

## PHILOTARSIDAE (PSOCOPTERA) OF THE BISMARCK ARCHIPELAGO

By **I. W. B. Thornton and T. R. New**<sup>1</sup>

*Abstract:* Collecting on Kar Kar, Manus, New Ireland and New Britain resulted in 3 species of philotarsids, and 2 of them are described as new; 5 species have now been recorded from the Bismarck Archipelago. On Manus are 2 species, 1 (*Aaroniella gressitti*) known from the Carolines, and 1 described as new, which is a member of the *bundoorensis* group of *Haplophallus* that is represented in New Guinea, Australia, New Caledonia and New Zealand. One other species of the latter group occurs in New Ireland. Two representatives of a second, widespread group of *Haplophallus* (the *orientalis* group) occur in the Bismarcks: 1 occurs on mountains of New Ireland and New Britain as well as New Guinea, and 1, newly described from New Britain, resembles a S. Marianas representative of the group.

Thornton & Smithers (1977) have recently examined the philotarsid fauna of New Guinea, in connection with a long-term study of the Psocoptera of the Melanesian Arcs of islands and archipelagos to the east of Australia. In that paper, 2 species were recorded from the Bismarcks: *Haplophallus oblongatus* Thornton & Smithers from New Ireland and New Britain, which also occurs in New Guinea, and *Haplophallus stigmatus* Thornton & Smithers, which is only known from New Ireland. The known New Guinea philotarsid fauna consists of 14 species: 6 of *Aaroniella*, 5 of *Haplophallus*, 2 of *Zelandopsocus*, and 1 of *Austropsocus*.

Types of both new species described below have been deposited in the Australia Museum, Sydney (AMS).

We collected for psocopterans in the Bismarck Archipelago for a total of 44 man-days in the field in October and November 1974: 8 on Kar Kar Island, 8 on the Admiralties (Manus and Los Negros), 14 on New Ireland and 14 on New Britain. FIG. 1 shows our coverage of these islands. We did not collect any philotarsids on Kar Kar, or on New Ireland. On the Admiralties we collected *Aaroniella gressitti*, known from Micronesia, and a distinctive *Haplophallus* species which is described below. On New Britain we collected another previously unknown species of *Haplophallus*, which is also described below. No representatives of the *Zelandopsocus-Austropsocus* line were found during our visit to the Bismarcks.

### GENUS *Aaroniella* Mockford, 1951

Of the 6 known New Guinea species of this genus, 4 have vein  $cu_2$  of the fore wing setose, and are thus quite atypical members of the genus. Two, *A. pedunculata* Thornton & Smithers and *A. antennata* Thornton & Smithers, have vein  $cu_2$  of the fore wing bare.

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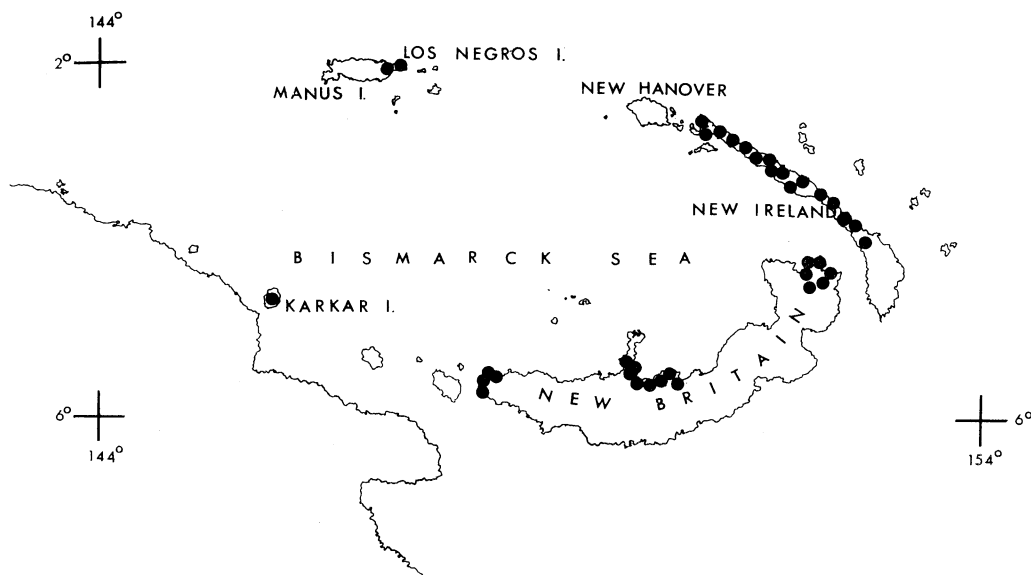


FIG. 1. Map of the Bismarck Archipelago showing sites where collections were made.

