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On the Oriental and New Guinean Species of the Genus *Amiota*
LOEW Originally Described by DUDA as *Phortica foliiseta*,
with Descriptions of Three New Species
(Diptera, Drosophilidae)

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Synopsis Examination of the "syntypes" of *Amiota (Phortica) foliiseta* (DUDA, 1923) preserved in the Hungarian Natural History Museum, Budapest, revealed that they involve four distinct species, *foliiseta*, *phyllochaeta* sp. n., *foliacea* sp. n., and *pappi* sp. n. The *foliiseta* complex is newly established and distribution records with additional material are presented.

Introduction

DUDA (1923) described a species from New Guinea and Formosa under the name *Phortica foliiseta*, its main distinctive character being the enlarged "blattformig" extremity of the male arista.

Dr. L. PAPP (Budapest), while searching, on our request, for the type specimens of *Erima fasciata* KERTÉSZ, found a series of 11 specimens labelled *Phortica foliiseta* DUDA. This series has never been seen by a specialist since the description of the species. The material contains, in fact, a complex of four species, and constitutes the base of our present paper. It permitted the establishment of the identity of *P. foliiseta* and the description of new species. The species with enlarged extremity of arista are grouped in the new complex *foliiseta*.

The Material of the Hungarian Museum

The 11 specimens found presently in the collections of the Hungarian Natural History Museum, Budapest, carry the label "Syntypus." We suspect this one has been added posteriorly to the study of DUDA. These specimens are as follows:

-two males: "N. Guinea, BIRÓ/Erima, Astrolabe B./*Ph. foliiseta* m. ♂, det. Dr. O. DUDA," the letter "m" (mihi) exists only on the label of one specimen.

-three males: "N. Guinea, BIRÓ 1900/Friedrich-Wilhelmshafen/*Ph. foliiseta*

mihi ♀, det. Dr. O. DUDA," the word "mihi" is missing on the labels of two of the three specimens.

-five males: "Formosa, SAUTER/Chip Chip 909. III./*Ph. foliiseta* m. ♂, det. Dr. O. DUDA," on the label of one specimen, the letter "m" is missing.

-one male: "Formosa, SAUTER/Mt Hoozan, 1919 V/*Phortica foliiseta* ♂ n. sp., det. Dr. O. DUDA."

DUDA (1923), in his original description of *A. foliiseta*, mentioned 8 ♂ and 1 ♀ from Formosa (Chip Chip, Mt. Hoozan, Kankau) and 3 specimens without precision of sex, from New Guinea (Friedrich-Wilhelmshafen).

By comparing the extant material and that mentioned by DUDA, we can establish:

-the two males from Erima, New Guinea, do not belong to the original series of syntypes because they are not mentioned by DUDA (loc. cit.).

-two males and one female from Formosa are missing. No specimen from Kankau exists here.

-the three specimens from Friedrich-Wilhelmshafen, New Guinea, are males and not females as indicated on the labels.

-no female exists in this series of 11 specimens.

Lectotype Fixation for *Amiota foliiseta* DUDA

According to what precedes, the specimen carrying the manuscript label "*Phortica foliiseta* ♂ n. sp." is the one DUDA considered as the "typus" of this species since it is the only one with the entire generic name and the abbreviation "n. sp." This male is in good condition and fits very well the description of the species. We, hereby, designate this specimen from Mt. Hoozan, Formosa, as the lectotype of *Phortica foliiseta* DUDA.

Taxonomy

The study of the genitalia of the males of this series showed that four species are represented:

-*foliiseta* DUDA, 4 males from Formosa: the lectotype from Mt. Hoozan and 3 paralectotypes from Chip Chip.

-*foliacea* n. sp., 2 males from Chip Chip, Formosa.

-*phyllochaeta* n. sp., 2 males from Erima, New Guinea.

-*pappi* n. sp., 3 males from Friedrich-Wilhelmshafen, New Guinea.

