Zootaxa 3980 (1): 127–135
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3980.1.7
http://zoobank.org/urn:lsid:zoobank.org:pub:9BD41479-0B77-4F50-9ED2-5361C049CE3F

A contribution to the systematics of Australasian Tanytarsini (Diptera: Chironomidae): first descriptions from New Caledonia

WOJCIECH GIŁKA[1,4] & ROLAND DOBOSZ[2,3]

[1]*University of Gdańsk, Department of Invertebrate Zoology and Parasitology, Wita Stwosza 59, 80–308 Gdańsk, Poland*
[2]*Upper Silesian Museum, Natural History Department, Sobieskiego 2, PL 41-902 Bytom, Poland*
[3]*University of Silesia, Faculty of Biology and Environmental Protection, Department of Zoology, Bankowa 9, 40-007 Katowice, Poland*
[4]*Corresponding author. E-mail: wojciech.gilka@biol.ug.edu.pl*

Abstract

First specific records of chironomids of the tribe Tanytarsini from New Caledonia based on detailed descriptions of new species are presented. *Cladotanytarsus* (*Cladotanytarsus*) *stylifer* **sp. nov.** and its closest relatives, *i.a. Cladotanytarsus* (*C.*) *isigacedeus* (Sasa *et* Suzuki, 2000), **comb. nov.**, known from males bearing extraordinarily elongate hypopygial anal points are diagnosed. *Paratanytarsus mirificus* **sp. nov.** is described as adult male with unique structure of its hypopygium and shortened antennae. Diagnostic description of *Tanytarsus fuscithorax* Skuse, 1889 is also complemented.

Key words: Diptera, Chironomidae, Tanytarsini, systematics, new taxa, New Caledonia

Introduction

In contrast to the well known chironomid fauna of the Australian mainland, published data on dipterans of this family from New Caledonia are scarce and mainly based on determinations to the genus level or taxa of higher rank. So far no specific records of Tanytarsini, except that concerning the cosmopolitan marine species, *Pontomyia natans* Edwards, 1926 (Huang *et al*. 2014), have been published from New Caledonia. The data coming from this island are mostly unspecified and/or not confirmed records of selected genera, *i.e. Rheotanytarsus* and *Tanytarsus*, or information on widespread presence of Chironomidae and/or Tanytarsini (Williams 1944, Starmühlner 1986, Mary & Marmonier 2000, Mary 2002). Thereby we present first detailed descriptions of new tanytarsine species of the genera *Cladotanytarsus* and *Paratanytarsus*, recently collected in New Caledonia.

Material and methods

The material is a small part of insect collections taken by the second author during Polish expeditions of the Department of Natural History, Upper Silesian Museum in Bytom, the Museum of Natural History, University of Wrocław and the Department of Biosystematics, University of Opole to New Caledonia in 2004-2008. All the chironomid specimens, including Tanytarsini were sampled after dusk at artificial light using a lamp powered by portable generator. The collected individuals were preserved in 70-75% ethanol, dissected and slide-mounted according to the method adjusted for tiny chironomids (Wirth & Marston 1968, Giłka & Paasivirta 2009). Measurements are in µm; lengths of leg segments and palpomeres were rounded off to the nearest 5 and 1 µm respectively; the antennal, leg and venarum ratios (AR, LR, VR) were calculated to the second decimal place. The morphological terminology and abbreviations follow Sæther (1980). The photographs were taken using the Nomarski DIC and LAS Montage multifocus with a Leica DM6000. The type specimens are booked to be deposited in the Muséum national d'Histoire naturelle, Paris, France.

Accepted by B. Rossaro: 3 Jun. 2015; published: 26 Jun. 2015

Systematics

Family: Chironomidae Newman, 1834

Subfamily: Chironominae Newman, 1834

Tribe: Tanytarsini Zavřel, 1917

Subtribe: Tanytarsina Zavřel, 1917

Genus: *Cladotanytarsus* Kieffer, 1921

Subgenus: *Cladotanytarsus s. str.* Kieffer, 1921

***Cladotanytarsus* (*Cladotanytarsus*) *stylifer* sp. nov., Giłka**
(Figures 1 and 4A)

Type material. Holotype, adult male: NEW CALEDONIA, La Roque river (south of Poindimié), 30 m a.s.l., 20°56'23.06" S / 165°21'18.77" E, 6 April 2008, at light, leg. R. Dobosz.

