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New records of Pauropoda (Myriapoda) from north-western Thailand

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Abstract

Fourteen species of Pauropoda are reported from altitudes above 1000 m in north-western Thailand, among them one species belonging to a new genus in Pauropodidae, *Angkapauropus* **gen. n.**, and one species in *Borneopauropus*, a genus in Brachypauropodidae, a family not previously reported from Thailand. The species new to science are: *Decapauropus prolixus* **sp. n.**, *D. capillaris* **sp. n.**, *D. brevilingulus* **sp. n.**, *D. premnos* **sp. n.**, *D. anatanosus* **sp. n.**, *D. undulatulus* **sp. n.**, and *Angkapauropus leptotrichos* gen. n., **sp. n.** (all in Pauropodidae); *Borneopauropus platylopas* **sp. n.** (Brachypauropodidae); *Samarangopus choanephorus* **sp. n.** (Eurypauropodidae), and *Sphaeropauropus angulatus* **sp. n.** (Sphaeropauropodidae).

Keywords

Myriapoda, Pauropoda, new genus, new species, taxonomy, Thailand, biogeography

Introduction

Pauropoda were first recorded from Thailand by Hansen (1902) who reported nine species, eight in *Allopauropus* and one in *Decapauropus*, from the Island Koh Chang in the Gulf of Thailand. The present author then reported 11 species, seven in *Deca-*

pauropus, three in *Samarangopus* and one in *Sphaeropauropus*, in a collection from Doi Inthanon in the northwest (Scheller 1995), altogether 20 species. The latter material was collected by Drs Louis Deharveng and Anne Bedos, Muséum national d´Histoire naturelle, Paris, and so is the collection from Doi Inthanon reported below.

All specimens were collected from Berlese funnel extractions and were preserved in ethanol and studied in monopropylene glycol. In the descriptions below individuals have been classified as adults, subadults and juveniles according to the number of pairs of legs. The sex of adults and subadults was recorded.

The type material has been lodged in the collections of the Zoological Museum, University of Lund, Sweden.

Systematics

Family Pauropodidae Verhoeff, 1934
Genus *Decapauropus* Remy, 1931

Decapauropus grandicollis Scheller, 1995

Material. Thailand, Chiang Mai province, Doi Inthanon, Mae Chaem road, secondary dry forest, litter, alt. 1150 m, 1 juv. 5, 1991.vi.30, loc. CM-080. – 1 specimen.

General distribution. Known previously from Doi Inthanon only (Scheller 1995).

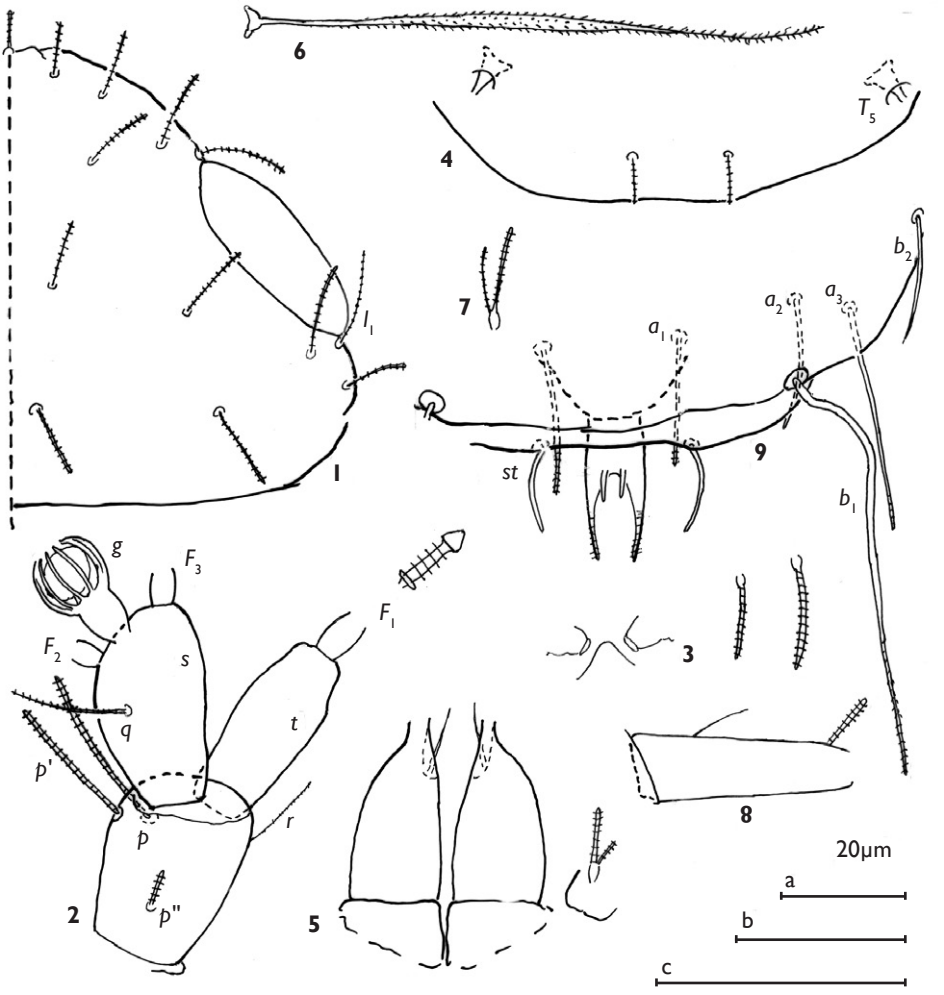
Decapauropus prolixus sp. n.

urn:lsid:zoobank.org:act:BBC206B8-80B2-4D40-96C5-F1BA62CF0E9F
http://species-id.net/wiki/Decapauropus_prolixus
Figs 1–9

Material. Holotype ad. 9(♂), Thailand, Chiang Mai province, Doi Inthanon, Mae Chaem road, secondary dry forest, litter, alt. 1150 m, 1991.vii.4, loc. CM-096. – 1 specimen.

Etymology. From the Latin *prolictus*, stretched out long (referring to the posterolateral appendages of the anal plate).

Diagnosis. *Decapauropus prolixus* may be close to *D. bispinus* Scheller (2009) from Sulawesi in Indonesia but can readily be distinguished from it by the shape of the temporal organs of the head, in tergal view small and longish in *D. prolixus*, large in *D. bispinus*, the antennal globulus *g*, pyriform, not spherical, the shape of the pygidial *st*, long, thin, cylindrical, not short, globular, and the lateral margins of the anal plate, parallel, not distinctly convex.



Figures 1–9. *Decapauropus prolixus* sp. n., holotype, ad. 9(♂) **1** head, median and right part **2** left antenna, sternal view **3** collum segment, median and left part, sternal view **4** tergite VI, posterior part **5** genital papillae and seta on coxa of leg 2, anterior view; **6** T_3 **7** seta on trochanter of leg 9 **8** tarsus of leg 9 **9** pygidium, posteromedian and left part, sternal view. Scale: a: Figs 4–8; b: 1–3; c: 9.

Description. *Length.* 0.48 mm. *Head* (Fig. 1). Setae on the tergal side subcylindrical striate. Relative lengths of setae, 1st row: a_1=10, a_2=12; 2nd row: a_1=14, a_2=15, a_3=17; 3rd row: a_1=12, a_2=15; 4th row: a_1=14, a_2=15, a_3=18, a_4=11; lateral group setae, l_1=18, l_2≈17, l_3=?. Ratio a_1/a_1-a_1 in 1st row 0.9, 2nd row 0.5, 3rd row 0.8, 4th row 1.5. Temporal organs small, in tergal view ovoid, as long as their shortest distance apart. Head cuticle glabrous.

Antennae (Fig. 2). Segment 4 with 4 cylindrical striate setae; their relative lengths: *p*=10, *p'*=8, *p"*=2, *r*=5. Tergal seta *p* 0.9 of the length of tergal branch *t*. The latter fusiform, 2.7 times as long as its greatest diameter and 1.1 times as long as the length of sternal branch *s*, that branch 1.7 times as long as its greatest diameter; anterodistal corner distinctly truncate. Seta *q* cylindrical striate, 0.7 of the length of *s*. Relative lengths of flagella (basal segments included) and basal segments: F_1=100, bs_1=7; F_2=58, bs_2=5; F_3=91, bs_3=5. F_1 3.4 times as long as *t*, F_2 and F_3 2.1 and 3.3 times as long as *s* respectively. Distal calyces of F_1 and F_3 conical, those of F_2 hemispherical, distal part of flagella axes inconsiderably widened below calyces. Globulus *g* proportionally large, pyriform, 1.5 times as long as wide, ≈10 bracts, capsule subspherical; width of *g* as long as the greatest diameter of *t*. Antennae glabrous.

Trunk (Figs 3, 4). Setae of collum segment (Fig. 3) simple cylindrical striate, sublateral setae 1.3 times as long as submedian setae; sternite process triangular, blunt anteriorly; appendages tapering distally, caps low. Process and appendages glabrous. Setae on tergites as setae on the head, 4+4 setae on tergite I and ?4+2 on VI , interposed tergites not studied. Submedian posterior setae on VI (Fig. 4) 0.5 of interdistance and 0.6 of the length of pygidial setae a_1.

Genital papillae (Fig. 5). Proximal 2/3 subcylindrical, distal part tapering into an subcylindrical top, papillae 2.1 times as long as the greatest diameter, seta thin, 0.3 of the length of papilla.

Bothriotricha (Fig. 6). Relative lengths: T_1=T_3=100, T_2=108, T_4=138, T_5=196; axes simple straight, very thin and with faint pubescence only distally, T_3 only (Fig. 6) stronger, fusiformly thickened in distal ¾ and with distinct oblique pubescence.

Legs (Figs 7, 8). Setae on coxa and trochanter (Fig. 7) of leg 9 furcate, branches cylindrical striate, secondary branch shorter than primary one. These setae more anteriorly with rudimentary secondary branches except in coxal setae of leg 2. Tarsus of leg 9 (Fig. 8) tapering, 3.5 times as long as its greatest diameter; proximal seta very thin tapering pointed, distal seta subcylindrical blunt striate, proximal one 0.3 of the length of tarsus and as long as the length of distal seta. Cuticle of tarsus glabrous.

Pygidium (Fig. 9). *Tergum*. Posterior margin between *st* straight. Relative lengths of setae: a_1=10, a_2=9, a_3=19, *st*=6; setae directed posteriorly, a_1 and a_3 almost straight, a_2 and *st* curved inwards, a_1 striate distally. Distance a_1-a_1 0.9 of the length of a_1, distance a_1-a_2 twice longer than distance a_2-a_3; distance *st-st* 1.3 times as long as *st* and as long as distance a_1-a_1.

Sternum. Posterior margin with low and broad bulge below base of anal plate. Relative lengths of setae (pygidial a_1=10): b_1=31, b_2=10, setae thin tapering, b_1 with short pubescence distally, 1.4 times as long as interdistance, b_2 0.7 of distance b_1-b_2.

Anal plate directed posteriorly, lateral margins parallel, posterodistal corners lengthened into two long tapering and distally faintly striate appendages, these ≈1.6 times as long as the length of plate; posterior margin between appendages U-shaped and with two short tapering glabrous appendages protruding backwards from sternal margin, length of short appendages ≈¼ of the length of posterolateral appendages; plate glabrous.

***Decapauropus capillaris* sp. n.**
urn:lsid:zoobank.org:act:A56C4313-659B-42AB-8FFF-540764DB2D29
http://species-id.net/wiki/Decapauropus_capillaris
Figs 10–19

Material. Holotype ad. 9(♂), Thailand, Chiang Mai province, Doi Inthanon, Mae Chaem road, secondary dry forest, litter, alt. 1150 m, 1991.vi.30, loc. CM-080. – Paratypes: 3 ad. 9 (2♀, 1♂), same data as holotype. – 4 specimens.

