

Two new species of the genus *Tanytarsus* van der Wulp (Diptera: Chironomidae) from Fennoscandia

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Abstract. Two new Tanytarsini species from Finland and Sweden are described and illustrated. Males of *Tanytarsus desertor* new species of the *mendax* species group and *Tanytarsus trux* new species of the *lugens* group are diagnosed and compared with their closest relatives.

Key words: Insecta, Diptera, Chironomidae, *Tanytarsus*, taxonomy, new species

Introduction

Reiss and Fittkau (1971) divided European *Tanytarsus* van der Wulp into several species groups. Four of these, the *eminulus*-, *gregarius*-, *lugens*-, and *mendax* groups were emended by Ekrem (2003, 2004) in order to include species from other geographical regions (e.g., Ekrem 2002; Ekrem *et al.* 2003). Chironomids collected in Finland and Sweden revealed two new *Tanytarsus* species, *T. desertor* and *T. trux*, belonging to the *mendax*- and *lugens* groups, respectively.

In Europe the *mendax* group comprises *T. aculeatus* Brundin, 1949; *T. mancospinosus* Ekrem *et* Reiss, 1999; *T. mendax* Kieffer, 1925; *T. occultus* Brundin, 1949; *T. volgensis* Miseiko, 1967; *T. formosanus* Kieffer, 1912; and, *T. tika* (Tourenq, 1975) (Ekrem 2003, 2004). The first five species have previously been recorded from Fennoscandia (Sæther & Spies 2004). *T. desertor* is thus the sixth species of the *mendax* group found in this region.

The *lugens* group includes three European species, all three known from Fennoscandia: *T. bathophilus* Kieffer, 1911; *T. lugens* (Kieffer, 1916); and, *T. latiforceps* Edwards, 1941. The latter is rare as it has only been recorded twice since 1938 (Thienemann 1941; Tuiskunen & Lindeberg 1986).

T. trux, found in Finnish Lapland and *T. latiforceps*, known exclusively from Fennoscandia, are closely related in terms of structure, as well as habitat preferences and life cycles. While *T. trux* shows characters typical of the *lugens* group, it is distinct in the extraordinary structure of its hypopygium.

Material and methods

The material examined was collected using a sweep net in June 1979 and in June to August 2001–2004. Specimens were dissected and mounted on microscope slides in Canada balsam or Euparal. Illustrations, descriptions and measurements were taken from slide-mounted individuals. The wing was measured from the arculus to the tip; lengths of legs segments, spurs and combs are rounded off to nearest 5 µm, lengths of palpomeres II–V to 1 µm and leg ratio (LR) values to 0.01. The measurements are given as ranges, followed by the mean (in parenthesis) when 3 or more specimens were measured. The morphological terminology with abbreviations follows Sæther (1980).

Designated types are deposited in the Department of Invertebrate Zoology, University of Gdańsk, Gdynia, Poland (DIZUG), Museum and Institute of Zoology,

Polish Academy of Sciences, Warsaw, Poland (MIZPAS), Museum of Natural History and Archaeology, Norwegian University of Science and Technology, Trondheim, Norway (VM), and the personal collection of L. Paasivirta, Salo, Finland (LP).

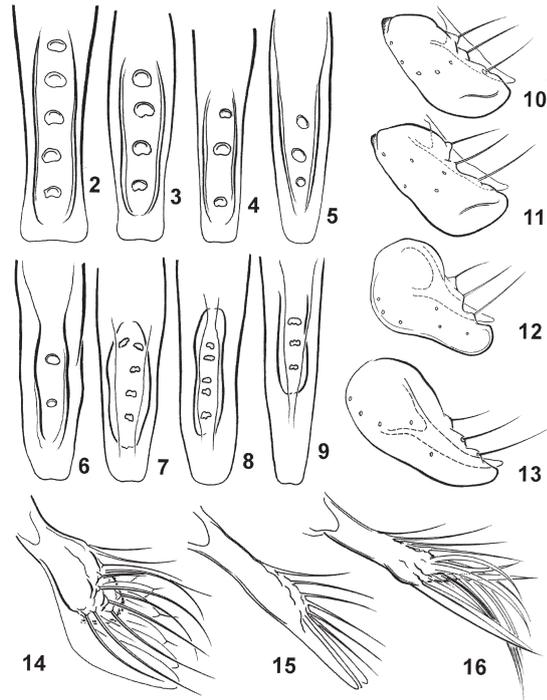
Tanytarsus desertor new species
(Figs. 1, 5, 6, 10, 11, 15)

