INSECTS OF MICRONESIA
Homoptera: Psyllidae

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INTRODUCTION

Psyllidae, sometimes erroneously called Chermidae, are abundant in Asia and Australia; many occur in the Philippines and Formosa. They have not migrated into Micronesia with any great success, however, and representation dwindles rapidly from west to east until no specimens are known from east of Kusaie.

Previous work on the psyllids of Micronesia is limited to that of Caldwell (B. P. Bishop Mus., Bull. **172,** 1942) and two papers by myself [B. P. Bishop Mus., Occ. Papers **17** (6), 1942; Pacific Science **5** (3), 1951]. The present work is based on over 400 specimens representing these earlier collections as well as those made especially for the present Insects of Micronesia program. The great majority of them consists of *Mesohomotoma hibisci* and *Leptynoptera sulfurea.*

It has been necessary to erect several new genera for specimens in the present collections. Because the fauna of much of eastern Asia is so little known, it is impossible to say whether these genera are endemic to Micronesia or are also found on the mainland of Asia.

The drawings in this paper have been made by Thomas Haar, Jean Poulter, and the author.

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The following abbreviations are used to indicate institutions in which specimens are deposited: US (United States National Museum), BISHOP (B. P. Bishop Museum), CM (Chicago Natural History Museum), and CAS (California Academy of Sciences).

Distribution of Micronesian Psyllidae

	Micronesian Island Groups										Other Localities
					Caroline						
	Bonin	Volcano	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	
1. Mesohomotoma hibisci	×	×	×	×	×	×	×		×	×	Australia, Okinawa, Solomon Is., New Caledonia, Society Is., Austral Is., Rapa
2. Nesiope ornata				×				×	×		Fiji, Borneo
3. Leptynoptera sulfurea				×	×	×	×		×	×	Amboina, Fiji ?
4. Chineura latipennis*				×							
5. C. paucivena*					×						
6. Trigonon longicornis					×	×					Larat, Amboina
7. Epipsylla albolineata					×						Taiwan
8. Insnesia disjuncta*								×			
9. I. clara									×	×	
10. I. extrema				×							
11. I. glabrascuta				×			×				
12. Isogonoceraia venusta*				×							
13. Trioza guama				×							
14. T. suavis					×						
15. T. disjuncta					×						
16. T. indigena									×		
17. T. lyra									×		
18. T. vitiensis									×		Fiji, Samoa, Society Is., Marquesas, Amboina, Singapore, Ceylon
19. T. swezeyi					×						Fiji, Samoa
20. T. praelonga*										×	
21. T. fulgidiceps*					×						
22. T. catillus*				×							

* Described as new.

SYSTEMATICS

FAMILY PSYLLIDAE

KEY TO GENERA OF MICRONESIAN PSYLLIDAE

1. Head deeply cleft anteriorly, antennae borne on protruding genae; fore wings with one or more cross veins (fig. 1) 2
   Head not cleft although genae may be produced as long processes, antennae not borne on apex; fore wings without cross veins 3
2. Fore wing with one cross vein, between Rs and M; without pterostigma ..... **Mesohomotoma**
   Fore wing with two cross veins, between Rs and M and Rs and pterostigma; with pterostigma ..... **Nesiope**
3. Fore wing without pterostigma 4
   Fore wing with pterostigma 7
4. Genae not produced into conical processes 5
   Genae produced as acute or blunt conical processes 6
5. Cubitus of fore wing unbranched, Rs and M_1 not touching ..... **Leptynoptera**
   Cubitus of fore wing branched normally, Rs and M_1 touching at midpoint of Rs ..... **Chineura**
6. R, M, and Cu of fore wing arising from basal vein at one point ..... **Trioza**
   R arising from basal vein separately, and M and Cu with common petiole ..... **Epipsylla**
7. Genae produced as prominent, more or less conical processes 8
   Genae not produced ventrally ..... **Trigonon**
8. Small delicate species; antennae less than twice as long as width of head, segments 3 to 10 of nearly equal length ..... **Isogonoceraia**
   Large robust species; antennae at least three times as long as width of head, segments 3 to 10 of decreasing length ..... **Insnesia**

Genus **Mesohomotoma** Kuwayama

1. **Mesohomotoma hibisci** (Froggatt).

   Tyora hibisci Froggatt, 1901, Linn. Soc. New South Wales, Proc. **26** (2): 287-288.

   Udamostigma hibisci Enderlein, 1910, Wissensch. Ergeb. Schwed. Zool. Exped. Kilimandjaro, 1905-1906, Hemiptera (Psyllidae), 138 [fide Crawford, 1925].

   Mesohomotoma hibisci, Crawford, 1925, Hawaiian Ent. Soc., Proc. **6**: 32.—Klyver, 1935, B. P. Bishop Mus., Bull. **113**: 125-127.—Tuthill, 1951, Pacific Science **5** (3): 273.

DISTRIBUTION: Pacific from Australia north to the Ryukyu and Bonin Islands, east to the Austral Islands.

BONIN IS. CHICHI JIMA: Sakai Ura, Aug. 1949, Mead; July 1951, Bohart; May 1958, Snyder.

VOLCANO IS. IWO JIMA: Sept. 1945, Dybas.

N. MARIANA IS. AGRIHAN: Aug. 1945, Borror-Holder. ANATAHAN: Aug. 1951, Bohart.

S. MARIANA IS. SAIPAN: Jan. 1945, Dybas; Magicienne Bay, Jan. 1945, Dybas; Mt. Tagpochau, Jan. 1945, Dybas; Lake Susupe, June and July 1946, Townes; Papago area, Jan. 1945, Dybas. GUAM: Dededo, July 1938, Sumay R., May 1945, Gressitt; southeast coast, May 1945, Gressitt and Bohart; Pt. Oca, May 1945, Gressitt and Bohart; Pago Bay, June 1945, Dybas; Fadang, June 1945, Dybas; Mt. Alifan, Apr. 1946, Krauss; 1 mile southeast of Asan, Oct. 1947, Dybas; Anderson Air Force Base, Aug. 1952, Krauss; Mt. Bolanos, Aug. 1952, Krauss; Talofofo, Aug. 1952, Krauss; Pt. Ritidian, Oct. 1952, Krauss; Mt. Lamlam, Oct. 1952, Oct. 1957, Krauss, Nov. 1952, Gressitt; Barrigada, Nov. 1952, Gressitt, Jan. 1954, Liming.

PALAU. BABELTHUAP: Ulimang, Dec. 1947, Dybas. ANGAUR: Feb. 1948, Dybas. KOROR: Dec. 1952, Beardsley. PELELIU: Feb. 1948, Dybas.

YAP. YAP: Kolonia, Mar. 1949, Maehler; Aug.-Oct. 1952, Krauss; Kolonia, Apr. 1954, Beardsley. RUMUNG: July-Aug. 1950, Goss.

CAROLINE ATOLLS. WOLEAI: Woleai, Falalis, Saliap, Utagal Is., Sept. 1952, Krauss; Falalis I., Feb. 1953, Beardsley. MERIR: Sept. 1952, Krauss. IFALUK: Ifaluk I., Feb. 1953, Beardsley. LAMOTREK: Lamotrek I., Feb. 1953, Beardsley. ELATO: Elato I., Feb. 1953, Beardsley. FARAULEP: Faraulep I., Feb. 1953, Beardsley. KAPINGAMARANGI: Matiro I., Aug. 1946, Townes; Werua I., July 1954, Niering; Hare I., June and Aug. 1954, Niering; Touhou I., July 1954, Niering. MOKIL: Jan. 1953, Gressitt. PINGELAP: Jan. 1953, Gressitt.

PONAPE. Feb. 1948, Dybas; Colonia, Peipalap, and Not Pt., June-Sept. 1950, Adams; Colonia, Jan. 1953, Gressitt; Mt. Temwetemwensekir, Feb. 1948, Dybas, Jan. 1953, Gressitt; Nanponmal and Jokaj, Jan. 1953, Gressitt; Colonia, Aug. 1956, Tuthill; Nanpil, Net Dist., Feb. 1948, Dybas.

KUSAIE. Matanluk, Jan. 1953, Gressitt; Mt. Fenkol, Jan. 1953, Gressitt; Innem R., Feb. 1953, Clarke.

Klyver (1935) describes and figures this species, the hibiscus or hau psyllid, in detail. Although I searched for this species on its host plant, *Hibiscus tiliaceus,* on Majuro in the Marshall Islands, I was unable to find it. Apparently it has not crossed the gap between Kusaie and the Marshalls. It is certainly the most common and conspicuous species of psyllid in western Micronesia. Specimens, heretofore unreported, are also at hand from Okinawa and Guadalcanal, Solomon Is.

HOST: *Hibiscus tiliaceus* L.