Etymology. From the Latin *capillaris*, slender as a hair (referring to the thin setae).

Diagnosis. *Decapauropus capillaris* shows striking resemblances to *D. virgininsularis* Scheller (Scheller 1990) from the U.S. Virgin Islands. They can be distinguished by the shape of the tergal antennal branch, 3.4–3.5 times as long as its greatest diameter in *D. capillaris*, not 4.9–5.3, the setae of the collum segment, both of the same shape, not sublateral seta much longer and thicker than submedian one, the tarsus of the last pair of legs, only somewhat tapering, not strongly tapering and very slender distally, the size of the *st*, rudimentary, not well developed, and the shape of the lateral margins of the anal plate, convex, not concave.

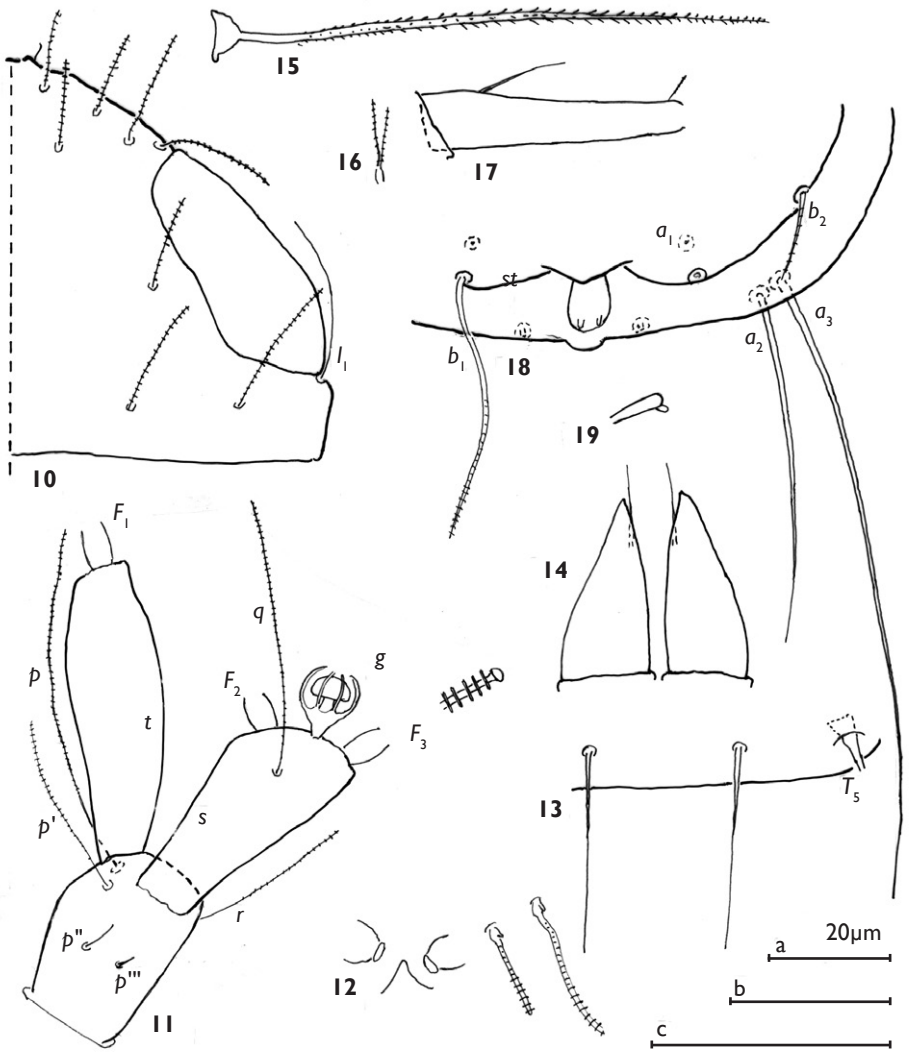
Description. *Length.* (0.50-)0.52(-0.65) mm. *Head* (Fig. 10). Setae on the tergal side thin striate. Relative lengths of setae (holotype only), 1st row: a_1=a_2=10; 2nd row: a_1=11, a_2=13, a_3=15; 3rd row: a_1=?, a_2=11; 4th row: a_1=?, a_2=14, a_3=16, a_4=?; lateral group setae, l_1=19, l_2=17, l_3=10. Ratio a_1/a_1-a_1 in 1st row 1.0, 2nd row 0.8, 3rd and 4th row?. Temporal organs in tergal view broadest in posterior part, length 0.9 of their shortest distance apart. Pore not ascertained. Head cuticle glabrous.

Antennae (Fig. 11). Segment 4 with five setae, all thin cylindrical striate; their relative lengths: *p*=10, *p'*=44, *p"*=11, *p'"*=5, *r*=39. Tergal seta *p* 1.2 times as long as the length of tergal branch *t*. The latter fusiform, (3.4-)3.5 times as long as its greatest diameter and 1.3 times as long as the length of sternal branch *s*, that branch 2.1 times as long as its greatest diameter; anterodistal corner distinctly truncate. Seta *q* thin cylindrical striate, 1.3 times as long as the length of *s*. Relative lengths of flagella (basal segments included) and basal segments: F_1=100, bs_1=5; F_2=?, bs_2=4; F_3=76, bs_3=5. F_1 3.7 times as long as *t*, F_3 3.0 times as long as *s*. Distal calyces small rounded, distal part of flagella axes not widened below calyces. Globulus *g* subspherical, 1.2 times as long as wide, 8 bracts, capsule with flattened bottom; width of *g* 0.8 of the greatest diameter of *t*. Antennae glabrous.

Trunk (Figs 12, 13). Setae of collum segment (Fig. 12) furcate, main branch cylindrical blunt striate, secondary branch rudimentary, sublateral setae 1.7 times as long as submedian setae; sternite process triangular, pointed anteriorly; appendages tapering distally. Process and appendages glabrous.

Setae on tergites as setae on the head, 4+4 setae on tergite I, 6+6 on II-V, 4+2 on VI. Submedian posterior setae on VI (Fig. 13) long tapering pointed, 1.4 times as long as interdistance.

Genital papillae (Fig. 14). Conical, 2.0 times as long as the greatest diameter, seta thin, 0.4 of the length of papilla.



Figures 10–19. *Decapauropus capillaris* sp. n., holotype, ad. 9(♂) **10** head, median and right part **11** right antenna, sternal view **12** collum segment, median and left part, sternal view **13** tergite VI, posteromedian part and right posterior corner **14** genital papillae, anterior view **15** T_3 **16** seta on coxa of leg 9 **17** tarsus of leg 9 **18** pygidium, posteromedian and left part, sternal view **19** anal plate, lateral view. Scale: a: Figs 13–17; b: 10, 12, 18, 19; c: 11.

Bothriotricha (Fig. 15). Relative lengths (holotype only): T_1=100, T_2=152, T_3=105, T_4=123, T_5=131; axes simple straight, very thin and with short pubescence, erect distally; T_3 only (Fig. 15) stronger, fusiformly thickened in proximal ¾ and with distinct oblique pubescence.

Legs (Figs 16, 17). Setae on coxa and trochanter (Fig. 16) of leg 9 furcate, branches cylindrical striate, secondary branch shorter than primary one. These setae more anteriorly with rudimentary secondary branches except in coxal setae of leg 2 (paratype male). Tarsus of leg 9 (Fig. 17) tapering, 3.5(-3.6) times as long as its greatest diameter; setae thin, proximal one tapering pointed, distal one subcylindrical blunt, faintly striate, proximal seta (0.3-)0.4 of the length of tarsus and (3.4-)3.5 times as long as distal seta. Cuticle of tarsus glabrous.

Pygidium (Figs 18, 19). *Tergum*. Posterior margin rounded but with small posterior lobe between *st*. Setae a_1 broken or rudimentary, relative lengths of setae: a_2=10, a_3=18, *st* rudimentary; setae directed posteriorly, a_2 and a_3 long thin tapering glabrous, somewhat curved inward. Distance a_1-a_2 three times longer than distance a_2-a_3; distance *st*-*st* ≈20 times as long as *st* and 0.4 of distance a_1-a_1.

Sternum. Posterior margin with distinct indentation and broadly triangular lobe below anal plate. Relative lengths of setae (pygidial a_2=10): b_1=7, b_2=3, setae thin tapering, b_1 indistinctly striate in distal half, as long as interdistance, b_2 0.7(-0.8) of distance b_1-b_2.

Anal plate somewhat turned up, narrowest anteriorly, linguiform, lateral margins a little convex, on underside of rounded distal part two very short cylindrical blunt appendages protruding backwards-downwards; plate glabrous.

***Decapauropus brevilingulus* sp. n.**
urn:lsid:zoobank.org:act:FEEA6B7A-30E5-43CB-9027-3ECA9438AA63
http://species-id.net/wiki/Decapauropus_brevilingulus
Figs 20–27

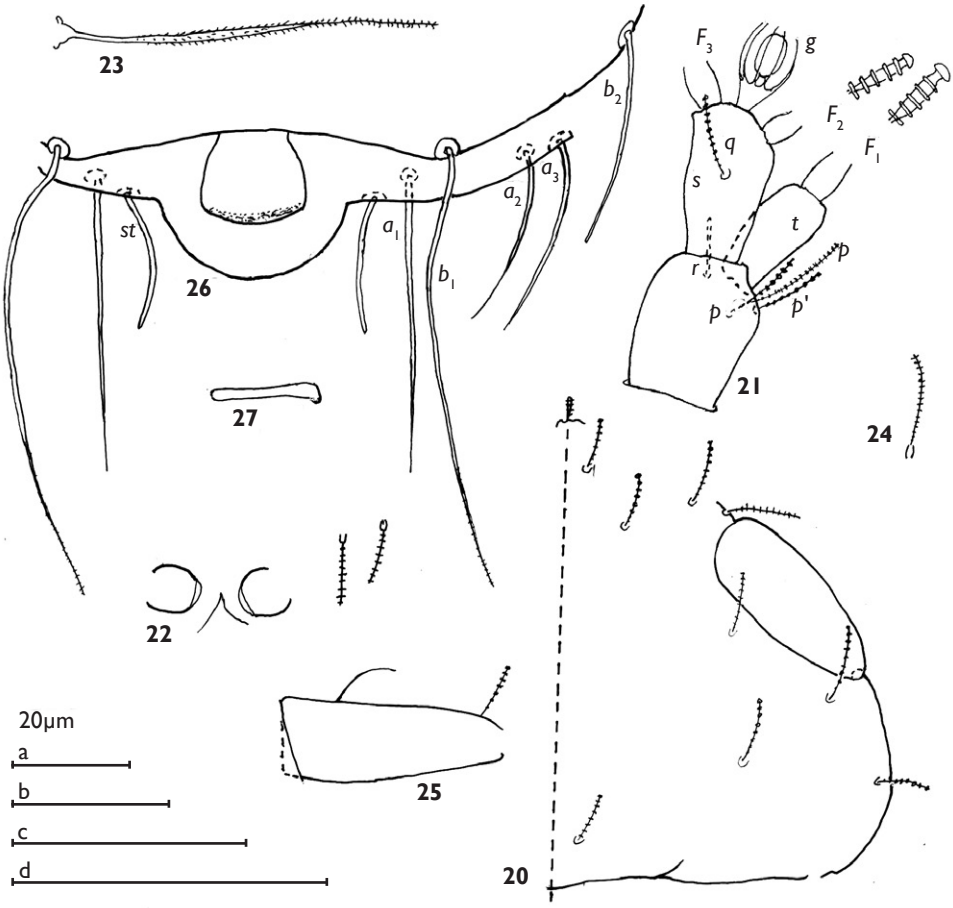
Material. Holotype ad. 9(♀), Thailand, Chiang Mai province, Doi Inthanon, below the top, alt. 2400 m, 1991.vii.8, loc. CM-243.

Etymology. From the Latin *brevis*, short, and *lingua*, tongue (referring to the shape of the anal plate).