**Aaroniella gressitti** Thornton, Lee & Chui, 1972

*Aaroniella gressitti* Thornton, Lee & Chui, 1972: 92-94, Figs. 13a, 14c, 15a, 16a, 16b, 17a.

MATERIAL EXAMINED: ADMIRALTY IS: 1 ♀, Manus I, near Rosson, ca 270 m, 8.XI.1974, in forest, a.m.

This specimen agrees with the holotype of *A. gressitti* in all respects save that the apical cells are faintly cloudy when viewed under low power, and the transverse fascia of the fore wing is broken, as it is in some specimens of *A. gressitti*. The positions of the brown patches of the fore wing and the genitalic characteristics are in exact conformity with the holotype.

*A. gressitti* is known from the Caroline Islands (Palau, Yap, Ponape and Kusaie) and has not been collected in New Guinea or Australia. It clearly differs from *A. pedunculata* and *A. antennata* in wing and head patterns, and notably in having the fore wing vein setae sited on dark spots in the apical 1/2 of the wing.

GENUS **Haplophallus** Thornton, 1959

This genus is represented in New Guinea by 5 species, 2 of which, *H. oblongatus* Thornton & Smithers and *H. separatus* Thornton & Smithers, are members of the *orientalis* group of species, having vein  $cu_2$  of the fore wing bare and the antennal apex not bearing a single long seta. The other 3 are included in the *bundoorensis* group, members of which have vein  $cu_2$  of the fore wing setose and the antennal apex attenuated, bearing a single long seta. The group is well represented in Australia.