Type material. Holotype male, slide mounted in Canada balsam. SWEDEN: Lake Storsjön near Ovan sjö, 60°34'N 16°32'E, 18.vii.2003, W. Gilka (DIZUG). Paratypes: 1 male prepared, labeled and deposited as holotype; 11 males slide mounted in Euparal: FINLAND: Jyväskylä, Lake Jyväsjärvi, 26.vi.2002 (5 males, LP); Kisko near Salo, Lake Kirkkojärvi, 4.vii.2001 (5 males, DIZUG); Lahti, Lake Vesijärvi, Mikkula, 4.viii.2001 (1 male, LP), L. Paasivirta.

Etymology. So far, the species has succeeded in eluding the dipterologists' attention and thus deserves being called a deserter. The name is to be treated as a noun in apposition.



FIG. 1. *Tanytarsus desertor* new species, male. Hypopygium.



FIGS. 2–16. *Tanytarsus desertor* new species (5, 6, 10, 11, 15), *T. occultus* Brundin, 1949 (2–4, 13, 16), *T. volgensis* Miseiko, 1967 (7–9, 12, 14), males. 2–9. – Variation in anal point. 10–13. – Superior volsella and digitus. 14–16. – Median volsella.

Diagnostic characters

Anal tergite without median setae. Anal point with blunt or transversely cut apex and 2–4 large oval spinulae. Superior volsella broadened apically with ventral concavity underlined by well visible incision and ventromedian lip. Digitus long, extending beyond margin of superior volsella. Stem of median volsella straight and slender, bearing 3–4 fan-folding lamellae.

Male (n = 2–13)

Wing length 1.55–1.57 mm.

Coloration. Antenna, lateral and anteromedian parts of scutal stripes, postnotum and sternum light brown; head capsule, tentorium, ground color of thorax, posterior part of median scutal stripes, scutellum, halter, legs and abdomen light green; wing poorly pigmented including arculus and costa.

Head. Flagellum with 13 segments, AR 0.93–0.96. Frontal tubercles well developed, 15–20 μ m long, c. 10 μ m wide. Length of palpomeres (in μ m): 36–38, 95–99, 91–103, 171–179. Clypeus with 11–19 setae.

Thorax. Ac 10–12, reaching antepronotum; Dc 8–10; Pa 1–2; Scts 6, 2 pairs in lateral and 1 pair in median position.

Wing. Densely covered with macrotrichia in distal 1/3, dense macrotrichia in cell r_{4+5} , distal area of cells m_{1+2} and m_{3+4} ; veins Sc, M, RM, R_{2+3} , proximal half of R_{4+5} and M_{1+2} , short proximal section of M_{3+4} , Cu and proximal part of false veins bare, other veins with macrotrichia; R_{4+5} ending distal of M_{3+4} , FCu slightly distal of RM.

Legs. Foretibia with slightly curved spur 15–20 μm long; combs of mid- and hind tibiae separated, armed with teeth 15 μm (midtibia) to 20 μm long (hind tibia), each comb bearing spur, midtibia with one spur straight and short and one curved and 25 μm long, hind tibia with two distinctly curved spurs of equal length, approximately 35 μm long; ta_1 of p_2 bearing 4–5 hook-shaped sensilla chaetica; pulvilli well developed. Length of leg segments and leg ratios as in Table 1.

Hypopygium. Gonostylus 120–130 μm long. Anal tergite without median setae, with small microtrichia-free area surrounding posterior sections of separated V-type tergite bands, lateral teeth simple, weak or absent, shoulders on posterior margin of the anal tergite well defined (Fig. 1); anal point with blunt or transversely cut apex and 2–4 (usually 3) large oval spinulae placed in row between anal crests, 4–7 lateral setae on each side of the anal point (Figs. 1, 5, 6). Superior volsella elongated and broadened apically, with ventral concavity underlined by incision and ventromedian lip (well visible in dorsal view), microtrichia absent, 5–7 dorsal setae and 3 setae placed on tubercles in anteromedian position, proximal seta somewhat weaker; digitus long, pointed, extending beyond margin of superior volsella (Figs. 1, 10, 11). Stem of median volsella straight and slender, approximately 30 μm long, with 5–7 setiform and 3–4 fan-folding lamellae (Figs. 1, 15). Inferior volsella slightly curved, apically rounded, with irregular dorso-apical ridge (Fig. 1).

