



Title	Taxonomic Study on the Family Pseudocaeciliidae (Psocoptera: Psocomorpha) of Japan : 2. Genera Heterocaecilius and Phallocaecilius
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Taxonomic Study on the Family Pseudocaeciliidae
(Psocoptera: Psocomorpha) of Japan
2. Genera *Heterocaecilius* and *Phallocaecilius*¹⁾

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Abstract The genera *Heterocaecilius* and *Phallocaecilius* of Japan are dealt with. *H. solocipennis* is transferred from the genus *Pseudocaecilius* and redescribed. A new species, *Heterocaecilius fuscus*, is described. *Phallocaecilius hirsutus* is recorded from Japan for the first time and redescribed. This is also the first record of the genus *Phallocaecilius* from Japan. Male and female genitalia are illustrated for the three species. Diagnostic characters of the genera and a key to the Japanese species of the genus *Heterocaecilius* are provided. This paper is the second part of the study of the Japanese Pseudocaeciliidae.

Key words: *Heterocaecilius*; *Phallocaecilius*; Pseudocaeciliidae; Psocoptera; taxonomy; Japan.

This paper is the second part of a revisional study of the Japanese Pseudocaeciliidae, and deals with the genera *Heterocaecilius* and *Phallocaecilius*.

The genus *Heterocaecilius* LEE et THORNTON, 1967, is characterized by the long Rs of forewing, the rod-like sclerites on endophallus in the male, the lobed and styled dorsal and ventral valves of gonapophyses and two pairs of setae of the subgenital plate in the female. The genus was described as a “collective group” and no type species was designated because LEE and THORNTON (1967) considered the genus as a heterogeneous assemblage of species that cannot be placed in other genera of the family. They recognized the following three assemblages of species in the genus: (1) *greenwoodi* group, which is characterized and differentiated from other species of the genus by the bilobed external valve of gonapophyses, (2) *H. diogenes* LEE et THORNTON, a junior synonym of *Caecilius brunellus* TILLYARD, which was thought to be intermediate between the genus *Lobocaecilius* LEE et THORNTON, 1967, and the *greenwoodi* group of the genus *Heterocaecilius*, and (3) remaining species assemblage. Subsequently MOCKFORD (1993) designated *H. minotus*, which is included in the third assemblage, as the type species of the genus *Heterocaecilius*. The genus is distributed in all of the major zoogeographical regions and consists of more than 50 species, about half of which are distributed in the Oriental Region but only a

¹⁾ Contribution from Biosystematics Laboratory, Graduate School of Social and Cultural Studies, Kyushu University, Fukuoka (No. 3).

few species occur in the Palaearctic Region.

The genus *Phallocaecilius* LEE et THORNTON, 1967, is peculiar both biologically and morphologically among genera of the family Pseudocaeciliidae. *P. hirsutus* (THORNTON), the only component of the genus, is viviparous (LEE et THORNTON, 1967 and my personal observation). The genus has a unique combination of the following morphological characters: Male forewing with sense-papillae in anal area; phallosome with prominent endophallus; endophallus with many thorn-like sclerites and a dorsal sclerotized band; female gonapophyses with reduced external valve and desclerotized dorsal and ventral valves. *P. hirsutus* (THORNTON) is hitherto recorded from Indonesia and Hong Kong.

In the present paper, two species of the genus *Heterocaecilius* and one species of the genus *Phallocaecilius* are described or redescribed from Japan: *Heterocaecilius solocipennis* (ENDERLEIN) is transferred from *Pseudocaecilius* and redescribed. A new species, *Heterocaecilius fuscus*, is described from the Ryukyus. *Phallocaecilius hirsutus* (THORNTON) is recorded from Japan for the first time and redescribed. This is also the first record of the genus *Phallocaecilius* from Japan. Male and female genitalia of all the species are illustrated. Generic diagnostic characters of the two genera and a key to Japanese species of the genus *Heterocaecilius* are provided.

Genus *Heterocaecilius* LEE et THORNTON, 1967

Type species: *Heterocaecilius minotus* LEE et THORNTON, 1967, by subsequent designation by MOCKFORD, 1993, Flora and Fauna Handbook, 10: 221.

Heterocaecilius LEE et THORNTON, 1967, Pacific Ins. Monog., 16: 13 (described as a "collective group"); MOCKFORD, 1993, Flora and Fauna Handbook, 10: 221.

Diagnosis. Venation of the *Caecilius* type; Rs long, as long as or longer than R_{4+5} . Male forewing usually without sense papillae. Hypandrium with a pair of posterior sclerotized projections. Phallosome with rod-like sclerites on endophallus. Subgenital plate bilobed, each lobe triangular and each bearing a seta at apex and near base mesally. Dorsal and ventral valves of gonapophyses with lobe and style.

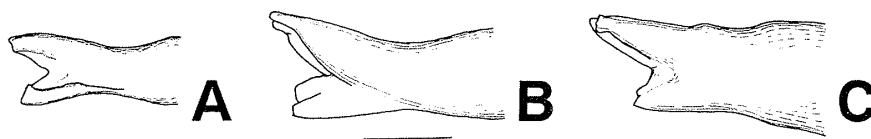


Fig. 1. Apices of laciniae, anterior aspect. A, *Heterocaecilius solocipennis*; B, *H. fuscus*; C, *Phallocaecilius hirsutus*. Scale: 0.025 mm.

