

THREE NEW SPECIES OF *PSEUDEXECHIA*  
TUOMIKOSKI FROM TANZANIA AND THAILAND  
(DIPTERA: MYCETOPHILIDAE)

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*Pseudexechia longistylus* sp. n. and *P. lanceostylus* sp. n. from Tanzania and *P. inthanonensis* sp. n. from Thailand are described, based on adult males. The terminalia are figured. The presence of a pair of medium sized bristle-like dorsocentral setae on scutum in the two African species and an aberrant wing venation in *P. inthanonensis* sp.n. is commented on.

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Key words. – Diptera; Mycetophilidae; *Pseudexechia*; Tanzania; Thailand; taxonomy.

*Pseudexechia* Tuomikoski, 1966 constitutes one of 14 genera in the tribus Exechiini, subfamily Mycetophilinae (Tuomikoski 1966). The genus is characterised by the absence of large discal setae on the mesoscutum, by the ovate clypeus and on characters in the male terminalia such as the bud-like sternal process. Chandler (1978) treated all eight holarctic species known at that time. Three palaeartic species were added later; viz. *P. trilobata* Ostroverkhova, 1979, *P. ussurensis* Zaitzev, 1982 and *P. altaica* Zaitzev, 1988. Matile (1970) revised the Afrotropical *Pseudexechia* comprising four species. A fifth species, *P. tanganyikae* (Lindner, 1958) originally described as *Exechia*, was later referred to this genus as well (Matile 1980). No species of *Pseudexechia* are hitherto known from the oriental region. Thus, 16 species of the genus *Pseudexechia* were known: 9 palaeartic, 2 nearctic and 5 afrotropical. Of only one of the five Afrotropical species both sexes were described, the four other were all described on single females. Female holotypes make it difficult to describe new species from the region as certain association of the sexes is not easy to establish without large samples or reared specimens. However, based on differences in external characters as coloration and wing venation the present specimens can not belong to any of the described species.

MATERIAL

The material consists of two males collected in the West Usambara Mountains in Tanzania in 1990, and one male collected in the Doi Inthanon mountain in

Thailand in 1991. The holotypes are deposited in the Museum of Zoology, Bergen (ZMBN).

METHODS AND TERMINOLOGY

The specimens were cleared and slide mounted in Canada balsam. The general terminology follows McAlpine (1981).

Wing measurements (fig. 1): Total wing length is measured from the extreme base of the distal median plate. A = distance between the points where  $R_1$  and  $R_{4+5}$  reach wing margin. B = distance between the points where  $R_{4+5}$  and  $M_1$  reach wing margin. C = width of M-fork at wing margin. D = width of Cu-fork at wing margin. E = distance from extreme base of the distal median plate to base of M-fork. F = distance from extreme base of the distal median plate to base of Cu-fork. Other measurements are self-explanatory and indicated in Fig. 1.

The tibial spur formula is the length of each spur in relation to the apical diameter of tibia in the following order: fore tibial spur; the two mid tibial spurs; the two hind tibial spurs.

SYSTEMATIC PART

*Pseudexechia longistylus* sp. n.  
(figs. 1 - 2)

Type material. – Holotype male, TANZANIA: Tanga region, W. Usambara Mts, Mazumbai, 1440 m a.s.l., 22.XI.1990, G. E. E. Söli, sweep net (ZMBN No. 179).