Derivation of the name. The specific epithet (bearing stylus) refers to the strongly elongate styliform hypopygial anal point.

Diagnosis. Anal point styliform, slender and strongly elongate, evenly tapering towards narrowly rounded apex, bearing few spinulae at base and slender crests almost reaching the tip. Superior volsella pear-shaped, with field of microtrichia on proximal half. Digitus extending far beyond superior volsella, apically pointed. Stem of median volsella stout, with 3 strong furcate lamellae. Inferior volsella with distinct lateral knee-like extension at base.

Description. ***Adult male.*** Small midge, wing length 1065 µm.

Colouration. Eyes black. Tentorium transparent. Head capsule, antennal flagellum, mouthparts, ground colour of thorax, legs and abdomen greenish yellow/pale brown. Wing transparent, with yellowish undertone. Antennal pedicel, scutal stripes, scutellum, postnotum and sternum brown to dark brown.

Head. Eyes reniform, broadly separated. Antenna with 13 flagellomeres, AR 0.62; plume fully developed. Frontal tubercles conical, minute, c. 3 µm long. Lengths of palpomeres 2–5 (in µm): 35, 77, 93, 155. Clypeus semicircular, with 14 setae.

Thorax chaetotaxy. Ac 10, Dc 7, Pa 1, Scts 4.

Wing. Shape, venation pattern and chaetotaxy typical for the genus, as shown in Fig. 4A.

Legs. Fore leg tibia with slightly curved spur, c. 15 µm long. Combs of mid and hind leg tibiae separated, composed of teeth up to 10 µm long. Mid leg tibia with two spurs: one spur darkly pigmented, straight, c. 15 µm long, second spur lightly pigmented, sinuous, c. 20 µm long; hind leg tibia with single dark straight spur, c. 10 µm long. Basitarsus of mid leg with 2 hook-shaped sensilla chaetica. For lengths of leg segments and leg ratios see Table 1.

TABLE 1. Leg segment lengths (µm) and leg ratios of male *Cladotanytarsus* (*C.*) *stylifer* **sp. nov.**

	fe	ti	ta_1	Ta_2	ta_3	ta_4	ta_5	LR
p_1	525	255	675	330	250	185	-	2.65
p_2	530	435	250	130	90	65	60	0.57
p_3	535	535	365	215	185	120	80	0.68

Hypopygium (Fig. 1). Gonostylus shorter than gonocoxite, c. µm 60 long, broadest at base, apically rounded. Anal tergite with V-type separated bands and several (5) median setae. Anal point styliform, slender and strongly elongate, evenly tapering towards narrowly rounded apex, bearing few (4) spinulae at base and slender crests almost reaching the tip of anal point (Fig. 1A, B). Superior volsella slender pear-shaped, broadest at base, narrowed

FIGURE 1. *Cladotanytarsus* (*C.*) *stylifer* **sp. nov.**, male. **A**—hypopygium, **B**—anal point, **C**—median volsella, **D**—inferior volsella and stem of median volsella (B–D—magnified c. 2 times relative to A).

in distal half and slightly swollen apically, bearing field of microtrichia on proximal half, 5 dorsal setae and 3 long setae placed on conical tubercles at base. Digitus straight or slightly curved, long, extending far beyond superior volsella, apically pointed (Fig. 1A). Stem of median volsella stout, c. 30 μm long, slightly curved and posteromedially directed, bearing several setiform and 3 strong furcate lamellae (Fig. 1C, D). Inferior volsella broadest at base, tapering towards apex, with distinct lateral knee-like extension at base and slightly protruding dorsomedian ridge near apex, evenly curved posteromedially (Fig. 1D).

Remarks. At least three morphologically close relatives known from the Australasian and Indo-Pacific Regions should be compared with *Cladotanytarsus stylifer* to prevent misidentification, *i.e.*: *C. bilinearis* Glover, 1973 (South Australia, Queensland), *C. conversus* (Johannsen, 1932) (southern China, India, Indonesia, Thailand; also Europe) and *C. isigacedeus* (Sasa *et* Suzuki, 2000) (Japan, Ishigaki) (Glover 1973, Langton & Garcia 2000, Sasa & Suzuki 2000); the latter species originally ascribed to *Tanytarsus* and here given in new combination. Adult males of all these species have the similar strongly elongate hypopygial anal point, but the length/shape of the gonostylus, frontal tubercles, the arrangement of spinulae, the shape of hypopygial volsellae and main metric characters allow to separate them, as shown in Table 2. The males of other *Cladotanytarsus* species known from somewhat similar structure of hypopygium are also European *C. cyrylae* Giłka, 2001, *C. nigrovittatus* (Goetghebuer, 1922), and *C. sagittifer* Giłka, 2009 described from the Arabian Peninsula; however, except the anal point length or its general shape they differ distinctly from species compared above and can be easily determined (*cf.* Giłka 2009, 2011).