The first three species have the male arista with a leaf-like expansion on the apex. The fourth one has a bare arista without this expansion.

Thus, four species possess this character, that is, the three above mentioned and the fourth described from Sabah by TAKADA *et al.* (1973), *A. nigrifoliiseta*. These four species constitute a species complex that can be named the *foliiseta* complex.

This complex has a broad distribution on both sides of the WALLACE's line, extending to the Oriental and Australian regions (Fig. 20).

✓ *Amiota (Phortica) foliiseta* (DUDA, 1923)

Phortica foliiseta DUDA, 1923, *Annl. hist.-nat. Mus. natn. hung.*, 20: 35.

Figs. 1-5

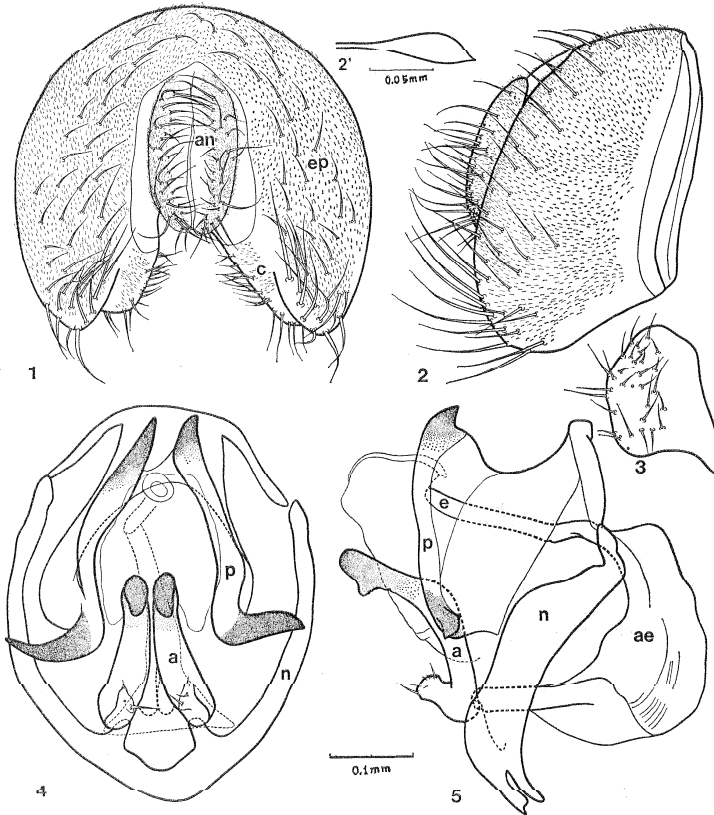
Owing to the fact that DUDA recognized only one species among this material, it is not possible to specify to what species his description refers. For this reason, a redescription is given here based mainly on the lectotype. As the female is not represented in this material, we cannot specify its identity. DUDA, in his description, says that the arista of the female "oben weitläufig mässig lang, unten kürzer behaart," without the leaf-like expansion; we are not able to verify this assertion.

♂. Body 3.5 mm in length. Antennae reddish brown, third joint yellowish orange. Arista with one or two basal short branches, apically with an elongate leaf-like expansion (Fig. 2'). Palpi reddish brown, slender, with four setae below. Ocellar triangle black. Periorbits brown. Frons reddish brown, anteriorly orange and half as broad as the width at the level of posterior reclinate orbitals, with a silvery pollinose band along the eyes. Clypeus brown with a milky white median spot. Carina low but long. Face brown with two lateral milky white spots below. Cheek yellow, narrow. Anterior reclinate orbital half as long as proclinate. Posterior reclinate two-thirds as long as proclinate. Vibrissa long, other orals fine. Mesoscutum gray with brown vittae anteriorly, brown spots posteriorly, humeri yellow. Scutellum reddish brown, two large pollinose basal spots, each encircling a small brown spot, apical pale spot extending along the posterior border of the scutellum. Thoracic pleura gray with a brown patch on the centre of the mesopleuron. Anterior scutellars strongly divergent, longer than posteriors. Sterno-index 0.9. Legs yellow. Wings hyaline, R_{4+5} and M convergent distally. C-index 2.2; 4V-index 2.5; 4C-index 2.0; 5x-index 1.0; Ac-index 3.7; Cx-index 0.6; C3-fringe 65%. Halteres light yellow, missing on the lectotype. Abdominal tergites black; 1T yellow, 3T with a lateral anterior clear spot, visible only when the abdomen is in extension.