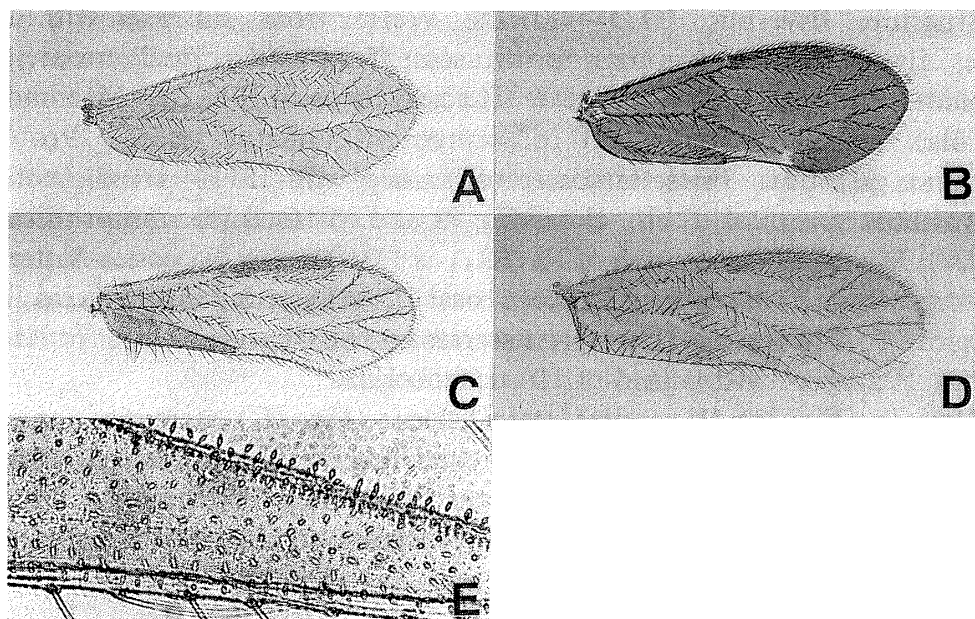


Fig. 2. Forewings. A, *Heterocaecilius solocipennis*, male; B, *H. fuscus*, male; C, *Phallocaecilius hirsutus*, male; D, ditto, female; E, ditto, male sense-papillae.

Key to Japanese species of *Heterocaecilius*

1. Body yellowish brown, claw without preapical tooth
 *H. solocipennis* ENDERLEIN
- Body blackish brown, claw with small preapical tooth ..*H. fuscus* sp. nov.

Heterocaecilius solocipennis (ENDERLEIN, 1907), comb. nov.

Pseudocaecilius solocipennis ENDERLEIN, 1907, Stett. ent. Ztg., 68: 95, (type locality: Kanagawa, Honshu, Japan); OKAMOTO, 1910, Ann. Mus. natn. Hung., 8: 202.; LEE et THORNTON, 1967, Pacific Ins. Monog., 16: 112.

Male. Coloration: Head yellowish brown, with dark reddish brown markings around orbit and median part of vertex; coronal suture black; clypeus brown; eye black often with reddish tinge; ocelli yellowish brown. Antenna blackish brown. Mouth parts yellowish brown; molar and teeth areas of mandible brown; maxillary palpus blackish brown. Thorax yellowish brown; cervical sclerite and prothorax brown; each lobe of mesoscutum with faint markings. Legs yellowish brown; fore and middle tibiae and tarsi blackish brown; claws black. Forewing (Fig. 2A) uniformly yellowish brown; veins darker than membrane, except CuP and CuA₂ hyaline. Hindwing pale yellowish brown; veins brown. Abdomen including genital segments yellow; hypandrial sclerites brown; apex of paramere black.

Structure: Eye ratio $IO:D=1.0:0.8$. Vertex, frons and gena with black bristles; clypeus densely with dark brown setae; frons with a small concavity at the middle. Antenna with black setae. Lacinial tip as in Fig. 1A. Mesonotum with black bristles, anterior part of scutum with minute setae. Pro- and metathorax glabrous. First tarsomere of hindleg with 13–14 ctenidiobothria. Claws without preapical tooth. Forewing Rs and M fused for a short distance (Fig. 2A); M arched; proportion of Rs:R₄₊₅ as 1.0:0.8; areola postica flattened. Hindwing setose all round margin except basal 1/3 of anterior margin; veins R₄₊₅ and apical 4/5 of M setose. Last tergite serrate on hind margin except for lateral portions. Paraproct with a field of 10 trichobothria.

Genitalia (Fig. 3): Hypandral lateral sclerite (Fig. 3C) narrowing apically, with a basal projection; median part of hypandrium weakly sclerotized. Phallosome (Fig. 3D, E) broad in basal half; apex of aedeagus divided as in Fig. 3F; endophallus with three pairs of rod-like processes and a median needle-like process (Fig. 3G, H).

Dimensions: B 1.68 (1.60–1.80); Fw 2.20 (2.10–2.30); Hw 1.73 (1.65–1.78); f1 0.42 (0.40–0.44); f2 0.29 (0.27–0.31); Hf 0.43 (0.41–0.45); Ht 0.81 (0.76–0.87); t1 0.25 (0.24–0.26); t2 0.11 (0.10–0.13).

Female. Coloration: Almost as in male. Antenna and legs paler than those of male. Genital segments yellow.

Structure: Almost as in male. Eye ratio $IO:D=1.6:0.5$. Antenna densely with short setae; flagellar segments about half as thick as those of male. First tarsomere of hindleg with 13–14 ctenidiobothria. Last tergite with hind margin not serrate. Paraproct with a field of 9 or 10 trichobothria.

Genitalia (Fig. 4): Subgenital plate (Fig. 4B) bilobed, each lobe triangular and bearing an apical and a basal setae and with a row of inner minute setae. Gonapophyses (Fig. 4C–D); external valve weakly lobed posteriorly, somewhat trapezoidal; dorsal valve lobed, swollen; ventral valve with long apical style.

Dimensions: B 2.09 (1.95–2.20); Fw 2.27 (2.20–2.35); Hw 1.78 (1.73–1.83); f1 0.37 (0.36–0.38); f2 0.25 (0.24–0.27); Hf 0.44 (0.42–0.45); Ht 0.80 (0.78–0.82); t1 0.25 (0.24–0.26); t2 0.11 (0.10–0.11).

Specimens examined.¹⁾ [Hokkaido] 3 males 11 females, Kafukai, Is. Rebuntô, 30. vii. 1994, K. YOSHIZAWA (YC); 2 males 6 females, same locality, 31. vii. 1994, K. YOSHIZAWA (YC); 11 males 49 females, Kutsuzoko, Is. Rishiritô, 27. vii. 1994, K. YOSHIZAWA (YC); 6 males 7 females, Yamunaisawa, Is. Rebuntô, 28. vii. 1994, K. YOSHIZAWA (YC); 3 females, Moshiri, 2. viii. 1994, K. YOSHIZAWA (YC); 4 males 24 females, Jôzankei, Sapporo C., 17. vii. 1993, K. YOSHIZAWA (YC); 4 males 12 females, Mt. Maruyama, Sapporo C., 18. vii.

¹⁾ Explanation of abbreviation. BLKU: Biosystematics Laboratory, Kyushu University; ELKU: Entomological Laboratory, Kyushu University; NSMT: National Science Museum, Tokyo; TC: TOMITA collection, YC: YOSHIZAWA collection.

