

SYSTEMATIC STUDY OF THE GENUS
PERIBAEA ROBINEAU-DESVOIDY OF EAST ASIA
 (DIPTERA: TACHINIDAE)

Tachi, T. and H. Shima, 2002. Systematic study of the genus *Peribaea* Robineau-Desvoidy of East Asia (Diptera: Tachinidae).— *Tijdschrift voor Entomologie* 145: 115-144, figs. 1-19. [ISSN 0040-7496]. Published 1 June 2002.

The East Asian species of the genus *Peribaea* Robineau-Desvoidy are revised. Twelve species are recognized, eleven of which are classified into four species groups: the *fissicornis* group, *egesta* group, *orbata* group, and *minuta* group. One species, *P. trifurcata*, is treated as *incertae sedis*. The autapomorphies of these species groups are defined and characters illustrated: *fissicornis* group: – male genitalia with distiphallus bearing strong spines ventrally; *egesta* group: – epiphallus absent, ventral part of distiphallus raised along midline; *orbata* group: – postgonite distinctly bifid apically, upper lobe short, lower lobe long and pointed apically; distiphallus subrectangular in shape, sclerotized on dorsal and ventral portion with some spinules ventrally in lateral view, middle portion weakly sclerotized or membranous; *minuta* group: – distiphallus suboval in shape, broadly sclerotized in lateral view bearing some spinules ventrally. The following six species are described from Japan and China: *P. abbreviata* sp. n., *P. apaturae* sp. n., *P. caesiata* sp. n., *P. egesta* sp. n., *P. glabra* sp. n., *P. hongkongensis* sp. n. Diagnoses of all species and descriptions of new species are given, and a key to the twelve species is provided.

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 Key word. – Tachinidae, *Peribaea*, species group, taxonomy, monophyly, East Asia.

Contribution from the Biosystematics Laboratory, Graduate School of Social and Cultural Studies, Kyushu University (No. 67).

The genus *Peribaea* Robineau-Desvoidy belongs to the tribe Siphonini in the subfamily Tachininae, and comprises forty-seven described species distributed only in the Old World. Members of this genus are easily recognized among siphonines by the possession of a downwardly directed lower proepimeral seta. This character state is peculiar but not unique among members of the Tachinidae. It is also found in *Phytomyptera* and *Chaetostigmoptera* (also in the Tachininae), but is considered to occur convergently in these groups (O'Hara 1989, Andersen 1996).

The monophyly of this genus is well established by the following apomorphic characters: pedicel with two large opposed or crossed setulae; lower proepimeral seta directed downwardly; postgonite with an apical incision, dividing into two equally-sized lobes; distiphallus sclerotized posteriorly; female abdominal sternum 8 bare or absent; labrum of first instar larva hook-like (O'Hara 1988, 1989, Andersen 1996). This genus is considered to be closely related to *Siphona* s. lat., based on two apomorphic charac-

ters: vein $A_1 + CuA_2$ extended to the wing margin; lower katepisternal seta subequal in length to upper anterior seta (O'Hara l.c., Andersen l.c.).

Taxonomic studies of this genus in the Palearctic and Oriental Regions have been conducted as follows. Malloch (1924, 1930a, b, 1935) described twenty-nine species as belonging to *Actia* from Malaya, the Philippines and India, of which six were transferred to *Peribaea* due to the presence of a downwardly directed lower proepimeral seta (Herting 1984, Mesnil & Pschorn-Walcher 1968, Crosskey 1973, 1976). Mesnil (1963) redescribed six Palearctic species, recognizing *ussuriensis* as a subspecies of *hyalinata*. Richter (1971, 1975, 1976, 1980, 1981, 1986, 1993) listed five species from central Asia, Mongolia, and the Far East. Shima (1970b) described one new species of *Strobliomyia* (a junior synonym of *Peribaea*) from Japan. Chao (1996) recorded five species from China. Andersen (1996) reported six species, including two new species, from Europe.

The purpose of this paper is to revise the *Peribaea*

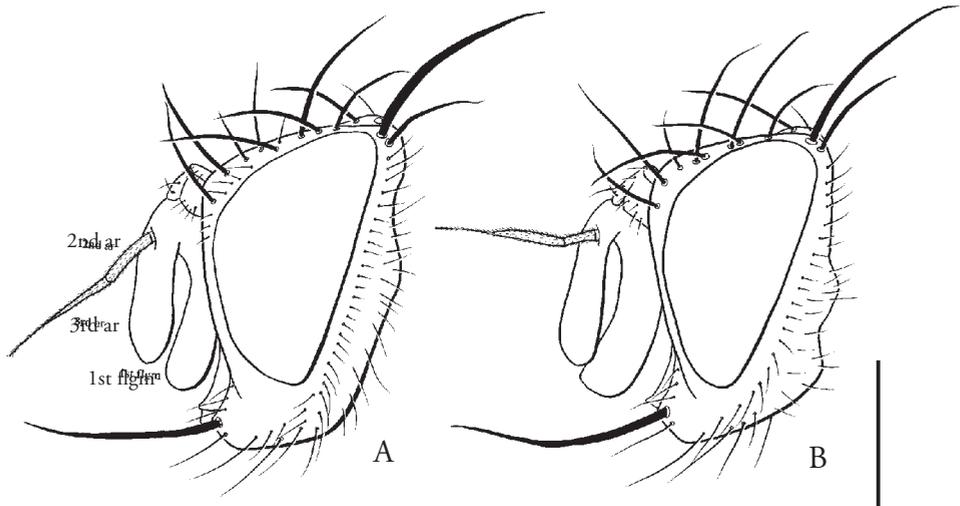


Fig. 1. Male heads in profile. – A, *Peribaea fissicornis* (Strobl); b, *P. abbreviata* sp. n. Abbreviations: 1st flgm: first flagellomere, 2nd ar: second aristomere, 3rd ar: third aristomere. Scale bar = 0.5 mm.

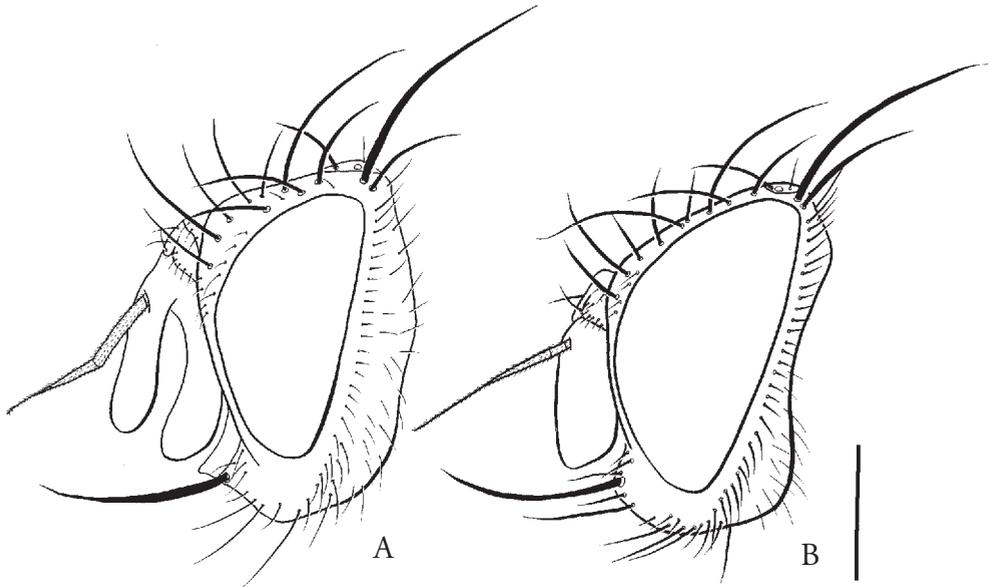


Fig. 2. Male heads in profile. – A: *P. egesta* sp. n.; b: *P. apaturae* sp. n. Scale bar = 0.5 mm

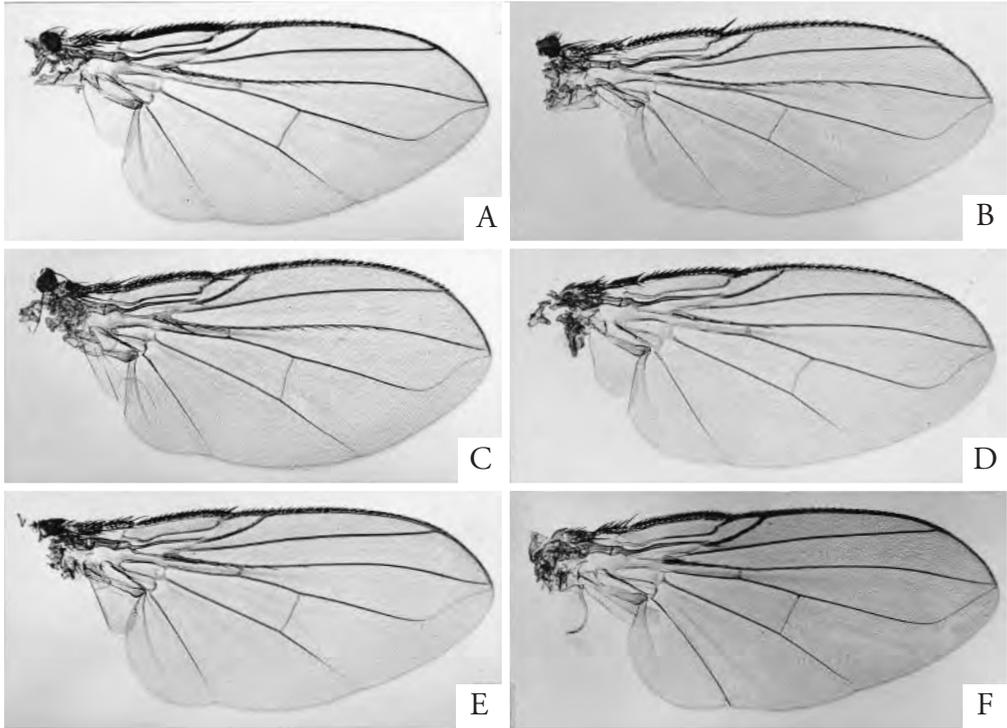


Fig. 3. Wings. — A, *P. abbreviata* sp. n.; b, *P. orbata* (Wiedemann); c, *P. tibialis* (Robineau-Desvoidy); d, *P. apaturae* sp. n.; e, *P. glabra* sp. n.; f, *P. ussuriensis* (Mesnil).

fauna of East Asia, including Japan, Korea, and China. Seven described species of *Peribaea* are known from this area: *Peribaea fissicornis* (Strobl, 1910), *P. insularis* (Shima, 190), *P. orbata* (Wiedemann, 1830), *P. palaestina* (Villeneuve, 1934), *P. similata* (Malloch, 1930), *P. tibialis* (Robineau-Desvoidy, 1851), and *P. ussuriensis* Mesnil, 1963 (Chao 1996, Mesnil 1963, Mesnil & Pschorn-Walcher 1968, Shima 1970b). In this paper we recognize twelve species from this area including six new species (*P. palaestina* and *P. similata* are not treated here), and define four species groups based on features of the male first flagellomere and male genitalia. One species, *P. trifurcata* (Shima), is treated as *incertae sedis*. Diagnoses of all species and descriptions new species are given, and the male and female terminalia are illustrated. A key to the twelve species is provided.

MATERIAL AND METHODS

Specimens studied were mainly from the collection of the Biosystematics Laboratory, Kyushu University

(BLKU). Additional specimens were examined from the following collections: Department of Entomology, Bernice P. Bishop Museum, Honolulu, Hawaii, USA (BPBM); Department of Entomology, Swedish Museum of Natural History, Stockholm, Sweden, (DESM); Entomological Laboratory, Kyushu University, Fukuoka, Japan (ELKU); Institute of Biological Science, Peking University, Beijing (IBPU); Institute of Zoology, Academia Sinica, Beijing (IZAS); Museum Zoologicum Bogoriense, Bogor, Indonesia, (MZB); National Institute of Agro-Environmental Sciences, Tsukuba, Japan (NIAES); Systematic Entomology, Hokkaido University, Sapporo, Japan (SEHU). The order of localities is cited from north to south.

Measurements and terminology of the adult (other than terminalia) are the same as in our previous paper (Tachi & Shima 1998). Eye-height and width of gena were measured in lateral view. Terminology of male terminalia and larva follows Sinclair (2000) and O'Hara (1988), respectively.

New distributional records and host species are marked with an asterisk.

SYSTEMATICS

Peribaea Robineau-Desvoidy

Herbstia Robineau-Desvoidy, 1851: 184 (junior homonym, preoccupied by *Herbstia* Edwards, 1834). Type species: *H. tibialis* Robineau-Desvoidy, 1851 (monotypy).

Peribaea Robineau-Desvoidy, 1863: 720. Type species: *P. apicalis* Robineau-Desvoidy, 1863 (by designation of Coquillett, 1910: 587).

See O'Hara (1989) for complete list of synonyms.

Description

Head. – Eye relatively large, subequal to or slightly smaller in female than in male; ocellar setae strong; fronto-orbital plate with some fine setulae in some species; anterior proclinate seta subequal in length to posterior one; anterior reclinate orbital seta situated near or posterior to middle of fronto-orbital plate, 2–2.5 times as long as posterior seta; 4–5 frontal setae; upper occiput and postgena with some fine white and some black setae; antenna of male with 1st flagellomere highly varied in shape, linear to broad, bifid, trifid or pectinate, linear in female; 1st aristomere short; 2nd aristomere 2–4 times as long as wide in some species; 3rd aristomere pubescent, thickened on basal 1/3–1/2; frontoclypeal plate Y-shaped; clypeus inverted U-shaped; palpus clavate; prementum short, about 3 times as long as wide; labella pad-like.

Thorax. – Three postpronotal setae in straight line; 3+4 ac, 3+3–4 dc, 1+3 ia; scutellum with short fine apical setae; subapical setae strong, 2–2.5 times as long as scutellum; lateral and basal setae present; lower proepimeral seta strong and directed downwardly; upper part of anepisternum usually with 1 seta anterior to row of anepisternal setae; 2+1 katepisternal setae, lower seta strong, subequal in length to upper anterior seta; prosternum setulose.

Wing. – Tegula black; basicosta orange to light brown; lower calypter whitish to light brown. R₁ setulose dorsally along entire length or on apical 1/2 or bare, on apical 1/3 ventrally or bare; R₄₊₅ setulose dorsally nearly to wing margin or to level of crossvein dm-cu or to level of wing margin of CuA₁. CuA₁ bare or setulose (only in *malayana*); A₁ + CuA₂ extended to the wing margin.

Legs. – Brownish to blackish in ground colour; trochanter and tibia yellowish in most species. Fore tibia with 3–5 ad, 3–6 pd, and 1 p setae; mid femur with 2 ad setae at middle and 2 pd setae apically; mid tibia with 1 ad, 1–5 pd, and 1 v setae; hind tibia with 1–8 ad, 2–8 pd, and 3–5 v setae; claws and pulvilli short.

Abdomen. – Blackish in ground colour in most species (sometimes partially yellowish on syntergum 1+2 and tergum 3); anterior 1/5–1/3 of terga 3–5 with whitish pollinosity in most species. Syntergum 1+2 with or without pair of lateral marginal setae; tergum

3 with pair of lateral and median marginal setae; terga 4 and 5 with 4–6 marginal setae; sternum 5 with pair of rounded median lobes on inner edges.

Male genitalia. – Epandrium usually not fused with surstylus at base (except in *trifurcata*); surstylus longer than cerci in lateral view, varied in shape, narrow or broad, nearly straight or curved dorsally, with or without setae; cerci weakly curved dorsally at middle or narrowed apically in lateral view, with long setae on entire length or basal 1/2; postgonite barely or strongly bifid apically, upper lobe short and rounded apically, lower lobe long and pointed apically; pregonite approximately sclerotized in C-shape in lateral view; epiphallus developed or absent; distiphallus suboval or subrectangular, broadly sclerotized and bearing strong spines ventrally or sclerotized on dorsal and ventral portion and bearing some spinules ventrally in lateral view; dorsal part of distiphallus mostly sclerotized and raised at apical 1/2 on midline, with some spinules at concave part.

Female terminalia. – Short; sternum 5 nearly rectangular with long black setae; tergum 6 broad and elongate, fused with each other dorsally; sternum 6 subrectangular, wider than long, with long black setae, but in some species partially with short transparent setulae; tergum 7 small hemitergite; sternum 7 subrectangular, with long black setae or short transparent setulae, in several species warped anteriorly at apex; sternum 8 strongly reduced (in *ussuriensis* absent), without setae; hypoproct present as median sclerite with strong setae, bent backwards above tergum 8; spiracles 6 and 7 present on each tergum.

First instar larva. – Labrum somewhat narrowed to strongly narrowed apically; lateral sclerite small and subtriangular or subrectangular; hypopharyngeal region with roof of food canal not obvious in most species; hypopharyngeal sclerite subtriangular or divided into two parts, subtriangular and subrectangular; dorsal cornu narrow and slender or broad; ventral cornu broad; each segment with or without tiny spinules; abdominal segment 6 with several rows of tiny spinules ventrally; abdominal segment 7 with many rows of tiny spinules ventrally; abdominal segment 8 with 7–8 large spinules dorsally in some species.

