INSECTS OF MICRONESIA
Homoptera: Cicadellidae[1]

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INTRODUCTION

This report is based on more than 3,000 specimens of Cicadellidae from nearly all of the principal parts of Micronesia, excluding a few minor islands such as the northern Mariana Islands, Marcus, Ocean, and Nauru. The material was received for identification from the following institutions: Bernice P. Bishop Museum, the Plant Quarantine Office at Pearl Harbor, the United States National Museum, the California Academy of Sciences, the Chicago Natural History Museum, the Government of Guam, the Hawaiian Sugar Planters' Association Experiment Station, Kyushu University, the Museum of Comparative Zoölogy, the National Institute of Agricultural Sciences at Tokyo, and the Trust Territory of the Pacific Islands. Most of the material was collected by P. A. Adams, J. W. Beardsley, G. E. Bohart, R. M. Bohart, E. H. Bryan, Jr., H. S. Dybas, T. Esaki, F. R. Fosberg, R. J. Goss, J. L. Gressitt, N. H. L. Krauss, Ira La Rivers, K. L. Maehler, A. R. Mead, R. W. L. Potts, and H. K. Townes. I am most indebted to the late Professor Teiso Esaki, Dr. J. Linsley Gressitt, and Dr. David A. Young, Jr., for sending me the material mentioned above.

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The following symbols indicate the museums in which specimens are stored: US (United States National Museum), BISHOP (Bernice P. Bishop Museum), KU (Kyushu University), CAS (California Academy of Sciences), CM (Chicago Natural History Museum), TT (Trust Territory), MCZ (Museum of Comparative Zoölogy), HSPA (Hawaiian Sugar Planters' Association Experiment Station), and RL (collection of the author).

[1] This represents, in part, Results of Professor T. Esaki's Micronesian Expeditions (1936-1940), No. 101.

ZOOGEOGRAPHY

The Micronesian cicadellid fauna now consists of only 82 species and nine subspecies or forms. Esaki and Ito (1954, Jap. Soc. Promotion Sci., Tokyo) report 259 cicadellid species from Japan and 224 species from the Ryukyus and Formosa. Such paucity of species in oceanic islands is also characteristic of several other groups of insects (Esaki, 1950, Eighth Int. Congr. Ent., Proc., 373-379). Continental islands, on the contrary, have a much richer fauna. Apparently the long sea distances between island groups and the adjacent continents hinder distribution of such fragile insects as the Cicadellidae. Furthermore, several leafhoppers are monophagous on a specific host plant, or are restricted to certain biotopes. The accompanying distributional list shows the largest number of species in the island groups nearest the continent: Palau, Yap, the Marianas, and the Bonin Islands. The number decreases progressively toward the east, reaching its lowest point in the Marshall and Gilbert Islands.

Of the 91 species and forms known, more than 77, or 85.6 percent, are endemic to Micronesia, most of the rest consisting of species introduced by commerce or human migration from the west to Micronesia (for example, *Nephotettix apicalis, Exitianus capicola,* and *Cicadulina bipunctella*). As the distribution list shows, most of the endemic species occur only in a specific island group or are restricted to a single island, whereas only a few (*Insulanus subviridis* and *Batrachomorphus viridoflavidus,* for instance) have a larger distribution.

Of the subfamilies, Agalliinae has only one species in Micronesia, but is otherwise well represented on the continents, excluding Australia. Among the Iassinae, the genus *Batrachomorphus* is well represented in Micronesia with five species which seem to be more closely related to oriental than to nearctic and neotropical species. Idiocerinae consists of only two Micronesian species, the one endemic, the other occurring as a different subspecies in Samoa and Fiji. Typhlocybinae has a large number of species in Micronesia, and more thorough collections from the different plants will certainly reveal several more species. Nirvaninae consists of a genus with two species related to some Indian forms. Hecalinae has only one representative which is closely related to a Japanese species. Tartessinae has some representatives in the westernmost part of Micronesia. The subfamily is limited to Australia and the Oriental Region. The genitalic structures of the males studied show the Micronesian species to be closely related to the oriental species of the subfamily. The genus *Coelidia* of the subfamily Coelidinae occurs only in the Bonin Islands with a number of species that seem to be related to the Japanese species of the genus. The oceanic genus *Tharra* has three Micronesian species. The largest subfamily, Deltocephalinae, is rather rich in Micronesian species. Most of them show an obvious relationship to certain Japanese and oriental forms. Regarding the subfamilies

Distributional List of Micronesian Cicadellidae

	Micronesian Island Groups												Other Localities
				Caroline									
	Bonin	Volcano	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Wake	Gilbert	
Agallinae													
1. Agallia oceanides*								×					
Iassinae													
2. Batrachomorphus viridoflavidus			×	×	×	×	×	×	×				
3. B. atrifrons			×										
4. B. harpago*									×				
5. B. curvatus*				×									
6. B. ogasawarensis	×												
Idiocerinae													
7. Pedioscopus tutuilanus curtulus*					×								
8. P. amabilis*				×									
Typhlocybinae													
9. Alebroides boninensis	×												
10. A. flavonigra*								×					
11. Empoasca nocturna*				×									
12. E. acuticeps*				×									
13. E. fumatipennis*				×									
14. E. morindae			G†				×	×					
15. E. barringtoniae			G										
16. E. ngatpangensis*				×									
17. E. puncticeps*				×									
18. E. yona			G										
19. E. pitiensis			G										
20. E. boninensis	×												
21. E. dentistylus*				×									
22. E. crenulata*						×							
23. E. xanthopus*				×									
24. E. esakii*								×					
25. E. sesuvii*											×		
26. E. macarangae			G		×								
27. E. pipturi			G										
28. E. fuscovitta			G										
29. E. bipunctulata			×										
30. E. colorata*									×				
31. E. c. var. rubro-punctata*								×					
32. Erythroneura macarangae*					×								
33. E. marthae*							×						
Nirvaninae													
34. Pactana elegantula*				×	×								
35. P. ornata*							×						
Hecalinae													
36. Parabolocratus gressitti*				×	×	×		×					
Tartessinae													
37. Tartessus ferrugineus proximus*	×												

not represented in Micronesia, the most remarkable feature is the absence of Cicadellinae represented by several genera and species in Japan, the Oriental Region, and New Guinea.

As the cicadellid fauna of areas adjacent to Micronesia, excluding Japan, is little known, it is not possible to make a satisfactory comparison between the cicadellid faunas of these regions and of Micronesia. It is, however, obvious that Micronesia belongs entirely to the Oriental Region so far as the Cicadellidae are concerned. I have not been able to find any relationship to the original Australian fauna. Esaki (1950, Eighth Int. Congr. Ent., Proc., 373-379) reports Micronesia as belonging partly to the Melanesian Subregion and partly to the Polynesian Subregion of the Oriental Region. However, the cicadellid fauna of Melanesia is still almost unknown. It seems to me that the cicadellid fauna of Micronesia shows relationship to the fauna of Melanesia, the East Indies, the Philippine Islands, and southern Japan, with the Bonin Islands showing the strongest Japanese influence, and there seem to be few similarities with the fauna of Samoa, Fiji, the Marquesas Islands, and the Hawaiian Islands.

Several leafhoppers are known to be serious pests on some cultivated plants, especially in the transmission of certain plant virus diseases. I have no knowledge of the damage caused by Cicadellidae in Micronesia, but the following species found in Micronesia are known as pests from the adjacent regions: *Nephotettix apicalis,* which transmits the virus disease known as rice dwarf or stunt; *Nesophrosyne argentatus,* which transmits tomato "big-bud" and tobacco yellow dwarf; and *Cicadulina bipunctella,* which transmits maize streak and maize wallaby ear disease.

SYSTEMATICS

Key to Micronesian Subfamily Groups of Cicadellidae

1. Elytra without cross veins anterior to apical series; first joint of hind tarsi ending in sharp apex; small, fragile forms, often brightly colored.....**Typhlocybides**
   Elytra with cross veins also in corium; first joint of hind tarsi truncate apically.... 2
2. Ocelli on face below fore margin of head; male valve and pygofer fused; genital plates narrow basally.....**Iassides**
   Ocelli on crown or in fore margin of head; valve usually more or less triangular, often articulated with pygofer; genital plates usually triangular.....**Cicadellides**

Subfamily Group IASSIDES

Robust species. Head short and broad; ocelli below fore margin of head. Valve totally fused with pygofer; genital plates long and narrow.

Key to Micronesian Subfamilies of Iassides

1. Lateral frontal sutures terminating at antennal pits..... 2
   Lateral frontal sutures extending beyond antennal pits to ocelli.....**Idiocerinae**

2. Robust, flattened, green-colored forms; dorsal surface of fore and middle tibiae flattened ..... **Iassinae**
   Smaller, gray, brown, or blackish-colored forms; fore and middle tibiae rounded ..... **Agalliinae**

Subfamily AGALLIINAE

Body small, narrowly wedge-shaped. Head short and broad. Lateral frontal sutures terminating at antennal pits. Ocelli on face. Lateral margins of pronotum very short. Fore and middle tibiae rounded. Flying wings with four apical cells. Male valve trapezoidal or pentagonal, fused at sides with pygofer. Style small, more or less forked. Connective broad, band-like, usually short.

Genus **Agallia** Curtis

Agallia Curtis, 1833, Ent. Mag. 1 (2): 193 (type: *A. consobrina* Curtis; Europe).—Melichar, 1903, Homopt.-Fauna Ceylon, 150.—Distant, 1908, Fauna of India, Rhynch. 4: 194.—Matsumura, 1912, Tohoku Imp. Univ., Jour. Coll. Agric. 4: 312.

Crown short and of uniform length, broader than pronotum. Disc of pronotum microsculptured. Elytra with small appendix and usually with three subapical cells. Spinulation of hind knees 2 + 1.

Male: Penis symmetric, *socle* (enlarged basal part of penis) developed, gonopore on ventral surface or apical. Connective short and broad, not furcate. Styli small, forked. Genital plates small, without macrosetae. Pygofer totally sclerotized, anal tube rather well developed.

This genus is widespread in the Old World, North America, and South America, poorly represented on oceanic islands, and probably absent in Australia.

1. **Agallia oceanides** Linnavuori, n. sp.

Female: Face yellow brown, about six pairs of dark-brown transverse stripes on sides of frontoclypeus, dark longitudinal middle stripe on same, extending downward to apex of anteclypeus, upper part of face with faint, angular brown spot at sides near ocelli. Crown grayish-yellow brown with pair of round black spots and pair of faint, light-brown triangular spots. Pronotum grayish-yellow brown, fore margin with pair of small, round, black spots and short, black, transverse stripe on either side, disc with six faint, light-brown longitudinal stripes. Scutellum yellow brown with large, black, basal triangles and small black triangle in middle of basal margin. Elytra not transparent, yellowish gray, veins mostly dark brown, apex and base of claval veins whitish. Undersurface and legs light brownish yellow.

Body form as in *A. venosa* Fall. Head as broad as pronotum; frontoclypeus dull, with dense scale-like microsculpturing; upper part of face shining, rugulous; crown of uniform length, roundly produced at middle, finely punctate. Pronotum short, hind margin shallowly sinuate, disc transversely furrowed and finely punctate. Elytra distinctly longer than abdomen, three closed subapical cells. Seventh sternite about 1.25 times as long as sixth, hind margin truncate with rather deep V-shaped notch in middle.

Length: 3.2 mm.

Male: Unknown.

Holotype, female (US 63372), Agric. Exper. Sta., Ponape, Caroline Is., June-Sept. 1950, Adams.

DISTRIBUTION: Caroline Is. (Ponape).

This species differs from the *Agallia* species of the adjacent regions in the small size, the coloring, and the shape of the seventh sternite.

Subfamily IASSINAE

Broad and somewhat flattened species. Coloring principally greenish. Head short; lateral frontal sutures terminating at antennal pits; ocelli on face. Pronotum rather large, disc transversely furrowed. Elytra with numerous fine setae; venation complete. Fore and middle tibiae more or less flattened dorsally. Male valve fused with pygofer, plates basally covered by eighth sternite which is roundly prolonged hindward. Style (in Micronesian species) long and narrow. Genital plates rather narrow.

Genus **Batrachomorphus** Lewis

Batrachomorphus Lewis, 1834, Ent. Soc. London, Trans. 1: 51 (type: *B. irroratus* Lewis; Europe).

Eurinoscopus Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Bull. 1: 346 (type: *E. lentiginosus* Kirkaldy; Australia).

Broad, short, and more or less depressed species. Head broad; crown very short and of uniform length; face short and broad; lateral margins of gena strongly sinuate. Pronotum wide, disc distinctly furrowed. Elytra with inner apical margin and first apical cell membranous and appendix-like; submarginal vein between appendix and first apical cell evanescent distally. Flying wings with three apical cells. Male: Eighth sternite roundly produced hindward, concealing short valve and basal part of plates. Genital plates shorter than pygofer, narrow, with numerous long, fine hairs. Styli long. Connective band-like, more or less pentagonally enlarged anteriorly. Pygofer rather large, sclerotized, side lobes broad, with some macrosetae and a long appendage. Penis simple, *socle* distinct, gonopore long, on ventral surface.

This genus is well represented in the Oriental Region, Japan, Samoa, and North and South America.

Key to Micronesian Species of Batrachomorphus

1. Face of male pale 2
   Face of male black ..... **3. atrifrons**
2. Unicolored species 3
   Faint transverse dark band across elytra at apex of clavus; penis with large basal *socle*, appendage of pygofer strongly curved ..... **5. curvatus**
3. Smaller species, length 4-5.5 mm 4
   Large species, length 5.5-6.5 mm ..... **6. ogasawarensis**
4. Ventral margin of appendage of side lobe of pygofer with tooth near apex ..... **4. harpago**
   Appendage of side lobe of pygofer simple ..... **2. viridoflavidus**

2. Batrachomorphus viridoflavidus (Metcalf), n. comb. (fig. 1, *a-f*).

Bythoscopus viridoflavidus Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. 189: 136.

Male: Color olive yellow, yellow green, or yellow brown, often a small dark spot at apex of clavus.

Head broad; crown very short, nearly eight times as broad as long; face about as long as broad; anteclypeus short and broad, about twice as long as its greatest width. Pronotum twice as broad as its median length, disc densely furrowed, anterior margin broadly curved, projecting only slightly in front of posterior-interior angle of compound eyes, curving imperceptibly into anterior-lateral margin, posterior margin very shallowly excavate. Elytra very finely punctate, with minute black setae. Genital plates rather long and narrow, with several long, fine hairs. Style long and rather broad and straight, a more or less distinct small tooth near apex, apex thin, hooklike. Penis rather long and slender, *socle* basally distinctly smaller than in other species of the genus; gonopore very long on ventral surface. Side lobe of pygofer bluntly triangularly rounded, with some macrosetae, appendage long, thin, and straight, apex hooked ventrad.

Female: Last sternite nearly twice as long as preceding, hind margin broadly excavate. Pygofer robust, conical, undersurface with numerous macrosetae.

Length: 3.45-5.5 mm.

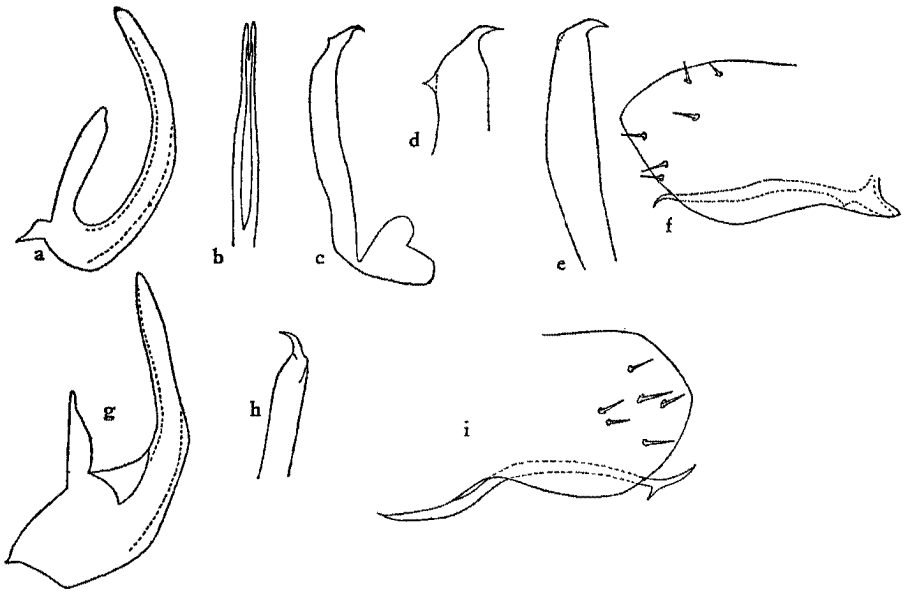

FIGURE 1.—a-f, *Batrachomorphus viridoflavidus: a,* penis, lateral view; *b,* apical part of penis, ventral view; *c,* style of Palau specimen; *d,* apex of Palau specimen; *e,* apical part of style of Truk specimen; *f,* side lobe, lateral view. g-i, *B. harpago: g,* penis, lateral view; *h,* apical part of style; *i,* side lobe, lateral view.

DISTRIBUTION: S. Mariana Is., Caroline Is.

S. MARIANA IS. SAIPAN: One, Afetna Pt., July 1946, Townes. GUAM, 11: Dededo, from *Piper guahamense,* May 1936, Swezey; Machanao, Aug. 1936, Swezey; Mt. Alifan, May 1936, E. H. Bryan, Jr., Swezey; Mt. Lamlam, 400 m., Nov. 1952, Gressitt; Mt. Santa Rosa, Apr. 1945, Gressitt, Bohart; Pt. Oca, June 1945, Gressitt, Bohart; Pt. Ritidian, Apr., Aug. 1945, Gressitt, Bohart; May 1945, Dybas.

PALAU. Ninety. NGAIANGL (Kayangel): Dec. 1952, Gressitt. BABELTHUAP: Dec. 1947, Dybas; East Ngatpang, Dec. 1952, Gressitt. KOROR: Sept. 1952, Krauss; Dec. 1952, Apr.-May 1953, Beardsley. NGARMALK (NW Auluptagel): 25 m., limestone ridge, Dec. 1952, Gressitt; Jan. 1953, Beardsley. PELELIU: July-Aug. 1945, Dybas, E. Hagen; Akarokuru-Ashiasu-Garudoroko, Aug. 1939, Esaki; Mt. Amiangal, Dec. 1952, Gressitt. ANGAUR: Aug. 1945, Dybas.

YAP. Seven. YAP: July 1951, Gressitt; Hill behind Yaptown, 50 m., Nov. 1952, Gressitt; Mt. Mataade, Dec. 1952, Gressitt; S. Yap I., July-Aug. 1950, Goss; Dugor-Kanif-Ruul, Sept. 1939, Esaki.

CAROLINE ATOLLS. LOSAP: Pis I., one, Apr. 1946, Townes.

TRUK. Eighteen. WENA (Moen): May 1946, Townes; Mar.-Apr. 1949, Potts; Nov. 1952, Beardsley; Mt. Chukumong (Teroken), 80 m., Dec. 1952, Gressitt. FEFAN: Mt. Iron, 180 m., Jan. 1953, Gressitt. TON (Tol): Mt. Unibot, 390 m., Jan. 1953, Gressitt.

PONAPE. Nine. Colonia, Jan. 1938, Esaki; Mt. Nahnalaud, 300 m., Mar. 1948, Dybas; Mt. Pairot, 600 m., Mar. 1948, Dybas; Mt. Temwetemwensekir, 180 m., Jan. 1953, Gressitt.

KUSAIE. Eighteen. Hill 1010, 300 m., Apr. 1953, Clarke; Mt. Matante, 380 m., Feb. 1953, Clarke; Wakapp, 390 m., Apr. 1953, Clarke.

HOST: *Piper guahamense.*

3. **Batrachomorphus atrifrons** (Metcalf), n. comb. (fig. 2, *a-c*).

Bythoscopus atrifrons Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 136.

Male: Brownish, face black except ocelli.

Body form, et cetera, as in *B. viridoflavidus*. Genital plates as in *viridoflavidus*. Style much thicker and distinctly curved. Penis thicker than in *viridoflavidus*. Side lobe of pygofer shorter, apex nearly truncate, apical ventral corner with several strong macrosetae; appendage as in *viridoflavidus*, but apex straight.

Female: Like *viridoflavidus*, coloring totally brownish.