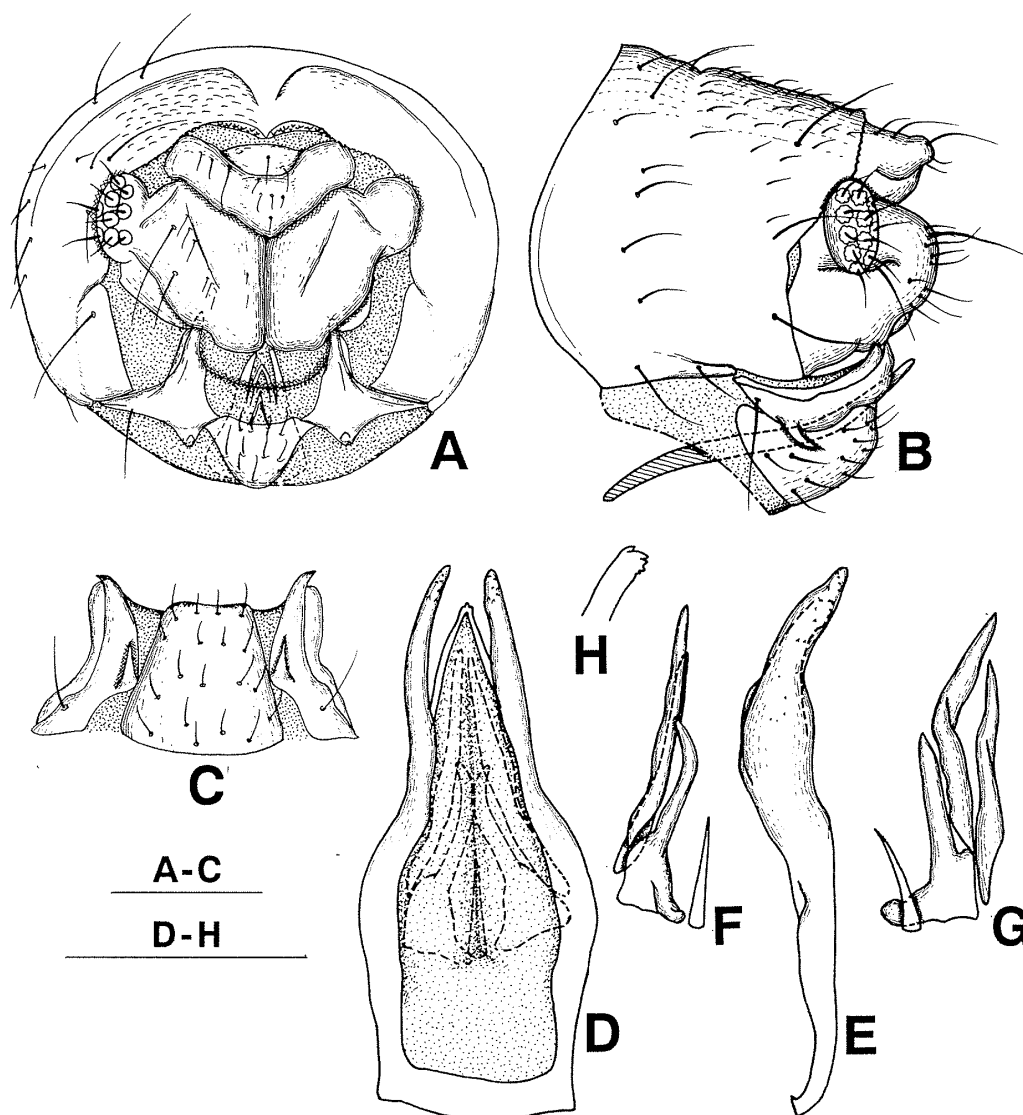


Fig. 3. Male genitalia of *Heterocaecilius solocipennis*. A, terminalia, posterior aspect; B, ditto, lateral aspect; C, hypandrium, ventral aspect; D, phallosome, lateral aspect; E, ditto, ventral aspect; F, apex of aedeagus, lateral aspect; G, sclerites on radula, lateral aspect; H, ditto, ventral aspect. Scale: 0.2 mm for A–C, 0.05 mm for D–H.

1993, K. YOSHIZAWA (YC); 5 females, Kaminokuni, 30. viii. 1994, K. YOSHIZAWA (YC). [Honshu] 6 males 35 females, Koiwai farm, Iwate Pref., 6. vii. 1993, K. YOSHIZAWA (YC); 12 males 30 females, Suzugataki, Asahi Vill., Niigata Pref., 2. vii. 1993, K. YOSHIZAWA (ELKU and YC); 1 female, Mt. Ungetsusan, Geihoku-chô, Hiroshima Pref., 5. ix. 1992, K. YOSHIZAWA (YC). [Kyushu] 2 females, Kashii, Fukuoka C., Fukuoka Pref., 8. vi. 1992, K. YOSHIZAWA (YC); 1 male 3 females, same locality, 10. vi. 1992, K. YOSHIZAWA (YC); 1 female, Mt. Kusenbu, Nakagawa-machi, Fukuoka Pref., 30. vii. 1993, S. IDE (YC); 1 female, Is. Nokonoshima, Fukuoka C., Fukuoka Pref., 21. vi. 1993,

