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Two new species of *Tanytarsus* from southeast of Brazil

(Insecta, Diptera, Chironomidae)

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The male, female, pupae and larvae of two new species of *Tanytarsus* of Neotropical region are described and figured. Larvae reared to the adult stage, live on leaves detritus bed of little marginal semi-permanent pools in riparian zone of Fazzari stream at Federal University of São Carlos (UFSCar), São Carlos-SP, Brazil. Adult male genitalia of the two new species are distinctive from the other *Tanytarsus* species by the battle club form of the inferior volsella and the S bent shape of the digitus. The larvae, which construct robust cases of coarse detritus, present an unusual pair of lateral tubules on posterior margin of the 7th abdominal segment.

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Introduction

The two new species herein described were collected and reared in the laboratory to obtain all life stages. The larvae live associated with litter bed of little pools in riparian zone of Fazzari stream at Federal University of São Carlos (UFSCar), São Carlos-SP, Brazil. All the material examined was mounted on slides with Euparal or Hoyer and the morphological terminology used follows Sæther (1977, 1980) except the term 'taeniae' (Langton 1994) used for the filamentous setae on pupal abdomen.

Tanytarsus magnus, spec. nov.

Figs 1-14

Types. Holotype: ♂ (in Euparal), Brazil, São Paulo, São Carlos, Federal University of São Carlos (UFSCar) campus, riparian zone of Fazzari stream, 21°59'S, 47°54'W, 05/09/97, leg. F. O. Roque. – Paratypes (mostly in Euparal, 4♂♂, 2♀♀, 1 pupa with pharate male, 1♀ pupa, 3 larvae) at the same locality. Pupae and larvae paratypes, 07/07/98, leg. S. Trivinho-Strixino; ♂ and ♀ paratypes, 05/09/97, leg. F. O. Roque. Holotype and most paratypes deposited in Laboratory of Aquatic Entomology collection at Federal University of São Carlos, São Paulo, Brazil; 1♂ imago in Zoology Museum of São Paulo, São Paulo, Brazil; 1♂ imago in Zoologische Staatssammlung München, Germany.

Diagnosis. The design of the anal point, the battle-club form of the inferior volsella and the bent-shape of the digitus are the main characteristics that differentiate the male imago of *Tanytarsus magnus*, spec. nov., except *Tanytarsus impar*, spec. nov., from the other Neotropical species of the genus (Sublette & Sasa 1994, Fittkau & Reiss 1973, Reiss 1972, Paggi 1992, Ekrem & Reiss 1999). The possession of the lateral tubules on posterior margin of the 7th abdominal segment of the larvae, also present in *T. impar*, is characteristic in this two species and seems unusual in the genus *Tanytarsus*. The male of *T. magnus* differentiate from *T. impar* by the large size, by the leg brown band pattern and by the almost rectangular shape of the superior volsella; the 4th instar larvae can be distinguished by the largest length and the lowest rate between basal antennal segment to head length antenna/head (≪1.0).

Description

Adult male (Fig. 1) (n=5). Median size species, body length about 5.0 mm.

Head. Yellowish. Antenna with 13 flagellomeres, fully plumose. Antennal ratio to 1.44 (1.34-1.46). 8-9 uniserial temporal setae. Frontal tubercles absent. Antennal flagellum brownish yellow, length 1375 µm (1276-1475). Eyes bare, with little dorsomedian extension. About 40 clypeal setae. Palp 5–segmented, length Pm 2-5: 51 (45-58), 174 (162-181), 206 (194-219), 321 (292-363) µm.

Thorax. Yellowish. Postnotum brownish. Antepronotal lobes reduced. Scutal tubercle absent. Antepronotals absent; 22-28 acrostichals, 8-10 dorsocentrals, 3 humerals, 3 prealars and 6 scutellars.

Wing. Length 2335 µm (2308-2385), width 600 µm (538-646). Membrane extensively covered with brownish macrotrichia. Brachiolum with 1 seta. Anal lobe reduced. Squama bare. Costa ending slightly distal to Cu_1. FCu slightly distal to RM; VR=1.10 (1.03-1.22).

Legs. Yellowish with distal brown bands in all segments. Front tibia with a slender light brown spur. Mid and hind tibia with two black combs, each bearing unequal spurs (Fig. 3). Segment length (in µm) and proportions as in Tab. 1A.

Abdomen. Yellowish brown. Tergites VI, VII and VIII brownish.

Hypopygium (Fig. 2). Anal tergite bands separated, not reaching anal point. Anal point short and bare. Superior volsella almost rectangular, curved downward at tip; 6-7 dorsal setae and 3-4 marginal proximal setae. Digitus with S-bent shape extending beyond median corner of superior volsella. Median volsella with long simple setae. Inferior volsella strongly clubbed distally; external distal corner without setae.

Adult female (n=2). Total length about 4.0 mm. Coloration as male.

Head. 8 temporals. Frontal tubercles absent. Antennal flagellum shorter than palp; Fm lengths 2-5: 137-156, 94-112, 119-137, 194-200 µm. AR=0.52. Eyes bare, with little dorsomedian extension. 55-60 clypeals. Lengths of palpomeres 2-5: 49, 178, 193, 344 µm.