TABLE 2. Diagnostic characters for identification of *Cladotanytarsus* (*C.*) *stylifer* **sp. nov.** and three morphologically close species: *C.* (*C.*) *bilinearis* Glover, 1973, *C.* (*C.*) *conversus* (Johannsen, 1932) and *C.* (*C.*) *isigacedeus* (Sasa *et* Suzuki, 2000); compiled from Glover (1973), Langton & Garcia (2000), Sasa & Suzuki (2000), photographs available online in the Type Specimen Database of the National Museum of Nature and Science (Tokyo), and the material presently examined.

character/species	*C.* (*C.*) *bilinearis*	*C.* (*C.*) *conversus*	*C.* (*C.*) *isigacedeus*	*C.* (*C.*) *stylifer*
Wing length (mm)	1.2–1.6	1.2–1.95	1.10–1.21	1.06
AR	0.84–1.05	0.71–1.22	0.65–0.72	0.62
LR_1	2.2–2.7	1.80–2.35	2.28–2.37	2.65
FT length (μm)	?	6–24	23	3
Gs/Gc length proportion	subequal	subequal	Gs < Gc	Gs < Gc
AP shape	styliform	club-shaped	styliform	styliform
AP spinulae	absent	at base of AP or absent	at base of AP and between crests	at base of AP
SVo	"more slender distally"	± horn-shaped, apex blunt or pointed	± horn-shaped, apex rounded	pear-shaped, slender, apex rounded
SVo microtrichia	?	absent or very sparse at base of SVo	at base of SVo	on proximal half of SVo
IVo	apical part posteromedially turned	apical part posteromedially turned	nearly straight	evenly curved, with lateral knee-like extension at base

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

Paratanytarsus mirificus sp. nov., Giłka

(Figures 2 and 4B)

Type material. Holotype, adult male: NEW CALEDONIA, Yaté, on river, 8 m a.s.l., 22° 9'17.39" S / 166°55'30.17" E, 3 March 2008, at light, leg. R. Dobosz.

Derivation of the name. The specific epithet (peculiar, quaint) refers to the extraordinary structure of the hypopygium and the antenna.