Genus **Nesiope** Kirkaldy

Although Crawford considered *Nesiope* to be a synonym of *Tyora,* I prefer to treat it as distinct until the nature of the head of *Tyora* can be learned. The position of the cross veins in the fore wing is quite different from that illustrated by Scott for *Tyora.* In the latter the first cross vein is between the apex of the

pterostigma and the r-m cross vein rather than nearer the base of the wing as it is in *Nesiope*. This alone is certainly not sufficient for generic distinction but the possibility is that the head of *Tyora* may be quite different.

2. **Nesiope ornata** Kirkaldy (fig. 1).

Nesiope ornata Kirkaldy, 1908, Linn. Soc. New South Wales, Proc. **33**: 390.—Crawford, 1919, Philippine Jour. Sci. **15**: 161.—Laing, 1922, Ann. Mag. Nat. Hist. IX, **9**: 555.

Tyora ornata, Crawford, 1920, Philippine Jour. Sci. **17**: 355.—Caldwell, 1942, B. P. Bishop Mus., Bull. **172**: 21.—Tuthill, 1951, Pacific Science **5** (3): 273.

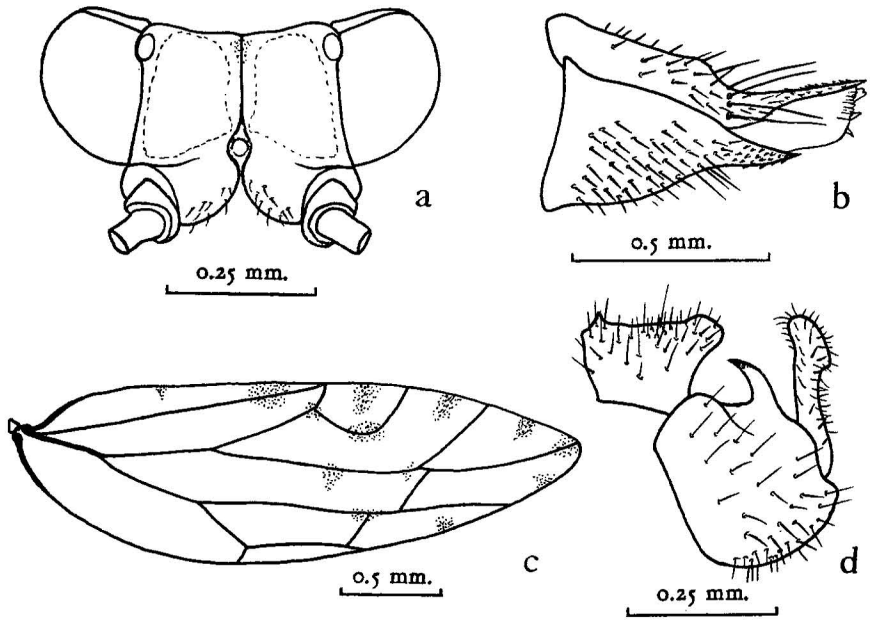

FIGURE 1.—*Nesiope ornata:* **a**, head, dorsal aspect; **b**, female cauda, lateral aspect; **c**, fore wing; **d**, male cauda, lateral aspect.

Length to tip of folded wings, 3.5-4 mm.

Color: General color testaceous. Tips of antennal segments, markings on thorax and abdomen, and maculations on fore wings, brown.

Structure: Head narrower than thorax, slightly declivous. Vertex flat, quadrate, caudal margin straight, medial suture prominent, margins of each half distinct, raised, anterolateral margins flared forward and up above base of antennae. Genae covering frons, strongly produced anteriorly as strongly divergent bases for antennae. Front ocellus nearly dorsally oriented. Antennae 2.4 times as long as width of head. Thorax quite flat dorsally. Pronotum on same plane as remainder of thorax, long and broad, anterior and posterior margins parallel, with small but distinct tubercle on anterior

margin each side of middle. Propleural suture very distinct, sharply flexed caudally before apex. Fore wings elongate, slender, tapering to acute apex, pterostigma present, basal vein very short, marginal cells small, two cross veins present, one from Rs to near apex of pterostigma, another from base of medial cell to Rs. Hind wings large, 0.75 as long as fore wings. Legs very stout, tibiae short. Hind tibiae shorter than femora, with large basal spur, one outer and three inner black-tipped apical spines, anterior, and largest, inner spine bifurcate. Basal segment of metatarsi with black claw on outer apical angle.

DISTRIBUTION: Fiji, Borneo, Caroline Is., S. Mariana Is.
S. MARIANA IS. GUAM: Sumay, June, July 1936, Swezey.
TRUK. TONOAS: Kutua, July 1939, Esaki.
PONAPE. Colonia, Dec. 1937, Esaki.
HOST: *Heritiera littoralis* Ait.

Genus **Leptynoptera** Crawford

3. **Leptynoptera sulfurea** Crawford (fig. 2).

Leptynoptera sulfurea Crawford, 1919, Philippine Jour. Sci. **15** (2) : 147.—Caldwell, 1942, B. P. Bishop Mus., Bull. **172** : 20.—Tuthill, 1951, Pacific Science **5** (3) : 273.

Leptynoptera didactyla Laing, 1922, Ann, Mag. Nat. Hist. IX, **9** : 554.

DISTRIBUTION: Amboina, Fiji?, S. Mariana Is., Caroline Is.

S. MARIANA IS. GUAM: Yigo, Umatac, 1936, Swezey.

PALAU: NGAIANGL: May 1957, Sabrosky. KOROR: June 1953, ex *Calophyllum inophyllum,* Beardsley.

YAP. YAP: Oct. 1952, Krauss; Mt. Gillifitz, Nov. 1952, Gressitt. RUMUNG: Oct. 1952, Krauss.

CAROLINE ATOLLS. TOBI: Sept. 1952, Krauss. FARAULEP: Faraulep I., Feb. 1953, Beardsley.

PONAPE: Agric. Expt. Sta., June-Sept. 1950, Adams; Peipalap Pk., June-Sept. 1950, Adams.

KUSAIE. Matanluk, Jan. 1953, Gressitt.

HOST: *Calophyllum inophyllum* L.

This very distinctive species is widespread throughout western Micronesia with its host plant *Calophyllum inophyllum* L. It is readily recognized by the very peculiar shape and venation of the fore wings and the abortive hind wings as well as the other structures as described by Crawford.

Genus **Chineura** Tuthill, new genus

Type species: *Chineura latipennis,* n. sp., here designated.

Small species. Head broad, eyes large, vertex rounded down, without distinct margin, anteriorly. Genae widely separated, swollen and more or less produced anterolaterad as small blunt projections. Margin of antennal insertion raised, especially dorsomedially where it projects over base of antenna. Frons visible ventrally, Clypeus large, visible in frontal view. Antennae slender, not as long as body, two large setae

on terminal segment unusually long. Thorax broad. Mesothorax strongly produced dorsad. Pronotum short, vertical. Fore wings short, very broadly rounded, without pterostigma, mediocubital petiole present, shorter than R, Rs and M touching. Meracanthae present, small. Metatibiae unarmed basally, with several slender spines along outer margin and row around apex concolorous with tibiae, not black. Proximal segment of metatarsi with two very small apical claws.

Apparently the species placed here are most closely related to *Pauropsylla* of any of the known genera. The coalescence of Rs and M in the fore wing is distinctive except for *Pauropsylla tuberculata* Crawford. As I have seen no

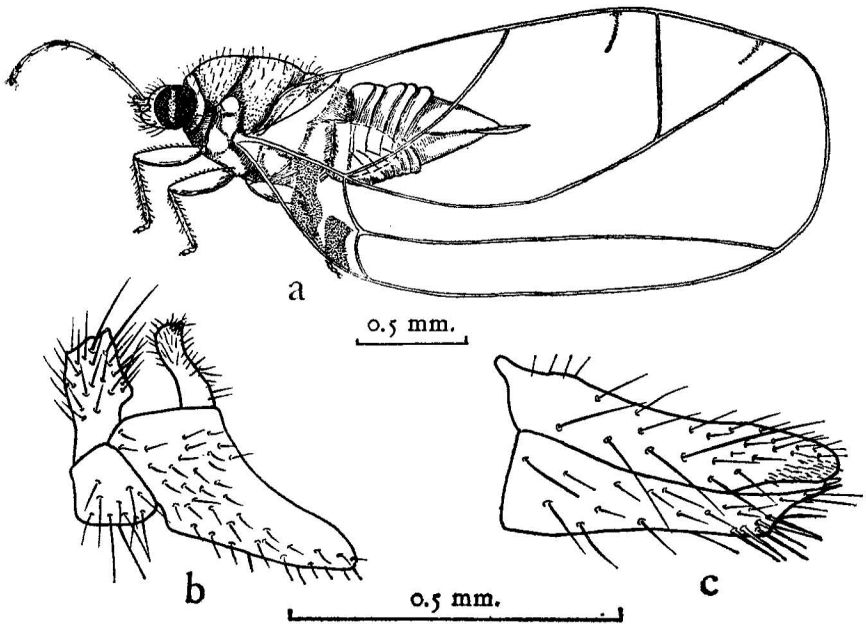

FIGURE 2.—*Leptynoptera sulfurea:* **a**, entire insect, lateral aspect; **b**, male cauda, lateral aspect; **c**, female cauda, lateral aspect.

specimens of *P. tuberculata,* I am unable to assign it to *Chineura* with any certainty but the venation would indicate a close relationship. The venation of the type of *Pauropsylla, P. udei,* is very different. In addition to venational differences, the structure of the genae in *Chineura* is distinct from *P. udei.*

The name *Chineura* is derived from the Greek letter χ and *neuron,* nerve, for the peculiar venation of the fore wing in which Rs and M_1 meet to form an X.