Diagnostic characters. – The male imago is charac-

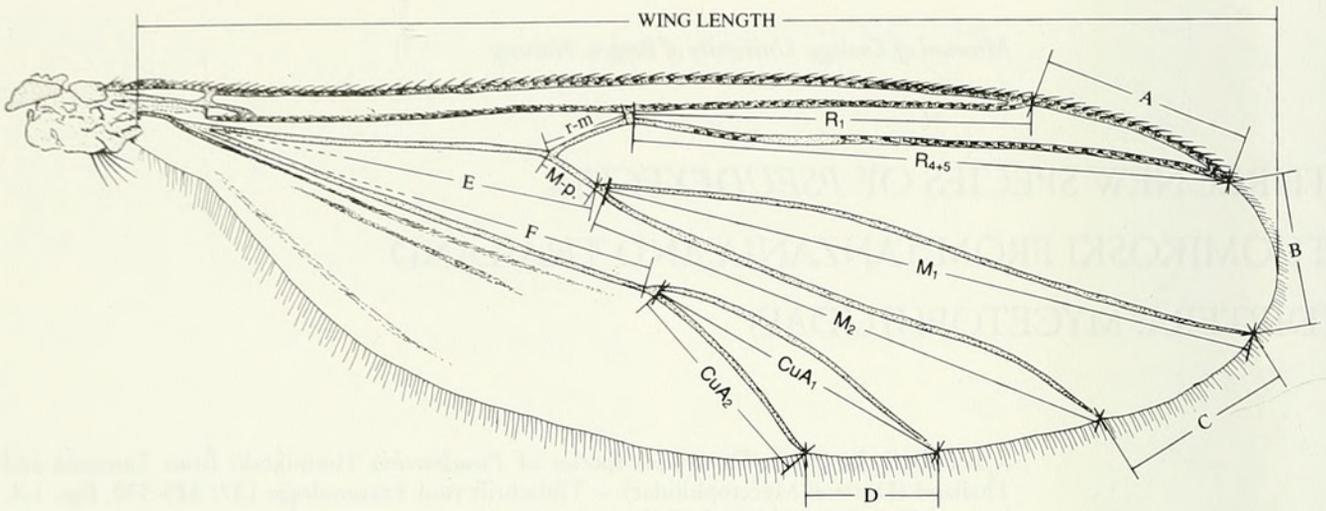
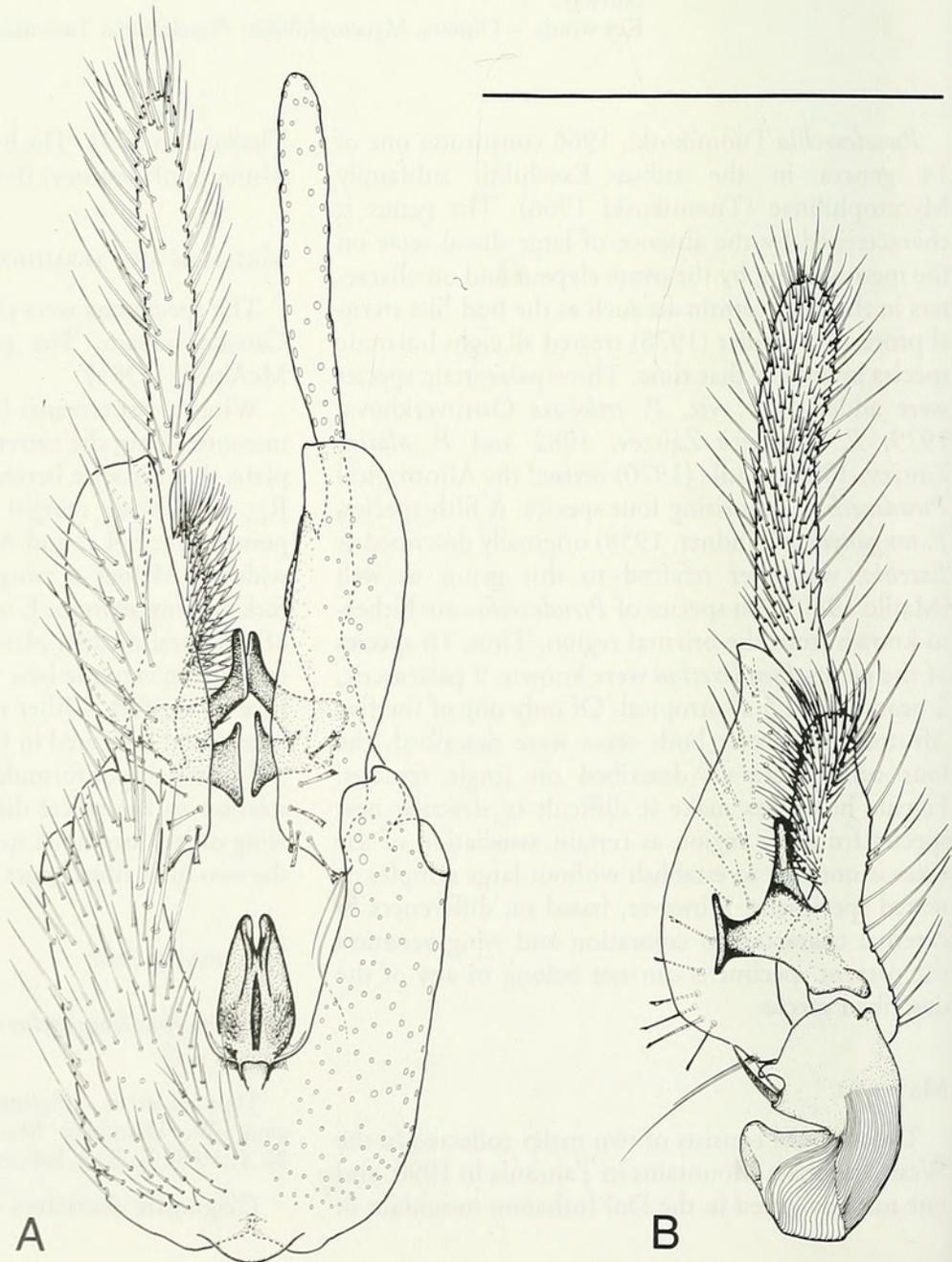