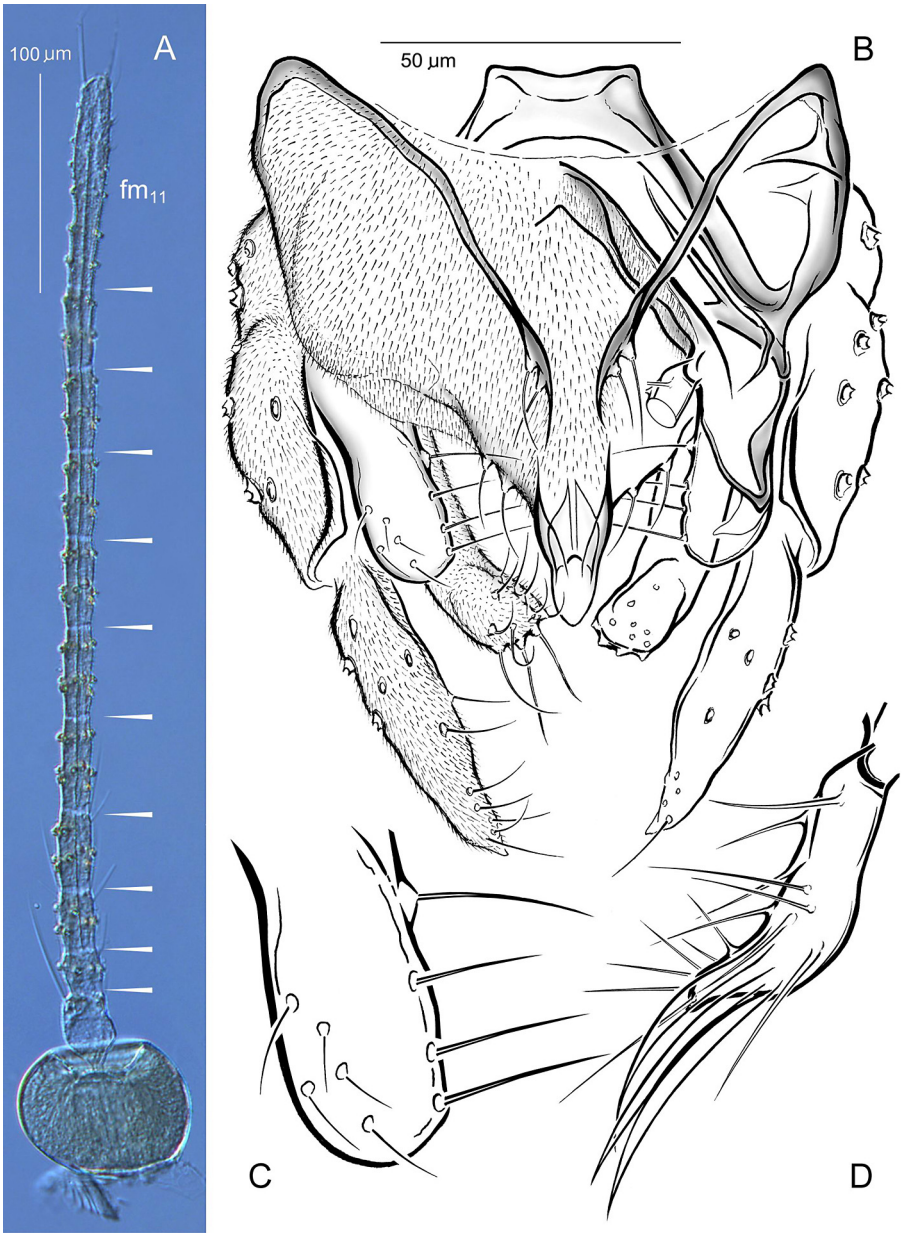

FIGURE 2. *Paratanytarsus mirificus* **sp. nov.**, male. **A**—antenna (white arrows: borders between flagellomeres, fm_{11}: ultimate 11th flagellomere), **B**—hypopygium, **C**—superior volsella, **D**—median volsella (C, D—magnified c. 2 times relative to B).

Diagnosis. Antenna short, with 11 flagellomeres, AR 0.24. Gonostylus shorter than gonocoxite, slender, with long subapical seta and pointed protuberance on apex. Superior volsella robust, roundish, with strong setae on median margin. Stem of median stout, slightly S-shaped, with bunch of subulate lamellae at apex and erect setiform lamellae on median margin.

Description. ***Adult male.*** Minute midge, wing length 885 µm.

Colouration. Eyes black. Tentorium transparent. Head capsule, antenna, mouthparts, ground colour of thorax, legs and abdomen greenish yellow/pale brown. Wing transparent with yellowish undertone. Scutal stripes, scutellum, postnotum and sternum light brown.

Head. Eyes with well developed dorsomedian extensions gradually narrowing from 5 facets at base to 4, 3 and 2 facets medially. Antenna short, with 11 well discernible flagellomeres, ultimate flagellomere slightly swollen apically, short (97 µm), AR 0.24; plume composed of long sparse setae (broken and missing on Fig. 2A). Frontal tubercles conical, minute, c. 5 µm long. Lengths of palpomeres 2–5 (in µm): 24, 52, 64, 115. Clypeus semicircular, with 15 setae.

Thorax chaetotaxy. Ac 10, Dc 6–7, Pa 2, Scts 4.

Wing. As shown in Fig. 4B. FCu far distal of RM, VR_{Cu} c. 1.65.

Legs. Fore leg tibia with straight spur, 12 μm long. Combs of mid and hind leg tibiae slightly separated, small, composed of teeth up to 8 μm long. Mid and hind leg tibiae each with two straight spurs of subequal length c. 15 μm. Basitarsus of mid leg with 1 hook-shaped sensillum chaeticum. For lengths of leg segments and leg ratios see Table 3.