Systematics

The new species fits in the *mendax* group having well developed frontal tubercles, separated anal tergite bands of V-type, large oval spinulae placed in row between the crests of the anal point, three anteromedian setae placed on elongated superior

volsella and the median volsella bearing fan-folding lamellae. *T. desertor* can be distinguished from other species of the *mendax* group on the following combination of hypopygial characters: absence of median setae on anal tergite, anal point with blunt or transversely cut apex bearing a few large oval spinulae, superior volsella broadened apically with concavity and ventromedian lip, long digitus and slender median volsella with 3–4 fan-folding lamellae.

Morphologically *Tanytarsus volgensis* is the most similar species to *T. desertor*. Both species lack median setae and have well defined shoulders on posterior margin of the anal tergite, have anal point spinulae placed between crests forming a pit (Figs. 6–9) and similarly shaped inferior volsella. The character best separating the two species is the shape of the superior volsella, in *T. desertor* as shown in Figures 10 and 11 opposed to the short and stout superior volsella tapering toward apex and lacking ventromedian lip in *T. volgensis* (Fig. 12). The size of the anal point spinulae, the small microtrichia-free area surrounding the base of the anal point, the relatively modest wing setation with Cu bare in *T. desertor*, as well as the structure of the median volsella (Figs. 14, 15) are also reliable characters for separating *T. desertor* and *T. volgensis*.

Lack of median setae on the anal tergite and the large anal point spinulae are characters also known from the Nearctic *T. dendyi* Sublette, 1964 (Ekrem *et al.* 2003). A relatively short, apically widened superior volsella with ventromedian lip, a similarly shaped median volsella and a similar LR are found also in the Nearctic *T. pelsuei* Spies, 1998. However, both these species, as well as the European *T. mancospinosus* (see Ekrem *et al.* 1999), differ from *T. desertor* by having a shorter or strongly reduced digitus and a rounded anal point. In addition, a great variability in the arrangement of the anal point crests and spinulae was observed in *T. pelsuei* (Spies 1998). The square or slightly concave apex of the anal point seen in *T. desertor* (Figs. 5, 6), is only known in the Japanese *T. shouautumnalis* Sasa, 1989; the

TABLE 1. Length of leg segments (in μm) and leg ratios of *Tanytarsus desertor* new species, male ($n = 2$).

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR
p_1	640–670	365–390	815	420	360	265	120	2.22–2.23
p_2	675–690	545–565	345–360	185–190	140	105	75	0.63–0.64
p_3	740–755	735–755	530	310	270	190	95	0.7

Japanese-American *T. angulatus* Kawai, 1991; the Nearctic *T. chloris* Ekrem *et al.*, 2003; and, the Holarctic *T. occultus* (Figs. 2–4). However, *T. shouautumnalis* keys to the *eminulus* group (Ekrem 2002, 2003). *Tanytarsus angulatus* and *T. chloris* are easily distinguished on highly specific hypopygial features (see Spies 1998; Ekrem *et al.* 2003), and *T. occultus* differs in the shape of both superior and median volsella (Figs. 13, 16).

Biology

The list of species occurring together with *T. desertor* allows us to presume that the new species inhabits eutrophic-mesotrophic lacustrine habitats. *Tanytarsus desertor* was collected together with *Stempellinella edwardsi* Spies *et Sæther*, 2004, *Tanytarsus occultus*, usually with *Tanytarsus smolandicus* Brundin, 1947 and with some species of the genus *Cladotanytarsus* Kieffer, 1921, apparently inhabiting the same type of habitat as these (Table 2). The collecting dates, including those obtained throughout a full

season at Lake Kirkkojärvi in Finland, suggest that *T. desertor* is univoltine, emerging in mid-summer.