Fig. 1. *Pseudexechia longistylus* sp. n., right wing showing measuring points. – Total wing length is measured from the extreme base of the distal median plate to tip of wing. A = distance between the points where  $R_1$  and  $R_{4+5}$  reaches wing margin. B = distance between the points where  $R_{4+5}$  and  $M_1$  reaches wing margin. C = width of M-fork at wing margin. D = width of Cu-fork at wing margin. E = distance from extreme base of the distal median plate to point of M furcation. F = distance from extreme base of the distal median plate to point of Cu furcation. M-p. = M-petiole.

Fig. 2. *Pseudexechia longistylus* sp. n., male terminalia. – A, ventral view; B, internal face of the gonostylus. Scale 0.50 mm.



terised by the enlarged terminalia in which the dorsal lobe of gonostylus ends in a very elongated lobe with a setose cushion basally, and by the shape of the bifurcate internal process. The ventral lobe of the gonostylus also is enlarged compared to other species.

**Etymology.** – From Latin, *longus*, long, and *stylus*, style, referring to the elongated gonostylus. A noun in apposition.

**Description of male holotype.** – Length of thorax 0.86 mm. Wing length 2.62 mm. Wing length / length of thorax 3.1. Wing length / length of fore femur 3.1.

**Coloration.** Antenna with scape, pedicel and basal part of flagellum yellow, gradually becoming darker and more greyish dusted towards tip. Head yellow. Maxillary palp greyish yellow. Thorax mainly yellow; scutum with narrow pale yellow or somewhat silvery shining stripe along lateral margin, delimited by darker margins below and above; scutellum darker yellow. Wing unmarked, yellow tinted, paler towards tip and hind margin. Wing veins yellow with dark setae. Halter greyish yellow. Legs mainly yellow; coxae paler yellow, hind coxa posteriorly with darker stripe. Abdominal tergites mainly yellowish brown; tergite 1 and 2 with pale lateral markings; tergite 3 to 5 with pale posterolateral markings, almost reaching middle; tergite 6 almost entirely dark. Terminalia mainly yellow, darker apically on gonocoxite, on sternal process and on parts of dorsal lobe of gonostylus.

**Head.** Total length of flagellum 1.35 mm. First flagellomere 1.5 times as long as second flagellomere. Second flagellomere 2.2 times as long as wide. Five large orbital setae. Small round median ocellus present. Diameter of lateral ocellus / diameter of median ocellus 1.7. Clypeus bearing 31 setae; width / length 0.8. Fourth palpomere about 1.5 times as long as third palpomere.