TABLE 3. Leg segment lengths (μm) and leg ratios of male *Paratanytarsus mirificus* **sp. nov.**

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR
p_1	425	265	490	230	175	130	80	1.85
p_2	445	300	185	80	65	50	45	0.62
p_3	490	370	250	145	130	75	50	0.68

Hypopygium (Fig. 2B–D). Gonostylus shorter than gonocoxite, c. 55 μm long, straight and slender, distinctly narrowed in distal part, with long subapical seta and pointed protuberance on apex. Anal tergite with darkly pigmented separated bands of V-type, each band bearing 2 setae placed on well developed conical tubercles, lateral teeth absent. Anal point stout, broad at base, slightly narrowed subapically, apex blunt; broad flake-shaped crests arranged typically for *Paratanytarsus* and separated by subapical knob, 2 long lateral setae placed on each side of anal point (Fig. 2B). Superior volsella robust, roundish, slightly elongate and posteromedially directed, bearing 4 strong setae on median margin (including the strongest seta placed on distinct tubercle at base) and several (5) dorsal setae in posterolateral position (Fig. 2B, C). Digitus semitransparent, short, subtriangular, with tip pointed (Fig. 2B). Stem of median stout, swollen at base, broadest at mid length, narrowed distally, slightly S-shaped, bearing bunch of subulate lamellae at apex and erect setiform lamellae on median margin (Fig. 2D). Inferior volsella reaching half length of gonostylus, with apical part slightly swollen and posteromedially turned (Fig. 2B).

Remarks. According to traditional diagnoses for *Paratanytarsus* based on Holarctic species (*e.g.* Cranston *et al*. 1989), adult males of this genus have 13 antennal flagellomeres, separated mid and hind leg tibial combs, each with spur, V-shaped anal tergite bands, and the best diagnostic character found in majority of species is the shape of hypopygial crests - curved, flake-shaped, giving a rounded appearance. However, recent discoveries of several unusual species resulted in emendations to that definition (*e.g.* Giłka 2009, Bolton *et al*. 2010, Trivinho-Strixino 2010). The abbreviated antenna composed of 11 flagellomeres, the extremely low AR and the robust roundish superior volsella found in the adult male of *Paratanytarsus mirificus* are further unique characters indicating the great heteromorphism in this genus.

Genus: *Tanytarsus* van der Wulp, 1874

Tanytarsus fuscithorax Skuse, 1889

(Figures 3 and 4C)

Material examined. NEW CALEDONIA, Nouméa, Magenta, 22°15’47.79” S / 166°28’0.81” E, 23 February 2008, at light, 1 adult male, leg. R. Dobosz.

Diagnostic description. ***Adult male.*** Wing length 1290 μm. AR 0.91. Frontal tubercles c. 15 μm long. Lengths of palpomeres 2–5 (in μm): 40, 103, 127, 206. Clypeus with 18 setae. Ac 17, Dc 9, Pa 1, Scts 6. Shape of wing, venation pattern and chaetotaxy typical for the genus, as shown in Fig. 4C. Combs of mid and hind leg tibiae composed of teeth up to 15 μm long, each comb with spur: longer spur bent subapically (c. 30 μm and 40 μm long on mid and hind leg tibia, respectively), shorter spur straight (c. 20 μm and 35 μm long on mid and hind leg tibia respectively). Basitarsus of mid leg with 5–6 hook-shaped sensilla chaetica. For lengths of leg segments and leg ratios see Table 4. Hypopygium as figured by Glover (1973, fig. 46a–d), Ekrem (2001, figs 25–27), and as shown in Fig. 3.

Remarks. The species was redescribed in detail by Ekrem (2001), thus only additional illustrations are presented here. The examined male fits well the proposed combination of diagnostic characters (op. cit.) having well developed frontal tubercles, a single median seta and extensive microtrichia free area around anal point, large

oval spinulae arranged in row between well developed crests, oval and bare superior volsella with a distinct lip, and no digitus; foliate lamellae of the median volsella are folded and overlapping in natural position, as shown in Fig. 3C. This eurytolerant species is probably widely distributed in Australasia and in the Oriental region (op cit.).

TABLE 4. Leg segment lengths (μm) and leg ratios of male *Tanytarsus fuscithorax* Skuse, 1889.