4. Chineura latipennis Tuthill, n. sp. (fig. 3).

Length to tip of folded wings, 1.5 mm.

Color: General color testaceous, center of vertex, spots on thoracic dorsum, and dorsum of abdomen yellow to orange, sides of abdomen brown. Wings translucent with indefinite brownish maculation as indicated on figure.

Structure: Body surface finely punctate. Head short, as wide as thorax. Vertex over twice as wide as mid length, rounded down anteriorly and narrowed between antennae, small pit each side of medial suture near caudal margin. Lateral ocelli on raised protuberances. No suture between vertex and genae. Genae roundly swollen and produced laterad below antennae as small upturned projections. Frons narrow, visible between genae. Margin of antennal sockets raised sharply except toward eyes. Antennae slender, slightly longer than width of head, segments of flagellum nearly equal in length. Eyes nearly hemispherical. Thorax very highly arched. Pronotum very short, nearly vertical, folded back along mesoprescutum as broad V. Fore wings short, broad, shape and venation as figured, lower surface of membrane with numerous small points in definite reticulate pattern. Hind wings large, nearly reaching tip of fore wings,

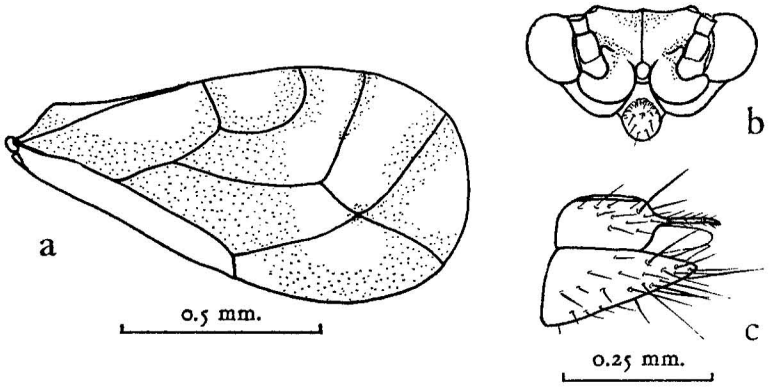

FIGURE 3.—*Chineura latipennis:* **a**, fore wing; **b**, head, frontal aspect; **c**, female cauda, lateral aspect.

venation prominent. Legs slender. Metatibiae longer than femora, unarmed at base, apex with continuous row of slender, lightly pigmented spines on sides and anterior margin. Pair of black clawlike spines on proximal segment of metatarsi, terminal tarsal claws very small.

Female genitalia as long as rest of abdomen, structure as figured. Male unknown.

Holotype, female (CM) and two paratypes (BISHOP, author's collection), Guam, Fadang, beating vegetation, May 31, 1945, Dybas; one female paratype, 1 mi. southeast of Asan, Guam, alt. 180-240 m., Nov. 1, 1947, Dybas.

HOST: Unknown.

5. Chineura paucivena Tuthill, n. sp. (fig. 4).

Length to tip of folded wings: 1.5 mm. (male); 1.75 mm. (female).

Color: Undeterminable as all specimens were preserved in alcohol.

Structure: Body surface nearly glabrous. Head as wide as thorax. Vertex smooth, evenly rounded down to frons, no suture between vertex and genae. Lateral ocelli on prominent protuberances, above level of eyes. Eyes large, rounded. Genae swollen ventrally, very slightly produced anteriorly below antennae. Frons broadly visible. Clypeus prominent, visible in cephalic view. Margin of antennal sockets raised, not as strongly as in *Ch. latipennis.* Antennae nearly twice as long as width of head, stout,

segment 3 longest, 4 to 8 nearly equal, 9 and 10 very short, 10 with two very long setae. Thorax strongly arched. Pronotum nearly vertical and straight. Fore wings short, broad, immaculate, nearly twice as long as wide, venation as figured, similar to that of *latipennis* except Cu unbranched. Legs long, slender, metathoracic legs very long. Metatibiae unarmed basally, with fringe of setae at apex, no large black spines. Proximal segment of metatarsi with two small black claws. Male and female genitalia as figured.

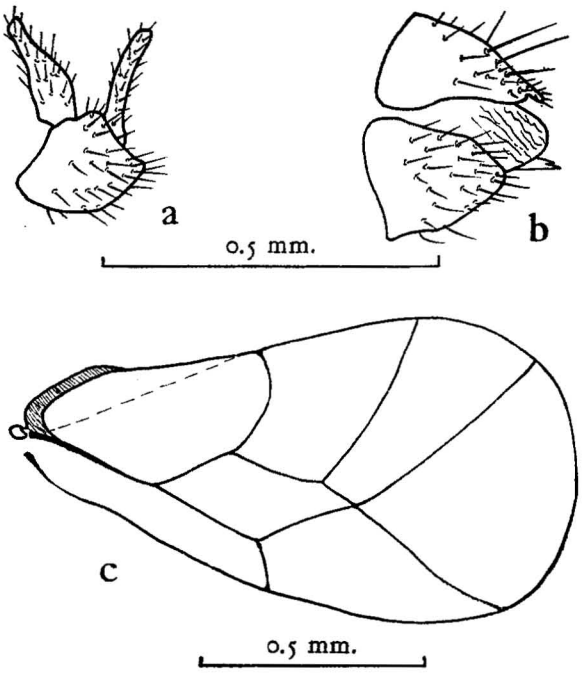

FIGURE 4.—*Chineura paucivena:* **a**, male cauda, lateral aspect; **b**, female cauda, lateral aspect; **c**, fore wing.

Holotype, male (US 66303), allotype, female (BISHOP), one male paratype (author's collection), Ulebsehel (Aurapushekaru), Palau Is., beating vegetation, January 14, 1948, Dybas.

HOST: Unknown.

Genus **Trigonon** Crawford

6. Trigonon longicornis (Crawford). (Figure 5.)

Heteropsylla longicornis Crawford, 1919, Philippine Jour. Sci. **15** (2): 153.

Trigonon longicornis, Crawford, 1920, Philippine Jour. Sci. **17**: 355.

DISTRIBUTION: Larat, Amboina, Caroline Is.

PALAU. BABELTHUAP: Iwang, Dec. 1952, Gressitt.

YAP. YAP: July 1951, Gressitt; Mar. 1954, and Kolonia, Apr. 1954, Beardsley; Giliman, June 1957, at light, Sabrosky.

HOST: Unknown.

Well described by Crawford in 1919, this species is represented in the material at hand by specimens from Yap and Babelthuap. The head and genitalia are figured here for the first time.

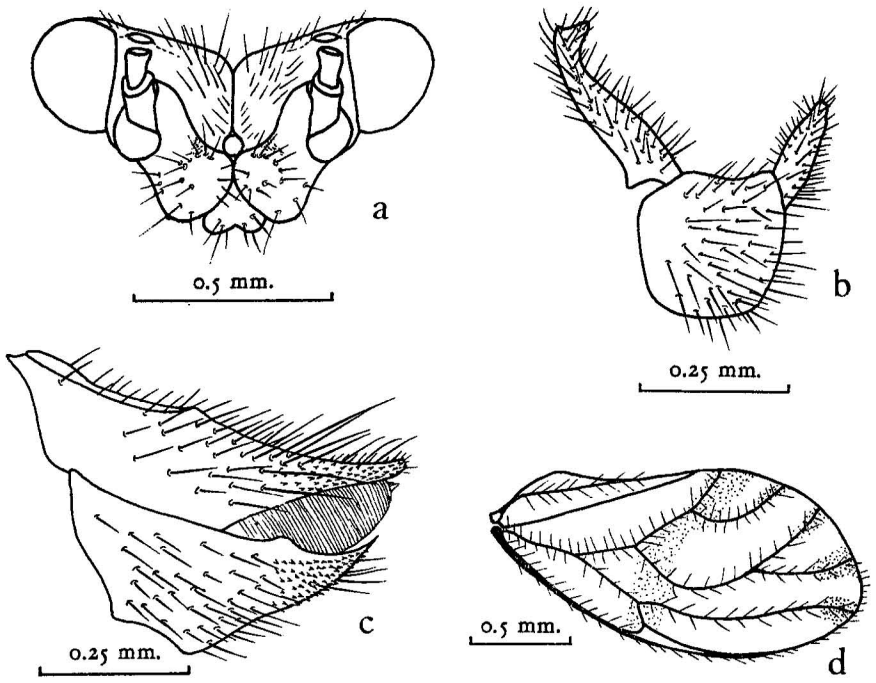

FIGURE 5.—*Trigonon longicornis:* **a**, head, frontal aspect; **b**, male cauda, lateral aspect; **c**, female cauda, lateral aspect; **d**, fore wing.