**Thorax.** Pronotum with vertical row of 3 erect setae. Scutum with pair of medium sized bristle-like dorsocentral setae posteromedially in front of scutellum (prescutellar setae); anterior and lateral margin with large setae; otherwise uniformly clothed with small setae (but larger and fewer than in other *Pseudexechia* except in *P. lanceostylus* sp. n.). Scutellum with pair of strong scutellar setae and pair of very short incurved setae basad of them. Proepisternum with 1 strong, 1 medium sized and 5 small setae. Laterotergite with 6–7 large and about 50 small setae.

**Wing** (fig. 1). Crossvein h with 1 ventral seta.  $R_1$  with 11 ventral setae apically.  $R_{4+5}$  with 26–27 ventral setae apically. Wing length / length of  $R_1$  2.6. Wing length / length of  $R_{4+5}$  1.9.  $R_{4+5}$  nearly straight. Length of r-m / length of M-petiole 1.7. A / B 1.4. E / length

of  $M_1$  0.7. E / length of  $M_2$  0.8. Base of Cu-fork well beyond base of M-fork. M-fork veins distally divergent. Cu-fork veins divergent. F / E 1.3. F / length of  $CuA_1$  1.7. F / length of  $CuA_2$  2.5. C / D 1.4. Vein  $CuP$  reaching as far as base of Cu-fork. Vein  $A_1$  weak, shorter.

**Legs.** Length of fore basitarsus / length of fore tibia 1.3. Tibial spur formula 3.4; 8.8, 5.6; 4.6, 4.6. Fore tibia with 1 ad, 36 p and 3 v setae. Mid tibia with 40 a, 5 pd and 11 p setae. Hind tibia with 8 a, 5 pd and 3 p setae. Posterior sensillae placodea on basal part of tibia 3; 3; 3.

**Terminalia** (fig. 2A, B). Length of gonocoxite 0.60 mm. Sternal process narrow with about 40 tiny setae; length / width 1.9. Dorsal lobe of gonostylus 0.84 mm long with very elongated lobe, basally with strongly setose cushion. Sclerotized internal process bifurcate with both prongs widening apically. Ventral lobe of gonostylus large, bearing 6 fan-tipped setae basally. One lobe of the inner lamellate parts of the gonostylus apically with a slightly curved, spine-like seta thus forming a hook. Cerci thin and slender, reaching to about apical level of gonocoxite, with two short but strong apical setae (not figured).

*Pseudexechia lanceostylus* sp. n.  
(fig. 3)

**Type material.** – Holotype male, TANZANIA: Tanga region, W. Usambara Mts., Mazumbai, 1530 m a.s.l., 02.–03.XI.1990, G. E. E. Søli, Malaise tent (ZMBN No. 180).

**Diagnostic characters.** – The male imago is characterised by the shape of the dorsal lobe of gonostylus which ends in a slender lobe, and by the shape of the bifurcate internal process.

**Etymology.** – From Latin, *lancea*, a small light spear, and *stylus*, style, referring to the slender lance-like dorsal lobe of gonostylus.

**Description of male holotype.** – Length of thorax 0.98 mm. Wing length 3.02 mm. Wing length / length of thorax 3.1. Wing length / length of fore femur 3.1.

**Coloration.** Antenna with scape, pedicel and basal part of flagellum yellow, gradually becoming darker and more greyish dusted towards tip. Head and maxillary palp yellow. Thorax mainly yellow; scutum uniformly brownish yellow with pale yellow or somewhat silvery shining stripe along lateral margin, delimited by darker margins below and above; scutellum brownish yellow with faint paler median stripe. Wing unmarked, yellow tinted, slightly paler towards hind margin. Wing veins yellow with dark setae. Halter pale yellow with three darker yellow stripes.