Periphallic organs (Figs. 1-3): Epandrium (genital arch) broad, black, ventrally pale and rounded, its postero-inferior part with numerous long bristles up-curved. Cercus (anal plate) narrow, bristly, pale yellow. Surstylus (clasper) without teeth. Phallic organs (Figs. 4-5): Aedeagus elongate rod-like, curved, with broad apodeme. Anterior parameres slightly curved, apparently fused at bases with the base of apodeme of aedeagus. Posterior parameres apically bifid and sometimes serrated. ♀ not seen.

Lectotype ♂, Mt. Hoozan (Fon-fang-shan*), Formosa (Taiwan), V. 1910 (SAUTER); paralectotypes 3 ♂, Chip Chip (Chi-chi*), III. 1909 (SAUTER), in

* Modern translations of Taiwan locality names cited from LIN & WHEELER, 1972. Univ. TEXAS Publ. 7213: 238.



Figs. 1-5. *Amiota (Phortica) foliiseta* DUDA. ♂. — 1,Periphallallic organs, posterior aspect; 2, ibid., lateral aspect; 2', leaf-like expansion of the arista; 3, surstylus; 4, phallic organs, ventral aspect; 5, ibid., lateral aspect. a, Anterior paramere; ae, apodeme of aedeagus; an, cercus; c, surstylus; e, aedeagus; ep, epandrium; n, novasternum; p, posterior paramere.

H.N.H.M., Budapest. Other material: 1 ♂, Wulai, Taipei, 12. VII. 1967 (THROCKMORTON, in OKADA, 1971: 92); 1 ♂, Rhoshan, Nan Tow, 24. VIII. 1974 (WATANABE); 1 ♂, Kaeng Khoi, Thailand, 10. VIII. 1971 (OKADA).

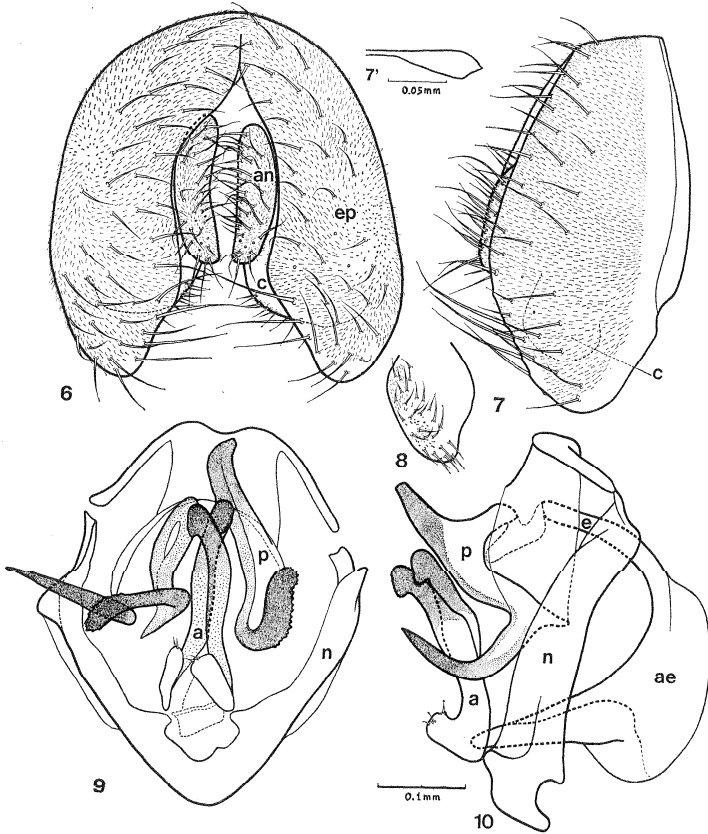
Distribution. Formosa, Thailand (loc. n.).

