

## Six new *Tanytarsus* species from Ghana, West Africa

(Insecta, Diptera, Chironomidae)

Torbjørn Ekrem

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In this study, the male adults of six new *Tanytarsus* species, all with spines between the anal crests on the hypopygium, are described. The new species *Tanytarsus kakumensis*, *T. pseudocongrus*, *T. saetheri*, *T. spiesi*, *T. superpenicillatus* and *T. tossai* are all recorded from Ghana, West Africa. *T. superpenicillatus* is also recorded from Tanzania. The study greatly increases the number of known *Tanytarsus* species from the Afrotropical region. An attempt to place the new species in the already existing European species-groups is shown to be difficult.

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### Introduction

The genus *Tanytarsus* v.d. Wulp 1874, is one of the most species rich genera in the family Chironomidae as a whole, and definitely the largest genus of the tribe Tanytarsini. Twentyfour species are previously registered from the Afrotropical region (Freeman & Cranston 1980), but only 11 of these have spines between their anal crests (Freeman 1958, Lehmann 1979, 1981). During the work of reviewing the Afrotropical *Tanytarsus* *eminulus*, *gregarius*, *mendax* and *lugens* groups, six new species were discovered in the material collected by the NUFU (The Norwegian Universities' Committee for Development Research and Education) project in Ghana. The new species are described below.

### Material, methods and morphology

The mounting procedure used is described by Sæther (1969). Morphological nomenclature follows Sæther (1980) with the corrections given by Sæther (1990). The different ratios and lengths measurements on legs and antennae, are taken as described by Schlee (1966), but calculated for all legs and given as ranges. All other measurements are given as full lengths or widths. The attachment of the anal point on the anal tergite is interspecific variable and often hard to distinguish without a lateral view of the hypopygium. Therefore, the anal point length is given as the length from the anterior begin of the anal crests to the apex of the anal point.



## Localities

### Ghana

Agumatsa Waterfalls, Wli, is located in the north-western part of the Volta region close to the Togo border. The upper part of the river at about 450 meters above sea level, has two large cascades and is rather fast flowing with stones and gravel as bottom substrate. Further down (225-335 meters elevations), the river runs more slowly and the bottom material consists of sand and mud. According to Hall & Swaine (1981) the forests in the area belong to the Dry Semi-Deciduous Fire Zone Subtype. Mean annual rainfall exceeds 1500 mm especially in the higher hills in the Volta Region (Hall & Swaine 1981).

Ankasa Game Production Reserve (5°17'N, 2°35'W), is a tropical rainforest consisting of wet evergreen forest. The low-land reserve (60-80 meters above sea level) is situated in the south-west part of the country at the border to Côte d'Ivoire. Annual rainfall is about 1750-2000 mm, and the area is rich in both fast and slow flowing rivers and streams. The forest canopy rarely exceeds 40 meters and is floristically very rich with a high diversity of species.

Boti Waterfalls (6°12'N, 0°14'W) is located north-west of the capital Accra and the small reserve covers an area of only 1.3 square km (0.5 square miles) at about 300 meters elevation. The river is fast flowing also below the waterfall, and the river substratum consists typically of sand, gravel and larger rocks. The area has a moist semi-deciduous south-east subtype forest (Hall & Swaine 1981). This forest type is dominated by tall evergreen trees with heights up to 60 meters and a discontinuous canopy. Annual rainfall is typically between 1200 and 1800 mm.

Kakum Forest Reserve (5°26'N, 1°19'W) is quite large, 212.4 square km (82.1 square miles) and has an altitude of about 150 meters. The dominating forest type is moist evergreen forest. The tallest trees are on average 43 meters. Deciduous trees form only a small portion of the forest canopy (less than 20 %) (Hall & Swaine 1981). The area is hilly with numerous small streams draining into the Kakum River. The water current is usually slow, and the substrate varies from silt and sand to gravel and stones. Annual rainfall is between 1200 and 1800 mm.

Subri Stream (6°11'N, 0°31'W) near Kibi. The collection site is located within the upland evergreen forest, which occurs in the isolated hill ranges (500-750 m elevations) in the area. The hills are steep with flat summits. Reduced temperatures, high rainfall and mistiness is typical of the area. The forests are very uneven, thickets, swamps and grassland alternates with patches of closed canopy. The soils which are rich in clays are too shallow to support large trees, and the largest trees rarely exceeds 45 meters (Hall & Swaine 1981).

### Tanzania

Kaputu Stream, Mazumbai Forest Reserve, West Usambara Mts. is located in North-East Tanzania. The stream originates at 1860 meters above sea level and flows through nearly undisturbed evergreen montane forest down to the collection site at about 1400 meters where it ends in a marshy area. The substrate at the collection site is composed of fine sand, mud and larger stones. The stable coastal climate supports one of the oldest forests in Africa, which is one of the most interesting endemic centres in Africa (Andersen & Johanson 1992).

### *Tanytarsus kakumensis*, spec. nov.

Fig. 1

**Type material.** Holotype: ♂, abdomen, wings and legs, Ghana, Central Region, Kakum Forest Reserve, Malaise trap, 8-18.XI.1994. – Paratype: 1♂, as holotype. All type material in Museum of Zoology, Bergen, Norway (ZMBN Type No. 304).

**Etymology.** The new species is named after its type locality Kakum Forest Reserve.

**Diagnosis.** *T. kakumensis*, spec. nov. is separable from other *Tanytarsus* species by the following combination of characters on the hypopygium: Relatively long anal point; several spines between well developed anal crests; tergite bands separated, reaching anal crests; superior volsella simple without a higher "plateau", with 5 dorsal setae, 2 median setae; digitus minute; median volsella well developed with branched lamellae apically in addition to several strong setose lamellae on basal half; inferior volsella with only a few dorsomedian microtrichia; gonostyli extraordinary short.