Thorax. 26 acrostichals, 17 dorsocentrals, 3 prealars, 3 humerals, 8-9 scutellars. Scutal tubercle absent.

Wing. Length 2392 µm (2292-2492), width 716 µm (708-723). VR=1.03 (1.02-1.05). Brownish macrotrichia covering all cells and veins.

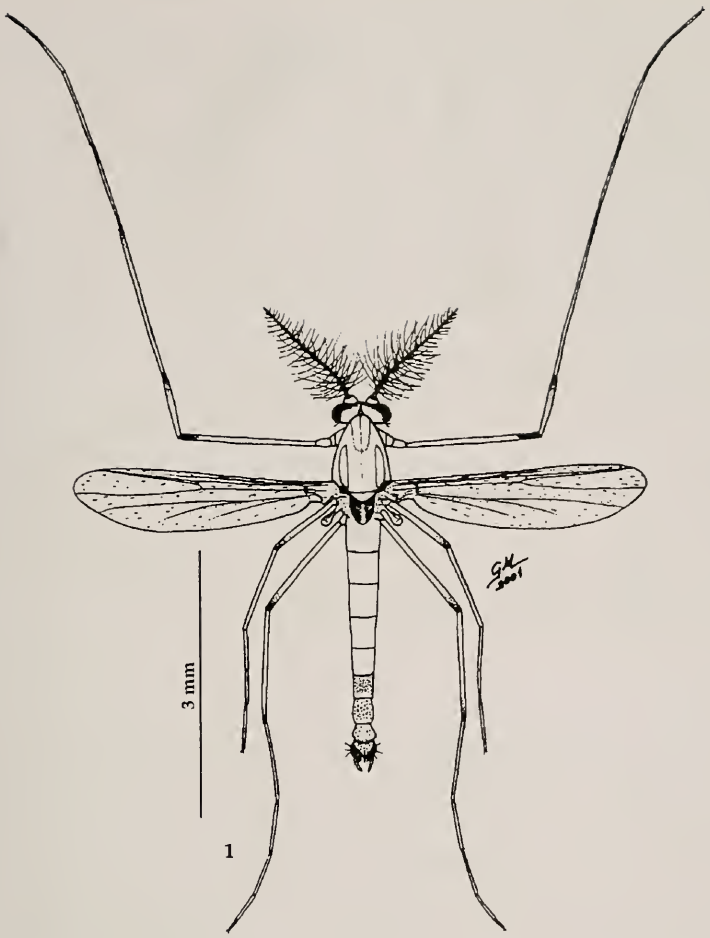
Legs. Mid and hind tibia with unequal black spurs. Segment lengths (in µm) and proportions as in Tab. 1B.

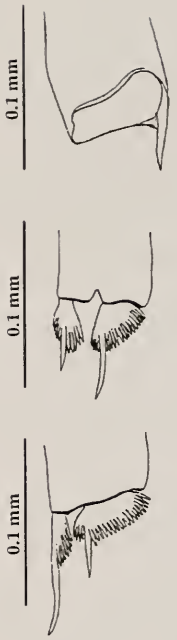
Genitalia (Fig. 4). Sternite VIII bearing 40-42 setae irregularly distributed; floor under vagina narrow, posteromedian contour of SVIII V-shaped, forming an angle medially. GpVIII simple forming sharp angle, with short caudolateral microtrichia. Notum 1.2 as long as free rami. Seminal capsule ovoid, length nears 100 µm, without neck. Spermathecal duct with loop. GcaVIII straight running diagonally to posterior corner of SVIII. GcIX with 7 setae.

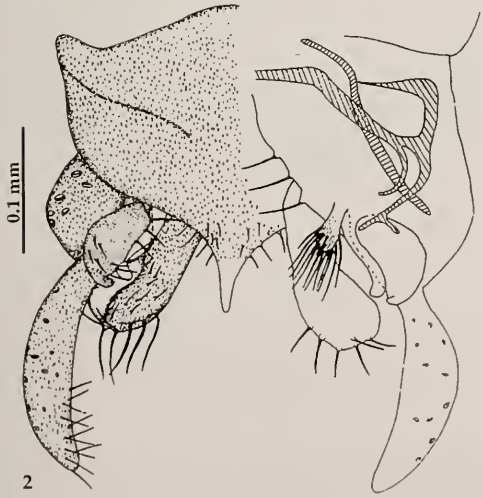
Pupa (exuviae). Abdominal length 4.63 mm (♂), 3.23 mm (♀). Pupal exuviae pale yellowish. Frontal apotome smooth. Cephalic tubercles bent inside and touching at apex (Fig. 6). Frontal setae not discernible. Thoracic horn smooth. Thorax smooth with granulation along median suture. Wing sheath without nose and pearl row. Thoracic setation: on both sides 3 precorneals (PC_{1-3}) situated in front and slightly ventral of the thoracic horn; PC_1 longer than PC_{2-3}. Two lateral antepronotals ($LAps_{1-2}$). 4 dorsocentrals (DC_{1-4}) present and situated in two widely separated pairs (Fig. 8).

