digitus, variations; **C**: median volsella (magnified × 1.5 relative to A).

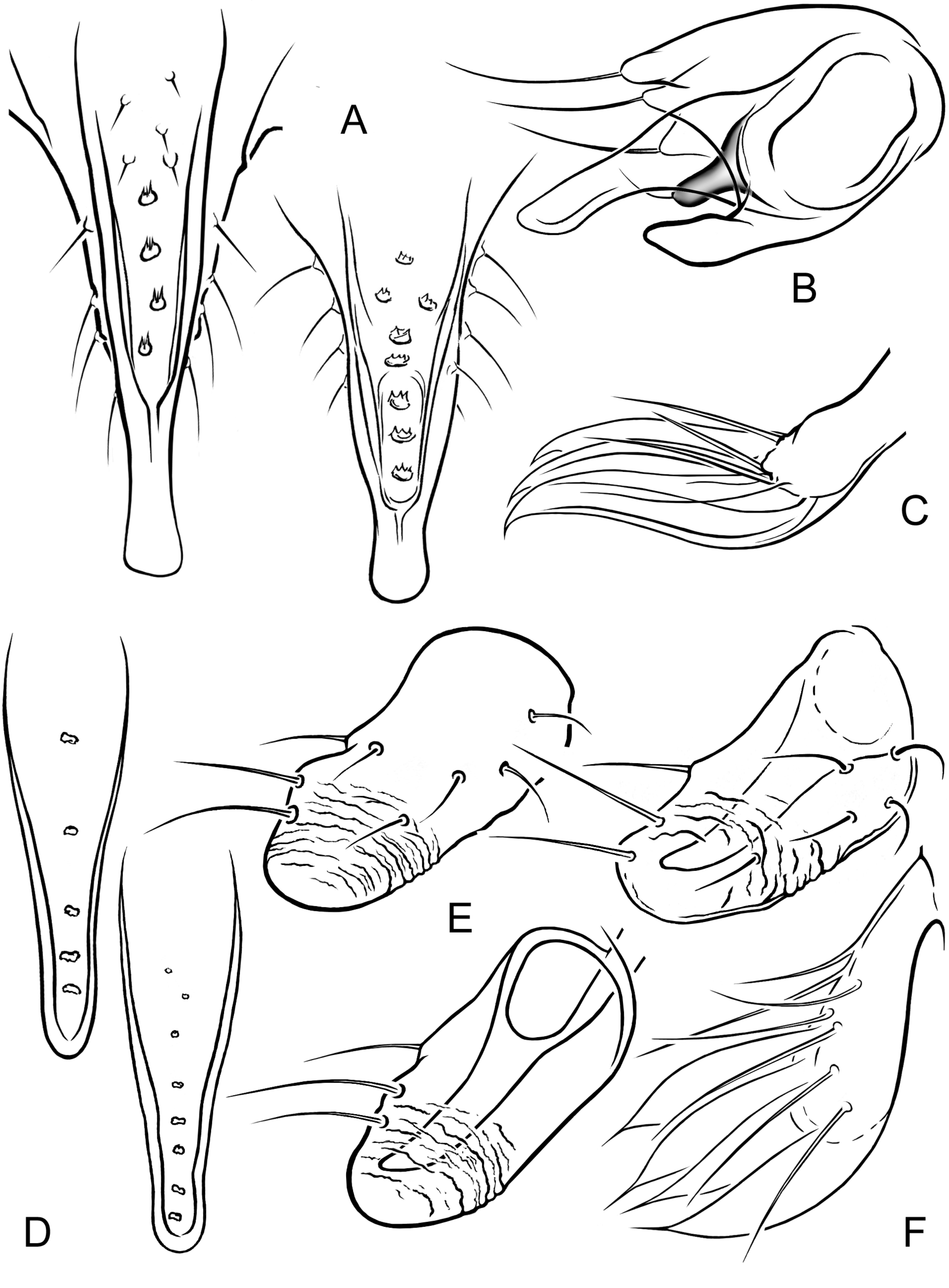

FIGURE 8. *Tanytarsus tamadecimus* Sasa, 1980 (**A**–**C**) and *T. tamaundecimus* Sasa, 1980 (**D**–**F**); males, hypopygial diagnostic structures. **A**, **D**: anal point, variations; **B**, **E**: superior volsella and digitus, variations; **C**, **F**: median volsella.