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR
p_1	675	355	875	450	315	270	125	2.46
p_2	700	565	340	175	125	95	65	0.60
p_3	715	690	-	-	-	-	-	-

Acknowledgements

We thank Peter S. Cranston (Australian National University, Canberra) and Torbjørn Ekrem (NTNU Vitenskapsmuseet, Trondheim) for information on Australasian Tanytarsini. The second author expresses his sincere thanks to Anne-Claire Goarant and David Paulaud (Direction de l'Environnement, Province Sud) and Jean-Jérome Cassan (Direction du Developpement Economique et de l'Environnement, Province Nord) for the permits to collect material in New Caledonia. The following persons are thanked for their help in the field work: Christian Mille and Sylvie Cazeres (IAC, Pocquereux), Hervé Jourdan (IRD, Nouméa), Martin Brinkert (Forestry, Poindimié). Jörn Theuerkauf, Paweł Krzyżyński, Marek Wanat, Tomasz Blaik are thanked for their great logistic help, advice, and nice company during field expeditions. Special thanks are directed to Berthold Janecek and Wolfram Graf (Institut für Hydrobiologie und Gewässermanagement, Vienna) for kindly providing the first author with specimens of *Cladotanytarsus conversus*—the comparative material used in this study.

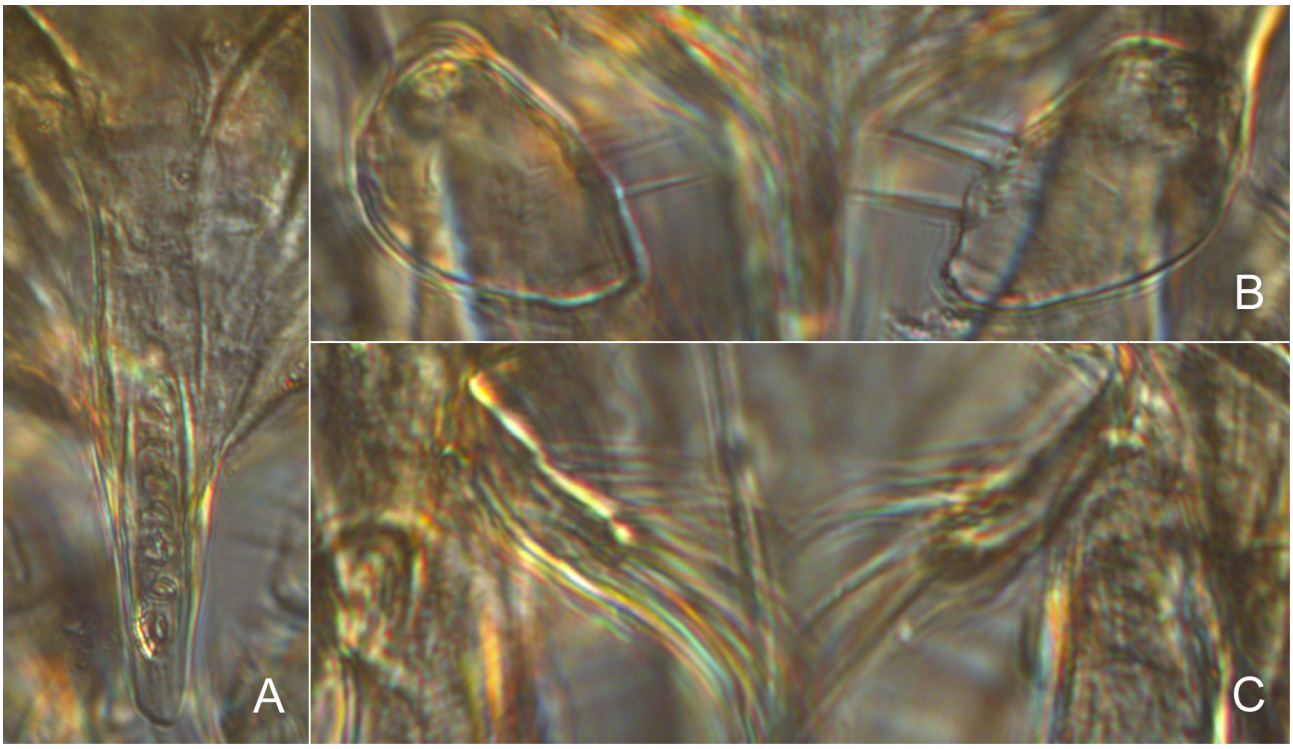

FIGURE 3. *Tanytarsus fuscithorax* Skuse, 1889, male. **A**—hypopygial anal point, **B**—superior volsellae, **C**—median volsellae.