✓ *Amiota (Phortica) phyllochaeta* sp. n.

Figs. 6-10

Species close to *A. foliiseta* DUDA from which it is distinguished mainly by the genitalia.

♂, ♀. Body 2.6 mm in length. Antennae yellow, third joint clearer. Arista



Figs. 6–10. *Amiota (Phortica) phyllochaeta* sp. n. ♂. — 6, Peripheralhallic organs, posterior aspect; 7, *ibid.*, lateral aspect; 7', leaf-like expansion of the arista; 8, surstylus; 9, phallic organs, ventral aspect; 10, *ibid.*, lateral aspect. Signs as in Figs. 1–5.

with three or four very short basal branches, apically with an elongate leaf-like expansion quite similar to that of *A. foliiseta* (Fig. 7') in ♂, missing in ♀ specimen. Palpi brown in its ventral border, with 6–8 setae. Periorbits silvery pollinose, confused with the similar band along the eyes. Cheek reddish brown, narrow. Scutellum reddish brown, basal pollinose spots larger than those of *A. foliiseta*, apical spot triangular. Sterno-index 0.95. Legs yellow. Wings hyaline, R_{4+5} and M convergent. C-index 2.2; 4V-index 2.5; 4C-index 1.7; 5x-index 1.1; Ac-index 2.8; C3-fringe 67%. Halteres light yellow. Abdominal tergites black, 1T yellow. Peripheralhallic organs (Figs. 6–8): Epandrium narrower than that of *A. foliiseta* in both caudal and lateral views. Phallic organs (Figs. 9–10) similar to these of *A. foliiseta*, but different in shapes from that species. Posterior parameres

bifid and serrated.

Holotype ♂ and 1 ♂ paratype, Erima, Astrolabe B., Papua New Guinea, 1896 (BIRÓ), in H.N.H.M., Budapest. 5 ♂, 1 ♀ paratypes, Wau, Morobe district, Papua New Guinea, 18. VIII-23. IX. 1977 (OKADA), in Bishop Museum and National Science Museum. Tokyo.

Distribution. New Guinea.

This species is very close to *A. foliiseta*. Only the shapes of the genitalia components distinguish the two species. The two taxa being allopatric in distribution (Formosa - New Guinea), it is tempting to consider *A. phyllochaeta* as subspecies. The experience of the genus *Drosophila* shows that such differences imply reproductive isolation. For this reason, we admit to the status of species *A. phyllochaeta*. Name: from the Greek, leaf-like bristle (arista).