Key to species of the genus *Peribaea* in East Asia

1. Vein R₁ bare (fig. 3a); male antenna with 1st flagellomere bifid or trifid (figs. 1a–b, 2a); female 1st flagellomere simple 2
- Vein R₁ setulose dorsally (figs. 3b–f); male and female 1st flagellomere simple (fig. 2b) 10
2. Male 3
- Female (*hongkongensis*, *insularis*, and *trifurcata* unknown) 8
3. Antenna with 1st flagellomere trifid 8

- *P. trifurcata* (Shima)
- First flagellomere bifid (figs. 1a-b, 2a) 4
4. Antenna with 2nd aristomere long, 5-7 times as long as wide, and 0.5-0.7 times as long as 3rd (figs. 1a, 2a) 5
- Second aristomere short, 3.5-4 times as long as wide, and 0.2-0.3 times as long as 3rd (fig. 1b)7
5. 3+3 dc; syntergum 1+2 with lateral marginal seta; scutellum usually dark grey *P. egesta* sp. n.
- 3+4 dc; syntergum 1+2 without lateral marginal seta; scutellum usually yellowish on apical $1/5$ - $1/3$6
6. Vertex wide, 0.38-0.4 of head width; antenna with 1st flagellomere black; abdominal sternum 5 without pair of accessory lobes on inner edges (fig. 4d); male genitalia with epiphallus present (fig. 4c) *P. fissicornis* (Strobl)
- Vertex narrow, 0.32-0.33 of head width; first flagellomere dark brown to brownish; abdominal sternum 5 with pair of accessory lobes on inner edges (fig. 8d); male genitalia with epiphallus absent (fig. 8c) *P. hongkongensis* sp. n.
7. Vertex narrow, about 0.3 of head width; gena about 0.25 of eye-height; syntergum 1+2 with pair of lateral marginal seta; sternum 5 with pair of accessory lobes on inner edges (fig. 6d) *P. insularis* (Shima)
- Vertex wide, about 0.35 of head width; gena 0.16-0.19 of eye-height; syntergum 1+2 without lateral marginal seta; sternum 5 without pair of accessory lobes on inner edges (fig. 5d) *P. abbreviata* sp. n.
8. 3+3 dc *P. egesta* sp. n.
- 3+4 dc 9
9. Antenna with 2nd aristomere long, 0.5-0.6 times as long as 3rd *P. fissicornis* (Strobl)
- Second aristomere short, 0.3-0.4 times as long as 3rd *P. abbreviata* sp. n.
10. Vein R_1 setulose dorsally on apical $1/2$ (figs. 3c-f)11
- Vein R_1 setulose dorsally on entire length (fig. 3b) *P. orbata* (Wiedemann)
11. Syntergum 1+2 and tergum 3 black in ground colour 12
- Syntergum 1+2 and most of tergum 3 yellow in ground colour *P. ussuriensis* (Mesnil)
12. Vein R_1 setulose ventrally on apical part 13
- Vein R_1 bare ventrally 14
13. Vein R_{4+5} setulose dorsally to level of wing margin of CuA_1 (fig. 3c); antenna with 1st flagellomere blackish *P. tibialis* (Robineau-Desvoidy)
- Vein R_{4+5} setulose dorsally to level of wing margin of R_1 (fig. 3d); first flagellomere orange to light brown *P. apaturae* sp. n.
14. Abdomen bluish; vertex wide, about 0.4 of head

- width *P. caesiata* sp. n.
- Abdomen blackish; vertex narrow, about 0.35 of head width *P. glabra* sp. n.

Species groups of East Asian *Peribaea* species

We define the following four species groups for eleven East Asian and all European species based on features of the male first flagellomere and male genitalia: *fissicornis* group, *egesta* group, *minuta* group, and *orbata* group. Each group is inferred to be monophyletic based on one or more synapomorphies as discussed at the beginning of each group.

Most of Oriental species also appear to be assigned to these four groups. However, some species, such as *P. unisetata* (Malloch, 1930a) and *P. pectinata* (Shima, 1970a), have a very specialized first flagellomere, and they are not assignable to either group together with *P. trifurcata*. They might compose a different species group, but are left for further study.

The *fissicornis* group

Diagnosis. – Male: Antenna with 1st flagellomere bifid (figs. 1a-b). Male genitalia (figs. 4-6): Surstylus in lateral view strongly curved dorsally at middle; postgonite slightly notched apically; epiphallus developed; distiphallus broadly sclerotized in lateral view with strong spines ventrally, and with membranous area apically and centrally in ventral view (fig. 5f). Female: First flagellomere not bifid.

Remarks. – This group is supported by one autapomorphic character: male genitalia with distiphallus bearing strong spines ventrally (figs. 4c, 5c, 6c). The following species are recognized as members of this group: *P. fissicornis* (Strobl), *P. abbreviata* sp. n., *P. insularis* (Shima), and *P. hertingi* Andersen.

Peribaea fissicornis (Strobl) (figs. 1a, 4a-d)

Thryptocera fissicornis Strobl, 1910: 139.
See Herting (1984) for complete list of synonyms.

A detailed description of this species was given by Mesnil (1963).

Diagnosis

Male: Vertex 0.38-0.4 of head width; parafacial much narrower than width of 2nd aristomere at middle height; gena 0.17-0.22 of eye-height; antenna with 1st flagellomere bifid; 2nd aristomere long, 5-6 times as long as wide and 0.5-0.7 times as long as 3rd; 3+4 dc; ultimate section of CuA_1 0.7-0.9 times as long as penultimate section, and 2.2-2.8 times as long as

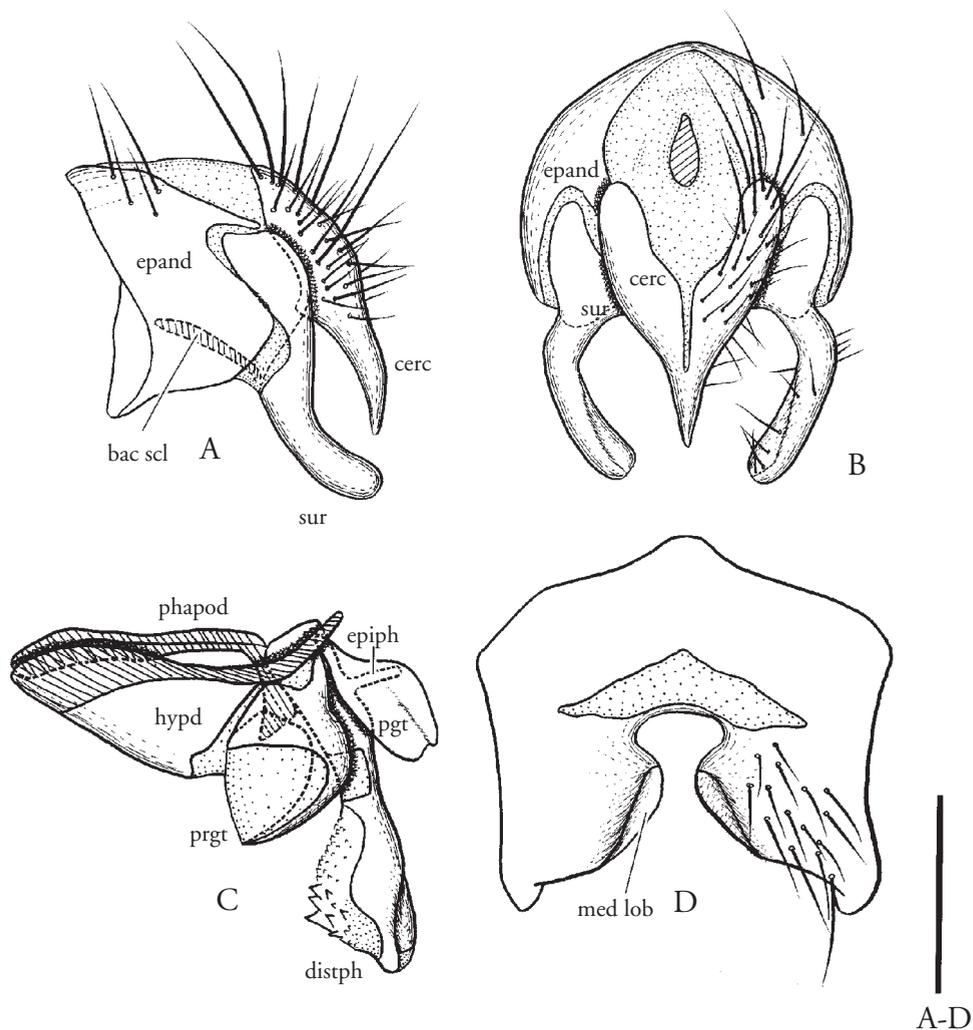


Fig. 4. Male genitalia of *P. fissicornis* (Strobl). – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d, Male abdominal sternum 5 in dorsal view (setae omitted on left side). Abbreviations: bac scl: basilliform sclerite, cerc: cerci, distph: distiphallus, epand: epandrium, epiph: epiphallus, hypd: hypandrium, med lob: median lobe, pgt: postgonite, phapod: phallapodeme, prgt: pregonite, sur: surstylus. Scale bar = 0.2 mm.

crossvein dm-cu; R_1 bare; R_{4+5} setulose dorsally to beyond level of crossvein dm-cu; CuA_1 bare; posterior margin of syntergum 1+2 to tergum 4 with very thinly yellowish band; syntergum 1+2 without distinct lateral marginal seta; sternum 5 nearly square with pair of elongated median lobes on inner edges; accessory lobes absent. Male genitalia. Surstylus strongly curved dorsally at middle in lateral view, strongly curved inwards in dorsal view; cerci weakly curved ventrally in lateral view, with some setae on basal 1/2; postgonite

slightly notched apically; epiphallus present; pregonite approximately sclerotized in C-shape, pointed apically; distiphallus broadly sclerotized in lateral view, with strong spines ventrally. Female: Antenna with 1st flagellomere not bifid; 2nd aristomere 5-6 times as long as wide and 0.5-0.6 times as long as 3rd. Female terminalia. Similar to *abbreviata*, but differing from it as follows: sterna 6 and 7 sometimes with short transparent setulae partially. First instar larva: Similar to *egesta*. Body length. – 3.7-4.0 mm.

Distribution. – Japan* (Hokkaido, Honshu, Kyushu), China (Zhejiang, Hong Kong*), Burma*, Europe, Siberia, Russia (Far East).

Host. – Unknown.

Remarks. – This species is widely distributed in the Palearctic Region and here recorded for the first time from Japan, Hong Kong and Burma. This species is similar to *P. hongkongensis* sp. n. in general appearance, but is easily distinguished from it by the wide vertex and black first flagellomere.

Thryptocera setinervis was described from a female specimen from China (Thomson 1869). Andersen (1996), as suggested by Crosskey (1976), considered *P. fissicornis* as a senior synonym. However, it is difficult to identify females of *fissicornis* and *egesta* groups which are characterized by specialized male first flagellomere. We treat this nominal species as *fissicornis* until the Chinese fauna is better known.

Material examined. – JAPAN [Hokkaido] 1♂, Nukabira, Tokachi, 28.viii.1959 (SEHU); 1♀, Mt. Rausu (200-900m), 22.vi.1967. [Honshu] 1♀, Mikashima, Tokorozawa City, Saitama Pref., 24.xi.1989; 1♀, Kawaguchi, Chiba Pref., 20.viii.1996; 1♂, Shimashimadani, Azumi Village, Nagano Pref., 4.viii.1997; 1♀, Togakushi, Nagano Pref., 24.vi.1996; 1♂, Mt. Hachimori, Nagano Pref., 1.vii.1996; 1♂1♀, Mt. Mizugaki, Sudama Town, Yamanashi Pref., 16.vii.1996, 12.viii.1975 (Malaise trap); 1♂, Ochiai, Sudama Town, Yamanashi Pref., 16.vii.1996; 1♀, Hinoki tōge, Gifu Pref., 26-28.vi.1967; 1♀, Mt. Kakezu, Geihoku Town, Hiroshima Pref., 21.viii.1998. [Kyushu] 1♂, Mt. Inunaki, Fukuoka Pref., 10.iv.1977; 1♀, Mt. Tachibana, Fukuoka Pref., 29.vi.1996; 1♂, Ropponmatsu, Fukuoka City, Fukuoka Pref., 20.vii.1989; 1♂, Mt. Hakucho, Kumamoto Pref., 17.v.1978; 1♀, Shiiba goe, Izumi Village, Kumamoto Pref., 25.vii.1997; 1♀, Kurio, Yakushima Is., Kagoshima Pref., 1-4.iv.1971. – CHINA [Hong Kong] 1♂, Taipokau, 31.v.1965 (Malaise trap) (BPBM). – BURMA. 3♂, Kambaiti, 2000 m, 7,10,19.iv.1934 (DESM) (all in BLKU except as indicated).

Peribaea abbreviata sp. n.

(figs. 1b, 3a, 5a-f, 16a, 19a-b)

Diagnosis

3+4 dc; R₁ bare; R₄₊₅ setulose dorsally to beyond level of crossvein dm-cu; CuA₁ bare. Male: Antenna with 1st flagellomere bifid; 2nd aristemere short, 3.5-4 times as long as wide and about 0.3 times as long as 3rd. Female: First flagellomere not bifid; 2nd aristemere 4-4.5 times as long as wide and 0.3-0.4 times as long as 3rd.

Description

Male: Head. – Whitish in ground colour; fronto-orbital plate and ocellar triangle light gray; frontal vitta orange; antenna with scape and pedicel orange; 1st flagellomere blackish; arista brown; palpus light yellow. Vertex about 0.35 of head width; parafacial

subequal to or slightly wider than width of 2nd aristemere at middle height; gena 0.16-0.19 of eye-height; 5 frontal setae; anterior reclinate orbital seta situated near middle of fronto-orbital plate, about 2 times as long as posterior seta; antenna with 1st flagellomere bifid; 2nd aristemere short, 3.5-4 times as long as wide and about 0.3 times as long as 3rd; palpus clavate; prementum short, about 3 times as long as wide; labella pad-like.

Thorax. – Gray in ground colour, with yellowish pollinosity; scutellum yellowish on apical 1/5. 3+4 dc.

Wing. – Hyaline; tegula black; basicosta light yellow. Relative lengths of costal sectors 2nd, 3rd, and 4th approximately as 1: 6: 3; ultimate section of CuA₁ 0.75-0.9 times as long as penultimate section, and 2.3-2.5 times as long as crossvein dm-cu; R₁ bare; R₄₊₅ setulose dorsally to beyond level of crossvein dm-cu; CuA₁ bare.

Legs. – Fore coxa, trochanter and tibia yellowish; femora and tarsi brownish. Fore tibia with 3-4 ad, 1-3 pd, and 1 p setae; mid tibia with 1 ad, 3-5 pd, and 1 v setae; hind tibia with 5-7 ad, 4-8 pd, and 3-4 v setae.

Abdomen. – Black in ground colour; anterior 1/3 of terga 3-5 with whitish pollinosity; posterior margin of syntergum 1+2 to tergum 4 with thin yellowish band. Syntergum 1+2 without lateral marginal seta; tergum 3 with pair of lateral and marginal setae; terga 4 and 5 with 4-6 marginal setae; sternum 5 nearly oval with pair of elongated median lobes on inner edges; accessory lobes absent.

Male genitalia. – Surstylus slender in lateral view, slightly curved dorsally at middle; cerci narrowed apically in lateral view with long setae on entire length; postgonite broadly notched apically; epiphallus present; pregonite similar to *fissicornis*; distiphallus with deep U-shaped apical notch in lateral view, and with membranous area apically and centrally in ventral view.

Female: Similar to male, but differing from it as follows: antenna with 1st flagellomere not bifid, about 3 times as long as wide; 2nd aristemere 4-4.5 times as long as wide and 0.3-0.4 times as long as 3rd.

Female terminalia. – Similar to *tibialis*, but differing from it as follows: sterna 6 and 7 with short setae.

First instar larva. – Similar to *egesta*.

Body length. – 3.0-4.0 mm.

Etymology. – This species is named after the short second aristemere.

Distribution. – Japan (Hokkaido, Honshu, Kyushu), Korea, China (Shaanxi).

Host. – Unknown.

Remarks. – This species is similar to *P. insularis* in general appearance, but easily distinguished from it by the following: male abdominal sternum 5 without accessory lobe; cerci with many long setae along entire length.

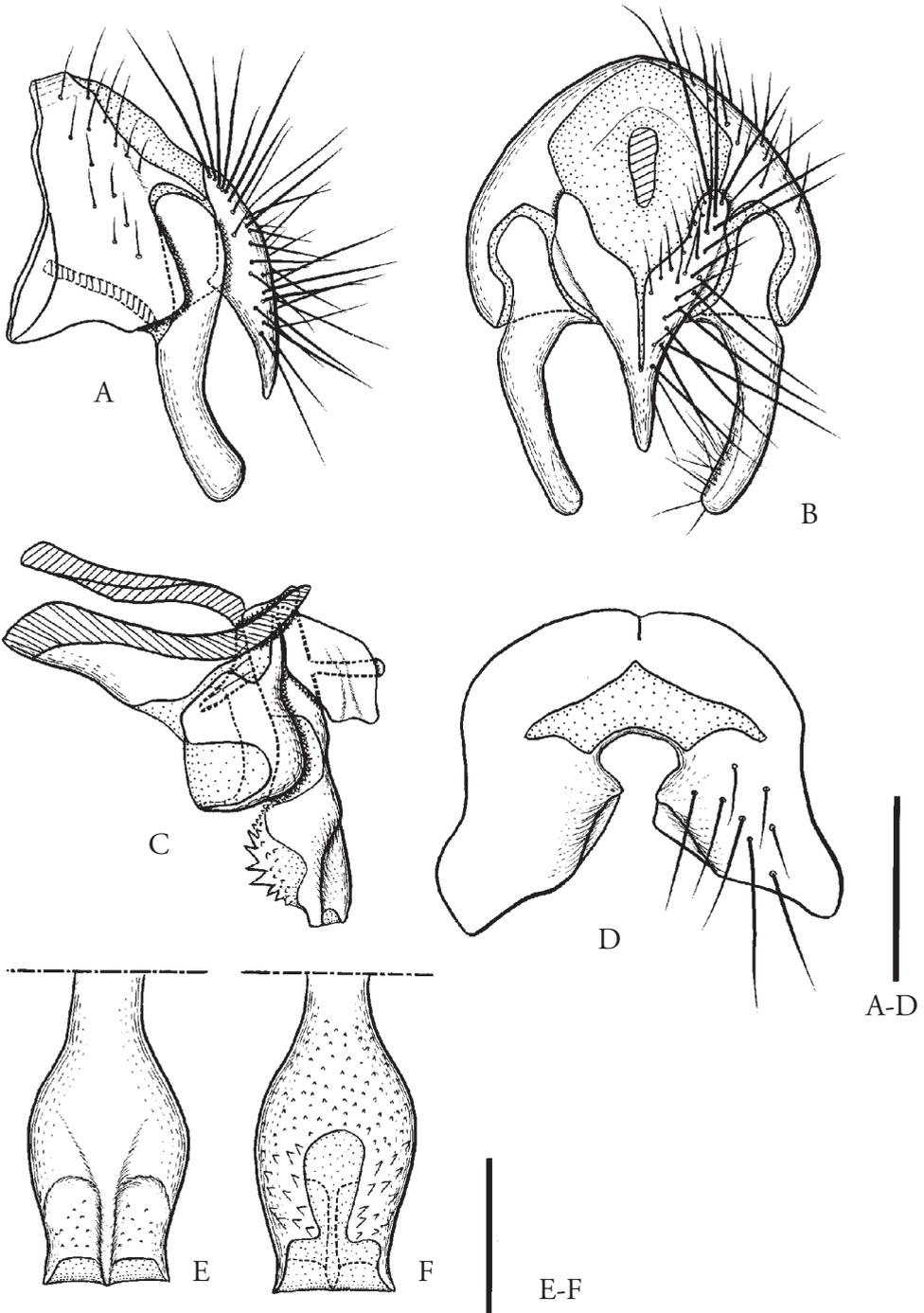


Fig. 5. Male genitalia of *P. abbreviata* sp. n. – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d, Male abdominal sternum 5 in dorsal view (setae omitted on left side); e, Distiphallus in dorsal view; f, same in ventral view. A-d: Scale bar = 0.2 mm; e-f: Scale bar = 0.1 mm.