Tanytarsus trux new species (Figs. 17–21)

Type material. Holotype male, slide mounted in Canada balsam. FINLAND: Lapland, Inari district, Lake Muottalampi, 10 km NE of Ivalo by the western Veskonniemi road, 68°43'N 27°40'E, 10.vi.1979, R. Palomäki (DIZUG). Paratypes: 11 males prepared and labelled as holotype (7 DIZUG, 2 MIZPAS, 2 VM); 1 male slide mounted in Euparal: Lapland, Inari district, Karhujärvi near Kaamanen, 69°11'N 26°56'E, 18.vi.2003, L. Paasivirta (DIZUG).

Etymology. From Latin *trux* (terrible, scary, wild), reflecting the unusual robust and dark-pigmented appearance of the hypopygium.

TABLE 2. Species of the tribe Tanytarsini sampled together with *Tanytarsus desertor* new species. Sampling sites: 1 – Jyväsjärvi, 26th June; 2 – Kirkkojärvi, 4th July; 3 – Storsjön, 18th July; 4 – Vesijärvi, 4th August.

Species / sampling site	1	2	3	4
<i>Cladotanytarsus atridorsum</i> Kieffer, 1924	+		+	+
<i>Cladotanytarsus mancus</i> -agg. (see Gilka 2001)		+	+	+
<i>Cladotanytarsus nigrovittatus</i> (Goetghebuer, 1922)	+	+		+
<i>Cladotanytarsus wexionensis</i> Brundin, 1947		+	+	+
<i>Paratanytarsus tenuis</i> (Meigen, 1830)		+		
<i>Stempellina almi</i> Brundin, 1947				+
<i>Stempellina subglabripennis</i> (Brundin, 1947)				+
<i>Stempellinella edwardsi</i> Spies <i>et Sæther</i> , 2004	+	+	+	+
<i>Tanytarsus chinyensis</i> Goetghebuer, 1934				+
<i>Tanytarsus dibranchius</i> Kieffer, 1926	+		+	
<i>Tanytarsus eminulus</i> (Walker, 1856)				+
<i>Tanytarsus lestagei</i> -agg. (see Ekrem 2004)	+			
<i>Tanytarsus mendax</i> Kieffer, 1925		+		+
<i>Tanytarsus multipunctatus</i> Brundin, 1947		+	+	
<i>Tanytarsus nemorosus</i> Edwards, 1929				+
<i>Tanytarsus occultus</i> Brundin, 1949	+	+	+	+
<i>Tanytarsus signatus</i> (van der Wulp, 1858)	+			+
<i>Tanytarsus smolandicus</i> Brundin, 1947	+		+	+
<i>Zavrelia pentatoma</i> Kieffer, 1913		+		

Diagnostic characters

Gonostylus robust, flattened, apically curved and directed medially. Anal point large, with broad lateral margins and widely rounded apex, armed with numerous trifold spinulae and fine tubercles creating an ornament on the ventral side. Digitus absent. Stem of median volsella club-shaped, bearing long spindle-shaped lamellae. Inferior volsella robust, broadened distally, with ventromedian groove and large ventral lobe.

Male (n = 13)

Wing length 2.38–2.62 (2.47) mm.