Length: 4.5 mm.

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. SAIPAN: Three, Mt. Tagpochau (Tapocho), May 1940, Yasumatsu and Yoshimura; 375 m., Feb. 1945, in crown of *Pandanus*, Dybas. GUAM: Two, Barrigada, June, July 1936, Swezey; one, Upi Trail, May 1936, Swezey.

HOST: *Morinda* sp.

The female is not readily distinguishable from the female of *B. viridoflavidus.*

4. **Batrachomorphus harpago** Linnavuori, n. sp. (fig. 1, *g-i*).

Male: Upper surface totally yellow brown. Elytra brownish, scutellar margin of clavus narrowly dark brown, appendix and first apical cell smoky. Dorsal surface of abdomen yellow, margins of segments orange. Undersurface light yellow brown.

Body form much as in *B. viridoflavidus*. Head broader than pronotum; crown very short, of uniform length; eyes large, prominent. Pronotum with rather long side margins, hind margin nearly straight; disc very shining, furrowing deep but rather sparse. Elytra very indistinctly punctate. Genital plates as in *viridoflavidus*. Style long, straight, broadening apicad, apex nearly rectangularly curved. Side lobe of pygofer short and rounded, with several short macrosetae; appendage strongly curved mediad, apex hooked.

Female: Coloring as in male. Genital segment as in *viridoflavus*.

Length: 4 mm.

Holotype, male (US 63373), Mt. Matante, Kusaie, Apr. 23, 1953, Clarke;

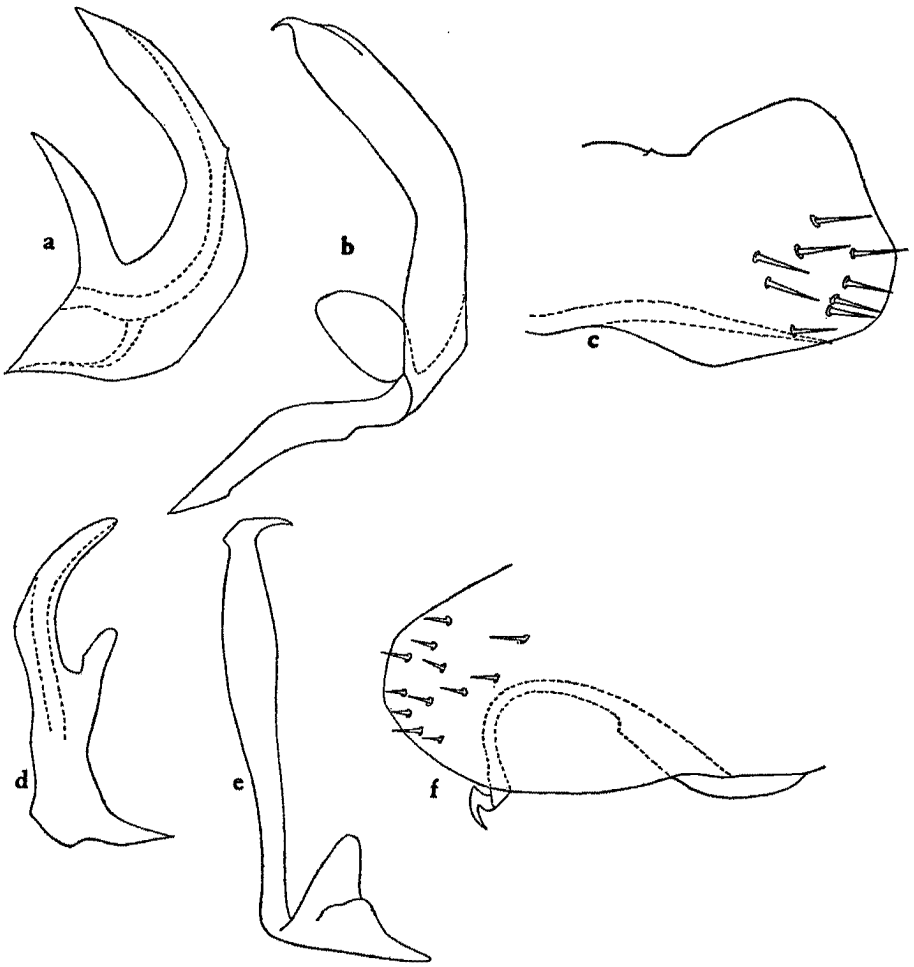

FIGURE 2.—a-c, *Batrachomorphus atrifrons: a,* penis, lateral view; *b,* style; *c,* side lobe, lateral view. d-f, *B. curvatus: d,* penis, lateral view; *e,* style; *f,* side lobe, lateral view.

allotype, female (US), Mwot, Kusaie, Apr. 10, 1953, Clarke. Three paratypes (BISHOP, RL), same data as for types.

DISTRIBUTION: Eastern Caroline Is. (Kusaie).

5. Batrachomorphus curvatus Linnavuori, n. sp. (fig. 2, *d-f*).

Male: Face light yellowish; each ocellus surrounded by red ring; eyes reddish gray; crown dark yellow brown. Pronotum and scutellum dark yellow brown. Elytra transparent, greenish; faint, brownish, transverse band across elytra at apex of clavus; apex smoky brownish. Undersurface and legs yellowish.

Body form broad and robust resembling somewhat *B. maculatus*. Head as broad as pronotum; crown very short, of uniform length. Pronotum large, side margins long, hind margin shallowly sinuate; disc deeply and rather densely furrowed. Elytra with dense puncturing bordering veins, each puncture bearing short, black seta. Genital plates as in *viridoflavidus*. Style straight, broadening apicad, apex rectangularly curved. Penis with large *socle,* stem rather short and slender, slightly curved; gonopore as in other Micronesian species of genus. Side lobe of pygofer rounded, several short macrosetae over apical part, appendage strongly curved mediad, apex hooked.

Female: Hind margin of seventh sternite rather strongly sinuate with small, triangularly produced lobe in middle.

Length: 5-5.5 mm.

Holotype, male (CM), Palau, Peleliu I., east coast, Aug. 1, 1945, Dybas; allotype, female (US), Babelthuap I., Ulimang, Dec. 10, 1947, Dybas. Two paratypes, females (BISHOP, RL), Koror, Feb. 2, May 1, 1947, Beardsley.

DISTRIBUTION: Western Caroline Is. (Palau).

6. Batrachomorphus ogasawarensis (Matsumura), n. comb.

Macropsis ogasawarensis Matsumura, 1912, Tohoku Imp. Univ., Jour. Coll. Agric. 4: 299.

Stragania ogasawarensis, Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. 11: 20.

Bythoscopus ogasawarensis, Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 254.

Male: Green. Elytra dark green especially near costal margin; membrane dark basally. Undersurface and legs pale yellowish, tibiae and tarsi greenish.

Crown somewhat longer in middle than at eyes, roughly transversely striate. Pronotum roughly transversely furrowed, about as broad at hind margin as head. Elytra totally roughly punctate. Valve broad conical, 2.5 times as long as preceding segment. Pygofer nearly twice as long as valve.

Female: Seventh sternite nearly twice as long as sixth, hind margin shallowly sinuate.

Length: 5.5-6.5 mm. (Description after Matsumura.)

This species somewhat resembles *Macropsis minuta,* but is easily distinguished by the much bigger size and the dark coloring of the elytra.

DISTRIBUTION: Bonin Is.

BONIN IS. (Ogasawara Jima): Five, Matsumura.

This species is unknown to me. The "valve" mentioned in the original description is apparently the eighth sternite which, in the species of the genus, is enlarged, covering the small valve and even a part of the plates.

Subfamily IDIOCERINAE

Body wedge-shaped. Head broader than pronotum, of nearly uniform length; face broad; lateral frontal sutures extending to ocelli; ocelli on face. Pronotum short, narrow laterally, fore and hind margins usually parallel with each other. Fore and middle tibiae rounded or a little flattened. Flying wings with four apical cells. Male: Ninth sternite and tergite totally fused. Genital plates long and narrow, lying in a vertical plane. Style long and slender.

Genus **Pedioscopus** Kirkaldy

Pedioscopus Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Bull. 1:349 (type: *P. philenor* Kirkaldy; Australia).

Head broader than pronotum; anteclypeus broadening downward; crown short, of uniform length, forming continuous curved surface with face; antenna of male simple. Pronotum very broad, sides short. Elytra with long apical cells and large appendix, no closed subapical cells.

Male: Penis with large basal *socle,* stem curved dorsad, pair of apical appendages; gonopore on ventral surface near appendages. Connective T-shaped. Style long and curved, apophyse serrate, apodeme long, broadening somewhat basally. Plates elongate, narrow, flattened, lying in vertical plane, with numerous long, fine hairs. Pygofer short dorsally, fused with ninth sternite. Tenth sternite sclerotized dorsally. Stridulatory organs well developed, somewhat as in the genus *Empoasca.*

This genus is represented in Australia and Oceania.

Key to Micronesian Species of Pedioscopus

1. Stem of penis narrow, apical appendages short; pygofer with short appendage; hind margin of seven female sternite truncate, V-shaped notch in middle ..... **7. tutuilanus curtulus**

   Stem of penis broad, lamellate, appendages long; no appendage in pygofer; hind margin of seventh female sternite rounded ..... **8. amabilis**

7. **Pedioscopus tutuilanus curtulus** Linnavuori, n. subsp. (fig. 3).

Male: Face and crown pale yellow; broad, black transverse band in fore margin of head extending downward as a broad, black longitudinal band on either side of frons to antennae; eyes gray. Pronotum black; faint, brown, transverse stripe near fore margin. Scutellum black with central light band broadening apicad. Elytra yellow with three broad, black or dark-brown longitudinal bands, apex smoky. Abdomen dorsally dark brown with broad yellow band on either side. Undersurface and legs yellowish, tibiae fuscous apically.

Body short and broad. Head much broader than pronotum; crown short and of uniform length; anteclypeus broadening downward; frons a little convex; no antennal discal plates. Pronotum short, a little more than twice as long as crown, dull with scale microsculpturing. Elytra with third apical cell very small, appendix very broad. Plates narrow, of uniform breadth. Style long, apophyse curved, slightly serrate. Penis with large *socle,* stem long and narrow, appendages short and directed ventrad from stem. Ventral margin of pygofer with broad, short appendage with two teeth.

Female: Pygofer short, ovipositor nearly as long as pygofer. Seventh sternite 1.5 times as long as sixth, hind margin truncate, small V-shaped notch in middle.

Length: 3.5 mm.

Holotype, male (US 63374), Yap, Hill behind Yaptown, 60 m., Nov. 28, 1952, Gressitt; allotype, female (US), same data. Four paratypes (BISHOP,

RL), Yap, Dugor-Rumu, 10 m., Nov. 29, 1952, Gressitt; Kolonia, Apr. 23, 1954, Beardsley; Mt. Mataade, 95 m., Dec. 1, 1952, Gressitt.

DISTRIBUTION: Western Caroline Is. (Yap).

This subspecies greatly resembles the nominate form *P. tutuilanus tutuilanus* (Osborn), but differs in the shorter and relatively broader body form and in the male genitalia. In the nominate form, the appendages of the penis are longer and less divergent from the stem and the style is longer and straighter. The nominate form is described from Samoa; I have also seen specimens from Fiji.

8. Pedioscopus amabilis Linnavuori, n. sp. (fig. 4).

Male: Face and crown pale yellow. Pronotum pale yellow with broad, sometimes broken, black transverse band. Scutellum yellowish with black basal triangles and some small dark spots in middle. Coloring of elytra about as in *P. tutuilanus curtulus*. Abdomen dorsally black brown with broad yellow band on either side. Undersurface and legs pale yellowish.

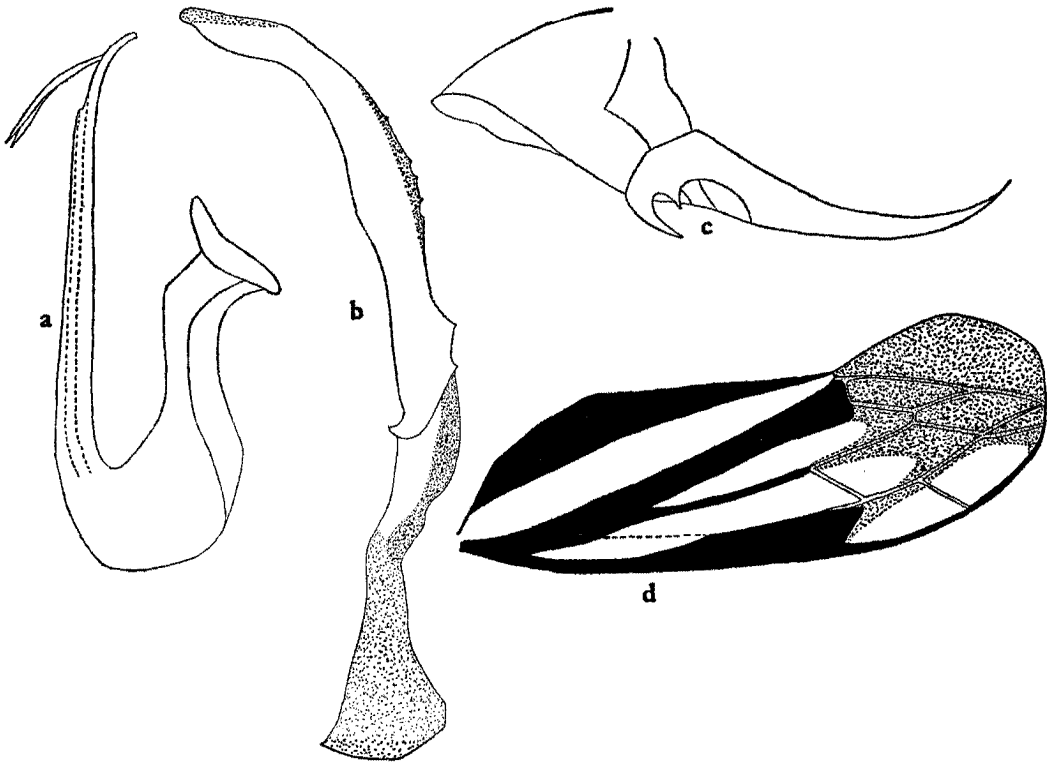

FIGURE 3.—*Pedioscopus tutuilanus curtulus:* **a**, penis, lateral view; **b**, style; **c**, side lobe, median view; **d**, elytron.

Body form as in *tutuilanus curtulus*. Elytra with narrower appendix, third apical cell larger, rectangular. Plates narrow, broadening apicad, with numerous long, dark-brown, fine hairs. Style broad, apophyse rather straight, distinctly serrate. Penis with large *socle*, stem broad and lamellate with pair of long appendages lying close to stem. Pygofer simple.

Female: Color as in male, but broad, black, longitudinal band in middle of underpart of face; upper part of face with two black transverse bands, the upper band sometimes reduced to pair of round black spots. Seventh sternite twice as long as sixth, hind margin rounded. Ovipositor black, reaching far over apex of abdomen.

Length: 4-4.5 mm.

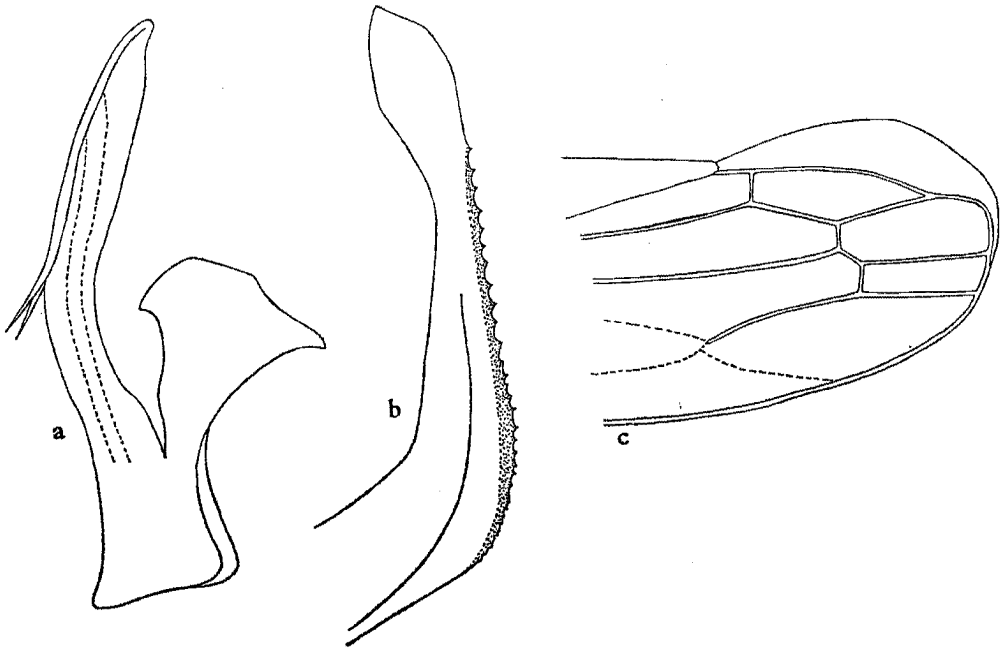

FIGURE 4.—*Pedioscopus amabilis:* **a**, penis, lateral view; **b**, apophyse of style; **c**, apical part of elytron.

Holotype, male (US 63375), Palau, Ulebsehel (Auluptagel), Sept. 1952, Krauss; allotype, female (BISHOP 2223), same data. One paratype (RL), same data as for holotype.

DISTRIBUTION: Western Caroline Is. (Palau).

SUBFAMILY GROUP TYPHLOCYBIDES

Small, narrow, delicate species. Color usually greenish or yellowish, often with bright markings. Face long and narrow; anteclypeus extending beyond normal curve of genae; clypeal suture often indistinct; lora and genae indistinctly separated; antenna long; antennal depressions deep; ocelli absent or, if present, on face; lateral frontal sutures extending to ocelli or ocellar vestiges. Pronotum narrow laterally and widest posteriorly. Fore and

middle tibiae rounded, hind tibiae long and slender, with long, delicate spines; apex of first joint of hind tarsi sharp. Elytra slender, with three longitudinal veins, cross veins absent except for apical series. Flying wings also with reduced venation.

Subfamily TYPHLOCYBINAE

Key to Micronesian Genera of Typhlocybinae

1. Wing with apical cells closed distally (tribe *Dikraneurini*) 2
   Wing with apical cells open distally (tribe *Typhlocybini*) ..... **Erythroneura**
2. Wing with two apical cells closed distally ..... **Alebroides**
   Wing with only one apical cell closed distally ..... **Empoasca**

Tribe DIKRANEURINI

Wing with apical cells all closed distally.

Genus **Alebroides** Matsumura

Alebroides Matsumura, 1931, Ins. Matsumurana **6**: 68 (type: *A. marginatus* Matsumura; Japan); 1934, Cat. Jap. Ins. **3**: 1.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 28.

Head broad; crown somewhat produced in middle, no coronal suture. Pronotum rather large, sides long. Elytra with third apical cell triangular and stalked. Flying wings with submarginal vein evanescent along costal margin from hamulus to apex, wing thus with two closed apical cells. Male: Plates with macrosetae and long, whitish hairs marginally. Penis well sclerotized, simple or with short basal appendages, gonopore subapical on ventral surface. Style long and slender.

This genus is distributed in Japan and Formosa.

Key to Micronesian Species of Alebroides

1. Testaceous white ..... **9. boninensis**
   Yellow with black markings ..... **10. flavonigra**

9. **Alebroides boninensis** Matsumura.

Alebroides boninensis Matsumura, 1931, Ins. Matsumurana **6**: 68; 1934, Cat. Jap. Ins. **3**: 1.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 28.

Female: Testaceous white; in middle of crown two obsolete grayish patches and white central, prominent stripe; ocelli somewhat darker. Elytra subhyaline, nearly colorless.

Crown blunt, conically produced, in middle about as long as broad at hind margin. Pronotum somewhat longer than crown in middle. Elytra: First and second sectors only visible at inner sides of cross veins; first and second apical sectors with short stalk as long as contiguous cross vein. Last sternite about twice as long as preceding sternite, at hind margin somewhat rounded; coleostron about twice as long as breadth at base; vagina protruding by one-quarter beyond apex of coleostron.

Length: 3.2 mm. (Description after Matsumura.)

Male: Unknown.

DISTRIBUTION: Bonin Is.

BONIN IS. CHICHI JIMA: Female, Aug. 30, 1905, Matsumura.