Type material. – Holotype ♂, Hodaka (1100 m), Gifu Pref., Honshu, Japan, 12.viii.1995, T. Tachi (BLKU). – Paratypes. JAPAN [Hokkaido] 1♀, Gōjikkoku, Shibecha Town, 14.viii.1996, T. Tachi; 2♀, Kamitoshibetsu, Ashoro Town, 10,17.viii.1996, T. Tachi. [Honshu] 1♀, Biwasawa, Inawasiro Town, Fukushima Pref., 14.viii.1996, M. Sueyoshi; 1♂, Okuwa village, Nagano Pref., 3.vii.1996, T. Tachi; 1♀, Mt. Hachimori, Asahi Village, Nagano Pref., 2.viii.1997, M. Sueyoshi; 1♀, Ogorogawa valley (1300m), Ina City, Nagano Pref., 23.vii.1998, T. Tachi; 1♂, Yunosawa tōge, Yamato Village, Yamanashi Pref., 18.vii.1996, T. Tachi; 3♀, Mt. Kanayama, Sudama Town, Yamanashi Pref., 19, 26.vii.1975, J. Emoto; 1♂, same data as holotype; 1♀, Mt. Kumakura, Chichibu Mts., Saitama Pref., T. Hayashi; 1♀, Mt. Takao, Tokyo Pref., 5.vii.1949, N. Fukuhara; 1♂, Mt. Kakezu, Geihoku Town, Hiroshima Pref., 18.vii.1998, T. Tachi. [Shikoku] 3♀, Tsuchigoya, Omogo Village, Ehime Pref., 9,11.viii.1998, R. Matsumoto. [Kyushu] 1♂, Noko Is. Fukuoka Pref., 3.iv.1998, M. Sueyoshi; 1♂, Mt. Tachibanayama, Fukuoka Pref., 25-30.ix.1978 (Yellow pan), K. Yamagishi; 1♂, Mt. Hiko-san, Fukuoka Pref., 10.v.1980, K. Ohara; 1♀, Mt. Hiko-san, Fukuoka Pref., 13. v.1975, A. Nakanishi. – KOREA. 1♂, Mt. Palgon-san (800 m) near Taegue, 18. vi.1977, K. Yamagishi; 1♂, Mt. Sudo-san (700 m), Gyongsangbug-Do, 31.vii. 1977, K. Yamagishi. – CHINA [Shaanxi] 1♂, Shuimoping, 1500-1650 m, SSW of Banfangzi, 5.vi.1997; H. Shima (IBPO) (all in BLKU except as indicated).

Peribaea insularis (Shima)
(fig. 6a-d)

Strobliomyia insularis Shima, 1970b: 179.

A detailed description of this species was given by Shima (1970b).

Diagnosis

Male: Vertex about 0.3 of head width; parafacial narrow, much narrower than width of 2nd aristemere at middle height; gena about 0.25 of eye-height; 5 frontal setae; anterior reclinate orbital seta about 1.5 times as long as posterior seta; antenna with 1st flagellomere bifid; 2nd aristemere short, 4-4.5 times as long as wide and 0.3-0.35 times as long as 3rd; 3+4 dc; ultimate section of CuA₁ about 0.7 times as long as penultimate section, and about 2.3 times as long as crossvein dm-cu; R₁ bare; R₄₊₅ setulose dorsally to beyond level of crossvein dm-cu; CuA₁ bare; posterior margin of syntergum 1+2 to tergum 4 with thinly yellowish band; syntergum 1+2 with pair of lateral marginal setae; sternum 5 nearly square with pair of elongated median lobes on inner edges; accessory lobes

present. Male genitalia. Surstylus strongly narrowed at middle in lateral view; cerci narrowed apically in lateral view, with long setae on basal half; postgonite slightly notched apically; epiphallus present; pregonite and distiphallus similar to *fissicornis*.

Female: Unknown.

Body length. – 3.8-4.2 mm.

Distribution. – Japan (Kyushu).

Host. – Unknown.

Remarks. – This species is distributed in southern Japan. It is similar to *P. abbreviata* sp. n., but easily distinguished from it by the following: vertex narrow; gena wide; male abdominal sternum 5 with pair of accessory lobes on inner edges.

Material examined. – Types: Holotype ♂, Asahigaoka, Tokunoshima Is., Amami-Islands, Kagoshima Pref., 7.xi.1966, Y. Miyatake (ELKU). – Paratype: 1♂, Ohyama, Okinoerabu Is., Amami-Islands, Kagoshima Pref., 28-30.vii.1963, C. M. Yoshimoto (BLKU). – Additional material: JAPAN [Kyushu] 1♂, Tete, Tokunoshima Is., Amami-Islands, Kagoshima Pref., 24.iv.1996 (BLKU).

The egesta group

Diagnosis. – Male: Antenna with first flagellomere bifid (fig. 2a). Male genitalia (figs. 7-8). Surstylus nearly straight in lateral view; postgonite notched apically; epiphallus absent; distiphallus broadly sclerotized, without distinct strongly spines ventrally; ventral part of distiphallus raised along midline (fig. 8f). Female: First flagellomere not bifid.

Remarks. – Monophyly of this group is based on by the following apomorphic characters: epiphallus absent (figs. 7c, 8c); ventral part of distiphallus raised along middle (fig. 8f). Two new species in East Asia, *P. egesta* and *P. hongkongensis*, are included in this group.

Peribaea egesta sp. n.
(figs. 2a, 7a-d, 16b, 19c-d)

Diagnosis

3+3 dc; R₁ bare; R₄₊₅ setulose dorsally to beyond level of crossvein dm-cu; CuA₁ bare. Male: Antenna with 1st flagellomere bifid; 2nd aristemere long, 6-7 times as long as wide and 0.5-0.7 times as long as 3rd. Female: First flagellomere not bifid; 2nd aristemere 5-6 times as long as wide and 0.4-0.5 times as long as 3rd.

Description

Male: Head. – Whitish in ground colour; fronto-orbital plate gray, whitish-yellow or yellowish pollinosity; ocellar triangle light gray; frontal vitra reddish brown; antenna with scape and pedicel light brown; 1st flagellomere blackish; arista brown; palpus orange. Vertex 0.37-0.4 of head width; parafacial some-

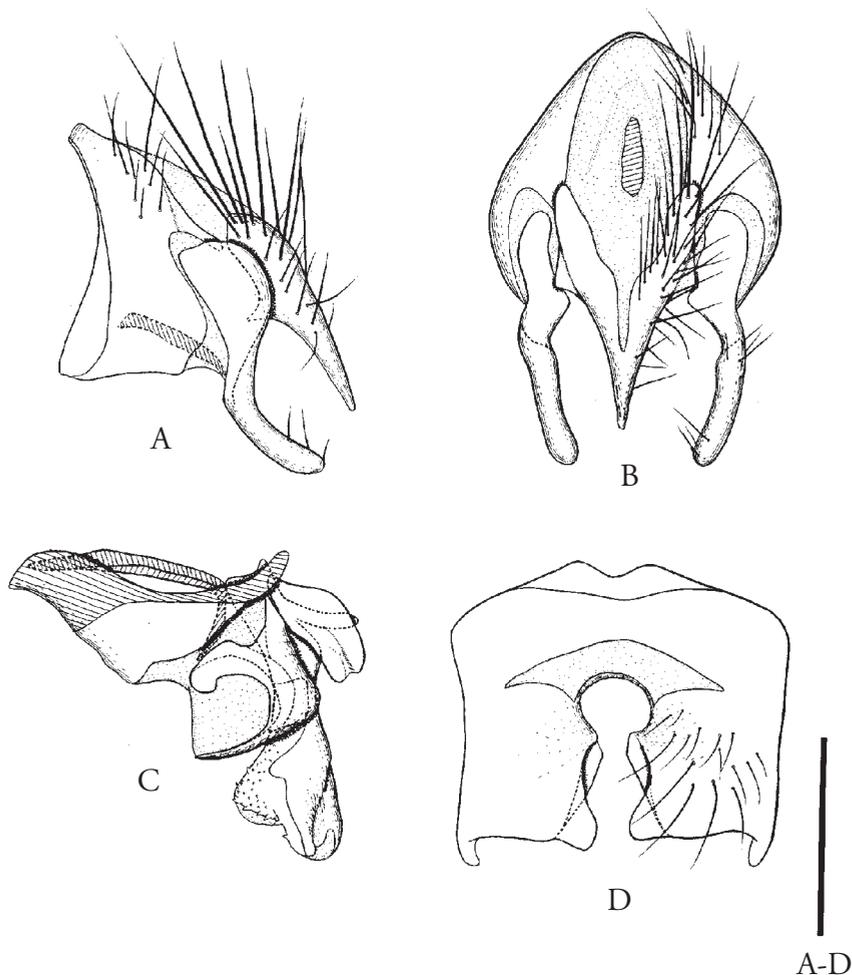


Fig. 6. Male genitalia of *P. insularis* (Shima). – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d, Male abdominal sternum 5 in dorsal view (setae omitted on left side). a-d: Scale bar = 0.2 mm.

what narrow, subequal in width to width of 2nd arismomere at middle height; gena about 0.2 of eye-height; anterior reclinate orbital seta situated near middle of fronto-orbital plate, about 2 times as long as posterior seta; 5 frontal setae; antenna with 1st flagellomere bifid; 2nd arismomere long, 5-6 times as long as wide and 0.5-0.7 times as long as 3rd; palpus clavate; prementum short, about 3 times as long as wide; labella pad-like.

Thorax. – Black in ground colour, with yellowish pollinosity. 3+3 dc.

Wing. – Hyaline; tegula black; basicosta orange.

Relative lengths of costal sectors 2nd, 3rd and 4th approximately as 1: 5.5: 2.5; ultimate section of CuA₁ 0.67-0.83 times as long as penultimate section, and 2-2.5 times as long as crossvein dm-cu; R₁ bare; R₄₊₅ setulose dorsally to beyond level of crossvein dm-cu; CuA₁ bare.

Legs. – Coxae, trochanters and tibiae reddish yellow; femora and tarsi brownish. Fore tibia with 3-4 ad, 1-3 pd, and 1 p setae; mid tibia with 1 ad, 1-2 pd, and 1 v setae; hind tibia with 4-5 ad, 4-7 pd, and 3-4 v setae.

Abdomen. – Black in ground colour; anterior ½ of

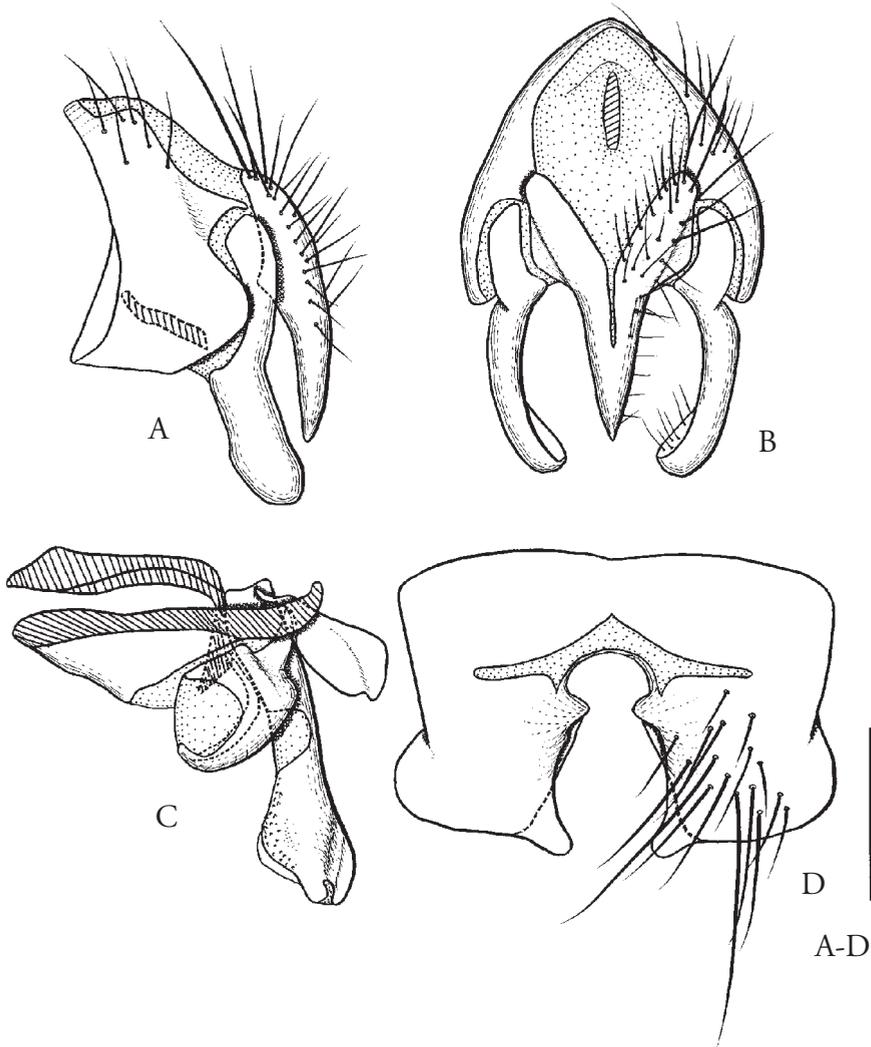


Fig. 7. Male genitalia of *P. egesta* sp. n. – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d, Male abdominal sternum 5 in dorsal view (setae omitted on left side). a-d: Scale bar = 0.2 mm.

terga 3-5 with whitish gray pollinosity; posterior margin of syntergum 1+2 to tergum 4 with very thin yellowish band (sometimes lacking in tergum 4). Syntergum 1+2 with pair of lateral marginal setae; sternum 5 nearly square, with pair of elongated median lobes on inner edges; accessory lobes present.

Male genitalia. – Surstylus thickened and straight at middle in lateral view; cerci gently curved ventrally in lateral view, with setae on basal $\frac{1}{2}$; postgonite with shallow ventroapical notch; epiphallus absent; pregonite broadly sclerotized in C-shape, apex rounded; distiphallus broadly sclerotized, with tiny spinules

ventrally in lateral view; ventral part of distiphallus with membranous area apically and raised part along midline.

Female: Differing from male as follows: antenna with 1st flagellomere subrectangular; 2nd arismomere 5-6 times as long as wide and 0.4-0.5 times as long as 3rd.

Female terminalia. – Similar to *tibialis*, but differing from it as follows: sterna 6 and 7 with short transparent setulae.