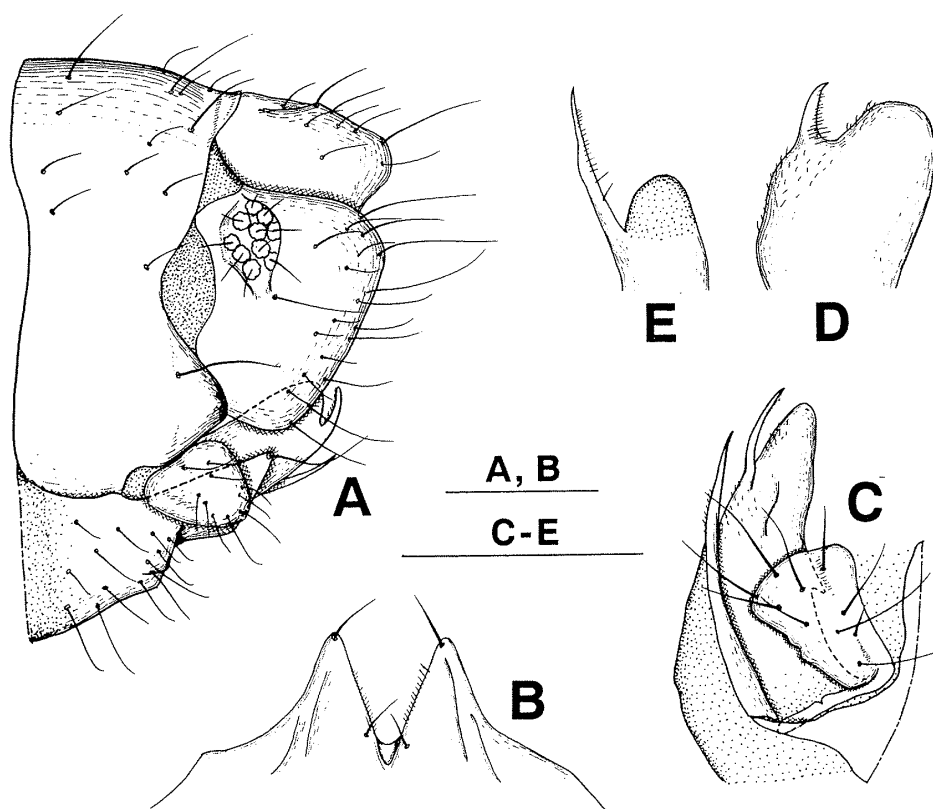


Fig. 4. Female genitalia of *Heterocaecilius solocipennis*. A, terminalia, lateral aspect; B, subgenital plate, ventral aspect; C, gonapophyses, ventral aspect; D, apex of dorsal valve, lateral aspect; E, apex of ventral valve, lateral aspect. Scale: 0.2 mm for A, 0.1 mm for B, 0.1 mm for C-E.

K. YOSHIKAWA (YC); 2 males 9 females, Kamisaka, Tsushima Is., Nagasaki Pref., 23. ix. 1993, K. YOSHIKAWA (YC).

*Distribution.*¹⁾ Japan (Hokkaido*, Honshu, Kyushu*, Tsushima Is.*).

Habitat. On leaves and branches of *Cryptomeria japonica* (Taxodiaceae) in Southern Hokkaido, Honshu, Kyushu and Tsushima Is., and on *Abies sachalinensis*, *Picea jezoensis* and *P. glehnii* (Pinaceae) in Hokkaido.

Remarks. This species was first described under the genus *Pseudocaecilius*, but it has the rod-like sclerites on endophallus, two setae on each lobe of subgenital plate and the lobed dorsal and ventral valves of gonapophyses which are regarded as diagnostic characters of the genus *Heterocaecilius*. Therefore, I transfer *P. solocipennis* to the genus *Heterocaecilius*.

Heterocaecilius fuscus sp. nov.

Heterocaecilius sp. TOMITA et HAGA, 1991, Bull. Sugadaira Montane Res. Cen., 32: 40, 52.

¹⁾ An asterisk means a new record.

Male. Coloration: Head including mouth parts dark blackish brown, coronal suture and antennal socket black; eye black; ocelli brown. Antenna blackish brown. Maxillary palpus dark blackish brown, third and fourth segments almost black. Thorax dark blackish brown; median part of mesoscutum with a brown spot. Legs brown, tibiae and tarsi dark blackish brown; claws black. Forewing (Fig. 5B) dark blackish brown, pterostigma, areola postica and its surrounding area darker; veins darker than membrane, except CuP and CuA₂ hyaline. Hindwing pale brown; veins and wing margin blackish brown. Abdomen pale brown with transverse reddish brown band on each segment; genital segment dark blackish brown.

Structure: Eye ratio IO:D=1.0:0.9. Vertex and frons with black bristles, clypeus densely with black setae; frons with a small concavity at the middle. Antenna with black setae. Lacinial tip as in Fig. 1B. Mesonotum with black bristles, anterior part of scutum densely with fine black setae. Pro- and metathorax glabrous. First tarsomere of hindleg with 13–15 ctenidiobothria; claw with preapical tooth. Forewing (Fig. 2B) Rs relatively short, equal in length to R₄₊₅; Rs and M touched a point or joined by a cross veins; M almost straight near the fork, then distinctly curved anteriorly; areola postica small. Hindwing setose all round margin except basal half of anterior margin; R₄₊₅ and apical half of M setose. Epiproct with papillae at apex. Paraproct with a field of 9–11 trichobothria and with papillae at apex.

Genitalia (Fig. 5): Hypandrium (Fig. 5C) well sclerotized, with a pair of more or less lamellate broad processes on posterior margin; the process and posterior margin of hypandrium with some conical tubercles. Phallosome (Fig. 5D, E) triangular, paramere broad; apex of aedeagus (Fig. 5F) minutely serrate on dorsal margin; endophallus with three pairs of rod-like sclerites as in Fig. 5G, H.

Dimensions: B 1.76 (1.70–1.88); Fw 2.04 (1.92–2.11); Hw 1.52 (1.42–1.60); f1 0.42 (0.40–0.44); f2 0.30 (0.28–0.32); Hf 0.43 (0.41–0.45); Ht 0.80 (0.75–0.88); t1 0.24 (0.22–0.26); t2 0.10 (0.09–0.11).

Female. Coloration: Almost as in male but paler. Legs uniformly dark brown.

Structure: Almost as in male. Eye ratio IO:D=1.0:0.3. Antennal flagellum about half as thick as that of male. Epiproct without papillae. Paraproct with a field of 9–12 trichobothria, without papillae.

Genitalia (Fig. 6): Subgenital plate (Fig. 6B) bilobed; each lobe well sclerotized, triangular, bearing an apical and a basal setae; basal part of subgenital plate deeply incised posteriorly. Gonapophyses (Fig. 6C–E); external valve rectangular; style of dorsal valve strongly hooked; lobe of ventral valve small.