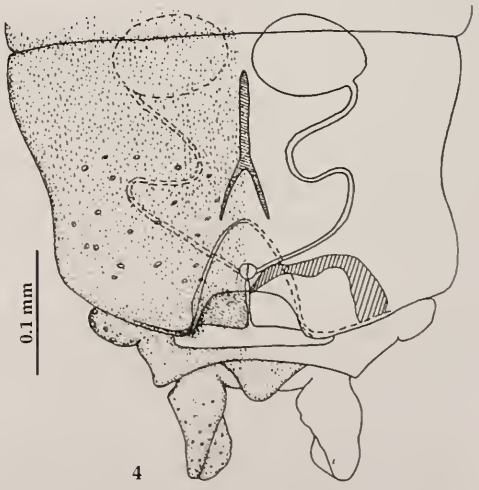
Tab. 1. Leg segments of *Tanytarsus magnus*, spec. nov. **A.** Male imago. **B.** Female imago.

		Fe	Ti	Ta_1	Ta_2	Ta_3	Ta_4	Ta_5	LR
A	PI	1390	680	1796	923	773	627	238	2.64
		1338-1446	661-692	1753-1846	892-954	754-800	585-661	231-261	2.59-2.66
	PII	1261	974	658	363	252	145	75	0.67
		1231-1308	934-1015	631-677	338-385	231-277	127-154	61-82	0.62-0.72
	PIII	1413	1171	838	531	446	299	115	0.71
		1330-1492	1154-1185	800-877	508-554	415-477	261-338	107-123	0.69-0.76
B	PI	1446	753	1953	1007	815	653	269	2.59
		1431-1461	707-800	1938-1969	1000-1015	800-831	615-692	261-277	2.46-2.74
	PII	1230	1169	646	369	246	154	92	0.55
		1200-1261	1138-1200	631-661		231-261		77-107	0.53-0.58
	PIII	1446	1330	884	546	477	269	130	0.66
		1415-1477	1292-1369	877-892	538-554		261-277	123-138	0.65-0.68