First instar larva. – Labrum somewhat narrow; lateral sclerite small subtriangular; hypopharyngeal region with roof of food canal not obvious; hypo-

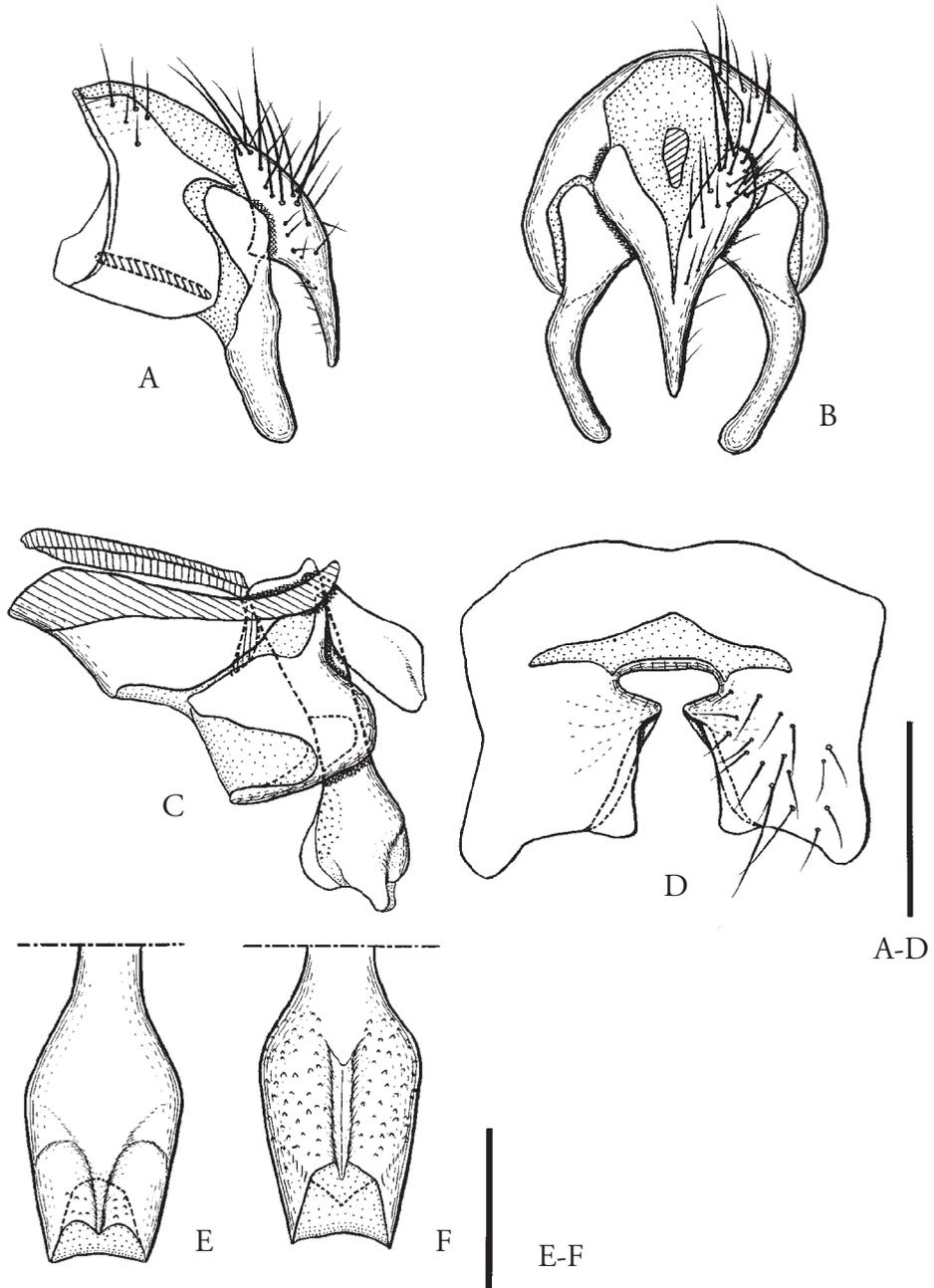


Fig. 8. Male genitalia of *P. hongkongensis* sp. n. – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d, Male abdominal sternum 5 in dorsal view (setae omitted on left side); e, Distiphallus in dorsal view; f, same in ventral view. A-d: Scale bar = 0.2 mm; e-f: Scale bar = 0.1 mm.

pharyngeal sclerite subtriangular; dorsal cornu broad; ventral cornu broad; each segment with tiny spinules; abdominal segment 6 with several rows of tiny spinules ventrally; abdominal segment 7 with many rows spinules ventrally; abdominal segment 8 with 7-8 large spinules dorsally.

Body length. – 4.0 mm.

Etymology. – This species is named after the absence of the epiphallus in the male genitalia.

Distribution. – Japan (Hokkaido, Honshu, Shikoku, Kyushu).

Host. – Unknown.

Remarks. – This species is easily distinguished from other species with bifid male first flagellomere by 3+3 dc setae, the absence of the epiphallus, and thickened surstylus.

Type material. – Holotype ♂, Mt. Kakezu, Hiroshima Pref., Honshu, Japan, 19.vii.1995, T. Tachi (BLKU). – Paratypes: JAPAN [Hokkaido] 1 ♀, Yokomanbetsu, Mts. Daisetsu, 10-13.vii.1986, H. Shima. [Honshu] 1 ♀, Naeba, Niigata Pref., 14.vii.1966, H. Shima; 1 ♂, Togakushi, Nagano Pref., 27.vi.1996, T. Tachi; 1 ♀, Okinami, Anamizu Town, Ishikawa Pref., 2.v.1992, I. Togashi; 2 ♂, Mt. Sanage-yama, Aichi Pref., 23.iv.1971, K. Yamagishi; 1 ♀, Ueyama-kôgen, Onsen Town, Hyogo Pref., 2.v.1997, M. Sueyoshi; 2 ♀, same locality as holotype, 17,18.vii.1998, T. Tachi. [Shikoku] 2 ♀, Minokoshi, Mt. Tsurugi, Tokushima Pref., 28.iv.1998, T. Tachi; 1 ♀, Kamegamori, Ehime Pref., 27.iv.1998, T. Tachi. [Kyushu] 1 ♂, Mt. Aburayama, Fukuoka Pref., 7-14.iv.1983, H. Shima; 1 ♂, Mt. Kusenbu, Fukuoka Pref., 26.iv.1978, H. Takahashi (all in BLKU).

Peribaea bongkongensis sp. n.
(figs. 8a-f)

Diagnosis

3+4 dc; R_1 bare; R_{4+5} setulose dorsally to level of crossvein dm-cu; CuA_1 bare. Male: Antenna with 1st flagellomere bifid; 2nd aristomere long, about 5 times as long as wide and about 0.5 times as long as 3rd. Female: First flagellomere not bifid, about 3 times as long as wide; 2nd aristomere about 5 times as long as wide and 0.3-0.4 times as long as 3rd.

Description

Male: Head. – Whitish in ground colour; fronto-orbital plate with yellowish pollinosity; frontal vitta orange; antenna with scape and pedicel orange to light brown; 1st flagellomere and apical 1/3 of arista blackish to dark brown, basal 2/3 of arista light brown to orange; palpus orange. Vertex about 0.32 of head width; parafacial about twice as wide as width of 2nd aristomere at middle height; gena 0.17-0.2 of eye-

height; 5 frontal setae; fronto-orbital plate with row of setulae; anterior reclinate orbital seta situated posterior to middle of fronto-orbital plate, about 2 times as long as posterior one; antenna with 1st flagellomere bifid; 2nd aristomere about 5 times as long as wide, and about 0.5 times as long as 3rd; 3rd aristomere thickened on basal half; palpus clavate; prementum 3-4 times as long as wide; labella pad-like.

Thorax. – Dorsum gray in ground colour, with yellowish pollinosity; postpronotal lobe whitish; scutellum pale yellowish on apical 1/3; pleura brownish, with grayish pollinosity. 3+4 dc; scutellum with pair of discal setae.

Wing. – Hyaline; tegula black; basicosta orange. Relative lengths of 2nd, 3rd, and 4th costal sectors approximately as 1: 6: 2.5; ultimate section of CuA_1 , 0.6-0.7 times as long as penultimate section, and about twice as long as crossvein dm-cu; R_1 bare; R_{4+5} setulose dorsally to level of crossvein dm-cu; CuA_1 bare.

Legs. – Coxae and trochanters reddish yellow; femora, tibiae, and tarsi brownish. Fore tibia with 4-5 ad, 3-4 pd, and 1 p setae; mid tibia with 1 ad, 1-3 pd, and 1 v setae; hind tibia with 5-6 ad, 5-7 pd, and 3-4 v setae.

Abdomen. – Black in ground colour; anterior 1/3 of terga 3-5 with whitish pollinosity; posterior margin of syntergum 1+2 to tergum 4 thinly yellowish. Syntergum 1+2 without distinct lateral marginal seta; tergum 3 with pair of lateral and median marginal setae; terga 4 and 5 with 4-6 marginal setae; sternum 5 nearly square, with pair of elongated median lobes on inner edges; accessory lobes present.

Male genitalia. – Surstylus nearly straight in lateral view; cerci narrowed on apical half in lateral view, with some setae on basal half; postgonite nearly square, not bifid; epiphallus absent; pregonite broadly sclerotized in C-shape, apex rounded; distiphallus broadly sclerotized, with tiny spinules ventrally in lateral view; ventral part of distiphallus with membranous area apically and greatly raised part along midline.

Female: Similar to male, but differing from it as follows: antenna with 1st flagellomere subrectangular, about 3 times as long as wide; 2nd aristomere about 5 times as long as wide and 0.3-0.4 times as long as 3rd.

Female terminalia. – Similar to *P. tibialis*, but differing from it as follows: sternum 7 only with short transparent setulae.

Body length. – 3.5-4.2 mm.

Etymology. – This species is named after the type locality.

Distribution. – China (Hong Kong).

Host. – Unknown.

Remarks. – This species is similar to *P. fssicornis* in general appearance, but differs from it in features of the male genitalia: sternum 5 with pair of accessory

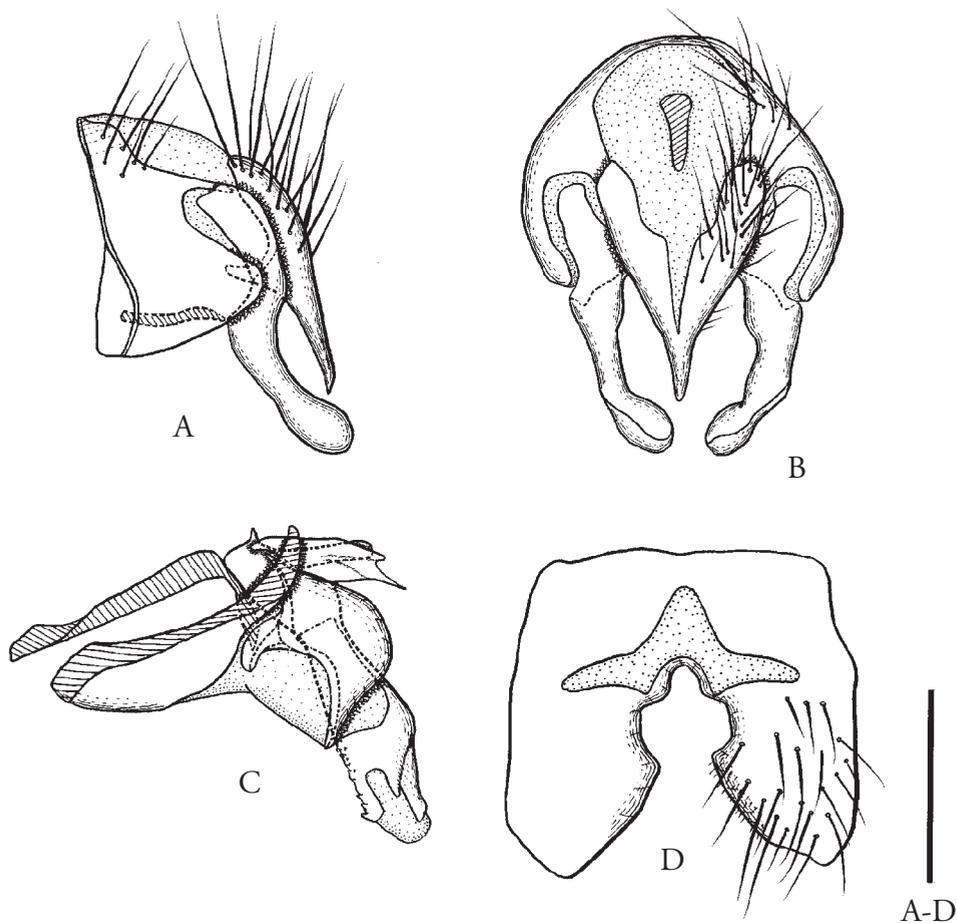


Fig. 9. Male genitalia of *P. orbata* (Wiedemann). – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d, Male abdominal sternum 5 in dorsal view (setae omitted on left side). A-d: Scale bar = 0.2 mm.

lobes; epiphallus absent; distiphallus with large sclerotized part ventrally.

Type material. – Holotype ♂, Taipokau, Hong Kong, 20.vi.1965 (Malaise trap), Lee kit Ming & Hui Wai Ming (BPBM). – Paratypes: CHINA [Hong Kong] 1♂ 2♀, same locality as holotype, 9.vii.1963, 8,26.vi.1965 (Malaise trap), Lee kit Ming & Hui Wai Ming; 1♂, Sai Kung Station, 12.v.1965 (Malaise trap) (all in BPBM).

The orbata group

Diagnosis. – Antenna with 1st flagellomere unsp-

cialized. Male genitalia (figs. 9-10): Surstylus slightly curved dorsally at middle in lateral view; postgonite distinctly bifid apically, upper lobe short, lower lobe long and pointed apically (figs. 9c, 10c); epiphallus present; distiphallus subrectangular in shape, sclerotized on dorsal and ventral portion with some spinules ventrally in lateral view, middle portion weakly sclerotized or membranous.

Remarks. – Autapomorphies of this group are recognized in features of the postgonite and distiphallus described above (figs. 9c, 10c). The following species are included in this group: *P. hyalinata* (Malloch), *P. orbata* (Wiedemann), *P. tibialis* (Robineau-Desvoidy).

Peribaea orbata (Wiedemann)

(figs. 3b, 9a-d, 17a, 19e-f)

Tachina orbata Wiedemann, 1830: 336.

See O'Hara (1989) for complete list of synonyms.

A detailed description of this species was given by Mesnil (1963) under the name *Strobliomyia aegyptia*.

Diagnosis

Whitish in ground colour; antenna with 1st flagellomere blackish. Vertex 0.28-0.35 of head width; parafacial subequal in width to that of 2nd aristomere at middle height; gena 0.16-0.18 of eye-height; 5 frontal setae; anterior reclinate orbital seta about 2.5 times as long as posterior seta; antenna with 1st flagellomere subrectangular, 2-2.5 times as long as wide; 3+4 dc; ultimate section of CuA_1 about 0.64 times as long as penultimate section, and about 2 times as long as crossvein dm-cu; R_1 setulose dorsally on entire length, on apical $\frac{1}{3}$ ventrally; R_{4+5} setulose dorsally to beyond level of crossvein dm-cu; CuA_1 bare; posterior margin of syntergum 1+2 to tergum 4 with thin yellowish band. Male genitalia. Surstylus strongly curved dorsally at middle in lateral view, apex thickened; cerci narrowed apically in lateral view; postgonite bifid apically, upper lobe rounded apically, lower lobe sharply pointed apically; epiphallus present; pregonite and distiphallus similar to *tibialis*. Female terminalia. Similar to *tibialis*, but differing from it as follows: sterna 6 and 7 with short transparent setulae. First instar larva. Labrum very narrow apically; dorsal cornu narrow and slender; hypopharyngeal region with roof of food canal not obvious; each segment without tiny spinules; abdominal segment 7 with many rows of tiny spinules ventrally.

Body length. – 2.5-4.3 mm.

Distribution. – Japan (Honshu, Kyushu, Ryukyus, Ogasawara Is.), China (Hubei, Fujian, Guangdong, Hainan, Yunnan, Taiwan, Hong Kong*), Philippines, Indonesia (Sumatra, Java*, Bali*, Lombok*), Borneo, Burma*, Thailand, Malaysia, Melanesia & Micronesia, Australia.

Host. – Lepidoptera, Noctuidae: *Aedia leucomelas* (Linnaeus)*, *Spodoptera litura* (Fabricius) (Shima 1999).

Remarks. – This species is widely distributed in the Oriental Region. It is distinct among species of *Peribaea* in having R_1 setulose dorsally on entire part.

Material examined. – JAPAN [Honshu] 2♂, Kasugai, Aichi Pref., 19.26.xi.1965. [Kyushu] 1♂, Noko Is., Fukuoka City, Fukuoka Pref., 27.x.1995; 1♂, Kuroki, Fukuoka Pref., 9.viii.1979; 1♀, Nagasaki-bana, Kagoshima Pref., x.1969; 1♂ 1♀, Mt. Inaodake, Sata Town, Kagoshima Pref., 22.23.vii.1997; 1♀, 'domari, Sata Town, Kagoshima Pref., 18.v.1996; 1♂, Kotobuki Town, Kanoya City, Kagoshima Pref., 24.xi.1970 (adult emerge); 1♀, Nagata, Yakushima Is.,

Kagoshima Pref., 30.vii.1968; 2♀, Kurio, Yakushima Is., Kagoshima Pref., 13.vii.1970; 1♂ 1♀, Kusukawa, Yakushima Is., Kagoshima Pref., 3.x.1968; 1♀, Uragami, Amami-Islands., Kagoshima Pref., 31.x.1966. [Ogasawara] 1♂ 1♀, Kita-fukurozawa, Chichijima Is., 25.26.v.1973. [Ryukyus] 5♂ 1♀, Oku, Kunigami Village, Okinawajima Is., Okinawa Pref., 16.18.iv.1996, 11.vii.1998; 2♂ 4♀, Miyako Is., Okinawa Pref., 27.x.1952 (BPBM), 5.vii.1975; 1♂ 1♀, Kabira, Ishigaki City, Ishigaki Is., Okinawa Pref., 1♀, Hoshidate, Taketomi Town, Iriomote Is., Okinawa Pref., 6.vii.1998; 1♀, Sonai, Yonaguni Is., 12.vi.1996. – CHINA [Yunnan] 24♂ 5♀, Mengla, 700-1000 m, Xishuang-banna, 4.13.17.18.19.x.1989, 3-5,6-9.viii.1990 (IBPU, IZAS, BLKU); 2♂, Dazhai, 1200 m, Jiangchen, Simao pr., 12.iii.1995 (IBPU, IZAS); 1♂ 1♀, Nanxi, 150-200 m, Honghe Hekou, 26.ii.1995 (IBPU, IZAS). [Taiwan: Taipei] 1♂ 7♀, Yehliu beach, Wanli-hsiang, 27.xi.1997; 1♀, Fushan, 400-600m, Wulai-hsiang, 28.xi.1997 (Malaise trap); 1♀, Taipei, 1-4.v.1958 (BPBM); 1♂, Kueishan, 300-500 m, 11.xi.1957 (BPBM); 1♂ 1♀, Suberbs, 21.x.1957 (BPBM). [Taiwan: Taichung] 2♂ 1♀, Suchilanchi, 1600 m, Huanshan, 25.xi.1997. [Taiwan: Nantó] 1♂ 1♀, Shanpin, 7.iv.1996; 1♂, Jihyuetan 650m, 27.iv.1981. [Taiwan: Kaohsiung] 1♂, Hungshuichi, 500 m, Liukuei, 22.xi.1997. [Taiwan: Chiayi] 1♂, Chuchi, 13.iv.1965 (BPBM); 1♀, Chiayi, 11.v.1958 (BPBM). [Taiwan: Tainan] 5♂ 6♀, Kwantzeling, 6-7.iv.1965 (BPBM). [Hong Kong] 1♀, Yunkon, Kowloon Penin., 20.x.1985. – BURMA 1♂ 5♀, Kambaiti, 2000 m, 7.9.19.iv.,16.v.,1.vi.1934 (DESM). – INDONESIA [Java] 1♂ 5♀, Bogor, Botanical Garden, 20.x.2000. [Bali] 1♀, Tamblingan Lake, 1300 m, 3.x.2000. [Lombok] 2♂, Senaru, 750 m, 30.ix.2000; 1♂ 1♀, Sesaot, 190 m, 1.x.2000 (MZB); 1♀, Pusuk Pass (Monkey forest), 260 m, 1.x.2000 (MZB); 3♂, Cibom, Ujungkulon National Park, 16.x.2000 (MZB) (all in BLKU except as indicated).

