SYSTEMATICS, MORPHOLOGY AND PHYSIOLOGY

New Species of *Tanytarsus* van der Wulp (Diptera: Chironomidae) from São Paulo State, Brazil

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ABSTRACT - *Tanytarsus lenyae* sp. n., *T. giovannii* sp. n., *T. fittkaui* sp. n. and *T. alfredoi* sp. n. from São Paulo State (Brazil) are described and diagnosed, the first as adult male and pupa, and the remaining as male, pupa and larva. The species were collected in areas of Cerrado, at the boundaries of São Carlos city. Complete diagnoses and drawings of the species are given. The imagos can be separated from other species of *Tanytarsus* van der Wulp mainly by differences in the antennal ratio, dorsomedian extension of the eyes, the thorax and wing setation, the shape of anal tergal bands, the anal point armament and the shape of superior volsella, digitus and median volsella. The pupae are characterized by the thoracic horn armament, the arrangement of the precorneals, the shape of anal comb and the abdominal setation. The larvae can be separated by differences in the antennal pedestal, the sclerotization of the second antennal segment, the size of Lauterborn organ pedicels, the shape of the clypeal seta S3 and the sclerotization of the mentum. Apparently, the four new species are not closely related, and the anal point armament alone would be enough to separate one species from the other.

KEY WORDS: Tanytarsini, Neotropical region

The family Chironomidae has a high species diversity and worldwide distribution, including Antarctica. The immature stages inhabit a wide range of habitats in freshwater, brackish, marine and terrestrial environments. The notable species richness of the family within particular biotopes, especially aquatic ones, is mainly due to the success of chironomid larvae in exploiting a wide spectrum of trophic, temporal and micro-spatial aspects of the ecosystems in which they occur (Coffman 1995).

In general, chironomid larvae are morphologically diagnosable at genus level. But some Tanytarsini larvae of the genus *Caladomyia* Säwedal (Trivinho-Strixino & Strixino 2000, 2003), *Tanytarsus* van der Wulp and *Nimbocera* Reiss are hard to separate (Trivinho-Strixino & Sanseverino 2003, Trivinho-Strixino & Strixino 2007). The chironomid pupal stage is short, rarely exceeding 72h in duration (Langton 1989). According to Langton (1989), this short period would seem unlikely to generate a diversity of detail in structures, which allows identification not only to genus, but also to species. However, within the tribe Tanytarsini the generic separation between pupal exuviae of *Tanytarsus* van der Wulp and/ or *Nimbocera* Reiss and *Caladomyia* Säwedal is not always possible (Reiff 2000, Sanseverino & Fittkau 2007). Most chironomid adults live for a few days, but some species survive up to two weeks. The imaginal stage serves the purposes of reproduction and dispersal (Coffman & Ferrington 1996). The external morphology of the adult males is very diverse and usually allows for differentiation of species and recognition of diagnostic characters on the species and generic level.

In the tribe Tanytarsini, subfamily Chironominae, the genus *Tanytarsus* van der Wulp is one of the most species rich, widely distributed and an eurytopic genus. The genus comprises species with different responses to disturbance, and can be used as good indicators of water quality (Kawai *et al* 1989, Lindegaard 1995). Fittkau (1971) investigated chironomids collected with light traps in the Amazon region, and mentioned that *Tanytarsus* was a remarkably diverse genus (70 species were estimated). Despite its great diversity, only 34 species of *Tanytarsus* have been described from the Neotropics until now, 20 of them from Brazil (Spies & Reiss 1996, Ekrem & Reiss 1999, Sanseverino *et al* 2002, Trivinho-Strixino & Sanseverino 2003, Trivinho-Strixino & Strixino 2004, 2007, Sanseverino & Fittkau 2006, Strixino & Sonoda 2006, Cranston 2007, Vinogradova *et al* 2009).

In the present work, four new species of *Tanytarsus* from São Paulo State, Brazil, are described and diagnosed, one as adult male and pupa, and three as male, pupa and larva.

Material and Methods

The sampling methods and location of the material are mentioned in the species descriptions. All species here described were collected in areas of cerrado, at the boundaries of the city of São Carlos, São Paulo State. The species prepared for light microscope were dissected in ethanol then transferred to a drop of Euparal on a slide and covered by a cover slip. One larva with pharate pupa and one larva of *T. alfredoi* sp. n. were prepared using Hoyer as mounting medium. Olympus, Jena and Zeiss microscopes equipped with phase contrast optics, high power oil-immersion lens and *camera lucida* were used for the species identification, descriptions, measurements and drawings.

The male morphological terminology and abbreviations follow Sæther (1980) and pupal terminology follows Sæther (1980) with modifications suggested by Langton (1991) and Langton (1994). All measurements are given as ranges. The antennal ratio (AR), leg ratios (LR, BV, SV), wing ratio (L/WR) and hypopygium ratio (HR), and lengths and widths of all other morphological features were measured according to Sæther (1968), Schlee (1966) and Soponis (1977): AR, antennal ratio: length of last flagellomere / length of remaining flagellomeres; LR, leg ratio: length of first tarsal segment/ length of tibia; BV, "Beinverhältnis": length of femur, tibia plus first tarsal segment/ length of tarsal segments 2-5; SV, "Schenkel-Schieneverhältnis": total length of femur plus tibia/ length of first tarsal segment; L/WR: wing length/ wing width ratio; HR, hypopygium ratio: length of gonocoxite/ length of gonostylus. Other abbreviations: Adult male – fe: femur; ti: tibia; ta_{1-5}: tarsal segments 1-5; P_{1-3}: front, mid and hind legs, respectively; C: Costa; Sc: Subcosta; R: Radius; R_1: first branch of the Radius; R_{2+3}: fusion of Radius branches R_2 and R_3; R_{4+5}: fusion of Radius branches R_4 and R_5; M: Media; M_{1+2}: fusion of Media branches M_1 and M_2; Cu: Cubitus; M_{3+4}: anterior branch of the cubital fork; Cu_1, posterior branch of the cubital fork; PCu, Postcubitus: vein that lies under Cu and Cu_1; An: Anal vein; Pupa – Dc_{1-4}: dorsocentral setae 1-4; Pc_{1-3}: precorneal setae 1-3; V, D and L: ventral, dorsal and lateral abdominal setae, respectively.

The type specimens are deposited in DCBU collection (Universidade Federal de São Carlos, São Carlos), São Paulo, Brazil.

Tanytarsus lenyae sp. n.

(Figs 1-10)

Diagnostic characters. *Tanytarsus lenyae* sp. n. differs from other *Tanytarsus* species by the combination of the following characters. **Adult male**: small, median tubercle on scutum; acrostichals lacking; eyes without dorsomedian extension; wings with few setae, anal tergal bands separate, curved; anal point with pointed tip, with a pair of well-developed anal crests, and spines placed irregularly between crests; superior volsella without microtrichia, with wrinkles and rugosities on median, lateral and posterior margins, anteromedian portion projected, posteromedian part elongate and wrinkled, digitus thumb-like, not extending beyond median margin of superior volsella; median volsella with pectinate lamellae. **Pupa**: frontal setae thick and short on weakly-developed cephalic tubercles; thoracic horn with long thin chaetae; three precorneals in triangular pattern, Pc_1 thicker and longer; abdominal tergite II with homogeneous field of shagreen sparse medially, tergites III-VI with an anterior pair of oval patches of spines, tergite VIII with very fine anterolateral shagreen, tergite IX with fine anterior shagreen; posterior lateral comb of segment VIII with four strong teeth and 6-7 smaller teeth; abdominal segments II-VI with three lateral setae, segment VII with two lateral setae and two lateral taeniae, segment VIII with five lateral taeniae.

Description

Male (n = 2). Body pale greenish, thorax with yellow vitae.

Head. AR 1.52-1.62. Flagellomeres one to twelve 276-290 µm long, ultimate flagellomere 420-470 µm long. Eye without dorsomedian extension; frontal tubercle small, 7-8 µm long, about twice as long as wide; 8-10 temporal setae; clypeus with 10-11 setae; lengths of palpomeres (in µm): 20-21, 21-22, 43-50, 68-73, 100-120.