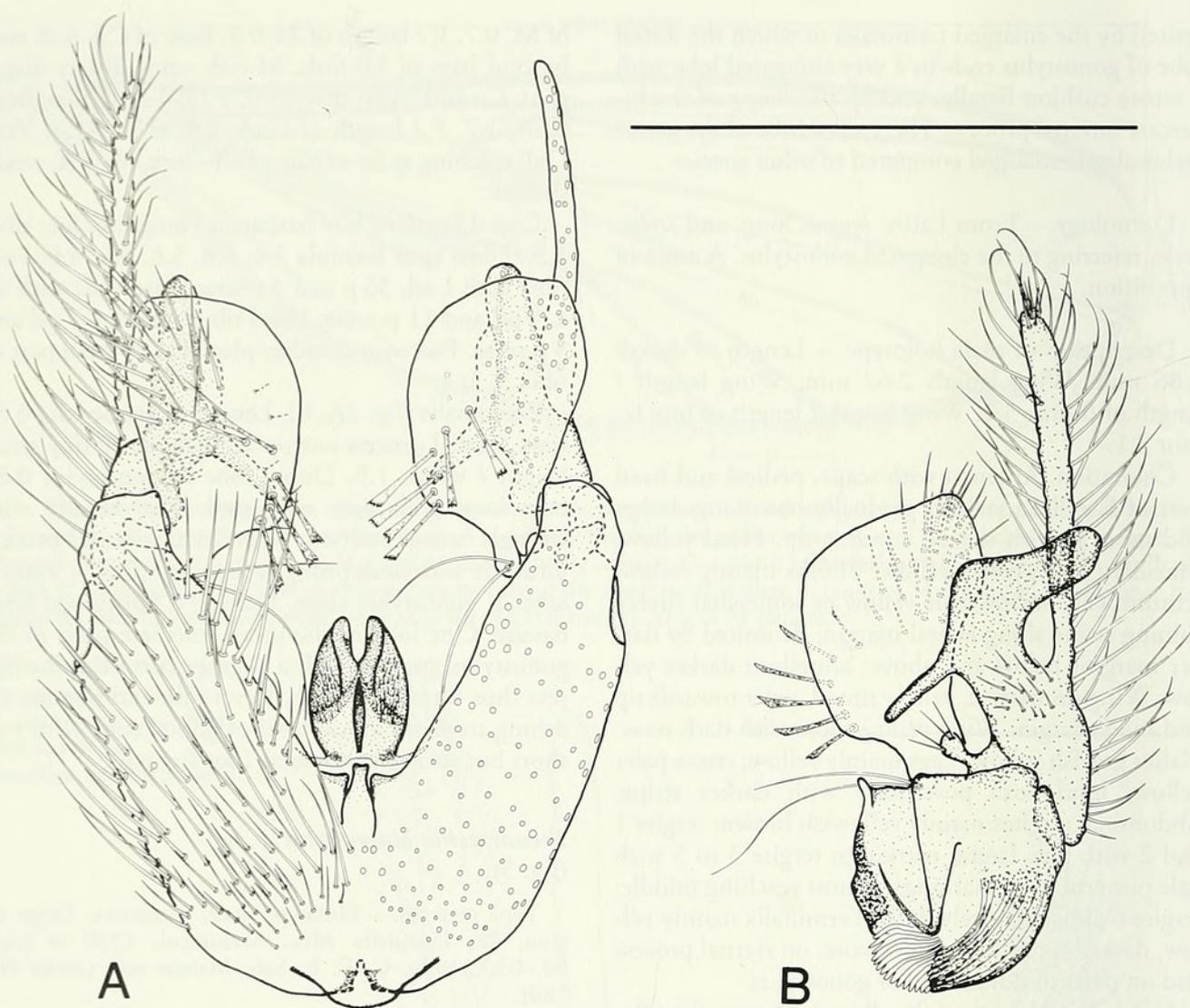


Fig. 3. *Pseudexechia lanceostylus* sp. n. male terminalia. – A, ventral view; B, internal face of the gonostylus. Scale 0.50 mm.

Legs mainly yellow; coxae paler yellow, fore coxa anteriorly with darker stripe. Abdominal tergites mainly yellowish brown; tergite 1 to 3 with pale lateral markings; tergite 4 and 5 with pale posterolateral markings, almost reaching middle; tergite 6 almost entirely dark. Terminalia mainly yellow, darker on sternal process and on parts of dorsal lobe of gonostylus.