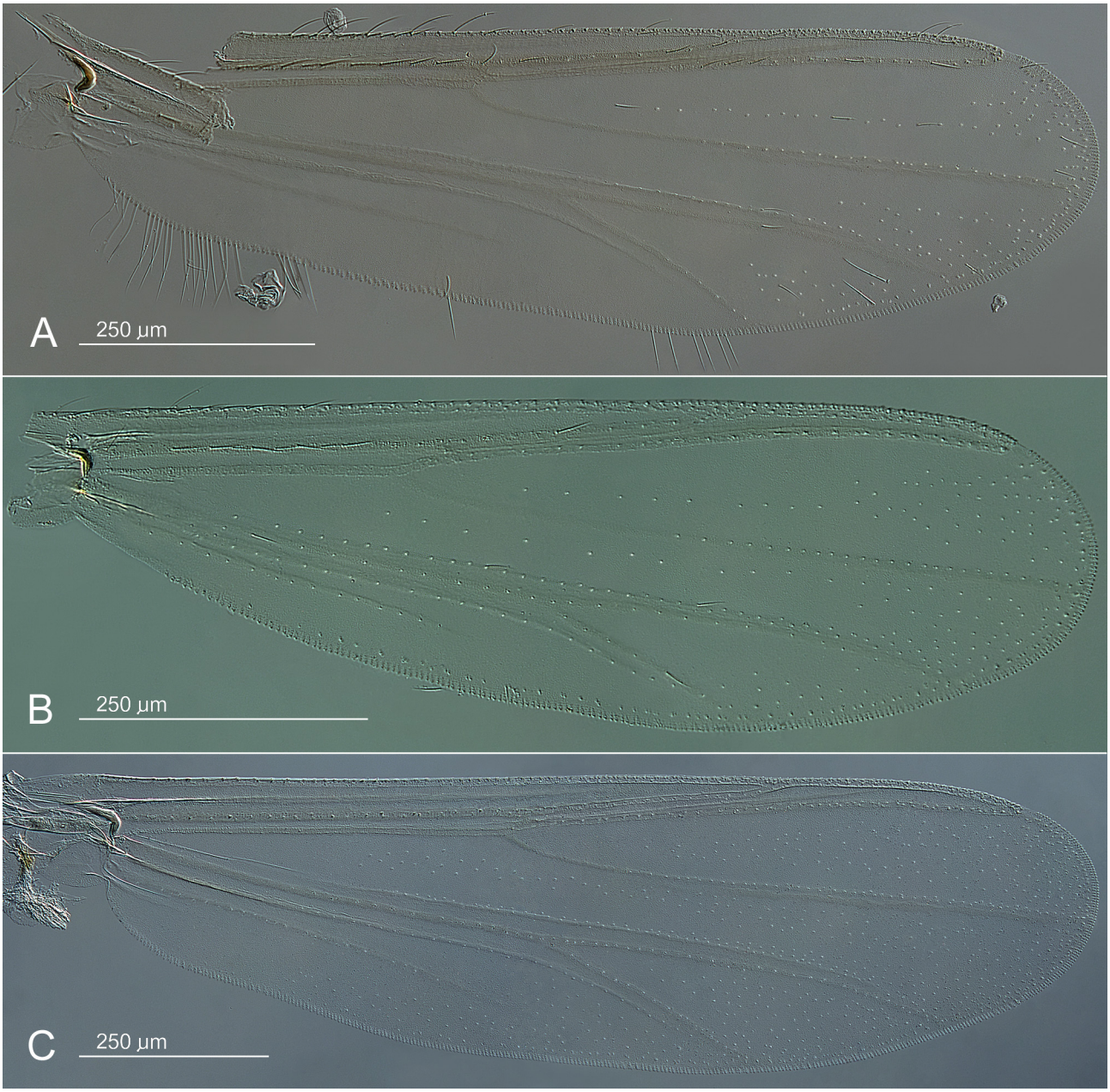

FIGURE 4. Wing of male: *Cladotanytarsus* (*C.*) *stylifer* **sp. nov.** (**A**), *Paratanytarsus mirificus* **sp. nov.** (**B**), *Tanytarsus fuscithorax* Skuse, 1889 (**C**).

References

Bolton, M.J., Ekrem, T., Sublette, J.E. & Sublette, M.F. (2010) A new species of *Paratanytarsus* Thienemann and Bause (Diptera: Chironomidae) with unusual larval and adult male morphology. *In*: Ferrington, L.C. Jr. (Ed.), *Proceedings of the XV International Symposium on Chironomidae*. Chironomid Group, University of Minnesota, Saint Paul, Minnesota, pp. 262–271.