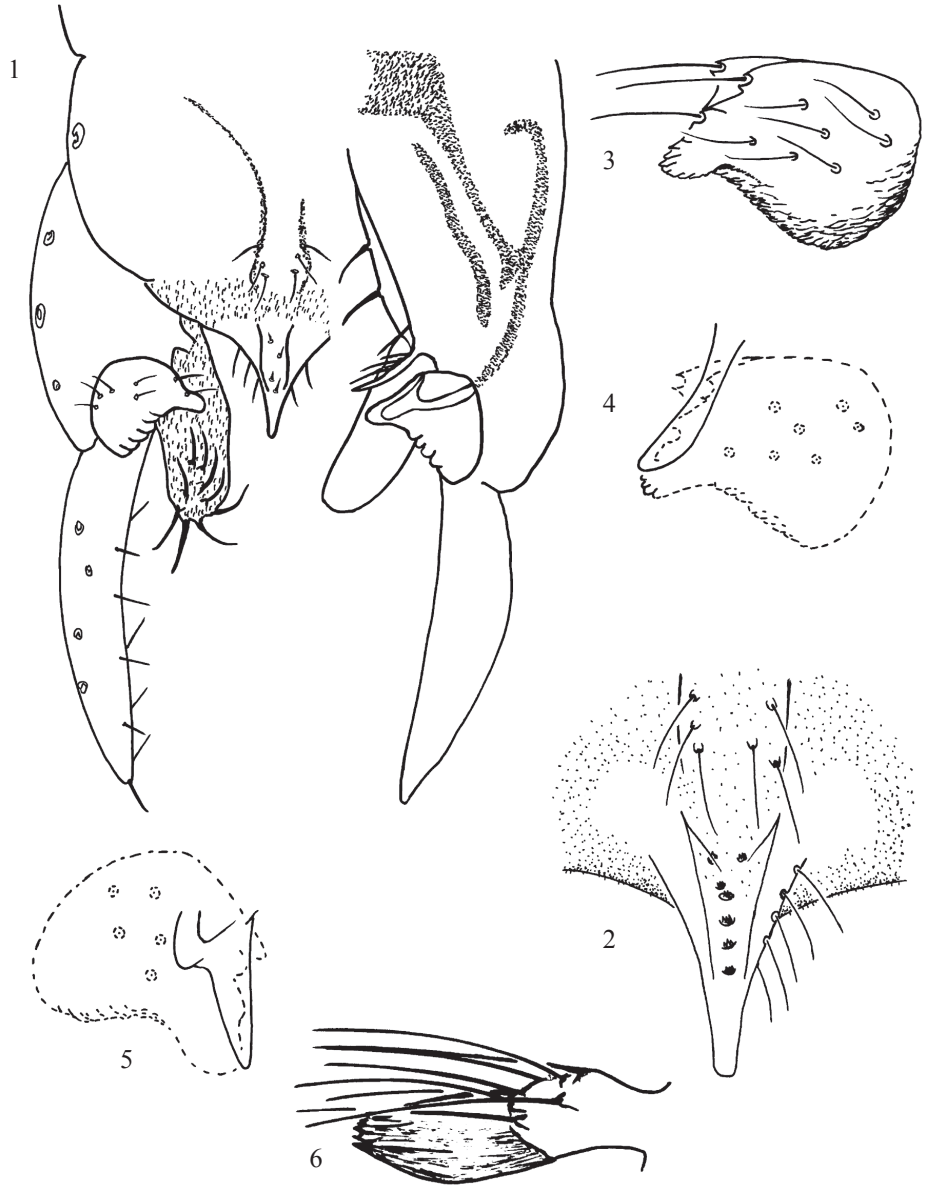
Thorax. Length 602-720 µm. Scutal tubercle present, weakly developed; 5-6 dorsocentrals, acrostichals apparently lacking, one prealar, two scutellars. Haltere with 2-4 setae.

Wing. Length 1140-1242 µm, width 320-360 µm; L/WR 3.45-3.56. Brachiolum with one seta, Sc bare, R with 4-5 setae, R_1, R_{4+5} and M bare, M_{1+2} with 14-16 setae, M_{3+4} with 6-8 setae, Cu, Cu_1, PCu and An bare. Cell m bare, r_{4+5} with 31-38 setae, m_{1+2} with 16-18 setae, m_{3+4}, cu and an bare, false vein difficult to distinguish, bare.

Legs. Foreleg bearing single tibial spur, 13-15 µm long. Combs of mid tibia 11-12 µm wide with 20-21 µm long spur, and 12-13 µm wide with 21-22 µm long spur; combs of hind tibia 12-13 µm wide with 22-23 µm long spur, and 12-13 µm wide with 23-24 µm long spur. Lengths of leg segments (in µm) and leg ratios as in Table 1.

Abdomen. Length 1312-1830 µm.

Hypopygium (Figs 1-6). Tergite IX 70-83 µm long, with 6-12 median setae placed from well anterior to more or less close to the base of the anal point, with 10-12 apical setae and microtrichia-free areas posteriorly; lateral tooth absent. Orolateral spine of laterosternite IX not observable. Anal tergal bands separate, curved, running parallel and ending anterior to the base of the anal point. Anal point (Figs 1-2) 30-37 µm long, elongate with pointed tip, with a pair of well-developed anal crests, 16-25 µm long, extending posteriorly on tergite IX; area between anal crests with microtrichia in anterior half; 4-7 spines placed irregularly between anal crests. Superior volsella as in Fig 3, without microtrichia, caudal half margins with wrinkles and rugosities, anteromedian portion projected, posteromedian part elongate and wrinkled; dorsal surface with 5-7 setae, one seta on anteromedian projection, one seta on median margin and one seta on well-developed ventral tubercle on anteromedian margin. Digitus somewhat thumb-like (Figs 4-5), not extending beyond median margin of superior volsella. Median volsella (Fig 6) 11-13 µm long with 18-22 µm long simple lamellae and 14-18 µm long pectinate lamellae, not reaching apex of inferior volsella. Inferior volsella 48-57 µm



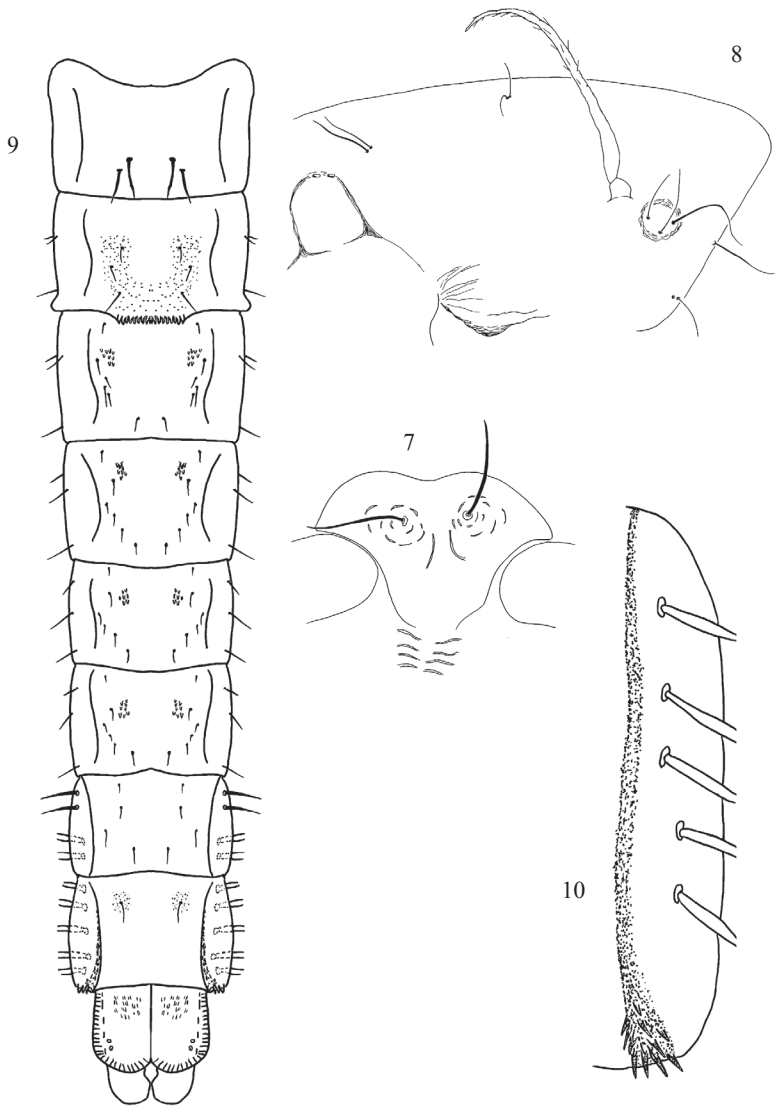
Figs 1-6 *Tanytarsus lenyae* sp. n. male genitalia. 1) hypopygium; 2) anal point area; 3) superior volsella, dorsal view; 4 and 5) digitus and superior volsella variation; 6) median volsella.

long, somewhat thick and slightly curved, distal part slightly swollen. Gonocoxite 75-87 µm long; gonostylus 72-87 µm long, somewhat slender; HR 0.96-1.06.

Pupa (n = 1). Total length about 2.61 mm. Pupal exuviae pale brown, thorax pale brown and lateral muscle marks darker.

Cephalothorax (Figs 7-8). Frontal apotome smooth. Frontal setae thick, 63 µm long, mounted apically on weakly developed cephalic tubercles; frontal warts absent. Pedicel sheath tubercle absent. Thorax smooth, 690 µm long. Wing sheath with nose, prealar tubercle well developed. Thoracic horn slender, 224 µm long, with long thin chaetae. Three precorneals forming a triangular pattern, placed on tubercle, Pc_1 thicker and longer, 93 µm long, Pc_2 73 µm long and Pc_3 44 µm long; one median antepronotal, 63 µm long, one lateral antepronotal, 25 µm long, probably broken, and one lateral antepronotal seta base; two pairs of dorsocentrals, anterior pair: Dc_1 49 µm, Dc_2 23 µm, posterior pair: Dc_3 60 µm long, Dc_4 62 µm long, thicker than the other three; distance between Dc_1 and Dc_2 5 µm, between Dc_2 and Dc_3 158 µm, and between Dc_3 and Dc_4 8 µm.

Abdomen (Figs 9-10). Total length 1920 µm. Tergites I and VII without armament. T II with homogeneous field of shagreen sparse medially. T III-VI with anterior pair of oval patches of spines. T VIII with very fine anterolateral shagreen. T IX with fine anterior shagreen. Sternites, conjunctives and pleura bare. Hook row 52 µm long, about 1/4 the width of tergite II. Pedes spurii B bare and well developed, present on segment II. Posterior lateral comb



Figs 7-10 *Tanytarsus lenyae* sp. n. pupa. 7) frontal apotome; 8) thorax and thoracic horn; 9) tergites I-IX; 10) posterolateral comb of segment VIII.

of segment VIII 18-20 µm wide, with four strong teeth and 6-7 smaller teeth. Abdominal setation: segment I with two taeniate dorsal setae; segment II with 3 D, 3 L and 3 V setae; segment III with 5 D, 3 L and 3 V setae; segment IV with 5 D, 3 L and 4 V setae; segments V-VI with 5 D, 3 L and 3 V setae; segment VII with 4 D, 2 L, two lateral taeniae and 3 V; segment VIII with 1 D seta, five lateral taeniae and 1 V seta; anal lobe well developed, with complete fringe of 22-23 taeniae in single row and with two pairs of dorsal taeniae; T II-VII with O-setae.