Genus **Epipsylla** Kuwayama

7. Epipsylla albolineata Kuwayama (fig. 6).

Epipsylla albolineata Kuwayama, Shigeru, 1908, Sapporo Nat. Hist. Soc., Trans. 2 (1, 2): 178.—Crawford, 1919, Philippine Jour. Sci. **15** (2): 177.—Kuwayama, Satoru, 1931, Ins. Matsumurana **5** (3): 126.

Length to tip of folded wings, 3.75 mm.

Color: General body color yellowish green to brownish yellow. Fore wings yellowish. Prominent white stripe, bordered with black, extending from tip of each genal process, across vertex and dorsum of thorax to metascutum where they unite.

Structure: Body stout, sparsely set with prominent setae, wings unusually broad. Head slightly declivous, as wide as thorax. Vertex with deep discal foveae, very strongly raised laterally as elongate lobe above eyes and projecting forward toward base of antennae. Lateral ocelli on lateral surface of lobes, above eyes. Anterior margin of vertex nearly straight, rounded down to genal processes, latter in same plane as vertex, slightly lower, as long as medial length of vertex, with many long setae, covering frons. Antennae on side of head, below level of vertex, in front of eyes, very long and slender, slightly more than four times as long as width of head, 1.6 times as long as

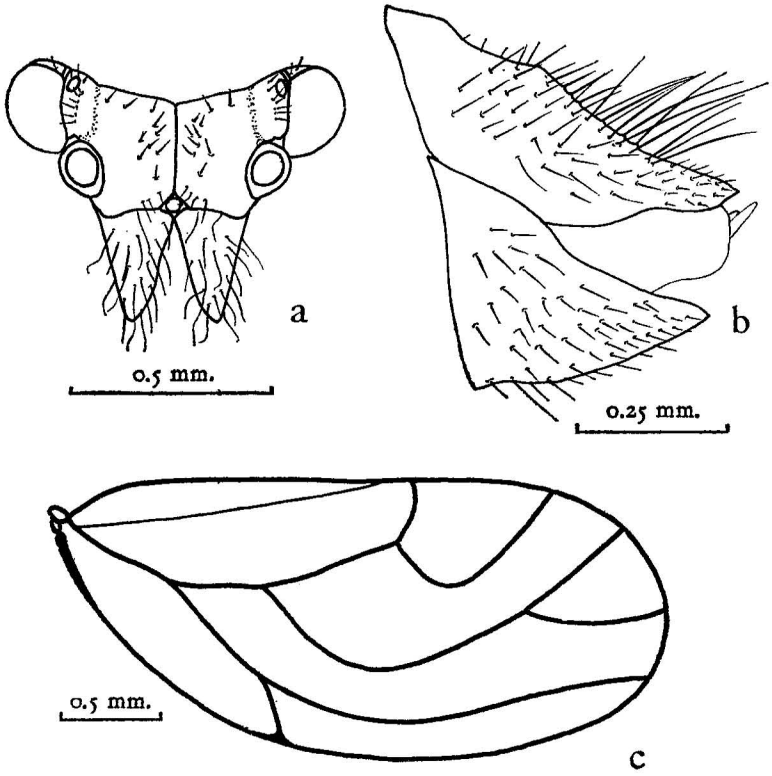

FIGURE 6.—*Epipsylla albolineata:* a, head, frontal aspect; b, female cauda, lateral aspect; c, fore wing.

body. Thorax broad, weakly arched longitudinally. Pronotum on same level as vertex and mesonotum. Propleural suture extending to small medial knob at junction with pronotum. Metascutum prominent, produced caudad as broad rounded lobe. Fore wings only slightly more than twice as long as wide, broadly rounded, costa almost evenly curved from base to apex, Cu_1 strongly arched, cubital cell larger than medial, Rs and M almost parallel. Hind wings nearly reaching tip of fore wings. Tibiae very long. Hind tibiae unarmed basally, with row of small, closely set, black setae around anterior margin of apex. Basal segment of metatarsi with two small black claws.

Female genital segment shorter than rest of abdomen. Structure as figured.

DISTRIBUTION: Taiwan (Formosa), Caroline Is.

PALAU. BABELTHUAP: Female, Ulimang, Dec. 1947, Dybas. KOROR: Female, July 1953, resting on foliage of *Derris* sp., Beardsley.

HOST: Unknown.

The two females at hand appear to be this species which was originally described from Formosa by Kuwayama. The minor discrepancies between his description and these specimens can only be properly assessed when Formosan specimens are available for comparison.

Genus **Insnesia** Tuthill, new genus

Robust species. Head wider than thorax. Vertex more or less declined from plane of notum, narrowed anteriorly, bulging over median ocellus, with more or less prominent tubercle against each eye behind antennal socket. Genae produced as blunt cones; either contiguous covering frons, or separated exposing frons. Antennae three times as long as width of head or longer, segments 3 to 10 very slender. Eyes recessive, extending back over propleura. Thorax broad. Pronotum broad and moderately long, forming continuing surface with vertex and mesonotum. Basalares (epipleurites or paraptera) prominent, tuberculate. Fore wings broad, broadly rounded apically, pterostigma prominent, venation psylline, Cu_1 highly arched, cubital cell somewhat quadrate. Hind wings large, venation distinct. Legs stout. Tibiae scarcely longer than femora. Metatibiae with stout basal spur, several heavy black spines at apex. Proximal segment of metatarsi with pair of black claws. Male proctiger simple, forceps large, flat, variously enlarged apically. Female genital segment large, heavy, longer than rest of abdomen.

Type species: *Insnesia disjuncta,* n. sp.

This genus is erected for a group of species formerly placed in *Arytaina.* However, as Heslop-Harrison has emphasized (Ann. Mag. Nat. Hist. XII, **4**: 417-560, 1951), many of the forms previously assigned to that genus cannot possibly be considered congeneric with *Arytaina genistae,* the type species. The species here assigned to *Insnesia* are far removed from true *Arytaina.* They are closest to *Psylla* and it might be argued that they constitute only a subgenus of that large genus. However, they not only form a distinct natural group but appear to have adequate structural distinctness to justify their separation as a genus. The most distinct structural differences are the short, blunt, conical genal processes which may or may not cover the frons, the preocellar (or postantennal) tubercles on the vertex, the very long, slender antennae, the highly arched Cu_1 in the fore wing, and the type of genitalia.

In addition to the type species, the following are placed here: *Arytaina clara* (Tuthill), *A. glabrascuta* Caldwell, and *A. extrema* Tuthill. It seems possible that various of the Asian species assigned to *Arytaina* by Crawford also should be assigned to *Insnesia,* especially those species in which he indicated a preocellar tubercle on the vertex and spatulate forceps in the male, such as *A. tuberculata, A. iolani* and *A. meridionalis.* As I have been unable to examine specimens of these species, they are not assigned to *Insnesia* at present.

metatibiae with stout basal spur, several heavy black spines at apex. Proximal seg-

Certainly they all have much shorter antennae than those considered here and perhaps other differences.

The name *Insnesia* is compounded of the first three and last five letters of Insects of Micronesia, the present publication.

8. Insnesia disjuncta Tuthill, n. sp. (fig. 7).

Length to tip of folded wings, 3.0-3.5 mm.