Dimensions: B 2.03 (1.84–2.13); Fw 2.12 (2.00–2.20); Hw 1.62 (1.52–

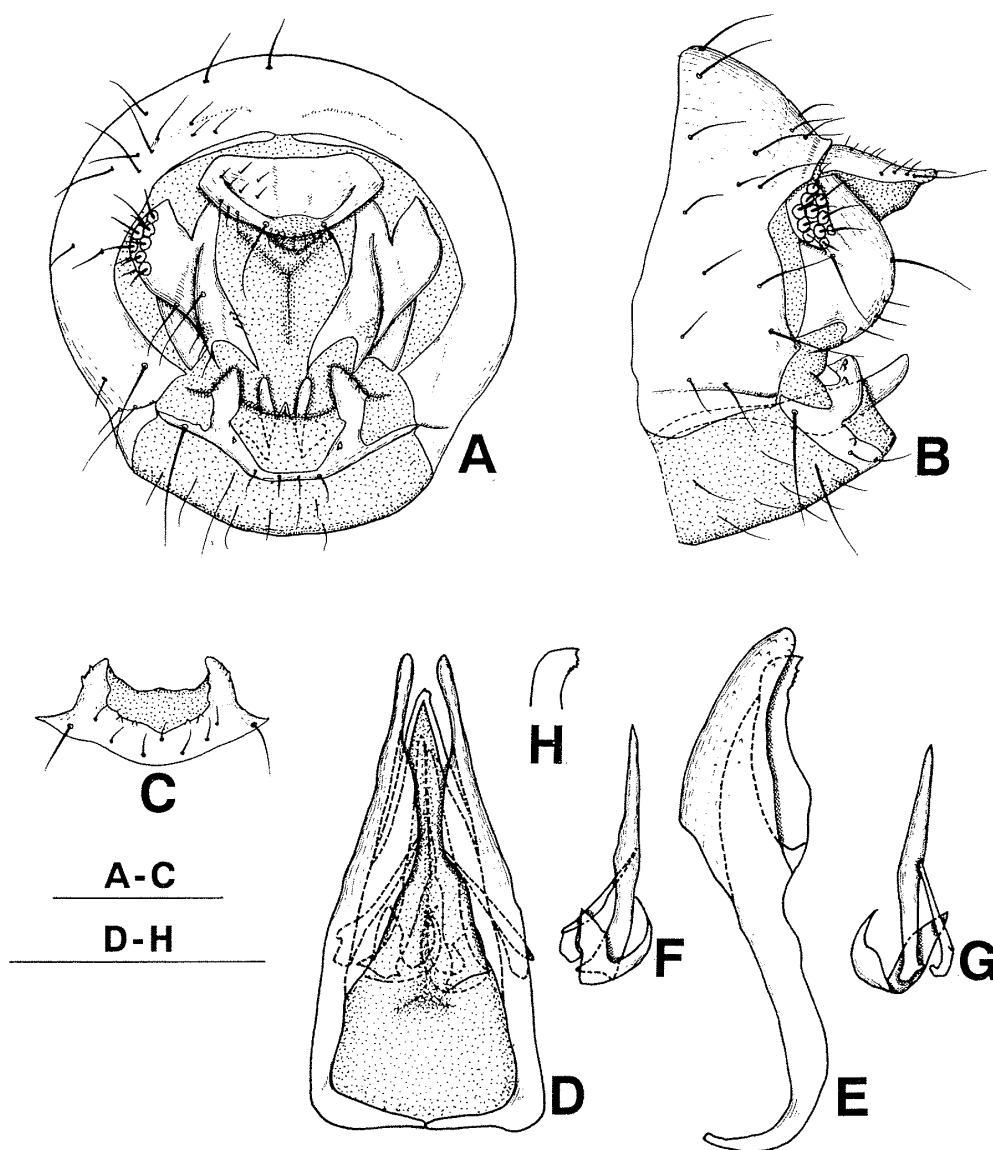


Fig. 5. Male genitalia of *Heterocaecilius fuscus*. A, terminalia, posterior aspect; B, ditto, lateral aspect; C, hypandrium, ventral aspect; D, phallosome, lateral aspect; E, ditto, ventral aspect; F, apex of aedeagus, lateral aspect; G, sclerites on radula, lateral aspect; H, ditto, ventral aspect. Scale: 0.2 mm for A–C, 0.05 mm for D–H.

1.70); f1 0.33 (0.30–0.36); f2 0.21 (0.19–0.23); Hf 0.43 (0.40–0.46); Ht 0.81 (0.78–0.85); t1 0.25 (0.25–0.26); t2 0.11 (0.10–0.11).

Holotype male (BLKU), Yona, Okinawajima Is., Okinawa Pref., 22. v. 1993, K. YOSHIKAWA.

Paratypes: 1 female, Miyanoura, Yakushima Is., Kagoshima Pref., 24. iii, 1990, R. MACHIDA (TC); 4 males 9 females, Shirataniunsuikyô Yakushima Is., Kagoshima Pref., 19. x. 1992, K. YOSHIKAWA (YC); 1 female, Mt. Yuwandake,