Diagnosis. *Decapauropus brevilingulus* sp. n. is well defined by its unique short linguiform anal plate in combination with a distinct semicircular lobe between the pygidial setae *st* and longish antennal globulus with ovoid capsule. At present its relationships can not be traced.

Description. *Length.* 0.55 mm. *Head* (Fig. 20). Setae on the tergal side thin annulate. Relative lengths of setae, 1st row: a_1=10, a_2=?; 2nd row: a_1=10, a_2=11, a_3=14; 3rd row: a_1=?, a_2=10; 4th row: a_1=9, a_2=a_4=11, a_3=13; lateral group setae not studied. Ratio a_1/a_1-a_1 in 1st row 1.4, 2nd row 0.5, 3rd row?, 4th row 1.3. Temporal organs small, ovoid in tergal view, length 0.6 of their shortest distance apart; small pore near posterior margin. Head cuticle glabrous.

Antennae (Fig. 21). Segment 4 with at least four setae, all thin cylindrical annulate blunt; their relative lengths: *p*=10, *p'*=7, *p"*=6, *r*=5. Tergal seta *p* 0.8 of the length of tergal branch *t*. The latter proportionally short, somewhat fusiform, twice longer than thick and 0.8 of the length of sternal branch *s*, that branch 1.9 times as long as its great-



Figures 20–27. *Decapauropus brevilingulus* sp. n., holotype, ad. 9(♂) **20** head, median and right part **21** left antenna, sternal view **22** collum segment, median and left part, sternal view **23** T_3 **24** seta on coxa of leg 9 **25** tarsus of leg 9 **26** pygidium, posteromedian and left part, sternal view **27** anal plate, lateral view. Scale: a: Fig. 23; b: Fig. 20; c: 21, 22, 24, 25; d: 26, 27.

est diameter; anterodistal corner distinctly truncate. Seta *q* thin cylindrical annulate, ≈0.5 of the length of *s*. Relative lengths of flagella (basal segments included) and basal segments: F_1=100, bs_1=5; F_2=38, bs_2=6; F_3=85, bs_3=8. F_1 5.5 times as long as *t*, F_2 and F_3 1.6 and 3.6 times as long as *s* respectively. Distal calyces somewhat flattened, distal part of flagella axes widened fusiformly below calyces. Globulus *g* longish, 1.5 times as long as greatest diameter, bracts and capsule proportionally long, 7 bracts; *g* as wide as the greatest diameter of *t*. Antennae glabrous.

Trunk. Setae of collum segment (Fig. 22) simple cylindrical blunt striate, sublateral and submedian setae of the same length; sternite process triangular, pointed anteriorly; appendages subspherical with flat caps. Process and appendages glabrous.

Most setae on tergites not available for study, those studied similar to those on head, 4+4 setae on tergite I, 4+2 on VI.

Bothriotricha. Most bothriotricha broken; T_3 (Fig. 23) with proximal 2/3 somewhat thickened, pubescence distinct, oblique on thickened part, erect distally; T_5 thin with very faint oblique pubescence.

Legs (Figs 24, 25). Setae on coxa (Fig. 24) and trochanter of all legs simple cylindrical striate. Tarsus of leg 9 (Fig. 25) tapering, 4.8 times as long as its greatest diameter; setae thin, proximal one curved tapering pointed glabrous, distal one subcylindrical blunt striate, proximal seta 0.2 of the length of tarsus and 1.3 times as long as distal seta. Cuticle of tarsus glabrous.

Pygidium (Figs 26, 27). *Tergum*. Posterior margin with large semicircular lobe between *st*. Setae a_2 and a_3 distinctly shorter than a_1; relative lengths of setae: a_1=10, a_2=6, a_3=7, *st*=3; *a*-setae directed posteriorly, proportionately long, tapering glabrous; a_1 straight, a_2 and a_3 curved inward. Distance a_1-a_1 as long as a_1, distance a_1-a_2 3.3 times as long as distance a_2-a_3; distance *st*-*st* 1.8 times as long as *st* and 0.8 of distance a_1-a_1.

Sternum. Posterior margin with shallow indentation between b_1. Relative lengths of setae (pygidial a_1=10): b_1=16, b_2=7, setae thin tapering, b_1 indistinctly striate in distal half, 1.2 times as long as interdistance, b_2 as long as distance b_1-b_2.

Anal plate horizontal, narrowest anteriorly, somewhat broader than long, shortly linguiform, distal margin somewhat thickened at posterior margin; no appendages.

***Decapauropus premnos* sp. n.**

urn:lsid:zoobank.org:act:DEE020F4-FABC-4962-B5FF-F52E9BEDF175

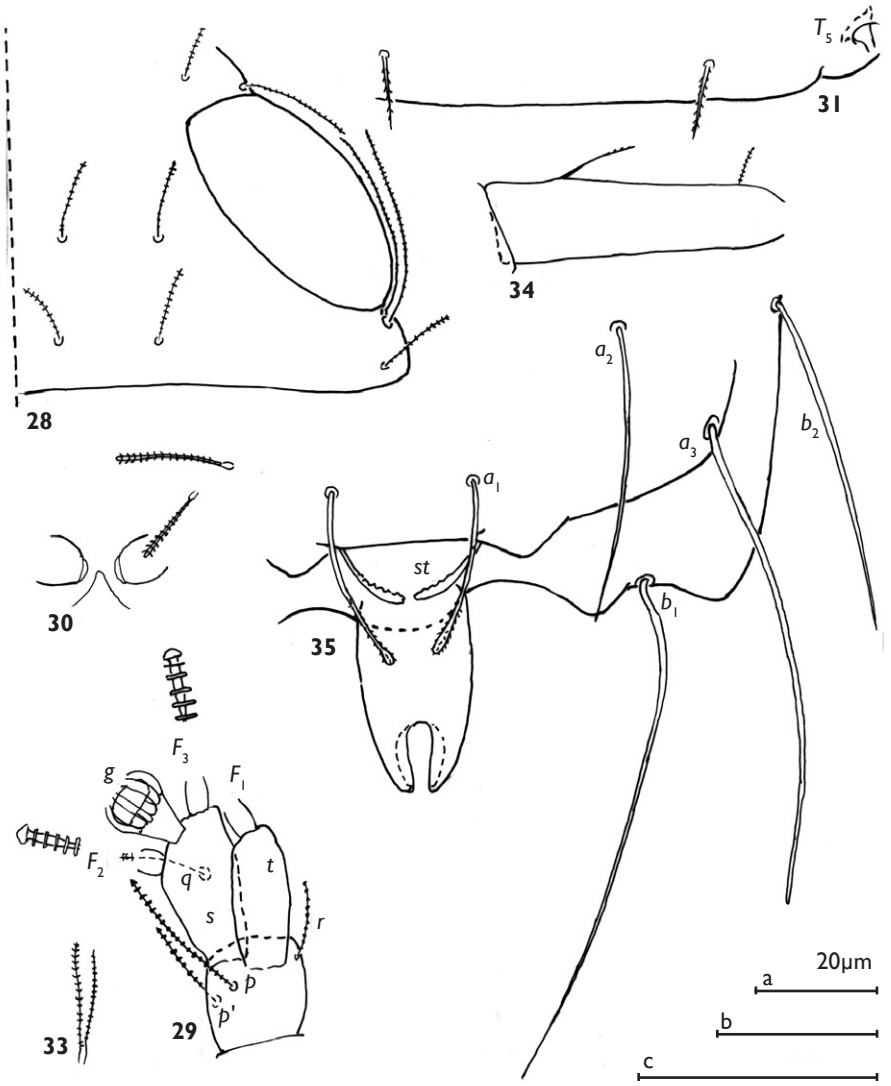
http://species-id.net/wiki/Decapauropus_premnos

Figs 28–35

Material. Holotype ad. 9(♀), Thailand, Chiang Mai province, Doi Inthanon, below the top, primary rain forest, soil, alt. 2400 m, 1991.vii.4, loc. CM-195. – Paratype subad. 8(♀), below the top, primary rain forest, soil, alt. 2400 m, 1991.vii.8, loc. CM-243. – Other material, 1 juv. 5, ibidem, Mae Chaem road, secondary dry forest, litter, alt. 1150 m, 1991.vi.30, CM-064. – 3 specimens.

Etymology. From the Greek *premnos*, stump of a tree (referring to the thick stalk of the antennal globulus *g*).

Diagnosis. *Decapauropus premnos* seems to be close to *D. mortensenii* (Hansen) which was described (1902) from the island Koh Chang in the Gulf of Thailand and later has been reported from Egypt, Seychelles, Sri Lanka, Java and Sumatra, and New Caledonia (with uncertainty also from Réunion, Mauritius and Australia). The new species can be distinguished from *D. mortensenii* by its thick stalk of the antennal globulus *g*, narrow in *D. mortensenii*, the distal part of the bothriotrix T_3, with marked swelling, not evenly thickened, by the shape of the tarsi, subcylindrical and only somewhat tapering, not slender and strongly tapering, by the proportion b_2/b_1-b_2, as long as,



Figures 28–35. *Decapauropus premnos* sp. n., holotype, ad. 9(♀) **28** head, median and right part **29** right antenna, tergal view **30** collum segment, median and left part, sternal view **31** tergite VI, posterior part **32** T_3 **33** seta on coxa of leg 9; **34** tarsus of leg 9 **35** pygidium, posteromedian and left posterior corner, tergal view. Scale: a: Figs 32–34; b: 28, 29, 31; c: 30. 35.

not b_2>b_1-b_2, and by the shape of the anal plate, longish and with evenly convex lateral margins, not shorter/broader and with shallow lateral indentation.

Description. *Length.* 0.62 mm. *Head* (Fig. 28). Setae on the tergal side thin cylindrical annulate. Relative lengths of setae, 1st row: a_1=a_2=10; 2nd row: a_1=?, a_2=12, a_3=14; 3rd row: a_1=11, a_2=10; 4th row: a_1=8, a_2=10, a_3=?, a_4=11; lateral group setae, l_1=25, l_2=26,

l_3=?. Ratio a_1/a_1-a_1 in 1st row 1.0, 2nd row ?, 3rd row 0.6, 4th row 0.8. Temporal organs large, in tergal view ovoid, length 0.8 of shortest interdistance. Head cuticle glabrous.

Antennae (Fig. 29). Segment 4 with at least three cylindrical annulate setae; their relative lengths: *p*=10, *p'*=6, *r*=5. Tergal seta *p* 1.2 times as long as the length of tergal branch *t*. The latter fusiform with distal end cut obliquely, 2.1 times as long as its greatest diameter and 0.9 of the length of sternal branch *s*, that branch twice longer than its greatest diameter; anterodistal corner distinctly truncate. Seta *q* cylindrical striate, 0.6 of the length of *s*. Relative lengths of flagella (basal segments included) and basal segments: F_1=100, bs_1=6; F_2=27, bs_2=4; F_3=82, bs_3=5. F_1 5.0 times as long as *t*, F_2 and F_3 1.2 and 3.6 times as long as *s* respectively. Distal calyces somewhat flattened, distal part of flagella axes inconsiderably widened below calyces. Globulus *g* proportionally large, pyriform, with thick stalk, 1.2 times as long as wide, ≈12 thin bracts, capsule with flattened bottom; width of *g* 1.1 times as long as the greatest diameter of *t*. Antennae glabrous.

Trunk (Figs 30, 31). Setae of collum segment (Fig. 30) simple cylindrical striate, sublateral setae 1.4 times as long as submedian setae; sternite process triangular, blunt anteriorly; appendages barrel-shaped, caps low. Process and appendages glabrous. Setae on tergites as setae on the head, 4+4 setae on tergite I and 4+2 on VI, interposed tergites not studied. Submedian posterior setae on VI (Fig. 31) 0.3 of interdistance and 0.8 of the length of pygidial setae a_1.