This species is unknown to me.

10. Alebroides flavonigra Linnavuori, n. sp. (fig. 5).

Male: Yellow. Black longitudinal band across anteclypeus and frons extending to upper surface across crown and pronotum broadening hindward to apex of scutellum. Elytra yellowish; broad, dark-brown longitudinal band along claval margin to apex of elytra. Abdomen blackish dorsally. Undersurface and legs yellow, apex of ovipositor and fore tibiae dark brown.

Body delicate. Head broader than pronotum; crown little convex, sloping downward near fore margin, only little longer in middle than at sides. Pronotum distinctly longer than head, sides long, hind margin shallowly sinuate. Scutellum rather large. Plates with

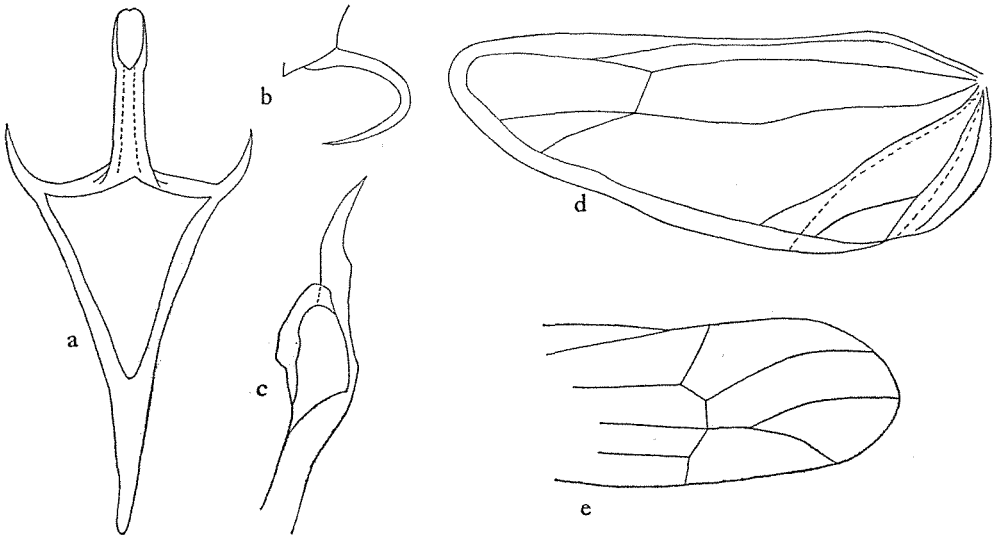

FIGURE 5.—*Alebroides flavonigra:* a, penis, ventral view; b, basal ventral angle of anal tube; c, apex of style; d, flying wing; e, apex of elytron.

macrosetae and long, fine hairs. Style long, broadened near apex, and then curved claw-like. Penis with large triangular *socle;* stem short and curved dorsad; two short basal appendages; gonopore large, subapical on ventral surface. Appendages of anal tube long, nearly semicircularly curved.

Female: Hind margin of seventh sternite truncate.

Length: 3.2-3.5 mm.

Holotype, male (US 63376), Ponape, Mt. Temwetemwensekir, 180 m., Jan. 17, 1953, Gressitt; allotype, female (BISHOP 2224), same locality, Jan. 19, 1953, Gressitt. Three paratypes (BISHOP, US, RL), same data as for holotype and Mt. Dolen Nankap, 570-600 m., Aug. 10, 1946, Townes.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

This species is easily distinguished by the peculiar coloring.

Genus **Empoasca** Walsh

Empoasca Walsh, 1862, Prairie Farmer **10**: 149 (type: *E. viridescens* Walsh, 1862; N. America).—Melichar, 1903, Homopt.-Fauna Ceylon, 212.—Distant, 1908, Fauna of India, Rhynch **4**: 401.—Oshanin, 1912, Kat. Paläarkt., Hemipt., 112.—Matsumura, 1931, Ins. Matsumurana **6**: 80.—Merino, 1936, Philippine Jour. Sci. **61**: 389.—Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 138.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 29.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 186.

The body is small and fragile, the coloring usually green. Head as broad as pronotum; crown either of uniform length or more or less angularly produced. Pronotum longer than head, broadest near hind margin. Third apical cell of elytra either triangular and stalked or not stalked. Hind wing with submarginal vein evanescent from apex to hamulus along costal margin with one closed apical cell. Male: Plates setose, often also with long, fine hairs. Style usually long and slender, apex often serrate. Penis either well developed with distinct *socle,* stem curved dorsad and with basal appendages or simple, weakly chitinized, and reduced. Pygofer usually with slender appendage on ventral margin of side lobe. Anal tube usually with short, curved appendages in ventral basal angles. Stridulatory organs well developed, form of apodemes and apophyses of second abdominal segment of great systematic value.

Several species of this genus are monophagous and restricted to a specific host plant.

The distribution of this genus is worldwide.

Key to Micronesian Species of Empoasca

1. Species with distinct red, fulvous, or orange markings 2
   No distinct fulvous markings 4

2(1). Very small and slender species, length 2.5 mm.; crown angularly produced; third apical cell of elytra stalked; crown with two fulvous spots, pronotum with pair of orange stripes; plates triangular ..... **12. acuticeps**
   Length 3 mm.; crown, pronotum, and elytra with bright-red markings 3

3(2). Elytra whitish with four large, angular red markings ..... **30. colorata**
   Elytra whitish with six smaller round spots in basal parts ..... **31. colorata var. rubropunctata**

4(1). Distinct, sharply limited, large black or dark-brown markings 5
   No large, distinct black markings 6

5(4). Crown with two, pronotum with four, fuscous longitudinal vittae ..... **28. fuscovitta**
   Face, crown, pronotum, and scutellum black with central light stripe; elytra with fuscous markings ..... **11. nocturna**

6(4). Plates distinctly triangular 7
   Plates long, sides more or less parallel 11

7(6). Brownish yellow, apex of elytra broadly infuscate; third apical cell of elytra triangular; style nearly straight, apodemes of second abdominal sternite strongly diverging ..... **13. fumatipennis**
   Not as above 8

8(7). Very small, slender species, length 2.5 mm.; bright green; pygofer simple, plates very short, apodemes of second sternite parallel ..... **17. puncticeps**
   Larger species; yellowish 9

9(8). Style slender, rather long; plates with several thick setae, apodemes of second sternite very large, nearly reaching pygofer.....**16. ngatpangensis**
Style broad and thick, short.....10

10(9). Plates with only fine hairs; head blunt. Host *Morinda*.....**14. morindae**
Plates with long, thick setae on side margin; head produced. Host *Barringtonia*.....**15. barringtoniae**

11(6). Plates very slender and long, basally of the same width, one-third distance before apex distinctly elbowed and directed mesad; style very long and slender, of same shape as plate; elytra with round black spot between media and cross veins.....**29. bipunctulata**
Not as above.....12

12(11). Appendages of side lobe of pygofer bifurcate.....13
Appendages of pygofer simple or absent.....14

13(12). Head moderately narrow, crown roundly produced; style long, slender, nearly straight, apex serrate.....**18. yona**
Head very broad, crown broader, of nearly uniform length; style thick, shallowly curved.....**19. pitiensis**

14(12). Appendages of anal tube very thick, serrate.....**22. crenulata**
Appendages of anal tube slender or absent.....15

15(14). Style not serrate apically.....16
Style serrate apically.....17

16(15). Plates with long setae, deflected apex of style sharp.....**26. macarangae**
Plates with short setae, deflected apex of style thick.....**27. pipturi**

17(15). Pygofer simple, plates much longer than pygofer, with very long setae, apex of style distinctly curved.....**24. esakii**
Pygofer with appendages, plates usually shorter, style straighter.....18

18(17). Appendage of pygofer much shorter than side lobe, apex of style rather thick, strongly serrate, apodemes of second sternite long, narrow, parallel.....**21. dentistylus**
Not as above.....19

19(18). Apodemes of second sternite short, plates long and narrow.....**25. sesuvii**
Apodemes of second sternite long and broad, plates shorter and broader.....**23. xanthopus**

Females of the genus are not generally identifiable. *E. boninensis* is excluded from the key as the species is unknown to me and the original description is too short and incomplete.

11. **Empoasca nocturna** Linnavuori, n. sp. (fig. 6, *a-e*).

Male: Ante- and frontoclypeus black, latter with central light-brown stripe; cheeks and ocellocular area pure white, round black spot below eyes. Crown black brown, central white stripe and white spot on either side; eyes dark gray. Pronotum and scutellum black with central, narrow, yellowish stripe. Elytra transparent, clavus and apical part dark brown; four large, round, colorless spots in bases of apical cells; corium yellow. Dorsal surface of abdomen dark brown in middle, yellow at sides. Undersurface and legs yellow.

Body gracile and narrow. Crown narrow, longer than broad at base, of uniform length, fore margin rounded. Pronotum longer than crown, sides long, hind margin shallowly sinuate. Elytra with third apical cell triangular and stalked. Plates short, triangular, with few setae near side margin. Penis strongly chitinized; basal *socle* large, triangular; stem rather straight, apex bifurcate; pair of long, curved basal appendages arising from sides of *socle,* second pair of short straight appendages between stem and lateral appendages;

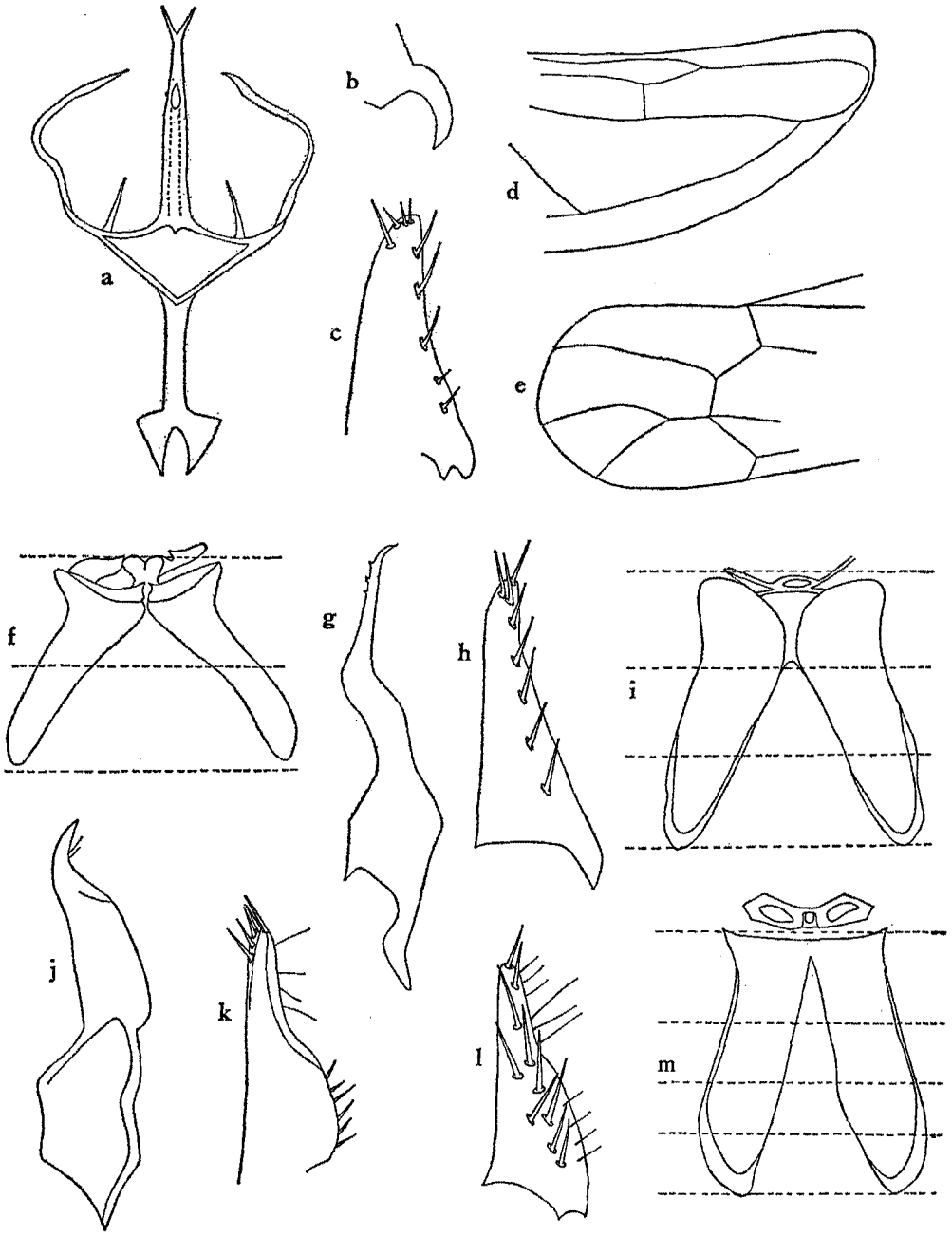

FIGURE 6.—**a-e**, *Empoasca nocturna: a*, penis and connective, ventral view; *b*, basal ventral angle of anal tube; *c*, plate; *d*, apex of flying wing; *e*, apex of elytron. **f-h**, *E. acuticeps: f*, apodemes of second sternite; *g*, style; *h*, plate. **i-k**, *E. morindae: i*, apodemes of second sternite; *j*, style; *k*, plate. **l, m**, *E. ngatpangensis: l*, plate; *m*, apodemes of second sternite.

gonopore on ventral surface rather far from apex. Side lobe triangular, with short, curved appendage. Anal tube with short, curved appendages in basal ventral angles.

Female: Hind margin of seventh sternite truncate. Ovipositor dark brown.

Length: 3 mm.

Holotype, male (US 63377), Palau, Auluptagel (Aurapushekaru), Feb. 7, 1954, sweeping native vegetation, Beardsley; allotype, female (US), same data. Two paratypes (BISHOP, RL), same locality, Feb. 7, 1954 and May 10, 1953, Beardsley.

DISTRIBUTION: Western Caroline Is. (Palau).

12. Empoasca acuticeps Linnavuori, n. sp. (fig. 6, *f-h*).

Male: Pale yellow. Crown with two fulvous spots at apex. Pronotum with two orange, backward-diverging, longitudinal stripes in middle. Elytra yellowish, scutellar and upper margin of clavus narrowly orange, apex smoky; round dark spot below apex of clavus. Undersurface and legs pale yellow.

Body small and narrow. Head narrower than pronotum; crown narrow, as broad as eye, nearly sharp triangularly, and strongly produced. Pronotum broad and relatively short. Elytra with third apical cell triangular and stalked. Apodemes of second sternite long, narrow, strongly diverging. Plates triangular, a few setae near side margin, no hairs. Style rather short and slender, a few small teeth in apical part. Penis simple, reduced. Side lobe of pygofer rounded, no appendage. Anal tube simple.

Female: Seventh sternite little longer than sixth, hind margin truncate. Apex of ovipositor black.

Length: 2.5 mm.

Holotype, male (US 63378), Ulebsehel (Auluptagel), Palau, Sept. 1952, Krauss; allotype, female (US), same locality, sweeping native vegetation, Feb. 7, 1954, Beardsley. Paratypes (BISHOP, RL): One, same locality, Krauss; one, same locality, Beardsley.

DISTRIBUTION: Western Caroline Is. (Palau).

13. Empoasca fumatipennis Linnavuori, n. sp. (fig. 8, *c-e*).

Male: Brownish yellow. Head and pronotum with faint, irregular, yellow spots. Apex of elytra from apex of clavus distinctly dark infuscate, veins mostly lighter yellowish.

Body slender. Head rather large; crown subangularly produced, distinctly longer in middle than at sides. Elytra with third apical cell triangular. Apodemes of second sternite rather broad and short, strongly diverging. Plates long, sharply triangular, several setae near side margin. Style short and slender, ending in thin, slightly curved apex, not serrate. Penis small, reduced. Side lobe of pygofer triangular, ventral margin with slender, straight appendage. Anal tube simple.

Length: 2.5 mm.

Holotype, male (BISHOP 2225), Palau, Ngarmalk I., May 10, 1953, Beardsley.

DISTRIBUTION: Western Caroline Is. (Palau).

14. Empoasca morindae Metcalf (fig. 6, *i-k*).

Empoasca morindae Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 140.

Male: Golden yellow with reddish-brown eyes.

Body slender. Head broader than pronotum, crown subangulate, as long as its greatest width and as long as median length of pronotum. Pronotum with anterior and posterior margins nearly parallel. Elytra with third apical cell not stalked (as in *E. barringtoniae*). Apodemes of second sternite long, rather narrow, slightly tapering apically, rather strongly diverging. Plates long, triangular, side margin slightly sinuate, with long hairs; setae mostly absent, short setae present only quite near apex and base. Style small, very thick, apex shallowly curved, not serrate. Pygofer with short lateral processes. Anal tube simple.

Female: Seventh sternite broader than long, hind margin almost truncate. Apex of ovipositor often black.

Length: 3 mm.

DISTRIBUTION: S. Mariana Is., eastern Caroline Is.

S. MARIANA IS. GUAM, 43: Agana, Oct. 1952, Krauss; Barrigada, July 1936, Swezey; Dededo, May 1936, Usinger; Haputo Pt., Mar. 1948, Maehler; Machanao, June 1936, Usinger; Mt. Alifan, Apr. 1946, Krauss; Mt. Santa Rosa, Aug. 1945, Bohart and Gressitt; Orote Peninsula, May 1936, Usinger;

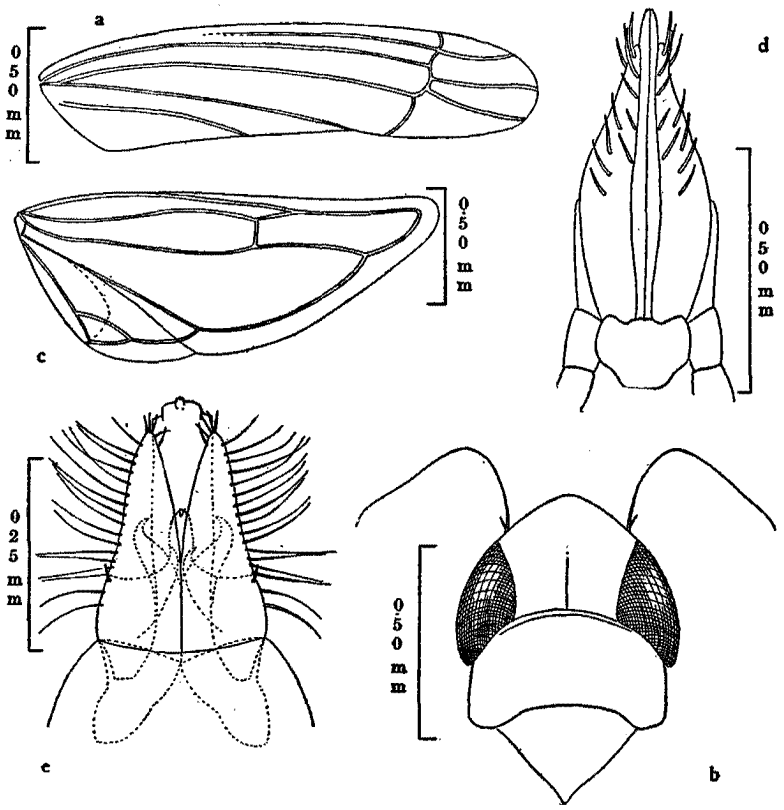

FIGURE 7.—*Empoasca barringtoniae:* a, elytron; b, dorsal view of head and thorax; c, flying wing; d, ventral view of female genitalia; e, ventral view of male genitalia. (After Metcalf.)

Piti, May 1936, Usinger; Potts Junction, Oct. 1952, Krauss; Pt. Oca, June, Oct. 1945, Bohart and Gressitt.

TRUK. Ton (Tol): Two, Mt. Unibot, 390 m., Jan. 1953, Gressitt.

PONAPE. Twelve. Colonia, Dec. 1937, Esaki, and June-Sept. 1950, Adams; Rohnkiti-Palikir, Jan. 1938, Esaki; Mt. Temwetemwensekir, 180 m., Jan. 1953, Gressitt.

HOSTS: *Morinda* sp., *Morinda citrifolia.*

The specimens from Ponape have the head a little more angularly produced, but the shape of the apodemes and the genitalia are similar to that of specimens from other localities.

15. Empoasca barringtoniae Metcalf (fig. 7).

Empoasca barringtoniae Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 141.

