THE GENERIC POSITION OF AMPHIGERONTIA FORMOSA BANKS (PSOCOPTERA: PSOCIDAE) AND RELATED SPECIES

By C. N. Smithers
The Australian Museum, Sydney

Abstract

Amphigerontia formosa Banks is redescribed and transferred to Sigmatoneura Enderlein. Scaphopocus Smithers and Sigmatoneura are synonymized by transfer of Scaphopocus phaeotherus Smithers to Sigmatoneura. Psocus filicornis Enderlein is considered to be the male of Cerastipsocus subcostalis Enderlein and Scaphopocus smithersi New to be the male of Scaphopocus albostriatus New; both are considered, with Amphigerontia kolbei Enderlein, to belong to Sigmatoneura.

Introduction

Amphigerontia formosa Banks (Banks, 1918) was described from a single female taken at Kuranda, Queensland. Additional material is now available, including males. As Banks’ description was brief, of one sex only and as no description was given of genitalia, a redescription of the species is given here. New data necessitate discussion of the generic position of the species and that of related species from Africa and Asia.

Redescription of Amphigerontia formosa Banks

This is one of Australia’s largest species of Psocoptera.

FEMALE

Coloration (in alcohol). Head pale brown with brown markings. An indistinctly defined median brown band from clypeo-labral suture to top of vertex; postclypeus with series of almost parallel brown stripes; brown mark between compound eye and back of head; a few irregular brownish marks on epicranial plates; gena with brown mark on anterior half. Labrum and anteclypeus dark in middle, paler laterally. Scape, pedicel and first flagellar segment pale brown; remainder of flagellum black. Eyes black. Ocelli margined black adjacent to each other. Maxillary palps pale, apical segment black. Mesonotum very dark brown, shiny; sutures, postero-lateral margin of lateral lobes and scutellum pale. Legs pale brown, tips of tibiae and tarsi dark. Fore wings (Fig. 1) hyaline with brown markings. Veins dark brown to whitish (see Fig. 1). Hind wing (Fig. 2) hyaline with faint brown tinge behind M and before R₁.

Morphology. Length of body: 5.0 mm. Median epicranial suture distinct. Anterior arms indistinct. Length of flagellar segments: f₁: 1.7 mm; f₂: 1.6 mm. Antennae nearly twice as long as fore wing. Antennae long, fine, with short setae. Eyes small, almost reaching level of vertex. IO/D (Badonnel): 2.3; PO: 0.73. Ocelli small, of equal size. Measurements of hind leg: F: 1.3 mm.; T: 2.3 mm; t₁: 0.5 mm; t₂: 0.25 mm; rt: 2:1; ct: 18, 3. Fore wing length: 6.0 mm; fore wing width: 2.1 mm. Fore wing (Fig. 1) somewhat narrowed towards apex. Pterostigma with fairly sharp hind angle. Rs and M joined by fairly long crossvein. R₄₊₅ curving back after separation from R₂₊₃ so as to approach M closely; R₄₊₅ curves forward again before reaching wing margin. Angle between M₁ and M₂ very acute. Areola postica tall with narrow apex. Sc short, approaching costa distally. Fore wing glabrous. Hind wing length: 4.0 mm; hind wing
width: 1.3 mm. Hind wings (Fig. 2) with Rs and M fused for a length, glabrous. Epiproct (Fig. 3). Paraproct (Fig. 4). Subgenital plate (Fig. 5). Gonapophysis (Fig. 6).

MALE

Coloration (in alcohol). Head as in female but overall a little darker. Flagellum entirely black. Tibiae a little darker than femora. Fore wings (Fig. 7). hyaline, a little brown colour at base, otherwise lacking the bold extension pattern of the female; pterostigma dark brown. Veins, including Cu2, medium dark brown. Terminal abdominal structures very dark brown. Hind wing (Fig. 8).