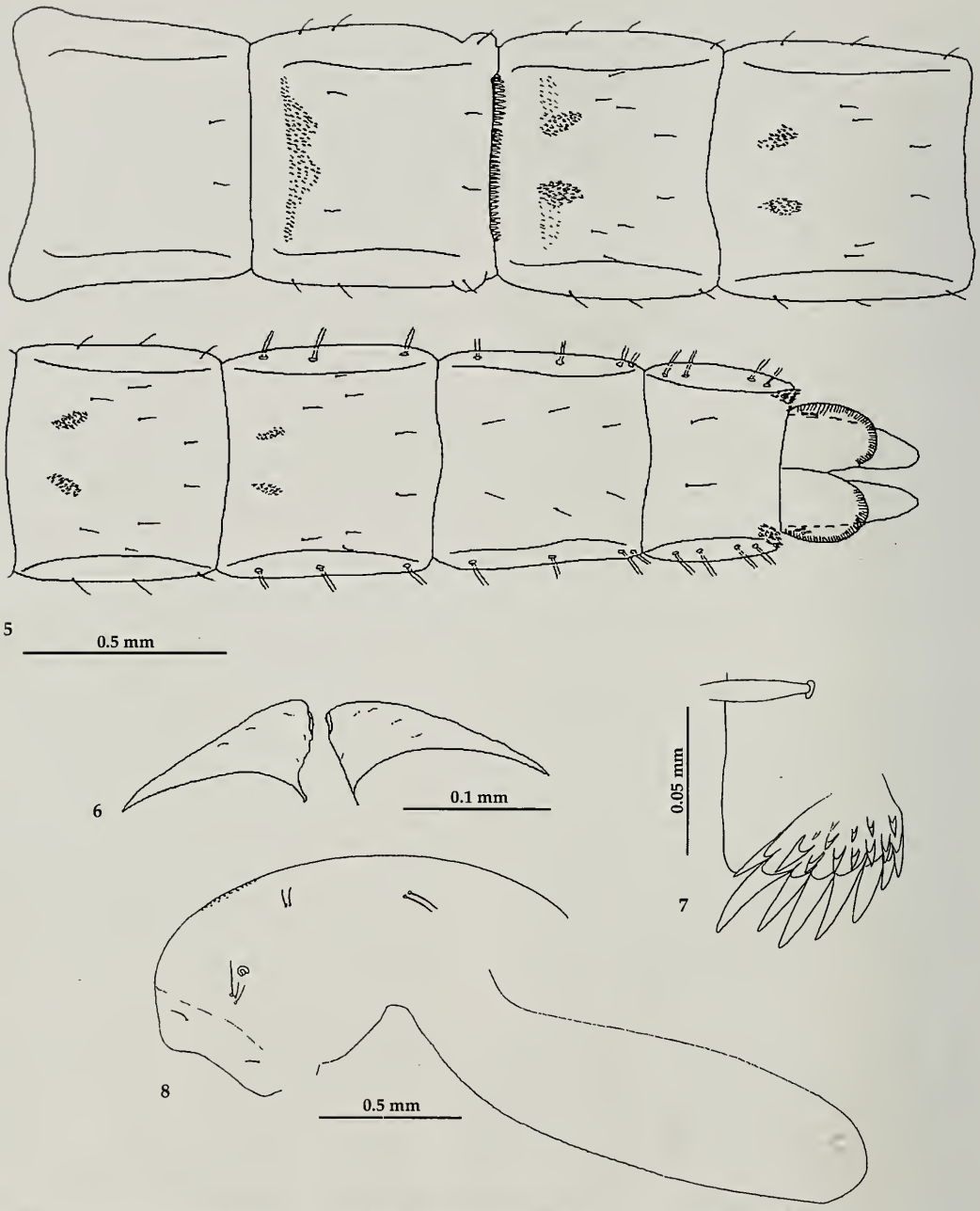






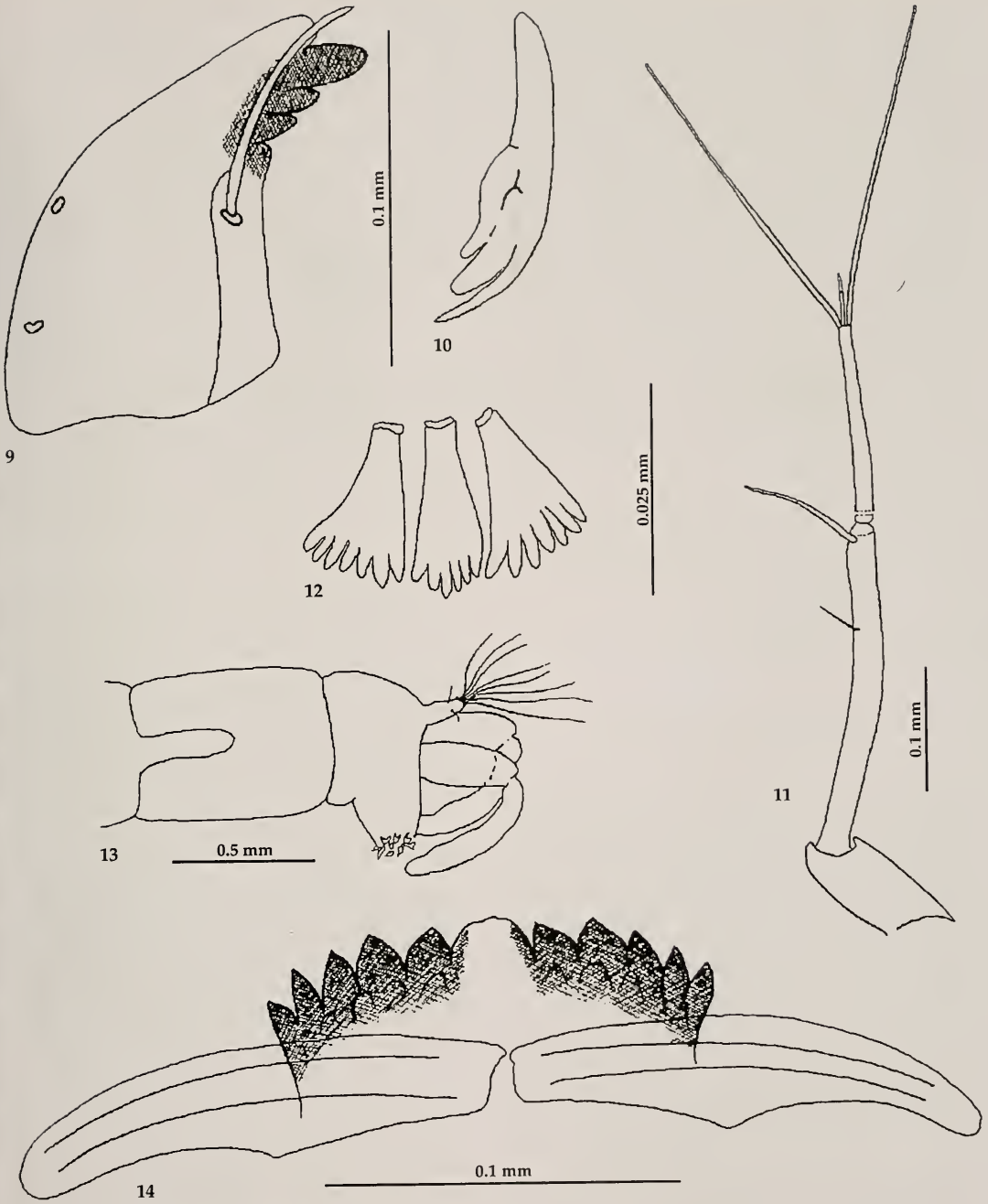


Figs 1-4. *Tanytarsus magnus*, spec. nov. Male and female. **1.** General dorsal view. **2.** Hypopygium, dorsal. **3.** Tibial spur of fore, mid and hind legs. **4.** Female genitalia, dorsal.



Figs 5-7. *Tanytarsus magnus*, spec. nov. Pupa. 5. Abdominal tergites. 6. Cephalic tubercles. 7. Anal comb. 8. Thorax, lateral view.