Etymology. Named in honor of Dr Leny Célia da Silva Correia.

Type material

Holotype. One pharate male, **BRAZIL**: São Paulo State, Brotas, Lagoa Dourada, 1988, G Melão *leg*., DCBU-UFSCar.

Paratypes. BRAZIL: same as holotype except for: one adult male, São Carlos, UFSCar Campus (Lagoa Mayaca), II-2001, L C S Correia *leg*.; one adult male, Luiz Antônio, V-96, K

Table 1 Lengths (in µm) and proportions of legs of *Tanytarsus lenyae* sp. n.

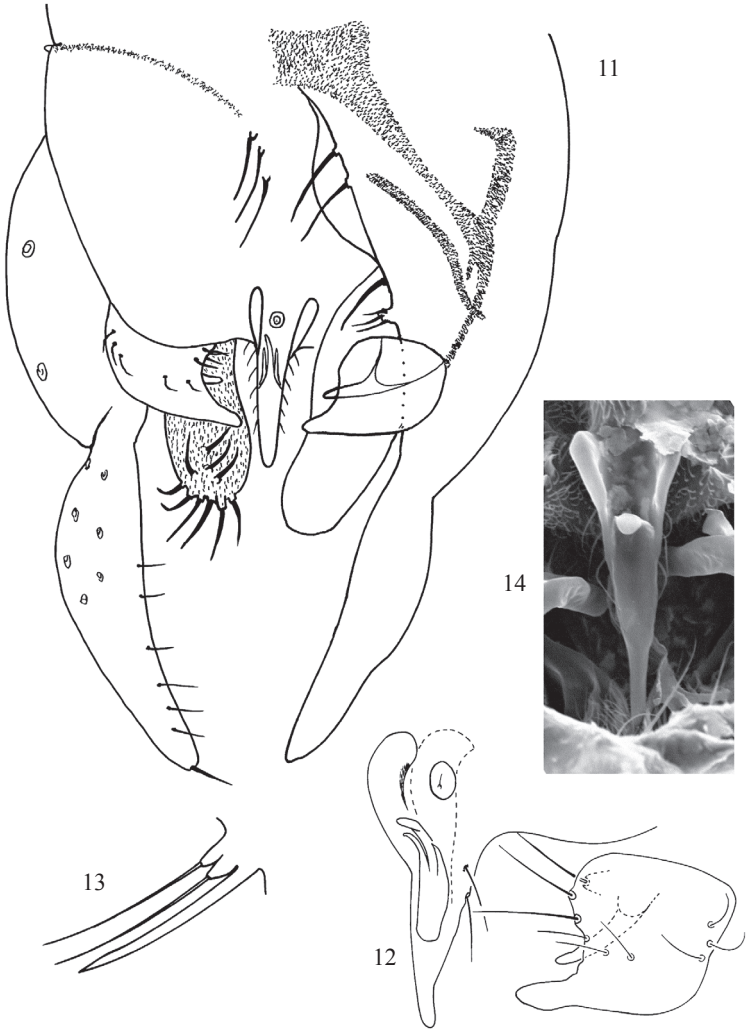
	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV
P_1	420–468	210–250	520–564	268–280	224–238	152–178	80–96	2.25–2.47	1.57–1.63	1.21–1.27
P_2	473–505	372–406	200–214	102–106	78–82	49–58	48–51	0.52–0.53	3.77–3.90	4.22–4.25
P_3	512–548	498–527	294–320	178–190	165–180	100–120	74–82	0.59–0.60	2.43–2.52	3.35–3.43

Sonoda *leg*.; two adult males, São Carlos, UFSCar Campus (Lagoa Mayaca), IV-2001, S Trivinho-Strixino *leg*.

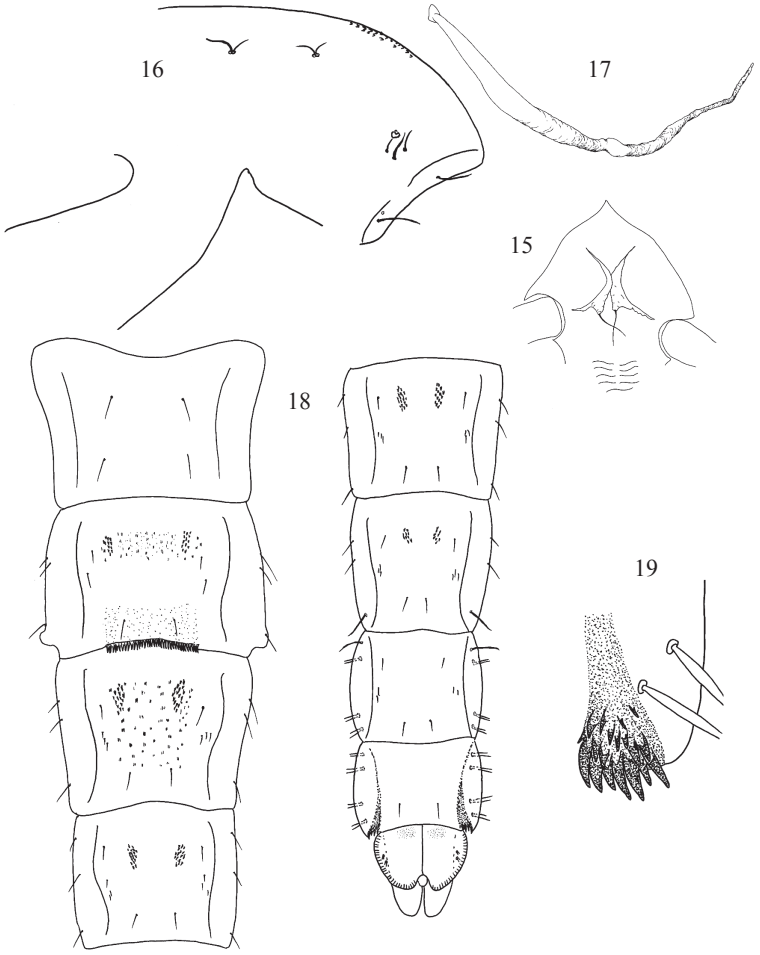
Comments. The presence of a median tubercle on scutum, absence of acrostichals and dorsomedian eye extension, wing with few setae, anal tergal band separate, curved, running parallel and ending anterior to anal point base, and the wrinkles and rugosities of the superior volsella are the main diagnostic characters of the adult male of *Tanytarsus lenyae* sp. n.. Males of *T. lenyae* have some characters in common with *T. monospinosus* Ekrem & Reiss and *T. jacaretingensis* Sanseverino & Fittkau. The three species have few setae on the wings and do not have eyes with dorsomedian elongation, a character present in all other described Neotropical *Tanytarsus* species. *Tanytarsus lenyae* and *T. jacaretingensis* are the only Neotropical *Tanytarsus* species with a scutal tubercle. The genus *Tanytarsus* is diagnosed without scutal tubercle (Cranston *et al* 1989), but since *Tanytarsus luctuosus* Freeman and *T. elisabethae* Ekrem have a scutal tubercle, the generic diagnosis was emended (Stur & Ekrem 2000). The acrostichals are absent in *T. lenyae* and *T. monospinosus*. Moreover, the form and rugosity of the superior volsella of *T. lenyae* appear to be similar to those observed in *T. monospinosus* and *T. jacaretingensis*, but *T. lenyae* differs from these species by the spines between anal crests (4-7) irregularly distributed in the *T. lenyae* and only one in the *T. jacaretingensis* and *T. monospinosus*) and by the design of anal tergal bands (Y-type in *T. monospinosus* and *T. jacaretingensis*). The pattern of the tergite shagreenation of *T. lenyae* pupa is similar to that observed in *T. amazonicus* Sanseverino & Fittkau and in *T.* sp. 61 (*sensu* Wiedenbrug & Ospina-Torres 2006), but the new species differs from these species in having long spines on thoracic horn (short in *T. amazonicus* and absent in *T.* sp. 61), and in having two L and two lateral taeniae setae on segment VII.

Tanytarsus giovannii sp. n.
(Figs 11-23)

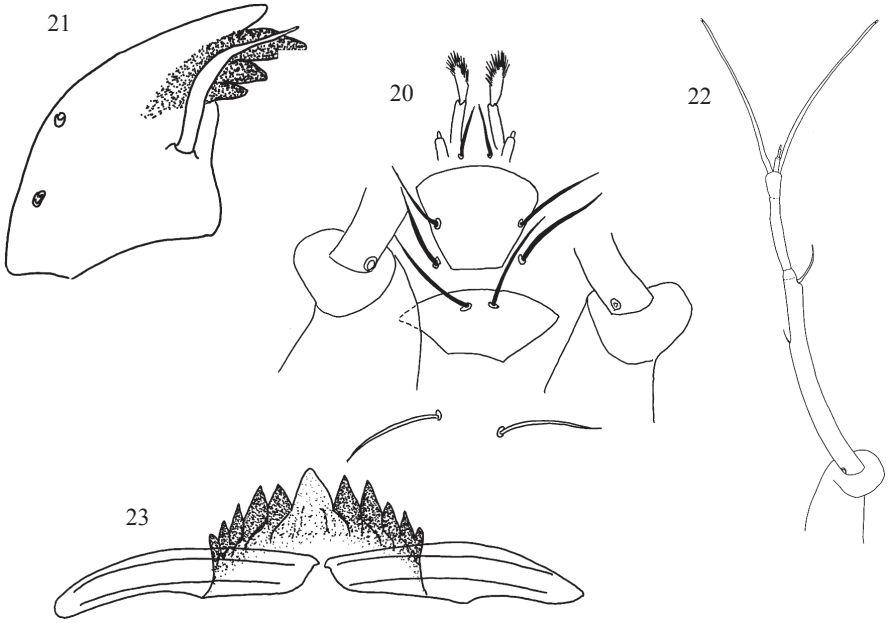
Diagnostic characters. *Tanytarsus giovannii* sp. n. differs from other *Tanytarsus* species by the combination of the following characters. **Adult male**: hairy wing; anal tergal



Figs 11-14 *Tanytarsus giovannii* sp. n. male genitalia. 11) hypopygium; 12) anal point, superior volsella and digitus; 13) median volsella; 14) detail of anal point in scanning microscopy.