Head. Total length of flagellum 1.53 mm. First flagellomere 1.7 times as long as second flagellomere. Second flagellomere 2.3 times as long as wide. Six large orbital setae. Tiny median ocellus present. Diameter of lateral ocellus / diameter of median ocellus 2.4. Clypeus bearing about 60 setae; width / length 0.8. Fourth palpomere about 1.5 times as long as third palpomere.

Thorax. Pronotum with vertical row of 3 erect setae. Scutum with pair of medium sized bristle like dorsocentral setae present posteromedially in front of scutellum (prescutellar setae); anterior and lateral margins with large setae; otherwise uniformly clothed with small setae (but larger and fewer than in other

*Pseudexechia* except in *P. longistylus* sp. n.). Scutellum with pair of strong scutellar setae and 2 pairs of very short posteriorly curved setae basad of them. Proepisternum with 1 strong, 2 medium sized and 8 small setae. Laterotergite with 8–10 large and about 60 small setae.

Wing. Crossvein h with 1–2 ventral setae.  $R_1$  with 5–8 ventral setae apically.  $R_{4+5}$  with 3–4 ventral setae basally and 36–39 ventral setae apically. Wing length / length of  $R_1$  2.6. Wing length / length of  $R_{4+5}$  1.8.  $R_{4+5}$  nearly straight. Length of r-m / length of M-pectiole 1.6. A / B 1.5. E / length of  $M_1$  0.7. E / length of  $M_2$  0.8. Base of Cu-fork well beyond base of M-fork. M-fork veins distally divergent. Cu-fork veins divergent. F / E 1.3. F / length of  $CuA_1$  1.5. F / length of  $CuA_2$  2.3. C / D 1.1. Vein CuP reaching as far as base of Cu-fork. Vein  $A_1$  strong, shorter.

Legs. Length of fore basitarsus / length of fore tibia 1.8. Tibial spur formula 3.7; 9.8, 7.5; 5.4, 5.3. Fore tibia with 1 ad, 39 p and 3 v setae. Mid tibia with 41 a, 5 pd and 7 p setae. Hind tibia with 9 a, 5 pd and 4