Abdomen (Fig. 5). Pedes spurii A absent; B present on segment II. Hook row about ⅔ width of segment II. Tergite I without shagreen. Tergite II with anterior band of fine shagreen larger in central area. Tergites III to VI with anterior pair of rounded patches of spines; VII and VIII bare. Segment VIII with posterolateral anal comb of 4-5 marginal teeth and 8-9 additional overlapping ventral teeth (Fig. 7). Anal lobe well developed with complete fringe of ca 75-80 taeniae and 2 pairs of dorsal taeniae. Abdom-



Figs 9-14. *Tanytarsus magnus*, spec. nov. Larva. **9.** Mandible. **10.** Premandible. **11.** Antenna. **12.** Pecten epipharyngis. **13.** Posterior abdominal segments. **14.** Mentum and ventromental plates.

inal setation: segments II-V with 3 L setae; VI with 3 lateral taeniae; VII-VIII with 4 lateral taeniae.

4th instar larvae (n=3). Total length about 10.0 mm. Color reddish.

Head. Width 375 µm, length 375 µm (354-385). lC=1.0. Clypeal setae S3 simple. Antenna 5-segmented on long pedestal (Fig. 11); basal segment 284 µm (269-295), longer than flagellum, bent out-

side, harder sclerotised than other antennal segments. Basal segment shorter than head length ($A_1/H = 0.76$), with basal ring organ and small seta in distal ⅔; AR=1.37; segment 2 about four times longer than segment 3, with an unsclerotized band near proximal basis; lauterborn organs short mounted on lightly sclerotized pedicels near 300 µm long. SI comb-like, bases fused; SII distally plumose, situated on pedestal about ⅓ as long as SII; SIII simple, seta-like; SIV present. Pecten epipharyngis with 3 distally serrated scales (Fig. 12). Premandible 80-92 µm long with three teeth (Fig. 10); brush well developed. Mandible (Fig. 9) about 157 µm with pale dorsal tooth; apical and 2 inner teeth brown. Mentum (Fig. 14) 120 µm (114-125) large with pale median tooth with truncate margin; five pairs of brown lateral teeth; first lateral slightly shorter than median and second lateral teeth. Ventromental plates touching medially.

Abdomen (Fig. 13). Presence of an unusual pair of large lateral tubules on posterior margin of the 7th abdominal segment. Anal tubules very long, near 1.0 mm, with median constriction curved down. Parapods with simple claws.

Etymology. From the Latin, refers to the large size of the species.

Tanytarsus impar, spec. nov.
Figs 15-26

Types. Holotype: ♂ (in Euparal), Brazil, São Paulo, São Carlos, Federal University of São Carlos *campus* (UFSCar), riparian zone of Fazzari stream, 21°59'S, 47°54'W, 23/09/99, leg. F. O. Roque. – Paratypes (mostly in Euparal, 3♂, 1♂ with correspondent pupal exuvia, 3♀♀, 1 pupal exuvia, 5 larvae) at the same locality; 3♂ paratypes, 21/09/98, leg. F. O. Roque; 1♂ paratype, 29/03/01, leg. L. C. Correia; pupal exuvie and larvae paratypes, 05/09/97, leg. S. Trivinho-Strixino; 2♀ paratypes, 29/03/01, leg. L. C. Correia; 1♀ paratype, 05/09/97, leg. F. O. Roque. Holotype and most paratypes deposited in Laboratory of Aquatic Entomology collection at Federal University of São Carlos, São Paulo, Brazil; 1♂ imago in Zoology Museum of São Paulo, São Paulo, Brazil; 1♂ imago in Zoologische Staatssammlung München, Germany.

Diagnosis. The male of *Tanytarsus impar*, spec. nov. congregates the same characteristics of *T. magnus*, spec. nov., differentiating of this by the lowest size, the brown band design of the legs and the inverted triangulate shape of the superior volsella. The 4th instar larvae can also be distinguished by the lowest length and the different rate between basal antennal segment to head length antenna/head (≥1.0).

Description

Adult male (Fig. 15) (n=5). Median size species, body length about 4.0 mm.

Head. Yellowish brown. Antenna with 13 flagellomeres, fully plumose. Antennal ratio to 1.71 (1.36-1.96). 10-11 uniserial temporal setae. Frontal tubercles absent. Antennal flagellum brownish, length 1086 µm (1020-1185). Eyes bare, with little dorsomedian extension. About 25-30 clypeal setae. Palp 5-segmented, length Pm 2-5: 41 (32-44), 153 (128-168), 151 (128-160), 288 (256-300) µm.

Thorax. Yellowish brown. Postnotum brownish. Antepronotal lobes reduced. Scutal tubercle absent. Antepronotals absent; 20-25 acrostichals, 9-10 dorsocentrals, 3 humerals, 3-4 prealars and 7-9 scutellars.

Wing. Length 1847 µm (1575-2080), width 481 µm (435-520). Membrane light brown extensively covered with brown macrotrichia. Anal lobe reduced. Brachiolum with 1 seta. Costa ending slightly distal to Cu_1. FCu slightly distal to RM; VR=1.06 (1.04-1.08).

Legs. Yellowish with brown bands. Fore femur with middle and distal brown bands; mid and hind femur with proximal and distal bands. Fore tibia with proximal and distal brown bands; mid and hind tibia with proximal band. Tarsus with distal brown band. Foreleg bearing single light-brown tibial spur. Mid and hind tibia with two black combs, each bearing unequal spurs (Fig. 16). Segment length (in µm) and proportions as in Tab. 2A.