Male: Bright golden yellow; head and pronotum light ochraceous buff, eyes tawny; elytra golden yellow, transparent on apical one-third.

Crown strongly projecting, subacute with sides forming almost a right angle. Pronotum nearly as long as crown. Plates long, triangular, flat, contiguous on basal half, diverging to rather acute apices on apical half, fringed with elongate slender setae on lateral borders. Penis simple, reduced. Style broad, flat; acute apex curved inward. Pygofer with lateral processes broad, flat, converging to slender acute apex in median line.

Female: Seventh sternite elongate, hind margin slightly sinuate laterally with slight, rounded median lobe.

Length: 2.5 mm. (Description after Metcalf.)

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. Guam, 21: Fadian, Aug. 1936, Swezey; Tumon, May 1936, Swezey.

HOSTS: *Barringtonia* sp., *Barringtonia speciosa.*

This species is very similar to *E. morindae,* but is smaller, narrower, the crown being distinctly angularly produced and the pronotum narrower. The male is unknown to me.

16. Empoasca ngatpangensis Linnavuori, n. sp. (figs. 6, *l, m*; 8, *a, b*).

Male: Light yellow; elytra transparent, shifting to yellowish green, apex faintly smoky.

Body gracile. Head rather wide, crown relatively narrow, subangularly produced. Pronotum rather small. Apodemes of second sternite very large, filling most of abdomen and nearly reaching pygofer, broad, rather diverging. Plates triangular, with several setae and long fine hairs. Style long and slender, straight, apex distinctly serrate. Penis simple, reduced. Side lobe of pygofer with short, spine-like appendage in ventral margin. Anal tube simple.

Female: Seventh sternite long, hind margin truncate.

Length: 3.5 mm.

Holotype, male (US 63379), Babelthuap, East Ngatpang, Palau, 65 m., Dec. 10, 1952, Gressitt; allotype, female (US), same data. Four paratypes (BISHOP, RL), same data as for types.

DISTRIBUTION: Western Caroline Is. (Palau).

Side lobe of pygofer with bifurcate appendage. Anal tube apparently with short appendages in basal ventral angles.

Female: Seventh sternite about twice as broad as long, hind margin transverse.

Length: 3.25 mm.

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. GUAM: Nine, Piti, May 1936, Swezey.

HOST: Beans.

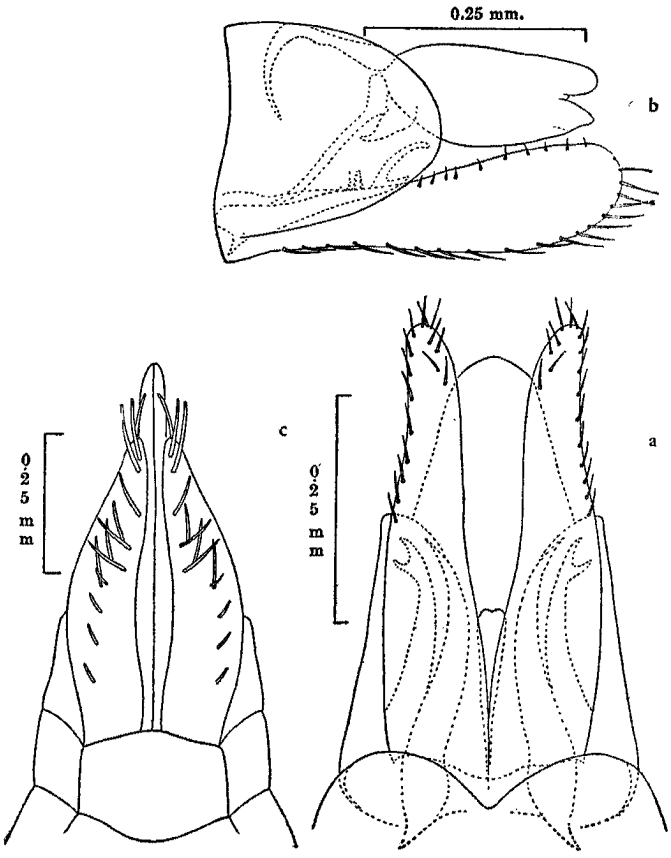

FIGURE 9.—*Empoasca pitiensis:* a, ventral view of male genitalia; b, lateral view of male genitalia; c, ventral view of female genitalia. (After Metcalf.)

20. **Empoasca boninensis** (Matsumura).

Chlorita boninensis Matsumura, 1931, Ins. Matsumurana **6**: 86; 1934, Cat. Jap. Ins. 2: 6.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 30.

Empoasca boninensis, Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 189.

Male and *female:* Closely allied to *Empoasca flavescens* (Fabricius), but differs from it as follows: Elytra with first and second apical sectors nearly parallel with each other, somewhat incurved; genital plates of male much longer, gradually becoming broader toward base, about five times as long as last sternite, with a few hairs; pygofer more slender, much shorter than genital plates.

Length: 3.5 mm. (Description after Matsumura.)

DISTRIBUTION: Bonin Is.

BONIN IS. CHICHI JIMA: Three, Aug. 1905, Matsumura.

21. Empoasca dentistylus Linnavuori, n. sp. (figs. 8, *p-r*; 10, *a, b*).

Male: Light yellow. Elytra transparent, shifting to yellowish green, apex faintly smoky.

Body gracile. Head rather wide; crown relatively narrow, slightly shorter than pronotum, of nearly uniform length, fore margin rounded. Pronotum rather small. Apodemes of second sternite long, narrow, close to each other. Plates long, parallel, with numerous setae laterally. Style with apex curved and somewhat resembling a bird's head, distinctly serrate with rather sharp teeth. Penis simple, reduced. Side lobe of pygofer triangular, with curved, short, slender appendage in ventral margin. Anal tube with long, straight, spine-like appendages in basal ventral angles.

Female: Seventh sternite rather long, hind margin roundly produced.

Length: 3 mm.

Holotype, male (BISHOP 2227), Palau, Auluptagel, sweeping native vegetation, Feb. 7, 1954, Beardsley; allotype, female (BISHOP), same data. Three paratypes (US, RL), same data as for types, and Sept. 1952, Krauss.

DISTRIBUTION: Western Caroline Is. (Palau).

22. Empoasca crenulata Linnavuori, n. sp. (figs. 8, *j*; 10, *d-f*).

Male: Yellowish green.

Body gracile. Head broad; crown about one-half as long as pronotum, broad, of nearly uniform length, fore margin rounded. Pronotum rather large. Apodemes of second sternite long, broad, very close to each other, apex truncate. Plates long and narrow as in *E. sesuvii,* several long setae and long, fine hairs. Style slender, shallowly curved, apex serrate. Penis reduced. Side lobe of pygofer roundly triangular, ventral margin with long appendage. Anal tube with broad, short, serrate appendages in basal ventral angles.

Female: Seventh sternite twice as long as sixth, hind margin truncate.

Length: 3.5 mm.

Holotype, male (US 63380), Sonsorol I., Sept. 13, 1952, Krauss; allotype, female (US), same data. Six paratypes (BISHOP, RL), same data as for types.

DISTRIBUTION: Southwestern Caroline Is. (Sonsorol).

23. Empoasca xanthopus Linnavuori, n. sp. (fig. 10, *g-j*).

Male: Dark yellow, apex of elytra faintly smoky.

Body very small and gracile. Head broad, crown narrow, of nearly uniform length, much shorter than pronotum, fore margin rounded. Pronotum as long as crown. Apodemes of second sternite long and broad, a little tapering apically, close to each other basally, then distinctly diverging. Plates rather long, apex curved, numerous long setae and long, fine hairs. Style slender, strongly serrate apically. Penis reduced. Side lobe of pygofer with long, nearly straight appendage. Anal tube with short, rather thick appendages in basal ventral angles.

Length: 2.5 mm.

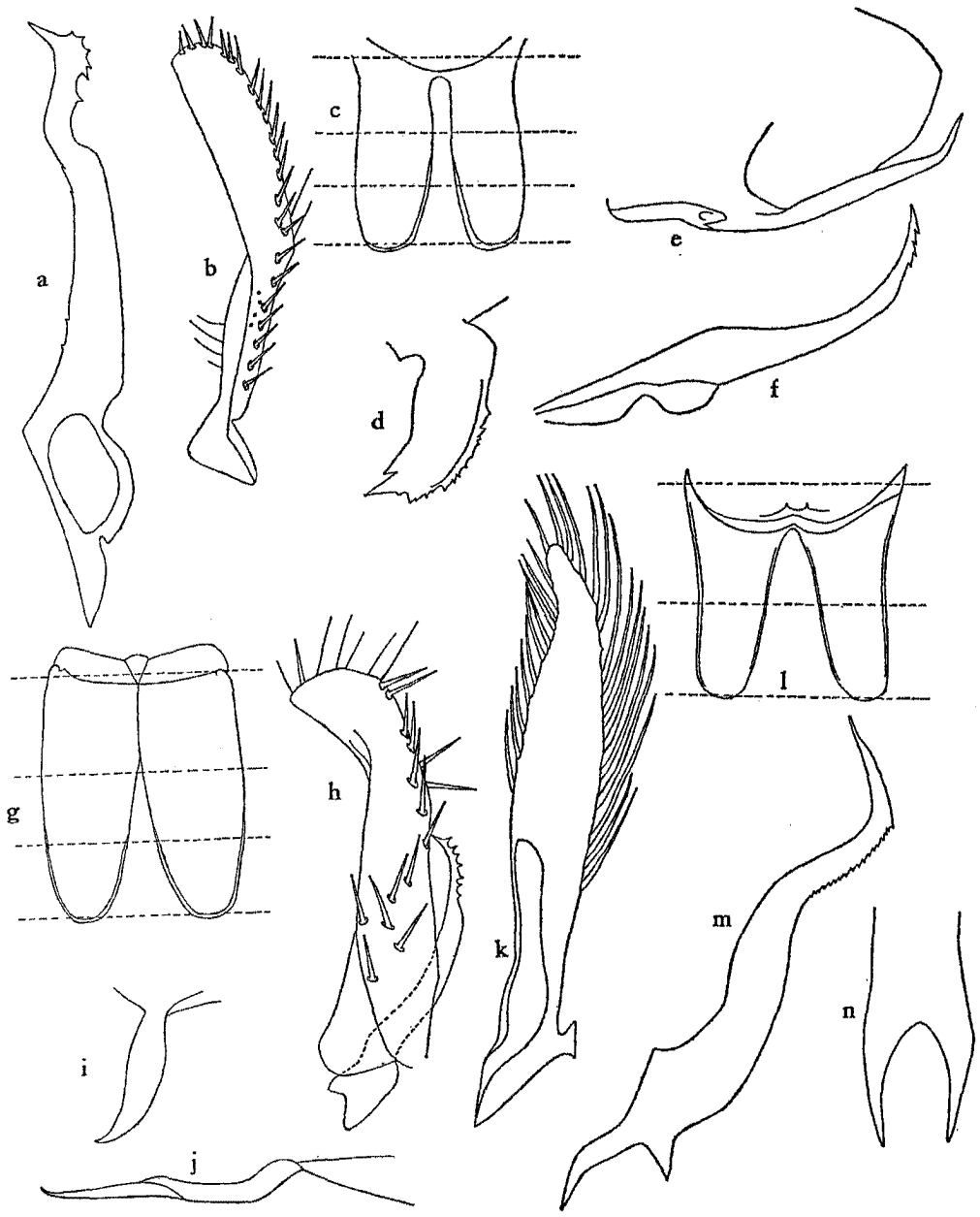

FIGURE 10.—**a, b,** *Empoasca dentistylus: a,* style; *b,* plate. **c,** *E. puncticeps,* apodemes of second sternite. **d-f,** *E. crenulata: d,* basal ventral angle of anal tube; *e,* side lobe, median view; *f,* style. **g-j,** *E. xanthopus: g,* apodemes of second sternite; *h,* plate and style, ventral view; *i,* basal ventral angle of anal tube; *j,* appendage of side lobe. **k-n,** *E. esakii: k,* plate; *l,* apodemes of second sternite; *m,* style; *n,* basal part of anal tube, ventral view.

Holotype, male (BISHOP 2228), Palau, Ngarmalk I. (Auluptagel), May 10, 1953, Beardsley.

DISTRIBUTION: Western Caroline Is. (Palau).

24. Empoasca esakii Linnavuori, n. sp. (fig. 10, *k-n*).

Male: Dark yellow, apex of elytra hyaline, colorless. Dorsal surface of abdomen orange yellow. Undersurface and legs pale yellow.

Body slender. Head large, much broader than pronotum; crown narrow, fore margin distinctly roundly triangularly produced. Pronotum as long as crown. Apodemes of second sternite rather small, narrow, moderately diverging. Plates long and narrow, much longer

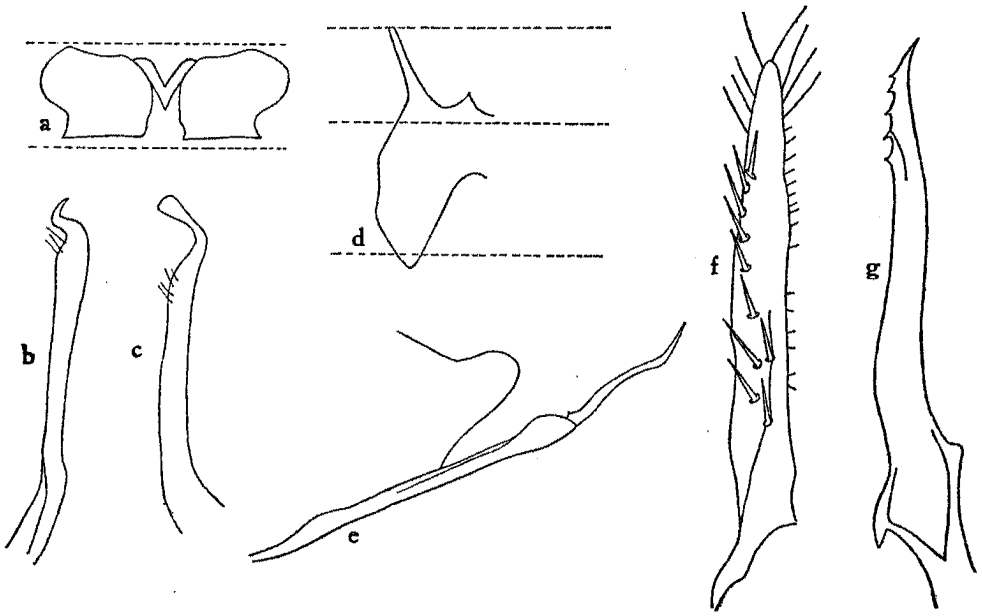

FIGURE 11.—**a, b,** *Empoasca macarangae: a,* apodemes of second sternite; *b,* style. **c,** *E. pipturi,* style. **d-g,** *E. sesuvii: d,* right apodeme of second sternite; *e,* side lobe, median view; *f,* plate; *g,* style.

than pygofer and anal tube, with numerous, very long setae. Style rather small, apex thin, curved, faintly serrate. Pygofer small, side lobe bluntly rounded, no appendage. Anal tube large, ventral basal angles prolonged and sharp.

Female: Elytra with two, small, dark-brown spots in corium near first and second cross veins. Apex of ovipositor black. Seventh sternite distinctly longer than sixth, hind margin nearly truncate or shallowly sinuate.

Length: 3 mm.

Holotype, male (KU), Ponape, Rohnkiti-One, July 18, 1939, Esaki; allotype, female (KU), same data. Five paratypes (KU, RL), same data as for types.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

This species is dedicated to the collector, Professor Teiso Esaki, who has contributed much to our knowledge of the insect fauna of the Pacific Islands.

25. Empoasca sesuvii Linnavuori, n. sp. (fig. 11, *d-g*).

Male: Pale yellow.

Body gracile, narrow. Crown slightly roundly produced, a little longer in middle than at sides, a little shorter than pronotum. Apodemes of second sternite very short and broad,

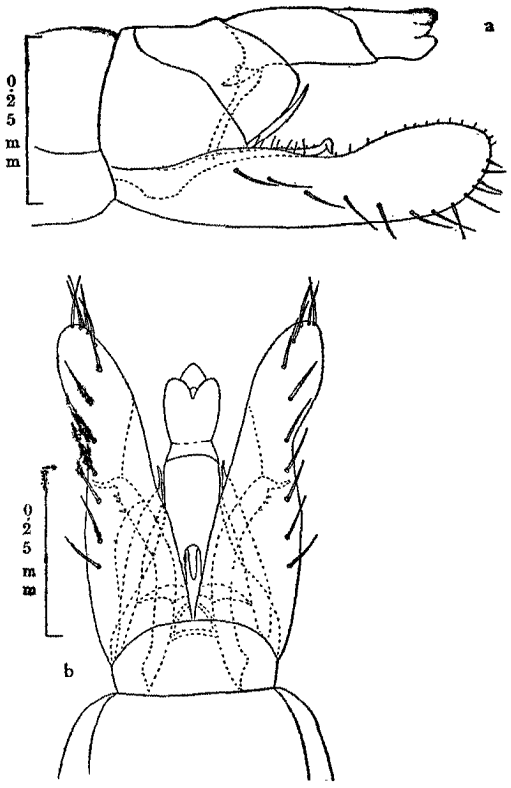

FIGURE 12.—*Empoasca macarangae:* **a**, male genitalia, lateral view; **b**, male genitalia, ventral view. (After Metcalf.)

apex obliquely angular. Plates long, very narrow, apex rather sharp, numerous setae, some long, fine hairs. Penis reduced. Style straight, slender, apex roughly serrate. Side lobe of pygofer short, triangular, with very long, straight appendage reaching beyond apex of pygofer. Anal tube rather large, no appendage.

Female: Hind margin of seventh sternite truncate at sides, round-triangular produced lobe in middle.

Length: 2.5-3 mm.

Holotype, male (BISHOP 2229), Wake, July 30, 1923, E. H. Bryan, Jr.;

allotype, female (BISHOP), same locality, July 29, 1923, Bryan. 149 paratypes (BISHOP, RL, US), same locality as for types, July 27, 30, 31, 1923, Aug. 1, 1923, Bryan, and Aug. 1, 1937, F. C. Hadden.

DISTRIBUTION: Wake I.

HOSTS: *Sesuvium* sp., *Sida* sp.

26. Empoasca macarangae Metcalf (figs. 11, *a, b*; 12).

Empoasca macarangae Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 142.

Male: Pale greenish yellow.

Body slender. Crown slightly subangulate, not quite as long as pronotum. Apodemes of second sternite very short, apex truncate. Plates very long, inner margin nearly straight,

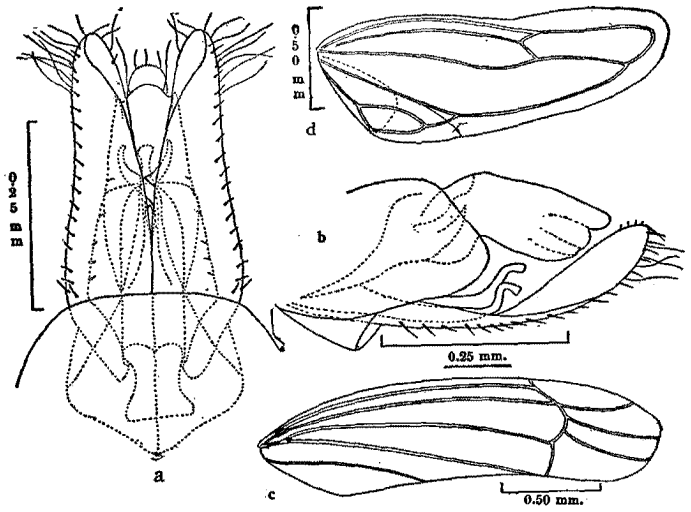

FIGURE 13.—*Empoasca pipturi:* **a**, male genitalia, ventral view; **b**, male genitalia, lateral view; **c**, elytron; **d**, flying wing. (After Metcalf.)

outer margin slightly sinuate, apex rounded, several stout setae. Style narrow, very long, apex deflected to short acute spine directed laterad. Penis reduced. Side lobe of pygofer roundly triangular, with long, slender appendage ending in slender acute spine. Anal tube with short, recurved appendage in basal ventral angles.

Female: Seventh sternite elongate, longer than broad, hind margin produced at median half, nearly straight.

Length: 3.25 mm.

DISTRIBUTION: S. Mariana Is., western Caroline Is.