Color: General body color orange to brown. Varying spots and longitudinal stripes

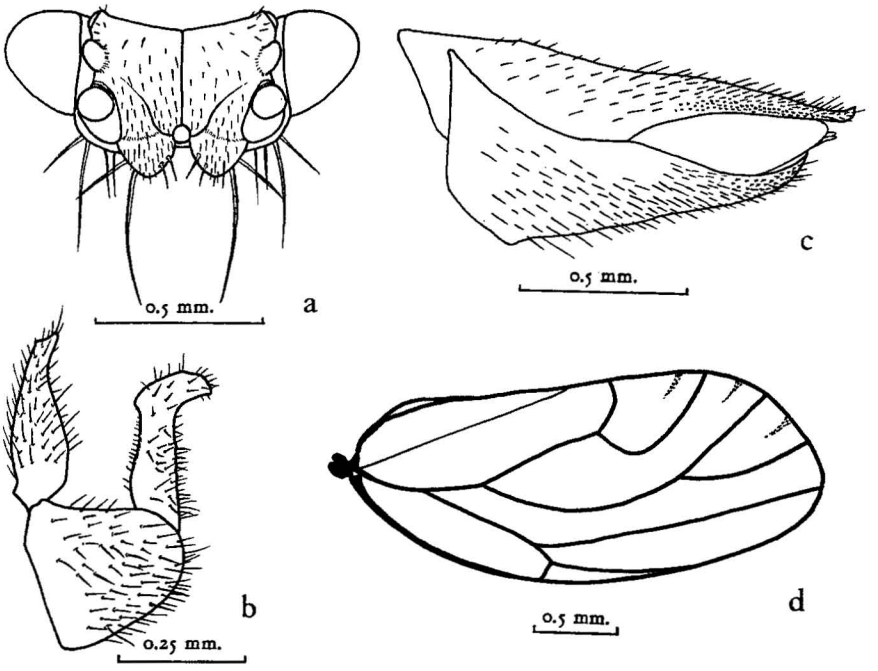

FIGURE 7.—*Insnesia disjuncta:* **a**, head, frontal aspect; **b**, male cauda, lateral aspect; **c**, female cauda, lateral aspect; **d**, fore wing.

on dorsum light green. Abdomen mostly pale anteriorly, dark brown caudally. Wings transparent, veins light brown.

Structure: Head broader than thorax. Vertex rather flat, narrowed anteriorly, rounded down to median ocellus. Lateral ocelli on tubercles, above level of eyes. Prominent rounded tubercle anterior to each ocellus. Genae distinct from vertex, produced over antennal socket, widely separated, exposing frons, extending ventrad as short blunt cones, 0.33 as long as medial length of vertex, with several very stout setae, one extremely large, as long as medial length of vertex. Antennae 4.3 times as long as width of head, segment 1 very stout, 3 to 10 very slender. Eyes somewhat elongate, recessive, extending nearly to mesonotum. Thorax broad, well arched dorsally. Pronotum long medially, very short laterally. Legs stout. Metatibiae scarcely longer than femora, with large basal spur; apical armature: one outer, one inner and three anterior heavy black spines. Claws of proximal segment of metatarsus very prominent. Mera-

canthae small, straight, conical. Fore wings broad, broadly rounded apically, 2.5 times as long as wide, pterostigma of moderate size, opaque, venation as figured, membrane with prominent points throughout, alar radulae very prominent. Hind wings large, 0.8 as long as fore wings, membrane also with sclerotic points, veins very distinct.

Male genitalia as figured. Female genital segment much longer than rest of abdomen, structure as figured.

Holotype, male (US 66304), allotype, female (US), Truk, Tol I., Mt. Unibot, 390 m., Jan. 2, 1953, Gressitt. Paratypes: One (BISHOP), Truk, Tol I., Mt. Unibot, light trap, 200 m., Dec. 30, 1952, two males, same data as types, male, 390 m., Feb. 4, 1953, all Gressitt; female (CAS), Moen, Civ. Ad. Area, at light, May 10, 1949, Potts; female (US), Dublon, 300-360 m., May 28, 1946, Townes.

DISTRIBUTION: Caroline Is. (Truk).

HOST: Unknown.

9. Insnesia clara (Tuthill).

Ataenia clara Tuthill, 1942, B. P. Bishop Mus., Occ. Papers **17** (6): 77.

Arytaina clara Tuthill, 1951, Pacific Science **5** (3): 273.

DISTRIBUTION: Caroline Is.

PONAPE. Wapar, Feb. 1936, Ono; Colonia, Dec. 1937 and Jan. 1938, Esaki; Mt. Kupuriso, Mar. 1948, Dybas; Agric. Expt. Sta. and Matalanim Plantation, June-Sept. 1950, Adams.

KUSAIE: Hill 1010, Feb. and Apr. 1953, Clarke.

HOST: Unknown.

The first specimens of this species from elsewhere than Ponape are in the present collection, taken in a light trap at 300 meters on Kusaie.

10. Insnesia extrema (Tuthill).

Arytaina extrema Tuthill, 1951, Pacific Science **5** (3): 274.

(non) *Arytaina iolani,* Caldwell, 1942, B. P. Bishop Mus., Bull. **172**: 21.

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. SAIPAN: Matansha-Calabera, Garapan, Garapan-Sadog, Tasi, Tapocho, Fanagam, May 1940, Yasumatsu and Yoshimura; Papago area and Talofofo Ridge, Jan. 1945, nr. Garapan, May 1945, and Halaihai-As Teo area, Feb. 1945, Dybas; Jan. 1945, Hagen; Kannat Edot, one, swept from *Acacia confusa,* three from *Aglaia* sp., June 1946, Townes. TINIAN: Mar. 1945, Hagen; central section and Mt. Lasso, March 1945, Dybas; Apr. 1945, Dybas; Marpo Valley, Oct. 1945, Dybas. AGIGUAN: May and June 1952, Kondo; May 1952, Peterson; May 1952, Owen. GUAM: Northern part, Apr. 1946, Krauss.

HOST: Unknown, possibly *Aglaia* sp.

Identified by Caldwell as *Arytaina iolani* Crawford, this is however quite distinct. Although it is apparently very common on some of the Marianas, no indication of its hostplant is given by any of the collectors although several collections of nymphs are in the material at hand.

Esaki; Mt. Kupuriso, Mar. 1948, Dybas; Agric. Expt. Sta. and Matalanim

11. Insnesia glabrascuta (Caldwell). (Figure 8.)

Arytaina variabilis glabrascuta Caldwell, B. P. Bishop Mus., Bull. 172: 22.

Length to tip of folded wings, 2.25-3.0 mm.

Color: General color yellowish brown; longitudinal vittae on mesoscutum, ventral portion of mesothorax, femora, part of abdomen, and genitalia of both sexes darker brown. Eyes red. Fore wings somewhat milky, with dark-brown maculae as figured.

Structure: Head declivous, including eyes, much broader than mesothorax. Vertex plane, with slight discal foveae, lateral margins raised above eyes, produced behind antennae as distinct rounded protuberance, anteriorly slightly protruding on each side above median ocellus. Lateral ocelli on lateral margins above eyes. Genal processes large, stout, rounded anteriorly, covering frons, less than 0.5 as long as medial length of vertex. Antennae slender, more than three times as long as width of head, nearly as long as body and folded wings. Eyes large, somewhat elongate and recessive. Dorsum of thorax broad, relatively flat. Pronotum long, on same plane as vertex. Fore

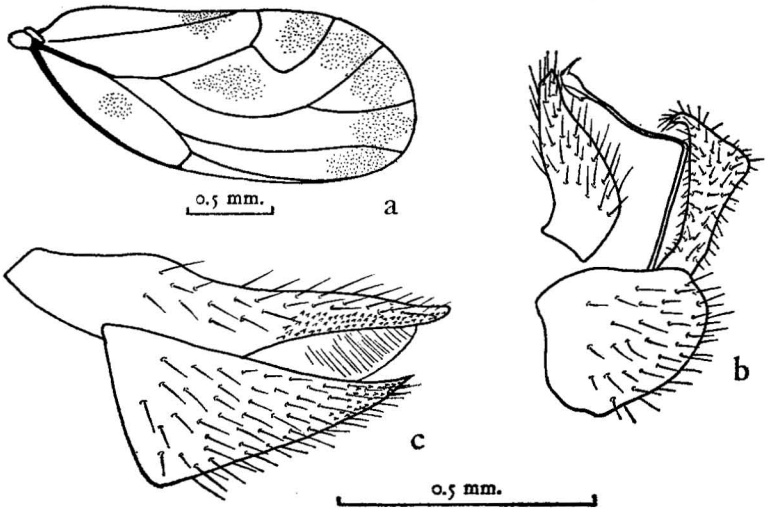

FIGURE 8.—*Insnesia glabrascuta:* a, fore wing; b, male cauda, lateral aspect; c, female cauda, lateral aspect.

wings broad, approximately 2.3 times as long as wide, broadly and evenly rounded apically. Pterostigma prominent, short; Cu_1 highly arched. Metatibiae with prominent basal spine with one outer, one inner and a cluster of three anterior apical spines.

Male and female genitalia similar to that of *clara* and *extrema*. Details as figured.

DISTRIBUTION: S. Mariana Is., Caroline Atolls.

S. MARIANA IS. SAIPAN: Kannat Edot, June 1946, *Intsia bijuga,* Townes. ROTA: June 1946, on *Intsia bijuga* Townes. GUAM: Jan.-Apr. 1945, Rollin Baker; Ordot and Pt. Oca, May 1945, Bohart and Gressitt; Fadang, May 1945, Dybas; Pt. Oca, July 1945, Bohart and Gressitt; Talofofo, Apr. 1946, Krauss; Talofofo Village, May 1948, on *Intsia bijuga* (ifil); Yigo, May 1945, Dybas; Mt. Alifan, Apr. 1946, Aug. 1952, Krauss.