Bothriotricha (Fig. 32). Relative lengths: T_1=100, T_2=103, T_3=76, T_4=?, T_5=107; axes simple straight, very thin and with faint pubescence only distally on T_1, T_2 and T_5, T_3 only (Fig. 32) stronger, with longish cylindrical end-swelling and distinct oblique pubescence.

Legs (Figs 33, 34). Setae on coxa (Fig. 33) and trochanter of leg 9 furcate, branches thin cylindrical striate, secondary branch somewhat thinner and shorter than primary one. These setae more anteriorly with rudimentary secondary branches. Tarsus of leg 9 (Fig. 34) subcylindrical, only somewhat tapering, 2.9 times as long as its greatest diameter; setae thin, proximal one tapering pointed, distal one subcylindrical blunt striate, proximal seta 0.4 of the length of tarsus and 2.1 times as long the length of distal seta. Cuticle of tarsus glabrous.

Pygidium (Fig. 35). *Tergum*. Posterior margin straight but with posterolateral corners rounded and two small rounded lobes just outside *st.* Relative lengths of setae: a_1=*st*=10, a_2=16, a_3=26. Setae curved inwards, *st* also converging, a_1 and *st* cylindrical with small swelling distally, a_2 and a_3 long thin tapering, a_2 pointed. Distance a_1-a_1 0.7 of the length of a_1, distance a_1-a_2 1.4 times as long as a_2-a_3; distance *st*-*st* 1.8 times as long as *st* and 1.1 times as long as distance a_1-a_1.

Sternum. Posterior margin with five rounded lobes, one on each side of insertion areas of setae b_1 and one below base of anal plate. Relative lengths of setae (pygidial a_1=10): b_1=28, b_2=19, setae thin tapering pointed glabrous, b_1 1.1 times as long as interdistance, b_2 1.1 times as long as distance b_1-b_2.

Anal plate large, directed posteriorly, 1.7 times longer than broad, lateral margins convex, narrowing off posteriorly and with U-shaped posterior incision, length of the latter 0.3 of the length of plate, plate glabrous.

***Decapauropus anatonus* sp. n.**
urn:lsid:zoobank.org:act:02DDC8EF-3D76-4250-9FCC-50680FD665CE
http://species-id.net/wiki/Decapauropus_anatonus
Figs 36–45

Material. Holotype ad. 9(♂), Thailand, Chiang Mai province, Doi Inthanon, below the top, primary rain forest, litter, alt. 2400 m, 1991.vii.4, loc. CM-210.

Etymology. From the Latin *anatonus*, extending upward (referring to the shape of the distal part of the bracts of the antennal globulus *g*).

Diagnosis. There are some species with resembling though not identical anal plates but *Decapauropus anatonus* sp. n. is well defined by the shape of the antennal globulus *g* with slender stalk and distal parts of the bract turned upward, this also combined with a distal swelling on the bothriotricha T_3. At present its relationships are not possible to trace.

Description. *Length.* 0.43 mm. *Head* (Fig. 36). Setae on the tergal side subcylindrical striate. Relative lengths of setae, 1st row: a_1=a_2=10; 2nd row: a_1=10, a_2=14, a_3=20; 3rd row: a_1=11, a_2=?; 4th row: a_1=10, a_2=17, a_3=24, a_4=13; lateral group setae not studied. Ratio a_1/a_1-a_1 in 1st row 1.4, 2nd row 0.5, 3rd row 1.3, 4th row 1.2. Temporal organs in tergal view ovoid, length 0.8 of their shortest interdistance. Head cuticle glabrous.

Antennae (Fig. 37). Segment 4 with at least three cylindrical striate setae; their relative lengths: *p*=10, *p'*=*r*=7. Tergal seta *p* 1.5 times as long as tergal branch *t*. The latter fusiform, twice longer than its greatest diameter and 0.7 of the length of sternal branch *s*, that branch 1.8 times as long as its greatest diameter; anterodistal corner distinctly truncate. Seta *q* cylindrical striate, 0.6 of the length of *s*. Relative lengths of flagella not available for study; F_1 long, distal calyces flattened, distal part of flagella axes inconsiderably widened below calyx. F_1 6.2 times as long as *t*. Globulus *g* pyriform, proportionally long, 1.7 times as long as the greatest diameter, stalk as long as globulus, bracts thin, turned upward distally, ≈10 bracts, capsule with flattened bottom, width of g 0.8 of the greatest diameter of *t*. Antennae glabrous.

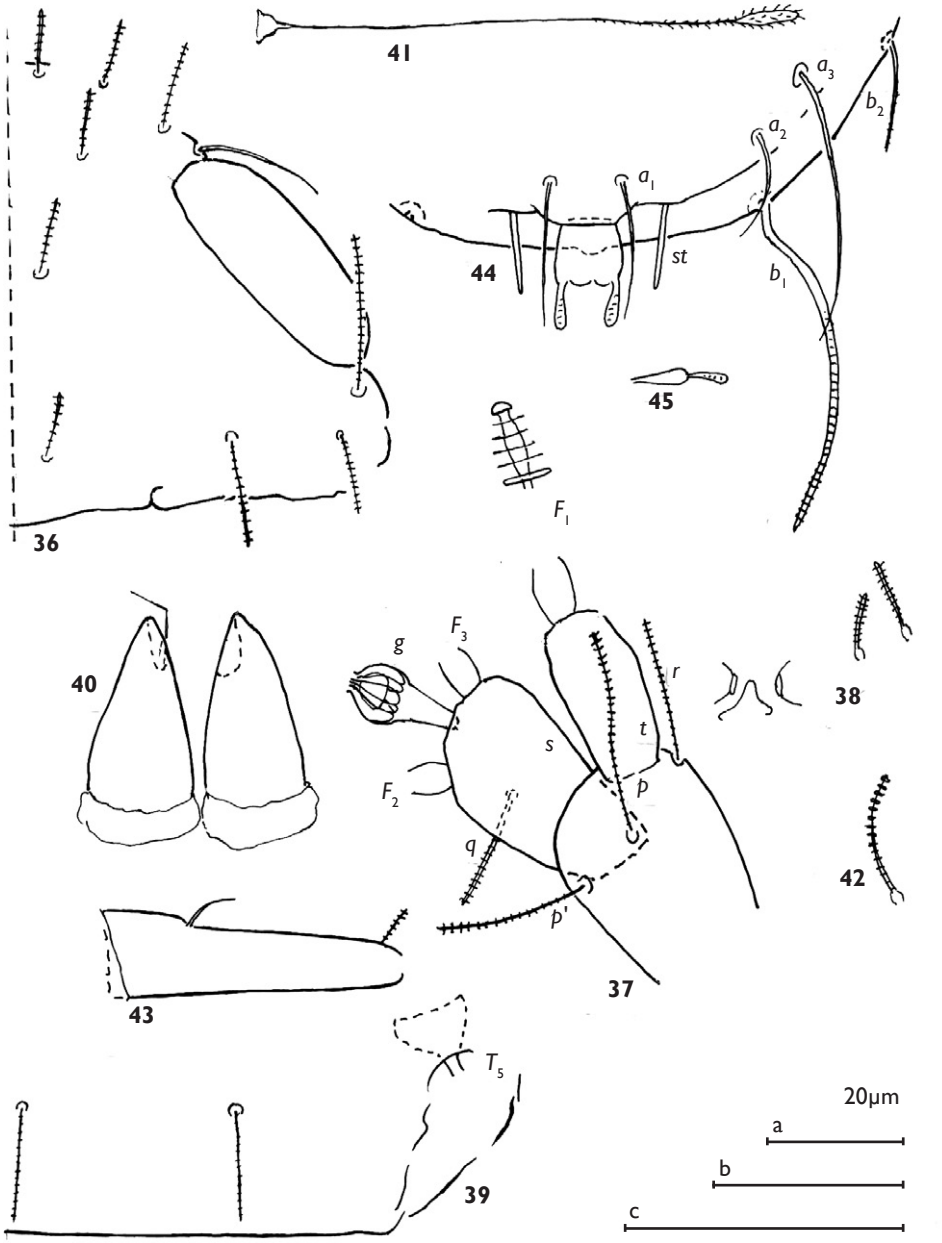
Trunk (Figs 38, 39). Setae of collum segment (Fig. 38) simple cylindrical striate, sublateral setae 1.3 times as long as submedian setae; sternal process blunt anteriorly, lateral margins concave; caps low, roundly conical. Process and appendages glabrous.

Tergite I incompletely divided transversally; setae on tergites as setae on the head, 4+4 setae on tergite I and 4+2 on VI, interposed tergites not studied. Submedian posterior setae on VI (Fig. 39) 0.5 of interdistance and 0.8 of the length of pygidial setae a_1.

Genital papillae (Fig. 40). Conical, 1.9 times as long as the greatest diameter, seta thin, 0.5 of the length of papilla.

Bothriotricha (Fig. 41). Relative lengths: T_1=100, T_2=?, T_3=112, T_4=140, T_5=157; axes simple straight, very thin and with faint pubescence only distally, T_3 (Fig. 41) strongest, with narrowly ovoid end-swelling and with distinct oblique pubescence on swelling and just below it.

Legs (Figs 42, 43). Setae on coxa and trochanter (Fig. 42) of legs 1–9 simple cylindrical striate. Tarsus of leg 9 (Fig. 43) tapering, 3.6 times as long as its greatest diam-



Figures 36–45. *Decapauropus antanosus* sp. n., holotype, ad. 9(♂) **36** head, median and right part **37** right antenna, tergal view **38** collum segment, median and left part, sternal view **39** tergite VI, posterior part **40** genital papillae, anterior view **41** T_3 **42** seta on trochanter of leg 9 **43** tarsus of leg 9 **44** pygidium, posteromedian and right part, tergal view **45** anal plate, lateral view. Scale: a: Fig. 41; b: 36, 38, 40, 42, 43; c: 37, 39, 44, 45.

eter; proximal seta very thin tapering, distal seta cylindrical blunt striate, proximal one 0.2 of the length of tarsus and 1.2 times as long as the length of distal seta. Cuticle of tarsus glabrous.

Pygidium (Fig. 44, 45). *Tergum*. Posterior margin rounded and with shallow lobe between *st*. Relative lengths of setae: a_1=10, a_2=8, a_3=17, *st*=6; setae thin, directed posteriorly, *a*-setae tapering pointed, curved inward, *st* cylindrical blunt. Distance a_1-a_1 0.6 of the length of a_1, distance a_1-a_2 1.8 times as long as a_2-a_3; distance *st*-*st* 1.8 times as long *st* and twice longer than distance a_1-a_1.

Sternum. Posterior margin rounded and with very small posterior lobe below anal plate. Relative lengths of setae (pygidial a_1=10): b_1=32, b_2=8, setae thin tapering, striate, b_1 1.3 times as long as interdistance, b_2 0.5 of distance b_1-b_2.

Anal plate directed posteriorly, as long as broad, lateral margins convex, posterior margin with shallow incision, posterodistal corners lengthened into two clavate appendages, these 0.7 of the length of plate; plate glabrous.