Morphology. Length of body: 4.0 mm. Median epicranial suture very distinct, anterior arms hardly discernible. Lengths of antennal segments: f1: 1.5 mm; f2: 1.5 mm. Antennae long and fine, densely setose; setae erect. Externally larger than in female but not quite reaching level of vertex. IO/D (Badonnel) 2.1; PO: 0.80. Ocelli large, anterior a little smaller than lateral ocelli. Measurements of hind leg: F: 1.1 mm; T: 2.0 mm; t1: 0.45 mm; t2: 0.25 mm; t3: 1.1 mm; ct: 17, 4. Fore wing length: 4.6 mm; fore wing width: 1.7 mm. Fore wing (Fig. 7). Hind wing (Fig. 8). Epiproct (Fig. 9). Paraproct (Fig. 10). Hypandrium (Fig. 11). Phallosome (Fig. 12).

MATERIAL EXAMINED

QUEENSLAND: 1♀ (holotype), Kuranda, (Perkins) (M.C.Z. 10,042); 3♀, Kipper Creek, Esk, 20.xii.1970 (D. K. Norris) (ANIC). 1♀, 3.2 km Paluma, 13.i.1970 (G.A. Holloway); 1♂, Smithfield, 15.xii.1974 (C.N. Smithers); J. V. Peters); 1♀, Iron Range, 12.v.1975 (M. S. Moulds); 1♀, Middle Claudia Iron Range, 4.x.1974 (M. S. Moulds); 1♂, Veresdale, 1.vi.1971 (C. N. and A. Smithers) (AM). NEW SOUTH WALES: 1♂, National Park, 29.i.1961 (C. K. A. S. Smithers); 1♂, Bega, 22.iii.1962 (A. S. Smithers); 1♂, Coote's Corner Orara R., 26.viii.1961 (C. N. and A. S. Smithers); 1♀, Coila Creek, S.M., 13.v.1975 (C. N. and G. F. Smithers); 1♂, 7♀, Muogamarra Nature Reserve, 23.v.1974 (C.N. Smithers); 1♂, same locality, 2.v.1974 (C.N. and A.S. Smithers); 2♀, same locality, 15.xi.1973 (C. N. and A. S. Smithers); 1♂, same locality, 18.iv.1974 (C. N. Smithers); 1♂, same locality, 18.vii.1974 (C. N. and A.S. Smithers); 1 nymph, same locality, 20.vi.1974 (C.N. and A.S. Smithers) (AM).

The holotype, which is a female preserved dry, was originally deposited in the Museum of Comparative Zoology, Harvard University but is now in the Australian National Insect Collection, Canberra. The other material listed here is in the Australian Museum (AM) and the Australian National Insect Collection (ANIC).

Discussion

1. Amphiherontia formosa Banks and Scaphopsocus phaeotherus Smith. The discovery of a male of Amphiherontia formosa confirms the opinion of Enderlein (1924) that the species had been incorrectly assigned to Amphiherontia Kolbe; the males of Amphiherontiinae have the eighth sternite strongly sclerotized and forming, with the ninth sternite (hypandrium), a strongly.
FIGS 1-6. Sigmateura formosa (Banks) ♀. (1) fore wing; (2) hind wing; (3) epiproct; (4) paraproct; (5) subgenital plate; (6) gonapophyses.
structure above which lies the phallosome. The phallosome is modified, by reduction, to parameres which are often proximally separated. *A. formosa* was probably placed in that genus because of the presence of a Rs-M crossvein in the fore wing. It is now well known that, in Psocoptera, definition of genera using this character alone can be unreliable. Enderlein (1924) placed *A. formosa* in *Loensis* Enderlein but such action is not justified on venational nor genital evidence; Thornton (1961) has already indicated that *A. formosa* cannot be included in *Loensis*. Smithers (1960) erected *Scaphopsocus*, including *Scaphopsocus phaeotherus* Smithers, on a single male from Tanzania (the Tanganyika). Comparison of males of *A. formosa* and *S. phaeotherus* shows clearly that they are closely related and certainly congeneric. The considered sexual dimorphism in *A. formosa*, as revealed by the new material and also noted by Takahashi (1921) for *Amphigerontia kolbei* Enderlein (see below) suggests that the female of *S. phaeotherus* has a patterned wing.