Figs 15-19 *Tanytarsus giovannii* sp. n. pupa. 15) frontal apotome; 16) thorax; 17) thoracic horn; 18) tergites I-IX; 19) posterolateral comb of segment VIII.



Figs 20-23 *Tanytarsus giovannii* sp. n. larva; 20) clypeus with clypeal seta S3, labral sclerite 2 with lateral S1 and antennal bases; 21) mandible; 22) antenna; 23) mentum and ventromental plates.

bands separate, curved and short; anal point with rounded tip, with pair of well-developed anal crests and one short thin seta placed in a grub between anal crests and a three-branched bar directed anteriorly; superior volsella without microtrichia, posteromedian corner of superior volsella well projected, digitus finger-like, extending well beyond median margin of superior volsella; median volsella short, with one single simple lamella. **Pupa**: frontal setae thin on well-developed cephalic tubercles; three precorneals in triangular pattern; abdominal tergite VIII without armament, tergite II with anterior pair of rounded patches of spines and sparse field of very fine spinules, tergite III with anterior pair of oval patches of spines and very fine, sparse field of spinules, tergites IV-V with anterior pair of oval patches of spines and very fine, sparse field of spinules on posterior tergite half, tergite VI with anterior pair of oval patches of spines, tergite IX with anterior field of small spinules; posterior lateral comb of segment VIII with 5-7 strong teeth and 5-20 smaller teeth; abdominal segments II-V with three lateral setae, segment VI with two lateral setae and one lateral taenia, segment VII with two lateral setae and two lateral taeniae (or one lateral seta and three lateral taeniae) and segment VIII with four lateral taeniae. **Fourth instar larva**: clypeal seta S3 simple; antenna placed on long pedestal without spur, basal segment longer than flagellum, with ring organ close to base and small seta in distal half; antennal segment 2 unsclerotized distally, about half the size of basal segment; small Lauterborn organs on unsclerotized pedicels; pecten epipharyngis with three indented scales; mandible with apical tooth and two inner teeth light brown, mentum with large pale median tooth and brown lateral teeth.

Description

Male (n = 8). Body pale greenish, thorax with yellow vitae.

Head. AR 1.07-1.36. Flagellomeres one to twelve 504-560 µm long, ultimate flagellomere 592-688 µm long. Eye with dorsomedian extension; frontal tubercle small, 5-8 µm long; 10-11 temporal setae; clypeus with 12-17 setae; lengths of palpomeres (in µm): 21-35, 22-40, 53-122, 83-123, 145-225.

Thorax. Length 840-930 µm. Scutal tubercle apparently absent, but in three specimens it seems to be indicated; 6-8 dorsocentrals, 7-18 acrostichals, one prealar, 2-4 scutellars. Haltere with 4-6 setae.

Wing. Length 1768-1896 µm, width 480-497 µm; L/WR 3.55-3.85. Brachiolum with one seta, Sc bare, R with 30-37 setae, R_1 with 30-38 setae, R_{4+5} with 63-68 setae, M bare (one seta on RM), M_{1+2} with 58-66 setae, M_{3+4} with 36-44 setae, Cu with 13-19 setae, Cu_1 with 26-28 setae, PCu with 38-43 and An with 26-36. Cell m with 10-14 setae (+ 9-12 setae on false vein), r_{4+5} with more than 130 setae, m_{1+2} with more than 130 setae (+ 50-56 setae on false vein), m_{3+4} with about 110-134 setae, cu with 56-72 setae and an with 67-78 setae.

Legs. Foreleg bearing single tibial spur, 22-23 µm long. Combs of mid tibia 17-18 µm wide with 35-37 µm long spur, and 17-18 µm wide with 48-50 µm long spur; combs of hind tibia 17-18 µm wide with 57-58 µm long spur, and 21-23 µm wide with 59-63 µm long spur. Lengths of leg segments (in µm) and leg ratios as in Table 2.

Abdomen. Length 1312-1830 µm.

Hypopygium (Figs 11-14). Tergite IX 107-126 µm long, with 5-8 median setae placed well anterior to the base of the anal point, with 12-14 apical setae, with double lateral tooth and microtrichia-free areas lateral to anal crests. Orolateral spine of laterosternite IX present, 4-7 µm. Anal tergal bands separate, curved, short and ending anterior to anal point base. Anal point (Figs 11, 12 and 14) 70-77 µm long, elongate with rounded tip, with a pair of well-developed anal crests, 33-48 µm long, extending posterior to tergite IX; microtrichia and spines absent; one short, thin seta placed in a grub between anal crests and a three-branched bar directed anteriorly (bar appears simple in dorsal view). Superior volsella as in Fig 12, without microtrichia, anterior, lateral and posterior margins curved, median margin concave, posteromedian corner well projected; dorsal surface with 6-7 setae, one seta on median margin, one seta on ventral surface and one seta on ventral tubercle close to anterior margin. Digitus (Fig 12) long and pointed, somewhat finger-like, extending well beyond median margin of superior volsella. Median volsella (Fig 13) short, 5-7 µm long, with 2-4 simple lamellae, 22-30 µm long, and one stronger simple lamella, 18-20 µm long, not reaching apex of inferior volsella. Inferior volsella 70-82 µm long, somewhat thick and slightly curved, distal part slightly swollen. Gonocoxite 106-130 µm long; gonostylus 122-126 µm long, somewhat elongate and slender; HR 0.86-1.04.

Pupa (n = 3). Total length 3.52-4.04 mm. Pupal exuviae pale, thorax and lateral muscle marks brownish.

Cephalothorax (Figs 15-17). Frontal apotome with few wrinkles. Frontal setae thin, 43-62 µm long, mounted apically on well developed cephalic tubercles; frontal warts absent. Pedicel sheath tubercle absent. Thorax smooth, 882-925 µm long, with granulation along median suture. Wing sheath with nose, prealar tubercle weakly developed. Thoracic horn smooth, 458-640 µm long. Three precorneals in triangular pattern, placed on tubercle, Pc_1 and Pc_3 thicker, 54-80 and 56-68 µm long respectively, Pc_2 57-72 µm long; one median antepronotal, 72-78 µm long, one lateral antepronotal, 50-57

Table 2 Lengths (in µm) and proportions of legs of *Tanytarsus giovannii* sp. n.

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV
P_1	910–1040	416–428	1176–1240	620–660	500–556	368–406	182–196	2.82–2.89	1.48–1.49	1.12–1.18
P_2	892–1000	694–762	438–462	208–221	150–163	81–96	68–77	0.60–0.63	3.99	3.62–3.81
P_3	958–1060	843–900	640–674	360–377	304–322	182–200	103–114	0.74–0.75	2.57–2.60	2.81–2.90

µm long, and one lateral antepronotal seta mark; two pairs of dorsocentrals, anterior pair: Dc_1 52-70 µm, Dc_2 33-38 µm, posterior pair: Dc_3 45-56 µm long, Dc_4 58-72 µm long, thick, stronger than the other three; distance between Dc_1 and Dc_2 5 µm, between Dc_2 and Dc_3 156 µm, and between Dc_3 and Dc_4 5 µm.
Abdomen (Figs 18-19). Total length 2620-3118 µm. Tergites I, VII and VIII without armament. T II with anterior pair of rounded patches of spines and very fine, sparse field of spinules. T III with anterior pair of oval patches of spines and very fine, sparse field of spinules. T IV-V with anterior pair of oval patches of spines and very fine, sparse field of spinules on posterior tergite half. T VI with anterior pair of oval patches of spines. T IX with anterior field of small spinules. Sternites, conjunctives and pleura unarmed. Hook row 173-237 µm long, about 1/3 the width of tergite II. Pedes spurii B bare and well developed, present on segment II. Posterior lateral comb of segment VIII 36-50 µm wide, with 5-7 strong teeth and 5-20 smaller teeth. Abdominal setation: segment I with 2 D setae; segment II with 3 D, 3 L and 3 V setae; segments III-IV with 5 D, 3 L and 5 V setae; segment V with 5 D, 3 L and 4 V setae; segment VI with 5 D, 2 L, one lateral taenia and 4 V setae; segment VII with 4 D, 2 L and two lateral taeniae (or 1 L and three lateral taeniae), V setae difficult to observe; segment VIII with 1 D seta, four lateral taeniae and 1 V seta; anal lobe well developed, with complete fringe of 20-23 taeniae in single row and with two pairs of dorsal taeniae; T II-VII with O-setae.

4th instar larva (n = 3). Total length 4.77-5.07 mm. Color pale red.
Head (Figs 20-23). Width 244-275 µm, length 344-375 µm; IC = 0.72. Clypeal seta S3 simple (Fig 20). Antenna placed on prominent pedestal (51-53 µm long), pedestal lacking spur (Figs 20 and 22); basal segment longer than flagellum, with ring organ close to base and small seta in distal 1/2; AR = 1.30-1.41; segment two unsclerotized distally. Lauterborn organs short, placed on pedicels (188 µm long) (Fig 22). Antennal blade 51 µm. Pecten epipharyngis consisting of three distally serrated scales. Premandible 74-77 µm long, with three teeth; brush well developed. Mandible 108-115 µm long; dorsal tooth pale; apical and inner teeth brown (Fig 21). Mentum 80-92 µm, with a large pale median tooth and five pairs of brown lateral teeth decreasing in size laterally (Fig 23). Ventromental plates 95-108 µm long, close together medially.
Abdomen. Anal tubules about 156-206 µm long, shorter than posterior parapods. Claws of posterior parapods large, simple.