***Decapauropus undulatulus* sp. n.**

urn:lsid:zoobank.org:act:05C6DFE9-0C2A-4742-8208-EF344964B483

http://species-id.net/wiki/Decapauropus_undulatulus

Figs 46–52

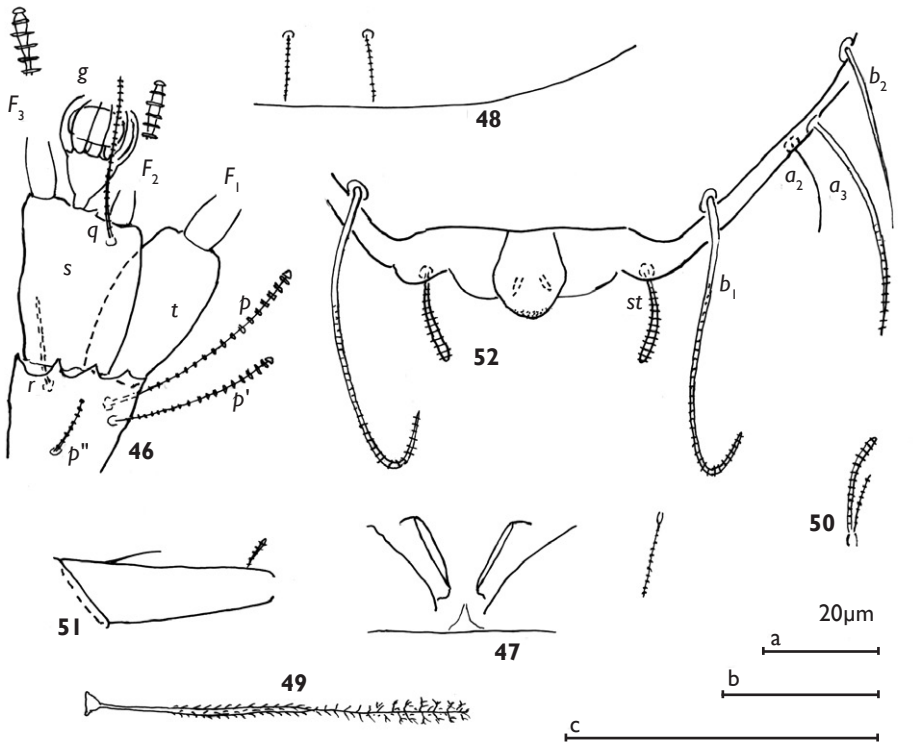
Material. Holotype ad. 9(♀), Thailand, Chiang Mai province, Doi Inthanon, Mae Chaem road, secondary dry forest, litter, alt. 1150 m, 1991.vi.30, loc. CM-080.

Etymology. From the Latin *undulatus*, wavy (referring to the distal margin of the 4th antennal segment).

Diagnosis. Many species in the genus have linguiform anal plates with two appendages but none of them has the appendages placed in the middle of the tergal side as in *Decapauropus undulatus* sp. n. Moreover is this species well defined by the peculiar undulated distal margin of the 4th antennal segment and the wide collum appendages which are directed inward/anteriorly. At present its relationships are not possible to trace.

Description. *Length.* 0.52 mm. *Head*. Not available for study.

Antennae (Fig. 46). Distal margin of segment 4 distinctly wavy, four setae; their relative lengths: *p*=10, *p'*=7, *p"*=3, *r*=4. Setae annulate, *p* and *p'* grow thicker outward, *p"* and *r* cylindrical. Tergal seta *p* 1.5 times as long as the length of tergal branch *t*. The latter fusiform, 1.3 times as long as its greatest diameter and 0.8 of the length of sternal branch *s*, that branch subcylindrical, 1.3 times as long as its greatest diameter; anterior truncation weak. Seta *q* cylindrical striate, inserted very near distal margin, as long as the length of *s*. Relative lengths of flagella (basal segments included) and basal segments: F_1=100, bs_1=7; F_2=44, bs_2=4; F_3=88, bs_3=7. F_1 5.5 times as long as *t*, F_2 and F_3 4.6 and 5.1 times as long as *s* respectively. Distal calyces small, distal part of flagella axes inconsiderably widened below calyces. Globulus *g* proportionally large, pyriform, 1.4 times as long as wide, ≈9 bracts, capsule with flattened bottom; width of *g* 0.6 of the length of the greatest diameter of *t*. Antennae glabrous.



Figures 46–52. *Decapauropus undulatus* sp. n., holotype, ad. 9(♂) **46** right antenna, sternal view **47** collum segment, median and left part, sternal view **48** tergite VI, posterior part **49** T_3 **50** seta on trochanter of leg 9 **51** tarsus of leg 9 **52** pygidium, posteromedian and left part, sternal view. Scale: a: Figs 49–51; b: 47, 48; c: Fig. 52, d: Fig. 46.

Trunk (Figs 47, 48). Setae on collum segment simple cylindrical striate, only one pair could be proved (Fig. 47); sternite process small, indistinct; appendages large short cylindrical directed inward and anteriorly, caps low. Process and appendages glabrous.

Setae on tergites only partly available for study, those proved thin cylindrical. Tergite VI with 4+2 setae, submedian posterior ones (Fig. 48) 0.9 of interdistance.

Bothriotricha (Fig. 49). Relative lengths: T_1=100, T_2=98, T_3=79, T_4=104, T_5=?; axes simple straight thin in T_1, T_2, T_4 and T_5, pubescence there faint on proximal halves, on distal halves of T_1, T_2 and T_4 distinct, partly erect, probably branched most distally; axes of T_3 (Fig. 49) somewhat thickened in proximal half, pubescence there oblique, on distal half as on other bothriotricha.

Legs (Figs 50, 51). Setae on coxa and trochanter (Fig. 50) of leg 9 furcate, branches cylindrical blunt striate, secondary branch shorter and thinner than primary branch. These setae more anteriorly with rudimentary secondary branches. Tarsus of leg 9 (Fig. 51) tapering, 3.6 times as long as its greatest diameter; proximal seta very thin tapering pointed, distal seta cylindrical blunt striate, proximal seta 0.3 of the length of tarsus and 1.7 times as long as the length of distal seta. Cuticle of tarsus glabrous.

Pygidium (Fig. 52). *Tergum*. Posterior margin with three posterior lobes, one each posterior of insertion point of *st* and one broader in between. Relative lengths of setae, a_1 not proved, a_2=10, a_3=23, *st*=15; a_2 cylindrical blunt glabrous, a_3 tapering pointed, striate distally, both setae curved inward and diverging; *st* somewhat clavate striate, directed posteriorly and curved inward. Distance *st-st* 2.2 times as long as *st*.

Sternum. Posterior margin with low lobe inside each seta b_1, straight in between. Relative lengths of setae (pygidial a_2=10): b_1=37, b_2=21, setae thin tapering, b_1 striate, as long as interdistance, b_2 almost as long as distance b_1-b_2.

Anal plate directed posteriorly, 1.2 times as long as wide, linguiform with convex lateral and posterior margins, thickened in most posterior part, two short appendages protruding from the middle of tergal side.

Genus *Angkapauropus* gen. n.
urn:lsid:zoobank.org:act:9E6637B7-6907-4553-B338-48D0C9B50730
http://species-id.net/wiki/Angkapauropus

Diagnosis. A genus in Pauropodidae with numerous and irregularly placed setae on tergites I-V, legs 1–9 5-segmented and interposed pairs 6-segmented, pygidial sternum with setae b_1 and b_2.

Etymology. The genus name referring to the site of collecting at Doi Inthanon, formerly known as Doi Angka.

Genotype. *Angkapauropus leptotrichos* sp. n.

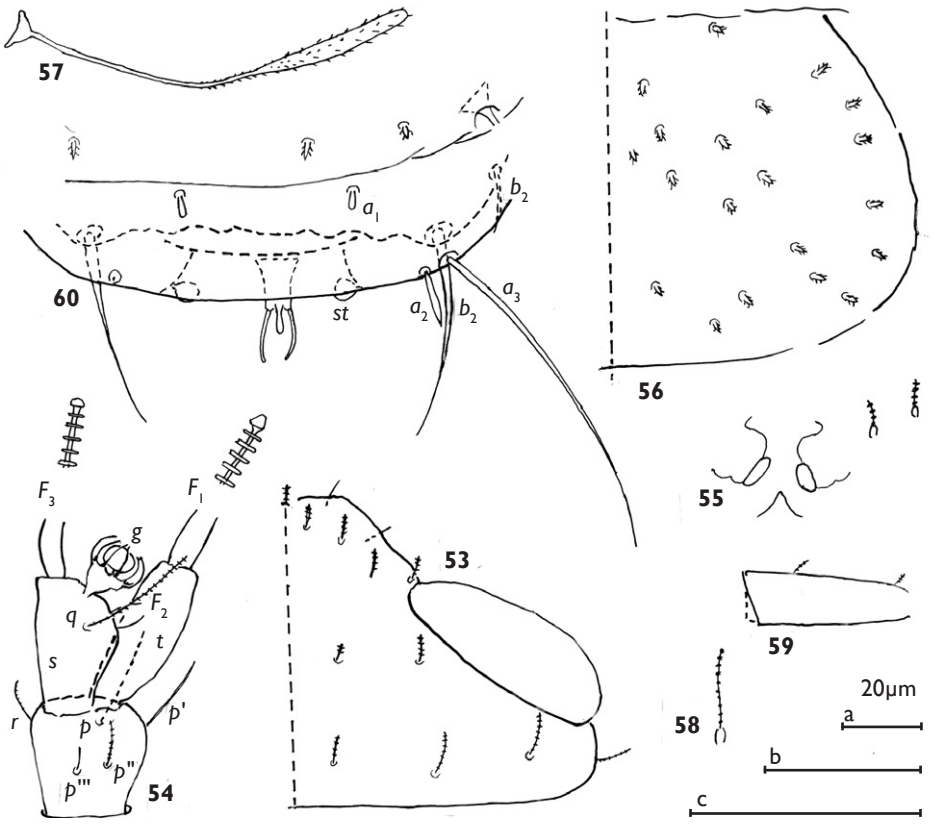
***Angkapauropus leptotrichos* sp. n.**
urn:lsid:zoobank.org:act:90CF2C6D-2166-46A1-B905-74DE0B07E199
http://species-id.net/wiki/Angkapauropus_leptotrichos
Figs 53–60

Material. Holotype ad. 9(♀), Thailand, Chiang Mai province, Doi Inthanon, Mae Chaem road, secondary dry forest, litter, alt. 1150 m, loc. CM-084. – Paratype, ad. 9(♀), ibidem, loc. CM-086. – 2 specimens.

Etymology. From the Greek *leptos*, thin, and *trichos*, hair (referring to the shape of the setae on head, antennae and legs.

Description. *Length.* 0.54(0.56) mm. *Head* (Fig. 53). Setae on tergal side short thin cylindrical striate. Relative lengths of setae (holotype only), 1st row: a_1=10, a_2=13; 2nd row: a_1=?, a_2=13, a_3=10; 3rd row: a_1=7, a_2=13; 4th row: a_1=13, a_2=17, a_3=20, a_4=13; lateral group setae not studied. Ratio a_1/a_1-a_1 in 1st row 0.6, 2nd row ?, 3rd row 0.2, 4th row 0.4. Temporal organs large, in tergal view ovoid, length as long as their shortest interdistance. Pore not ascertained. Head cuticle glabrous.

Antennae (Fig. 54). Segment 4 with five cylindrical striate setae; their relative lengths: *p*=10, *p'*=(8-)9, *p"*=*r*=5, *p'"*=3. Tergal seta *p* 0.6(-0.7) of the length of tergal



Figures 53–60. *Angkapauropus leptotrichos* gen. n., sp. n., holotype, ad. 9(♀) **53** head, median and right part, tergal view **54** right antenna, sternal view **55** collum segment, median and left part, sternal view **56** tergite I, right half **57** T_3 **58** seta on coxa of leg 9 **59** tarsus of leg 9 **60** posterior part of tergite VI and pygidium, posteromedian and left posterior corner, tergal view. Scale: a: Fig. 56; b: 53, 55, 57–59; c: 54. 60.

branch *t*. The latter fusiform with distal end cut obliquely, (2.4-)2.6 times as long as its greatest diameter and (1.0-)1.2 times as long as the length of sternal branch *s*, that branch 1.6 times as long as its greatest diameter; anterodistal corner distinctly truncate. Seta *q* cylindrical striate, almost as long as the length of *s*. Relative lengths of flagella (basal segments included) and basal segments: F_1=100, bs_1=9(-10), F_2=45(-52), bs_2=4(-5); F_3=87(-91), bs_3=5, curved. F_1 4.2(-4.7) times as long as *t*, F_2 and F_3 1.8 and 4.4(-4.5) times as long as *s* respectively. Distal calyces conical, distal part of flagella axes not widened below calyces. Globulus *g* shortly pyriform, as long as wide, ≈10 bracts, capsule somewhat flattened; width of *g* as long as the greatest diameter of *t*. Antennae glabrous.