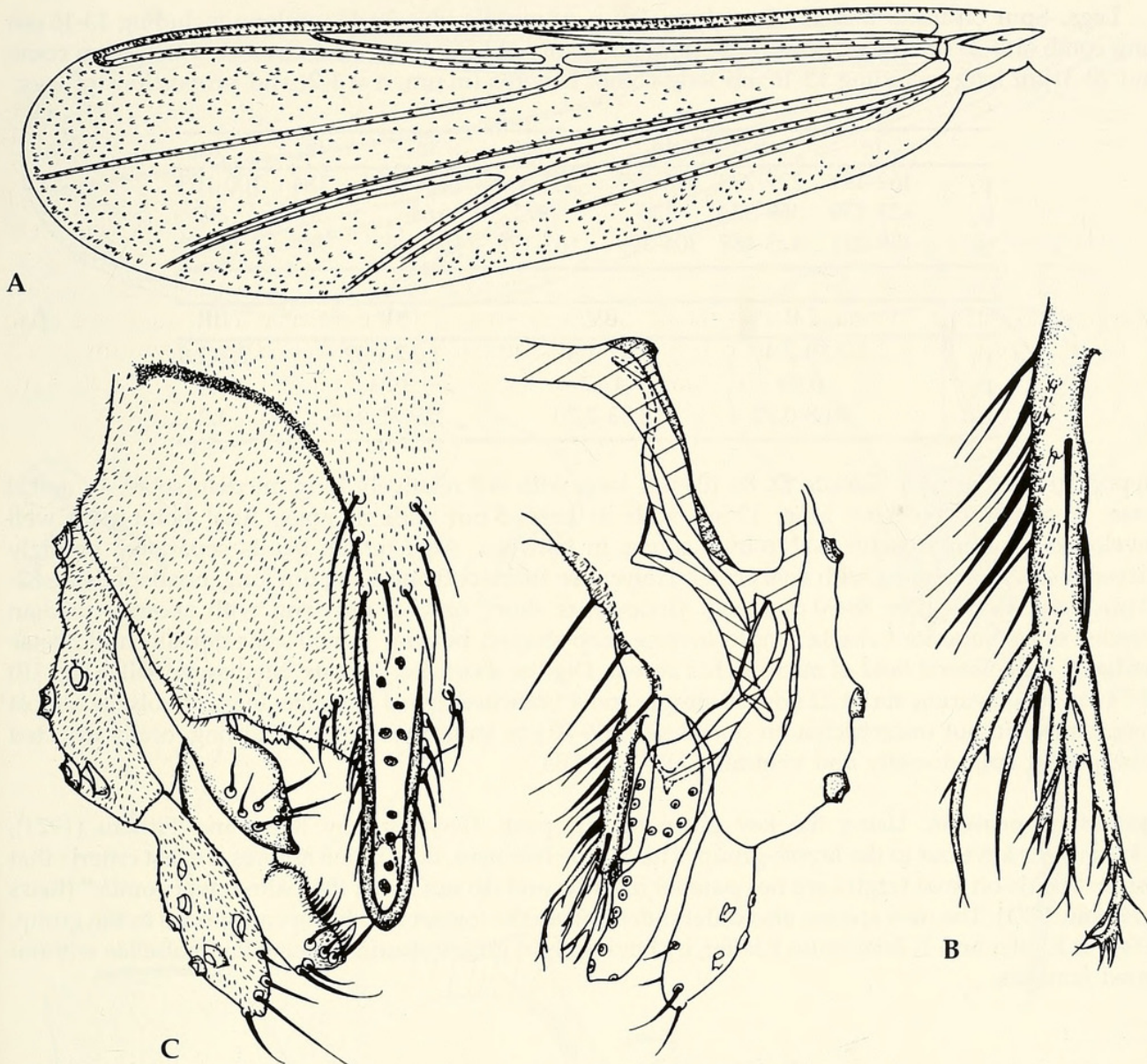


Fig. 1. *Tanytarsus kakumensis*, spec. nov. A. Wing. B. Median volsella. C. Hypopygium dorsal and ventral view.

**Comments.** The description of *Tanytarsus kakumensis* is based only on the hypopygium, abdomen, wings and legs for the following reason: The two slides with the two specimens contains two morphological different heads as well as thoraxes. This difference is much larger than what is considered normal intraspecific variation. Since both specimens are from the same locality and exactly the same Malaise trap, it is likely that one head and one thorax from one of the specimens has been switched with another Chironominae during the mounting procedure.

### Description

Male imago (n=2).

Wing length. 1.64-1.71 mm.

**Coloration.** Cleared specimens with dark bands basally on tibiae of mid and hind legs in addition to apically on femur, tibiae,  $ta_1$  and  $ta_2$  of all legs; wings transparent; abdomen light greenish with brown transverse bands on tergite II, III, VI, VII and VIII.

**Wing (Fig. 1A).** VR 1.20. Setation: Brachiolium 1 seta, Sc bare, R with 25-31 setae,  $R_1$  with 22-30,  $R_{4+5}$  with 39-46, M with 7-9, RM bare,  $M_{1+2}$  with 40-41,  $M_{3+4}$  with 22, Cu with 13-19,  $Cu_1$  with 15-16, PCu with 26-28 and An with 22-26 setae. Cells: m bare,  $r_{4+5}$  with about 150 setae,  $m_{1+2}$  with about 190 including false vein,  $m_{3+4}$  with about 60-70, cu and an combined with about 110-140 setae.



Legs. Spur on front tibia 23-32  $\mu\text{m}$  long. Spurs of middle tibia 39-45  $\mu\text{m}$  long including 13-16  $\mu\text{m}$  long comb and 23  $\mu\text{m}$  long including 13  $\mu\text{m}$  long comb; of hind tibia 55-64  $\mu\text{m}$  including 16  $\mu\text{m}$  comb and 23-31  $\mu\text{m}$  long including 13-16  $\mu\text{m}$  long comb. Lengths (in  $\mu\text{m}$ ,  $n = 1-2$ ) and proportions of legs:

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
p <sub>1</sub>	462-491	229-233	523-578	300-307	242-245	184	100-103
p <sub>2</sub>	423-459	359-384	226	97	64	39	39
p <sub>3</sub>	459-481	423-488	304-329	161-178	158-168	97	39-52

	LR	BV	SV	BR
p <sub>1</sub>	2.33-2.49	1.47-1.56	1.25-1.32	2.4-2.8
p <sub>2</sub>	0.59	4.47	3.73	3.3
p <sub>3</sub>	0.68-0.72	2.53-2.70	2.90-2.94	4.2

Hypopygium (Fig. 1C). Tergite IX 86-103  $\mu\text{m}$  long with 6-8 relatively long, median setae, 16 apical setae. Anal point 49-53  $\mu\text{m}$  long, 12  $\mu\text{m}$  wide at base, 8  $\mu\text{m}$  wide at apex. Anal point with well developed anal crests with 8-11 robust spines in between. Anal tergite bands separated, strongly curved anally, connecting with anal crests. Transverse sternapodeme 47-51  $\mu\text{m}$  long, phallapodeme 82-90  $\mu\text{m}$  long. Gonocoxite 88-90  $\mu\text{m}$  long. Gonostylus short, only 49  $\mu\text{m}$  long with about 4 median directed setae. Superior volsella simple, inverse drop-shaped, bearing 5 small setae dorsally and 2 setae medially; dorsolateral field of microtrichia absent. Digitus short and delicate. Median volsella (Fig. 1B) 70-74  $\mu\text{m}$  long bearing about 12 normal simple and 4 branched apical lamellae. Inferior volsella almost completely without microtrichia on dorsal side, 66-70  $\mu\text{m}$  long, with about 10 strong, orally directed setae placed both dorsally and ventrally. HR 1.79-1.83.

**Systematic position.** Using the key given to European *Tanytarsus* by Reiss and Fittkau (1971), *T. kakumensis* keys out to the *lugens*-group. This is true however, only if one ignores the last criteria that states: “Bands on anal tergite are not parallel distally, and do not reach the paired anal combs” (Reiss & Fittkau 1971). The new species also differentiates from the former two European species in the group, *T. lugens* Kieffer and *T. bathophilus* Kieffer, by having short gonostyli and long median volsellae without broad lamellae.

*Tanytarsus pseudocongrus*, spec. nov.  
Fig. 2

**Type material.** Holotype: ♂, Ghana, Western Region, Ankasa Game Production Reserve, Malaise trap, 7-11.XII.1993. – Paratype 1♂, Ghana, Volta Region, Wli, Agumatsa Waterfalls, Malaise trap, 17-20.XI.1993. All type material in Museum of Zoology, Bergen, Norway (ZMBN. Type No. 305).

**Etymology.** The name “*pseudocongrus*” reflects the similarities in morphology to *Tanytarsus congrus* Lehmann.

**Diagnosis.** *T. pseudocongrus*, spec. nov. is separable from other *Tanytarsus* species by the following combination of characters: AR less than 0.45; LR less than 2.90; hypopygium: Spines in one row between well developed anal crests; superior volsella oval with a few microtrichia spread between 4-5 dorsal setae and 2 median setae where 1 is sitting on a small ventral projection; digitus with a swollen apex reaching beyond superior volsella at its median posterior margin, carrying 1 seta placed basally; median volsella relatively short with 3 distal, feathery lamellae in addition to 2 simple lamellae.