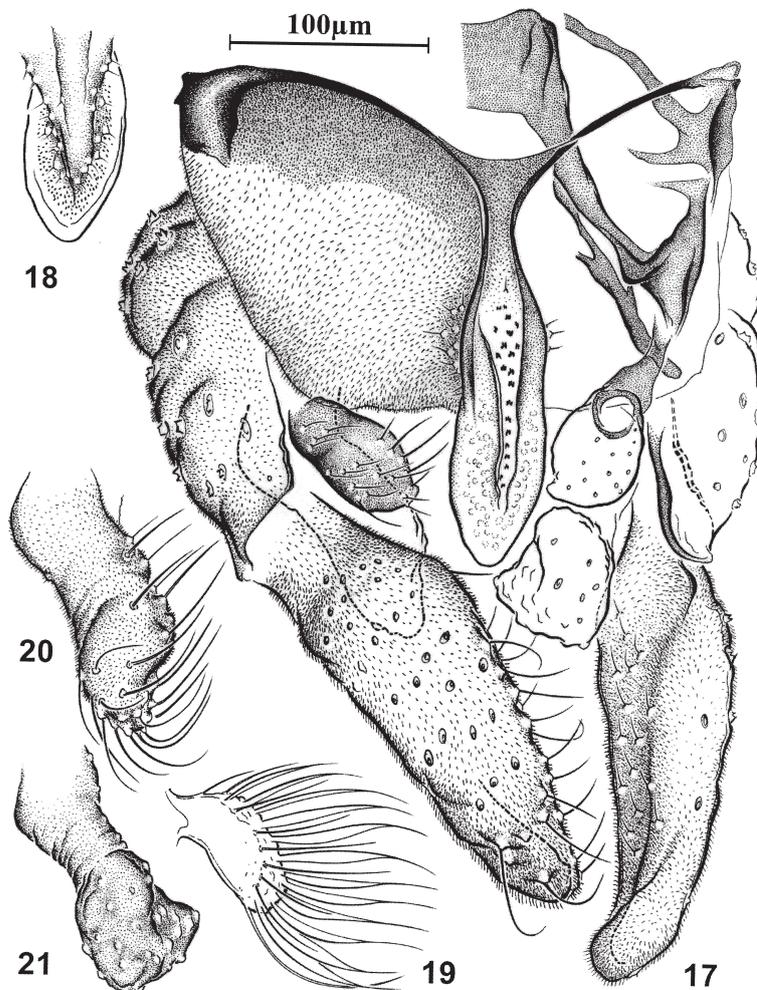
Coloration. Tentorium, pedicel, lateral and anteromedian parts of scutal stripes, postnotum, sternum and distal part of abdomen including hypopygium dark brown; ground color of thorax, posterior part of median scutal stripes, scutellum, halter, legs and proximal part of abdomen olive-brown.

Head. Flagellum with 13 segments, AR 0.66–1.35 (0.78). Frontal tubercles well developed, 15–40 μm long, 10–20 μm wide. Length of palpomeres (in μm): 55–60, 119–167 (130), 120–155 (133), 159–254 (186). Clypeus with 15–35 setae.

Thorax. Ac 15–20, usually 15–16 setae placed in row reaching antepronotum; Dc 11–24, usually 14–17 setae placed in double irregular row; Pa 1–5, usually 3; Scts 11–20, usually 13–14 setae placed in double irregular row.

Wing. Cells r_{4+5} and m_{1+2} sparsely covered with macrotrichia in distal half, cell m_{3+4} bare; veins Sc, M, RM, R_{2+3} , usually proximal half of R_{4+5} and almost whole Cu bare, other veins with macrotrichia; R_{4+5} ending well distal of M_{3+4} and somewhat proximal of M_{1+2} ; FCu below or slightly distal of RM; false veins well visible.

Legs. Foretibia with curved spur 20–40 μm long; combs of mid- and hind tibiae separated, with teeth



FIGS. 17–21. *Tanytarsus trux* new species, male. 17. – Hypopygium. 18. – Anal point, ventral view. 19. – Median volsella. 20. – Inferior volsella, dorsal view. 21. – Inferior volsella, dorsomedian view.

20–25 µm (midtibia) to 25–30 µm long (hind tibia), each comb bearing spur 45 µm (midtibia) to 50 µm long (hind tibia); ta_1 of p_2 armed with 4–8 hook-shaped sensilla chaetica (13 sensilla chaetica found in single specimen); pulvilli well developed. Length of leg segments and leg ratios as in Table 3.

Hypopygium. Gonostylus robust, 240–260 µm long, flattened, broadened in proximal part, tapering to tip, apically curved and directed medially (Fig. 17). Anal tergite with 1–2 minute median setae or median setae absent, anal tergite bands of V-type, underlined with dark-pigmented area, lateral teeth absent; anal point large, with broad lateral margins and widely rounded apex, armed with 20–45 trifold spinulae and about 10 short lateral setae on each side (some setae hidden under lateral extensions of the anal point), about 20 short setae and numerous fine tubercles creating an ornament on ventral side of anal point, anal crests present (Figs. 17, 18). Superior volsella bean-shaped, widest in median part, with apical protuberance, microtrichia absent, 15–25 setae in dorsal and 3–5 (usually 4) in anteromedian position, proximal seta weaker; digitus absent. Stem of median volsella club-shaped, 50–70 µm long, bearing dense long setiform and spindle-shaped lamellae (Fig. 19). Inferior volsella robust, apically broadened, with ventromedian groove and large ventral lobe (Figs. 20, 21).