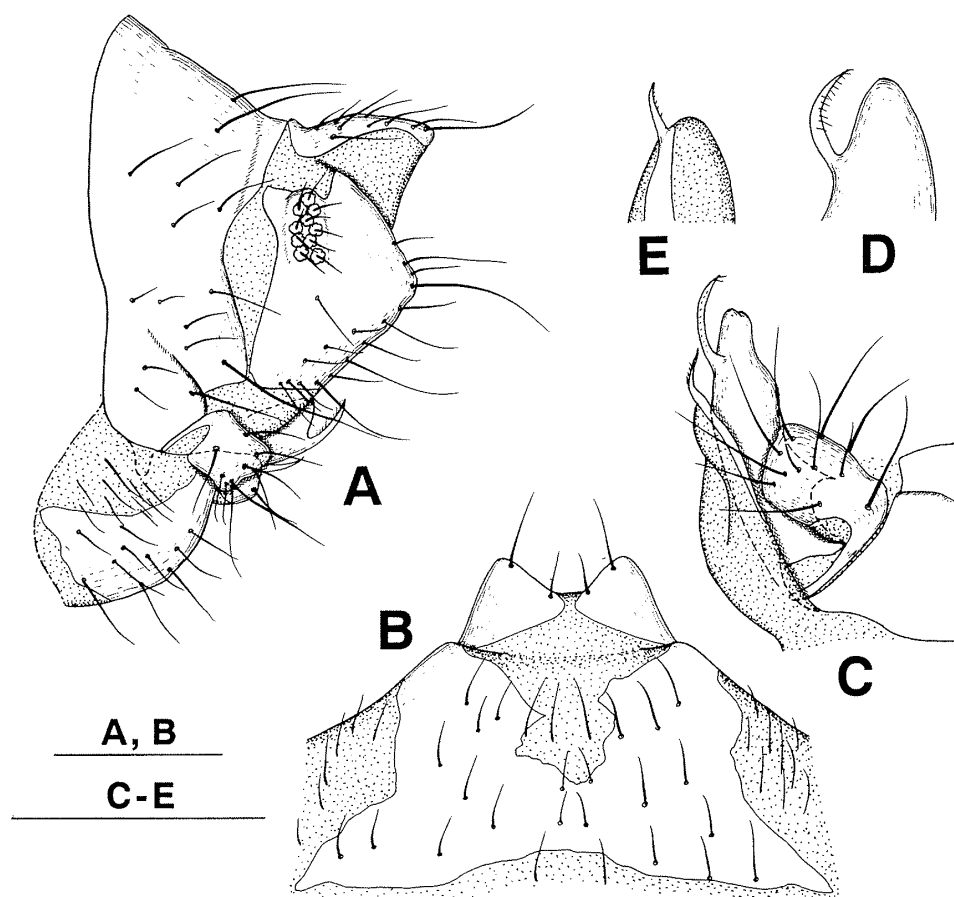


Fig. 6. Female genitalia of *Heterocaecilius fuscus*. A, terminalia, lateral aspect; B, subgenital plate, ventral aspect; C, gonapophyses, ventral aspect; D, apex of dorsal valve, lateral aspect; E, apex of ventral valve, lateral aspect. Scale: 0.2 mm for A, 0.1 mm for B, 0.1 mm for C-E.

Amami-Ôshima Is., Kagoshima Pref., 29. v. 1993, K. YOSHIZAWA (YC); 1 males 3 females, same locality, 30. v. 1993, K. YOSHIZAWA (YC); 1 female, Kominato, Amami-Ôshima Is., Kagoshima Pref., 31. v. 1993, K. YOSHIZAWA (YC); 1 male 4 females, Asato, Amami-Ôshima Is., Kagoshima Pref., 31. v. 1993, K. YOSHIZAWA (YC); 4 males 7 females, Yona, Okinawajima Is., Okinawa Pref., 20. v. 1993, K. YOSHIZAWA (YC); 4 males 8 females, Mt. Terukubiyama, Okinawajima Is., Okinawa Pref., 23. v. 1993, K. YOSHIZAWA (YC); 3 males 8 females, Benoki, Okinawajima Is., Okinawa Pref., 25. v. 1993, K. YOSHIZAWA (YC); 8 males 12 females, Sade, Okinawajima Is., Okinawa Pref., 24. v. 1993, K. YOSHIZAWA (YC); 5 males 8 females, same data as for holotype (ELKU and YC); 1 male 7 females, Mt. Yonahadake, Okinawajima Is., Okinawa Pref., 21. v. 1993, K. YOSHIZAWA (YC); 1 female, Mt. Omotodake, Ishigakijima Is., Okinawa Pref., 17. v. 1993, K. YOSHIZAWA (YC); 2 males, Shirahama, Iriomotejima Is., Okinawa Pref., 12. v. 1993, K. YOSHIZAWA (YC); 12 males 21 females,

Monbanare, Iriomotejima Is., Okinawa Pref., 13. v. 1993, K. YOSHIZAWA (YC).

Distribution. Japan (Yakushima Is., Amami-Ōshima Is., Okinawajima Is., Ishigakijima Is., Iriomotejima Is.).

Habitat. On leaves and branches of evergreen trees, and one female was caught from leaf litter collected in Yakushima Is. by Tullgren's funnel.

Remarks. This new species is very similar to *H. anomalis* (THORNTON, 1961) (from Hong Kong) and *H. bidigitatus* LI, 1993 (from Hunan, China), but can be distinguished from *anomalis* by the female coloration, shape of the subgenital plate and the last tergite of male abdomen which lacks the serration on its posterior margin, and from *bidigitatus* by the coloration and the hypandrial process which lacks bristles.

Genus *Phallocaecilius* LEE et THORNTON, 1967

Type species: *Pseudocaecilius hirsutus* THORNTON, 1961, by original designation, Proc. R. ent. Soc. Lond. (B), **30**: 148.

Phallocaecilius LEE et THORNTON, 1967, Pacific Ins. Monog., **16**: 12.

Head and mesonotum densely with long bristles and setae. Venation of the *Caecilius* type, areola postica flattened; male forewing with sense-papillae in anal area. Hypandrium with lateral sclerites. Phallosome angled basally, with weakly sclerotized aedeagus; endophallus extended, with thorn-like sclerites and a dorsal sclerotized band. Subgenital plate bilobed, with some setae near apex. External valve of gonapophyses reduced, small; dorsal and ventral valves almost membranous, unlobed.

Phallocaecilius hirsutus (THORNTON, 1961)

Pseudocaecilius hirsutus THORNTON, 1961, Proc. R. ent. Soc. Lond. (B), **30**: 148, (type locating: Peak (400 m), Hong Kong Island).

Phallocaecilius hirsutus: LEE et THORNTON, 1967, Pacific Ins. Monog., **16**: 26; VAUGHAN *et al.*, 1989, Treubia, **30**: 71.

Male. Coloration: Head brown, with pale yellowish brown bands from antennal sockets to ocelli, and along coronal suture; postocciput dark brown; antennal socket encircled with brown; eye black; ocelli pale yellowish brown; clypeus brown. Mouth parts brown; molar and teeth areas of mandible dark brown. Thorax pale yellowish brown; prothorax, scutum and scutellum pale brown. Legs pale yellowish brown; fore tibia and tarsus brown; middle and hind tibiae and tarsi pale brown; claws dark brown. Forewing (Fig. 2C) pale yellowish brown; veins brown except CuP and CuA₂ hyaline. Hindwing pale; veins brown except R₂₊₃, R₄₊₅, apical half of M and A pale brown. Abdomen pale yellowish brown with dark brown transverse bands along posterior margins

of terga; hypandrial sclerite and apex of phallosome dark brown.