***Tanytarsus pallidicornis* (Walker, 1856)**

Tanytarsus pallidicornis (Walker, 1856): Reiss & Fittkau 1971: 140, 193 (male, figs 58, 59, systematics); Giłka 2011a: 79 (male, diagnostics, figs 349–352; Poland).

Material examined. Phjŏngjang, 18 July 1981, 2 males, leg. W. Krzemiński.

Remarks. *Tanytarsus pallidicornis* is one of the best-defined in the genus. This common eurytopic species is widely distributed in the Holarctic but only now recorded from North Korea.

***Tanytarsus takahashii* Kawai *et* Sasa, 1985**

Tanytarsus takahashii Kawai *et* Sasa, 1985: 22 (male, fig. 8; Japan); Ekrem 2002: 28 (male, figs 47, 48; Japan + references therein).

(Fig. 7A–C)

Material examined. Phjŏngjang, 18 July 1981, 9 males; Sokam, 8 July 1981, 2 males; leg. W. Krzemiński.

Remarks. A group membership of *Tanytarsus takahashii*, based on morphology, was discussed by Ekrem (2002) who indicated several possible placements for this species (the *mendax*, *eminulus* or *lestagei* group). Later, molecular analyses supported the concept of the *lestagei* group as the place for *T. takahashii* (Lin *et al.* 2018b). The species has been also compared with the fossil species *T. serafini* Giłka, 2010, and suggested to belong to the *serafini* group (cf. Giłka 2010, pl. II, figs. 2–7 and Fig. 7A–C).

***Tanytarsus tamadecimus* Sasa, 1980**

Tanytarsus tamadecimus Sasa, 1980: 26 (male, figs 28, 29; Japan).

(Fig. 8A–C)

Material examined. Hwangju, 18–19 June 1981, 2 males; Kŭmgang-san, 28 June – 2 July 1981, 3 males; Sokam, 8 July 1981, 1 male; leg. W. Krzemiński.

Remarks. The Korean specimens of *Tanytarsus tamadecimus* fit the original description, except for a couple of characters, possibly taken from specimens deformed before their illustrating. According to Sasa (1980), the digitus is "composed of a long spatulated dorsal process and a ventral hook-like process connected with each other". In fact, at the Sasa's illustrations the hook-like process looks so unusually (not known from any other species) as we assume it could be misidentified with a long darkly pigmented tubercle at the digitus base that was omitted in the original illustrations (cf. Sasa 1980, fig. 29B, F, G and Fig. 8B). Character/shape overinterpretation seems to pertain also to the anal point and median volsella (cf. Sasa 1980, fig. 29D, E and Fig. 8A, C), thus we attach illustrations of selected variations to supplement the description.

Tanytarsus tamadecimus and *T. chinyensis* are treated here as close relatives (see also remarks to *T. chinyensis*). The concept of the *chinyensis* species group *sensu* Reiss and Fittkau (1971) was recently refuted and/or its species composition was suggested to be reduced (Lin *et al.* 2018a, b); however, neither *T. chinyensis* nor *T. tamadecimus* have been included in the analyses. Consequently, we keep the *chinyensis* group, with the two species and *T. cretensis* Reiss, 1987, plus *T. tamagotoi* Sasa, 1983 and *T. simantoseteus* Sasa, Suzuki *et* Sakai, 1998, as it was suggested (op. cit.), plus a series of species by Sasa and co-authors: *T. chuzesecundus* Sasa, 1984, *T. inawaijeus* Sasa, Kitami *et* Suzuki, 2000, *T. oyaberotundus* Sasa, Kawai *et* Ueno, 1988 and *T. tusimatkeleus* Sasa *et* Suzuki, 1999. Males of all the species have the broad thumb-like or spatulate digitus and the horn-like posteromedian corner of the superior volsella.

***Tanytarsus tamaundecimus* Sasa, 1980**

Tanytarsus tamaundecimus Sasa, 1980: 27 (male, female, pupa, figs 30–32; Japan); Ekrem 2002: 28 (diagnostics).