CAROLINE ATOLLS. ULITHI: Potangeras I., Nov. 1947, Dybas.

HOST: Probably *Intsia bijuga,* the ifil tree, although no record of nymphs is known.

The distinctively marked wings of this species serve to separate it immediately from other members of the genus as well as from all other psyllids known from Micronesia. Previously known only from Guam, specimens are at hand from Ulithi Atoll, Rota, and Saipan.

Genus **Isogonoceraia** Tuthill, new genus

Type species: *Isogonoceraia venusta* n. sp., here designated.

Small species. Head as broad as thorax. Eyes large, strongly recessive, elongate, reaching mesonotum laterally. Vertex elongate, swollen anteriorly, head resembling that of psocopteron. Medial suture of vertex distinct. Genae produced, conical, contiguous, covering frons. Antennae longer than width of head, segments nearly equal. Thorax broad, rather flat dorsally. Pronotum narrow, on plane with vertex and mesonotum, extending caudad along sides of mesoprescutum, nearly U-shaped. Fore wings broad, rounded apically, with large pterostigma, venation psylline, basal vein short, Rs straight. Meracanthae small, straight, conical. Metatibiae with small spur at base, with several black spines apically. Proximal segment of metatarsi with two black claws. Terminal tarsal claws scarcely pigmented, with large ventral pads.

The relationships of the peculiar species on which this genus is established are obscure. It shows some resemblance to *Diaphorina* but differs from it in the swollen vertex, longer antennae, recessive eyes, shape of the vertex, shape of wings, presence of a pterostigma, and venation.

The name Isogonoceraia is compounded from the Greek *isos* (equal), *gonia* (a joint), *keraia* (antennae) in reference to the nearly equal length of all the segments of the flagellum of the antennae.

12. **Isogonoceraia venusta** Tuthill, n. sp. (fig. 9).

Length to tip of folded wings, 1.66 mm.

Color: General color cinereous, eyes red, brown markings on mesothorax and metathorax, abdominal tergites and sternites more or less brown, genitalia brown. Fore wings hyaline except pterostigma white, small brown spot on anal margin. Hind wings slightly milky.

Structure: Body surface finely rugose with very fine, sparse pubescence except genae with large, numerous setae. Head as wide as thorax. Vertex elongate, narrowed anteriorly between antennae, swollen and bulging anteriorly. Suture between vertex and genae distinct, genae produced, contiguous, conical. Antennae 1.5 times as long as width of head, segments 3 to 10 nearly equal in length, 3 and 10 shortest, 8 longest. Eyes strongly recessive and elongate, extending back across prothorax laterally. Pronotum nearly on plane of vertex and mesonotum, narrow but flat dorsally, curved around prescutum of mesothorax as broad U. Fore wings broad, venation as figured, veins with prominent setae. Hind wings large, nearly reaching apex of fore wings. Legs stout. Metatibiae with small basal spur, apex with five black spines, one on outer margin, one inner, a cluster of three anterior. Proximal segment of metatibiae with pair of prominent black claws and with pad extending under distal segment.

Male genitalia as figured. Female genital segment much shorter than rest of abdomen, structure as figured.

Holotype, male (US 66305), allotype, female (US), and four paratypes (BISHOP, author's collection), Tinian, Mariana Is., Mt. Lasso, on *Cynometra,* June 9, 1946, Townes. Paratypes, male, female (CM), Talofofo Ridge, Saipan, Jan. 23, 1945, Dybas.

DISTRIBUTION: S. Mariana Is. (Tinian, Saipan).

HOST: Probably *Cynometra* sp.

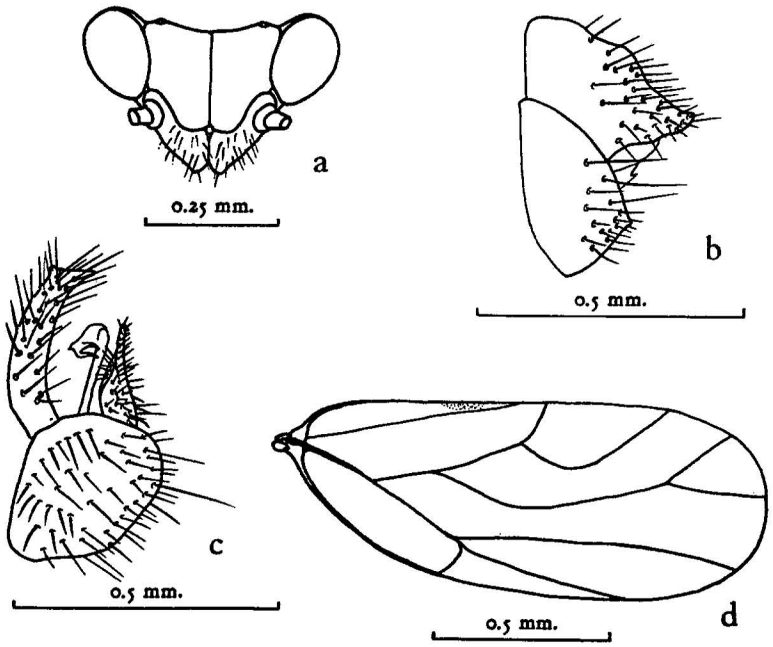

FIGURE 9.—*Isogonoceraia venusta:* **a,** head, frontal aspect; **b,** female cauda, lateral aspect; **c,** male cauda, lateral aspect; **d,** fore wing.

Genus **Trioza** Forster

13. Trioza guama Caldwell (fig. 10).

Trioza guama Caldwell, 1942, B. P. Bishop Mus., Bull. **172**: 22.

Trioza propria Tuthill, 1951, Pacific Science **5** (3): 276.

DISTRIBUTION: Mariana Is.

N. MARIANA IS. PAGAN: Songsong-Regusa, Apr. 1940, Yasumatsu and Yoshimura.

S. MARIANA IS. TINIAN: Tinian Harbor, Mar. 1945, Dybas. GUAM: Piti, Aug. 1936, Swezey; Orote Pt., Oct. 1947, Dybas.

HOST: Unknown. Type specimen from *Glochidion marianum.*

Described by Caldwell from one male specimen, redescribed by Tuthill (1951) as *T. propria,* from a single female. Another male and a female specimen are now at hand. Apparently this is a common and widespread species in the Marianas which probably will be found abundantly with selective collecting.

The male is much more intensely colored than the female, a common phenomenon in psyllids. The structure of the genitalia of the male is figured from a specimen in the presently available material. The species is quite distinct from all others known from the Pacific area and is readily identified.

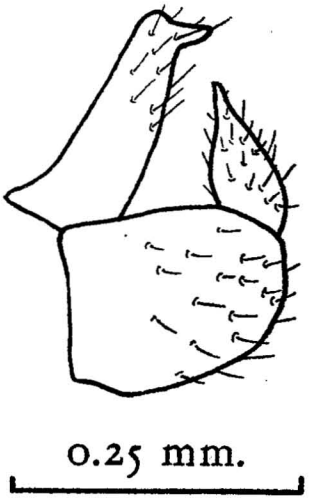

FIGURE 10.—*Trioza guama,* male cauda, lateral aspect.

14. Trioza suavis Tuthill.

Trioza suavis Tuthill, 1951, Pacific Science **5** (3) : 275.

DISTRIBUTION: Mariana Is., Caroline Is.

S. MARIANA IS. GUAM: Mt. Lamlam, Feb. 1958, Krauss; Yigo, Oct. 1957, Krauss.

PALAU. BABELTHUAP (Babeldaob) : Ngardok-Ngarmisukan, Feb. 1938, Esaki; Eimilik-Ngarmisukan, Aug. 1939, Esaki; Ngarmisukan-Kaishar, Aug. 1939, Esaki; Ngaremeskang, Dec. 1952, Gressitt; E. Ngatpang, Dec. 1952, Gressitt.

HOST: *Ficus* sp., forming galls on the leaves (Esaki).

This species was previously known only from the Caroline Islands, Palau.

15. Trioza disjuncta Tuthill.

Trioza disjuncta Tuthill, 1951, Pacific Science **5** (3) : 277.

DISTRIBUTION: Caroline Is.

PALAU. BABELTHUAP: Male, Ngarmisukan-Kaishar, Aug. 1939, Esaki.
HOST: Unknown.
The only specimen known is the unique male type.

16. Trioza indigena Tuthill.

Trioza indigena Tuthill, 1951, Pacific Science **5** (3) : 278.

DISTRIBUTION: Caroline Is.

PONAPE. Sankakuyama-Colonia, July 1939, Esaki; Tolenot Pk., June-Sept. 1950, Adams; southeast Nanponmal, Jan. 1953, light trap, Gressitt; Mt. Temwetemwensekir, Jan. 1953, light trap, Gressitt.