Structure: Eye small, ratio $IO:D=1.0:0.5$. Vertex and frons with long black bristles, clypeus densely with black setae; frons with a small concavity at the middle. Lacinial tip as in Fig. 6H. Mesonotum with long black bristles and densely with black fine setae. Pro- and metathorax glabrous. First tarsomere of hindleg with 13–17 ctenidiobothria. Forewing Rs and M touched a point or joined by a cross vein (Fig. 2C); cells a and cu_2 covered with sensapillae (Fig. 2E); areola postica flattened. Hindwing setose all round margin; veins and membrane glabrous. Paraproct with a field of 10 trichobothria.

Genitalia (Fig. 7): Hypandrium with lateral sclerites (Fig. 7C), median part desclerotized. Phallosome (Fig. 7D, E) with lateral projections at basal angle of phallobase; paramere strongly arched in lateral aspect; aedeagus weakly sclerotized, bent dorsally; endophallus extended, with a dorsal sclerotized band and many thorn-like sclerites.

Dimensions: B 2.09 (1.93–2.23); Fw 2.16 (2.07–2.21); Hw 1.78 (1.65–1.87); f1 0.49 (0.46–0.53); f2 0.29 (0.28–0.30); Hf 0.48 (0.45–0.50); Ht 0.81 (0.78–0.83); t1 0.25 (0.24–0.29); t2 0.10 (0.10).

Female. Coloration: As in male.

Structure: Almost as in male. Eye ratio $IO:D=1.8:0.6$. Antennal flagellum about half as thick as that of male. First tarsomere of hindleg with 13–15 ctenidiobothria. Forewing without sense-papillae (Fig. 2D). Paraproct with a field of 10 or 11 trichobothria.

Genitalia (Fig. 8): Subgenital plate (Fig. 8B) bilobed, with 4 to 6 setae near apex; each lobe short, broad and rounded. Gonapophyses (Fig. 8C); external valve reduced, triangular, only with 2 long and a few shorter setae; dorsal valve swollen, entirely desclerotized; ventral valve large, almost membranous.

Dimensions: B 2.66 (2.45–2.85); Fw 2.52 (2.21–2.75); Hw 2.05 (1.90–2.35); f1 0.47 (0.44–0.50); f2 0.31 (0.28–0.35); Hf 0.56 (0.52–0.62); Ht 0.99 (0.95–1.02); t1 0.30 (0.28–0.32); t2 0.12 (0.11–0.12).

Specimens examined. [Ryukyus] 3 females, Mt. Bannadake, Ishigakijima Is., Okinawa Pref., 18. iii. 1991, M. OWADA (NSMT); 8 males 64 females, same locality, 8. v. 1993, K. YOSHIKAWA (YC); 1 male, same locality, 6. xii. 1992, T. TSUTSUMI (TC); 2 males 5 females, Itona, Ishigakijima Is., Okinawa Pref., 9. v. 1993, K. YOSHIKAWA (YC); 5 males 6 females, Omoto, Ishigakijima Is., 16. xi. 1994, K. YOSHIKAWA (YC); 1 male, Haemita, Iriomotejima Is., Okinawa Pref., 11. v. 1993, K. YOSHIKAWA (YC); 46 males 38 females, Monbanare, Iriomotejima Is., Okinawa Pref., 13. v. 1993, K. YOSHIKAWA (ELKU and YC); 4 females, same locality, 18. xi. 1994, K. YOSHIKAWA (YC); 9 males 19 females, same locality, 19. xi. 1994, K. YOSHIKAWA (YC); 2 females, Nakamagawa-rindô, Iriomotejima Is., 9. xii. 1992, T. TSUTSUMI (TC); 1 male 2 females, Mt. Urabedake, Yonagunijima Is., 3. xii. 1992, T. TSUTSUMI (TC).