(Fig. 8D–F)

Material examined. Kŭmgang-san, 28 June – 2 July 1981, 3 males, leg. W. Krzemiński.

Remarks. Ekrem (2002) listed characters found as crucial in delimitation of *Tanytarsus tamaundecimus* on the basis of the original description. However, the type material has not been examined, neither photographs of the holotype are displayed at the NMNS website. The examined Korean specimens have been preliminarily confirmed as *T. tamaundecimus* (Ekrem, pers. comm.), thus several key structures and their variations are supplemented here (Fig. 8D–F).

Tanytarsus volgensis **Miseiko, 1967**

Tanytarsus fimbriatus Reiss *et* Fittkau, 1971: 118 (male, figs 29, 30); Reiss 1980: 149 (North Korea).

Tanytarsus volgensis Miseiko, 1967: Ekrem 2004: 139 (male, figs 194–202; =*fimbriatus* Reiss *et* Fittkau, 1971); Giłka & Paasivirta 2007: 107–109 (male, figs 7–9, 12, 14).

Material examined. Hwangju, 18–19 June 1981, 7 males; Kaesŏng, 16 July 1981, 1 male; Phjŏngjang, 11 June 1981, 27 males; 13 June 1981, 28 males; 18 July 1981, 26 males; Sariwŏn, 18 June 1981, 5 males; Sokam, 8 July 1981, 29 males; leg. W. Krzemiński.

Remarks. This eurytopic and widespread Holarctic species (cf. Giłka 2011c) was found as the most frequent and abundant tanytarsine in North Korea - recorded from two sites by Reiss (1980, as *T. fimbriatus*) and now confirmed at further 5 localities (123 males = over 55% of all examined specimens). Interestingly, an extremely wide range of the body size and colouration have been observed in the examined males, among which the biggest specimens, darker are nearly twice as long as the smallest ones, lighter (see also remarks to *Micropsectra atrofasciata* and *M. joganplumosa*).

Subtribe: Zavreliina Sæther, 1977

Genus: *Stempellina* Thienemann *et* Bause in Bause, 1913

So far, over 20 specific names have been ascribed to *Stempellina* as the genus, subgenus of *Tanytarsus* or to other Tanytarsini generic names. According to current knowledge, the number of known species is lower due to systematic combinations other than original or doubtful status of some names (*nomina dubia*). *Stempellina* includes 15 described species: 2 extinct and 13 extant (Giłka 2005, Zakrzewska *et al.* 2020), thus its share in the tribe's world extant fauna is less than 2%. *Stempellina* are recorded in all continents except Antarctica, mostly in the Holarctic. In North Korea, one unknown species has been found.

Stempellina radoszkowskii **sp. nov.**

http://zoobank.org/urn:lsid:zoobank.org:act:F90C1ED3-A009-432A-94B6-BD34FE2AA118

(Fig. 9A–E)

Type material. Holotype, adult male: North Korea, Paektu Mountain, Samdžijŏn at Samji Lake (41°50'N 128°20'E; ~1400 m a.s.l.), 23–25.08.1992, sweep net, leg. A. Palaczyk.

Derivatio nominis. The specific epithet commemorates Oktawiusz Wincenty Radoszkowski (1820–1895), the meritorious entomologist and the first Polish discoverer of insects from Korea.

Diagnosis. Antenna with 5–6 flagellomeres, borders between flagellomeres 5–9 indistinct, ultimate segments completely fused, plume consisted of short sparse setae. Frontal tubercles robust. Hypopygial median setae absent. Anal point short and apically swollen, anal point crests thin, spinulae absent. Superior volsella extensive, apex round, with small apical protuberance. Stem of median volsella straight, with setiform and long spindle–shaped lamellae.

Description. Adult male (n = 1).

Body size. Minute species, total length ~2 mm. Wing length 1010 μm.

Colouration (in alcohol). Eyes, scutal stripes, postnotum and sternum light brown, remaining body parts pale yellowish, wing membrane transparent, veins a bit darker.

FIGURE 9. *Stempellina radoszkowskii* **sp. nov.**, male. **A**: antenna; **B**: hypopygium, **C**: anal point, **D**: superior volsella; **E**: hypopygial volsellae, arrangement (C–E magnified × 2–3 relative to B).