Trunk (Figs 55, 56, 60). Setae of collum segment (Fig. 55) short simple cylindrical annulate, sublateral setae 1.2 times as long as submedian setae; sternite process triangular; appendages cylindrical, diameter of caps distinctly shorter than top of appendage. Process and appendages glabrous.

Setae on tergites short cylindrical, numerous and irregularly inserted on I-V, ≈40 setae on I (Fig. 56), ≈15 on V, setae on VI in two transversal rows, 6 ones in anterior row and 4 ones in posterior row. Submedian posterior setae on VI (Fig. 60) 0.1 of interdistance and as long as the length of pygidial setae a_1.

Bothriotricha (Fig. 57). Relative lengths: T_1=100, T_2=?, T_3=74(-80), T_4=91(-105), T_5=117(-124); axes simple straight, very thin and with faint pubescence only distally on T_1, T_2 and T_5, T_3 only (Fig. 57) stronger, with longish cylindrical end-swelling, 1/3 of the length of bothriotrix, distinct but sparse oblique pubescence.

Legs (Figs 58, 59). Setae on coxa (Fig. 58) and trochanter of legs 1–9 simple thin cylindrical annulate. Tarsus of leg 9 (Fig. 59) subcylindrical, only somewhat tapering, 3.0 times as long as its greatest diameter; setae very thin, cylindrical annulate, proximal seta 0.1 of the length of tarsus and as long as distal seta. Cuticle of tarsus glabrous.

Pygidium (Fig. 60). *Tergum*. Posterior margin with distinct posterior lobes outside setae *st,* in between straight. Relative lengths of setae: a_1=*st*=1, a_2=3, a_3=15. Setae very different, a_1 short clavate, a_2 short lanceolate, diverging, a_3 long tapering, curved inwards, diverging, *st* short clavate, converging. Distance a_1-a_1 (5.7-)6.7 times as long as the length of a_1, distance a_1-a_2 (3.2-)3.7 times as long as distance a_2-a_3; distance *st*-*st* 8(-9) times as long as *st* and 1.1(-1.5) times as long as distance a_1-a_1.

Sternum. Posterior margin almost straight between insertion areas of setae b_1, no lobe below anal plate. Relative lengths of setae (pygidial a_1=1): b_1=9(-10), b_2=3, setae tapering pointed, glabrous, b_1 0.6(-0.9) of the length of interdistance, b_2 0.6 of the length of distance b_1-b_2.

Anal plate broadest anteriorly, distinctly longer than broad, lateral margins concave, each posterior corner with long thin subcylindrical appendage protruding backward and somewhat curved inward; between these appendages a shorter one protruding backward from tergal side, long appendages almost as long as plate, shorter one 0.7 of the length of plate.

Family Brachypauropodidae Silvestri, 1902
Genus *Borneopauropus* Scheller, 2008

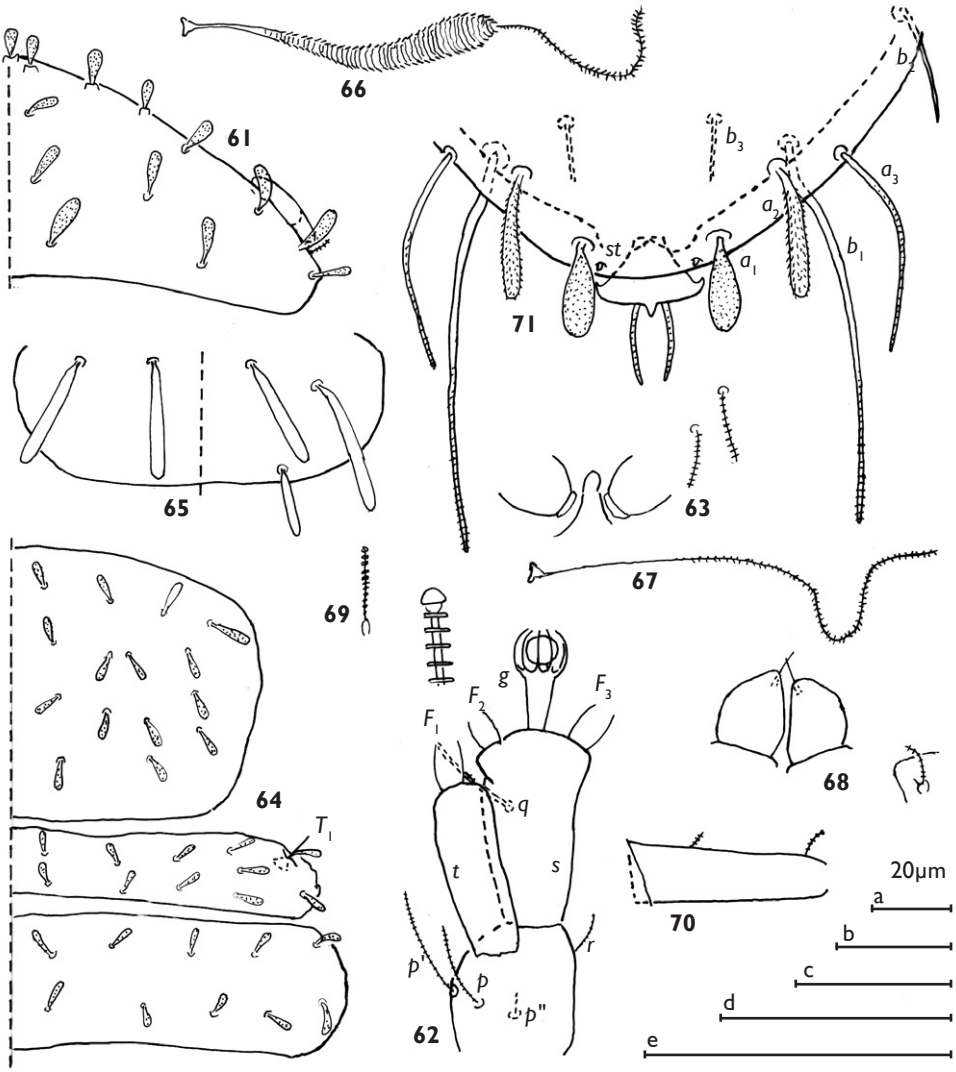
Borneopauropus platylopas sp. n.

urn:lsid:zoobank.org:act:786F9B4C-205F-44C5-B98F-99128031C94C
http://species-id.net/wiki/Borneopauropus_platylopas
Figs 61–71

Material. Holotype ad. 9(♂), Thailand, Chiang Mai province, Doi Inthanon, Mae Chaem road, secondary dry forest, litter, alt. 1150 m, 1992.vi.30, loc. CM-080. – Paratype, ad. 9(♀), ibidem, loc. CM-194. – 2 specimens.

Etymology. From the Greek *platys*, broad, and *lopas*, plate (referring to the unusually broad anal plate).

Diagnosis. Up to now four species have been described in the genus, one from Sulawesi in Indonesia, two from Sabah and one from Tasmania. *B. platylopas* has most characters



Figures 61–71. *Borneopauropus platylopas*, sp. n., holotype, ad. 9(♂) **61** head, median and right part, tergal view **62** right antenna, tergal view **63** collum segment, median and left part, sternal view **64** tergites I-II, right half **65** tergite VI, right half **66** T_3 **67** T_2 **68** genital papillae and seta on coxa of leg 2, anterior view **69** seta on coxa of leg 9 **70** tarsus of leg 9 **71** pygidium, posterior part, tergal view. Scale: a: Figs 64, 65; b: Figs 66–70; c: Fig. 61; d: 62, 63; e: 71.

in common with the Indonesian species, *B. curtipes* Scheller (Scheller 2009) and one of the two species from Sabah, *B. penanorum* Scheller (Scheller et al. 1994). It can be distinguished from both by the shape of the bothriotricha T_3, clavate part moderately widened with long distal flagellum in *B. platylopas*, not strongly widened and with shorter flagellum in *B. cur-*

tipes and *B. penanorum,* and by the shape of the pygidial setae a_3, long thin tapering, not bladder-shaped, and the shape of the anal plate, broad triangular, not longish linguiform.

Description. Length. (0.51-)0.58 mm. *Head* (Fig. 61). Tergal and lateral sides with 26 setae arranged as in Fig. 61; transversal rows indistinct laterally. Setae longest in posteromedian part; all but lateral setae clavate, shortly pubescent, lateral group setae cylindrical annulate. Temporal organs small with at least two short uplifted extensions. Head cuticle glabrous.

Antennae (Fig. 62). Segment 4 with 4 cylindrical annulate setae; relative lengths: p=10, p'=11(-12), p''=4(-6), r=4. Tergal seta p 0.6 of the length of tergal branch t. The latter subcylindrical, (2.6-)2.9 times as long as wide, 0.9 of the length of sternal branch s. That branch thickest in distal third and with anterodistal corner somewhat more truncated than posterodistal corner; s (2.0-)2.1 times as long as greatest diameter, its seta q cylindrical striate, 0.5 of the length of s. Relative lengths of flagella (base segments included) and base segments: F_1=100, bs_1=8; F_2=(65-)66, bs_2=6; F_3=72(-74), bs_3=(7-)8. F_1 3.1 times as long as t, F_2 and F_3 (1.9-)2.2 and (2.0-)2.3 times as long as s respectively. Distal calyces helmet-shaped, glabrous. Globulus g, (1.6-)1.8 times as long as greatest diameter, the latter (0.9-) as long as greatest diameter of t. Antenna glabrous.

Trunk (Figs 63 - 65). Setae of collum segment (Fig. 63) simple cylindrical blunt annulate; sublateral seta 1.2 times as long as submedian seta. Sternite process blunt-ended; appendages barrel-shaped with low caps; process and appendages glabrous.

Tergites (Figs 64, 65), I, V, VI entire, II, III, IV transversely and weakly 2-parted. Number of setae on tergites (holotype only, if two groups of values anterior and posterior groups of setae respectively): I 30, II 19+20, III 28+21, IV 25+19, V 20+13, VI 4+2. Setae bladder-shaped with short oblique-erect pubescence, setae lengthening posteriorly, those on VI (Fig. 65) about twice longer than those on I. Cuticle of tergites glabrous.

Bothriotricha (Figs 66, 67). Relative lengths: T_1=100, T_2=108(-110), T_3=(122-)146, T_4=(89-)113, T_5=(140-)144. Axes simple, most proximally glabrous; proximal half of T_3 (Fig. 66) strongly clavate with short pubescence arranged in dense whorls, distal half very thin; other bothriotricha (Fig. 67) with thin and curved axes; pubescence short oblique on proximal parts, erect distally.

Genital papillae (Fig. 68). Short, as long as wide, seta 0.5 of the length of papilla.

Legs (Figs 69, 70). All legs 5-segmented. Setae on coxa (Fig. 69) and trochanter of legs 1–9 simple, cylindrical annulate blunt, rudimentary secondary branch only on coxal setae of leg 2 in male. Tarsus of leg 9 (Fig. 70) short, almost cylindrical, (2.9-)3.4 times as long as greatest diameter; setae short cylindrical annulate, proximal one 0.1 of the length of tarsus and (0.5-)0.6 of the length of distal seta. Cuticle of tarsus glabrous.

Pygidium (Fig. 71). *Tergum*. Hind margin rounded. Relative lengths of setae: a_1=10, a_2=(13-)14, a_3=(22-)25, *st* rudimentary. a_1 bladder-shaped, faintly pubescent, a_2 longish clavate, distinctly pubescent, somewhat curved inward, a_3 thin tapering, faintly striate, curved inward. Distance a_1–a_1 1.5 times as long as a_1, distance a_1–a_2 twice longer than distance a_2–a_3; distance *st*–*st* ≈25 times as long as *st* and 0.6 of distance a_1–a_1.