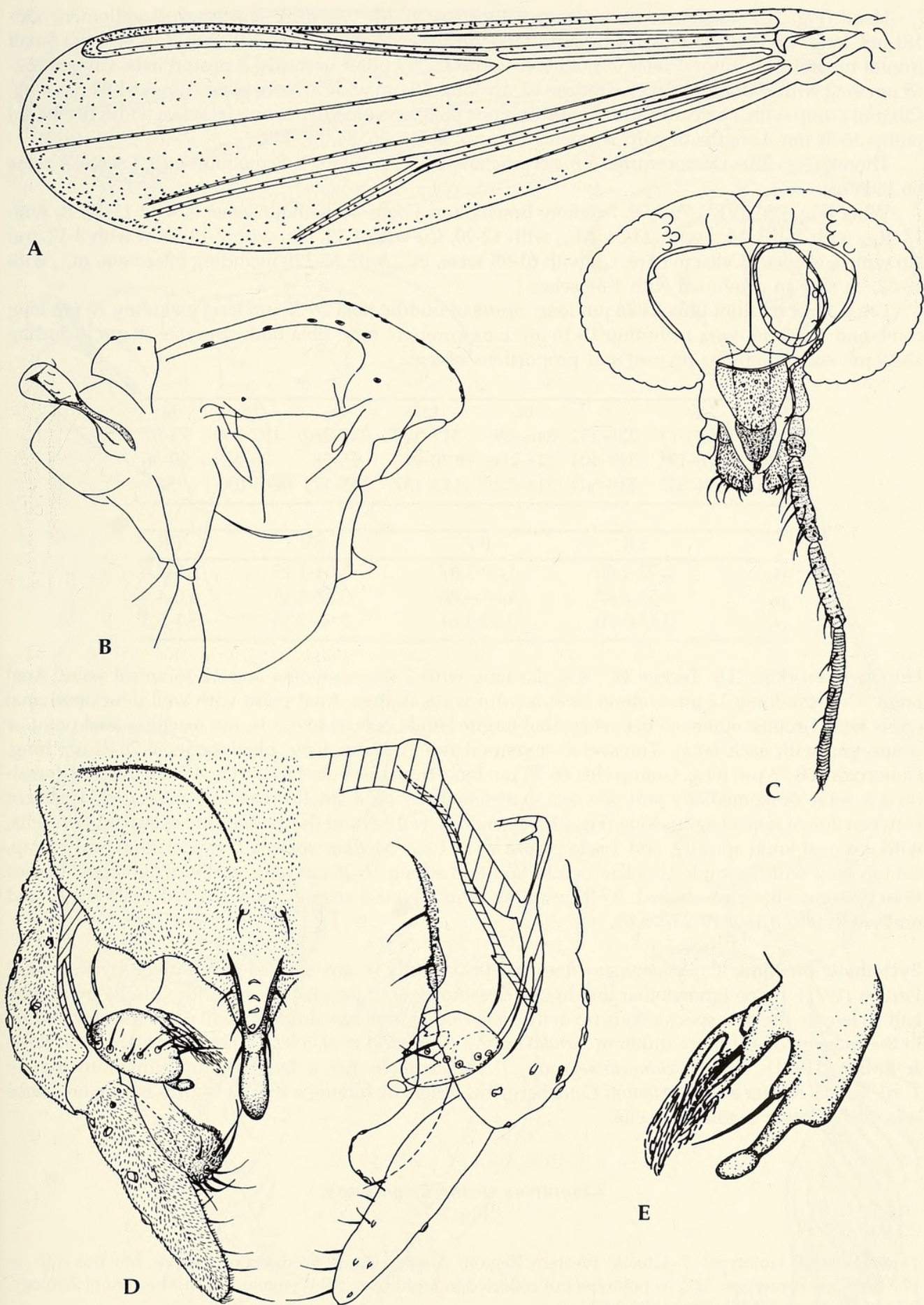
**Description**

Male imago (n=2).

Total length 1.84-1.87 mm. Wing length 0.94-1.03 mm. Total length/wing length 1.79-1.89.

Coloration. Cleared specimens with head light yellowish, dark brown antennae and eyes; thorax as well as abdomen and legs yellowish.





**Fig. 2.** *Tanytarsus pseudocongus*, spec. nov. **A.** Wing. **B.** Thorax. **C.** Head. **D.** Hypopygium dorsal and ventral view. **E.** Digitus and median volsella.



Head (Fig. 2C). Antennae normally developed with AR 0.38-0.40. Thirteenth flagellomere 158-181  $\mu\text{m}$  long. Longest antennal seta about 400  $\mu\text{m}$  long. Distance between eyes 145-149  $\mu\text{m}$ . Small frontal tubercles. Temporal setae 7-8; 2 inner verticals, 2-3 outer verticals, 3 postorbitals. Clypeus 52-55  $\mu\text{m}$  long with about 11 setae. Tentorium 81  $\mu\text{m}$  long, 19  $\mu\text{m}$  wide at sieve plate. Stipes 84-87  $\mu\text{m}$  long. Cibarial pump with 2 pairs of ventrolateral and one pair ventromedian sensorial setae, width of cibarial pump 36-39  $\mu\text{m}$ . Lengths of palp segments (in  $\mu\text{m}$ ): 23-26, 26, 84, 87, 149.

Thorax (Fig. 2B). Dorsocentrals 5-6, acrostichals 10-11, prealars 1. Scutellum with 4 setae. 4 setae on halteres.

Wing (Fig. 2A). VR 1.79-1.99. Setation: Brachiolum 1 seta, Sc without setae, R with 11-15, R<sub>1</sub> with 13, R<sub>4+5</sub> with 16-23, M<sub>1+2</sub> with 23-24, M<sub>3+4</sub> with 12-20, Cu with 1-11, Cu<sub>1</sub> with 7-13, PCu with 3-17 and An with 6-14 setae. Cells: m bare, r<sub>4+5</sub> with 61-95 setae, m<sub>1+2</sub> with 65-120 including false vein, m<sub>3+4</sub> with 23-52, cu and an combined with 1-48 setae.

Legs. Spur on front tibia 23-26  $\mu\text{m}$  long. Spurs of middle tibia 26-32  $\mu\text{m}$  long including 13  $\mu\text{m}$  long comb and 19-29  $\mu\text{m}$  long including 13-16  $\mu\text{m}$  long comb; of hind tibia both spurs 29-39  $\mu\text{m}$  including 13-19  $\mu\text{m}$  comb. Lengths (in  $\mu\text{m}$ ) and proportions of legs:

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
p <sub>1</sub>	462-514	226-252	646-685	317-320	249-262	197-200	74-87
p <sub>2</sub>	426-494	349-404	213-216	90-94	55-58	39-42	29-36
p <sub>3</sub>	494-507	449-504	313-320	181-187	165-171	97-100	52

	LR	BV	SV	BR
p <sub>1</sub>	2.72-2.86	1.59-1.67	1.04-1.15	2.8-3.0
p <sub>2</sub>	0.54-0.62	4.65-4.86	3.58-4.15	4.0-4.4
p <sub>3</sub>	0.63-0.70	2.52-2.61	2.98-3.16	5.1-5.5

Hypopygium (Fig. 2D). Tergite IX 74-82  $\mu\text{m}$  long with 2 short, median and 12-16 apical setae. Anal point 37-47  $\mu\text{m}$  long, 12  $\mu\text{m}$  wide at base, 4-6  $\mu\text{m}$  wide at apex. Anal point with well developed anal crests with 4 robust spines in between. Anal tergite bands curved towards, not reaching anal point or connecting with each other. Transverse sternapodeme 31-39  $\mu\text{m}$  long, phallapodeme 70-74  $\mu\text{m}$  long. Gonocoxite 68-76  $\mu\text{m}$  long. Gonostylus 66-70  $\mu\text{m}$  long. Superior volsella bearing 4-5 small setae dorsally, one setae dorsomedially and one seta ventromedially on a small projection; microtrichia present between dorsal setae. Digitus long (Fig. 2E), extending well beyond the medial side of superior volsella, with a dorsal knob apically, and 1 seta placed at its base. Median volsella (Fig. 2E) short and stump, 4-8  $\mu\text{m}$  long with 2 simple lamellae in addition to 3 strong 16-26  $\mu\text{m}$  long, feathery lamellae. Inferior volsella somewhat club-shaped, 49-55  $\mu\text{m}$  long, with about 6 strong setae directed both anally and orally. HR 0.97-1.16, HV 2.63-2.83.