HOST: *Elaeocarpus Kusanoi* Koidzumi.

Besides the type series, five additional specimens of *T. indigena* are at hand, all from Ponape. The species feeds upon *Elaeocarpus Kusanoi,* a tree endemic to Ponape and causes the formation of small galls on the leaves.

17. Trioza lyra Tuthill.

Trioza lyra Tuthill, 1951, Pacific Science **5** (3) : 276.

DISTRIBUTION: Caroline Is.

PONAPE: Nipit-Ronkiti, Jan. 1938, Esaki.

HOST: Unknown.

Only one pair of this peculiar species is known; no additional specimens have been collected.

18. Trioza (Megatrioza) vitiensis Kirkaldy.

Trioza vitiensis Kirkaldy, 1907, Hawaiian Ent. Soc., Proc. **1** (3) : 103.

Trioza eugeniae Crawford, 1915, Philippine Jour. Sci. **10**: 265.

Megatrioza vitiensis, Crawford, 1919, Philippine Jour. Sci. **15**: 195; 1927, Insects of Samoa **2** (1) : 31.—Tuthill, 1942, B. P. Bishop Mus., Occ. Papers **17** (6) : 75.

Phyllopecta vitiensis, Klyver, 1932, B. P. Bishop Mus., Bull. **98**: 99-101; 1935, ibid. **113**: 27.

DISTRIBUTION: Fiji, Samoa, Society Islands, Marquesas, Amboina, Ceylon, Singapore, Caroline Is.

PONAPE: Colonia-Jokaji, Jan. 1938; Matalanim, Jan. 1938; Matalanim-Nipit, Jan. 1938, Colonia-Paliker, July 1939; all by Esaki.

HOST: *Eugenia malaccensis* L., forming galls on the leaves.

Both Crawford (1919) and Klyver (1932) have described this species in detail, and the latter has figured it with equal care. It ranges through much of the western and southwestern Pacific on its host plant, *Eugenia malaccensis* L.

19. Trioza (Megatrioza) swezeyi (Crawford). (Figure 11.)

Megatrioza swezeyi Crawford, 1927, Insects of Samoa **2** (1) : 32.—Tuthill, 1943, B. P. Bishop Mus., Occ. Papers **17** (18) : 226.

Length to tip of folded wings, 5.75 mm. Body, 2.25 mm.

Color: General color mahogany to brown; antennae, except two terminal segments, genal processes, mesothoracic legs, and tibiae and tarsi of all legs testaceous.

Structure: Body sparsely covered with long setae. Head small, narrower than thorax, declivous. Vertex with smooth, shiny surface, slight shallow discal impressions, smoothly continuous with eyes, with deep V at midline on caudal margin, rounding smoothly down to genal processes. Genal processes broadly rounded, contiguous, short, one-third as long as medial length of vertex. Antennae short, slender, 1.4 times as long as width of head. Thorax large, broad, quite flat for genus. Pronotum depressed far below vertex and mesonotum. Fore wings very large, three times as long as wide, acutely pointed apically, basal vein very short, R and R_1 forming straight line, Rs straight, medial cell very long. Hind wings reduced to small stubs 0.1 as long as fore wings. Metacoxae produced anteriorly as large acute spurs, larger than meracanthae. Metatibiae unarmed basally, with one outer and two inner apical spines, between inner spines a row of closely set stiff setae. Apical claws of tarsi very small, lightly sclerotized, with large ventral pads.

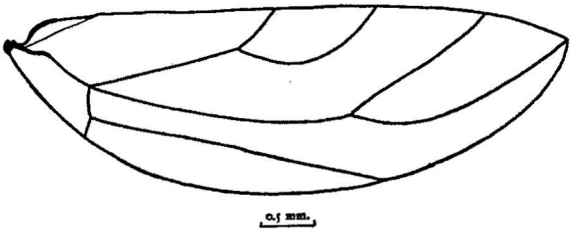

FIGURE 11.—*Trioza swezeyi,* fore wing.

Male genital segment very large, elongate. Proctiger short, produced caudad as large elongate caudal lobes surrounding forceps. Forceps shorter than proctiger, heavily pubescent, details of structure unknown. Female genital segment shorter than rest of abdomen, valves of equal length.

DISTRIBUTION: Fiji, Samoa, Caroline Is.

PALAU. BABELTHUAP: Female, Ngaremeskang, Dec. 1952, Gressitt.

HOST: Unknown.

Only five specimens of this very distinctive species have been recorded.

20. **Trioza (Megatrioza) praelonga** Tuthill, n. sp. (fig. 12).

Length to tip of folded wings: female, 5.0 mm.; male, 4.5 mm. Body, 2 mm. long.

Color: General color of female testaceous, dark brown dorsally except margins of vertex, antennae, and pronotum; mesopleura, prothoracic and mesothoracic legs dark. General color of male dark brown, antennae, margins of vertex, genal processes, metapleura, tibiae and tarsi of hind legs, testaceous. Wings very slightly milky.

Structure: Body sparsely set with long setae. Head narrower than thorax, declivous. Vertex 1.3 times as wide as long, strongly and evenly concave, smooth and shining, without setae, caudal margin shallowly notched medially, margin raised all around, medial suture prominent, anterior margin overhanging median ocellus. Eyes small, hemispherical. Postocular area large. Genal processes large, blunt, slightly divergent, slightly over 0.5 as long as mid length of vertex. Antennae slender, short, slightly less than twice as long as width of head. Thorax very strongly arched. Pronotum very

short, vertical, depressed far below plane of mesonotum, below plane of vertex; proepisterna expanded into flattened lobes laterally. Fore wings very large and long, slender, acuminate, 3.75 times as long as wide, Rs curved to costa, terminating nearly opposite Cu_1, marginal cells elongate, medial much larger than cubital. Hind wings much reduced, less than 0.25 as long as fore wings. Metacoxae slightly raised anteriorly, not spiniform, meracanthae long, slender, curved. Tibiae much longer than femora. Metatibiae with serrate basal carina, one outer and two inner apical spines, with comb of thick-set short stiff setae on outer margin of apex. Apical claws of tarsi very small, lightly sclerotized, with large ventral pads.

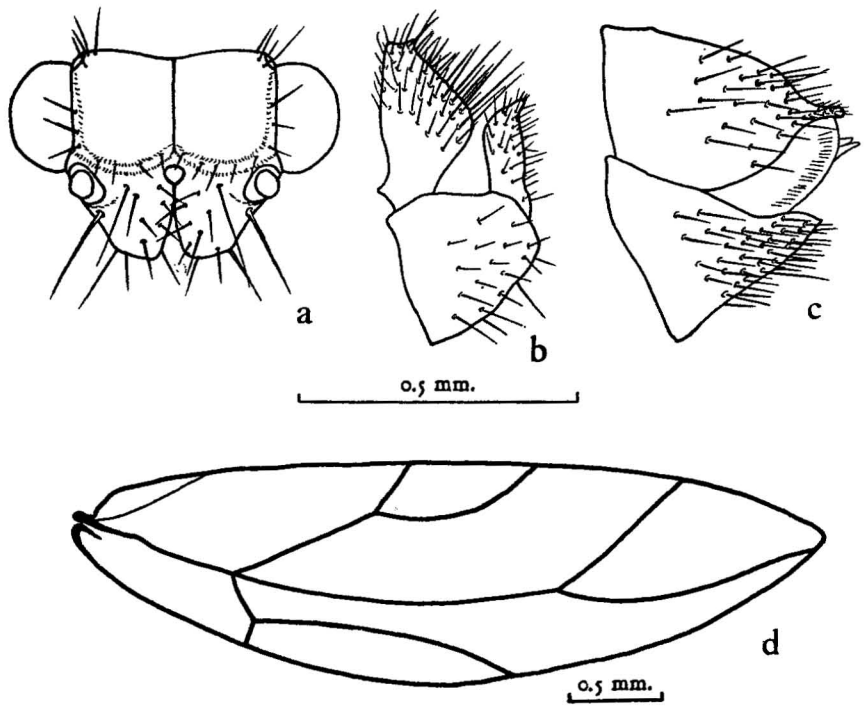

FIGURE 12.—*Trioza praelonga:* **a**, head, frontal aspect; **b**, male cauda, lateral aspect; **c**, female cauda, lateral aspect; **d**, fore wing.

Male genitalia as figured. Female genital segment shorter than rest of abdomen, stout, dorsal valve longer than ventral, abruptly narrowed to short, slender apical prolongation, blunt, lateral valvulae prominent and strongly sclerotized.

Holotype, male (US 66306), allotype (US) and six paratypes (US, BISHOP, author's collection), Hill 1010, Kusaie, 300 m., light trap, Apr. 13, 1953, Clarke.

DISTRIBUTION: Caroline Is. (Kusaie).

HOST: Unknown.