Peribaea tibialis (Robineau-Desvoidy)

(figs. 3c, 10a-f, 17b)

Herbstia tibialis Robineau-Desvoidy, 1851: 185.

See Andersen (1996) for complete list of synonyms.

Diagnosis

Male: Whitish in ground colour; antenna with 1st flagellomere blackish to brownish. Vertex 0.3-0.35 of head width; parafacial narrow, about twice as wide as width of 2nd aristomere at middle height; gena about 0.16 of eye-height; 4-5 frontal setae; anterior reclinate orbital seta situated near middle of fronto-orbital plate, about 2.5 times as long as posterior seta; antenna with 1st flagellomere nearly rectangular, about 2 times as long as wide, and 4-5 times as long as pedicel; 3+4 dc; ultimate section of CuA_1 0.63-0.7 times as long as penultimate section, and 2.1-2.3 times as long as crossvein dm-cu; R_1 setulose dorsally on apical $\frac{1}{2}$, on apical $\frac{1}{3}$ ventrally; R_{4+5} setulose dorsally to level of wing margin of CuA_1 ; CuA_1 bare; posterior margin of syntergum 1+2 to tergum 4 usually without thin yellowish band. Male genitalia. Surstylus slightly curved dorsally at middle in lateral view, apex thickened; cerci narrowed apically in lateral view,

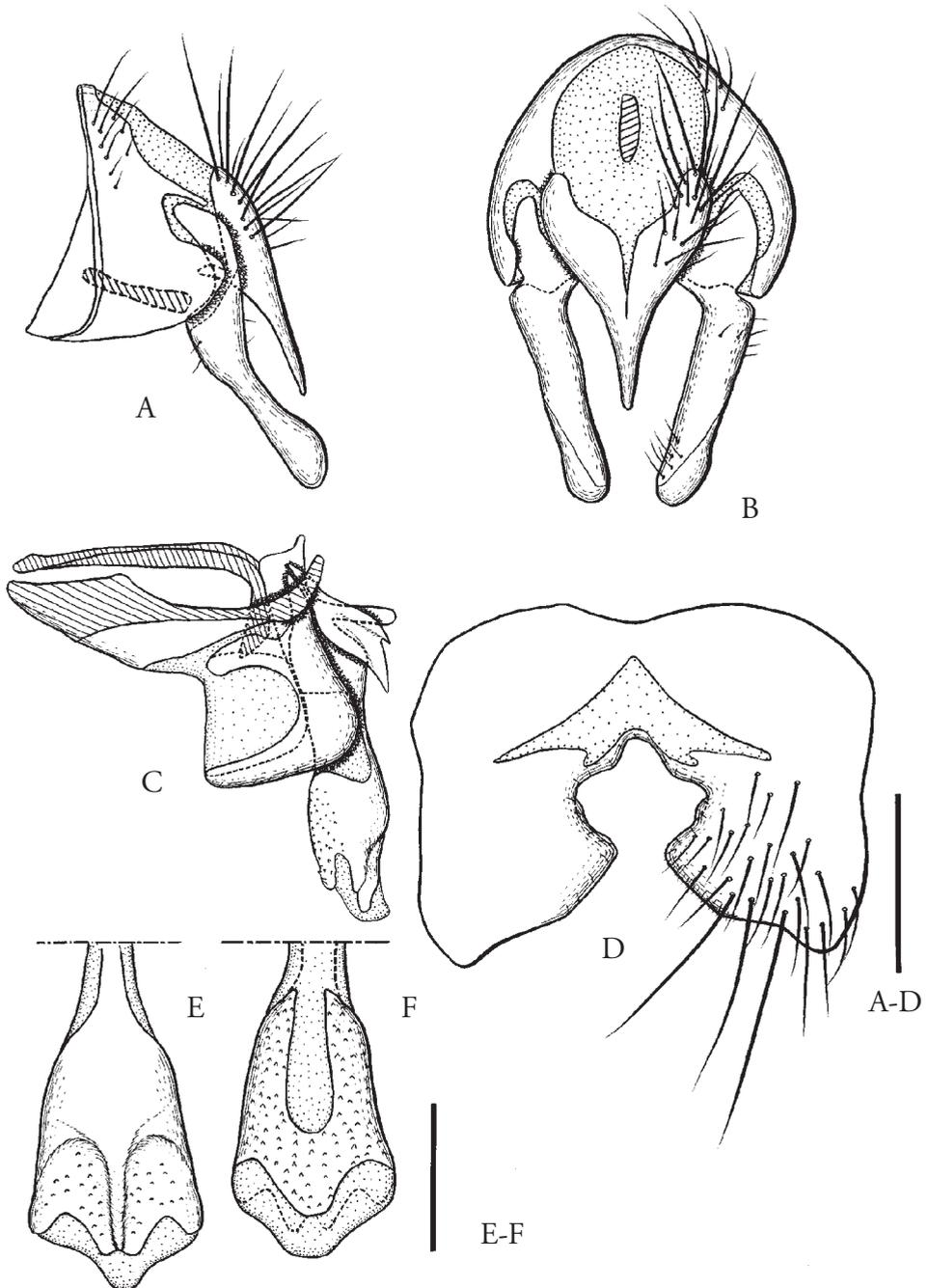


Fig. 10. Male genitalia of *P. tibialis* (Robineau-Desvoidy). – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d, Male abdominal sternum 5 in dorsal view (setae omitted on left side); e, Distiphallus in dorsal view; f, same in ventral view. A-d: Scale bar = 0.2 mm; e-f: Scale bar = 0.1 mm.

with setae on basal 1/3; postgonite distinctly bifid apically, upper lobe short, lower lobe long and pointed apically; pregonite broadly sclerotized in C-shape, apex rounded; epiphallus present; distiphallus subrectangular in shape, sclerotized on dorsal and ventral portion with some spinules ventrally in lateral view, middle portion weakly sclerotized or membranous. Female: Differing from male as follows: antenna with 1st flagellomere slender, 3-3.3 times as long as wide. Female terminalia. Sternum 5 nearly square with many setae; tergum 6 ring-like; sternum 6 nearly rectangular with many setae (sometimes partially with short transparent setulae); tergum 7 small hemitergite; sternum 7 nearly rectangular with many setae (sometimes partially with short transparent setulae); sternum 8 weakly sclerotized, without seta; spiracles 6 and 7 present on each tergum. First instar larva: Similar to *orbata*, but differing from it as follows: hypopharyngeal sclerite small and subtriangular or subrectangular; dorsal cornu slightly broad.

Body length. – 4.0-4.8 mm.

Distribution. – Japan (Hokkaido*, Honshu, Kyushu, Ryukyus*), Korea*, China (Heilongjiang, Shaanxi*, Zhejiang, Hunan, Fujian, Guangdong, Guizhou, Yunnan*, Taiwan, Hong Kong*), Burma*, Europe, Palestine, Transcaucasia, Uzbekistan, Mongolia, Russia (Far East).

Host. – Lepidoptera, Notodontidae: *Furcula furcula* (Clerck,)* (Ishikawa Pref., Honshu, Japan).

Remarks. – This species is similar to *P. apaturae* in general appearance, but easily distinguished from it by the following: R_{4+5} setulose dorsally to level of wing margin of CuA; first flagellomere blackish. This species is widely distributed and common in Japan and China.

Material examined. – JAPAN [Hokkaido] 10♂ 11♀, Kamitoshibetsu, Ashoro Town, 10,11,16,17.viii.1996; 7♂ 1♀, Kiyokawa, Ashoro Town, 23.vii.1967; 2♀, Utonai Lake, 19.viii.1996; 2♀, Soranuma, Sapporo City, 22.vii.1996; 1♀, Mt. Yubaridake, Sorachi, 15.vii.1967; 1♀, Sarobetsu 11-12.vii.1968 (SEHU); 1♀, Mt. Moiwai, Sapporo City, 26.vii.1966 (SEHU); 1♀, Hokkaido Univ. Forest, Tomakomai City, 18.viii.1977. [Honshu] 1♀, Hisayoshi, Ikarigaseki Village, Aomori Pref., 16.vii.1985; 1♀, Tatsunokuchi, Ishikawa Pref., 25.x.1999; 1♂, Oumagoshi, Asahi Village, Nagano Pref., 2.viii.1997; 1♂, Kisokomakōgen, Kisofukushima Town, Nagano Pref., 3.ix.1996; 1♀, Ueda, Nagano Pref., 23.ix.1974; 2♂ 1♀, Shimashimadani, Nagano Pref., 4.5.vii.1966, 22.v.1975; 1♀, Yamanaka Lake, Yamanashi Pref., 20.x.1970; 1♂, Mikashima Tokorozawa City, Saitama Pref., 19.vii.1970; 1♀, Chigaya, Yoshida Town, Saitama Pref., 8.x.1972; 1♀, Yamabushi-tōge, Saitama Pref., 23.ix.1972; 1♀, Heirinji, Niiza City, Saitama 2.ix.1973; 1♀, Kamafuse, Yorii Town, Saitama Pref., 7.viii.1978; 1♀, Mt. Takao, Tōkyō Pref., 22.v.1953 (NIAES); 1♀, Mt. Yamabushi, Shizuoka City, Shizuoka Pref., 6-7.vii.1996; 1♂, Momosegawa Imazu Town, Shiga pref., 15.vii.1997; 1♀, Mt. Kongō, Osaka Pref., 24.vii.1995; 1♀, Ashū, Miyama Town, Kyōtō

Pref., 14.viii.1997; 2♂, Mt. 'tosan, Wakayama Pref., 28.vii.1995; 1♀, Kusama, Niimi City, Okayama Pref., 4.xi.1995; 1♀, Tsuki, Sōja City, Okayama Pref., 5.v.1995. [Kyushu] 1♀, Yamada-ryokuchi, Kitakyūshū City, Fukuoka Pref., 23.v.1996; 2♂ 2♀, Noko Is., Fukuoka City, Fukuoka Pref., 9.v.1996, 1.xi.1997, 21.xi.1998; 1♂ 2♀, Shimobaru, Fukuoka City, Fukuoka Pref., 30.ix.1995; 1♀, Mt. Sefuri, Fukuoka Pref., 1.x.1996; 1♀, Mt. Inunaki, Fukuoka Pref., 6.x.1995; 1♂, Uchio, Chikushino City, Fukuoka Pref., 1.x.1996; 1♀, Mt. Ariake, Tsushima Is., Nagasaki Pref., 22.v.1968; 1♂, Oomasu, Tsushima Is., Nagasaki Pref., 30.x.1996; 3♀, Tsuyanagi, Mine City, Tsushima Is., Nagasaki Pref., 29.x.1996; 1♂, Ūkujima Is., Goto-Islands, Nagasaki Pref., 31.v.1996; 1♀, Naidaijin, 650-800 m, Kumamoto Pref., 7.v.1967; 1♀, Yutsubo, Kokonoe Town, Oita Pref., 5.x.1996. [Ryukyus] 2♂, Mt. Ushiku, Iriomote Is., Okinawa Pref., 7-10.xi.1963; 1♀, Funaura, Iriomote Is. Okinawa Pref., 27-31.x.1971. KOREA 4♂ 4♀, Mt. Sudosan (300-1000 m), Gyongsangbug-do, 11,14,15.vi.,31.vii.,1,2,5.viii.1977; 1♂, Imjin-gak, P'ajv-gan, Kyonggi-do, 8.vii.1998. – CHINA [Shaanxi] 1♂, Shuimoping, 1500 m, SSW of Banfangzi, 3.vi.1997. [Yunnan] 1♂, Meng-ya, 600-1000 m, Xishuangbanna, 18.x.1989 (IBPU); 2♂ 1♀, Menglun, 500-700 m, Xishuangbanna, 4, 6-9.viii.1990 (IBPU, IZAS, BLKU). [Taiwan: Taipei] 1♂, Fushan, 400-600 m, Wulai, 28.xi.1997; 1♀, Suchilanchi 1600 m, 24.xi.1997. [Taiwan: Nantō] 1♂, Tungyenchai, 950 m, Meichi, Jenai, 19.xi.1997. [Taiwan: Kaohsiung] 3♀, Hungshuichi, 500 m, Liukuei, 22.xi.1997. [Hong Kong] 7♂ 1♀, Taipokau, Kowloon, 27,30.vi.1964, 30.vi., 2,7,29,30.vii.1965 (BPBM); 1♂, Long Ke, N.T. Sai Kung District, 12.vii.1964 (BPBM). – BURMA 1♂ 3♀, Kambaiti, 27.iii.,8,24.iv.16.v.1934 (DESM) (all in BLKU except as indicated).

The *minuta* group

Diagnosis. – Male: Antenna with 1st flagellomere unspecialized (fig. 2b). Male genitalia (figs. 11-14). Surstylus curved dorsally at middle in lateral view; postgonite barely bifid apically; epiphallus present; distiphallus suboval in shape, broadly sclerotized in lateral view and bearing some spinules ventrally.

Remarks. – The autapomorphic feature for this group is the shape of the distiphallus mentioned above (figs. 11c, 12c, 13c, 14c). This group includes the following species in East Asia: *P. apaturae* sp. n., *P. caesiata* sp. n., *P. glabra* sp. n., *P. longirostris* Andersen, *P. malayana* (Malloch), and *P. ussuriensis* (Mesnil). The following European species are also included in this group based on illustrations of the male genitalia by Andersen (1996): *P. discicornis* (Pandellé, 1894), *P. longirostris* Andersen, 1996 (examined) and *P. minuta* (Robineau-Desvoidy, 1863).

Peribaea apaturae sp. n.
(figs. 2b, 3d, 11a-d, 18a)

Peribaea sp.: Shima, 1999: 62.

Diagnosis

Antenna with 1st flagellomere orange to light

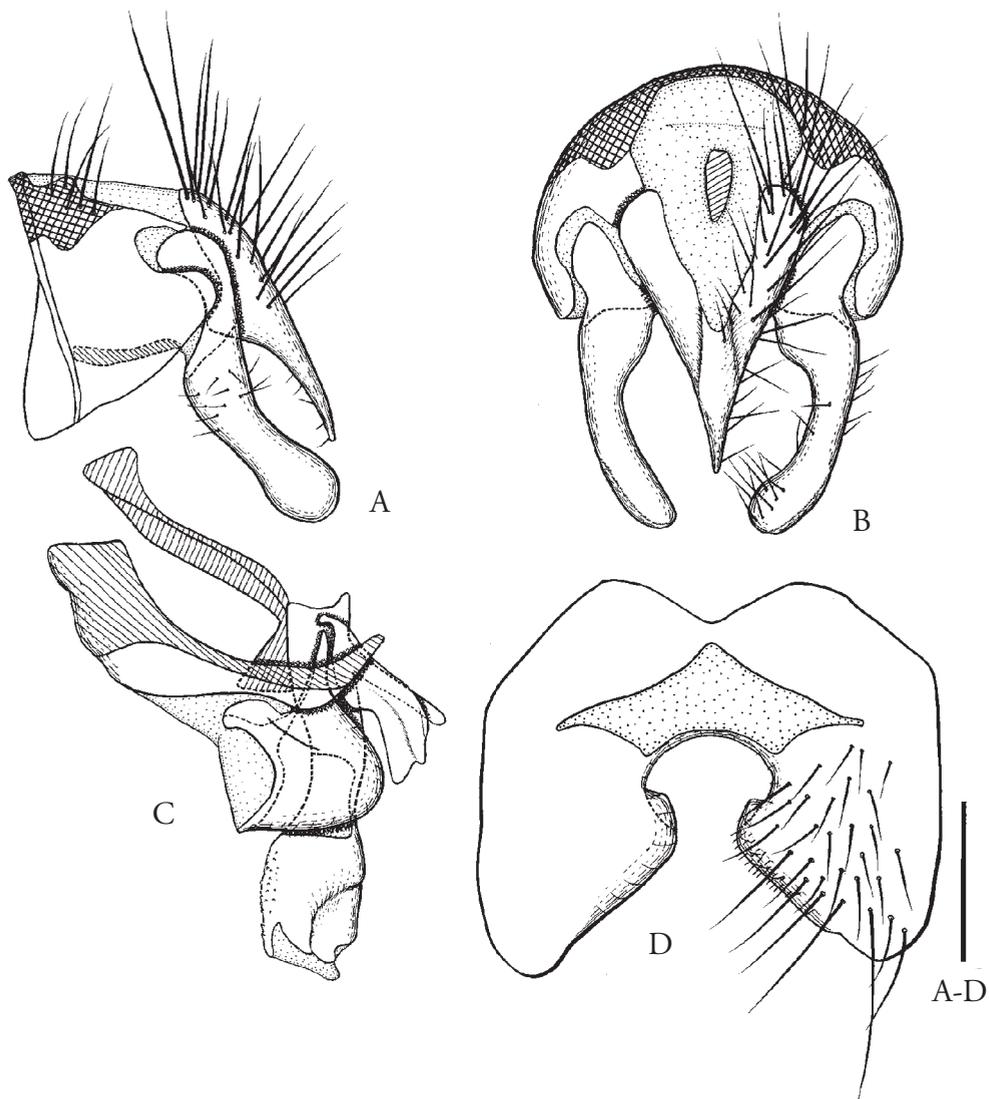


Fig. 11. Male genitalia of *P. apaturae* sp. n. – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d, Male abdominal sternum 5 in dorsal view (setae omitted on left side). A-d: Scale bar = 0.2 mm.

brown; 3+4 dc; R_1 setulose dorsally on apical $\frac{1}{3}$, with 2-5 setulae ventrally on apical part (rarely bare ventrally); R_{4+5} setulose dorsally to level of wing margin of R_1 ; CuA_1 bare; abdomen black.