**Systematic position.** *T. pseudocongrus* does not fit perfectly in any species-group given by Reiss and Fittkau (1971). If one ignores that the digitus does not extend beyond the superior volsella by at least half its length, the new species ends up in the *chinyensis*-group. Not doing so, will place the new species in the morphological more different *mendax*-group (Cranston et al. 1989) = *holochlorus*-group in Reiss & Fittkau (1971) . In the *chinyensis*-group, *T. pseudocongrus* has a hypopygium similar to that of *T. curticornis* Kieffer and *T. brundini* Lindeberg, but differs by having a shorter digitus baring one basal seta, and a larger median volsella.

*Tanytarsus saetheri*, spec. nov.  
Fig. 3

**Type material.** Holotype: ♂, Ghana, Western Region, Ankasa Game Production Reserve, Malaise trap, 6-12.XII.1993. – Paratypes: 2♂♂, as holotype but collected in Light trap. All type material in Museum of Zoology, Bergen, Norway (ZMBN Type No. 306).

**Etymology.** The new species is named in honour of Prof. Ole A. Sæther at University of Bergen for his excellent work on chironomids.



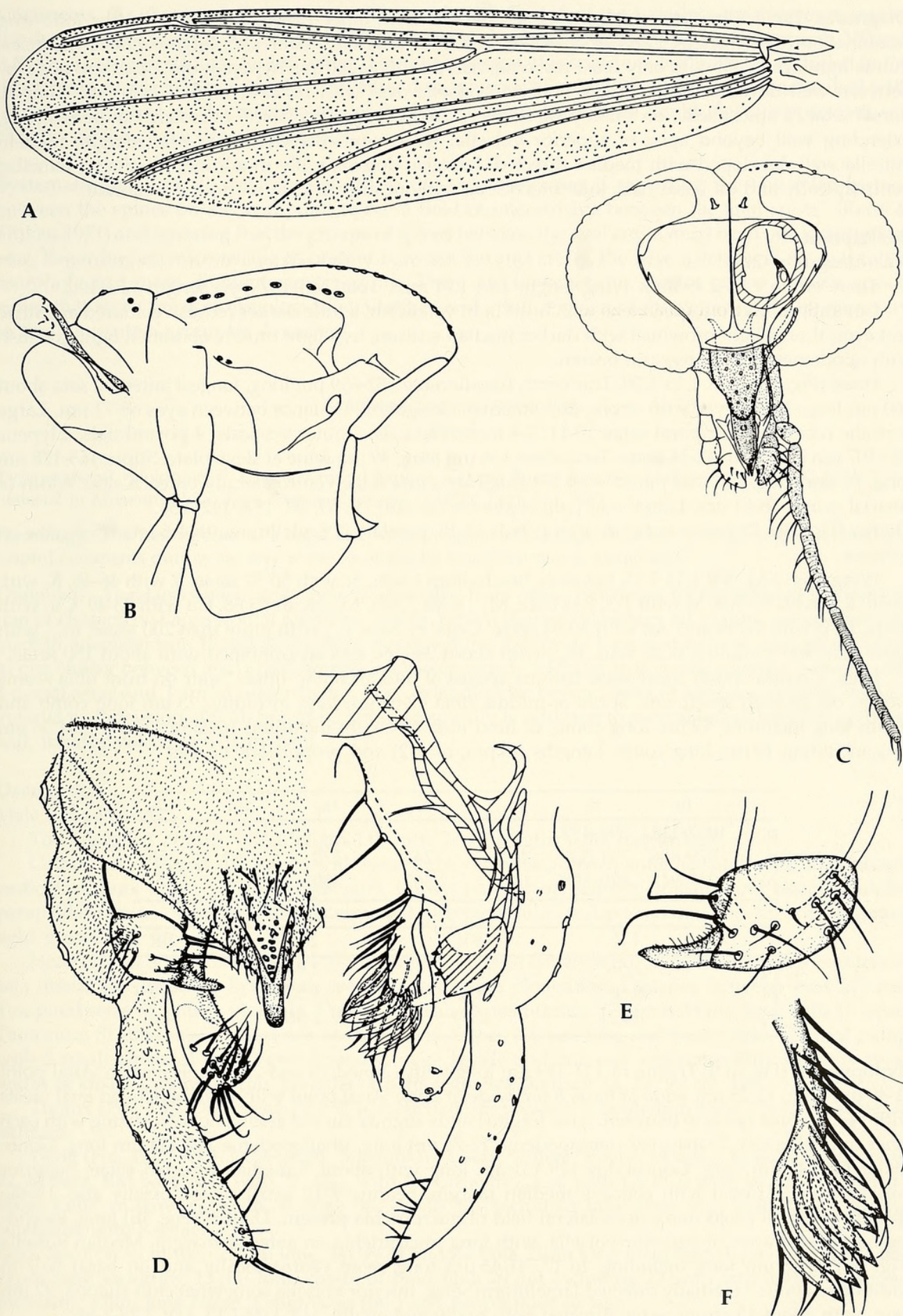


Fig. 3. *Tanytarsus saetheri*, spec. nov. A. Wing. B. Thorax. C. Head. D. Hypopygium dorsal and ventral view. E. Superior volsella with digitus. F. Median volsella.



**Diagnosis.** *Tanytarsus saetheri*, spec. nov. is separable from other *Tanytarsus* species by the following combination of characters: Large species, about 3 mm long; AR about 1.15; large cephalic tubercles; thorax light brownish with only one brown median mesonotal stripe; hypopygium: Spines in one row between well developed anal crests; superior volsella oval with concave median margin, about 10 dorsal setae, 3 apical setae on small projections and a field of dorsolateral microtrichia; digitus long, extending well beyond apex of superior volsella, with long microtrichia on oral margin; median volsella well developed with median directed, lamellae dorsoapically in addition to simple lamellae ventroapically and on basal half; inferior volsella without microtrichia on dorsolateral half.

**Description**

Male imago (n=2).

Total length 2.95-2.99 mm. Wing length 1.64-1.71 mm. Total length/wing length 1.73-1.82.

Coloration. Cleared specimens with head light yellowish, a little darker reddish coloured antennae and eyes; thorax light brownish with darker median scutum; legs light brown; abdomen light greenish with apodemes in hypopygium brown.

Head (Fig. 3C). AR 1.13-1.20. Thirteenth flagellomere 652-659 µm long, longest antennal seta about 660 µm long. Large eyes with strong dorsomedian elongation. Distance between eyes 68-71 µm. Large cephalic tubercles. Temporal setae 10-11; 3-4 inner verticals, 3 outer verticals, 4 postorbitals. Clypeus 103-107 µm long with 12-14 setae. Tentorium 136 µm long, 39 µm wide at sieve plate. Stipes 165-178 µm long, 10 µm wide. Cibarial pump with 3-4 small sensorial setae ventrolaterally on each side, width of cibarial pump 58-61 µm. Lengths of palp segments (in µm): 36-39, 39, 152, 142, 258.

Thorax (Fig. 3B). Dorsocentrals 5-8, acrostichals 13-15, prealars 2. Scutellum with 4-6 setae. 5-6 setae on halteres.

Wing (Fig. 3A). VR 1.11-1.15. Setation: Brachiolium 1 seta, Sc with 50-57 setae, R with 46-48, R<sub>1</sub> with 63-80, R<sub>4+5</sub> with 90-104, M with 1-3, RM bare, M<sub>1+2</sub> with 72-84, M<sub>3+4</sub> with 65-68, Cu with 33-49, Cu<sub>1</sub> with 30-32, PCu with 76-98 and An with 50-54 setae. Cells: m bare, r<sub>4+5</sub> with more than 200 setae, m<sub>1+2</sub> with more than 200 including false vein, m<sub>3+4</sub> with about 200, cu and an combined with about 150 setae.