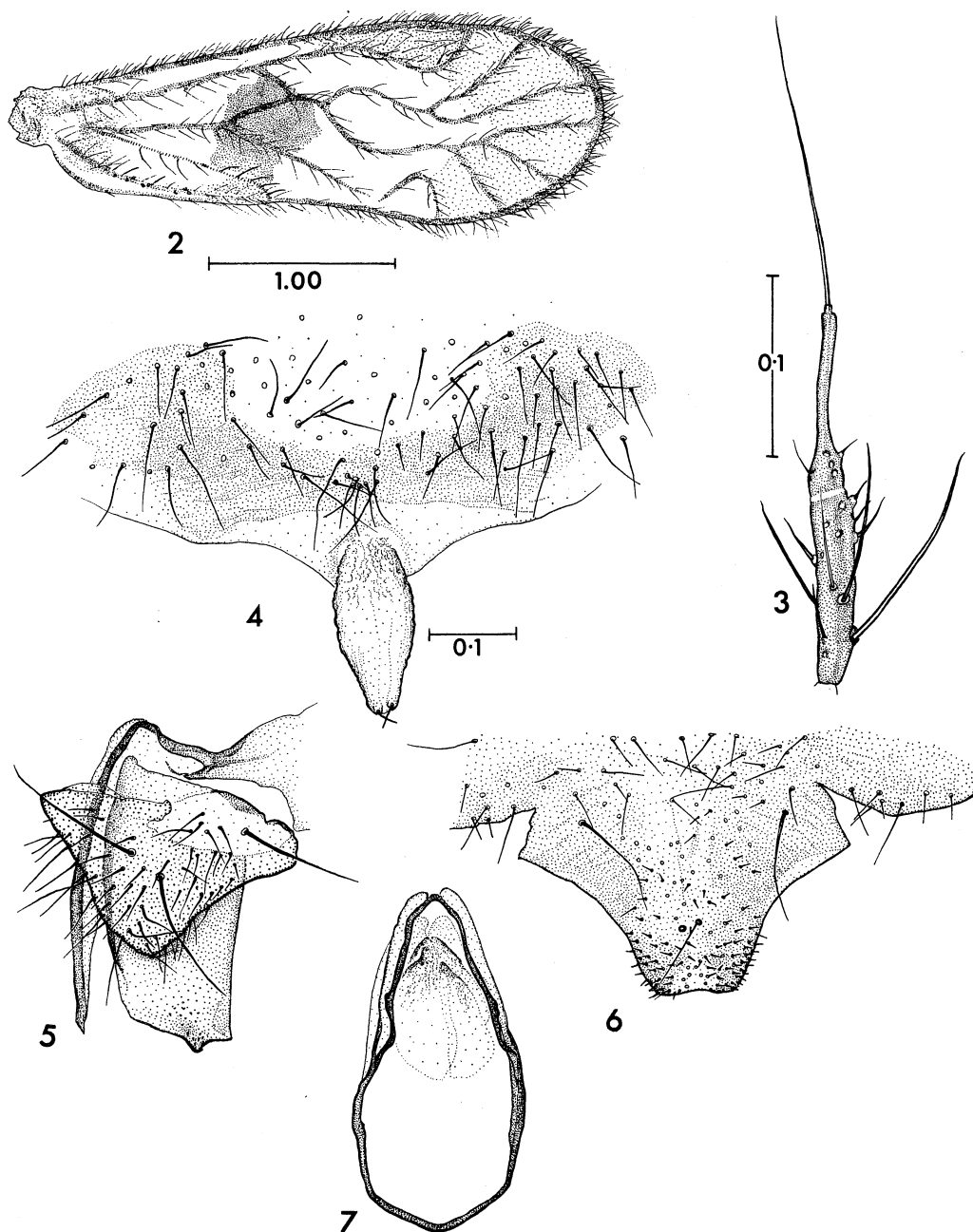


FIG. 2-7. *Haplophallus manus*, n. sp., ♀: 2, fore wing; 3, apex of antenna; 4, subgenital plate; 5, gonapophyses. ♂: 6, hyandrium; 7, phallosome. Fig. 4-7 to common scale.

Four species are now known from the Bismarcks, 1 also occurring in New Guinea. There are 2 species of the *orientalis* group and 2 of the *bundoorensis* group.

**Haplophallus manus** Thornton & New, new species FIG. 2-7

♀. *Coloration* (after 6 months in alcohol). Buff. Eyes black. Vertex predominantly pale, with diffuse grayish brown markings dorsal to eyes and along median region. Ocellar protuberance dark brown. Genae pale. Median region of frons slightly darker. Postclypeus with 6 or 7 very narrow pale grayish brown striae either side of midline, meeting in midline. Anteclypeus pale. Labrum dark brown. Maxillary palpi pale, apical segment dark brown. Scape and pedicel pale buff,  $f_1$  buff, dark grayish brown apically, rest of flagellum dark grayish brown. Thoracic nota grayish brown. Legs predominantly white, tarsi dark brown. Fore wing with grayish brown markings as in FIG. 2; apical region of wing darkened except adjacent to veins; a transverse band across central region of wing, base darkened. Hind wing with cell R3 and apical regions of cells R5, M,  $Cu_2$  darkened. Abdomen buff, with traces of darker pigment dorsally. *Morphology*. Antennal apex attenuated with single long apical seta as in FIG. 3. Tarsal claw with subapical tooth. Basal hind tarsal segment with 18 ctenidia. Fore wing as in FIG. 2;  $Cu_2$  with 9 setae. Hind wing vein setae:  $r_1$ —4,  $r_s$ —0,  $r_{2+3}$ —0,  $r_{4+5}$ —14,  $m$ —8,  $cu_1$ —0. Subgenital plate (FIG. 4) apically tripartite, apical lobe bearing a pair of short apical setae, subapical sclerite bare. Gonapophyses (FIG. 5): ventral valve with spiculate apex; dorsal valve rectangular with spiculate prominence; outer valve triangular with 3 very long setae and numerous shorter setae. Epiproct semicircular, setose. Paraproct with a circular field of 21 trichobothria and 2 setae lacking basal rosettes. *Dimensions*. B 2.5, IO: D 2.0, Fw 3.11, Hw 3.32,  $f_1$  0.43,  $f_2$  0.27,  $f_1/f_2$  1.78, F 0.82, T 1.23,  $t_1$  0.35,  $t_2$  0.06,  $t_3$  0.07,  $rt$  5.83: 1: 1.17.