Head. Eyes bare, reniform, broadly separated by frons. Antenna only with 5–6 well discernible flagellomeres, borders between flagellomeres 5–9 indistinct, ultimate segments completely fused, AR ~2.6 (when flagellum measured as 6-segmented), ~2.0 (as 7-segmented), ~1.3 (as 9-segmented); plume weak, consisted of short and sparse setae (Fig. 9A). Frontal tubercles robust, ~30 µm long and ~10 µm wide at base, conical, with apex rounded. Length of palpomeres 2–5 (µm): 32, 66, 72, 117. Clypeus with 16 setae.

Thorax chaetotaxy. Setae weak, poorly observable; Ac not observed, likely absent, Dc 7–8, Pa 1, Scts 2 (pair of setae placed medially).

Wing. Squama bare, anal lobe reduced, cell m_{3+4}, distal part of cells m_{1+2} and r_{4+5} with macrotrichia, cell r_{4+5} with a single row of macrotrichia in 3/4 distal part; veins C, R, R_1, R_{4+5} (distal 1/4–1/2 part), M_{1+2} (distal 3/4 part), Cu_1 and false vein above M_{3+4} always with macrotrichia; An and false vein under Cu_1 (distal part) usually with some macrotrichia, other veins bare; M_{3+4} ending distinctly distal of R_{4+5}.

Legs. Fore leg tibia with s-shaped spur (~5 µm long). Combs of mid and hind leg tibiae fine, each bearing spur: straight and equally long (~20 µm) on mid leg, and unequal on hind leg - longer spur (~40 µm) slender and evenly curved, shorter spur (~16 µm) straight; ta_1 of p_2 bearing 2 hook–shaped sensilla chaetica. For length of legs segments and legs ratios see Table 1.

Table 1. Leg segment lengths (µm) and leg ratios of male *Stempellina radoszkowskii* **sp. nov.** p_1–p_3 = pair of legs 1–3, fe = femur, ti = tibia, ta_1–ta_5 = tarsomeres 1–5, LR = leg ratio.

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR
p_1	575	245	670	-	-	-	-	2.73
p_2	550	410	260	120	-	-	-	0.63
p_3	575	485	395	215	-	-	-	0.81

Hypopygium. Gonostylus (~75 µm) as long as gonocoxite. Anal tergite with bands V-shaped broadly separated and 2–3 posterolateral setae, median setae absent. The tergite tapering towards short and apically slightly swollen anal point, anal point crests thin, spinulae absent (Fig. 9B, C). Superior volsella extensive, broadest at base, tapering towards round apex bearing small apical protuberance; 3 setae on anteromedian margin (Fig. 9B, D, E). Stem of median volsella straight, ~30 µm long, with setiform and long spindle–shaped lamellae reaching tip of inferior volsella (Fig. 9B, E). Inferior volsella slightly curved, parallel-sided, with distal part rounded (Fig. 9B, E).

Remarks. Except for a combination of hypopygial characters given in the diagnosis, the adult male of *Stempellina radoszkowskii* differs from all known *Stempellina* by lower number of antennal flagellomeres. This character was recently analysed in extant and fossil species of the genus (Zakrzewska *et al.* 2020), as well as in *Stempellinella* (Zakrzewska & Jankowska 2021). A distinct trend towards reduction of the number of flagellomeres (12 or less) in extant species relative to those of fossil is confirmed here.

Genus: *Zavrelia* Kieffer, Thienemann *et* Bause in Bause, 1913

The small genus *Zavrelia* comprises 11 described and named species distributed in the northern hemisphere (Zorina 2008; Ekrem & Stur 2009; Kobayashi 2014). Only one species has so far recorded from North Korea.

Zavrelia sinica Ekrem *et* Stur, 2009

Zavrelia sinica Ekrem *et* Stur, 2009: 137 (male, female, pupa, larva, figs 10–11; China, North Korea).

Material examined. Kŭmgang-san, 28 June – 02 July 1981, 2 males (paratypes), leg. W. Krzemiński.

Remarks. Detailed illustrated descriptions of adults and immature stages, with remarks on systematics and ecology of *Zavrelia sinica* gave Ekrem and Stur (2009). The species is known from two sites, in the Northeast China and North Korea, where just a couple of specimens, including three adult males have been collected (two examined here).