Legs. Conspicuously more setae toward apexes of mid and hind tibiae. Spur on front tibia seems broken off on both specimens. Spurs of middle tibia 42-52 µm long including 23 µm long comb and 36 µm long including 19 µm long comb; of hind tibia 55-64 µm including 16-23 µm comb and 36 µm long including 19 µm long comb. Lengths (in µm, n=1-2) and proportions of legs:

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
p <sub>1</sub>	1082-1111	394-433	—	—	—	—	—
p <sub>2</sub>	879-888	791-807	481	242	178	90	55
p <sub>3</sub>	917-943	879-888	640	365	339	184	71

	LR	BV	SV	BR
p <sub>1</sub>	2.56*	—	1.46*	—
p <sub>2</sub>	0.60	3.83	3.50	6.9
p <sub>3</sub>	0.72	2.59	2.88	4.6

Hypopygium (Fig. 3D). Tergite IX 111-119 µm long with 12 median and 22-24 apical setae. Anal point 41-49 µm long, 12-25 µm wide at base, 8 µm wide at apex. Anal point with well developed anal crests with 14-22 robust spurs in between. Anal tergite bands slightly curved anally, not connecting with each other or anal crests. Transverse sternapodeme 72-74 µm long, phallapodeme 117-121 µm long. Gonocoxite 144-146 µm long. Gonostylus 129-131 µm long with about 9 median directed setae. Superior volsella (Fig. 3E) oval with concave median margin, bearing 7-10 small setae dorsally and 3 setae apically on small projections; dorsolateral field of microtrichia present. Digitus (Fig. 3E) long, extending far beyond apex of superior volsella, with long microtrichia on anterior margin. Median volsella (Fig. 3F) 85-88 µm long including 16-17, 41-45 µm long setae ventroapically and on basal half in addition to about 7 medially directed lamelliform setae. Inferior volsella somewhat club-shaped, 92 µm long, with about 15 strong setae directed both orally and anally. HR 1.09-1.13, HV 2.28-2.44.



**Comments.** As shown above, three specimens were collected at the type locality. However, one of the designated paratypes looks freshly hatched and shows large diversion in length measures, VR and AR. The specimen also has folded wings. For these reasons, this specimen has not been included in the description except in the parts where no other data were available (LR and SV of foreleg, marked with an asterisk). Based on the morphology of the hypopygium, there is no doubt that this specimen is a member of the above described species.

**Systematic position.** *T. saetheri* keys out to the *eminulus*-group if regarding the few microtrichiae between the spines on the anal point to be “a field of microtrichia between the anal crests” (Reiss & Fittkau 1971) and ignoring that the groups of spines between the anal crests must be in one longitudinal row. Regarding no microtrichia as present between the anal crests, the new species will key out to the morphologically more different *mendax*-group. There are however, no species in the *eminulus*-group either that show great morphological similarities and a full revision of the genus might be necessary to find or create a group for *T. saetheri*.

***Tanytarsus spiesi*, spec. nov.**

Fig 4

**Type material.** Holotype: ♂, Ghana, Central Region, Kakum Forest Reserve, Malaise trap, 8-18.XI.1994. Type material in Museum of Zoology, Bergen, Norway (ZMBN Type No. 307).

**Etymology.** The new species is named after Martin Spies who enlightened me with good discussions and helpful comments during my stay at the Zoologische Staatssammlung, München.

**Diagnosis.** *Tanytarsus spiesi*, spec. nov. is separable from other *Tanytarsus* by the following combination of characters: Large frontal tubercles; strong, brown thoracic markings on scutum, preepisternum, median anepisternum II and postnotum; hypopygium: Relatively long and narrow anal point; spurs in one cluster between anal crests; tergite bands separated, reaching anal crests; superior volsella with 3 dorsal setae and 3 apical setae; digitus long, extending far beyond apex of superior volsella; median volsella well developed with branched lamellae apically in addition to several setose lamellae on basal half; inferior volsella medially bent.

**Description**

Male imago (n=1).

Total length 1.71 mm. Wing length 1.03 mm. Total length/wing length 1.67.

Coloration. Cleared specimens with head light yellowish, brown antennae and eyes, dark brown pedicelli; thorax light yellowish with dark brown patches on scutum dorsally and laterally under parapsidal suture, on median anepisternum II, preepisternum and postnotum; legs brown; abdomen light greenish.

Head (Fig. 4C). AR 0.84. Pedicel 68 µm long. Thirteenth flagellomere 323 µm long, longest antennal seta about 400 µm long. Eyes with weak dorsomedian elongation. Distance between eyes 171 µm. Temporal setae 8; 3 inner verticals, 2 outer verticals, 3 postorbitals. Clypeus 39 µm long with 10 setae. Tentorium 81 µm long, 19 µm wide at sieve plate. Stipes 100 µm long and 6 µm wide. Cibarial pump with 2 small sensorial setae ventrolaterally on each side and one pair ventromedially towards apex, width of cibarial pump 42 µm. Lengths of palp segments (in µm): 23, 23, 90, 90, 149.

Thorax (Fig. 4B). Dorsocentrals 6-7, acrostichals 16, prealars 1. Scutellum with 4 setae. 6 setae on halteres.

Wing (Fig. 4A). VR 1.30. Setation: Brachiolium 1 seta, Sc bare, R with 14 setae, R<sub>1</sub> with 14, R<sub>4+5</sub> with 22, M bare, RM bare, M<sub>1+2</sub> with 27, M<sub>3+4</sub> with 18, Cu with 7, Cu<sub>1</sub> with 12, PCu with 16 and An with 15 setae. Cells: m bare, r<sub>4+5</sub> with 86 setae, m<sub>1+2</sub> with 127 including false vein, m<sub>3+4</sub> with 27, cu and an combined with 8 setae.

Legs. Spur on front tibia 23 µm long. Spurs of middle tibia 23 µm long including 10 µm long comb and 21 µm long including 13 µm long comb; of hind tibia 29 µm including 13 µm comb and 23 µm long including 13 µm long comb. Lengths (in µm,) and proportions of legs:



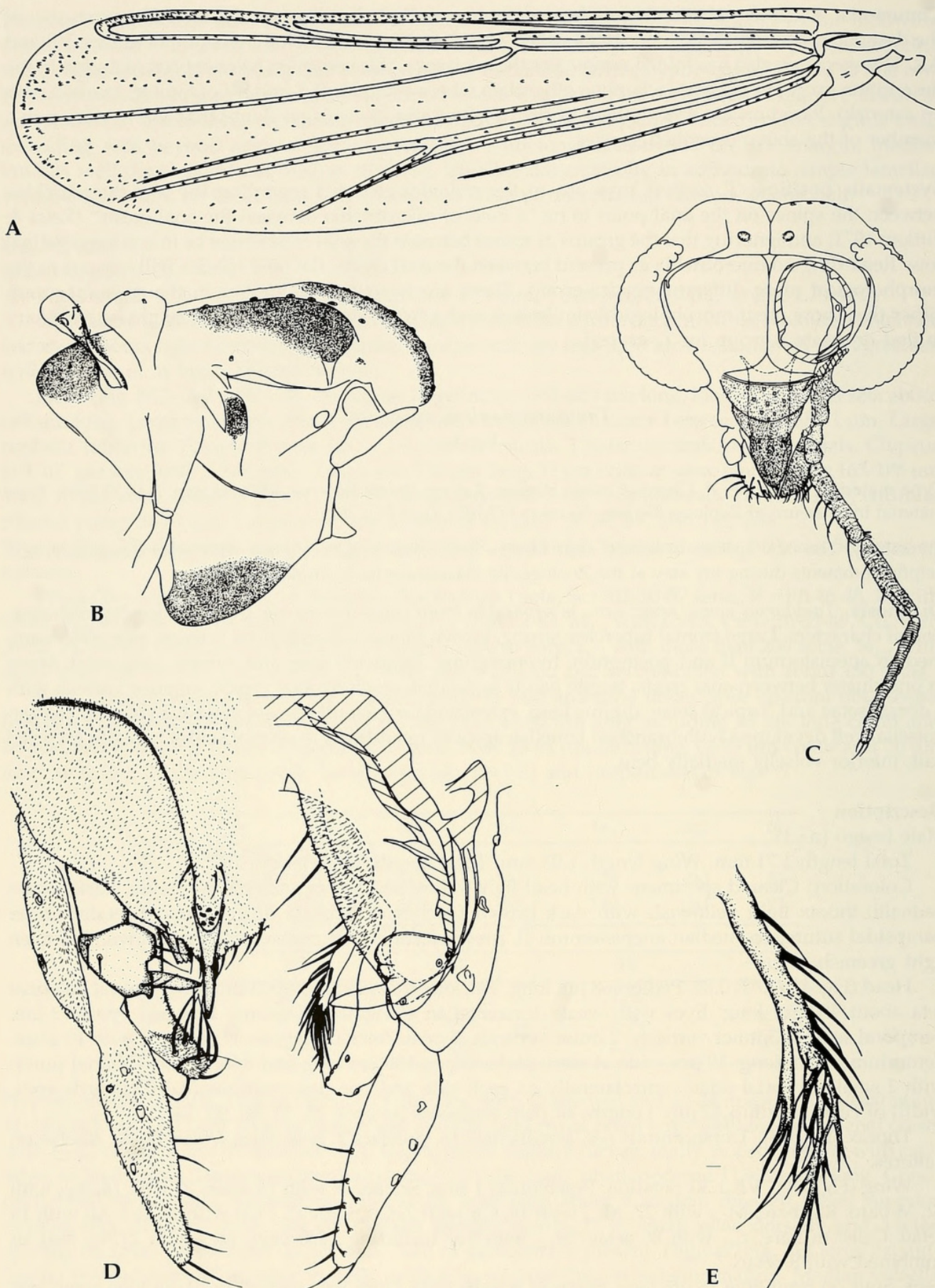


Fig. 4. *Tanytarsus spiesi*, spec. nov. A. Wing. B. Thorax. C. Head. D. Hypopygium dorsal and ventral view. E. Median volsella.



	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
p <sub>1</sub>	452	207	–	–	–	–	–
p <sub>2</sub>	452	384	242	103	64	39	32
p <sub>3</sub>	443	488	336	203	174	100	55

	LR	BV	SV	BR
p <sub>1</sub>	–	–	–	–
p <sub>2</sub>	0.63	4.51	3.45	–
p <sub>3</sub>	0.69	2.38	2.74	6.8

Hypopygium (Fig. 4D). Tergite IX 66 µm long with 4 median and 12 apical setae. Anal point relatively long and slender, 35 µm long, 10 µm wide at base, 2 µm wide at apex. Anal point with 7 spines between weak anal crests. Anal tergite bands separated, curved anally, connecting with anal crests. Transverse sternapodeme 49 µm long, phallapodeme 80 µm long. Gonocoxite 82 µm long. Gonostylus 68 µm long with about 7 median directed setae. Superior volsella somewhat heart-shaped, bearing 3 setae dorsally and 3 setae apically. Digitus long, extending far beyond apex of superior volsella. Median volsella (Fig. 4E) with about 10 simple, median directed lamellae, 56 µm long including three 29 µm long branched lamellae. Inferior volsella medially bent, 49 µm long, with about 9 strong setae directed both orally and anally. HR 1.21, HV 2.51.

**Systematic position.** *T. spiesi* keys out to the *eminulus*-group if the criteria of spines in one longitudinal row is ignored, but like the case of *T. saetheri*, there are no morphological very similar species in the group.

*Tanytarsus superpenicillatus*, spec. nov.  
Fig. 5

**Type material.** Holotype: ♂, Ghana, Eastern Region, Boti Waterfalls, Malaise trap, 4.XI.1994. – Paratypes: 2♂♂, Ghana, Eastern Region, Kibi, Subri Stream, Light trap, XI.1993 & 4.II.1993; 1♂, Tanzania, Tanga Region, West Usambara Mt., Mazumbai, Kaputu, Malaise trap, XI.1990. All type material in Museum of Zoology, Bergen, Norway (ZMBN Type No. 308).

**Etymology.** *superpenicillatus* from Latin, meaning “larger brush” referring to the extremely long lamellae on median volsella.

**Diagnosis.** *Tanytarsus superpenicillatus*, spec. nov. is separable from other *Tanytarsus* species by the following combination of characters: Large species about 2.5 mm long; AR about 0.70; LR about 3.0; large cephalic tubercles; thorax with brown patches on antepnotum, scutum and postnotum; hypopygium: Spines in one row between well developed anal crests, superior volsella somewhat pear-shaped with dorsolateral microtrichia and 3 median setae; digitus delicate and often hard to recognise; median volsella extremely long with lamellae extending as far as apex of gonostyli.

**Description**

Male imago (n = 4).

Total length 2.35-2.89 mm. Wing length 1.23-1.51 mm. Total length/wing length 1.81-1.93.

Coloration. Cleared specimens with head light yellowish, dark reddish brown antennae and eyes; thorax with brown antepnotum and brown patches on postnotum, dorsally and laterally on scutum; legs with darker apexes of femur and tibia; wings transparent with two small brown patches on squama and almost black arcus; abdomen light greenish with darker bands on anterior parts of tergites VI and VII and posterior on tergite VII, apodemes in hypopygium brown.

Head (Fig. 5C). AR 0.64-0.72. Thirteenth flagellomere 329-352 µm long. Longest antennal seta about 485-550 µm long. Eyes with strong dorsomedian elongation, distance between eyes 94-126 µm. Temporal setae 8-9; 3 inner verticals, 2-3 outer verticals, 3-4 postorbitals. Clypeus 74-84 µm long with 13-17 setae. Tentorium 100-113 µm long, 26-29 µm wide at sieve plate. Stipes 113-123 µm long and 6-9 µm wide. Cibarial pump 45-55 µm wide with 2 small sensorial setae ventrolaterally on each side. Lengths