Description

Male: Head. – Light yellow in ground colour; fronto-orbital plate with golden pollinosity; frontal vitta orange to light yellow; antenna with scape and pedicel orange; 1st flagellomere orange to light brown;

arista brownish; palpus orange. Vertex 0.31-0.34 of head width; parafacial narrow, subequal in width to that of 2nd aristemere at middle height; gena 0.13-0.16 of eye-height; 5 frontal setae; anterior reclinate orbital seta situated posterior to middle of fronto-orbital plate, about 2 times as long as posterior seta; antenna with 1st flagellomere subrectangular, 2.4-2.6 times as long as wide, and 3.3-4 times as long as pedicel; 2nd aristemere short, about 2 times as long as wide; palpus clavate; prementum about 3 times as

long as wide; labella pad-like.

Thorax. – Gray in ground colour, with yellowish pollinosity; scutellum pale yellowish on apical $\frac{1}{3}$. 3+4 dc; scutellum with pair of discal setae.

Wing. – Hyaline; tegula black; basicosta light yellow. Relative lengths of costal sectors 2nd, 3rd, and 4th approximately as 2: 10: 4; ultimate section of CuA_1 0.5–0.6 times as long as penultimate section, and about twice as long as crossvein dm-cu; R_1 setulose dorsally on apical $\frac{1}{3}$, with 2–5 setulae ventrally on apical part (rarely bare ventrally); R_{4+5} setulose dorsally to level of wing margin of R_3 ; CuA_1 bare.

Legs. – Coxae, trochanters and tibiae reddish yellow; femora and tarsi brownish. Fore tibia with 4 ad, 3–4 pd, and 1 p setae; mid tibia with 1 ad, 1–2 pd, and 1 v setae; hind tibia with 4–5 ad, 4–5 pd, and 3 v setae.

Abdomen. – Black in ground colour; anterior $\frac{1}{5}$ of terga 3–5 with whitish pollinosity; posterior margin of syntergum 1+2 to tergum 4 with thinly yellowish band. Syntergum 1+2 without lateral marginal seta; tergum 3 with pair of lateral and median marginal setae; terga 4 and 5 with 4–6 marginal setae; sternum 5 similar to *ussuriensis*.

Male genitalia. – Surstylus slightly curved dorsally at middle in lateral view, with some outer setae at middle and inner setae at apex; cerci slender, narrowed apically in lateral view; postgonite, epiphallus, and distiphallus similar to *ussuriensis*.

Female: Very similar to male.

Female terminalia. – Similar to *tibialis*.

Body length. – 4.0–4.7 mm.

Etymology. – This species is named after the generic name of the host species.

Distribution. – Japan (Honshu, Kyushu).

Host. – Lepidoptera, Nymphalidae: *Apatura metis substilata* Butler, 1873; *Hestina japonica* (C. et R. Felder, 1862); *Sasakia charonda* (Hewitson, 1863) (Shima, 1999).

Remarks. – Shima (1999) recorded this species as *Peribaea* sp. parasitic on the three species of Nymphalidae listed above. All specimens examined were obtained by rearing from hosts. As far as we have investigated, this species appears to be monoparasitic. It is similar to *P. tibialis*, but differs from it as follows: postgonite barely bifid apically; distiphallus suboval in shape, broadly sclerotized in lateral view.

Type material. – Holotype ♂, Mt. Hikosan, Fukuoka Pref., 9.iv.1997 (emerged) [18.iii.1997 (host larvae collected)], R. Matsumoto (BLKU). – Paratypes: JAPAN [Honshu] 1♂, Ipponmatsu, Towada City, Aomori Pref., 2.xi.1974 (host larvae collected), K. Mori; 1♂, Itadome Spa, Kuroishi City, Aomori Pref., 3.ix.1973 (host larvae collected), K. Mori; 1♂, Inekarizawa, Hirosaki City, Aomori Pref., 20.v.1997 (emerged), K. Suzuki; 1♂, Kanazawa City, Ishikawa Pref., 25-

26.v.1975 (emerged), A. Taketo; 4♂ 6♀, Koshido Town, Toyota City, Aichi Pref., iv.1986 (emerged), B. Tanaka; 1♀, Mt. Myōken, Osaka Pref., 3.iv.1957 (SEHU); 3♀, Nagaya, Niimi City, Okayama Pref., 31.xii.1996 (host larvae collected), R. Matsumoto; 1♀, Hashima, Kurashiki City, Okayama Pref., 2.i.1996 (host larvae collected), R. Matsumoto; 1♂ 3♀ Kurashiki City, Okayama Pref., 29–30.iii.1998, R. Matsumoto. [Kyushu] 2♂, Minami Park, Fukuoka City, Fukuoka Pref., 4.6.iv.1998 (emerged), T. Tachi; 2♂ 9♀, Imajyuku, Fukuoka City, Fukuoka Pref. 14–15.v.1997, T. Tachi; 1♀, Mt. Inunaki, Fukuoka Pref., 14.iv.1978, K. Ueda; 2♂ 2♀, same locality as holotype, 28.ii.1999 (host larvae collected), T. Tachi; 1♂, same locality as holotype, 9.iv.1997, R. Matsumoto; 1♂, Mt. Kujyū, Oita Pref., 2.v.1978, H. Takahashi (all in BLKU except as indicated).

Peribaea caesiata sp. n.
(figs. 12a–d)

Diagnosis

3+4 dc; R_1 setulose dorsally on apical $\frac{1}{3}$, bare ventrally; R_{4+5} setulose dorsally to crossvein r-m; CuA_1 bare; abdomen bluish.

Description

Male: Head. – Whitish in ground colour; fronto-orbital plate with whitish gray pollinosity; frontal vitta orange; antenna with scape and pedicel orange; 1st flagellomere blackish; arista brown; palpus orange. Vertex about 0.4 of head width; parafacial about 1.5 times as wide as length of 2nd aristomere at middle height; gena about 0.2 of eye-height; 5 frontal setae; anterior reclinate orbital seta situated posterior to middle of fronto-orbital plate, about 2 times as long as posterior seta; 5 frontal setae; antenna with 1st flagellomere suboval, about twice as long as wide, and 3.8–4 times as long as pedicel; 2nd aristomere 2–3 times as long as wide; prementum about 4 times as long as wide; labella pad-like.

Thorax. – Dorsum light gray in ground colour, with whitish pollinosity; postpronotal lobe whitish; pleura gray, with whitish pollinosity. 3+4 dc; scutellum with pair of discal setae.

Wing. – Hyaline; tegula black; basicosta orange. Relative lengths of costal sectors 2nd, 3rd, and 4th approximately as 2: 8: 3; ultimate section of CuA_1 about 0.6 times as long as penultimate section, about 2 times as long as crossvein dm-cu; R_1 setulose dorsally on apical $\frac{1}{3}$, bare ventrally; R_{4+5} setulose dorsally to crossvein r-m; CuA_1 bare.

Legs. – Coxae, trochanters, and tibiae reddish yellow; femora and tarsi brownish. Fore tibia with 4 ad, 3–4 pd, and 1 p setae; mid tibia with 1 ad, 2–3 pd, and 1 v setae; hind tibia with 4–5 ad, 4–5 pd, and 3 v setae.

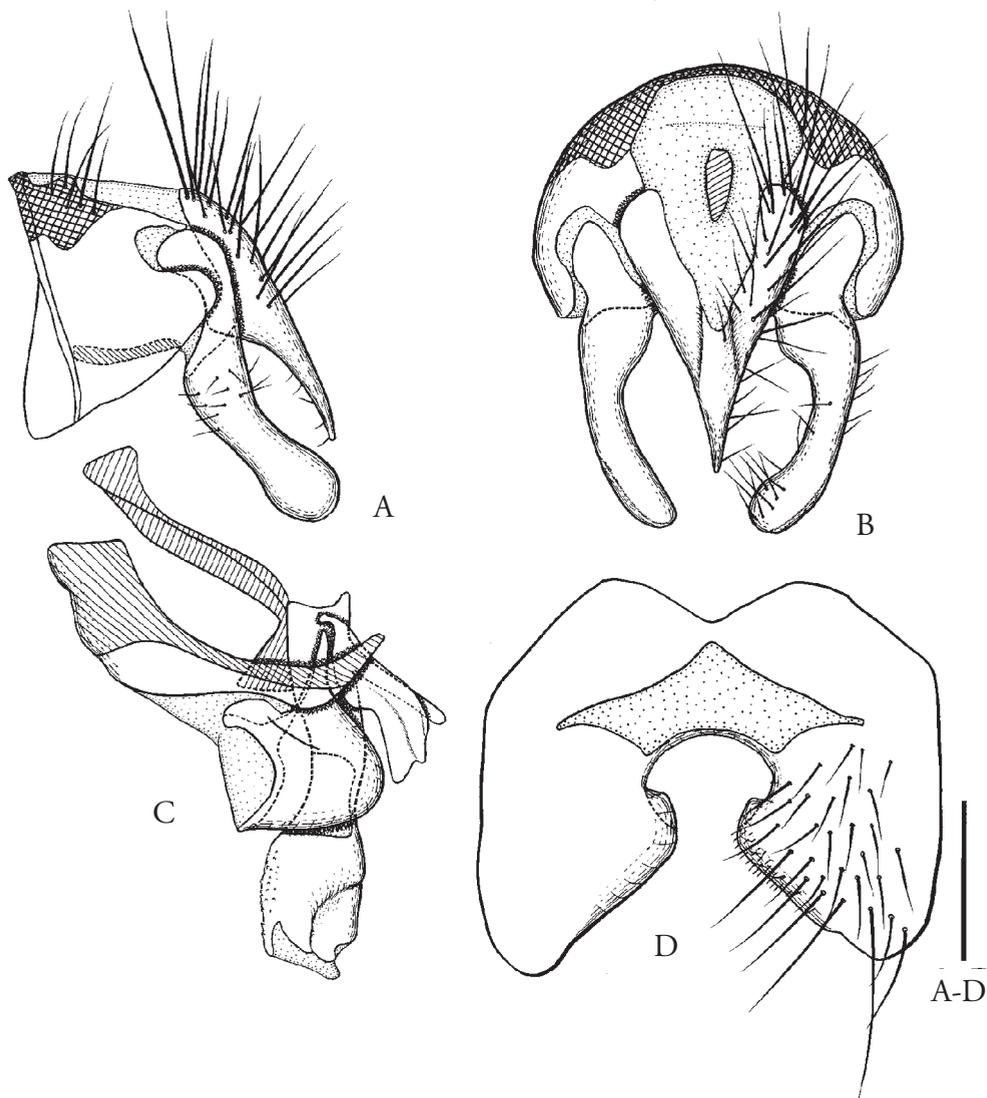


Fig. 12. Male genitalia of *P. caesiata* sp. n. – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d, Male abdominal sternum 5 in dorsal view (setae omitted on left side). A-d: Scale bar = 0.2 mm.

Abdomen. – Gray in ground colour; entire of terga 3-5 with bluish pollinosity; posterior margin of syntergum 1+2 to tergum 4 with very thin yellowish band. Syntergum 1+2 with pair of lateral marginal setae; tergum 3 with pair of lateral and marginal setae; terga 4 and 5 with 4-6 marginal setae; sternum 5 similar to *ussuriensis*.

Male genitalia. – Epandrium with dark brown area at upper part; surstylus curved dorsally at middle with some outer setae at middle and inner setae at apex,

apex slightly thickened in lateral view; cerci narrowed at apical half, apex pointed; pregonite, postgonite, epiphallus, and distiphallus similar to *ussuriensis*.

Female: Unknown.

Body length – 4.7-5.0 mm.

Etymology. – This species is named after the body colour.

Distribution. – Japan (Honshu, Kyushu), Korea.

Host. – Unknown.

Remarks. – This species is similar to *P. glabra* sp. n.

in general appearance, but easily distinguished from it by its bluish abdomen and wide vertex.

Type material. – Holotype ♂, Ueyama-kôgen, Onsen Town, Hyôgo Pref., Japan, 2.v.1997, M. Sueyoshi (BLKU). – Paratypes: JAPAN [Kyushu] 1 ♂, Mt. Shiratori, Kumamoto Pref., 21.iv.1980, I. Ohtsuka. KOREA. 1 ♂, Samgak-Koji (1000-1300 m), Macheon-Myeon, 11.v.1991, T. Saigusa (all in BLKU).

Peribaea glabra sp. n.
(figs. 3e, 13a-f, 18b)

Diagnosis

3+4 dc; R_1 setulose dorsally on apical $\frac{1}{3}$, bare ventrally (rarely with 1-3 setulae ventrally); R_{4+5} setulose dorsally to level of crossvein dm-cu; CuA_1 bare; abdomen black.

Description

Male: Head. – Whitish in ground colour; fronto-orbital plate with golden pollinosity; frontal vitta orange; antenna with scape and pedicel orange to light brown; 1st flagellomere blackish; arista brown; palpus orange. Vertex 0.33-0.35 of head width; fronto-orbital plate with some setae; parafacial wider than width of 2nd aristomere at middle height; gena 0.16-0.21 of eye-height; 5 frontal setae; anterior reclinate orbital seta situated near middle of fronto-orbital plate, 2-2.5 times as long as posterior seta; antenna with 1st flagellomere subrectangular, 1.5-2.6 times as long as wide and 3-3.6 times as long as pedicel; 2nd aristomere about 4 times as long as wide; palpus somewhat clavate; prementum about 4 times as long as wide; labella pad-like.

Thorax. – Gray in ground colour, with yellowish pollinosity; scutellum yellowish on apical $\frac{1}{3}$. 3+4 dc.

Wing. – Hyaline; tegula black; basicosta light yellow. Relative lengths of costal sectors 2nd, 3rd, and 4th approximately as 1: 7: 2.5; ultimate section of CuA_1 about 0.6-0.8 times as long as penultimate section, and 2-2.4 times as long as crossvein dm-cu; R_1 setulose dorsally on apical $\frac{1}{3}$, bare ventrally (rarely with 1-3 setulae ventrally); R_{4+5} setulose dorsally to level of crossvein dm-cu (in a few specimens to level of wing margin of R_1); CuA_1 bare.

Legs. – Coxae, trochanters, and tibiae reddish yellow; femora and tarsi brownish. Fore tibia with 3-5 ad, 3-6 pd, and 1 p setae; mid tibia with 1 ad, 2-3 pd, and 1 v setae; hind tibia with 5-7 ad, 4-6 pd, and 3-4 v setae.

Abdomen. – Black in ground colour; anterior $\frac{2}{3}$ of terga 3 and 4 and anterior $\frac{1}{3}$ of tergum 5 with whitish pollinosity; posterior margin of syntergum 1+2 to tergum 4 with thin yellowish band. Syntergum 1+2 usually without lateral marginal seta (sometimes with pair

of lateral marginal setae); tergum 3 with pair of lateral and marginal median setae; terga 4 and 5 with 4-6 marginal setae; sternum 5 similar to *ussuriensis*.

Male genitalia. – Surstylus curved dorsally at middle with some setae on apical $\frac{2}{3}$ (sometimes with many setae), apex thickened in lateral view; cerci narrowed and pointed apically in lateral view; postgonite, pregonite, epiphallus, and distiphallus similar to *ussuriensis*.

Female: Very similar to male.

Female terminalia. – Similar to *orbata*, but differing from it as follows: sterna 6 and 7 with short transparent setulae partially; sternum 8 somewhat large, weakly sclerotized and without seta.

First instar larva. – Similar to *orbata*, but differing from it as follows: labrum curved ventrally; lateral sclerite subtriangular or subrectangular; dorsal cornu broad.

Body length. – 3.8-4.5 mm.

Etymology. – This species is named after the absence of setulae on the ventral part of wing vein R_1 .

Distribution. – Russia (Ussuria), Japan (Hokkaido, Honshu, Shikoku, Kyushu), China (Shaanxi, Sichuan, Taiwan, Hong Kong).

Host. – Lepidoptera, Drepanidae: *Oreta turpis* Butler (Ishikawa Pref., Japan).

Remarks. – This species is very similar to *P. minuta* and *P. longirostris*, but is distinguished from them by the shapes of the cerci and surstylus in male genitalia and length of the prementum.