Systematics

The new species is an obvious member of the *lugens* group having wide and separated anal tergite bands underlined with a dark-pigmented area, trifold anal point spinulae, elongated bean-shaped superior volsella lacking digitus and club-shaped stem of the median volsella bearing long spindle-shaped lamellae. The flattened and characteristically shaped gonostylus is similar to that known in *T. latiforceps* (see Tuiskunen & Lindeberg 1986). *Tanytarsus trux* can easily be distinguished from other known members of the *lugens* group on the large anal point and the shape of the inferior volsella. These

characters, as well as the ornamented ventral side of the anal point, are unique within the genus *Tanytarsus*. A similar arrangement of fine tubercles covering the anal point is so far known only in *Micropsectra spinigera* Reiss, 1995 within the tribe Tanytarsini (Reiss 1995).

Biology

The life cycle of *Tanytarsus trux* is undoubtedly similar to that of the closely related *T. latiforceps*. Both species emerge in spring and were collected during a short period in June. The statements by Säwedal (1977) and Ekrem (2004) based on Thienemann's (1941) observation that *T. latiforceps* emerge only just after the ice cover is broken up need an amendment. Up to now *T. latiforceps* has been recorded from the alkaline pond Nissejaure in Abisko on 1st June (Thienemann 1941). However, Nissejaure Pond can be ice-free in the beginning of May (see Säwedal 1977, Fig. 1). It has also been recorded from Vänö Island in the south-western archipelago in Finland on 11th June (Tuiskunen & Lindeberg 1986). The third *T. latiforceps* site, found during our study, is the large spring-based pond Myllylampi in Oripää, 50 km north of Turku in southern Finland, where the species was collected on 3rd June 2004, but was absent on 10th May, 22nd May and 24th June. *T. latiforceps* and *T. trux* are certainly cold stenotherms with a short emergence period in late spring. This explains both the sporadic records of *T. latiforceps* and the lack of any previous record of *T. trux* in one of the best sampled areas in Europe, including the 100 sites explored by the first author in Fennoscandia, with more than 80 sites in Lapland including Abisko and Karhujärvi in July to September between 2002 and 2004.

The available field data indicate that *T. trux* inhabits mesotrophic-oligotrophic lakes in Lapland. The small lake Muottalampi, the unnamed lake in the locality Karhujärvi and the nearby lake Sierramjärvi

TABLE 3. Length of leg segments (in µm) and leg ratios of *Tanytarsus trux* new species, male (n = 13).

	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄	ta ₅	LR
P ₁	1015–1125 (1055)	685–815 (770)	940–1240 (1010)	475–615 (515)	385–535 (425)	275–390 (300)	155–185 (170)	1.17–1.82 (1.32)
P ₂	985–1045 (1020)	890–985 (945)	370–515 (405)	245–340 (270)	185–265 (210)	155–185 (160)	120–140 (125)	0.39–0.55 (0.43)
P ₃	1155–1260 (1200)	1110–1230 (1185)	570–810 (625)	355–520 (390)	290–455 (330)	185–270 (210)	140–155 (150)	0.51–0.66 (0.53)

are the water reservoirs in the closest vicinity of the sampling sites. *Tanytarsus trux* was collected together with *Paratanytarsus laccophilus* (Edwards, 1929); *P. penicillatus* (Goetghebuer, 1928); *Tanytarsus aberrans* Lindeberg, 1970; and, *T. niger* Andersen, 1937, apparently inhabiting the same type of habitat. *Paratanytarsus hyperboreus* Brundin, 1949; *P. penicillatus*; and, *Tanytarsus aculeatus* collected at both sites in late summer are also known as northern lacustrine species.

Concluding remarks

Taxonomic studies on the chironomids of Fennoscandia, one of the best known regions in the world, still yield species new to science. Including the two new *Tanytarsus* species described above, the Finnish and Swedish Tanytarsini faunas comprise 112 and 77 species respectively, and are for this tribe among the most species rich countries both in Europe (Sæther & Spies 2004; Gilka 2005) and in the world (Cranston 2000).

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