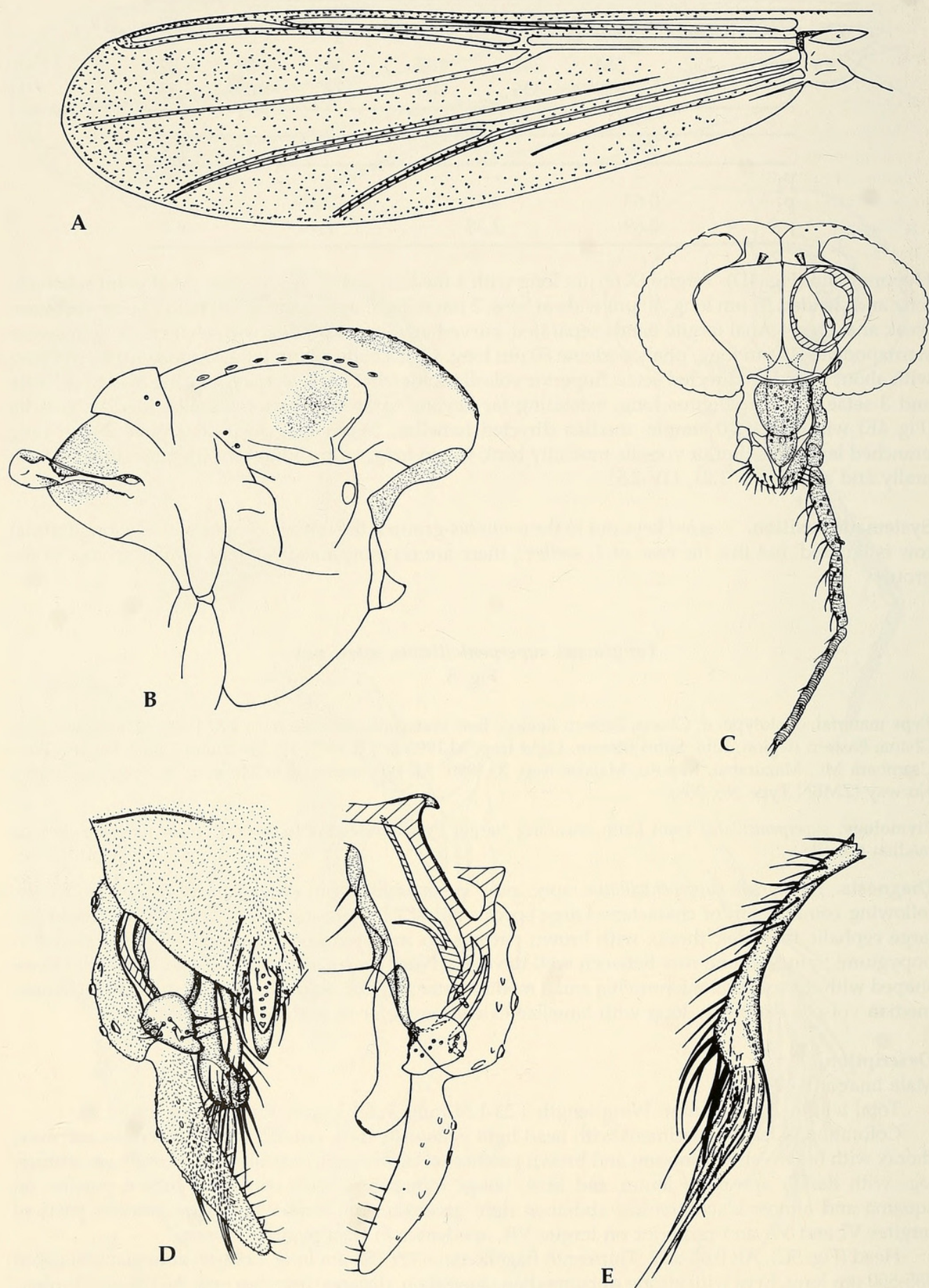


Fig. 5. *Tanytarsus superpenicillatus*, spec. nov. A. Wing. B. Thorax. C. Head. D. Hypopygium dorsal and ventral. E. Median volsella.



of palp segments (in  $\mu\text{m}$ ): 26-32, 26-32, 100-123, 103-113, 184-207.

Thorax (Fig. 5B). Dorsocentrals 8-10, acrostichals 15-19, prealars 2-3. Scutellum with 6-8 setae. 6-12 setae on halteres.

Wing (Fig. 5A). VR 1.23-1.27. Setation: Brachiolum 1 seta, Sc with 15-36 setae, R with 28-37,  $R_1$  with 38-44,  $R_{4+5}$  with 53-72, M and RM bare,  $M_{1+2}$  with 48-70,  $M_{3+4}$  with 32-35, Cu with 23-29,  $Cu_1$  with 20-24, PCu with 23-60 and An with 28-39 setae. Cells: m bare,  $r_{4+5}$  with more than 200 setae,  $m_{1+2}$  with more than 250 including false vein,  $m_{3+4}$  with more than 150, cu and an combined with about 150-200 setae.

Legs. Hind tibia with more setae towards apex. Spur on front tibia 36-42  $\mu\text{m}$  long. Spurs of middle tibia 36-39  $\mu\text{m}$  long including 16-23  $\mu\text{m}$  long comb and 26-29  $\mu\text{m}$  long including 16-23  $\mu\text{m}$  long comb; of hind tibia 45-48  $\mu\text{m}$  including 19-23  $\mu\text{m}$  comb and 32-42  $\mu\text{m}$  long including 16-19  $\mu\text{m}$  long comb. Lengths (in  $\mu\text{m}$ ) and proportions of legs:

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
p <sub>1</sub>	662-782	300-378	904-969	443-468	349-388	300-333	126-132
p <sub>2</sub>	617-720	497-598	323-336	145-149	94-100	48- 58	36- 39
p <sub>3</sub>	630-775	630-743	433-468	258-268	229-242	132-152	64- 71

	LR	BV	SV	BR
p <sub>1</sub>	2.97-3.16	1.51-1.56	1.02-1.06	2.8-4.0
p <sub>2</sub>	0.64-0.65	4.22-4.54	3.43-3.50	4.0-6.7
p <sub>3</sub>	0.67-0.72	2.43-2.51	2.80-2.92	5.0-6.9

Hypopygium (Fig. 5D). Tergite IX 103-121  $\mu\text{m}$  long with 7-11 median and 16-24 apical setae. Anal point 37-62  $\mu\text{m}$  long, 12-18  $\mu\text{m}$  wide at base, 5-8  $\mu\text{m}$  wide at apex. Well developed anal crests. Anal point with 8-20 robust spines in between. Anal tergite bands almost straight, transverse, but not connecting with each other. Transverse sternapodeme 51-68  $\mu\text{m}$  long, phallapodeme 94-115  $\mu\text{m}$  long. Gonocoxite 85-133  $\mu\text{m}$  long. Gonostylus 85-117  $\mu\text{m}$  long with about 10 median directed setae. Superior volsella pear shaped, bearing 8-10 small setae dorsally and 3 setae medially; dorsolateral field of microtrichia present. Digitus short and delicate. Median volsella (Fig. 5E) bearing 17-20 median and 12-15 apical setose lamellae in addition to 4-7 extremely long, 132-152  $\mu\text{m}$ , and about four 62-82  $\mu\text{m}$  long, broad lamellae. Inferior volsella somewhat club-shaped, 64-92  $\mu\text{m}$  long, with about 12 strong setae directed orally and about 5 strong setae directed anally. HR 1.04-1.14, HV 2.18-2.85.

**Systematic position.** *T. superpenicillatus* keys out to the *lugens*-group in the key to European *Tanytarsus* species (Reiss & Fittkau 1971). The new species separates from the other European species in the group especially by the extremely long median volsella.

*Tanytarsus tossai*, spec. nov.  
 Fig. 6

**Type material.** Holotype: ♂ Ghana: Western Region, Ankasa Game Production Reserve, Malaise trap, 6-12.XII.1993. – 3 paratypes: 1♂, as holotype; 1♂, as holotype but collected in Light trap; 1♂ Ghana: Volta Region, Wli, Agumatsa Waterfalls, Light trap, 17-20.XI.1993. All type material is deposited at Museum of Zoology, Bergen, Norway (ZMBN Type No. 309).

**Etymology.** The species is named after my very good friend Tor Helge (“tossa”) Opdahl for his support during my work on this material.

**Diagnosis.** The male imagines are separable from other *Tanytarsus* species by having the following combination of characters on the hypopygium: Anal point with a swollen apex, and a single row of spines between anal crests, somewhat elongate superior volsella tapered with widest width on the median margin, long dorsolateral field of microtrichia along the posteriolateral margin, narrow digitus only reaching beyond the superior volsella at the very tip, median volsella about 20  $\mu\text{m}$  long with about 12 anally bent lamellae of variable length, inferior volsella straight, with long medially directed microtrichia placed on the distal ½.