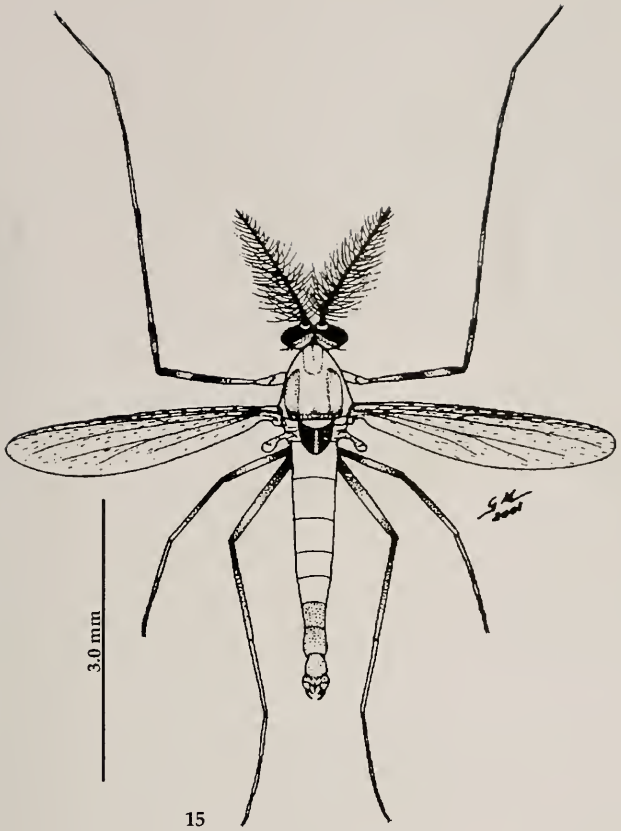
Abdomen. Yellowish brown. Tergites VI, VII and VIII brownish. Hypopygium (Fig. 17). Anal tergite bands separated, not reaching anal point. Anal point short, without microtrichia. Superior volsella almost triangulate, curved downward at tip; dorsal with 7-8 setae and 3 setae in anterior margin. Digitus with S-bent shape extending well beyond median corner of superior volsella. Median volsella short with long simple setae. Inferior volsella strongly clubbed distally; external distal corner without setae.

Adult female (n=3). Total length about 3.5 mm. Coloration as male.

Head. 7-9 temporals. Frontal tubercles absent. Antennal flagellum shorter than palp; Fm lengths 2-5: 100-120, 92-100, 100-112, 160-192 µm. AR=0.54. Eyes bare, with little dorsomedian extension. 40-45 clypeals. Length of palpomeres 2-5: 40, 144, 158, 280 µm.

Thorax. 25-26 acrostichals, 10-12 dorsocentrals, 3-4 prealars, 8-10 scutellars.

Wing. Length 1653 µm (1640-1680), width 533 µm (520-560). VR=1.15 (1.06-1.16). Wing cells and veins covered by brown macrotrichia.



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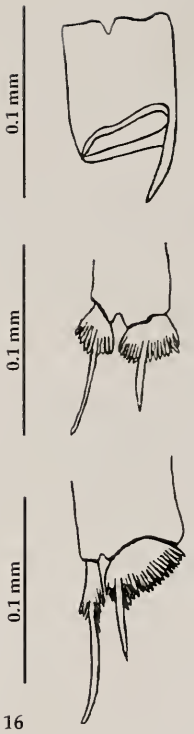

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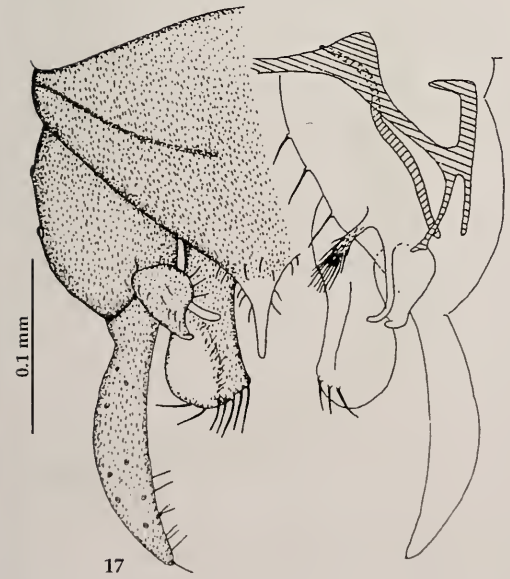

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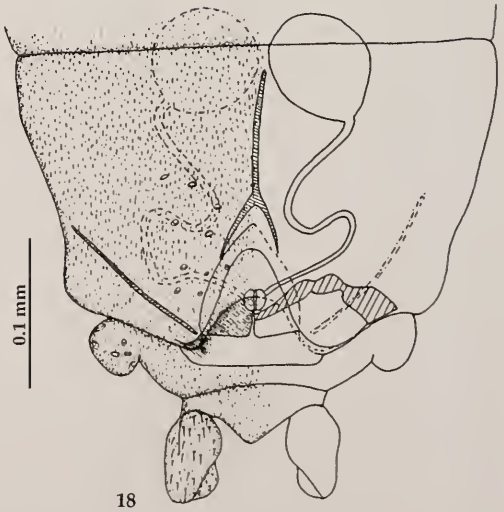