Type material. – Holotype ♂, Kamitoshibetsu, Ashoro Town, Hokkaido, Japan, 10.viii.1996, T. Tachi (BLKU). – Paratypes. RUSSIA [Ussuria: Primorsk Terr.] 6 ♂, Ussuriysk Reserve 150 m, 22-26.vii.1990 (Malaise trap), T. Saigusa. – JAPAN [Hokkaido] 1 ♂, Shumarinai Lake, 7.viii.1996, T. Tachi; 3 ♂ 3 ♀, same locality as holotype, 10,16,17.viii.1996, T. Tachi; 2 ♂, Tôro Lake, Shibechea Town, 14.viii.1996, T. Tachi; 2 ♀, Utonai Lake, 19.viii.1996, T. Tachi; 1 ♂, Asahikawa City, 14.ix.1979, T. Inaoka. [Honshu] 1 ♀, Orikabe, Ôhazama Town, Iwate Pref., 13.viii.1996, M. Sueyoshi; 1 ♂, Biwasawa, Inawashiro Town, Fukushima Pref., 14.viii.1996, M. Sueyoshi; 1 ♂, Renge spa, 1300-1470 m, Itoigawa City, Niigata Pref., 27.vii.1998, T. Tachi; 1 ♂, Inagawa, Okuwa Village, Nagano Pref., 3.vii.1996, T. Tachi; 1 ♀, Karasawa pass, Chino City, Nagano Pref., 31. viii. 1996, M. Sueyoshi; 2 ♀, Shimashima-dani, Azumi Village, Nagano Pref., 22,23.v.1975, A. Nakanishi; 1 ♀, Mt. Hachimori, Asahi Village, Nagano Pref., 25.vii.1998, T. Tachi; 2 ♂, Hirogawara, Ashiyasu Village, Yamanashi Pref., 19,20.vi.1997, R. Matsumoto; 1 ♀, Yunosawa tôge, Yamato Village, Yamanashi Pref., 21.viii.1997 (Malaise trap), T. Tachi; 1 ♂ 1 ♀, Mt. Mizugaki, Sudama Town, Yamanashi Pref., 30.

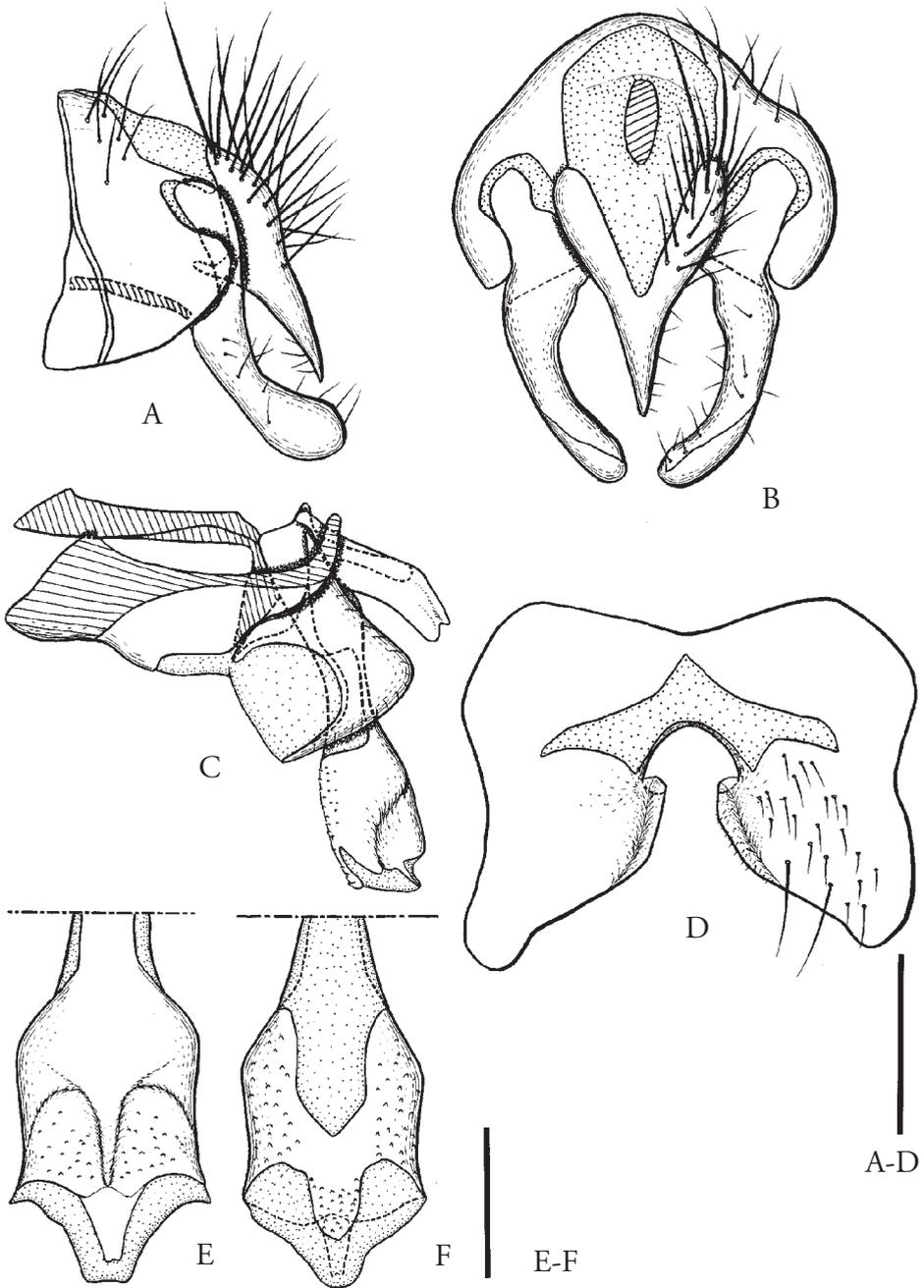


Fig. 13. Male genitalia of *P. glabra* sp. n. – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d, Male abdominal sternum 5 in dorsal view (setae omitted on left side); e, Distiphallus in dorsal view; f, same in ventral view. A-d: Scale bar = 0.2 mm; e-f: Scale bar = 0.1 mm.

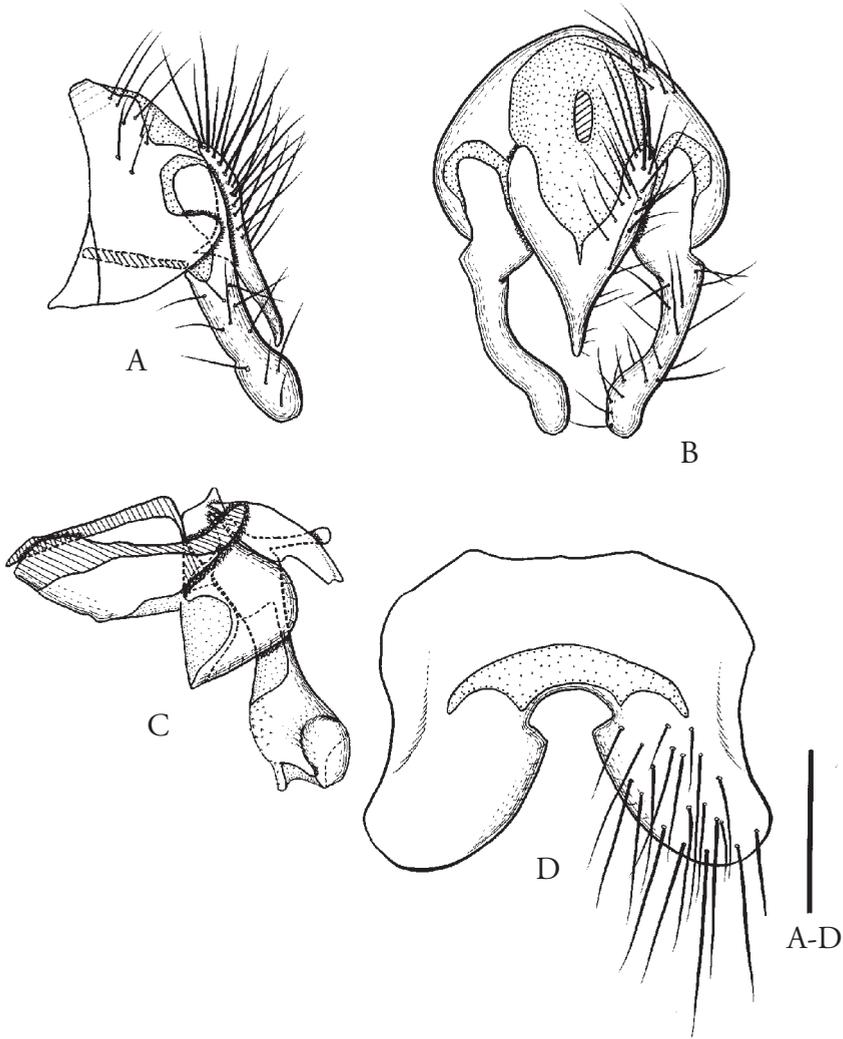


Fig. 14. Male genitalia of *P. ussuriensis* (Mesnil). – A, Epandrium, cerci and surstyli in lateral view; b, same in dorsal view (setae omitted on left side); c, hypandrium, pregonite, postgonite and aedeagus in lateral view; d: Male abdominal sternum 5 in dorsal view (setae omitted on left side). a-d: Scale bar = 0.2 mm.

viii.1996, M. Sueyoshi; 1♂, Nabetani, Tatsunokuchi, Ishikawa Pref., 1.v.1990, I. Togashi. [Shikoku] 1♂, Tengu-kôgen, Higashitsuno Village, Kôchi Pref., 2.vii.1996, M. Sueyoshi; 1♀, Mt. Ishizuchi (400m), Omogokei, Ehime Pref., 27.ix.1999, M. Sugimoto. [Kyushu] 1♀, Mt. Aburayama, Fukuoka Pref., 20.vii.1989, H. Shima; 1♀, Mt. Kusenbu, Fukuoka Pref., 11.vi.1987, H. Shima; 1♀, Mt. Ichifusa, Kumamoto Pref., 22.v.1986, T. Saigusa; 1♂, Oike, Kokonoe Town, Oita Pref., 9.ix.1997, R. Matsumoto; 1♀, Mt. Hoyoshidake, Kagoshima Pref., 8. vii.1995, T.

Tachi; 1♂, Miyaura, Yaku Is., Kagoshima Pref., 5.6.iv.1971, K. Yamagishi. – CHINA [Shaanxi] 6♂, Shuimoping, 1500-1700 m, Banfangzi, 5, 6.vi.1997, T. Saigusa & H. Shima (IBPU, IZAS, BLKU). [Sichuan] 2♂, Tianquan, 27.30.viii.1993, H. Shima (IBPU, IZAS); 1♀, Ta-zhan, Jiuzhai Gou, 1.viii.1993, H. Shima (IBPU); 1♂, Linggongli, 1300-1400 m, Emeishan, 17.viii.1998, T. Saigusa (IZAS). [Taiwan: Nantô] 1♀, Nanshanchi, 31.iii.1996, R. Matsumoto. [Hong Kong] 2♂, Taipokau, Kowloon, 5.vi.1965 (Malaise trap), Lee Kit Ming & Hui Wai Ming (BPBM); 1♂, Sai

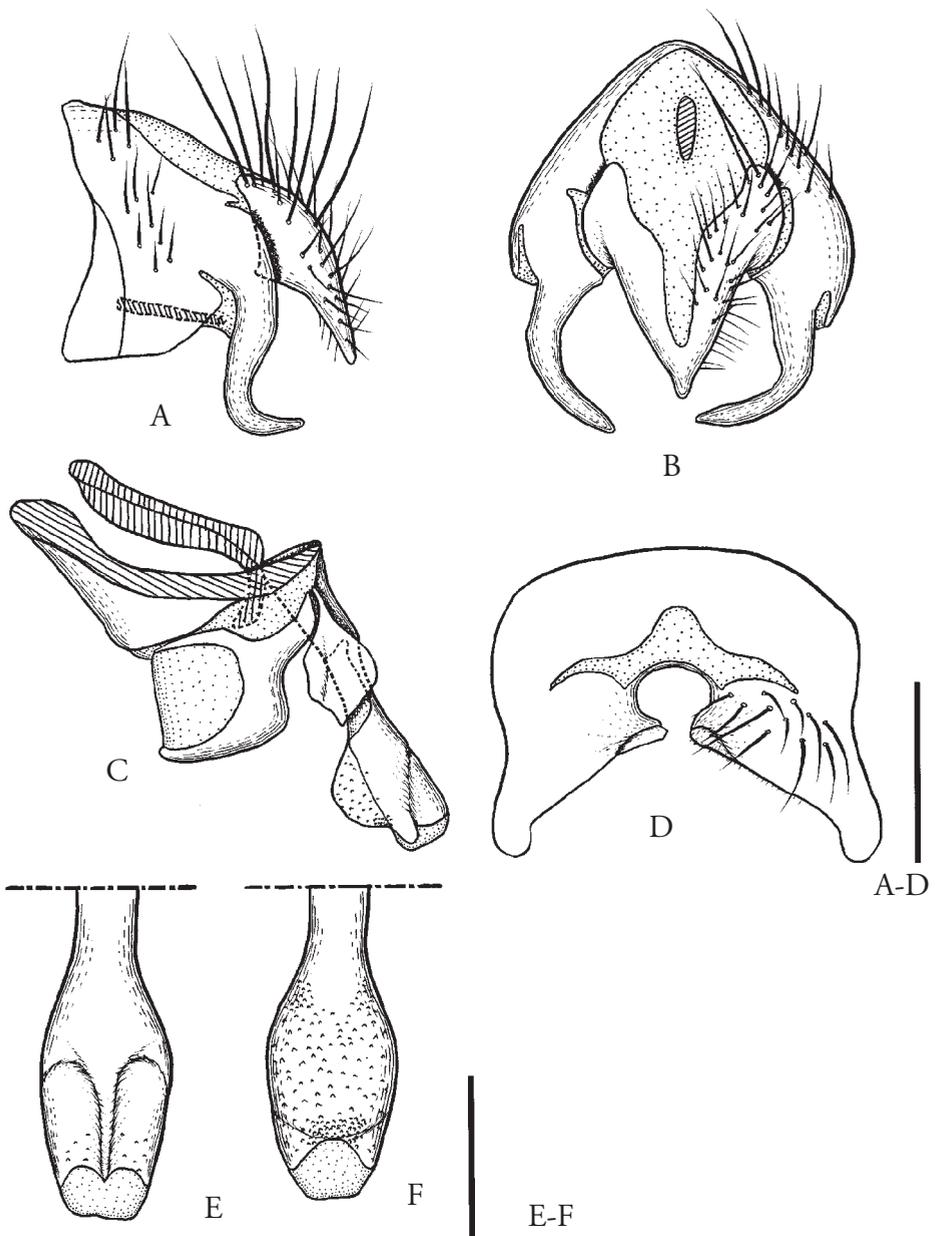


Fig. 15. Male genitalia of *P. trifurcata* (Shima). – a: Epiandrium, cerci and surstyli in lateral view; b: same in dorsal view (setae omitted on left side); c: hypandrium, pregonite, postgonite and aedeagus in lateral view; d: Male abdominal sternum 5 in dorsal view (setae omitted on left side); e: Distiphallus in dorsal view; f: same in ventral view. a-d: Scale bar = 0.2 mm; e-f: Scale bar = 0.1 mm.

Kung Station, 5.v.1965 (light), W.J. Voss & Hui Wai Ming (BPBM) (all in BLKU except as indicated).

Peribaea ussuriensis (Mesnil)
(figs. 3f, 14a-d, 18c)

Strobliomyia hyalinata ussuriensis Mesnil, 1963: 807.

Strobliomyia ussuriensis: Mesnil & Pschorn-Walcher, 1968: 164.

Peribaea ussuriensis: Herting, 1984: 124.

Diagnosis

3+4 dc; R_1 setulose dorsally on apical $\frac{1}{2}$, on apical $\frac{1}{3}$ ventrally; R_{4+5} setulose dorsally to beyond level of crossvein dm-cu; CuA_1 bare; abdomen partly yellowish.

Redescription

Male: Head. – Whitish in ground colour; fronto-orbital plate with yellowish pollinosity; frontal vitta light yellow to orange; antenna with scape and pedicel orange; 1st flagellomere blackish; arista brownish; palpus light yellow. Vertex about 0.3 of head width; parafacial much narrower than width of 2nd aristomere; gena 0.12-0.13 of eye-height; 5 frontal setae; anterior reclinate orbital seta situated near middle of fronto-orbital plate, about 2 times as long as posterior seta; antenna with 1st flagellomere subrectangular, about 2 times as long as wide and about 4 times as long as pedicel; 2nd aristomere 2-3 times as long as wide; palpus clavate; prementum about 3 times as long as wide; labella pad-like.

Thorax. – Gray in ground colour, with yellowish pollinosity; scutellum yellowish on apical $\frac{1}{3}$. 3+4 dc; scutellum with pair of discal setae.

Wing. – Hyaline; tegula black; basicosta light yellow. Relative lengths of costal sectors 2nd, 3rd, and 4th approximately as 2: 10.5: 4; ultimate section of CuA_1 about 0.6 times as long as penultimate section, and about 2 times as long as crossvein dm-cu; R_1 setulose dorsally on apical $\frac{1}{2}$, on apical $\frac{1}{3}$ ventrally; R_{4+5} setulose dorsally to beyond level of crossvein dm-cu; CuA_1 bare.

Legs. – Coxae, trochanters and tibiae reddish yellow; femora and tarsi brownish. Fore tibia with 4-5 ad, 3-4 pd, and 1 p setae; mid tibia with 1 ad, 1-2 pd, and 1 v setae; hind tibia with 4-5 ad, 4-5 pd, and 3 v setae.

Abdomen. – Syntergum 1+2 and most of tergum 3 yellowish; terga 4 and 5 blackish; anterior $\frac{1}{5}$ of terga 3 and 4 and anterior $\frac{1}{4}$ of tergum 5 with whitish pollinosity; posterior margin of syntergum 1+2 to tergum 4 with thin yellowish band. Syntergum 1+2 without lateral marginal seta; tergum 3 with pair of lateral and median marginal setae; terga 4 and 5 with 4-6 marginal setae; sternum 5 with pair of rounded median lobes on inner edges.

Male genitalia. – Surstylus nearly straight with

some long setae, apex slightly thickened in lateral view, curved inwards at basal $\frac{1}{3}$ in dorsal view; cerci slender in lateral view, slightly narrowed apically; postgonite notched apically; epiphallus present; pregonite more or less sclerotized in C-shape; distiphallus suboval in shape, broadly sclerotized and bearing some spinules ventrally in lateral view.