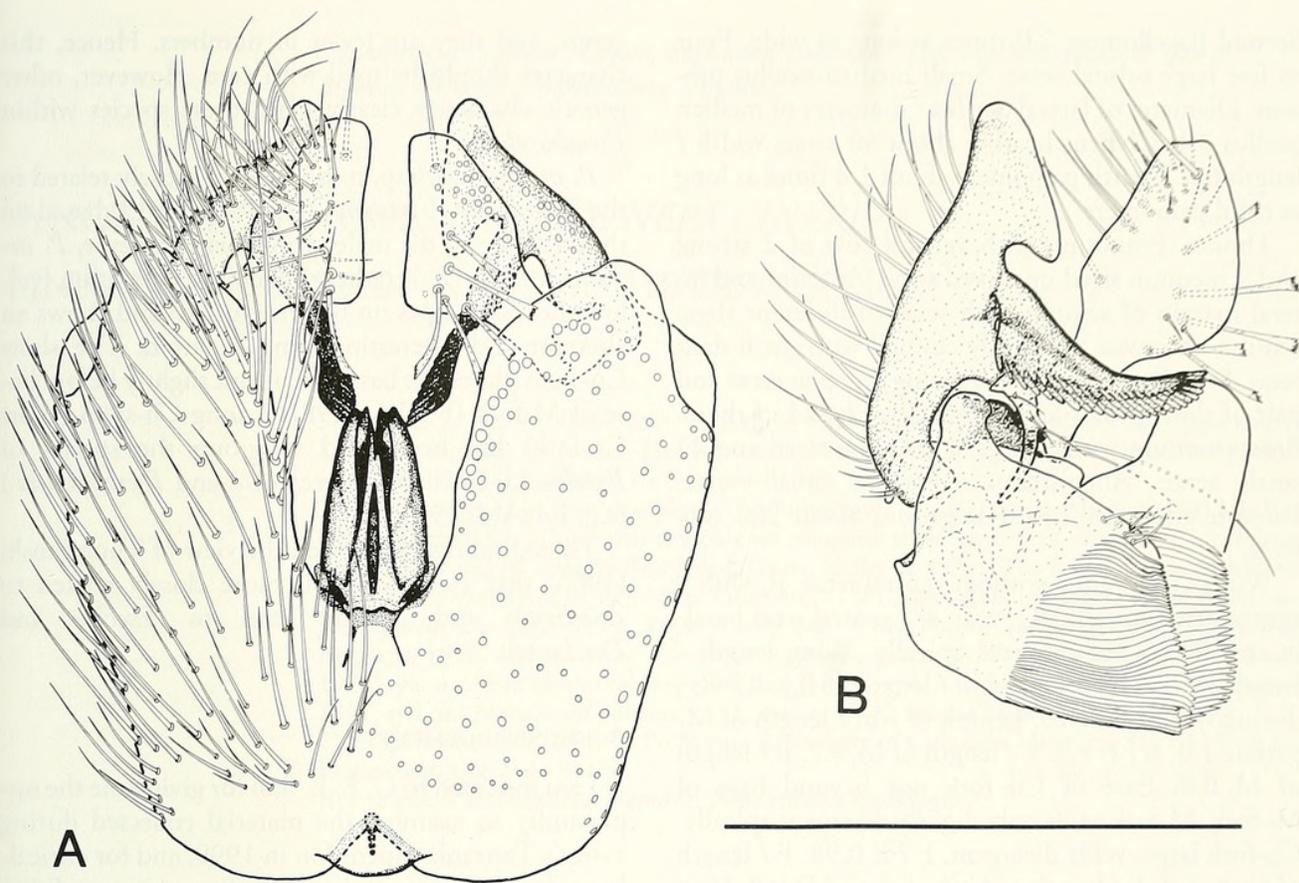


Fig. 4. *Pseudexechia inthanonensis* sp. n. male terminalia. – A, ventral view; B, internal face of the gonostylus. Scale 0.50 mm.

p setae. Posterior sensillae placodea on basal part of tibia 3; 4; 3.

Terminalia ( Fig. 3A, B). Length of gonocoxite 0.57 mm. Sternal process rounded with about 55 tiny setae; length / width 1.4. Dorsal lobe of gonostylus 0.51 mm, ending in slender lobe. Sclerotized internal process bifurcate, the the prongs pointing in almost opposite directions. Ventral lobe of gonostylus broad and rounded, bearing 6 fan-tipped setae. Inner lamellate parts of gonostylus with lobe ending in strong seta-like hook. Cerci thin, not reaching apical level of gonocoxite, with two strong apical and one strong subapical setae (not figured).

*Pseudexechia inthanonensis* sp. n.  
(fig. 4).

Type material. – Holotype male, THAILAND: Chiang Mai province, Doi Inthanon, about 2200 m a.s.l., 12.IV.1991, J. Kjærandsen, sweep net (ZMBN No. 181).

Diagnostic characters. – The male imago is separable from other species by the shape of the dorsal lobe of gonostylus, which has a smooth rounded hook at the tip and a large internal process with 25 teeth, by the shape of the sternal process and by the short stem of the cubital fork.

Etymology. – From Doi Inthanon, a mountain in northern Thailand. A noun in genitive case.

Description of male holotype. – Length of thorax 1.20 mm. Wing length 3.82 mm. Wing length / length of thorax 3.2. Wing length / length of fore femur 3.3.

Coloration. Antenna with scape, pedicel and first flagellomere for half of its length pale yellow, rest of flagellum greyish yellow. Head mainly brown, frons and sides yellowish. Maxillary palp yellow. Pronotum yellowish brown. Scutum brown with three yellow stripes, median stripe broadening to fore margin, and narrow yellow lateral margins. Scutellum brown with yellowish lateral margins. Pleura yellowish brown. Wing unmarked, greyish yellow tinted, paler on basal half posterior of R-stem. Wing veins yellowish brown with dark setae. Halter pale yellow with three greyish yellow stripes. Legs mainly yellow; coxae paler yellow, each coxa with yellowish brown stripe. Abdominal tergites mainly brown; tergite 2 to 5 with pale posterolateral markings, reaching middle; tergite 6 dark brown. Terminalia mainly yellow, darker on sternal process and on parts of dorsal lobe of gonostylus. Tip of dorsal lobe of gonostylus whitish.