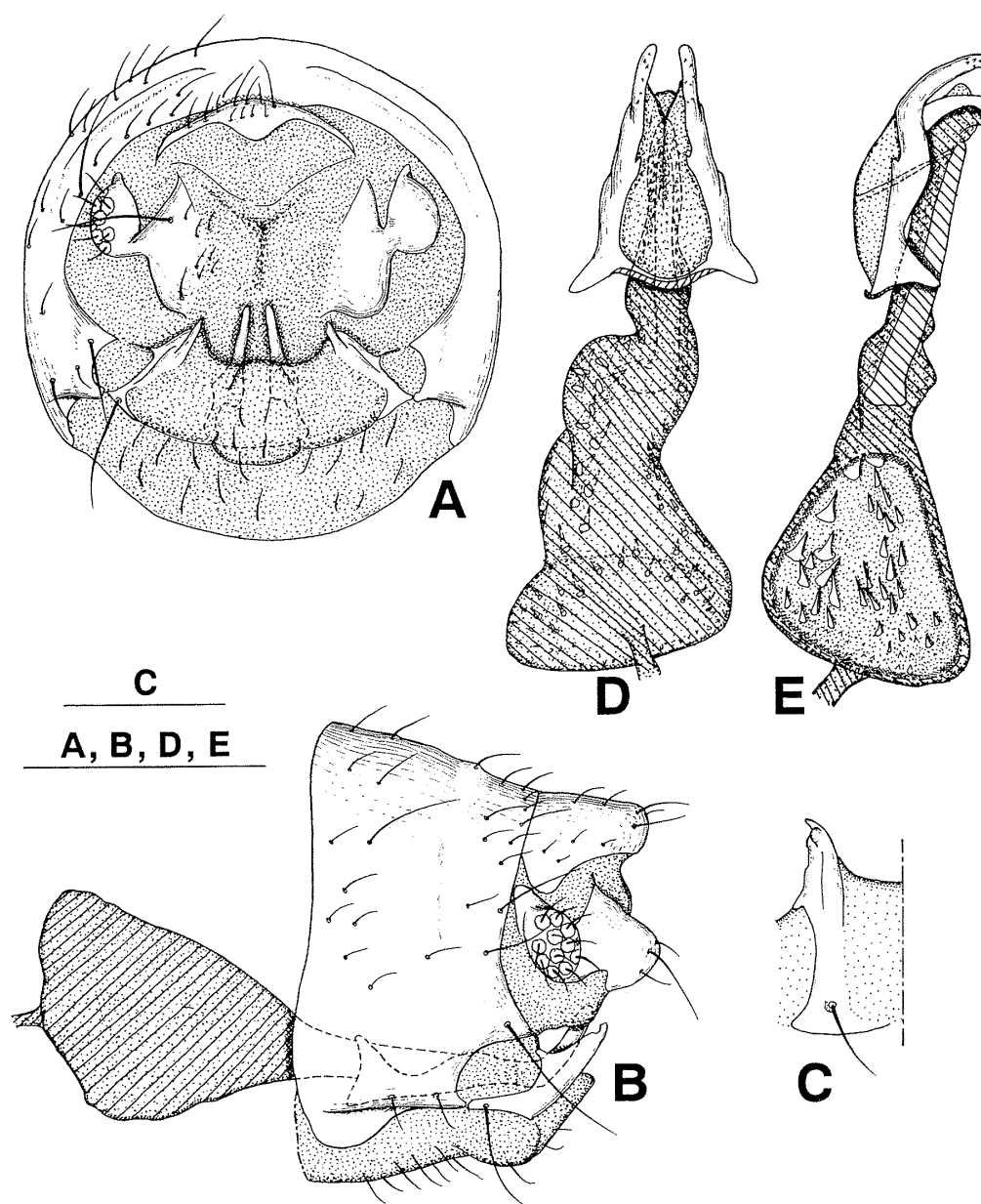


Fig. 7. Male genitalia of *Phallocaecilius hirsutus*. A, terminalia, posterior aspect; B, ditto, lateral aspect; C, hypandrium, ventro-lateral aspect; D, phallosome, lateral aspect; E, ditto, ventral aspect. Scale: 0.2 mm for A, B, D and E, 0.1 mm for C.

Distribution. Japan* (Ishigakijima Is., Iriomotejima Is., Yonagunijima Is.); Hong Kong; Indonesia.

Habitat. On dried dead leaves and branches of evergreen broad-leaved trees.

Remarks. VAUGHAN *et al.* (1989) discussed the geographical variation between the populations of Hong Kong, the type locality, and Indonesia.

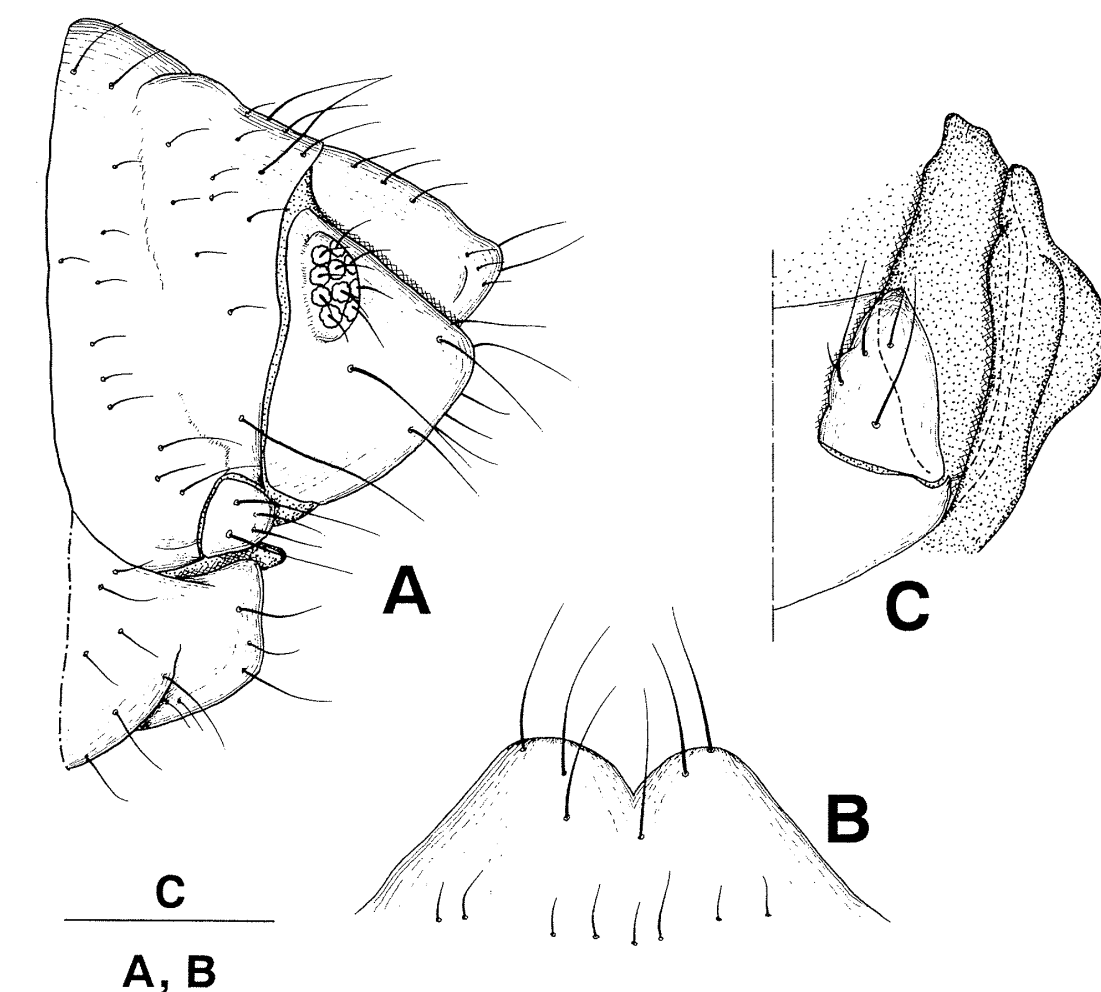


Fig. 8. Female genitalia of *Phallocaecilius hirsutus*. A, terminalia, lateral aspect; B, sub-genital plate, ventral aspect; C, gonapophyses, ventral aspect. Scale: 0.2 mm for A, 0.1 mm for B, C.

According to their description and illustrations, many or some of the individuals of Indonesia differ from those of Hong Kong in the following points: Areola postica of forewing shorter and more rounded; sense-papillae covering more limited area of forewing in male; external valve of female gonapophyses larger but showing continuous variation in size, dorsal valve with lobe and style, and ventral valve pointed at apex.

The Japanese specimens are similar to those from Hong Kong, and do not possess the character states appearing in the specimens from Indonesia. On the other hand, Japanese specimens differ from the original description as follow: Forewing Rs and M touched a point in some individuals; weakly sclerotized aedeagus can be observed when the phallosome is seen in lateral aspect; hypandrial lateral sclerite can be observed which was probably misinterpreted as lateral

sclerotized bar of last abdominal tergite in the original description.

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