Etymology. Named in honor of Dr Giovanni Strixino for his great contribution to the knowledge of Brazilian Chironomidae ecology.

Type material
Holotype. Pupa with pharate male, **BRAZIL**: São Paulo State, São Carlos, Lagoa dos Patos (Parque Ecológico), 12-VII-2002, S. Trivinho-Strixino *leg*., DCBU-UFSCar.
Paratypes. BRAZIL: same as holotype except for: two males with pupal and larval exuviae and two males with pupal exuviae; three males with pupal exuviae, São Carlos, Córrego Canchim, 26-VI-99, L. C. S. Correia *leg*.; one male with pupal exuviae, São Carlos, Córrego Fazzari, X-99, F. O. Roque *leg*.; three larvae.

Comments. Reiss & Fittkau (1971) placed adult males with anteriorly directed anal point bars in the *triangularis* group of the genus *Tanytarsus*. Pinder (1982) elevated the *triangularis* group to the genus *Virgatanytarsus*, supported mainly by the presence of anteriorly directed bars (or 'rods', as called by Pinder). The presence of bars on the adult male anal point also corroborated the establishment of the genus *Caladomyia* by Säwedal (1981), but in this genus the bars are placed differently and directed posteriorly. The occurrence of anteriorly directed bars in *T. giovannii* sp. n. leads to the question of whether the species should be placed in *Tanytarsus* or in *Virgatanytarsus*. Regarding only the anal point bars, the males of *T. giovannii* sp. n. would key to *Virgatanytarsus*, but all other hypopygial characters match the diagnosis of *Tanytarsus*. Moreover, the immature stages of the new species fit the diagnosis of the genus *Tanytarsus*. The larva and pupa of *T. giovannii* do not possess, respectively, posterior parapods claws with serrations on their inner margins neither a broad pupal anal comb. Both characters were considered by Pinder (1982) and Pinder & Reiss (1986) as diagnostic and unique to *Virgatanytarsus*. However, as discussed by Cranston (2000), the diagnostic characters of the immature stage used to discriminate *Virgatanytarsus* by Pinder do not correlate in Australian taxa with adult male synapomorphies. Cranston (2000) described larvae and pupae of Australian *Tanytarsus* species having, respectively, posterior parapods with inner spines on claws and broad pupal anal comb, but adult males with anal point without bars or any other *Virgatanytarsus*-like structures. In the genus *Tanytarsus* the presence of anteriorly directed bars on the anal point is found besides *T. giovannii* in *T. curvicristatus* Contreras-Lichtenberg, *T. liepae* Glover and *T. signatus* van der Wulp. In our opinion, the genus *Virgatanytarsus* can be diagnosable by the following combination of characters: larvae with posterior parapods bearing serrations ("spines") on the claws, pupae with broad anal comb and adult males with anteriorly directed bars. Since the immature stages of *T. giovannii* do not match this diagnosis, we decided to include *T. giovannii* in the genus *Tanytarsus*. A phylogenetic analysis using morphological and/ or molecular data is necessary to elucidate the systematic position of some *Tanytarsus* species and the relationships between the genera of Tanytarsini with bar-like structures on anal point.

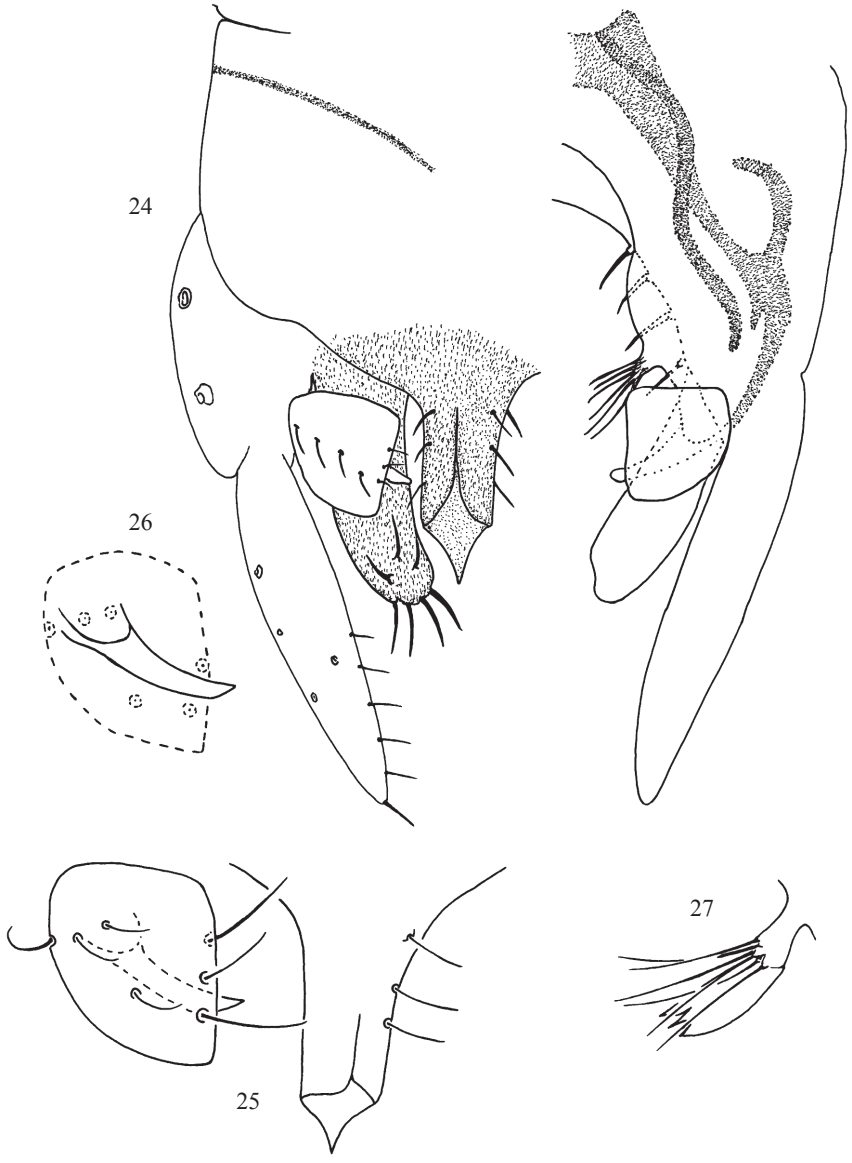
Tanytarsus giovannii is very similar to the phytotelm-dwelling *Tanytarsus bromelicola* Cranston. Both species have many characters in common such as the male anal point armament, form of the male volsellae, pupal abdominal setation and shagreenation, the form, absence of spur on antenna pedestal, pigmentation and teeth number of the larval mandible and mentum, the simple clypeal seta S3 of the larva. The male of *T. giovannii* can be separated from *T. bromelicola* by having a higher AR (1.07-1.36; in *T. bromelicola* 0.55-0.58), presence of frontal tubercles, superior volsella with 6-7 dorsal setae (10-11 in

T. bromelicola) and a shorter median volsella. The digitus of *T. giovannii* extends beyond median margin of superior volsella, and in *T. bromelicola* it seems not to reach the superior volsella median margin. However, the digitus position and extension should be carefully interpreted since some distortion could occur during mounting. The pupa of *T. giovannii* differs from that of *T. bromelicola* by having a smooth thoracic horn (granular in *T. bromelicola*) and a well-developed wing nose (weak in *T. bromelicola*). The larva of *T. giovannii* can be separated from that of *T. bromelicola* by differences found in the antenna and ventromental plates. The third antennal segment of *T. giovannii* is much smaller than the second one, while in *T. bromelicola* the third segment is more than half the length of the second one. The ventromental plates of *T. giovannii* are wider than those of *T. bromelicola*.