Head. Total length of flagellum 1.84 mm. First flagellomere 1.7 times as long as second flagellomere.

Second flagellomere 2.0 times as long as wide. Four to five large orbital setae. Small median ocellus present. Diameter of lateral ocellus / diameter of median ocellus 2.1. Clypeus bearing about 40 setae; width / length 0.8. Fourth palpomere about 1.4 times as long as third palpomere.

Thorax. Pronotum with vertical row of 2 strong and 2 medium sized upcurved setae. Anterior and lateral margin of scutum with setae of different sizes; scutum otherwise uniformly clothed with small dark setae. Scutellum with pair of strong scutellar setae and pair of short posteriorly curved setae basad of them. Proepisternum with 1 large, 2 medium sized and 24 small setae. Anepisternum with 6 small setae. Laterotergite with 12–14 large and about 200 tiny setae.

Wing. Crossvein h without ventral setae.  $R_1$  with 9 ventral setae apically.  $R_{4+5}$  with 4–5 ventral setae basally and 58–65 ventral setae apically. Wing length / length of  $R_1$  2.3. Wing length / length of  $R_{4+5}$  1.7.  $R_{4+5}$  distinctly downcurved. Length of r-m / length of M-petiole 1.0. A / B 1.9. E / length of  $M_1$  0.7. E / length of  $M_2$  0.8. Base of Cu-fork not beyond base of M-fork. M-fork veins only slightly divergent apically. Cu-fork large, veins divergent. F / E 0.98. F / length of  $CuA_1$  1.2. F / length of  $CuA_2$  1.7. C / D 0.9. Vein  $CuP$  reaching well beyond base of Cu-fork. Vein  $A_1$  strong, shorter.

Legs. Length of fore basitarsus / length of fore tibia 1.2. Tibial spur formula 3.5; 6.7, 6.4; 4.6, 4.5. Fore tibia with 6 ad, 45p and 8 v setae. Mid tibia with 49 a, 5 pd and 4 p setae. Hind tibia with 6 a, 5 pd and 8 p setae. Posterior sensillae placodea on basal part of tibia 3; 3; 3.

Terminalia ( Fig. 4A, B). Length of gonocoxite 0.67 mm. Sternal process narrow without setae; length / width 1.8. Dorsal lobe of gonostylus 0.67 mm long with smooth rounded hook at tip and relatively large sclerotized internal process with 25 teeth. Ventral lobe of gonostylus bearing 4–5 fan-tipped ventral setae and one strong dorsal setae apically. Inner lamellate parts of gonostylus with 5 small setae. Cerci thin and slender, reaching to about apical level of gonocoxite, without strong setae (not figured).

## DISCUSSION

The presence of a pair of medium sized bristle-like dorsocentral setae posteromedially above scutellum in *Pseudexechia longistylus* sp. n. and *P. lanceostylus* sp. n. is not in accordance with the generic description. Tuomikoski (1966) used absence of 'discal bristles' as one of the main diagnostic characters for *Pseudexechia*. The other setae on the scutal disc in these two species are also relatively strong, erect and bristle-like when compared with other species in the

genus, and they are fewer in numbers. Hence, this character should be used with care. However, other generic characters clearly place these species within *Pseudexechia*.

*P. inthanonensis* sp. n. is evidently closely related to the Palearctic *P. trisignata* (Edwards, 1913) based on the structure of the male terminalia. However, *P. inthanonensis* sp. n. is rather different in coloration (yellow thoracic stripes on brown ground) and shows an aberrant and interesting wing venation. The short Cu-stem places the base of Cu-fork slightly before base of M-fork (F / E = 0.98). A long Cu-stem (short Cu-fork) has been used to group the species of *Exechia* s.l. (including *Exechiopsis* and *Pseudexechia*) (e.g. Edwards 1925).

These findings strengthen the view of Tuomikoski (1966) that *Pseudexechia* is more closely related to *Allodiopsis* and *Allodia* than to *Exechia* and *Exechiopsis*.

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