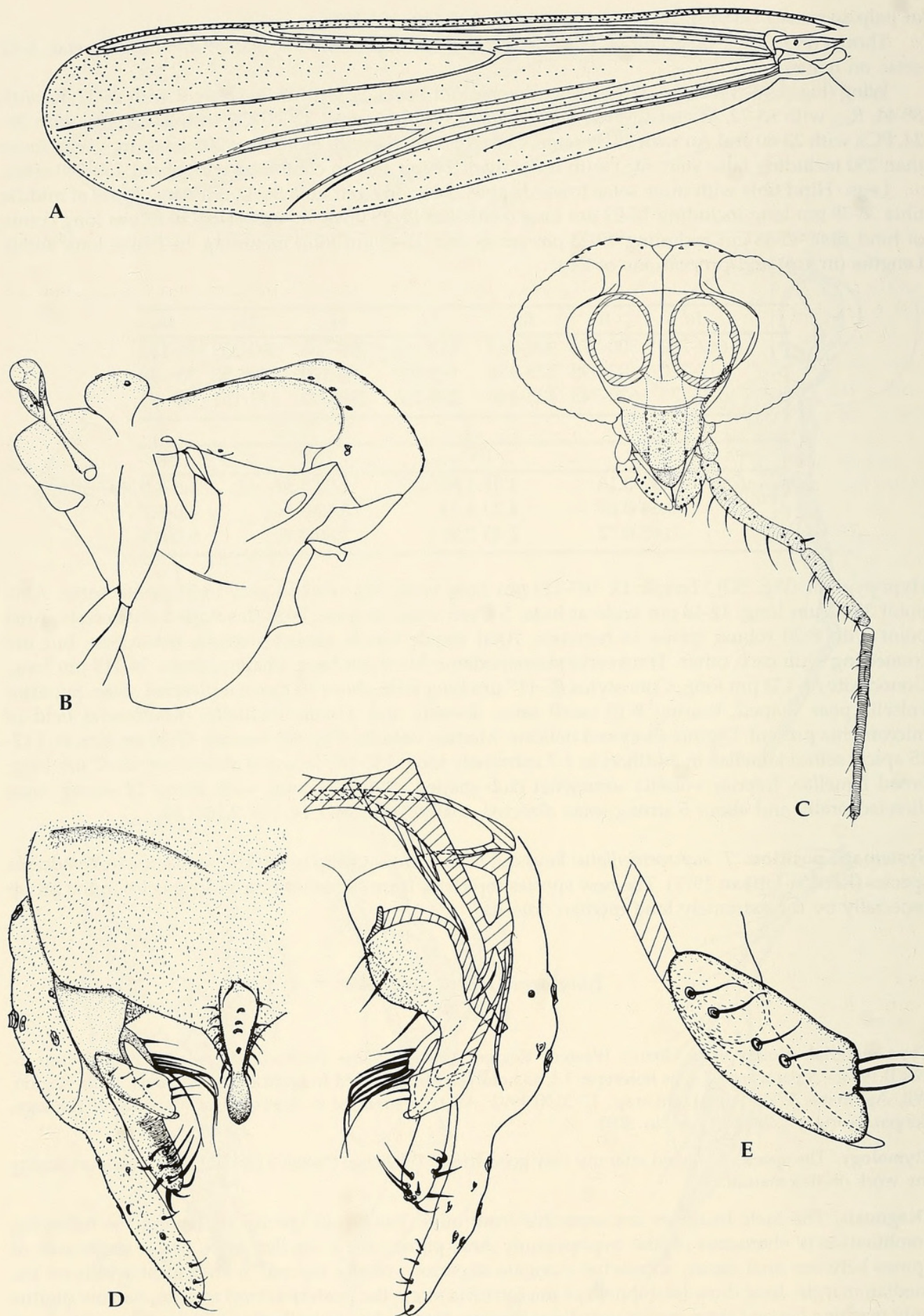


Fig. 6. *Tanytarsus tossai*, spec. nov. A. Wing. B. Thorax. C. Head. D. Hypopygium dorsal and ventral. E. Hypopygium detail.



Description

Male imago (n=4).

Total length 2.41-2.60 mm. Wing length 1.35-1.39 mm. Total length/wing length 1.77-2.03. Coloration. Cleared specimens with light yellow head, brown antennae, dark brown eyes; light yellow thorax without special markings, light brown legs, wings transparent with somewhat brownish veins; abdomen, hypopygium light yellowish.

Head (Fig. 6C). AR 0.97-1.03. Thirteenth flagellomere 452-462 µm long. Longest antennal seta 497-502 µm. Temporal setae 8-9; 4 inner verticals, 3 outer verticals, 1-2 postorbitals. Clypeus 77-88 µm long, with 11-15 setae. Tentorium 77-121 µm long, 26-33 wide at sieve plate. Stipes 114-146 µm long, 7-11 µm wide. Lengths of palp segments (in µm): 26-37, 29, 128-158, 110-146, 194-249. Frontal tubercles barely recognisable sitting on frontal suture.

Thorax (Fig. 6B). Dorsocentrals 7-9, acrostichals 11-15, prealars 1. Scutellum with 4 setae. Halteres with 6 small setae.

Wing (Fig. 6A). VR 1.19-1.27. Brachiolum with 1 seta, Sc bare, R with 22-30 setae, R<sub>1</sub> with 22-31, R<sub>3+4</sub> with 47-52, M<sub>1+2</sub> with 45-64, M<sub>3+4</sub> with 29-31, Cu with 16-28, Cu<sub>1</sub> with 17-21, PCu with 32-44 and An with 21-25 setae. Cells r<sub>4+5</sub> with about 170-280 setae, m<sub>1+2</sub> with about 175-260 including false vein, m<sub>3+4</sub> with 90-110, cu with 69-92 and an with 40-58 setae, occasionally both vein M and cell m with 1 seta.

Legs. Spurs of front tibia 18-37 µm long. Spurs of mid tibia 32-45 µm long including 15-23 µm long comb and 26-45 µm long including 16-18 µm long comb; of hind tibia 36-44 µm long including 16-18 µm long comb and 29-40 µm long including 15-18 µm long comb. Lengths (in µm) and proportions of legs:

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
p <sub>1</sub>	682-748	282-330	1125-1173	483-491	403-414	330-337	139-180
p <sub>2</sub>	620-698	488-665	365-378	142-161	81-126	52- 58	37- 45
p <sub>3</sub>	652-704	539-697	474-528	286-312	260-282	145-158	66- 71

	LR	BV	SV	BR
p <sub>1</sub>	3.41-3.90	1.52-1.62	0.84-0.96	2.6-3.8
p <sub>2</sub>	0.56-0.75	4.33-4.77	2.99-3.67	4.6-7.2
p <sub>4</sub>	0.71-0.93	2.17-2.44	2.47-2.86	3.8-6.4

Hypopygium (Fig. 6D). Tergite IX with 2-6 median, 12-20 apical setae. Anal point 37-44 µm long, 14-28 µm wide at base, 5-9 µm wide at the swollen apex, 2-6 spurs between well developed anal crests. Phallapodeme 106-140 µm long, transverse sternapodeme 58-76 µm long. Gonocoxite 110-120 µm long, gonostylus 69-81 µm long. Superior volsella bearing 4 small dorsal setae, 3 stronger subapical setae and a long, dorsolateral field of microtrichia. Median volsella 32 µm long with about 12 strong and anally bent lamellae, longest lamella 27-34 µm long. Inferior volsella 74-80 µm long with straight distal ½ figuring long medially directed microtrichia and about 13 strong apical setae. HR 1.37-1.67, HV 3.21-3.59.

**Systematic position.** The morphologically closest group of *T. tossai* is probably the *mendax*-group and ignoring “Appendage 1 elongated, and strongly narrowed towards end.” and “The distally parallel, separated bands on the anal tergite reach to the paired anal comb” in the key to European *Tanytarsus* (Reiss & Fittkau 1971), will place the new species in this group. (*holochlorus*-group (Reiss & Fittkau 1971) = *mendax*-group (Cranston et al. 1989).

Discussion

In the key to male imagines of Chironominae (Cranston et al. 1989), all of the above described species key out to *Tanytarsus*. The large morphological variation between these species reflects the well known interspecific variation in *Tanytarsus* as a whole. An attempt to place the new species into the already existing European species-group concept has been made, but as shown, all but one species fail to be



placed without ignoring one or more diagnostic characters. The now existing European species-groups based on adult morphology therefore, do not work for Afrotropical *Tanytarsus* species.

A division of the worlds *Tanytarsus* into subgenera or species-groups might have to await a thorough revision of the genus including more descriptions of associated material, or at least redescrptions of already described species.

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