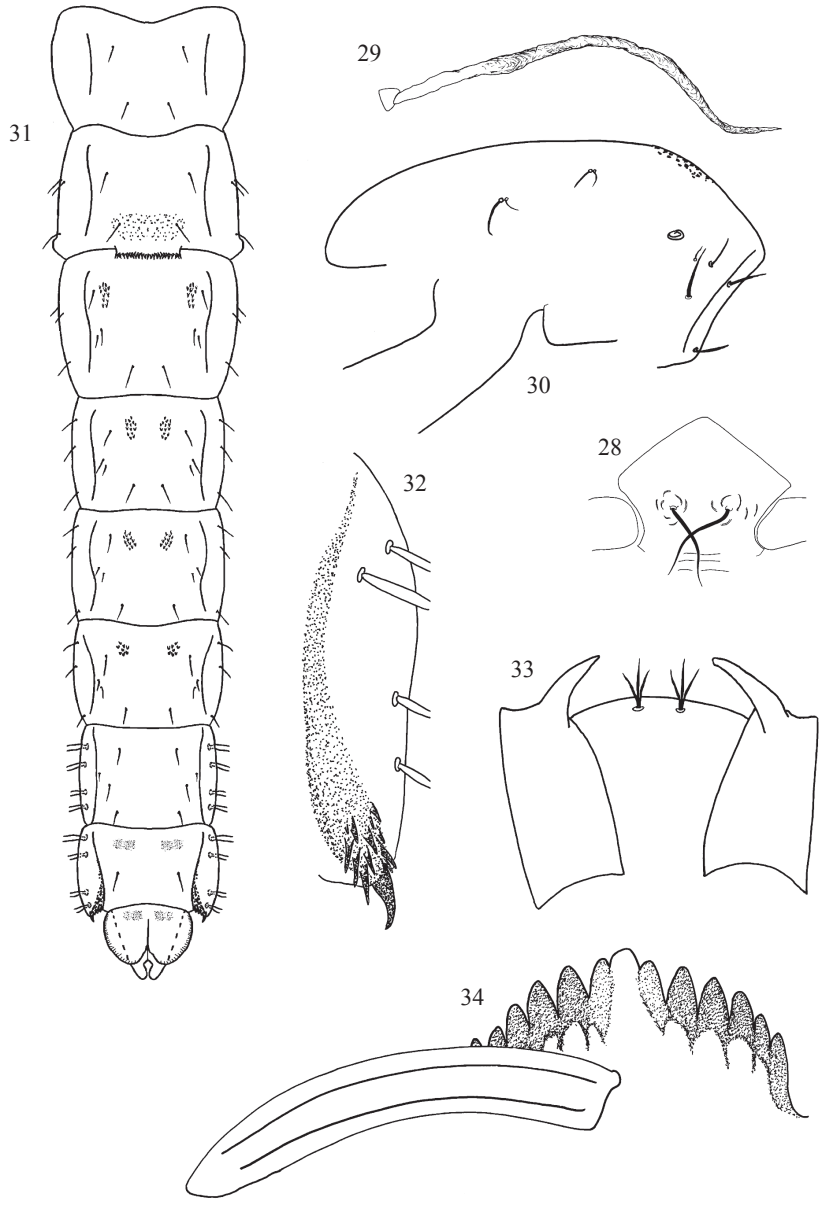
Tanytarsus fittkaui sp. n.
(Figs 24-34)

Tanytarsus sp. 61: Wiedenbrug & Ospina-Torres 2005.

Diagnostic characters. *Tanytarsus fittkaui* sp. n. differs from other *Tanytarsus* species by the combination of the following characters. **Adult male**: low antennal ratio; hairy wings; anal tergal bands separate and short; anal point without armament, cylindrical, with a longitudinal scar, posterior part triangular; superior volsella without microtrichia, digitus finger-like, extending beyond median margin of superior volsella; median volsella with foliate lamellae. **Pupa**: thin frontal setae on weakly-developed cephalic tubercles; thoracic horn smooth; three precorneals in a more or less triangular pattern; abdominal tergite



Figs 24-27 *Tanytarsus fittkaui* sp. n. male genitalia. 24) hypopygium; 25) anal point, superior volsella and digitus; 26) digitus; 27) median volsella.



Figs 28-34 *Tanytarsus fittkaui* sp. n. pupa (28-32) and larva (33-34). 28) frontal apotome; 29) thoracic horn; 30) thorax; 31) tergites I-IX; 32) posterolateral comb of segment VIII; 33) clypeus with clypeal seta S3 and antennal tubercles; 34) mentum and ventromental plate.

II with sparse field of very fine spinules posteriorly, tergites T III-VI with anterior pair of oval patches of spines, tergite VIII with anterolateral field of few fine spines, tergite IX with anterior field of sparse fine spines; posterior lateral comb of segment VIII with 1-2 strong teeth and 9-12 smaller one; abdominal segments II-VI with three lateral setae, segments VII and VIII with four lateral taeniae. **Fourth instar larva**: clypeal seta S3 three-branched; antenna placed on pedestal with long spur, antennal segment 2 longer than combined lengths of segments 3-5, cylindrical with unsclerotized ring near base, small Lauterborn on long unsclerotized pedicels; pecten epipharyngis with three distally serrated scales; premandible with three teeth; mandible with apical tooth and two light brown inner teeth; mentum with pale notched median tooth and brown lateral teeth.

Description

Male (n = 3). Body pale greenish, thorax with yellow vitae.

Head. AR 0.59-0.61. Flagellomeres one to twelve 430-458 µm long, ultimate flagellomere 265-272 µm long. Eye with dorsomedian extension; frontal tubercle very small, 3-4 µm long; 6-7 temporal setae; clypeus with 10-11 setae; lengths of palpomeres (in µm): 15-25, 18-30, 58-75, 78-96, 115-160.

Thorax. Length 645-680 µm. Scutal tubercle absent;

4-5 dorsocentrals, 12-14 acrostichals, one prealar, two scutellars. Haltere with four setae.
Wing. Length 600 (pharate male)-1112 µm, width 160 (pharate male)-354 µm; L/WR 3.14-3.75 (pharate male). Brachiolum with one seta, Sc bare, R with 16-17 setae, R_1 with 16-18 setae, R_{4+5} with 37-38 setae, M bare, M_{1+2} with 26-28 setae, M_{3+4} with 22-24 setae, Cu with 9-10 setae, Cu_1 with 16-17 setae, PCu with 3-5 and An with 14-16. Cell m bare (+ 1-2 setae on false vein), r_{4+5} with about 100 setae, m_{1+2} with 82-88 (+ 30-32 setae on false vein), m_{3+4} with 36-38 setae, cu with 7-8 setae and an bare.
Legs. Foreleg bearing single tibial spur, 20 µm long. Combs of mid tibia 13 µm wide with 24 µm long spur, and 13 µm wide with 26 µm long spur; combs of hind tibia 15 µm wide with 23 µm long spur, and 17 µm wide with 26 µm long spur. Lengths of leg segments (in µm) and leg ratios as in Table 3.
Abdomen. Length 1880 µm.
Hypopygium (Figs 24-27). Tergite IX 84-85 µm long, without median setae, with 12-13 setae placed on anal point, lateral tooth and microtrichia-free areas absent. Orolateral spine of laterosternite IX apparently absent. Anal tergal bands separate, short, not reaching median part of tergite. Anal point (Figs 24-25) cylindrical, with a longitudinal scar, posterior part triangular, 35-40 µm long, elongate, microtrichia, anal crests and spines absent; superior volsella as in Fig 25, without microtrichia, anterior and median margins straight, lateral margin curved and posterior margin curved to straight; dorsal surface with 3-4 setae, two setae on median margin, one seta on ventral surface (not on tubercle). Digitus (Figs 25-26) long and pointed, somewhat finger-like, extending beyond median margin of superior volsella. Median volsella (Fig 27) 8-9 µm long, with 18-21 µm long simple lamellae and 11-15 µm long foliate lamellae, not reaching apex of inferior volsella. Inferior volsella 50-51 µm long, slightly thick and curved. Gonocoxite 68-70 µm long; gonostylus 68-71 µm long, somewhat elongate and slender; HR 0.95-1.02.

Pupa (n = 3). Total length 2.61-2.64 mm. Pupal exuviae pale, thorax and lateral muscle marks brownish.
Cephalothorax (Figs 28-30). Frontal apotome with few wrinkles. Frontal setae thin, 78-83 µm long, mounted apically on weakly developed cephalic tubercles; frontal warts absent. Pedicel sheath tubercle absent. Thorax smooth, 722-738 µm long. Wing sheath with nose, prealar tubercle well developed. Thoracic horn smooth, 345-362 µm long. Three precorneals in a more or less triangular pattern, placed on tubercle, Pc_1 stronger, Pc_3 thin; one median antepronotal, 53-56 µm long, one lateral antepronotal and one lateral antepronotal seta mark; two pairs of dorsocentrals, Dc_4 stronger than the other three; precorneals, lateral antepronotal and dorsocentrals lengths difficult to measure; distance between Dc_1 and Dc_2 6 µm, between Dc_2 and Dc_3 170 µm, and between Dc_3 and Dc_4 6 µm.
Abdomen (Figs 31-32). Total length 1894-1908 µm. Tergites I and VII without armament. T II with sparse field of very fine spinules posteriorly. T III-VI with anterior pair of oval patches of spines. T VIII with anterolateral field of few, very fine spines. T IX with anterior field of sparse, very fine spines. Sternites, conjunctives and pleura unarmed. Hook row 68-70 µm long, about 1/4 the width of tergite II. Pedes spurii B bare and present on segment II. Posterior lateral comb of segment VIII 16-19 µm wide, with 1-2 strong teeth and 9-12 smaller teeth. Abdominal setation: segment I with 2 D setae; segment II with 2 D, 3 L and 3 V setae; segment III with 4 D, 3 L and 3 V setae; segment IV-V with 4 D, 3 L and 4 V setae; segment VI with 4 D, 3 L (1-2 setae taeniate) and 4 V setae; segment VII with 4 D setae, four lateral taeniae and 3 or 4 V setae; segment VIII with 1 D seta, four lateral taeniae and 1 V seta; anal lobe well developed, with complete fringe of 28 taeniae in single row and with two pairs of dorsal taeniae; T II-VII with O-setae.

Table 3 Lengths (in µm) and proportions of legs of *Tanytarsus fittkaui* sp. n.

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV
P_1	540	246	658	340	288	212	102	2.67	1.53	1.19
P_2	542	405	228	96	70	50	49	0.56	4.43	4.15
P_3	570	550	340	202	189	110	61	0.61	2.59	3.29

Fourth instar larval exuviae (n = 1).
Head (Figs 33-34). Length 250 µm, width 206 µm. Clypeal seta S3 with three long branches. Antenna placed on prominent pedestal (78 µm long) bearing a large apical spur (58 µm) (Fig 33); basal segment 174 µm longer, with ring organ close to base and small seta in distal half; AR = 1.50; segment 2 (91 µm) unsclerotized in 1/3 distal and with a basal sclerotized ring; segments 3-5 (9, 7, 4 µm, respectively) unsclerotized; pedicels and Lauterborn organs missing. Premandible 48 µm long, with three teeth, brush well developed. Mandible 80 µm long, with pale dorsal tooth; apical and two inner teeth brown. Mentum 57 µm long, with slightly pale median tooth, hardly notched laterally and five pairs of brownish lateral teeth decreasing in size laterally (Fig 34). Ventromental plates longer than mentum (75 µm), close together medially.
Abdomen. Claws of posterior parapods simple.