The specimens described here are very close to *T.* (*M.*) *concava* from

Fiji. However, minor differences are present throughout, the most apparent being the size and shape of the wings. The very large elongate fore wings and greatly reduced hind wings are similar to *T. swezeyi,* but the nature of the vertex and other characters are very different.

This and the following species, *T. fulgidiceps,* are very similar to *T. concava,* and apparently represent a portion of a species complex in the islands of the western Pacific.

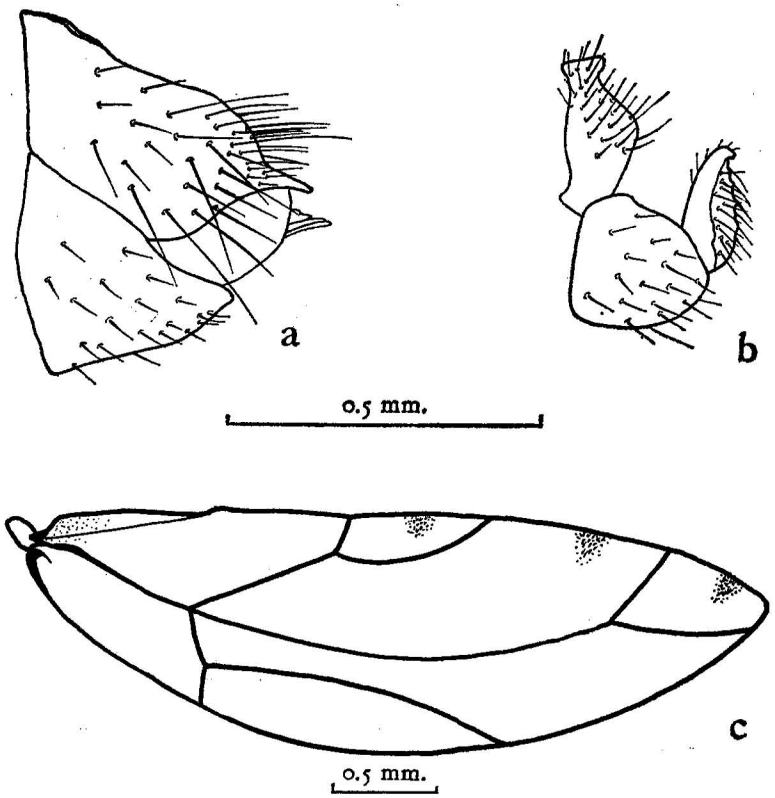

FIGURE 13.—*Trioza fulgidiceps:* **a,** female cauda, lateral aspect; **b,** male cauda, lateral aspect; **c,** fore wing.

21. Trioza (Megatrioza) fulgidiceps Tuthill, n. sp. (fig. 13).

Length to tip of folded wings, 4.25 mm.; length of body, 2 mm.

Color: General body color testaceous, vertex, eyes, segments 4 to 10 of antennae, pronotum, tibiae and tarsi of prothoracic legs, sides of mesoscutum, dorsum of abdomen, dark brown. Membrane of fore wings very slightly yellow, diffuse brown spot in anal angle, three prominent brown spots on margin midway between M_1 and M_2, M_2 and Cu_1, Cu_1 and Cu_2, extending onto membrane around alar radulae.

Structure: Body sparsely pubescent. Head narrower than thorax, somewhat declivous. Vertex smoothly concave, shining, without setae, upturned on margins, about two-thirds as long as wide, protruding above median ocellus anteriorly. Lateral ocelli small, inconspicuous. Eyes small, hemispherical. Genal processes conical, blunt-tipped, slightly divergent, five-eighths as long as mid length of vertex. Antennae slender, 2.33 times as long as width of head. Thorax strongly arched. Pronotum very short, depressed far below mesonotum, below plane of vertex, with single line of large setae on dorsal portion. Proepisterna broadly expanded laterally below eyes. Fore wings large, nearly twice as long as body, three times as long as wide, acute apically, Rs curved to costa, exceeding Cu_1, marginal cells approximately equal, cubital slender. Hind wings one-third length of fore wings, nearly reaching tip of abdomen in female. Metacoxae raised anteriorly but not spiniform, meracanthae slender, long, slightly curved. Metatibiae with small serrate basal carina, one outer and two inner apical spines, with comb of small setae on outer margin. Tarsal claws small. Male genitalia as figured. Female genital segment shorter than rest of abdomen, swollen basally, sharply constricted toward apex, dorsal valve slightly longer than ventral, similar to *T. praelonga.*

Holotype, female (US 66307), Babelthuap, Palau Is., wooded peak southwest of Ulimang, Dec. 20, 1947, Dybas. Allotype, male (US), Ulebsehel (Aurapushekaru), Jan. 13, 1948, Dybas. Paratypes: Female (BISHOP), same data as holotype; E. Ngatpang, 65 m., Dec. 10, 1952, Gressitt.

DISTRIBUTION: Caroline Is. (Palau).

HOST: Unknown.

This species is closely related to *T. concava* and *T. praelonga.* It may be distinguished from both by the prominent spots on the margin of the fore wing, the smaller marginal cells, especially the medial, and the longer Rs. The antennae and the hind wings are both distinctly longer than they are in *praelonga* and the fore wings are much shorter.

22. **Trioza (Megatrioza) catillus** Tuthill, n. sp. (fig. 14).

Length to tip of folded wings, 3.4-4 mm.; length of body, 1.5-1.75 mm.

Color: Male, general color dark brown, antennal segments 2 and 3, profemora, meso- and metathoracic legs, and venter of pro- and metathorax testaceous; wings milky. Female, uniformly testaceous except eyes, segments 4 to 10 of antennae, and protibiae and tarsi dark; wings milky.

Structure: Body surface rugose or punctate and with long sparse pubescence except vertex glabrous, shining. Head as wide as mesoscutum, somewhat declivous. Vertex evenly concave, margins abrupt on all sides, caudal margin sharply notched medially, anterior margin protruding over small median ocellus. Genal processes small, scarcely divergent, blunt, 0.5 as long as mid length of vertex. Antennae slightly less than twice as long as width of head. Eyes small, hemispherical, far back on head, extending behind caudal margin of vertex. Thorax strongly arched. Pronotum much below mesonotum, on same plane as vertex, very short. Proepisterna flattened and broadly flared anteriorly below eyes. Fore wings slender, very long, nearly 3.5 times as long as wide, basal vein short, Rs slightly sinuate, not reaching apex of Cu_1, margin cells small, cubital elongate. Hind wings much reduced, not reaching tip of body, less than 0.3 as long as fore wings. Metacoxae slightly raised anteriorly, meracanthae long, slender, curved. Metatibiae with very slight serrations at base, with one outer and two inner apical spines. Apical tarsal claws inconspicuous.

Male genitalia very small, structure as figured. Female genital segment much shorter than abdomen, structure as figured, lateral valvifers heavily sclerotized.

Holotype, male (CM), allotype, female (CM), Magicienne Bay, Saipan,

beating vegetation, Jan. 5, 1945, Dybas. Paratypes: Female, three males (BISHOP, author's collection), same data as types; male, Laulau Bay, Saipan, Jan. 5, 1945, Dybas.

DISTRIBUTION: S. Mariana Is. (Saipan).

HOST: Unknown.

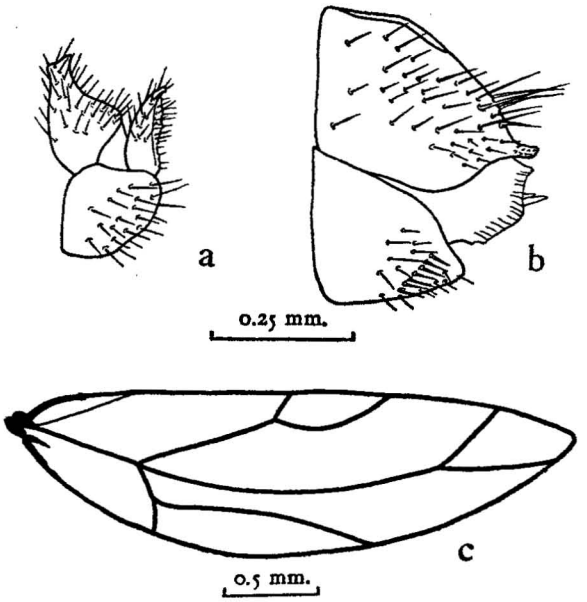

FIGURE 14.—*Trioza catillus:* **a**, male cauda, lateral aspect; **b**, female cauda, lateral aspect; **c**, fore wing.

Additional Species

Ten or 11 species are represented by single incomplete specimens or females and are undescribed. They represent *Psylla, Trioza, Paurocephala, Chineura,* and undetermined genera. One other partial specimen, labeled as from Arno, Marshall Is., I believe to be a contaminant from western North America. The presence of these unidentifiable specimens certifies that further collecting in western Micronesia will bring more forms to light.