S. MARIANA IS. GUAM, 13: Mt. Alifan, May 1936, Usinger; Pt. Ritidian, Aug. 1945, Gressitt.

YAP. YAP: One, Yaptown, July 1946, Townes.

HOST: *Macaranga* sp.

29. Empoasca bipunctulata Metcalf (fig. 15).

Empoasca bipunctulata Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 144.

Male: Face ochraceous orange, with pale, rather indistinct, median vitta and two pairs of oblique vittae; dorsal pair starts at apex of head and slopes laterad to middle of eyes, ventral pair broader, starts at top of median vitta, and slopes laterad to antennae. Crown ochraceous orange with pale median vitta starting about center of crown, terminating anteriorly in two recurved fasciae above ocelli, and extending almost to eyes; behind these fasciae a pair of broad, short dashes directed caudad. Pronotum chiefly ochraceous orange with faint, ivory-white, median vitta, lateral parts broadly ivory white. Elytra translucent with ochraceous-greenish reflections, round black spot between media and cross veins just posterior to these.

Crown as long as width between eyes, obtusely rounded anteriorly. Pronotum about twice as broad as long, hind margin broadly excavate. Apodemes of second sternite rather large, as in *E. morindae*. Plates very long and narrow; basal two-thirds about same width throughout, then elbowed, narrowed, directed mesad, and ending in obtuse apices with elongate setae. Style straight, apex narrow, serrate. Appendage of side lobe of pygofer long, slender, terminating in slender flagellate processes. Penis small.

Female: Seventh sternite about 1.5 times as broad as long, posterior lateral angles strongly projected; posterior border excavate in broad, U-shaped sinus, median area projected into road, sharp, triangular tooth with shallow, median, V-shaped notch.

Length: 2.75 mm.

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. SAIPAN: Thirty (US), Kannat Edtot, on *Intsia bijuga,* July 1946, Townes. ROTA: Two (US), Rota I., July 1946, Townes. GUAM: Four, Piti, May 1936, on sedges, Usinger and Swezey; Umatac, May 1936, Usinger.

HOSTS: *Intsia bijuga,* sedges.

30. Empoasca colorata Linnavuori, n. sp. (fig. 16).

Male: Yellowish white. Face yellow; cheeks with bright-red, transverse band below eyes; another bright-red, transverse band in upper part of frontoclypeus. Crown with broad, red, transverse band between fore corners of eyes; eyes dark gray. Pronotum with broad, red, curved, transverse band on disc; fore margin narrowly, basal margin broadly, yellowish white. Scutellum with orange basal triangles and two red spots between them. Elytra whitish with four large, red markings, apex brownish smoky. Undersurface and legs yellowish white, red longitudinal band on either side of thorax.

Body small, slender. Head a little broader than pronotum; crown bluntly triangularly produced. Pronotum a little longer than head, sides rather long. Plates long, sharply triangular, with row of about eight longer, and several shorter, setae, several long, fine hairs in apical part. Style slender, rather short, shallowly curved, apex serrate. Penis simple, reduced. Side lobe of pygofer roundish triangular, ventral margin with thick appendage bearing short, broad, triangular tooth near apex. Anal tube with short, blunt appendage in basal ventral angles.

Female: Seventh sternite twice as long as sixth; hind margin truncate.

Length: 3 mm.

Holotype, male (US 63381), Kusaie, Mutunlik, 22 m., Jan. 26, 1953, Clarke; allotype, female (US), same locality, Apr. 21, 1953, Clarke. Twenty-two paratypes (BISHOP, RL, US, CM), all Kusaie: 16 m., Jan. 23-24, 1953,

Gressitt; Mutunlik, 22 m., Jan. 23, 27, 31, 1953, Feb. 6, 14, 1953, Clarke; Hill 1010, 300 m., Apr. 13, 1953, Clarke.

DISTRIBUTION: Eastern Caroline Is. (Kusaie).

31. **Empoasca colorata** var. **rubropunctata** Linnavuori, n. var.

Female: Pale yellow. Ocelli in fore margin of head surrounded by red ring extending both to upper surface and frontal surface of head. Crown with two red spots in basal part of disc; eyes reddish gray. Pronotum yellowish white, with transverse, broken, red band, formed by four large, red maculae near fore margin. Scutellum yellowish white, base with

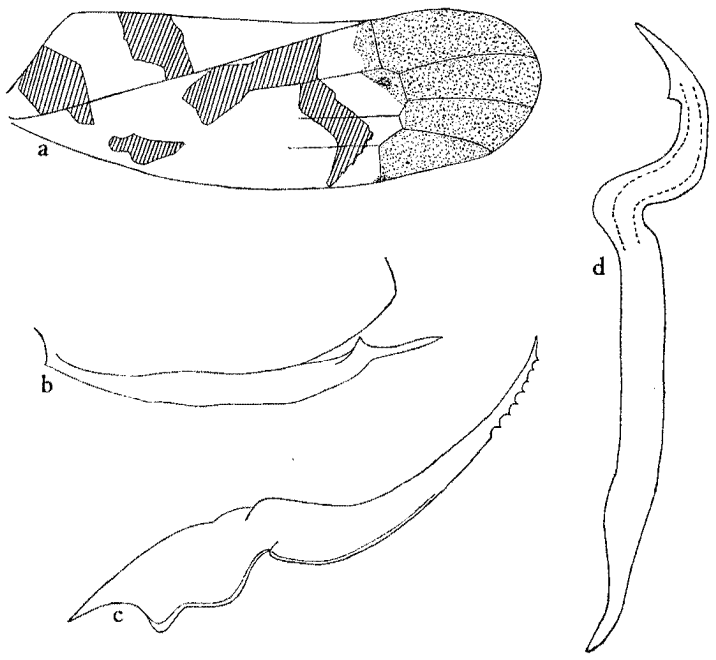

FIGURE 16.—*Empoasca colorata:* **a**, elytron; **b**, side lobe, median view; **c**, style; **d**, penis, lateral view.

two small, red spots. Elytra whitish, with six red spots: two in clavus, two in costal margin, and two near clavus suture in corium; apex smoky with some more distinct dark spots. Undersurface and legs pale yellow, red spot on either side of thorax.

Body, et cetera, as in nominate form. Hind margin of seventh sternite slightly produced in middle, with faint median notch.

Length: 3 mm.

Holotype, female (BISHOP 2230), Mt. Temwetemwensekir, 180-200 m., Ponape, Jan. 16, 1953, Gressitt. Paratypes (US, RL), one, same data as for holotype and one, Agric. Exper. Sta., Colonia, 16 m., Jan. 7, 1953, Gressitt.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

TRIBE TYPHLOCYBINI

Wing with apical cells open distally.

Genus **Erythroneura** Fitch

Erythroneura Fitch, 1851, New York State Cabinet Nat. Hist., Ann. Rept. **4**: 62 (type: *E. tricincta* Fitch; N. America).—Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1**: 364.—Oshanin, 1912, Kat. Paläarkt., Hemipt., 114.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 32.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 209.

Empoascanara Distant, 1918, Fauna of India, Rhynch. **7**: 94 (type: *E. prima* Distant; South India).—Matsumura, 1932, Ins. Matsumurana **6**: 190.

Small, gracile species. Color yellowish or greenish, often with bright or dark markings. Head about as wide as pronotum, crown more or less angularly produced, ocelli absent. Pronotum large, widest near hind margin. Elytra with third apical cell quadrangular. Flying wings with two apical cells, open distally. Plates with a few short setae. Style elongate, apex more or less asymmetrical, angularly enlarged mesad and laterad. Penis either simple or with appendages. Pygofer usually with appendages.

The distribution of this genus is nearly cosmopolitan.

KEY TO MICRONESIAN SPECIES OF ERYTHRONEURA

1. Length 2.6 mm.; elytra yellowish, with broken, longitudinal red band along radius ..... **32. macarangae**
   Length 2 mm.; elytra greenish yellow, with three small, dark-red spots in apical part ..... **33. marthae**

32. **Erythroneura macarangae** Linnavuori, n. sp. (fig. 17, *a-d*).

Male: Face, crown, pronotum, and scutellum yellow brown. Elytra yellowish; clavus yellow; along radius a broken, longitudinal red band formed of two stripes and apical roundish spot. Flying wings hyaline. Undersurface and legs yellowish.

Body gracile and slender. Head a little broader than pronotum; crown rectangularly produced, a little shorter than pronotum. Plates long, sides parallel, apex rounded and upturned. Style long, apex sharply triangularly enlarged mesad and laterad, nearly truncate distally. Penis with broad, flattened stem, with furcate ventral appendage, branches lying close to each other; gonopore subapical on ventral surface. Side lobe of pygofer truncate apically, with small appendage in upper angle.

Female: Hind margin of seventh sternite truncate.

Length: 2.6 mm.

Holotype, male (US 63382), Hill behind Yaptown, Yap, 60 m., Nov. 28, 1952, Gressitt; allotype, female (US), Dugor-Rumu, Yap, 10 m., Nov. 29, 1952, Gressitt. Five paratypes (BISHOP, US, RL), Yaptown, on *Macaranga,* July 13, 1946, Townes; Mt. Mataade, 60 m., Dec. 2, 1952, Gressitt.

DISTRIBUTION: Western Caroline Is. (Yap).

HOST: *Macaranga* sp.

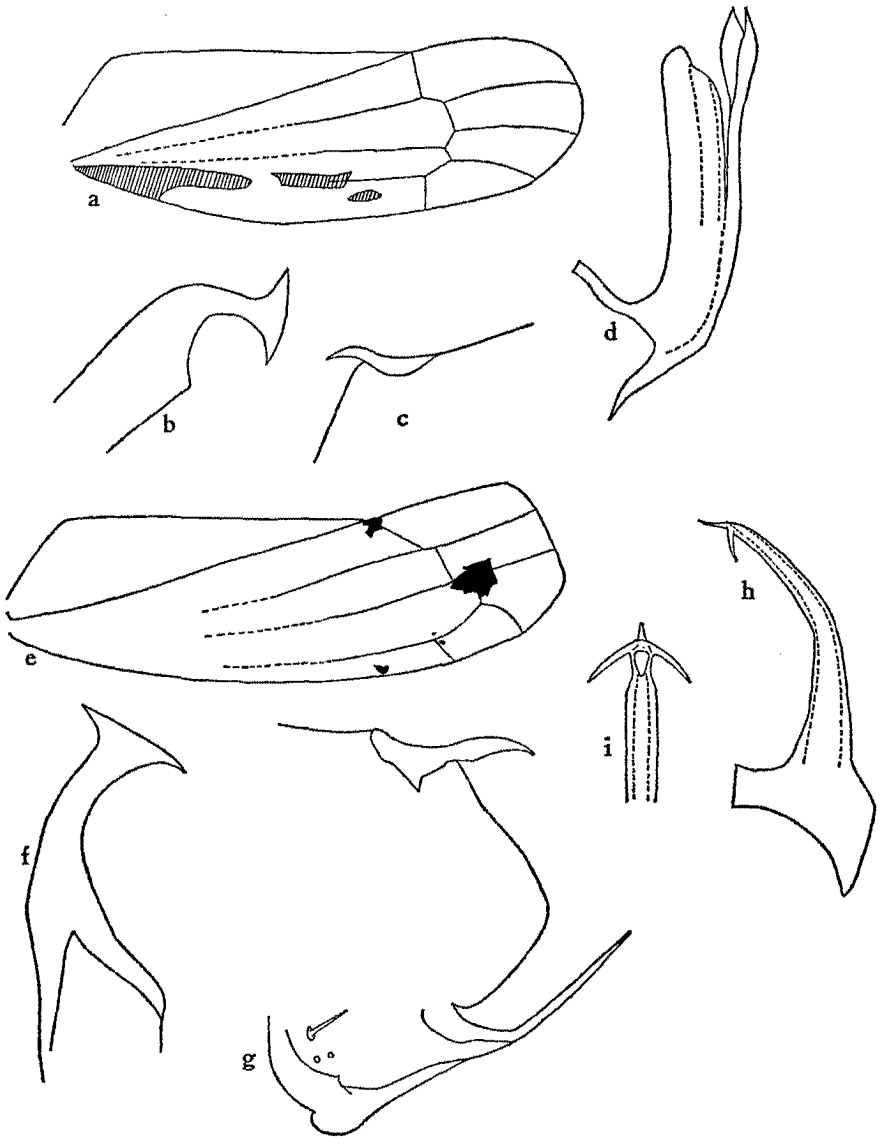

FIGURE 17.—**a-d**, *Erythroneura macarangae: a*, elytron; *b*, apex of style; *c*, upper apical angle of side lobe, median view; *d*, penis, lateral view. **e-i**, *E. marthae: e*, elytron; *f*, apex of style; *g*, side lobe; *h*, penis, lateral view; *i*, apex of penis, ventral view.

33. Erythroneura marthae Linnavuori, n. sp. (fig. 17, *e-i*).

Male: Pale yellow, eyes yellowish gray. Elytra greenish yellow, apical part with three small, dark-red spots plus one or two very small, faint spots.

Body very small and slender. Head smaller than pronotum; crown sharply triangularly produced, about 1.5 times as long in middle as at sides. Elytra much longer than abdomen. Plates short, apex bluntly rounded. Style elongate, apex distally truncate, sharply triangularly enlarged mesad and laterad. Penis with narrow, curved stem; pair of short apical appendages; gonopore subapical on ventral surface. Side lobe of pygofer truncate, both upper and ventral angles with appendage.

Female: Seventh sternite rather large, hind margin rounded at sides, slightly triangularly produced in middle.

Length: 2 mm.

Holotype, male (BISHOP 2231), Truk, Mt. Chukumong, 25-50 m., Wena, Feb. 3, 1953, Gressitt; allotype, female (BISHOP), same data. Eight paratypes (US, RL), same locality as for holotype, ex wild bean, Nov. 6, 1952, Beardsley.

DISTRIBUTION: Central Caroline Is. (Truk).

HOST: Wild bean.

This species somewhat resembles *E. tripunctula* (Melichar) from Ceylon which, however, is smaller, only 1.5 mm., and has the red spots of the elytra in another position.

Subfamily Group CICADELLIDES

Robust or slender species. Ocelli in primitive forms on crown; in higher forms on fore margin of head near eyes. Male: Ninth sternite mostly more or less triangular, articulated with pygofer in higher forms, or more or less fused in primitive forms. Plates more or less triangular, styles fused with plates in higher forms. Connective triangular in primitive forms, usually Y-shaped or linear in higher forms.

Key to Micronesian Subfamilies of Cicadellides

1. Ocelli on crown. Depressed, often bright-colored forms ..... **Nirvaninae**
   Ocelli in fore margin of head 2
2. Costal area of flying wings expanded near base; frontoclypeus long and narrow, of equal breadth; crown small ..... **Coelidiinae**
   Costal area of flying wings not expanded near base; frontoclypeus broader, distinctly broadening upward 3
3. Jugum of flying wings with submarginal vein in which third anal vein ends; robust, dark-colored forms; crown very short; pronotum anteriorly strongly produced ..... **Tartessinae**
   No submarginal vein in jugum of flying wings, third anal vein ending in wing margin or evanescent before reaching wing margin 4
4. Margin of gena below eyes strongly sinuate or incised; dorsoventrally flattened, greenish-colored forms; crown flat, strongly roundly produced, anterior margin acute or foliaceous; lateral margins of pronotum carinate ..... **Hecalinae**
   Margin of gena not strongly sinuate; body usually not flattened; crown triangularly produced or short and rounded, not acute or foliaceous ..... **Deltocephalinae**

Subfamily NIRVANINAE

Elongate, strongly dorsoventrally depressed forms. Color yellowish, often with black, bright-red, or orange markings. Head usually more or less strongly produced; lora usually small; frontoclypeus concave or flat, extending posteriorly as far as hind margin of face; antenna very long. Pronotum with long lateral margins. Fore and middle tibiae rounded. Elytra with veins evanescent except for apical ones, appendage very narrow or absent.

This subfamily is distributed through the Oriental Region, tropical Africa, Australia, and Central America.

Genus **Pactana** Linnavuori, new genus

Type: *Pactana elegantula* Linnavuori, n. sp., by present designation.

Body long, depressed, with black and bright-red markings. Face flat; anteclypeus tapering downward; frontoclypeus long, first strongly broadening upward toward antennal pits, then strongly triangularly tapering to upper margin of face, rugulous, slightly concave in middle; sides of frons more or less broadly visible from above at sides of crown from eyes to apex; lora very small. Crown rather strongly roundly triangularly produced, 1.25-2 times as long as pronotum, side and fore margins sharp and slightly raised in apex; disc flat; no distinct coronal suture; ocelli on disc in region of antennae, removed from side margin about 1.5 times their own diameter. Pronotum broadening hindward, sides long, fore margin rounded, hind margin rather deeply sinuate. Dorsal surface of fore tibia with three slender spines; spinulation of hind knees 3 + 1. Elytral venation as in *Nirvana,* obscure basally, four apical cells, no appendage.

Male: Plates divergent, long, and narrow, sharp triangular, apex bluntly rounded, lateral margin strongly turned dorsad, macrosetae absent. Valve small, reduced, rounded. Style small; apophyse thick, of nearly equal breadth, apex truncate distally, with sharp laterad prolonged spine; apodeme rectangularly enlarged distally; no ventral arm. Connective T-shaped, broad transverse band with narrower stem. Penis small, symmetric; no basal *socle;* stem slightly curved, flattened, apex with ventrally enlarged disc, gonopore in middle of disc. Pygofer sclerotized, side lobe rounded, dorsal margin with row of macrosetae, ventral margin with thick appendage. Anal tube large, conical, reaching apex of pygofer, mostly sclerotized dorsally.

This genus is found in the Caroline Islands.

This new genus seems to be closely related to *Kana* Distant in the position of the ocelli near the cephalic margin, but differs in the much more prolonged head. Male genitalia of *Kana* are unknown to me.

Key to Micronesian Species of Pactana

1. Crown elongate triangular, nearly twice as long as pronotum; length 4.2-5 mm.; penis slender ..... **34. elegantula**
   Crown shorter and more blunt, 1.25 times as long as pronotum; length 4-4.5 mm.; penis shorter and thicker ..... **35. ornata**

34. **Pactana elegantula** Linnavuori, n. sp. (figs. 18, *a*; 19, *a-e*).

Male: Face mostly black, upper part of frontoclypeus yellowish. Crown black, sides from eyes to apex broadly pale yellow; side margin dark; antenna yellow; eyes gray. Pronotum and scutellum black. Elytra black with following markings: Clavus with a long, red longitudinal stripe basally and two round, red spots apically; membrane with red band along claval suture and large, red, transverse spot at apex of clavus; costal

margin dark brown, with two orange, triangular spots and two hyaline spots apically; first apical cell with round, hyaline spot at base. Abdomen dark, sides orange. Legs with spines pale yellow.

Body elongate. Crown long, roundly triangularly produced, nearly twice as long as pronotum, disc flat. Plates divergent, long, and narrow, sharply triangular, apex rounded, lateral margin strongly turned up. Valve small, rounded. Style thick. Penis small, stem curved dorsad, rather slender, apex with ventrally enlarged disc; gonopore in middle of disc. Side lobe of pygofer short, rounded, dorsal margin serrate apically, with row of macrosetae; appendage of ventral margin long and rather slender, tapering apically, apex with two blunt, faint teeth.

Female: Lighter in color. Black only under part of frontoclypeus. Crown pale yellow, with black median stripe. Pronotum red, sides narrowly black and median stripe black. Abdomen mostly yellowish or orange. Seventh sternite a little longer than sixth, hind margin truncate with very faint, roundish lobe in middle.

Length: 4.2-5 mm.