Etymology. Named in honor of Dr Ernst Josef Fittkau for his great contribution to the knowledge of Chironomidae.

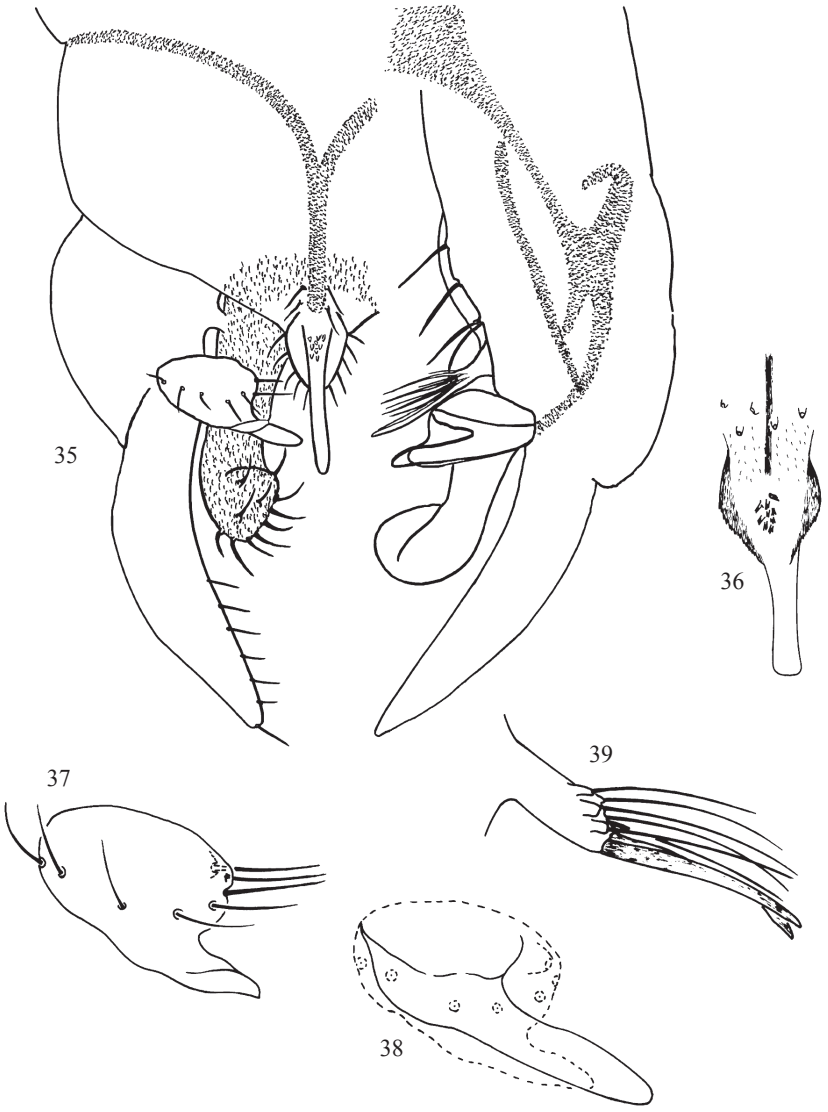
Type material
Holotype. One adult male with pupal and larval exuviae, **BRAZIL**: São Paulo State, São Carlos, Córrego do Fazzari, 12-VI-2001, F O Roque *leg*., DCBU-UFSCar.
Paratypes. BRAZIL: same as holotype except for: one adult male; **one** pharate male, 29-III-99; one pharate male and two pupae on same slide, collected in puddles, 29-III-2001, L C S Correia *leg*.

Comments. The design of the anal point separates *T. fittkaui* sp. n. from all known *Tanytarsus* species. The male anal point of *T. fittkaui* does not fit well the generic diagnosis of *Tanytarsus*. The cylindrical anal point with a longitudinal scar and a lozenge-like tip is unique among all the described

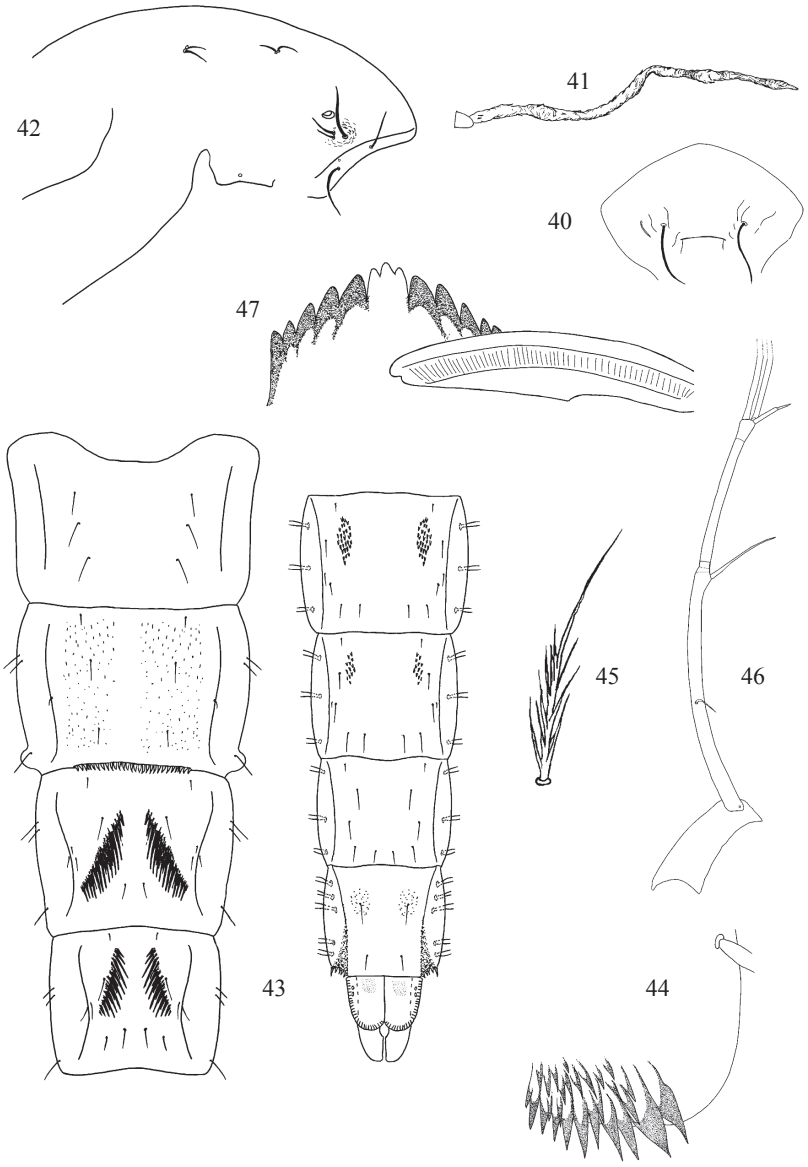
Tanytarsus species. The same anal point design has been seen in non-described specimens collected recently from light-traps in central Amazon (Sanseverino *pers*. *obs*.). Considering the large variation in features and shapes seen in *Tanytarsus* anal points, as well as the fact that all other imaginal, pupal and larval morphological characters of *T. fittkaui* fit the generic diagnosis, we decided to include *T. fittkaui* in the genus *Tanytarsus*. The pupa of *T. fittkaui* keys in Wiedenbrug & Ospina-Torres (2005) to *Tanytarsus* sp. 61. The thoracic horn, pattern of the abdominal shagreenation and armament, abdominal setation and the form of the posterior lateral comb of *T. fittkaui* are very similar to *Tanytarsus* sp. 61, and the pupae of both species cannot be separated. The antennal segment 2 of the larva of *T. fittkaui* has a basal sclerotized ring in narrow, unsclerotized base (about 35%), then is pigmented for approximately 60% of its length. The antennal segments 3-5 are pale, and the clypeal seta S3 has three branches.

***Tanytarsus alfredoi* sp. n.**
(Figs 35-47)

Diagnostic characters. *Tanytarsus alfredoi* sp. n. differs from other *Tanytarsus* species by the combination of the following characters. **Adult male**: hairy wings; anal tergal bands Y-type, fused on median part of tergite and ending close to anal point base; anal point slightly broadly rounded to quadrate at tip, with pair of well-developed anal crests and spines placed irregularly between crests; superior volsella without microtrichia, posteromedian corner of superior volsella well projected, digitus somewhat thumb-like, extending well beyond median margin of superior volsella; and median volsella with subulate lamellae. **Pupa**: thin frontal setae on weakly-developed cephalic tubercles; pedicel sheath tubercle triangular; thoracic horn with very small spines; three precorneals in a triangular pattern; abdominal tergite II with homogeneous field of



Figs 35-39 *Tanytarsus alfredoi* sp. n. male genitalia. 35) hypopygium; 36) anal point; 37) superior volsella; 38) digitus; 39) median volsella.