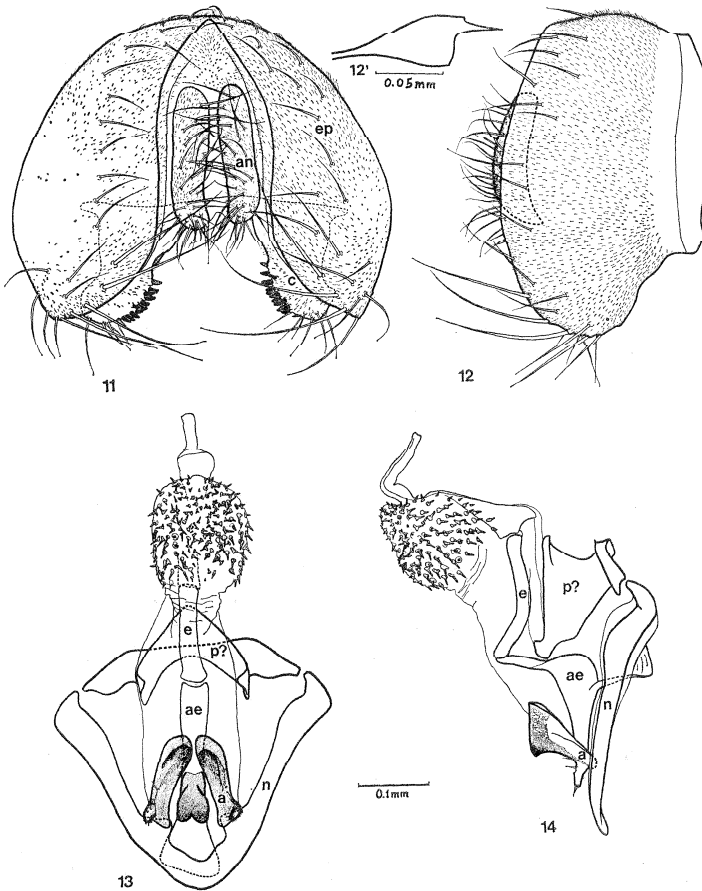
✓ *Amiota (Phortica) foliacea* sp. n.

Figs. 11-14

Species closely allied to *A. foliiseta* in general features and coloration but differing by a triangular leaf-like expansion of the male arista, surstylus with teeth, short anterior parameres and a spiny phallic structure.

♂. Body 3.3 mm in length. Antennae brown, third joint silvery pollinose. Arista with three basal short branches, with leaf-like expansion triangular, truncate, bearing a dorsal apical hair shorter than the width of the expansion (Fig. 12'). Palpi brown with about seven setae below. Frons velvety brown, ocellar triangle and the span between it and the orbits black with a milky white band along the eyes. Clypeus black with a milky white median spot. Carina low but long. Face black with two lateral milky white spots below. Cheek brown, broader than in the other species of the complex. Proclinate and posterior reclinate orbitals of equal length, anterior reclinate half as long as the other two orbitals. Vibrissa long, other orals fine. Mesoscutum gray with elongate brown patches, no vittae. Scutellum gray except for one apical brown band reaching the base of the anterior scutellars. Thoracic pleura gray with a brown patch on the centre of the mesopleuron. Anterior scutellars divergent, slightly longer than the posteriors. Sterno-index 0.95. Legs yellow. Wings hyaline, R_{4+5} and M convergent. C-index 2.4; 4V-index 2.5; 4C-index 2.0; 5x-index 1.3; Ac-index 4.0; Cx-index 0.6; C3-fringe 78%. Halteres whitish. Abdominal tergites black, 1T yellow with a lateral brown spot, 3T and 4T with small anterior lateral gray pollinose patch.

Periphallic organs (Figs. 11-12): Epandrium broad, with some long bristles. Surstylus with an irregular row of strong short teeth. Membrane between epandrium and cercus with setulae. Phallic organs (Figs. 13-14): Aedeagus rod-like, its terminal part forming a right angle with the basal part, apodeme narrower than in the other two species of the complex. A voluminous, membranous spiny structure at the apex of aedeagus. Anterior parameres short, broadened apically.



Figs. 11-14. *Amiota (Phortica) foliacea* sp. n. ♂. — 11, Periphallallic organs, posterior aspect; 12, *ibid.*, lateral aspect; 12', leaf-like expansion of the arista; 13, phallic organs, ventral aspect; 14, *ibid.*, lateral aspect. Signs as in Figs. 1-5.