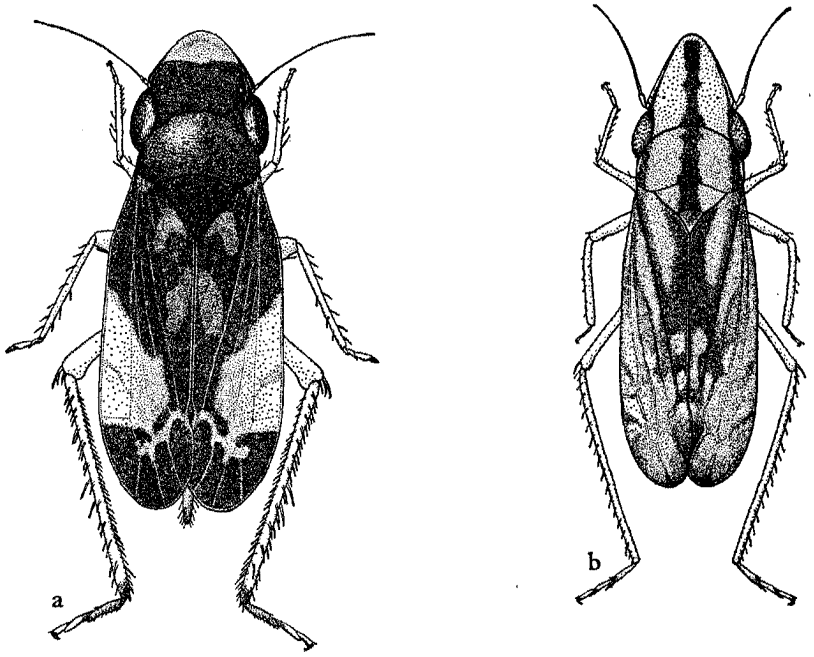

FIGURE 18.—Dorsal view: a, *Pactana elegantula;* b, *P. ornata.*

Holotype, male (US 63383), Yap, Mt. Madaade (Matade), 95 m., Yap I., Dec. 1, 1952, Gressitt; allotype, female (US), same locality, Oct. 1952, Krauss. Nine paratypes (BISHOP, RL, KU, US, CM), Yap: Same locality as for holotype, Oct. 1952, Krauss, and July 8, 1951, Dec. 1, 1952, Gressitt; Hill behind Yaptown, 60 m., Nov. 28, 1952, Gressitt; Dugor-Kanif-Ruul, Sept. 2, 1939, Esaki; Gagil, July-Aug. 1950, Goss. Two paratypes (BISHOP, RL), Palau: East Ngatpang, 65 m., Babelthuap I., Dec. 10, 1952, Gressitt.

DISTRIBUTION: Western Caroline Is. (Yap, Palau).

35. Pactana ornata Linnavuori, n. sp. (figs. 18, *b*; 19, *f, g*).

Male: Coloring much as in *P. elegantula.* Face black, upper part of frontoclypeus yellowish. Crown black, apex yellowish; antenna yellowish; eyes dark gray. Pronotum and scutellum black. Elytra black, clavus with three red markings: Small one at base, quadrangular one in middle and stripe in apical part; corium with large, red, quadrangular spot, directed obliquely basad, near base of clavus; cross veins mostly red; costal margin with two large, whitish, colorless spots. Undersurface dark, pygofer and sides of abdomen reddish brown, legs pale yellow.

Body much as in *P. elegantula,* but smaller. Head much shorter and more blunt, only 1.25 times as long as pronotum; crown blunt and rounded apically, disc flat, sparsely

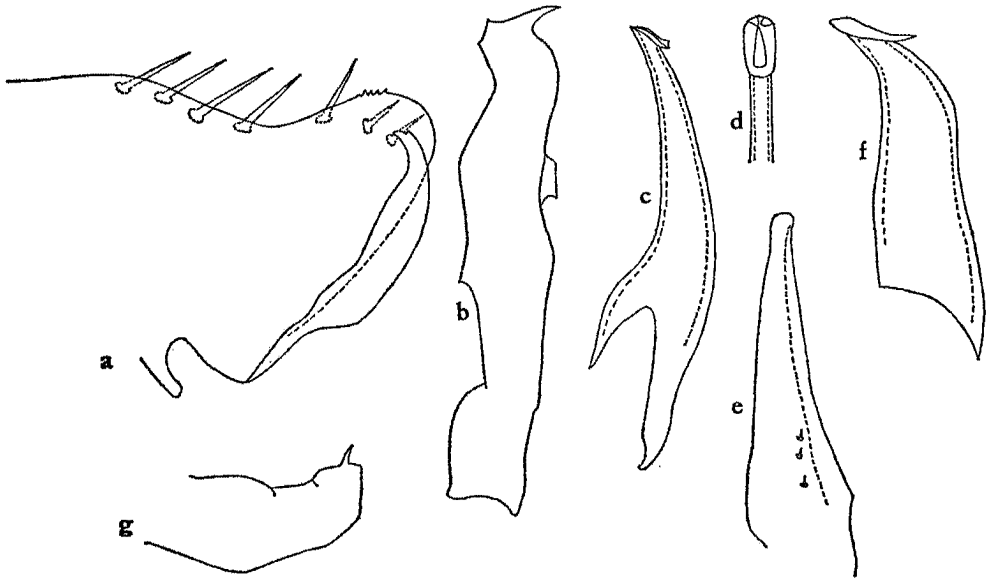

FIGURE 19.—**a-e,** *Pactana elegantula: a,* side lobe, median view; *b,* style; *c,* penis, lateral view; *d,* apex of penis, ventral view; *e,* plate. **f, g,** *P. ornata: f,* penis, lateral view; *g,* appendage of side lobe.

punctate; sides of frons rather broadly visible on either side of crown anteriorly. Genitalia much as in *P. elegantula.* Style broader. Penis shorter, stem much broader, disc of apex larger. Appendage of side lobe thicker also in apex, apex truncate distally, with thin, sharp tooth in dorsal margin near apex.

Female: Seventh sternite as long as sixth; hind margin slightly produced in middle.

Length: 4-4.5 mm.

Holotype, male (BISHOP 2232), Truk, Mt. Iron, 180 m., Fefan I., Jan. 31, 1953, Gressitt; allotype, female (BISHOP), same data. Four paratypes (BISHOP, US, RL, KU), Truk: Same data as for types; Ton (Tol) I., Mt. Unibot, 390 m., Jan. 2, 1953, Gressitt; Ton (Tol) I., Olej-Foup, Apr. 11, 1940, Yasumatsu and Yoshimura.

DISTRIBUTION: Central Caroline Is. (Truk).

SUBFAMILY HECALINAE

Rather large, elongate, depressed forms. Color greenish. Head strongly produced; fore margin acute or foliaceous; face lying in strongly oblique or nearly horizontal plane; margin of cheek strongly sinuate or incised below eye; crown flat. Lateral margins of crown long and carinate.

This subfamily is a tribe of Deltocephalinae [Linnavuori, 1959, Soc. Zool. Bot. Fenn., "Vanamo," Ann. Zool. **20** (1) : 35-36].

Genus **Parabolocratus** Fieber

Parabolocratus Fieber, 1866, Zool.-bot. Ges. Wien, Verh. **16**: 502 (type: *P. glaucescens* Fieber; Europe).—Horváth, 1899, Term. Füzetek **22**: 370.—Oshanin, 1906, Verz. Palaearkt., Hemipt **2**: 86.—Matsumura, 1912, Tohoku Imp. Univ., Jour. Coll. Agric. **4**: 285.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 35.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 77.

Head as wide as pronotum, anterior margin acute or subfoliaceous. Anteclypeus rectangular; frontoclypeus swollen. Crown flat, much longer medially than next to eye, apically triangular or parabolic. Sides of pronotum rather long, parallel or converging, carinate. Elytra with small appendix, two closed subapical cells, apical cells very short. Color greenish. Spinulation of fore tibiae 1 + 4 or 1 + 6.

Male: Plates with lateral margin sinuate, ending in slender, long apex, a few macrosetae in row in lateral margin. Valve triangular. Style small, apophyse curved, apodeme lamellate. Connective Y-shaped. Penis symmetric; *socle* small; stem long, curved, arising from ventral part of *socle,* with apical appendages; gonopore subapical on ventral surface. Pygofer sclerotized, side lobes rather long, parabolic, with several macrosetae. Anal tube sclerotized, rather large.

This genus is distributed through southern Europe, Africa, the Oriental Region, and North America.

36. **Parabolocratus gressitti** Linnavuori, n. sp. (fig. 20).

Male: Face pale yellow, upper part of frons with curved, dark-brown, transverse band; eyes reddish gray. Crown, pronotum, and scutellum pale yellow, with four orange, more or less parallel, longitudinal stripes from apex of crown to scutellum. Elytra yellowish green, veins darker greenish, apex brownish infuscate, with some round, whitish spots. Undersurface and legs pale yellow.

Crown a little shorter than pronotum, bluntly angularly produced, disc flat, slightly upturned apically. Pronotum with long sides, hind margin slightly sinuate. Elytra as long as abdomen. Plates long, apical part very long and narrow. Style rather small, apophyse claw-like, curved. Penis with stem rather long and nearly straight, pair of very long, curved, basally-directed, apical appendages, stem ending in pair of short, diverging processes. Pygofer with large, semicircular, black, sclerotized area behind anal tube. Anal tube rather large, reaching apex of side lobe.

Female: Head as long as pronotum. Elytra a little shorter than abdomen. Coloring as in male, except apex of elytra pale with only small, dark spot in base of appendix. Seventh sternite a little longer than sixth, hind margin sinuate in middle, with small, triangular, median lobe.

Length: Male 5 mm.; female 6-7.5 mm.

Holotype, male (US 63384), Palau, Babelthuap, Ulimang, Dec. 16-25, 1947, Dybas; allotype, female (US), same data. The following are paratypes (BISHOP, RL, CM, US). Palau: Four, same data as for types; one, Ngaiangl (Kayangel), Dec. 15, 1952, Gressitt; eight, Koror, Nov. 21, 1947, Dybas, Sept. 1952, Krauss, Apr. 14-20, 1953, Beardsley; one, Auluptagel, Nov. 1952, Krauss; one, Peleliu, Mt. Amiangel, Dec. 22, 1952, Gressitt. Yap: One, Yap I., Oct. 1952, Krauss; five, Map I., July-Aug. 1950, Goss; two, Rumung I.,

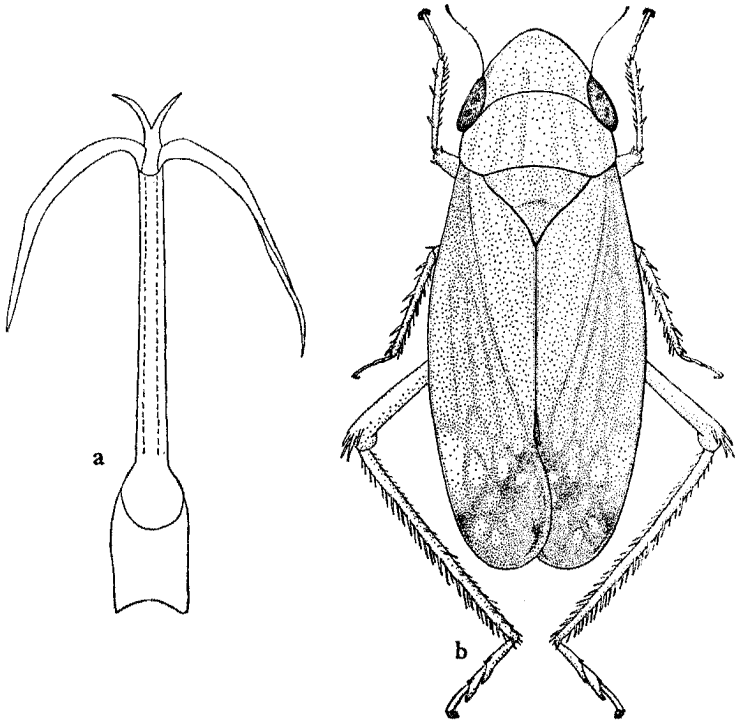

FIGURE 20.—*Parabolocratus gressitti:* a, penis, ventral view; b, male, dorsal view.

July-Aug. 1950, Goss and Oct. 22, 1952, Krauss. Caroline Atolls: Nine, Ulithi, Mogmog I., Oct. 6, 1952, Krauss. Ponape: Two, Agric. Exper. Sta., June-Sept. 1950, Adams; Sokehs I., Feb. 26, 1948, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau, Yap, Ponape, Ulithi A.).

This species resembles the Japanese *P. lineatus* Horváth, but it is smaller, the stem of the penis is shorter, the apical appendages are directed basad (dorsad in *P. lineatus*), and the processes in the apex of the stem are much shorter. This species is dedicated to Dr. J. Linsley Gressitt.

Subfamily TARTESSINAE

Robust, elongate leafhoppers. Color mostly dark brownish or blackish. Face flat, postclypeus only encroaching onto anterior part of frons, from which it is separated by epistomal suture. Frons extensive, usually rectangular in shape, entirely facial in position. Antennal ledges transverse, antennal depressions shallow. Crown very short, usually shorter in middle than next to eye, separated from face by marginal carina, eyes large, ocelli in fore margin. Pronotum heart-shaped, strongly produced, sides very short, hind margin more or less strongly sinuate. Scutellum large. Elytra usually with complete venation, appendix well developed. Jugum of flying wings with submarginal vein in which third anal vein ends.

This subfamily is found in the Australian and Oriental Regions.

Genus **Tartessus** Stål

Tartessus Stål, 1865, Öfv. K. Vet.-Akad., Förh. **22**: 156 (type: *Bythoscopus malayus* Stål; Malaya).—Spångberg, 1877, Öfv. K. Vet.-Akad., Förh. **34**: 3.—Signoret, 1878, Soc. Ent. France, Ann. V, **8**: 348.—Distant, 1908, Fauna of India, Rhynch. **4**: 302-303.—Matsumura, 1912, Tohoku Imp. Univ., Jour. Coll. Agric. **4**: 296.—Merino, 1936, Philippine Jour. Sci. **61**: 366.—Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 128.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 18.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 64.

Large species. Color dark brownish or blackish. Head broader than pronotum; eyes large; crown very broad and short, usually distinctly shorter in middle than next to eye, separated from face by marginal carina; ocelli in fore margin near eyes, distinctly visible from above. Face flat; anteclypeus small, nearly rectangular, or slightly broadening downward; postclypeus broad, rugulous. Frons rugulous. Pronotum heart-shaped, projecting anteriorly well in front of eyes; disc transversely furrowed. Scutellum large, nearly as long as pronotum. Appendix of elytra broad; three closed subapical cells. Flying wings with marginal vein continued onto anal area. Fore tibiae dorsally with two rows of numerous slender spines, spinulation of hind knees 2 + 2.

Male: Valve roundly produced or roundly triangular. Plates long, narrow, triangular, with some slight setae, distinct macrosetae absent. Style elongate, robust; apophyse long, curved, often broad and slightly serrate dorsally; apodeme long and narrow; style distinctly fused with plate in lateral basal angles of plates. Connective very short, broad, band-like, not furcate. Penis symmetric; *socle* well developed; stem broad, long, straight, often flattened, arising from ventral part of *socle,* simple or with apical and ventral appendages; gonopore on ventral surface rather far from apex. Pygofer completely heavily sclerotized; side lobe long, triangular or rounded, often bearing apical spine, no macrosetae, no membranous fold near base. Anal tube long, sclerotized, with pair of long, thick basal appendages.

This genus is found in the Oriental Region, the East Indies, Japan, and Australia. The Australian species described as members of this genus which I have examined have dissimilar male genitalia and probably represent other, still undescribed, genera of the subfamily.

Key to Micronesian Species of Tartessus

1. Seventh sternite of female narrow, strongly compressed and elevated, hind margin deeply incised; pygofer short, broad-conical, ovipositor about one-third longer than pygofer; color ochraceous buff.....**40. ochraceus**
   Seventh sternite of female broad, rectangular, flat, hind margin shallowly incised; pygofer long, long-conical, ovipositor less than one-third longer than pygofer; color mostly darker..... 2
2. Penis with only a pair of slight, short processes in apex; color light yellowish brown, face with one or two black transverse bands.....**37. ferrugineus proximus**
   Penis with long appendages..... 3
3. Penis with pair of apical and pair of ventral appendages; color blackish or dark brown.....**41. fieberi sycophantus**
   Penis with only a pair of apical appendages..... 4
4. Stem of penis with serrate ridge on either side ventrally.....**39. cristatus**
   Penis smooth.....**38. swezeyi**

37. **Tartessus ferrugineus proximus** Linnavuori, n. subsp. (fig. 21).

Male: Totally light yellow brown. Upper margin of frons with black, shining, transverse band between ocelli; sometimes with another band below between antennal ledges. Elytral veins slightly darker. Abdomen dorsally dark brown.

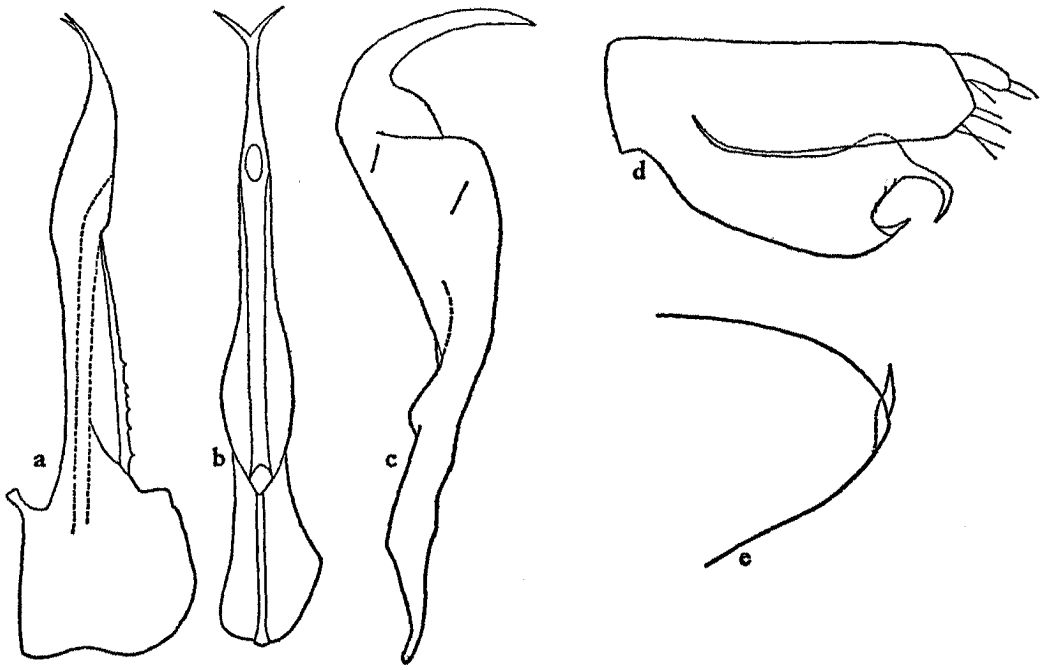

Figure 21.—*Tartessus ferrugineus proximus:* a, penis, lateral view; b, penis, ventral view; c, style; d, anal tube; e, side lobe, lateral view.

Head broad; eyes prominent; crown rather short, twice as long next to eyes as in middle. Pronotum rather strongly produced; transverse furrows of disc rather faint. Scutellum a little longer than pronotum. Plates long, triangular. Style with strongly curved, rather slender apophyse. Penis lamellately flattened; *socle* large, nearly quadrangular; stem rather broad, ending in pair of short, dorsad-diverging apical processes; stem ventrally scored from gonopore to *socle,* sides slightly serrate. Side lobe of pygofer with very short apical spine directed dorsad. Anal tube long, appendage thick, broadening apically, apex sinuate with two short, curved spines.

Female: Seventh sternite over twice as long as sixth; hind margin roundly produced, slightly excavate in middle.

Length: 8.5-11 mm.

Holotype, male (US 63385), Bonin Is., Chichi Jima, Tsurihama, June 23, 1949, A. R. Mead; allotype, female (US), same data. Two paratypes (NIAS, RL), Bonin Is.: Same data as for types and Chichi Jima, Omura, 1925-35, Daido.

DISTRIBUTION: Bonin Is.

This form resembles the Japanese *T. ferrugineus* ssp. *nigricosta* Matsumura, especially in the genitalia, but differs in the light-brown coloring, the latter species being much darker with dark-brownish markings, e.g., in the costal margin of elytra.

38. Tartessus swezeyi Metcalf (figs. 22; 23, *a-d*).

Tartessus swezeyi Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. 189: 130.

Male: Face ochraceous orange with narrow border of black just below crown; broadly curving fascia of black at level of antennae; below this band a central black spot on frontoclypeus; lateral areas of frontoclypeus narrowly black connected across narrow part of frontoclypeus below central black area; ventral area of anteclypeus ochraceous orange with lateral borders heavily marked with black; anteclypeus bordered with black. Crown ochraceous orange, posterior border narrowly black. Pronotum chiefly ochraceous orange. Elytra chiefly blackish fuscous; veins black; clavus pale green with veins black. Ventral surface blackish; fore and middle legs ochraceous orange heavily marked with black, hind legs chiefly black or blackish fuscous.