♂. *Coloration* (after 6 months in alcohol). As ♀, but overall slightly darker and pigment covers apical area of fore wing even adjacent to veins. Apical region of tibiae slightly darkened, tarsi brown. *Morphology*. Antennal apex not available. Fore wing:  $cu_2$  with 14 setae. Hind wing setae:  $r_1$ —6,  $r_s$ —0,  $r_{2+3}$ —0,  $r_{4+5}$ —11,  $m$ —12,  $cu_1$ —0. Basal hind tarsal segment with 17 ctenidia. Hypandrium (FIG. 6) slightly bilobed, with numerous short preapical setae, 2 long median setae and 2 further long setae more posteriorly; incised laterally. Phallosome (FIG. 7) with rounded rugose apex. Epiproct rounded, with long apical setae. Paraproct with field of ca 30 trichobothria and 1 central seta without a basal rosette. *Dimensions*. B 2.4, IO: D 1.3, Fw 2.63, Hw 2.06,  $f_1$  0.51,  $f_2$  not available, F 0.69, T 1.13,  $t_1$  0.34,  $t_2$  0.06,  $t_3$  0.08,  $rt$  5.67: 1: 1.33.

Holotype ♀ (AMS), ADMIRALTY IS: Manus I, Lorengau, High School grounds, 1300 hr, 6.XI.1974; allotype ♂ (AMS), same data as holotype.

*H. manus* is a member of the *bundoorensis* group, and on pattern of the fore wing is easily distinguished from all the known New Guinea or Australian species of the groups. It is known only from the Admiralties.

**Haplophallus stigmatus** Thornton & Smithers, 1977

*Haplophallus stigmatus* Thornton & Smithers, 1977: 440.

This species, also a member of the *bundoorensis* group, is known only from New Ireland.

**Haplophallus talilus** Thornton & New, new species FIG. 8-11

♀. *Coloration* (after 6 months in alcohol). Buff. Eyes black. Vertex with well-defined brown markings across posterior, dorsal to eyes, and along epicranial suture. Ocelli hyaline, with black crescents on inner borders. Facial markings as in FIG. 9: postclypeus with ca 5 broad dark brown striae either side of midline; midline unmarked except at anterior border. Anteclypeus pale. Labrum very dark brown.

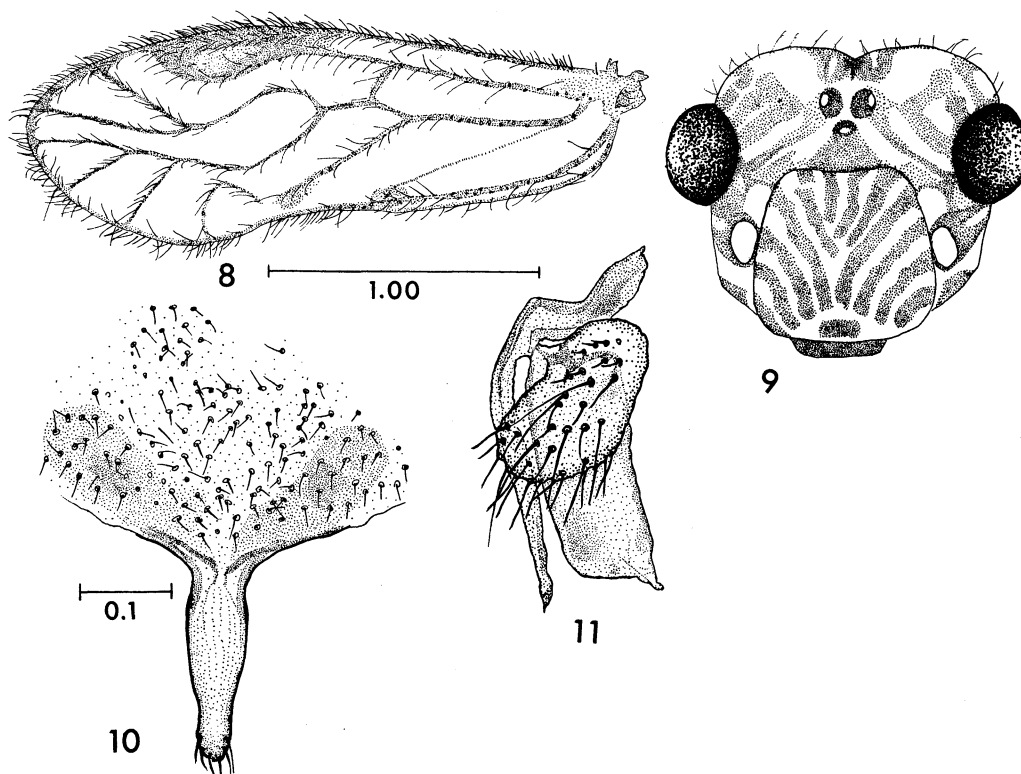


FIG. 8-11. *Haplophallus talilus*, n. sp., ♀: 8, forewing; 9, head pattern (not to scale); 10, subgenital plate; 11, gonapophyses. Fig. 10-11 to common scale.