Cranston, P.S., Dillon, M.E., Pinder, L.C.V. & Reiss, F. (1989) 10. The adult males of Chironominae (Diptera: Chironomidae) of the Holarctic region—Keys and diagnoses. *Entomologica scandinavica*, 34 (Supplement), 353–502.

Ekrem, T. (2001) Diagnoses and immature stages of some Australian *Tanytarsus* van der Wulp (Diptera: Chironomidae). *Australian Journal of Entomology*, 40, 312–325.
http://dx.doi.org/10.1046/j.1440-6055.2001.00246.x

Giłka, W. (2009) Order Diptera, family Chironomidae, tribe Tanytarsini. *In*: Sheikh Tahnoon Bin Zayed Al Nahyan, H.H. & van Harten, A. (Patron & Editor), *Arthropod fauna of the United Arab Emirates*. *Vol. 2.* Dar Al Ummah Printing,

Publishing, Distribution & Advertising, Abu Dhabi, UAE, pp. 667–682.
Giłka, W. (2011) *Ochotkowate - Chironomidae, plemię: Tanytarsini, postaci dorosłe, samce. Klucze do oznaczania owadów Polski. [Non-biting midges - Chironomidae, tribe Tanytarsini, adult males. Keys for the Identification of Polish Insects]. No 177. Part XXVIII, Muchówki - Diptera, Issue 14b. Polskie Towarzystwo Entomologiczne*. Biologica Silesiae, Wrocław, 95 pp. [in Polish]
Giłka, W. & Paasivirta, L. (2009) Evaluation of diagnostic characters of the *Tanytarsus chinyensis* group (Diptera: Chironomidae), with description of a new species from Lapland. *Zootaxa*, 2197, 31–42.
Glover, B. (1973) The Tanytarsini (Diptera: Chironomidae) of Australia. *Australian Journal of Zoology*, supplement number 23, 403–478.
http://dx.doi.org/10.1071/AJZS023
Huang, D., Cranston, P.S. & Cheng, L. (2014) A complete species phylogeny of the marine midge *Pontomyia* (Diptera: Chironomidae) reveals a cosmopolitan species and a new synonym. *Invertebrate Systematics*, 28, 277–286.
http://dx.doi.org/10.1071/IS13059
Langton, P. & Garcia, X.-F. (2000) A review of *Cladotanytarsus conversus* (Johannsen) with first record from Europe (Insecta, Diptera, Chironomidae). *Spixiana*, 23, 199–206.
Mary, N. (2002) Spatio-temporal variations in macroinvertebrate assemblages of New Caledonian streams. *Bulletin Français de la Pêche et de la Pisciculture*, 364, 197–215.
http://dx.doi.org/10.1051/kmae:2002011
Mary, N. & Marmonier, P. (2000) First survey of interstitial fauna in New Caledonian rivers: influence of geological and geomorphological characteristics. *Hydrobiologia*, 418, 199–208.
http://dx.doi.org/10.1023/A:1003938629671
National Museum of Nature and Science, Tokyo. *Type Specimen Database.* Available from: http://www.type.kahaku.go.jp/TypeDB/ (accessed 4 May 2015)
Sæther, O.A. (1980) Glossary of chironomid morphology terminology (Diptera: Chironomidae). *Entomologica scandinavica*, 14 (Supplement), 1–51.
Sasa, M. & Suzuki, H. (2000) Studies on the chironomid species collected on Ishigaki and Iriomote islands, Southwestern Japan. *Tropical Medicine*, 42, 1–37.
Starmühlner, F. (1986) Checklist of the fauna of mountain streams of tropical Indopacific Islands. *Annales Naturhistorisches Museum Wien*, 88/89, 457–480.
Trivinho-Strixino, S. (2010) Two new species of *Paratanytarsus* (Diptera: Chironomidae) from southeast of Brazil. *Zootaxa*, 2726, 59–67.
Williams, F.X. (1944) Biological studies in Hawaiian water-loving insects. Part III. Diptera or flies D. Culicidae, Chironomidae and Ceratopogonidae. *Proceedings of the Hawaiian Entomological Society*, 12, 149–180.
Wirth, W.W. & Marston, N. (1968) A method for mounting small insects on microscope slides in Canada balsam. *Annals of the Entomological Society of America*, 61, 783–784.