Crown very short, only about half as long in middle as next to eye, eyes prominent. Pronotum 1.5 times as broad as long; disc finely irregularly, transversely rugulous; anterior margins strongly produced, hind margin broadly incised. Valve elongate, hind margin rounded. Plates long, narrow, triangular, apex with about seven delicate setae. Style elongate, rather slender; apophyse long, rather narrow, curved. Penis long; *socle* well developed; stem flattened, straight, with pair of long, curved apical appendages directed dorsad. Side lobe of pygofer long, sharply triangular, no appendage. Anal tube as in *T. cristatus,* long, nearly reaching apex of side lobe; basal appendage long, straight, tapering to sharp apex.

Female: General color darker or lighter fuscous; head and pronotum ochraceous tawny. Eyes black; preocular area at base of antennae black. Elytra ochraceous, veins blackish fuscous. Abdomen dorsally black with elongate, ochraceous tawny spots at base of segments. Undersurface chiefly fuscous with ochraceous tawny areas, e.g., in margins of segments. Legs ochraceous tawny, femora lined with blackish. Seventh sternite broader than long; hind margin slightly produced with median U-shaped sinus; posterior lateral angles of sinus obtusely triangularly produced.

Length: 7.5-9 mm.

Nymph: (Description after Metcalf.) Chiefly ochraceous yellow, more or less marked with black; eyes usually black; lateral and posterior margins of tegminal pads chiefly black and lateral borders of some of dorsal abdominal segments marked with black; face with two bright-orange, curving fasciae, one on dorsal margin and one at about level of antennae. Front legs very much stouter than corresponding limbs in adults. In youngest of nymphs, posterior border of whole femur sparsely ciliate with long setae. Tibia greatly flattened and closely ciliate on both anterior and posterior border with elongate setae forming curious basket-like structure which must be correlated with the life of the nymph.

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. ROTA: One, Sonson-Taipingot, Feb. 1936, Esaki. GUAM, 57: Jan. 1954, Liming; Jan.-Apr. 1945, Baker; Pt. Ritidian, Apr. 1936, E. H. Bryan, Jr.; Pt. Ritidian, Oct. 1952, Krauss; Pt. Ritidian, June,

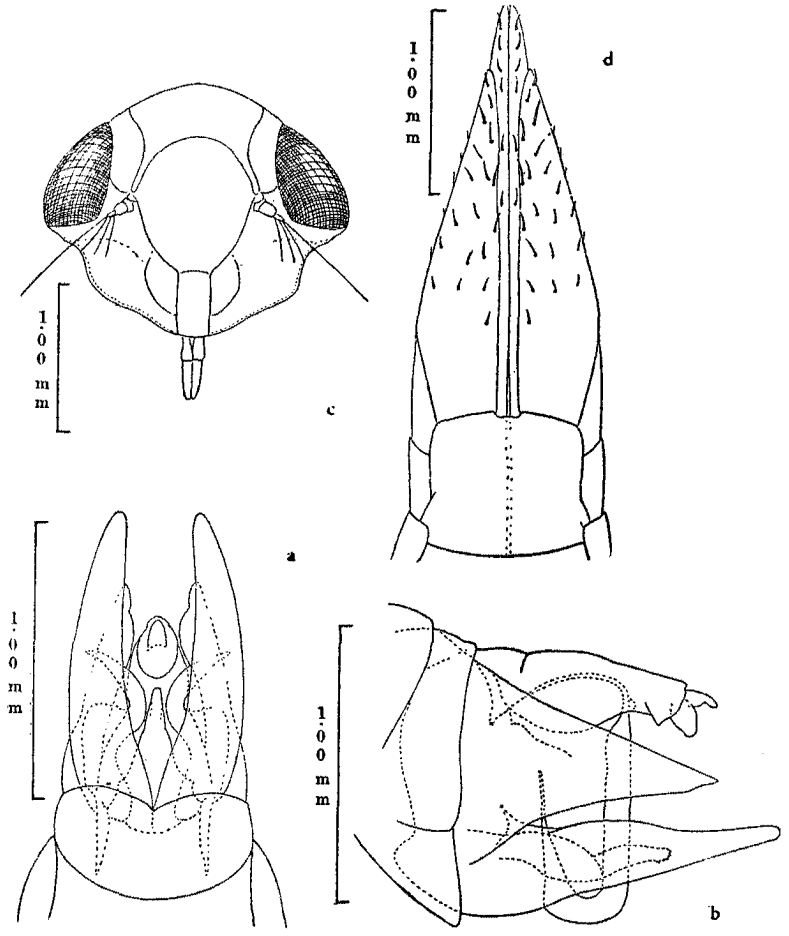

FIGURE 22.—*Tartessus swezeyi:* a, ventral view of male genitalia; b, lateral view of male genitalia; c, frontal view; d, ventral view of female genitalia. (After Metcalf.)

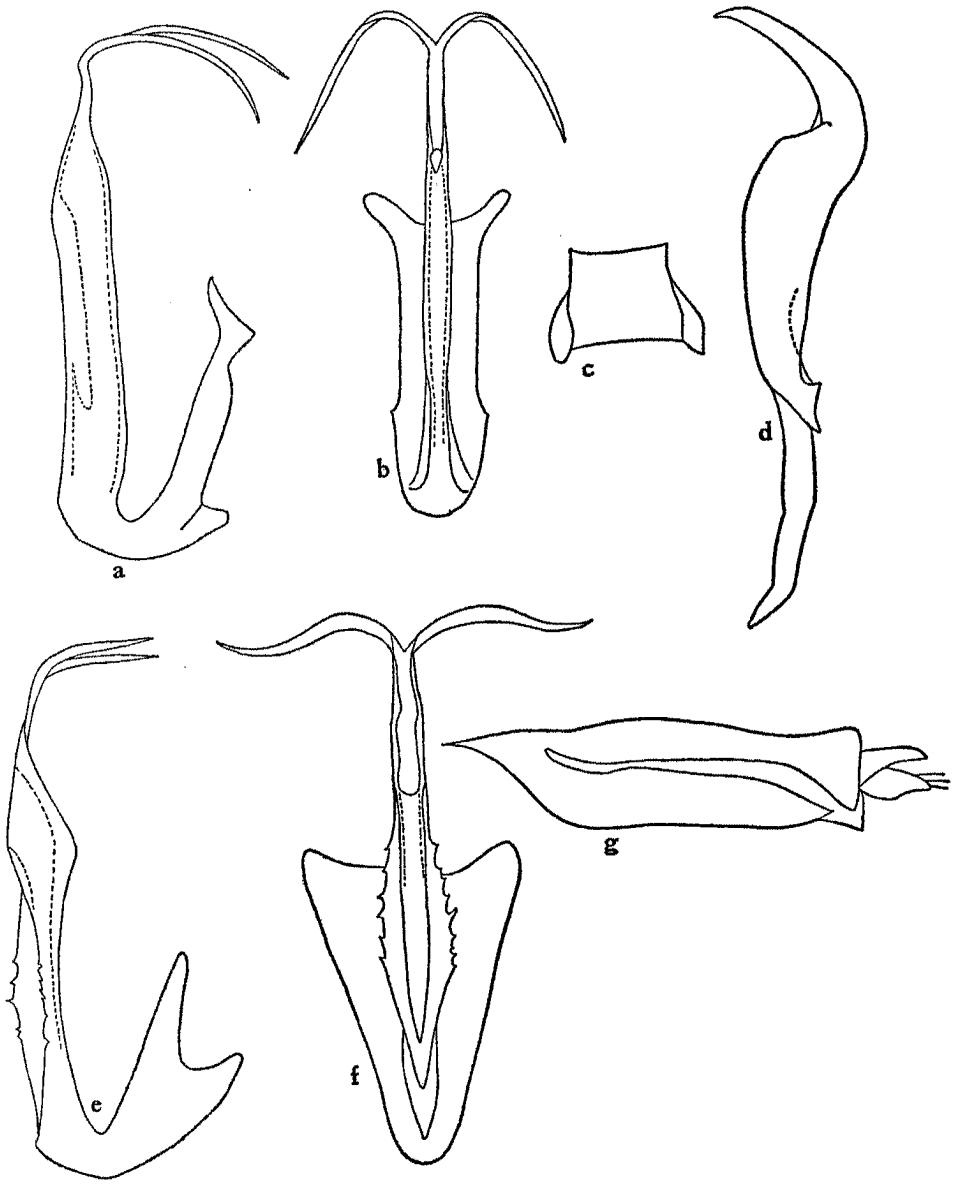

FIGURE 23.—**a-d**, *Tartessus swezeyi: a*, penis, lateral view; *b*, penis, ventral view; *c*, connective; *d*, style. **e-g**, *T. cristatus: e*, penis, lateral view; *f*, penis, ventral view; *g*, anal tube.

Aug. 1945, Gressitt; Mt. Santa Rosa, May 1936, Swezey; Harmon Field, Jan. 1944, Baker; Yigo, July 1946, Townes; Pt. Oca, Agana, May 1945, Gressitt, Bohart; Barrigada, on *Premna* sp., July 1936, Swezey; Asan, on *Ficus* sp., Aug. 1936, Swezey; Pilgo River, May 1945, Gressitt, G. Bohart; Mt. Alutom, July 1946, Townes; Pt. Teguam, Aug. 1945, Gressitt, Bohart; Piti, on *Glochidion* sp., Aug. 1936, Swezey; Haputo, Apr. 1948, Maehler; Mt. Alifan, Apr. 1946, Krauss; Upi Trail, May 1936, Usinger; Machanao, June 1936, Swezey; Mt. Chachao, May 1936, Swezey.

HOSTS: *Ficus* sp., *Glochidion* sp., *Premna* sp.

39. Tartessus cristatus Linnavuori, n. sp. (fig. 23, *e-g*).

Male: Coloring much as in *T. swezeyi,* but lighter. Crown, pronotum, and scutellum reddish brown. Elytra reddish brown, costal margin broadly dark, veins dark brown. Abdomen dorsally dark and undersurface dark; legs reddish brown.

Body form, et cetera, as in *T. swezeyi.* Plates long, narrow, triangular. Style elongate, rather slender, as in *T. swezeyi.* Penis with *socle* well developed; stem shorter than in *T. swezeyi,* straight, ventral surface below gonopore somewhat scored with broad, lamellate, serrate ridge on either side; dorsal surface enlarged before apex; pair of rather long apical appendages directed dorsad. Side lobes long, narrow triangular, no appendage. Anal tube long, with pair of thick, straight basal appendages.

Female: Unicolored light brown; elytra brownish, veins light brown. Abdomen dark dorsally; undersurface and legs light brownish. Seventh sternite as in *T. swezeyi.*

Length: 7.5-9 mm.

Holotype, male (CM), central part, Tinian I., Mar. 25, 1945, Dybas; allotype, female (CM), same data. The following are paratypes (BISHOP, US, RL, KU). Saipan: One, Afenia-Charanka, July 4, 1939, Esaki; one, Matansha-Calabera, May 8, 1940, Yasumatsu and Yoshimura; Halaiha-As-Teo area, Dec. 1944, Dybas; Papago area, Feb. 1945, Dybas. Tinian: Mar. 25, 1945, Dybas; Tinian Harbor, Mar. 1945, Dybas; 15, on *Bikkia marianensis,* June 9-11, 1946, Townes. Agiguan: Six, May 25, 1952, Kondo; June 7, 1952, Peterson.

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

HOST: *Bikkia marianensis.*

This species resembles *T. swezeyi,* but is much lighter colored and the penis has a pair of serrate ridges.

40. Tartessus ochraceus Metcalf (fig. 24).

Tartessus ochraceus Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 129.

Female: General color ochraceous buff; compound eyes brown; some of veins of elytra infuscate. Face with broad, transverse, rose-red fascia just below dorsal margin; another narrow, distinct, transverse, ochraceous-orange fascia at level of antennae.

Crown very short, about half as long on median line as next to eyes; nearly six times as wide as its greatest length; anterior margin triangularly produced, nearly a right angle, posterior margin slightly rounded. Postclypeus nearly 1.5 times as long as median length, greatest width at level of ocelli, then lateral margin concavely emarginate to middle of eye, expanded to base of antennae, and narrowed to anteclypeus; distinct transverse ruga

extending across postclypeus at level of eyes; above this ruga, surface of postclypeus finely rugous, below ruga, surface smooth. Antennal flagellum with two basilar segments, the first with elongate lateral seta about half as long as antenna and flagellum, the second with lateral seta about half as long as seta on first segment. Pronotum about twice as broad as its median length, anterior margin acutely projecting in front of eyes, posterior margin broadly incised; lateral margins short; disc finely, transversely rugulous. Mesonotum nearly 1.5 times as long as its greatest width. Seventh sternite strongly compressed and elevated; posterior margin deeply incised; incision nearly four times as deep as its greatest width; ovipositor and ovipositor sheath about one-third longer than pygofer.

Length: 9 mm. (Description after Metcalf.)

DISTRIBUTION: Guam.

S. MARIANA IS. GUAM: Female, Piti, Sept. 21, 1936, Swezey.

This species is unknown to me.

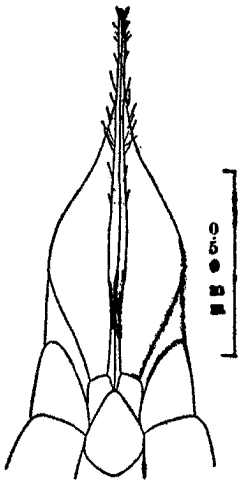

FIGURE 24.—*Tartessus ochraceus,* female genitalia, ventral view. (After Metcalf.)

41. **Tartessus fieberi sycophantus** Linnavuori, n. subsp. (fig. 25).

Male: Face yellow; anteclypeus black; frontoclypeus with broad, black longitudinal band in middle reaching a little above level of antennal pits; cheeks below antennae with black spot. Crown yellow; eyes brownish gray. Pronotum shining black; fore margin behind eyes narrowly yellow. Scutellum black. Elytra black brown, veins black. Undersurface blackish. Legs yellow, hind tibiae sometimes infuscate.

Head broader than pronotum; eyes prominent; crown roundly produced, very short, three times as long next to eyes as in middle. Pronotum long, sharply triangularly produced; hind margin deeply incised; disc strongly transversely furrowed. Scutellum a little longer than pronotum. Valve round-triangular. Plates long, narrow, triangular. Style robust; apophyse broad, nearly rectangularly curved laterad, with short, serrate ridge at apex. Penis stout; *socle* large; stem rather short; pair of ventral appendages directed apicad and lying close to stem; apical appendages straight, somewhat diverging, rather short. Side lobe of pygofer rather short, triangular, no appendage. Anal tube with pair of thick, apically strongly toothed and curved, basal appendages.

Female: Coloring as in male, but usually lighter brownish. Dark markings of face more distinct, sometimes forming paired transverse side stripes on frontoclypeus. Pale specimens totally ocher brown as in *T. ferrugineus*. Abdomen black. Pronotum more rounded anteriorly. Hind margin of seventh sternite truncate with semicircular median notch; posterior lateral angles of notch distinctly produced and sharply triangular.

Length: 7.5-10 mm.

Holotype, male (US 63386), Palau, Ngarmalk (NW Auluptagel), 25 m., Dec. 12-13, 1952, Gressitt; allotype, female (US), same data. The following are paratypes (BISHOP, US, RL, KU, CM, MCZ). Palau, 34: Ngaiangl (Kayangel), Dec. 15, 1952, Gressitt; Babelthuap, East Ngatpang, 65 m., Dec.

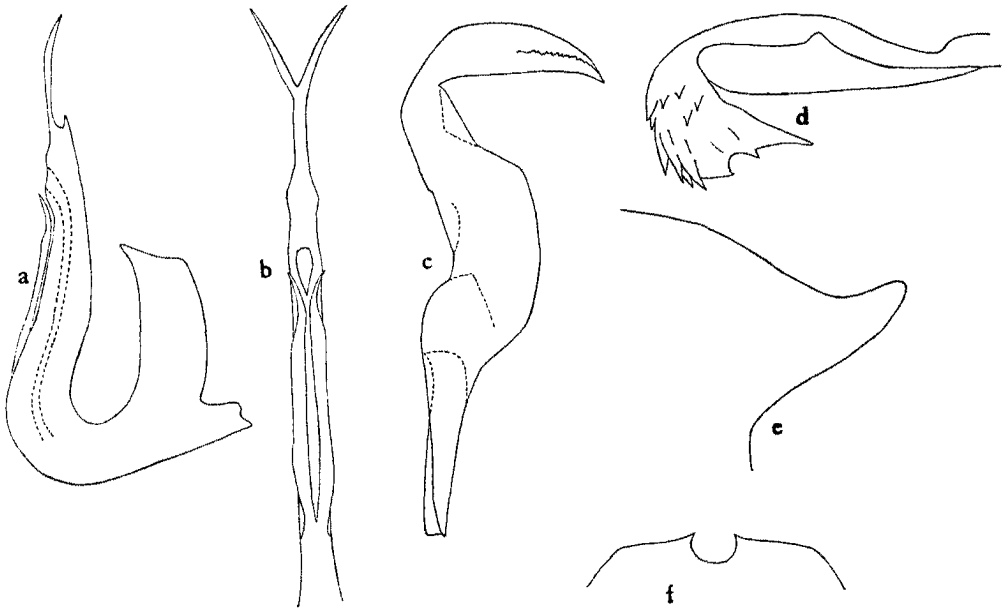

FIGURE 25.—*Tartessus fieberi sycophantus:* **a**, penis, lateral view; **b**, apical part of penis, ventral view; **c**, style; **d**, appendage of anal tube; **e**, side lobe; **f**, seventh sternite of female.

10, 1952, Gressitt; Babelthuap, Ngaremeskang, 25 m., Dec. 20, 1952, Gressitt; Koror, Nov. 30, 1947, Dybas; Ngarmalk (NW Auluptagel), Sept. 1952, Krauss; Ngarmalk, Dec. 13, 1952, Gressitt; Ngarmalk, Dec. 19, 1952, Beardsley; Peleliu, east coast, Aug. 1, 1945, Dybas; Mt. Amiangal, Dec. 22, 1952, Gressitt. Yap, 20: Yap I., Oct. 1952, Krauss; Map I., Oct. 22, 1952, Krauss; Rumung I., Oct. 22, 1952, Krauss; Rumung I., July-Aug. 1950, Goss; Yap I., Mt. Tabiwol (Gillifitz), 150 m., Dec. 29, 1952, Gressitt; Yap I., Mt. Mataade, 95 m., Dec. 1, 1952, Gressitt; Yap I., Kolonia, on *Wedelia biflora,* Mar. 1-8,

1949, Townes; Yap I., Hill behind Yaptown, 60 m., Nov. 28, 1952, Gressitt; Tomil, Mar. 5, 1949, Townes; Tomil-Maki, Sept. 10, 1939, Esaki.

DISTRIBUTION: Western Caroline Is. (Palau, Yap).

HOST: *Wedelia biflora.*

This subspecies resembles *T. fieberi acutangulus* Linnavuori from the Philippines, but is smaller, the elytra are not distinctly black iridescent, the apophyse of style is much narrower, the stem of penis is stouter and shorter, the side lobe of the pygofer is narrower, and the basal appendages of the anal tube are dissimilarly toothed apically. I know only the female of *T. fieberi fieberi* Stål from the Moluccas; it differs from this subspecies by being bigger and in the form of the median notch of the seventh sternite which is smaller with the posterior lateral angles rounded.

Subfamily COELIDIINAE

Long, anteriorly narrow, apically broad leafhoppers. Color usually brownish or blackish, rarely with bright markings. Anteclypeus broadening downward; frontoclypeus long and narrow, parallel-sided; lateral frontal sutures extending to ocelli; antenna long; gena very broad. Head narrower than pronotum; crown small, narrowest basally; eyes large; ocelli on anterior margin of head. Pronotum short, lateral margins weakly carinate. Elytra usually broadening apically, appendix broad. Costal area of flying wings expanded near base.

This subfamily is found in all principal geographical regions except Europe.