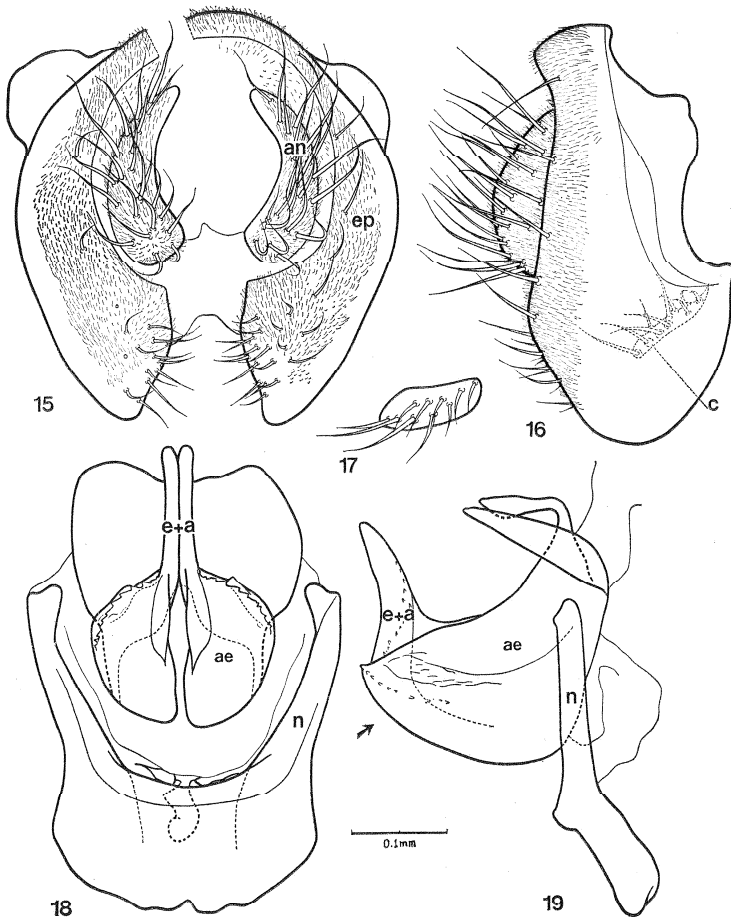
Holotype ♂, 1 ♂ paratype, Formosa, Chip Chip, III. 1899 (SAUTER), in H.N.H. M., Budapest. Name: from the Latin *foliaceus*=in shape of leaf.

Distribution. Formosa.

Amiota (Phortica) pappi sp. n.

Figs. 15-19

It is difficult to put this species into one of the subgenera of the genus *Amiota* since some of them, such *Erima*, are not well defined and the homologies of their



Figs. 15–19. *Amiota (Phortica) pappi* sp. n. ♂. — 15,Periphallallic organs; 16, ibid., lateral aspect; 17, surstylus; 18, phallic organs, ventral aspect; 19, ibid., lateral aspect, the arrow indicates the direction of observation in the ventral aspect (Fig. 18). Signs as in Figs. 1–5.

genitalia are not well established. However, we tentatively include this species in the subgenus *Phortica*.

♂, ♀. Body 2.0–3.3 mm in length. Antennae reddish brown. Arista without branches, no leaf-like apical expansion. Palpi brown, clear on the external board. Frons reddish brown, yellowish between eyes and ocellar triangle. Clypeus brown. Face brown. Cheek brown, narrow. Proclinate orbital a little longer than posterior reclinate. Anterior reclinate half as long as proclinate and situated in equal distance from the other two orbitals. Vibrissa moderate in length. Mesoscutum brownish gray, with obscure pollinose longitudinal stripes. Humeri

yellowish white, pollinose. Scutellum gray with a triangular brownish apical patch. Thoracic pleura gray, with large brown patches. Anterior scutellars divergent, as long as posteriors. Sterno-index 0.9. Legs yellow, femora brownish fuscous at the basal two-thirds. Tibiae with an apical and a median less distinct annuli, more conspicuous on the mid tibia. Wings hyaline, R_{4+5} and M convergent. C-index 2.4; 4V-index 3.3; 4C-index 2.0; 5x-index 1.1; Ac-index 4.1; Cx-index 0.6; C3-fringe 78%. Halteres whitish. Abdominal tergites black, 1T yellow with an anterior lateral brown spot, 2T brown, 3T with a small anterior lateral yellowish patch.