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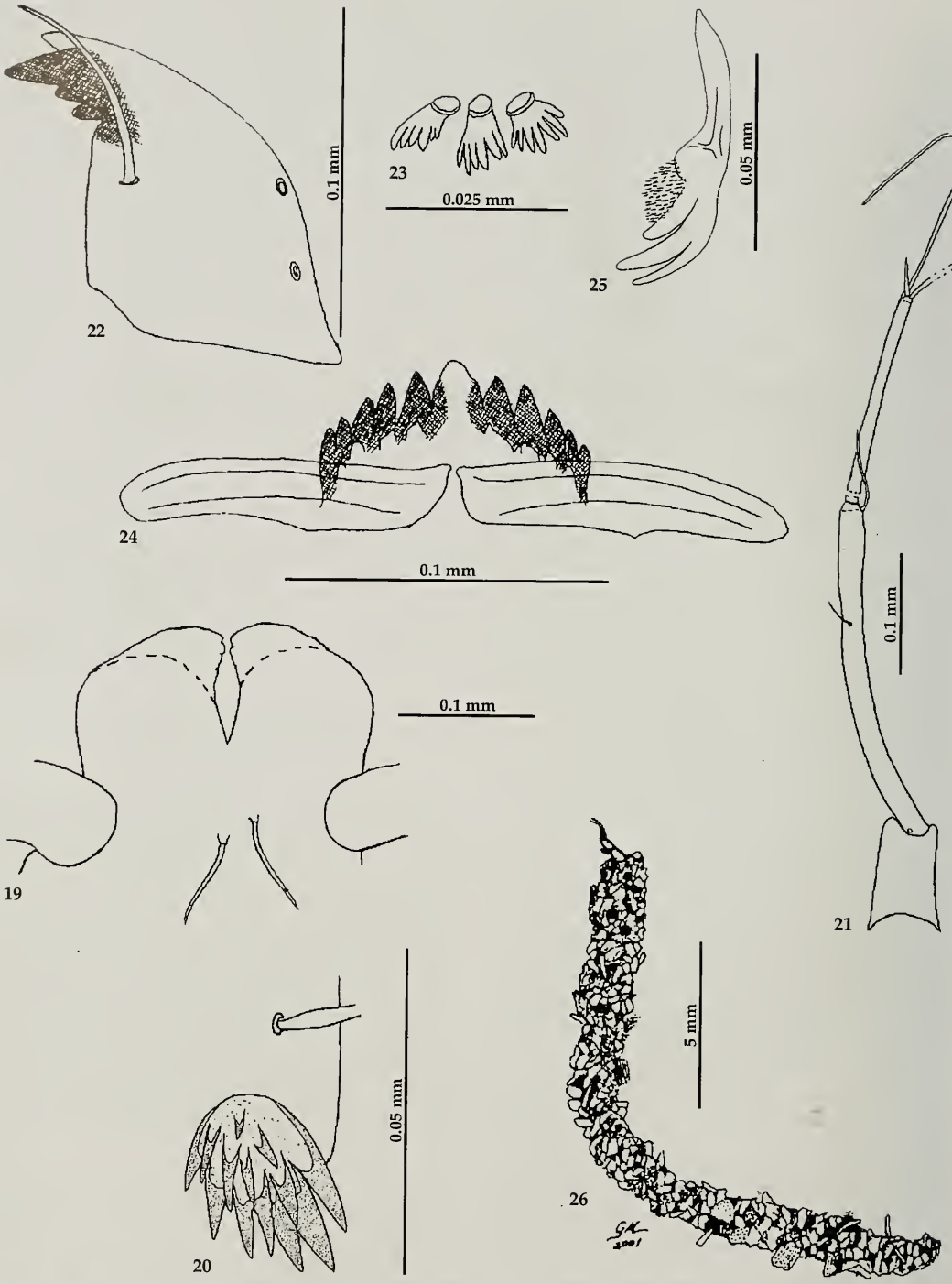
Figs 15-18. *Tanytarsus impar*, spec. nov. Male and female. **15.** General dorsal view. **16.** Tibial spur of fore, mid and hind legs. **17.** Hypopygium, dorsal. **18.** Female genitalia, dorsal.



Figs 19-26. *Tanytarsus impar*, spec. nov. Pupa and larva. **19.** Cephalic tubercles. **20.** Anal comb. **21.** Antenna. **22.** Mandible. **23.** Pecten epipharyngis. **24.** Mentum and ventromental plates. **25.** Premandible. **26.** Larval case.

Legs. Mid and hind tibia with unequal black spurs. Segment lengths (in µm) and proportions in Tab. 2B.

Genitalia (Fig. 18). Sternite VIII bearing 20-24 setae irregularly distributed on central area; floor under vagina narrow, posteromedian contour of SVIII V-shaped, forming an angle medially. GpVIII simple forming sharp angle, with short caudolateral microtrichia. Notum 2 times longer than free rami. Seminal capsule ovoid, length 75-80 µm, without neck. Spermathecal duct with loop. GcaVIII straight running diagonally to posterior corner of SVIII. GcIX with 6-7 setae. Tergite IX with about 20-24 biserial strong setae.