Apical 2 segments of maxillary palpi dark brown. Antennae pale grayish brown. Thorax dark brown dorsally, pleura paler. Legs: femora with 2 brown bands, tibiae with 3 narrow dark brown bands, tarsus wholly dark; hind femur with bands more diffuse and partially confluent. Fore wing hyaline; pterostigma gray, darker around border; slight dark shading near apex of  $cu_2$ . Hind wing hyaline. Abdomen with diffuse dark brown pigment dorsally. *Morphology*. Antennal apex not available. Fore wing as in FIG. 8;  $Cu_2$  bare. Hind wing veins with setae as follows:  $r_1-5$ ,  $r_{2+3}-0$ ,  $r_{4+5}-11$ ,  $m-14$ ,  $cu_1-7$ . Tarsal claw with subapical tooth. Basal hind tarsal segment with 13 ctenidia. Subgenital plate (FIG. 10) with long sinuously tapered apical lobe bearing 3 short marginal setae either side of apex. Gonapophyses (FIG. 11): ventral valve long, constricted near apex; dorsal valve rectangular, with slight apical projection; outer valve large, oval. Epiproct rectangular; a slight median transverse fold with 4 short setae; long apical and preapical setae. Paraproct with field of ca 18 trichobothria. *Dimensions*. B 2.15, IO: D 2.3, Fw 2.30, Hw 1.69, antennae not available, F 0.49, T 0.81,  $t_1$  0.09,  $t_2$  0.03,  $t_3$  0.05, rt 3.00: 1: 1.67.

♂. Unknown.

Holotype ♀ (AMS), PNG: New Britain: Gazelle Peninsula, Talili Gap, ca 210 m, 16.XI.1974; 2 ♀♀ paratypes, same data as holotype (AMS).

*H. talilus*, a member of the *orientalis* group, differs from *H. oblongatus*, known from New Guinea, New Britain and New Ireland, and *H. separatus* from New Guinea, in head pattern (closer to *H. separatus*) and female genitalia (closer to *H. oblongatus*). It resembles *H.*

*fuscistigma* Thornton, Lee & Chui, known from the Southern Marianas (Saipan) very closely, differing only in relative length of dorsal valve of the female gonapophyses pigment pattern of legs and the lack of a transverse pigmented band across the fore wing. Two Australian species of this group, *H. sinus* Thornton & New and *H. wongae* Thornton & New, also resemble *H. talilus*. However, *H. talilus* differs from *H. sinus* in head pattern and genitalic structure, and from *H. wongae* in pigmentation pattern of the legs and fore wing.

**Haplophallus oblongatus** Thornton & Smithers, 1977

*Haplophallus oblongatus* Thornton & Smithers, 1977: 434.

This species of the *orientalis* group is known from New Guinea, New Ireland and New Britain. It has only been collected in the mountains (Mt Wilhelm, Daulo Pass, and Wau on New Guinea; the Lelet Plateau on New Ireland; and at 1050 m in the Nakanai Mts on New Britain).

#### DISCUSSION

The known philotarsid fauna of the Bismarcks appears to be an attenuation of the New Guinea fauna, with Micronesian influence.

No philotarsids are known from the Bismarcks that could represent an extension of the New Guinean fauna so far as the genera *Aaroniella*, *Zelandopsocus* and *Austropsocus* are concerned. *Aaroniella gressitti*, found on Manus Island, is a Micronesian species and is not known from New Guinea or Australia. Its closest southern relatives are the temperate *A. rawlingsi* Smithers (southern Australia, Tasmania and New Zealand), and *A. howensis* Smithers & Thornton (Lord Howe Island). No species of the *Austropsocus-Zelandopsocus* line of the family have been collected in the Bismarcks.

The *Haplophallus* species of the Bismarcks probably do represent an attenuation of the New Guinea fauna. The 2 main species groups each have 2 representatives in the Bismarcks. *H. oblongatus* of the *orientalis* group is a mountain form, but does not appear to have differentiated on New Ireland or New Britain. *H. talilus* (New Britain), the other member of the *orientalis* group, resembles *H. oblongatus*. The Micronesian *H. fuscistigma* is closely similar to both these species. Of the *bundoorensis* group, *H. manus* is quite distinctive and may be the most northerly representative of the group, other species of which occur in New Guinea, Australia, New Caledonia and New Zealand; *H. stigmatus*, from New Ireland, is more similar to New Guinean and New Caledonian members of the group.

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