Sternum. Posterior margin between b_1 rounded but with large lobe below anal plate; lobe with median indentation and rounded posterolateral corners. Relative

lengths of setae (pygidial a_1=10): b_1=(40-)43, b_2=13(-16), b_3=7. b_1 thin tapering, blunt, striate distally, b_2 and b_3 cylindrical. b_1 (1.3-)1.4 times as long as distance b_1-b_1, b_2 0.7(-0.9) of distance b_1-b_2 and b_3 0.3(-0.4) of distance b_3-b_3.

Anal plate (Fig. 71) narrowest anteriorly, triangular, posterolateral corner turned anteriorly and posterior margin with small median process, two cylindrical blunt faintly pubescent appendages protruding backward from sternal side just nearby the posteromedian process, length of appendages somewhat longer than plate.

Family Eurypauropodidae Ryder, 1879
Genus *Samarangopus* Verhoeff, 1934

***Samarangopus poculifer* Scheller, 1995**
http://species-id.net/wiki/Samarangopus

Material. Thailand, Chiang Mai province, Doi Inthanon, Mae Chaem road, secondary dry forest, litter, alt. 1150 m, 1991.vi.30, 1 ad. 9(♀), ibidem, litter, 1991.vi.30, loc. CM-074, ibidem, litter, 1 ad. 9(♂), 1991.vi.30, loc. CM-080, ibidem, litter, 1 juv. 6, 30.vi.1991, CM-089; below the top, alt 2400, 1 ad. 9(♀), 1991.vii.4, loc. CM-202. – 4 specimens.

General distribution. Known from Doi Inthanon only (Scheller 1995).

***Samarangopus umbonifer* Scheller, 1995**
http://species-id.net/wiki/Samarangopus_umbonifer

Material. Thailand, Chiang Mai province, Doi Inthanon, secondary dry forest, litter, alt. 1150 m, 1 ad. 9(♀), 1991.vi.30, loc. CM-086. – 1 specimen.

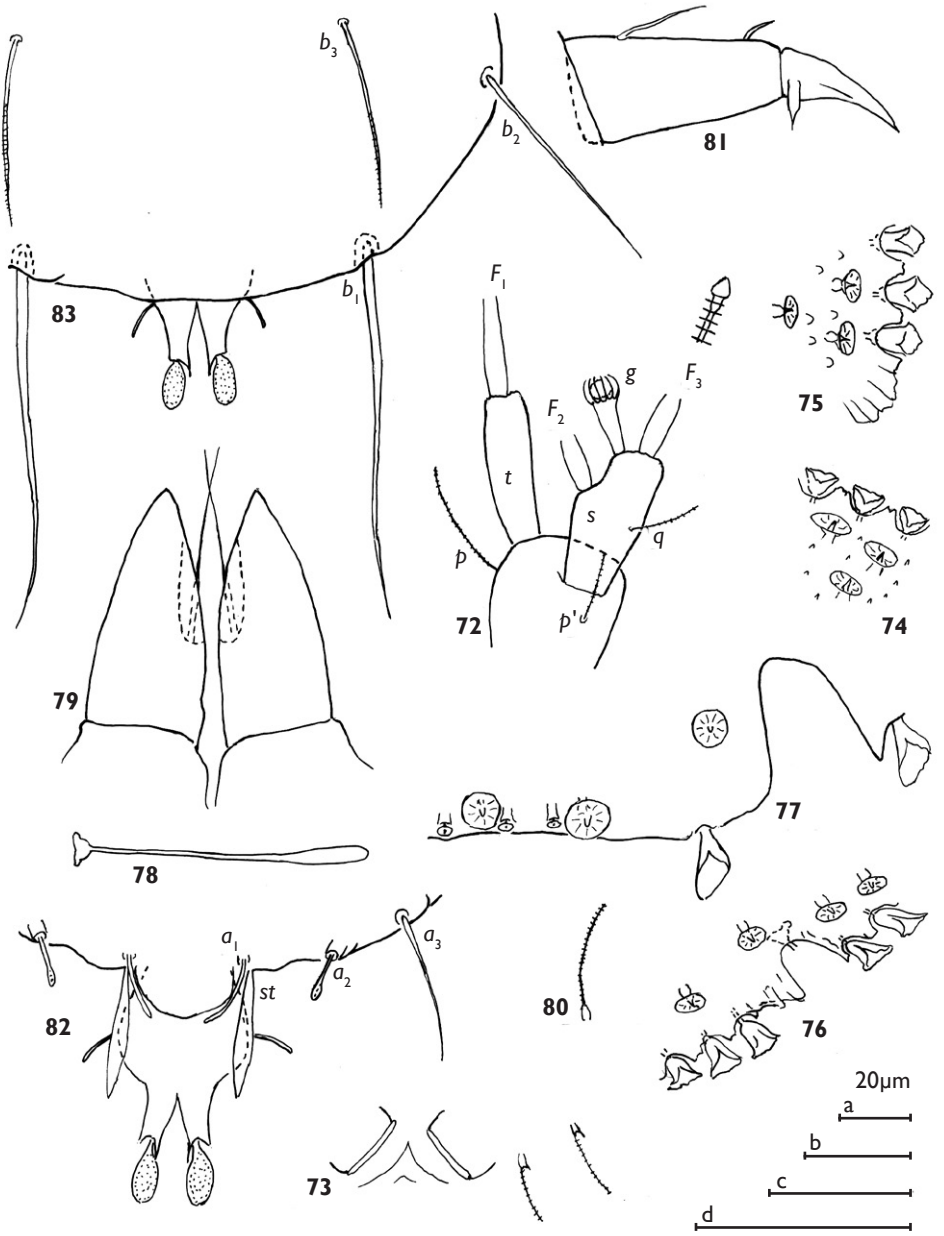
General distribution. Known from Doi Inthanon only (Scheller 1995).

***Samarangopus choanephorus* sp. n.**
urn:lsid:zoobank.org:act:CC141A91-BC0A-4E8B-B550-BDBE60F9D981
http://species-id.net/wiki/Samarangopus_choanephorus
Figs 72–83

Material. Holotype ad. 9(♂), Thailand, Chiang Mai province, Doi Inthanon, below the top, primary rain forest, soil, alt. 2400 m, 1991.vii.4, loc. CM-195. – 1 specimen.

Etymology. From the Greek *choane*, funnel, and *phero*, bear, carry (referring to the funnel-shaped organs on the tergites).

Diagnosis. *Samarangopus choanephorus* sp. n. may be grouped together with *S. umbonifer* Scheller from Thailand (Scheller 1995) and *S. condylus* Scheller from the Philippines (Scheller 2009), for certain more to the former than to the latter. Good distinguishing characters in relation to *S. umbonifer* are the shape of the antennal globulus



Figures 72–83. *Samarangopus choanephorus* sp. n., holotype ad. 9(♂) **72** left antenna, sternal view **73** collum segment, median and left part **74** tergite I, anterolateral margin with campanulate protuberances and fungiform organs **75** tergite I, posterolateral corner **76** tergite IV, right lateral margin around insertion pit of T_3 **77** tergite VI, right posterolateral part **78** T_3 **79** genital papillae, anterior view **80** seta on trochanter of leg 9 **81** tarsus of leg 9 **82** pygidial tergum, posterior part, tergal view **83** pygidial sternum, sternal view. Scale: a: Fig. 79; b: Figs 74–76; c: Figs 72, 73, 77, 78, 80, 81; d: Figs 82, 83.

g, stalk much longer than globulus in *B. choanephorus*, shorter in *B. umbonifer*, the large funnel-shaped organs of the tergites, with central rod, not without, the protuberances of the posterior margin of the tergite VI, with evenly convex lateral margins, not with a small knob on each side, the shape of the setae on coxa and trochanter of leg 9, simple, not furcate, and the length of the pygidial setae b_3, almost as long as the b_2, not distinctly shorter.

Description. *Length.* 0.74 mm. *Antennae* (Fig. 72). Chaetotaxy of segments 1–4: 2/2/2/2; no *g ´*. Setae thin striate, on segment 4 only two proved, their relative lengths *p*=10, *p ´*or *p ´´*=6. Tergal branch *t* almost cylindrical, 3.1 times as wide as greatest diameter and as long as sternal branch *s*. That branch twice longer than greatest diameter, anterodistal corner distinctly truncate. Seta *q* as setae of 4th segment, 0.5 of the length of *s.* Relative lengths of flagella (base segments included) and base segments: F_1=100, bs_1=18, F_2=?, bs_2~10, F_3=85, bs_3=17. F_1 5.6 times as long as *t*, F_3 3.3 times as long as *s*. Calyces conical; flagella axes inconsiderably widened below calyx. Globulus *g* 1.6 times as long as greatest width; 10 thin bracts, capsule spherical, diameter of *g* 0.8 of the greatest diameter of *t.* Antenna glabrous.

Trunk (Figs 73–77). Setae of collum segment (Fig. 73) similar thin furcate, main branch pointed striate, secondary branch rudimentary pointed; sublateral setae 1.3 times as long as submedian setae. Sternite process broad triangular pointed anteriorly. Appendages wide cylindrical, caps flat. All parts of collum segment glabrous.

Tergites with four main types of protuberances (Figs 74–77): 1. stalked campanulate marginal protuberances (Figs 74–77), short on anterior margin of tergite I, larger on lateral margins of tergites; 2. fungiform organs (Figs 74–77) with hat in the shape of an upside down transparent funnel with a central rod, foot subcylindrical, these distributed over whole the surface of tergites; 3. small subcylindrical organs with upside down funnel at top (Fig. 77); 4. many small conical structures in between the different protuberances. Number of marginal protuberances: (holotype only): I – 36, II, 1 small – T_1 – 11; III, 8 – T_2 – 8; IV, 8 – T_3 – 6; V, 9 – T_4 – 4, VI, 7 – T_5 – 1.

Bothriotricha. All but T_3 with very thin axes, curved distally. T_3 (Fig. 78) with thicker axes distally forming a subcylindrical, almost glabrous, swelling, length ¼ of the length of bothriotrix. Relative lengths of bothriotricha (holotype only): T_1=100, T_2=95, T_3=42, T_4≈90, T_5=89.

Genital papillae (Fig. 79). Conical, glabrous, 2.2 times as long as greatest diameter, setae long, 0.8 of the length of papillae, inserted below the middle of papillae.

Legs (Figs 80, 81). All legs 5-segmented. Seta on coxa and trochanter (Fig. 80) of legs 1–9 thin simple striate. Tarsi tapering, those of leg 9 (Fig. 81) 3.7 times as long as its greatest diameter; two tergal setae, both pointed glabrous; length of proximal one 0.4 of the length of tarsus and 3 times longer than distal seta. Cuticle of tarsus glabrous. No proximal seta on tarsi of leg 1. All legs with large main claw and small setose anterior secondary claw; in leg 9 the former reaching 0.5 of the length of tarsus. Appendage on femur of leg 1 not studied.

Pygidium (Figs 82, 83). *Tergum.* Posterior margin undulate with larger pentagonal lobe between *st.* Setae a_1 cylindrical, curved inward, converging, a_2 short clavate straight

converging, faintly pubescent distally, a_3 long thin tapering pointed diverging, *st* straight lanceolate, faintly pubescent. Relative lengths of setae: a_1=10, a_2=6(-7), a_3=(20-)21, *st*=(15-)16. Distance a_1-a_1 1.3 times as long as a_1, distance a_1-a_2 as long as distance a_2 –a_3; distance *st-st* almost as long as *st* and 1.1 times as long as distance a_1-a_1. Cuticle glabrous.

Sternum (Fig 83). Posterior margin rounded. Setae long tapering pointed, b_2 straight diverging, b_3 somewhat curved inward. Relative lengths of setae (pygidial a_1=10): b_1=(45-)47, b_2=(26-)29, b_3=24(-25). b_1 1.1 times as long as interdistance, b_2 1.1 times as long as distance b_1-b_2, b_3 0.6 of interdistance.