Table 2. Annotated checklist of Tanytarsini recorded from North Korea. [1]original material (examined), [2]record confirmed on the basis of the material examined.

no.	species	reference (systematics)	North Korea
1	*Cladotanytarsus sinjongensis* Ree *et* Kim, 1988	Ree & Kim (1988)	new record
2	*Micropsectra atrofasciata* (Kieffer, 1911)	Stur & Ekrem (2006)	new record
	=*Micropsectra tonewdeea* Sasa *et* Tanaka, 2002, syn. nov.	Sasa & Tanaka (2002), NMNS 405:070	as above
3	*Micropsectra joganplumosa* Sasa *et* Okazawa, 1991	Sasa & Okazawa (1991), NMNS 217:029	new record
	=*Micropsectra tusimalemea* Sasa *et* Suzuki, 1999, syn. nov.	Sasa & Suzuki (1999), NMNS 372:016	as above
	=*Micropsectra tusimamenea* Sasa *et* Suzuki, 1999, syn. nov.	Sasa & Suzuki (1999), NMNS 372:018	as above
	=*Micropsectra tusimaquerea* Sasa *et* Suzuki, 1999, syn. nov.	Sasa & Suzuki (1999), NMNS 354:069	as above
4	*Micropsectra jokatertia* Sasa *et* Ogata, 1999	Sasa & Ogata (1999), NMNS 352:051	new record
5	*Neozavrelia fengchengensis* Wang *et* Wang, 1996	Wang & Wang (1996), Giłka (2012), Orel (2021)	Giłka (2012) [1]
6	*Neozavrelia tamanona* (Sasa,1980)	Sasa (1980), NMNS 078:089; Sasa & Kawai 1987; Giłka (2012)	Giłka (2012) [1]
7	*Paratanytarsus dissimilis* (Johannsen, 1905) or *P. inopertus* (Walker, 1856)	Palmén (1960), Langton *et al*. (1988), Giłka (2011a)	Reiss (1980)
8	*Paratanytarsus laccophilus* (Edwards, 1929)	Reiss & Säwedal (1981)	Reiss (1980)
9	*Rheotanytarsus tusimatfegeus* Sasa *et* Suzuki, 1999	Sasa & Suzuki (1999), NMNS 371:001	new record
10	*Stempellina radoszkowskii* Giłka *et* Gadawski, sp. nov.	this article	new species
11	*Tanytarsus chinyensis* Goetghebuer, 1934	Reiss & Fittkau (1971), Giłka & Paasivirta (2009), Lin *et al*. (2018a, b)	Reiss (1980) [2]
12	*Tanytarsus heusdensis* Goetghebuer, 1923	Reiss & Fittkau (1971), Giłka & Paasivirta (2009), Lin *et al*. (2018a, b)	Reiss (1980)
13	*Tanytarsus iriolemeus* Sasa *et* Suzuki, 2000	Sasa & Suzuki (2000), NMNS 385:035	new record
14	*Tanytarsus occultus* Brundin, 1949	Brundin (1947, 1949), Reiss & Fittkau (1971), Ekrem *et al.* (2003), Ekrem (2004), Giłka & Paasivirta (2007), Giłka *et al.* (2018)	new record
15	*Tanytarsus oscillans* Johannsen, 1932	Ekrem (2002)	new record
16	*Tanytarsus oyamai* Sasa, 1979	Sasa (1979), NMNS 013:051a; Ekrem (2002)	new record
17	*Tanytarsus pallidicornis* (Walker, 1856)	Reiss & Fittkau (1971), Giłka (2011a)	new record
18	*Tanytarsus takahashii* Kawai *et* Sasa, 1985	Kawai & Sasa (1985), Ekrem (2002)	new record
19	*Tanytarsus tamadecimus* Sasa, 1980	Sasa (1980)	new record
20	*Tanytarsus tamaundecimus* Sasa, 1980	Sasa (1980), Ekrem (2002)	new record
21	*Tanytarsus volgensis* Miseiko, 1967	Reiss & Fittkau (1971), Ekrem (2004), Giłka & Paasivirta (2007)	Reiss (1980) [2]
22	*Zavrelia sinica* Ekrem *et* Stur, 2009	Ekrem & Stur (2009)	Ekrem & Stur (2009) [1]