Female: Similar to male, but differing from it as follows: antenna with 1st flagellomere slender, about 3 times as long as wide.

Female terminalia. – Similar to *tibialis*, but differing from it as follows: sterna 6 and 7 with short transparent setulae; sternum 8 absent.

Body length. – 4.0-4.5 mm.

Distribution. – Russia (Ussuria), Japan (Hokkaido*, Honshu*, Shikoku*, Kyushu, Ryukyus*).

Host. – Unknown.

Remarks. – This species was described as a subspecies of *Peribaea hyalinata* by Mesnil (1963). It can be easily distinguished from other East Asian species by the partly yellowish abdomen.

Material examined. – RUSSIA [Ussuria: Primorsk Terr.] 1 ♂, Ussuriysk Reserve (150 m), 22-26.vii.1990 (Malaise trap). – JAPAN [Hokkaido] 1 ♂, Moashoro, Ashoro Town, 24.viii.1997. [Honshu] 1 ♀, Orikabe, Oohasama Town, Iwate Pref., 9.viii.1996; 1 ♂, Kose, 1200m, Karuizawa Town, Nagano Pref., 29.vii.1998; 1 ♀, Yasyagami, Ashiyasu Village, Yamanashi Pref., 28.viii.1996 (at light); 1 ♂, 19.viii.1978 (Malaise trap); 1 ♀, Ooyagi, Moroyama Town, Saitama Pref., 28.ix.1980; 1 ♀, Yorii Town, Saitama Pref., 15.vi.1978; 1 ♀, Mt. Kongō, Osaka Pref., 25.vii.1995. [Shikoku] 1 ♀, Mt. Ishizuchi, Omogo Village, Ehime Pref., 23.ix.1999. [Kyushu] 1 ♂ 1 ♀, Mt. Tachibana, Fukuoka Pref., 29.vi.1996. [Ryukyus] 1 ♀, Maisedake, Ishigakijima Is., Okinawa Pref., 29.vii.1995 (all in BLKU).

Species incertae sedis

Peribaea trifurcata (Shima)
(figs. 15a-f)

Strobliomyia trifurcata Shima, 1970a: 263.

A detailed description of this species was given by Shima (1970a).

Diagnosis

3+4 dc; R_1 bare; R_{4+5} setulose dorsally to wing margin; CuA_1 bare; anterior $\frac{1}{3}$ of terga 4 and 5 with whitish pollinosity; terga 4 and 5 with 4-6 marginal seta; sternum 5 with pair of elongated median lobes on inner edges. Male genitalia. Surstylus fused with epandrium at base, strongly curved dorsally at apical $\frac{1}{3}$ in lateral view, apex pointed; cerci narrowed on apical half in lateral view, with many long setae on entire length; epiphallus absent; postgonite truncated apically; pregonite broadly sclerotized in C-shape,

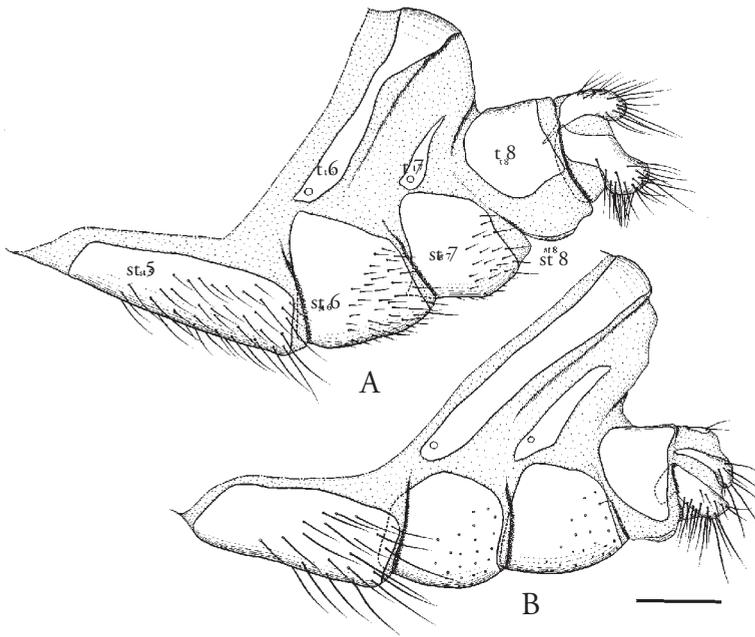


Fig. 16.
Female terminalia in lateral view. – a: *P. abbreviata* sp. n.;
b: *P. egesta* sp. n. (Abbreviations. st: abdominal sternum,
t: abdominal tergum.
Scale bar = 0.2 mm.

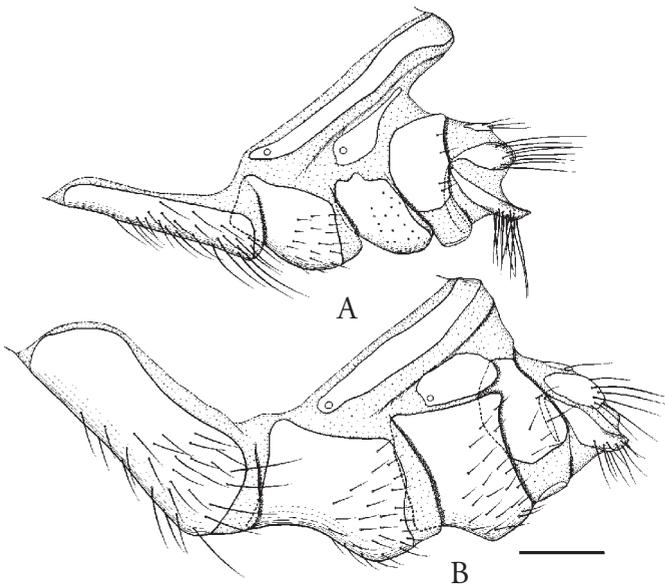


Fig. 17.
Female terminalia in lateral view. – a: *P. orbata* (Wiede-
mann); b: *P. tibialis* (Robin-
eau-Desvoidy). Scale bar =
0.2 mm.

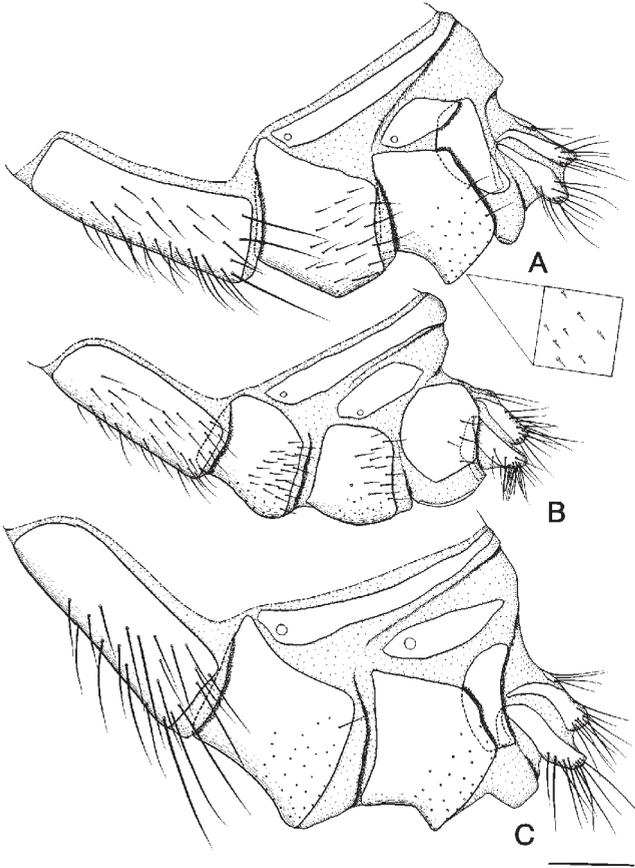


Fig. 18.
Female terminalia in lateral view. — a: *P. apaturae* sp. n.; b: *P. glabra* sp. n.; c: *P. ussuriensis* (Mesnil). Scale bar = 0.2 mm.

apex rounded; distiphallus mostly sclerotized with some tiny spinules ventrally in lateral view; ventral part of distiphallus broadly sclerotized with many tiny spinules and membranous apically.

Female: Unknown.

Body length. — 3.5 mm.

Distribution. — Taiwan*, Philippines, New Guinea.

Host. — Unknown.

Remarks. — Shima (1970a) described this species from New Guinea. Dear & Crosskey (1982) recorded it from Philippines. This species is here reported for the first time from Taiwan, and is easily distinguished from other members of this genus in having a trifold male first flagellomere.

Material examined. — TAIWAN. 1♂, Antung, Hualien Hsien, 12.xi.1985 (BLKU). — NEW GUINEA [New Britain] 1♂, Gaulim, 130m, Gazelle Peninsula, 28.x.1962 (BPBM).

Further species

The following species were recorded from Asia

(Chao 1996, Mesnil 1963), but there was no material available for this study. It is possible that they were misidentified or confused with material from other areas.

Peribaea palaestina (Villeneuve)

Actia palaestina Villeneuve, 1934: 57.

Remarks. — Chao (1996) recorded this species from Yunnan, China.

Peribaea similata (Malloch)

Strobliomyia similata Malloch, 1930a: 137.

Remarks. — Mesnil (1963) identified one Japanese specimen as *Strobliomyia similata*. Chao (1996) recorded this species from Inner Mongolia and Yunnan, China.

DISCUSSION

Monophyly of the genus *Peribaea*

Andersen (1983) first recognized this genus as

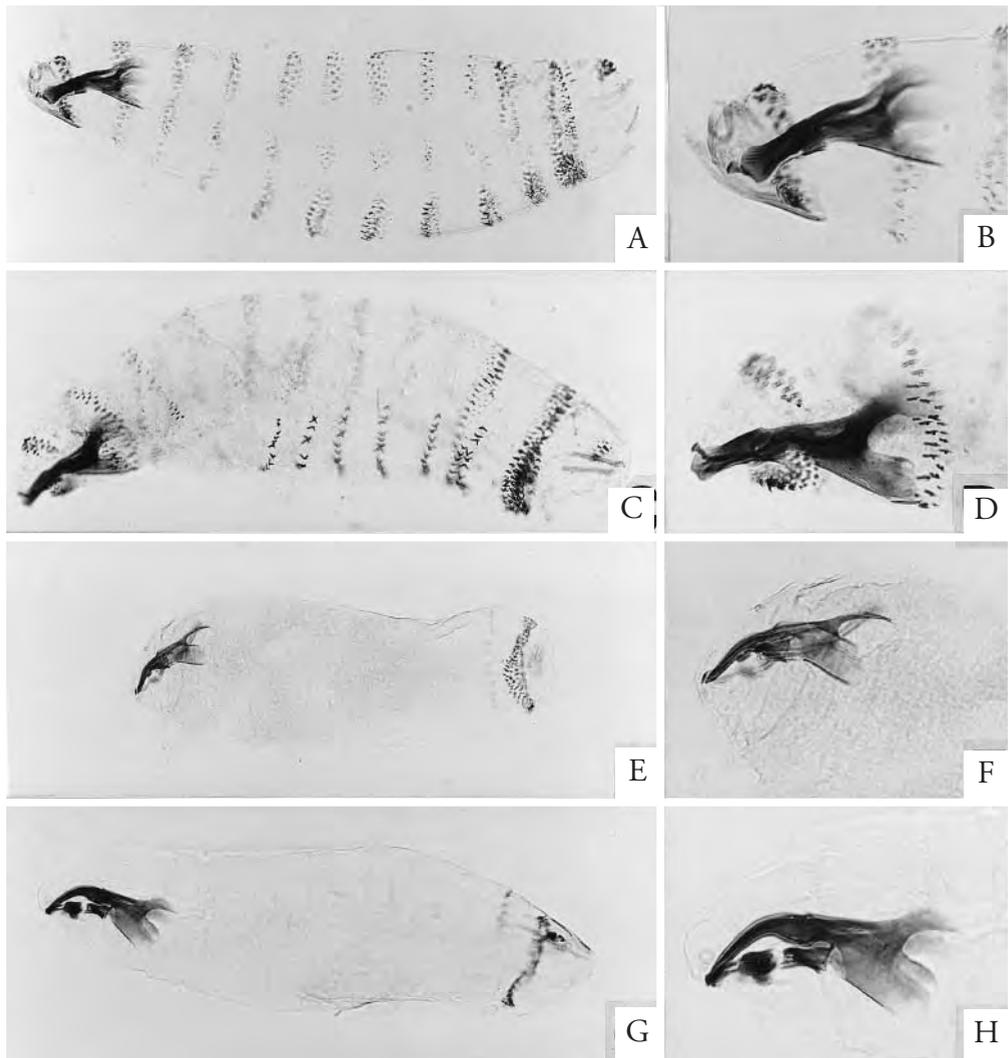


Fig. 19. First instar larvae and cephalopharyngeal skeletons in lateral view. – a, b: *P. abbreviata* sp. n.; c, d: *P. egesta* sp. n.; e, f: *P. orbata* (Wiedemann); g, f: *P. glabra* sp. n.

monophyletic supported by a downwardly directed lower proepimeral seta and bare female abdominal sternum 8. O'Hara (1989) inferred its monophyly by four characters including above-mentioned two characters as well as: distiphallus sclerotized posteriorly; labrum of first instar larva hook-like. Andersen (1996) later added two character states to the autapomorphies of this genus, and excluded the feature of the first instar larva mentioned by O'Hara (l.c.): pedicel with two larger opposed or crossed setulae; postgonite with an apical incision, dividing the postgonite

into two more equally-sized lobes.

We have reexamined the proposed autapomorphies of this genus. The dorsally continuous female abdominal tergum 6 is added to support its monophyly and that of the postgonite is removed. Consequently, we consider that the monophyly of this genus is supported by the derived states of the following six characters: pedicel; lower proepimeral seta; distiphallus of male genitalia; female abdominal tergum 6; female abdominal sternum 8; labrum of first instar larva.

1. Pedicel. – The pedicel usually bears some setulae in the Tachinidae. In the Siphonini some species have a few long and several short setulae on the pedicel, others have only several setulae. Members of *Peribaea* always have two large opposed or crossed setulae (figs. 1-2) and this character state is considered an autapomorphy of this genus as Andersen (1996) indicated.
2. Lower proepimeral seta – All members of this genus possess a downwardly directed lower proepimeral seta. This feature is considered an autapomorphy of this genus as Andersen (1983) and O'Hara (1989) indicated. Although two genera, *Elfia* Robineau-Desvoidy, 1850 and *Phytomyptera* Rondani, 1845 in the subfamily Tachininae, also share this character state, it is interpreted as derived independently because they are not close to the Siphonini and share no other common features with the tribe.
3. Postgonite – Andersen (1996) mentioned that the postgonite in this genus is equally divided into two lobes. However, in the *orbata* group as established here, the postgonite is unequally bifid apically (figs. 9c, 10c): upper lobe is short and rounded and lower lobe is long and pointed apically. In the *fissicornis* and *egesta* groups, (*fissicornis*, *abbreviata*, *insularis*, *egesta*, and *hongkongensis*) the fork of the postgonite is also obscure (figs. 4c, 5c, 6c, 7c, 8c). Therefore, we consider that this character state does not support the monophyly of this genus.
4. Distiphallus – Some features of the distiphallus in the male genitalia among the Siphonini species seem to be more or less independently derived (O'Hara 1989). The distiphallus of this genus is sclerotized dorsally to apical margin in lateral view, and is divided into two U-shaped weakly sclerotized parts in dorsal view (figs. 5e, 8e, 10e, 13e) (Andersen 1996). We also recognize this character state as apomorphic.
5. female abdominal tergum 6 – The female abdominal tergum 6 is divided into usually small hemitergites in most genera of Siphonini. According to O'Hara (1989) and Andersen (1996), this genus has well developed hemitergites in the tergum 6 and sometimes continuous dorsally. As far as we examined (we did not examine the African species O'Hara (1989) examined), the tergum 6 of the *Peribaea* species is broad and elongate, and fused with each other dorsally in all species. We consider that this character is an autapomorphy of this group, though *Solieria* and *Clausicella* in the Leskiini and *Elfia* in the Neaerini also have a ring-like terga 6.
6. Female abdominal sternum 8 – Members of the tribes Siphonini, Leskiini, and Minthoini usually have some setulae in the female abdominal sternum 8. Members of *Peribaea* have no setulae on sternum 8. The bare sternum 8 is presumed to be

an autapomorphy of this group, though the genus *Entomophaga* also has this character state (O'Hara 1989, Andersen 1996).

7. Labrum of first instar larva – The labrum of first instar larvae is well investigated in the Siphonini, and members of this group have the apical narrowed or hook-like labrum in this larval stage (O'Hara 1988). Andersen (1983) considered this feature as plesiomorphic, while O'Hara (1989) considered it apomorphic. In our present examination, the labrum of the *orbata* group is sharp and narrow apically (figs. 19e, 19f), and in other groups is somewhat broadened apically (figs. 19a, 19b). The labrum of this genus is distinctly narrower than the most siphonines, Leskiini, and Minthoini. Therefore, we interpret it apomorphic following O'Hara (1989).

ACKNOWLEDGMENTS

We are grateful to Drs. Neal Evenhuis (BPBM), Thomas Pape (DESM) and Joachim Ziegler (Deutsches Entomologisches Institut, Eberswalde, Germany) for loans of valuable specimens, and Dr. P. L. Th. Beuk (editor) and two anonymous referees for their comments. One of us, Tachi, wishes to express his thanks to Prof. Emer. T. Saigusa (Fukuoka City), Prof. O. Yata and Assoc. Prof. K. Araya (BLKU) for constant guidance and encouragement, and to Prof. J. Yukawa (ELKU) for giving an opportunity to collect many dipterous insects in Indonesia. We also are much indebted to the following entomologists for offering specimens: Mr. R. Matsumoto (Osaka Museum of Natural History), Dr. M. Sueyoshi and Miss. M. Sugimoto (BLKU).

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Received: 22 January 2001

Accepted: 27 April 2001