Figs 40-47 *Tanytarsus alfredoi* sp. n. pupa (40-44) and larva (45-47). 40) frontal apotome; 41) thoracic horn; 42) thorax; 43) tergites I-IX; 44) posterolateral comb of segment VIII; 45) clypeal seta S3; 46) antennal base and antenna; 47) mentum and ventromental plate.

spinules, tergites III and IV with long bands of longer spines, tergites V-VI with anterior pair of oval patches of spines; posterior lateral comb of segment VIII with 4-5 strong teeth and 12-13 smaller teeth; abdominal segment I with taeniate dorsal setae, segments II-IV with three lateral setae, segments V-VII with three lateral taeniae and segment VIII with five lateral taeniae. **Fourth instar larva**: clypeal setae S3 plumose; antenna placed on prominent pedestal with an apical short spur, antennal segment 2 longer than combined lengths of segment 3-5, unsclerotized distally and with a basal sclerotized ring and with short Lauterborn organs; premandible with three teeth; mandible with apical brown tooth and two inner brown teeth; mentum with pale, well notched, median tooth and brownish lateral teeth.

Description

Male (n = 2). Body pale greenish, thorax with yellow vitae.

Head. AR 0.95-0.97. Flagellomeres one to twelve 532-548 µm long, ultimate flagellomere 517-525 µm long. Eye with dorsomedian extension; frontal tubercle very small, 5 µm long; 7-8 temporal setae; clypeus with 15-16 setae; lengths of palpomeres (in µm): 34, 40, 112, 108, 200.

Thorax. Length 870-920 µm. Scutal tubercle absent; 7-8 dorsocentrals, 10 acrostichals, one prealar, four scutellars. Haltere with five setae.

Wing. Length 1752-1754 µm, width 472-480 µm; L/WR 3.65-3.71. Brachiolum with one seta, Sc bare, R with 20-24 setae, R_1 with 27-32 setae, R_{4+5} with 62-76 setae, M bare,

M_{1+2} with 48-57 setae, M_{3+4} with 36-43 setae, Cu with 11-17 setae, Cu_1 with 18-23 setae, PCu with 22-30 and An with 25-27. Cell m with 14 setae (+ 2-8 setae on false vein), r_{4+5} with more than 140 setae, m_{1+2} with more than 140 setae (+ 68-72 setae on false vein), m_{3+4} with 80-95 setae, cu with 45-60 setae and an with 60-82.

Legs. Fore femur and fore tibia with brown band. Foreleg bearing single tibial spur, 40-46 µm long. Combs of mid tibia 24-26 µm wide with 18-20 µm long spur, and 26-27 µm wide with 40-42 µm long spur; combs of hind tibia 22-24 µm wide with 40-41 µm long spur, and 24-25 µm wide with 51-52 µm long spur. Lengths of leg segments (in µm) and leg ratios as in Table 4.

Abdomen. Length 2160-2230 µm.

Hypopygium (Figs 35-39). Tergite IX 112-124 µm long, with 5-6 median setae, 10 apical setae, double lateral tooth and microtrichia-free areas posteriorly. Orolateral spine of laterosternite IX absent. Anal tergal bands Y-type, fused on median part of tergite and ending close to anal point base. Anal point (Figs 35 and 36) 52-58 µm long, elongate and broadly rounded to quadrate at tip, with pair of well-developed anal crests serrate along the margins, 32-33 µm long, extending posterior to tergite IX; microtrichia in anterior half of the area between anal crests; 4-9 spines placed irregularly between anal crests. Superior volsella as in Fig 37, somewhat comma-like, without microtrichia, anterior, lateral and posterior margins curved, median margin convex, posteromedian corner well projected; dorsal surface with five setae, two setae on median margin and one seta on ventral tubercle, the last three setae close to anterior margin. Digitus (Fig 38) long, somewhat thumb-like, extending well beyond median margin of superior volsella. Median volsella (Fig 39) 18-20 µm long, with 26-28 µm long simple lamellae and 28-29 µm long subulate lamellae, not reaching apex of inferior volsella. Inferior volsella 72-74 µm long, thick and curved, distal part swelled. Gonocoxite 90-92 µm long; gonostylus 106-112 µm long, elongate and somewhat curved and thick; HR 0.80-0.86.

Pupa (n = 1). Total length 3.32 mm. Pupal exuviae pale, cephalothorax, lateral muscle marks and spines on tergites brown.

Cephalothorax (Figs 40-42). Frontal apotome smooth. Frontal setae thin, 88 µm long, mounted apically on weakly developed cephalic tubercles; frontal warts absent. Pedicel sheath tubercle well developed, triangular. Thorax smooth, 930 µm long, with small point along median suture. Wing sheath with nose, prealar tubercle well developed, one prealar seta seem to be present. Thoracic horn slender, 560 µm long, with very small spines. Three precorneals in a triangular pattern, placed on tubercle, Pc_1 thicker and longer, 78 µm long, Pc_2 and Pc_3 very close to each other, 54 µm and 42 µm long respectively; one median antepronotal, 62 µm long, one lateral antepronotal, 64 µm long, and one lateral antepronotal seta mark; two pairs of dorsocentrals, anterior pair: Dc_1 52 µm long, Dc_2 60 µm long, posterior pair: Dc_3 58 µm long, Dc_4 50 µm long, Dc_4 thicker than the other three; distance between Dc_1 and Dc_2 6 µm, between Dc_2 and Dc_3 215 µm, and between Dc_3 and Dc_4 6 µm.

Abdomen (Figs 43-44). Total length 2440 µm. Tergites I and VII without armament. T II with homogeneous field of spinules, sparse or interrupted on the middle. T III with long bands of longer spines, bands more than 1/2 the length of tergite. T IV with long bands of longer spines, bands about 1/2 the length of tergite. T V-VI with anterior pair of oval patches of spines. T VIII with anterolateral field of fine spines. T IX with anterior field of spines. Sternites, conjunctives and pleura unarmed. Hook row 235 µm long, wider than 1/2 the width of tergite II. Pedes spurii B bare and present on segment II. Posterior lateral comb of segment VIII about 50 µm wide, with 4-5 strong teeth and 12-13 smaller teeth. Abdominal setation: segment I with 3 D setae, the most posterior longer and taeniate; segment II with 3 D, 3 L and 3 V setae; segments III-IV with 5 D, 3 L and 5 V setae; segments V-VI with 5 D setae, 3 lateral taeniae, V setae difficult to count; segment VII with three lateral taeniae, D and V setae difficult to distinguish; segment VIII with 2 D setae, five lateral taeniae and 0 V seta; anal lobe well developed, with complete fringe of 34 taeniae in single row and with two pairs of dorsal taeniae; T II-VII with O-setae.

4th instar larva (n = 2). Total length: (5.12-6.29) mm.

Head (Figs 45-47). Length 312 µm, width 225 µm. Clypeal seta S3 plumose (Fig 45). Antenna placed on prominent pedestal, 94-105 µm long, bearing an apical, short spur (Fig 46); basal segment (237-250) µm long, with ring organ close to base and small seta in distal half; AR = 1.30-1.37; segment 2 154-166 µm, unsclerotized distally and with a basal sclerotized ring; segments 3-5 28, 9, 4 µm long, respectively; pedicels unsclerotized and unequally long (694-687 and 487-525 µm long), bearing short Lauterborn organs. Premandible 63-65 µm long, with three teeth; brush well developed. Mandible 95-98 µm long, with prominent pale dorsal tooth; apical and two inner teeth brown. Mentum 72-74 µm long, with pale median tooth strongly notched laterally and five pairs of brownish lateral teeth, decreasing in size laterally (Fig 47). Ventromental plates 90-95 µm, longer than mentum and close together medially.

Abdomen. Anal tubules about 205-237 µm long, slightly shorter than posterior parapods. Claws of posterior parapods large, simple.

Table 4 Lengths (in µm) and proportions of legs of *Tanytarsus alfredoi* sp. n.

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV
P_1	934–1020	388–390	1194–1305	630–660	517–540	405–434	164–172	3.06–3.36	1.46–1.50	1.07–1.10
P_2	855–907	652–656	460–465	210–225	145–150	87–90	72–75	0.70	3.66–3.92	3.27–3.36
P_3	930–975	787–960	615–630	345–360	314–328	192–196	102–105	0.65–0.78	2.44–2.59	2.79–3.07

Etymology. Named in honor of Dr José Alfredo Pinheiro Dutra (*in memoriam*) for his great contribution to the knowledge of Brazilian entomology.

Type material
Holotype. One adult male with pupal exuviae, **BRAZIL**: São Paulo State, São Carlos, Córrego Canchim, 27-VI-2001, F O Roque *leg*., DCBU-UFSCar.
Paratypes. BRAZIL: same as holotype except for: **one** adult male, VII-2001; one larva with pharate pupa, slide-mounted in Hoyer, Córrego Fazzari, VI-2005, P. Kleine *leg*.; one larva, as former except 25-VII-2008, S Trivinho-Strixino *leg*.

Comments. Among Neotropical species of *Tanytarsus*, the presence of Y- type anal tergal bands has been observed only in *T. alfredoi* sp. n., *T. jacaretingensis* and *T. monospinosus*. However, this is the first time in the Neotropics that a species with Y-type anal tergal bands and spines between anal point crests is recorded. The combination of both characters has been seen in the Holarctic *Tanytarsus pallidicornis* species-group (*sensu* Reiss & Fittkau 1971). Nevertheless, the pupa of *T. alfredoi* fails to key to species of the *pallidicornis* group in Langton (1991) because of the presence of five lateral taeniae on segment VIII. The species also does not key to any *Tanytarsus* species or pupal morphotype in Wiedenbrug & Ospina-Torres (2005).

The larva of *T. alfredoi* keys to Tanytarsini genus B in Trivinho-Strixino & Strixino (1995). Larvae of *T. alfredoi* and Tanytarsini genus B have very long Lauterborn organ pedicels, which are unusually unequal in length. The antennal segment 2 has a basal sclerotized ring as in *T. fittkaui* sp. n., but the antennal segments of *T. alfredoi* are more sclerotized than those of *T. fittkaui* sp. n. Moreover, the clypeal seta S3 is plumose in *T. alfredoi* and three-branched in *T. fittkaui* sp. n.

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