FIGURE 10. Oktawiusz Wincenty Radoszkowski (1820–1895), the meritorious entomologist and the first Polish discoverer of insects from Korea. Born in Łomża. He attended the Warsaw School at the Faculty of Mathematics and Natural Sciences, where he met the eminent Polish zoologist, Antoni Waga, whose knowledge affected Radoszkowski's further scientific interest, entomology. In the period of the partitions of Poland, Radoszkowski went to the Artillery Academy in St. Petersburg. Graduated with honours, he lectured at his Alma Mater for few years, remained on active duty for over 30 years, and numerous journeys gave him opportunity to collect specimens from far regions of Asia. Radoszkowski has published 112 scientific articles, mostly based on materials from Russia and Korea. In the years 1867-1880, the prestigious position of the President of the Russian Entomological Society enabled him to support Polish scientists deported to Siberia. Radoszkowski, as the retired General, returned to Warsaw in 1879, where he continued his research.

Historical note

The first well-documented Polish scientific expeditions to Asia date back to 1865, the time of the partitions of Poland, and deportation of one of the most famous Polish zoologists, Benedykt Dybowski (1833–1930), to East Siberia. During his 12-year period in exile, Dybowski devoted himself to study the avifauna of Siberia, as well as extensive research of fauna of the Lake Baikal. His fascination with Asia zoogeography did not end after he was pardoned and has led to another expedition to Kamchatka in 1878. Unique zoological collections that Dybowski and his travel companions were sending to their homeland brought the Polish researcher a well-deserved reputation and increased interest in zoological expeditions among compatriots. One of them was 20-year-old Jan Kalinowski (1857–1941), who accompanied Dybowski during a five-year expedition to Kamchatka. This journey was only the beginning for Kalinowski's forthcoming zoological expeditions in Asia and South America. One of them was the first documented zoological exploration of the Korean Peninsula. During his lonely two-year trip, Kalinowski skilfully collected various zoological materials and had sent them directly to the museum owned by Polish collectors (the Branicki Museum), where the specimens had been distributed to specialist for examination. Oktawiusz Radoszkowski (Fig. 10) was the first Polish entomologist who described over a dozen of hymenopteran species based on Kalinowski's material from Korea (Radoszkowski 1887, Chłapowski 1900, Brzęk 1955, Dylewska *et al.* 1973, Pawłowski 1997).

The period of the end of partitions of Poland, both World Wars, then followed by restrictions by communist regime in post-war Poland limited the possibilities of exchange with the West but opened further possibilities of exploring Asian countries as part of research programs carried out in cooperation with the USSR and other socialist countries. The most active researchers of the Institute of Systematics and Evolution of Animals of the Polish Academy of Sciences have participated in expeditions to Far East, including North Korea. During the years 1971–1992 fifteen zoological expeditions were organized. In cooperation with the Korean Academy of Sciences, mainly represented by the Zoological Institute in Pyongyang, Polish researchers have collected, among others, over 93,000 specimens of invertebrates, including 86,600 insects and thousands of dipteran and chironomid specimens taken mostly by Wiesław Krzemiński (in 1981) and Andrzej Palaczyk (in 1992) (Pawłowski & Tomek 1997; Krzemiński, pers. comm.). At the same time, on the basis of agreement between Hungary and North Korea, twenty zoological expeditions by researchers of the Hungarian Natural History Museum to North Korea has been held (Mahunka & Steinmann 1971; Papp & Horvatovich 1972) which resulted in Chironomidae collections worked up later by Reiss (1980).

North Korean Chironomidae, collected by Polish dipterologists, have so far been studied in the University of Gdańsk (Giłka 2012), as well as by specialists of the Norwegian University of Science and Technology in Trondheim, Norway, the Far Eastern Branch of the Russian Academy of Sciences in Vladivostok, Russia, and in the Shizuoka University, Japan (Ekrem & Stur 2009, Orel & Makarchenko 2016, Makarchenko *et al*. 2016). The research resulted in records of several species (Table 2), including *Zavrelia sinica*, and now, *Stempellina radoszkowskii,* both described on the basis of the material taken during Polish expeditions, the type specimens of which are part of the LSZ DIZP scientific collection today.

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