Pupa (exuviae). Abdominal length 2.92 mm (♂), 2.62 mm (♀). Pupal exuviae pale yellowish. Frontal apotome with conic cephalic tubercles bent inside and touching at apex; frontal seta near 80 µm (Fig. 19). Three precorneals (PC_{1-3}), two lateral antepronotals ($LAps_{1-2}$) and 2 widely separated pairs of dorsocentrals (DC_{1-4}) present. Wing sheath without nose and pearl row. Pedes spurii A absent; B present on segment II. Hook row about ⅔ width of segment II. Tergite I without shagreen. Tergite II with weak anterior band of fine shagreen. Tergites III to VI with anterior pair of oval patches of spines; VII and VIII bare. Posterolateral comb light brown (Fig. 20) with 6-7 marginal and 5-6 overlapping ventral teeth. Anal lobe well developed with complete fringe of ca 75-80 taeniae and 2 pairs of dorsal taeniae Abdominal setation: segments II-V with 3 L setae; VI with 3 lateral taeniae; VII-VIII with 4 lateral taeniae.

4th instar larvae (n=5). Total length about 7.0 mm. Color reddish.

Head. Width 283 µm (262-294), length 295 µm (277-307). IC=0.95. Antenna 5-segmented on long pedestal (Fig. 21); basal segment 304 µm (277-307), longer than flagellum, hardly bent outside, harder sclerotised than other antennal segments. Basal segment slightly longer than head length ($A_1/H=1.05$), with basal ring organ and small seta in distal ⅔; AR=1.28 (1.27-1.36); segment 2 lightly sclerotized near 8× longer than segment 3, with an unsclerotized band near proximal basis; lauterborn organs short mounted on long lightly sclerotized pedicels near 260 µm long. Clypeal setae S3 simple. SI comblike, bases fused; SII distally plumose, situated on long pedestal; SIII simple, seta-like; SIV present. Labral lamella well developed. Pecten epipharyngis with 3 distally serrated scales (Fig. 23). Premandible with three unequal teeth (Fig. 25); brush well developed. Mandible (Fig. 22) about 138 µm with pale dorsal tooth; apical and 2 inner teeth brown. Mentum (Fig. 24) 86 µm (80-92) large with pale median tooth slightly notched laterally; five pairs of brown lateral teeth decreasing in size laterally. Ventromental plates near 105 µm large touching medially.

Abdomen. Presence of a pair of large lateral tubules on posterior margin of the 7th abdominal segment. Anal tubules very long, near 1.0 mm, with median constriction curved down. Parapods with simple claws.

Etymology. From Latin *impar* (unique).

Ecological notes

The riparian zone of Fazzari spring presents several small pools, some temporary and others, that receive subterranean water exfiltration during dry season, are semi-permanents. The larvae of *T. magnus* and *T. impar* which construct robust cases from coarse detritus (Fig. 26), live on the detritus bed of these pools. The low rate of dissolved oxygen

Tab. 2. Leg segments of *Tanytarsus impar*, spec. nov. **A.** Male imago. **B.** Female imago.

		Fe	Ti	Ta_1	Ta_2	Ta_3	Ta_4	Ta_5	LR
A	PI	1071	526	1320	743	589	461	200	2.51
		1040-1600	465-585	1200-1395	675-795	540-630	420-510	180-210	2.38-2.58
	PII	942	774	484	257	183	114	74	0.63
		870-1000	690-825	440-525	225-285	160-210	90-120	60-80	0.62-0.64
	PIII	1116	944	649	415	370	237	111	0.69
		975-1200	840-1040	585-720	360-440	315-440	180-280	90-120	0.67-0.70
B	PI	1065	545	1375	725	590	455	210	2.52
		1060-1080	495-600	1320-1410	705-750	555-615	435-480	195-225	2.35-2.66
	PII	905	780	430	215	165	95	60	0.55
		885-945	765-810	405-465	180-240		90-105		0.53-0.57
	PIII	1055	905	595	360	335	200	95	0.65
		1020-1095	885-930	585-600	345-375	315-345	195-210	90-105	0.64-0.66

($< 2.0\ mg \cdot l^{-1}$), the low depth (10-20 cm) and the coarse detritus substrate formed by decomposing leaves, fruits, and brushwoods (Roque & Trivinho-Strixino 2001), joined to its instability (some may disappear at the end of dry season) and seem the main environmental characteristics of these pools. The possession of the lateral tubules on posterior margin of the 7th abdominal segment of the larvae may be an adaptation to live in these instable pools.

Adult emergence of both species shows a seasonal pattern that follows the regional climatic conditions, with higher numerical densities at the end of dry season (September) when the pools are nearly dried. During the wet season (October – March) the number of emerged adults is lower, with few individuals collected by emergence trap. This pattern of emergence, different to other species of Chironomidae of this region (Trivinho-Strixino & Strixino 2000, Sonoda & Trivinho-Strixino 2000), may be related to the intermittent feature of the majority of pools in the area which practically dry out during the winter months. The mass emergence prior to the end of dry season enable the species to colonize other pools beside the main bed of the Fazzari stream where the exfiltration process of the ground water prevent the total drainage of the system.

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