Periphallalic organs (Figs. 15–17): Epandrium superiorly narrowing, postero-inferiorly with some short bristles. Surstylus narrow, entirely inside the epandrium. Cercus curved, superiorly narrowing. Phallic organs (Figs. 18–19) of very complicated structure, the principal piece consists of a hollow, large and bifid sclerite.

Holotype ♂, 2 ♂ paratypes, Friedrich-Wilhelmshafen (Madang), Papua New Guinea, 1900 (BIRÓ), in H.N.H.M., Budapest. Other paratypes, Papua New Guinea: 62 ♂, 2 ♀, Wau, VIII–X. 1977 (OKADA); 5 ♂, McAdam Memorial Park, nr Wau, 22. IX. 1977 (OKADA); 1 ♂, Bulolo, 15. IX. 1977 (OKADA); 1 ♂, Garagos R., nr Lae, 28. IX. 1977 (OKADA); 2 ♂, Lae, 27–29. IX. 1977 (OKADA): mostly by sweeping and around human eyes, a few on fungi and at light traps, in Bishop Museum, National Science Museum, Tokyo, H.N.H.M. and Gif-sur Yvett.

Distribution. New Guinea.

This species resembles *Amiota (Erima) fasciata* (KERTÉSZ) in having bare arista in both sexes and annulated tibiae, but differs from the latter in male genitalia. Name: species dedicated to our colleague Dr. L. PAPP of Budapest.

Key to the New Species to Insert in That of OKADA (1971)

29. Frons with thick frontal hairs; tibiae without black annuli; arista plumose in female, with 2–3 short dorsal basal branches and apically swollen in male. *foliiseta* complex. 29a
- Frontal hairs absent; tibiae with black annuli; arista with at least dorsal branches. 30
- Some very short frontal hairs present; tibiae with an apical brown annulus; arista bare in both sexes. Genitalia figs. 15–19 (New Guinea) (cf., couplet 3) *pappi*
- 29a. Mesoscutum and scutellum black, with irregular gray pollinose patches, leaf-like expansion of arista cordiform. Male genitalia in TAKADA *et al.* (1973, figs. 4–6). *nigrifoliiseta*
- Mesoscutum and scutellum gray pollinose with brown patches, leaf-like expansion of arista otherwise shaped. 29b
- 29b. Frons velvety brown, ocellar triangle and space between it and orbits black; leaf-like expansion of arista triangular, truncate, with a dorsal apical hair

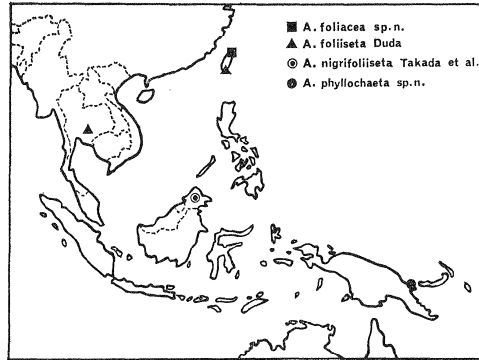


Fig. 20. Geographical distribution of the four species of *foliiseta* complex.

- shorter than the width of expansion (Fig. 12^o); coxa I brown, palpi dark brown. Genitalia figs. 11–14; surstylus with strong teeth. *foliacea*
- Frons reddish brown; leaf-like expansion of arista not triangular; coxa I and palpi yellow to reddish brown. Surstylus without strong teeth. 29c
- 29c. Apical brown spot of scutellum extending along its posterior border. Genitalia figs. 1–5. *foliiseta*
- Apical brown spot of scutellum triangular. Genitalia figs. 6–10.
 *phyllochaeta*

Summary

Three new species of the genus *Amiota* LOEW of Formosa and New Guinea are described. A key to these species is included in the previous key of thirty-five species of *Amiota* published by OKADA (1971). A species complex is defined to include the four species with a leaf-like apical expansion of male arista under the name *foliiseta* complex.

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