Anal plate (Fig. 82) 1.4 times as long as broad, lateral margins convex, distal part of plate cleft by a V-shaped incision into two somewhat tapering cylindrical branches; four appendages: each branch provided with one outer and one inner tooth and in between a straight bladder-shaped appendage, that broadest in distal half, length of appendage 0.4 of the length of plate; two short thin cylindrical appendages protruding outward-backward from lateral margins. Plate glabrous, appendages with faint pubescence.

Family Sphaeropauropodidae Verhoeff, 1934
Genus *Sphaeropauropus* Silvestri, 1930

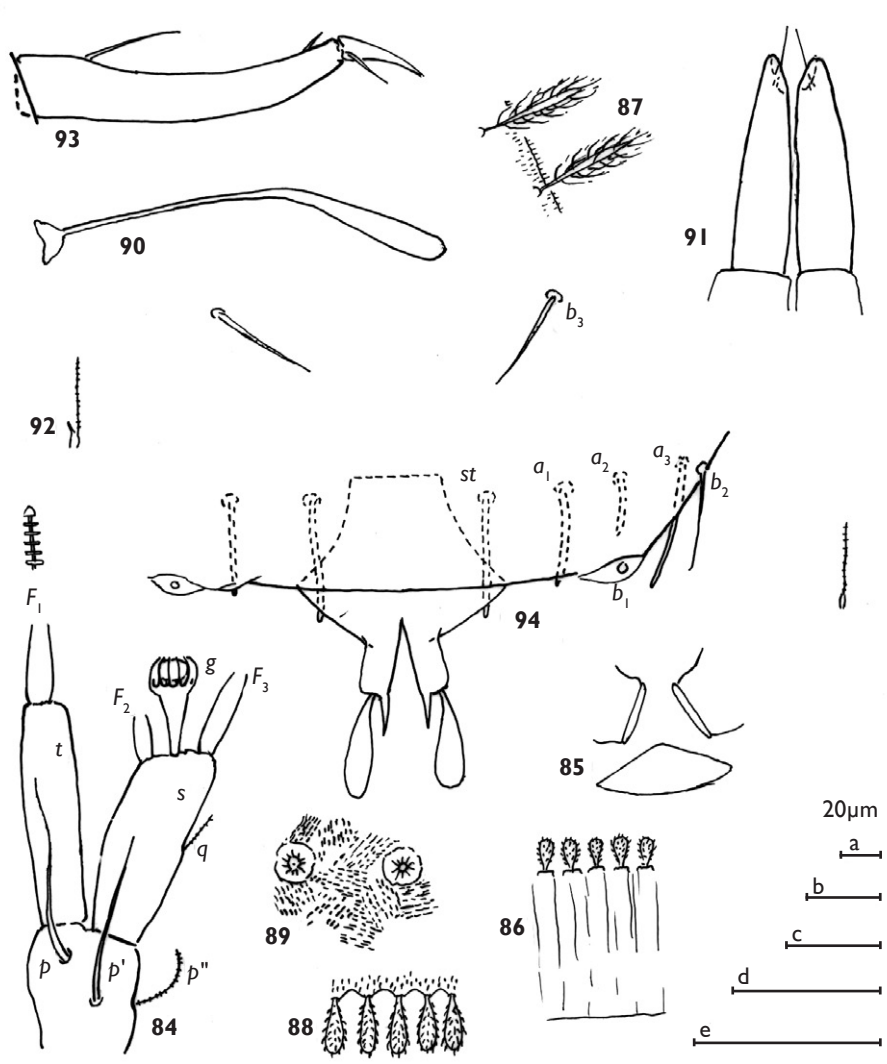
Sphaeropauropus convolvolutus Scheller, 1995
http://species-id.net/wiki/Sphaeropauropus_convolvolutus

Material. Thailand, Chiang Mai province, Doi Inthanon, below the top, litter, alt. 2400 m, 1 ad. 9(♀), 1991.vii.4, loc. CM-220.

General distribution. Known from Doi Inthanon only (Scheller 1995).

Sphaeropauropus angulatus sp. n.
urn:lsid:zoobank.org:act:980E30A4-B446-46AA-8887-A487ACC4B385
http://species-id.net/wiki/Sphaeropauropus_angulatus
Figs 84–94

Material. Holotype ad. 9(♂), Thailand, Chiang Mai province, Doi Inthanon, near Mae Chaem crossing, litter, alt. 1700 m, 1991.vii.12, loc. CM-162. – Paratype ad. 9(♂), below the top, primary rain forest, litter, alt. 2400 m, 1991.vii. 4, loc. CM-206. – Non type material, Mae Chaem road, secondary dry forest, litter, alt. 1150 m, 1juv. 3, 1991.vi.30, loc. CM-064, ibidem, litter, 1 subad. 8(♀), 1991.vii.4, loc. CM-096, ibidem, below the top, primary rain forest, litter, alt. 2400 m, 1 juv. stad.?, 1991.vii.4, loc.CM-194, ibidem, below the top, primary rain forest, soil, 1 subad. 8(♀), 1991. vii.4, loc. CM-195, ibidem, litter, 1 ad. (♀), 1991.vii.4, loc. 202, ibidem, soil, 1 stad.?, 1991.vii.4, loc. CM-207, ibidem, litter,1 juv. 5, 1 juv. 3, 1991.vii.4, loc. CM-212, ibidem, litter, 1 ad. 9(♀), 1991.vii.4, loc. CM-219, ibidem, litter, 2 juv. stad?,1991. vii.4, loc. CM-222. – 13 specimens.



Figures 84–94. *Sphaeropauropus angulatus* sp. n., holotype ad. 9(♂) **84** left antenna, sternal view; 85 collum segment, median and left part **86** tergite I, anterior margin, sternal view **87** tergite I, anterolateral margin, tergal view **88** tergite VI, posteromedian margin, sternal view **89** tergite I, inner part, tergal view **90** T_3 **91** genital papillae, anterior view **92** seta on coxa of leg 9 **93** tarsus of leg 9 **94** pygidium posteromedian and left part, sternal view, only insertion points of b_1 shown. Scale: a: Fig. 91; b: Figs 86–88, 92; c: Fig. 93; d: Fig. 94; e: Figs 84, 85, 89, 90.

Etymology. From the Latin *angulatus*, with angles (referring to the shape of the lateral margins of the anal plate).

Diagnosis. *S. angulatus* is well defined from its congeners by the shape of the anal plate with distinct lateral corners and by the cuticular pattern of the tergites. At present its relationships can not be traced.

Description. *Antennae* (Fig. 84). Chaetotaxy of segments 1–4: 2/2/2/3. Setae of first three segments and seta *p*" of 4th segment thin cylindrical, faintly striate, *p* and *p*' of 4th segment distinctly tapering, pointed glabrous, relative length of setae there: *p*=10, *p*'=*p*"=10, *r*=5. *g* ´ of 3rd segment not proved. Tergal seta *p* 0.8 of the length of tergal branch *t.* The latter cylindrical, 4.0 times as long as the greatest diameter and 1.1 times as long as sternal branch *s.* That branch subcylindrical, 2.8 times as long as the greatest diameter. Anteriodistal truncation small, seta *q* short thin pointed, 0.2 of the length of *s.* Relative lengths of flagella (base segments included) and base segments: F_1=100, bs_1=13, F_2=51, bs_2=7, F_3=89, bs_3=15. F_1 2.8 times as long as *t,* F_2 and F_3 1.5 and 2.7 times as long as *s* respectively. Globulus *g* straight, stalk thin, *g* 2.2 times as long as its greatest diameter; ≈10 bracts, capsule almost spherical. Calyces small conical, flagella axis not widened below calyx. Cuticle of antennae glabrous.

Trunk (Figs 85–89). Submedian setae of collum segment (Fig. 85) not proved, sublateral setae thin simple striate; sternite process broad low; appendages short cylindrical with thin caps. Process and appendages glabrous.

Tergites with tuft-like setae with clavate stalk (Figs 86–88). Cuticle between setae (Fig. 89) with very small sessile organs in the centre of round glabrous spots surrounded by dense short pubescence arranged in a checkered pattern. Pubescence longest on lateral parts of tergites.

Bothriotricha. All but T_3 with very thin glabrous, very shortly pubescent axes. T_3 (Fig. 90) with thicker axes and distal swelling, length of the latter 1/3 of the length of bothriotrix. Relative lengths of bothriotricha: T_1=100, T_2=144, T_3=62, T_4=139, T_5=146.

Genital papillae (Fig. 91). Longish, 3.4(-3.6) times as long greatest diameter, proximal half subcylindrical, distal half tapering, seta 0.3 of the length of papilla. Cuticle glabrous. Coxal seta of leg 2 as on leg 1.

Legs (Figs 92, 93). All legs 5-segmented. Setae on coxa and trochanter of legs 9 (Fig. 92) furcate, main branch very thin, striate; secondary branch rudimentary pointed glabrous. These setae on legs 1–8 similar. Tarsus of leg 9 slender bow-shaped, (4.9-)5.0 times as long as greatest diameter, two tergal setae, both tapering pointed glabrous. Proximal seta 0.2 of the length of tarsus and (4.0-)4.2 times as long as distal seta. No proximal seta on tarsus of leg 1. Appendage of anterior side of femur of leg 1 not studied. Legs glabrous. All legs with almost straight main claw and small setose anterior secondary claw, length of main claw 0.3 of the length of tarsus.

Pygidium (Fig. 94). *Tergum*. Posterior margin straight. Setae subsimilar to each other, cylindrical straight glabrous, directed posteriorly. Relative lengths of setae: a_1=10, a_2=6(-7), a_3=14(-16), *st*=(11-)12. Distance a_1-a_1 2.5 times as long as a_1, distance a_1-a_2 almost as long as distance a_2–a_3; distance *st*-*st* 1.6 times as long as *st* and 0.5 of distance a_1-a_1. Cuticle glabrous.

Sternum. Posterior margin straight. Setae tapering pointed, b_3 converging. Relative lengths of setae (pygidial a_1=10): b_1 lost, b_2=13, b_3=16. b_2 as long as distance b_1-b_2, b_3 0.3 of interdistance.

Anal plate pentagonal with distinct lateral corners and two somewhat diverging cylindrical branches protruding backwards from posterior part of sternal side; each branch

with two distal appendages: one inner short pointed, the other long clavate; the latter 0.5 of the length of plate; clavate appendages faintly pubescent, other parts of plate glabrous.

Remarks

Pauropods have been reported from Thailand twice only, by Hansen (1902) who described nine species from the island Koh Chang in the Gulf of Thailand, all belonging to the genera *Allopauropus* and *Decapauropus* (Pauropodidae), and by the present author (Scheller 1995), 11 species from Doi Inthanon in north-western Thailand belonging to three genera from three families, *Decapauropus* in Pauropodidae, *Samarangopus* in Eurypauropodidae, and *Sphaeropauropus* in Sphaeropauropodidae. Now four species described earlier and ten new species are reported: six ones in *Decapauropus* and one in the new genus *Angkapauropus* in Pauropodidae, one in *Borneopauropus* in Brachypauropodidae, a family new to Thailand, one species in *Samarangopus* in Eurypauropodidae, and one in *Sphaeropauropus* in Sphaeropauropodidae. Three of the new species described above seem to be related to species occurring in south east Asia (Indonesia, the Philippines, Sabah) but no less than five species have specific characters or character combinations which, as far as now known, indicate that they belong to a fauna with restricted geographic distribution.

Together 21 species are known from Doi Inthanon representing six genera in four families. Only one of the species, *Decapauropus mortensenii* Hansen, has been collected outside, in Thailand on the Island Koh Chang and also in a large area from Egypt in the west to New Caledonia in the east.

From the whole Thailand 28 species in four families and six genera are now known. Because only one of these species has a wide range the degree of endemism seems to be unusually large.

References

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