2. Other species related to *Amphigerontia formosa* and *Scaphopsocus phaeotherus*

Enderlein (1906) described *Amphigerontia kolbei* from Japan (male only) and Okamoto (1907) described *Cerastipsocus singularis* (male only) and *hakodatensis* (female only), also from Japan. Enderlein (1908) regard Okamoto’s species as being the two sexes of one species, *singularis*, and placed it with *Cerastipsocus subcostalis* Enderlein (1903) from Singapore, *Sigmateneura* (Enderlein 1908).

Okamoto (1932) recorded a species which he referred to as *Psocus kolbei* (Enderlein) from Japan as did Tsutsumi (1964). Tsutsumi (1965) transferred *Psocus kolbei* (Enderlein) to *Scaphopsocus* and listed *Sigmatoneura singularis* (Okamoto) as a synonym, at the same time providing figures of the male and female genitalia. Roesler (1944) had, in his key to genera of the Psocoptera, placed *Sigmatoneura* as a subspecies of *Cerastipsocus Kolbe* using venational features; thus, at the time of Tsutsumi’s paper (1965) the genus *Scaphopsocus* was regarded as containing two species *phaeotherus* and *kolbei*.

New (1973) described *Scaphopsocus albostriatus* (female only) and *smithersi* (male only) from Ife-Ife, Nigeria. Taking into consideration the fact that the specimens came from the same locality and that we now know of the extreme sexual dimorphism in wing pattern, it seems extremely likely that one species, *albostriatus*, is represented. New (1975) described *Scaphopsocus orientalis* (male only) from Singapore.

Enderlein (1903) described *Cerastipsocus subcostalis*, which he subsequently made the type species of *Sigmatoneura* Enderlein. At the same time (cit., p. 218) when describing *Psocus filicornis* he pointed out the remarkable fact that 12 females of *C. subcostalis* were taken with 6 males of *Ps. filicornis*. Perusal of the descriptions of these two species and the collection data suggests very strongly that *Ps. filicornis* is the male of *C. subcostalis*.

*Sigmatoneura subcostalis* (Enderlein) and *S. singularis* (Okamoto) [*Scaphopsocus kolbei* (Enderlein)] are clearly congeneric.
FIGS 7-12. Sigmatoneura formosa (Banks) ♂. (7) fore wing; (8) hind wing; (9) epiproct; (10) paraproct; (11) hypandrium; (12) phallosome.
3. Establishment of valid generic name

From the foregoing it becomes clear that there have been described the following congeneric species: *albostriatus* New, *formosa* Banks, *kolbei* Enderlein, *phaeothorus* Smithers, *orientalis* New and *subcostalis* Enderlein. It remains now to establish the valid generic name for this group of species. They cannot be included in *Amphigerontia* Kolbe, *Psocus* Latreille nor *Cerastipsocus* Kolbe on morphological grounds. The earliest generic name available for any member of the group, other than the above three, is *Sigmatoneura* Enderlein; this name should therefore be used.

**Synonymic list of species of Sigmatoneura** Enderlein

Type species: *Cerastipsocus subcostalis* Enderlein 1903.

Type species: *S. phaeotherus* Smithers syn. nov.

**Sigmatoneura subcostalis** (Enderlein)


**Sigmatoneura kolbei** (Enderlein) comb. nov.


**Sigmatoneura formosa** (Banks) comb. nov.


**Sigmatoneura albostriata** (New) comb. nov.


**Sigmatoneura phaeothera** (Smithers) comb. nov.


**Sigmatoneura orientalis** (New) comb. nov.

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References

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INTERESTING BUTTERFLY RECORDS FROM SOUTHERN QUEENSLAND AND CENTRAL NEW SOUTH WALES

By D. Binns

Toad Hall, Australian National University, P.O. Box 4, Canberra, A.C.T.

Abstract

A new locality and a previously unrecorded food plant are recorded for *Pseudalmenus chlorinda* (Blanchard); interesting collections of *Toxidia thyrrhus* Mabille and *Argynnis hyperbius inconstans* Butler are reported.