Key to Micronesian Genera of Coelidiinae

1. Robust, dark species; penis asymmetric, with several spines ..... **Coelidia**
   Narrow, parallel-sided species, often with red or yellow markings; penis symmetric, unarmed ..... **Tharra**

Genus **Coelidia** Germar

Coelidia Germar, 1821, Mag. Ent. **4**: 75 (type: *C. venosa* Germar; Brazil).—Stål, 1862, Öfv. K. Vet.-Akad., Förh. **19**: 494.—Matsumura, 1914, Sapporo Nat. Hist. Soc., Trans. **5**: 82.—Oman, 1949, Ent. Soc. Washington, Mem. **3**: 54.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 23.

Daridna Walker, 1858, List. Homopt. Brit. Mus., Suppl., 319 (type: *D. subtangens* Walker; Brazil).

Jassus (*auct. nec* Fabricius, 1803), Stål, 1866, Hemipt. Africana **4**: 119.—Spångberg, 1878, Öfv. K. Vet.-Akad., Förh. **35**: 3.—Matsumura, 1902, Term. Füzetek **25**: 401; 1914, Tohoku Imp. Univ., Jour. Coll, Agric. **5**: 206.—Melichar, 1903, Homopt.-Fauna Ceylon, 177.—Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Bull. **3**: 74.—Distant, 1908, Fauna of India, Rhynch. **4**: 327.—Baker, 1915, Philippine Jour. Sci. D **10**: 53.—Merino, 1936, Philippine Jour. Sci. **61**: 369.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 51-56.

Deridna Van Duzee, 1917, Univ. Calif. Agric. Exper. Sta., Tech. Bull. 2:75 (invalid emendation of *Daridna*).

Large, robust species. Coloring dark, brownish or blackish. Head narrower than pronotum; anterior margin bluntly rounded; crown rather short; disc raised above level of eyes and separated from them by short perpendicular space; ocelli on anterior margin of crown. Face very broad; ocellocular area narrow; anteclypeus broadening downward; frontoclypeus long, narrow, parallel-sided. Pronotum short, lateral margins diverging posteriorly, disc minutely knobbed. Elytra broad; appendix large; outer subapical cell acuminate basally, truncate distally; central and inner subapical cells open basally.

Male: Plates long and narrow, often with short setae distally. Style of various shapes, elongate, usually nearly parallel-sided. Connective Y-shaped, short. Penis asymmetric; *socle* developed; stem usually long and slender, armed usually with numerous spines; gonopore apical or in stem sometimes far from apex. Pygofer sclerotized, side lobe triangular, often with short appendages and slightly spinose distally. Anal tube long, sclerotized.

This genus is distributed through nearly all principal geographical regions. This genus seems, however, somewhat heterogenous and possibly contains some still undescribed material.

Key to Micronesian Species of Coelidia

1. No reddish longitudinal bands on frontoclypeus 2
   Frontoclypeus with two reddish longitudinal bands ..... **43. ogasawarensis**
2. Frontoclypeus 2.5-3 times as long as broad 3
   Frontoclypeus short, about twice as long as broad ..... **44. fuscovenosa**
3. Frontoclypeus about 2.5 times as long as broad 4
   Frontoclypeus long, at least 3 times as long as broad ..... **47. insularis**
4. Elytral veins dark 5
   Elytral veins concolorous with cells ..... **42. boninensis**
5. Elytra yellowish ..... **45. nigrifrons**
   Elytra blackish ..... **46. virescens**

42. Coelidia boninensis Matsumura (fig. 26).

Coelidia boninensis Matsumura, 1914, Sapporo Nat. Hist. Soc., Trans. 5: 84.

Male: Light yellow brownish. Face and crown yellowish; sides of frontoclypeus shifting to reddish brown. Elytra light yellow brownish; veins finely granulated. Flying wings yellowish gray. Undersurface and legs yellowish, thorax marked with dark.

Body relatively robust, broadening hindward. Anteclypeus long, moderately broadening downward, with basal central carina; frontoclypeus nearly 2.5 times as long as broad. Crown short, distinctly broadening apically. Pronotum with concolorous knobs, somewhat rugulous. Scutellum not knobbed, sides somewhat rugulous. Plates long, linear, with longitudinal furrow in middle, apex roundly truncate. Style very short, but broad, nearly parallel-sided, apex triangular. Connective short and broad. Penis long, slender; stem slightly curved; apex with about three short teeth dorsally; membrane with 11 spines on dorsal surface at gonopore; gonopore on dorsal surface, rather far from apex. Side lobe of pygofer triangular, margins apically thick, turned up medially, apex with some slight spines.

Female: Elytra yellow brown. Seventh sternite nearly twice as long as sixth, hind margin slightly produced.

Length: Male 6-7.2 mm.; female 7.5 mm.

DISTRIBUTION: Bonin Is.

BONIN IS. (Ogasawara Jima): One, Sept. 1905, S. I. Kuwana; several, Matsumura. CHICHI JIMA: One, 1931, Motoike and Ise.

43. Coelidia ogasawarensis Matsumura.

Coelidia ogasawarensis Matsumura, 1914, Sapporo Nat. Hist. Soc., Trans. **5**: 84.

Male: Light brownish yellow. Crown with two reddish spots in middle, also sides next to eyes reddish. Frontoclypeus with two reddish longitudinal stripes, side margins below antennae dark brown; anteclypeus reddish basally, with reddish central stripe. Pronotum dark spotted in middle; sparsely fine-knobbed, each knob bearing very short, pale-yellowish hair. Scutellum with two faint, brownish, longitudinal spots in middle. Elytra

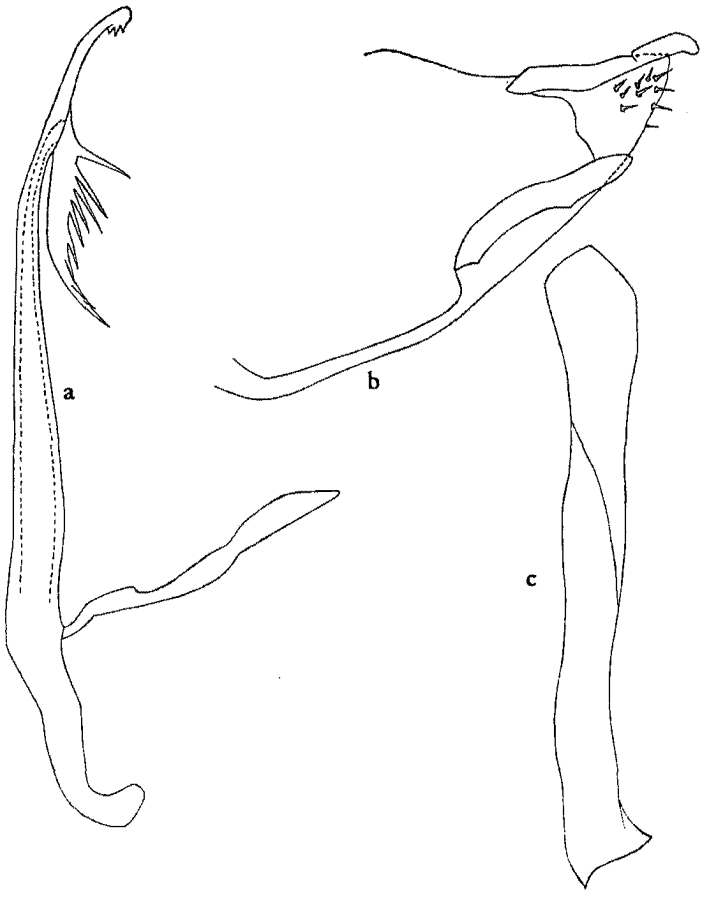

FIGURE 26.—*Coelidia boninensis:* a, penis, lateral view; b, side lobe, median view; c, plate.

light brownish yellow; veins indistinctly finely granulate. Underside of thorax dark spotted; hind tibiae brownish apically; claws dark.

Anteclypeus strongly broadening apicad; frontoclypeus more than twice as long as broad. Plates pale yellowish, narrowing behind middle, then somewhat broadening apically, lateral margin turned up behind middle, apex nearly straightly truncate.

Length: 6 mm. (Description after Matsumura.)

DISTRIBUTION: Bonin Is.

BONIN IS. (Ogasawara Jima): Two, Matsumura.

This species is unknown to me.

44. Coelidia fuscovenosa Matsumura.

Coelidia fuscovenosa Matsumura, 1914, Sapporo Nat. Hist. Soc., Trans. **5**: 85.

Like *C. boninensis,* differing as follows:

Male: Anteclypeus and lora yellowish brown; frontoclypeus yellow brownish, with row of yellowish, dark spots on either side; antennal pits and cheeks mostly dark; antenna yellowish, flagellum in middle yellow brownish. Pronotum dark brown, strongly yellowish knobbed. Scutellum with brownish spots. Elytra dark apically; veins mostly dark; claval veins lighter; near apex a yellowish, transverse stripe; stigma and spot in upper margin near apex and costa from base to middle dark. Flying wings dark smoky. Undersurface and abdomen totally dark, with hind margins of segments yellowish. Legs yellowish, thighs with dark longitudinal line.

Antennal flagellum twice as long as in *C. boninensis;* anteclypeus only slightly broadened downward, no longitudinal ridge in middle. Plates dark, base yellowish, very long, linear, distinctly tapering apically, lateral margin with long, whitish hairs.

Female: Like *C. boninensis,* but body longer, coloring darker, and elytral veins dark brown. Seventh sternite somewhat deeper sinuate at sides, ovipositor somewhat longer, extending over pygofer.

Length: Male 6 mm.; female 7.5 mm. (Description after Matsumura.)

DISTRIBUTION: Bonin Is.

BONIN IS. (Ogasawara Jima): Several, Matsumura.

This species is unknown to me.

45. Coelidia nigrifrons Matsumura.

Coelidia nigrifrons Matsumura, 1914, Sapporo Nat. Hist. Soc., Trans. **5**: 85.

Male: Cheeks, ocellocular area and anteclypeus dirty yellow brownish; frontoclypeus more or less dark at sides, with broad, yellow-brown median band; in immature specimens sides reddish, while in dark specimens most of frontoclypeus dark brown. Crown yellow brown; eyes and ocelli dark brown. Pronotum black, densely light knobbed, especially near fore margin; each knob with yellow hair; lateral sides yellow brown, often with black triangular spot. Scutellum yellow brown, base with transverse row of four black spots and sparsely faint knobbed. Elytra yellow brownish or ocher brownish; veins thick, black; apex infuscate; costal margin black; basal part of clavus with bow-like, whitish, transverse spot; usually also white spot basally in first and fifth apical cells. Abdomen dorsally dark brown. Undersurface of thorax black brownish, segments margined with yellow brown; venter ochraceous; hind margins of segments dark brownish. Legs yellow brown.

Body long, narrow, nearly parallel-sided. Anteclypeus rather long, moderately broadening downward, with distinct central ridge in basal part; frontoclypeus 2.5 times as long as broad. Crown narrow, distinctly broadening apically. Genitalia as in *C. boninensis.*

Female: Ovipositor black brownish. Seventh sternite nearly three times as long as sixth; hind margin roundly truncate at sides, broadly triangularly produced in middle, with very faint median notch.

Length: 7-9.2 mm.

DISTRIBUTION: Bonin Is.

BONIN IS. (Ogasawara Jima): Matsumura; two, 1931, Motoike and Ise. CHICHI JIMA: Five, June-July 1949, Langford; July 1951, R. Bohart; hills north of Omura, one, July 1949, Mead; Sakaiura, one, July 1949, Mead; Tsurihama, two, June 1949, Mead.

46. **Coelidia virescens** Matsumura.

Coelidia virescens Matsumura, 1914, Sapporo Nat. Hist. Soc., Trans. **5**: 86.

Male: Black, shifting to greenish. Crown yellow, face black, cheeks near antennae, outer margin of lora, apex, and middle stripe in anteclypeus yellowish; antenna brownish; flagellum yellowish, slightly brownish in middle. Pronotum pale yellowish, finely knobbed, each knob with short, pale-yellowish hair. Scutellum with sparse, short, whitish hairs, sides narrowly light brownish yellow. Elytra brownish; veins blackish, shifting to greenish. Margins of segments in undersurface of thorax yellowish. Venter yellowish; genital segment blackish. Legs light brownish yellow; femora with brownish longitudinal stripe. Plates black, apex and base yellow.

Crown distinctly broadening apically; anteclypeus strongly broadening downward, with short, faint, longitudinal ridge in base; antennal flagellum reaching over apex of anteclypeus. Plates long; apex, seen from above, narrowly tapering.

Female: Face yellowish; frontoclypeus with dark, oblong, longitudinal spot. Scutellum with yellowish spots in middle. Seventh sternite 1.5 times as long as sixth, blackish, yellowish in middle and at sides; hind margin bluntly angularly produced in middle, angularly sinuate at sides. Ovipositor long, reaching much over pygofer.

Length: Male 6.5 mm.; female 8 mm. (Description after Matsumura.)

DISTRIBUTION: Bonin Is.

BONIN IS. (Ogasawara Jima): Two, Matsumura.

This species is unknown to me.

47. **Coelidia insularis** Matsumura.

Coelidia insularis Matsumura, 1914, Sapporo Nat. Hist. Soc., Trans. **5**: 88.

Female: Light brownish yellow. Frontoclypeus somewhat darkened in middle; antenna yellowish. Pronotum black, dirty yellowish knobbed, each knob with yellowish hair. Scutellum black, sides yellowish. Elytra yellowish brown, apex darker, somewhat shifting to greenish; veins dark; yellowish spot in upper margin near apex of clavus, another, larger yellowish spot in costal margin near stigma. Undersurface dark, margins of segments yellowish.

Crown somewhat furrowed at sides; frontoclypeus about three times as long as broad; anteclypeus strongly broadening downward; antennal flagellum reaching over middle coxae. Seventh sternite twice as long as sixth; hind margin slightly produced in middle, slightly sinuate at sides.

Length: 8.5 mm. (Description after Matsumura.)

DISTRIBUTION: Bonin Is.

BONIN IS. (Ogasawara Jima): Two, Matsumura.

This species is unknown to me.

48. Coelidia insularis var. **lineatofrons** Matsumura.

Coelidia insularis var. *lineatofrons* Matsumura, 1914, Sapporo Nat. Hist. Soc., Trans. **5**: 88.

Female: Frons with dark longitudinal stripe in middle. Yellow macula near stigma in elytra reduced to very small yellowish spot. Others as nominate form. (Description after Matsumura.)

DISTRIBUTION: Bonin Is.

BONIN IS. (Ogasawara Jima): One, Matsumura.

This form is unknown to me.

Genus **Tharra** Kirkaldy

Tharra Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1** (9): 324 (type: *T. labena* Kirkaldy; Queensland); 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3**: 75.—Baker, 1915, Philippine Jour. Sci. D **10**: 58.—Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 131; 1950, B. P. Bishop Mus., Occ. Papers **20** (5): 73.

Body elongate, nearly parallel-sided. Head narrower than pronotum; crown elongate, anterior margin distinctly projecting in front of eyes, broadly rounded; ocelli in anterior margin; anteclypeus broadening downward; frontoclypeus narrow on clypeal suture, widened but distinctly incised at level of antennae. Pronotum short and broad; scutellum large. Elytra with narrow appendix; three closed subapical cells. Plates narrow basally, broadening apically, elongate, no macrosetae, with long, fine hairs. Style small, thick; apophyse short, thick, slightly curved. Connective Y-shaped. Penis symmetric; large basal *socle* with long, thick, dorsal elongation; stem usually slender, arising from ventral part of *socle;* gonopore apical. Pygofer sclerotized, short, with pair of long, thin, curved appendages reaching to apex of anal tube. Anal tube long, sclerotized.

This genus is found in Polynesia, north Australia, Micronesia, and the Philippine Islands.

Key to Micronesian Species of Tharra

1. Female seventh sternite short and broad, with broad, V-shaped notch on hind border extending almost to base of segment ..... **50. rubrovittata**
   Female seventh sternite with hind margin roundly produced with slight median notch 2
2. Ochraceous tawny, no bright markings; plates narrow, stem of penis longer than dorsal elongation of *socle,* broadening apically ..... **49. ocellata**
   Red or yellow markings; plates very broad apicad; stem of penis very thin, much shorter than dorsal elongation of *socle* 3
3. Elongate, slender form; male 5.5 mm., female 6 mm.; lighter or darker brownish, elytra with only more or less faint yellowish or reddish spots (Yap) ..... **55. flavomaculata yapicola**
   Brownish or reddish with large bright red or yellow stripes and spots 4
4. Smaller forms; male 4.5-5 mm., female 5-5.5 mm 5
   More robust forms; male 5.2-6 mm., female 6-6.5 mm 6

5. Basal part of black or black-brownish elytra with three bright-red longitudinal bands in male and female, apical part at most with some round, red spots (Palau)..... **54. flavomaculata palauensis**

   Elytra black brownish or light brownish; markings bright red in male, yellow in female, bands reaching farther apically; apical part often with red or yellow spots (Truk)..... **51. flavomaculata flavomaculata**

6. Robust; male elytra red with some faint-brownish stripes; female elytra black brown with several bright yellow or orange markings (Kusaie)..... **53. flavomaculata superba**

   More slender; coloring chiefly as in nominate form, but also female with red markings (Ponape)..... **52. flavomaculata ponapensis**

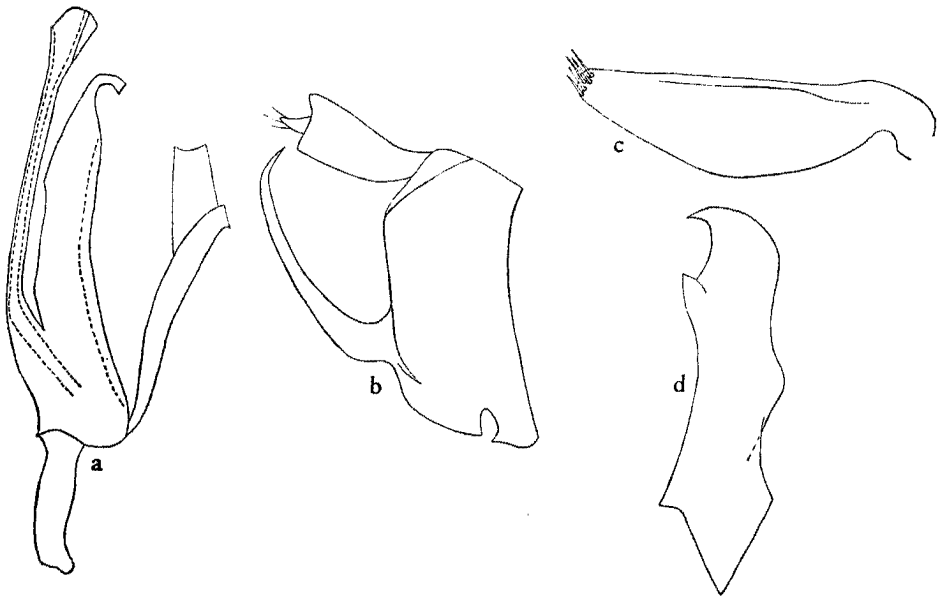

FIGURE 27.—*Tharra ocellata:* **a**, penis, lateral view; **b**, pygofer and anal tube, lateral view; **c**, plate; **d**, style.

49. **Tharra ocellata** Metcalf (fig. 27).

Tharra ocellata Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. 189: 132.

Male: General color ochraceous tawny. Dorsal third of face usually blackish fuscous; eyes blackish. Elytra ochraceous brown. Undersurface and legs ochraceous buff; hind wings smoky brown.

Crown one-fourth longer than basal width, distinctly foveate, with slender median basal carina; disc finely but distinctly rugulous, rugae extending diagonally from median area. Frontoclypeus about 2.5 times as long as dorsal width, finely rugulous dorsad, most of area, however, entirely smooth; no median carina; lateral margins diverging from dorsal margin to above base of antennae, then rather deeply sinuate and converging to base of narrow anteclypeus; anteclypeus somewhat expanded ventrally. Pronotum shorter

than crown, about three times as broad as its median length, posterior margin broadly and shallowly sinuate. Scutellum longer than crown, slightly wider than median length. Plates elongate, narrow, broadest in middle, narrowing basally and apically, some slight setae in apex. Style very thick and short, apophyse very short. Penis with stem rather thick, broadening apically, longer than dorsal elongation of *socle* which is flattened, and ending in curved, thin apex. Pygofer short and broad; appendage very long, straight basally, turned up near apex. Anal tube long.

Female: Coloring as in male, clavus sometimes with longish, colorless or yellowish stripe, costal margin of elytra sometimes dark. Seventh sternite longer than sixth; hind margin produced, with triangular V-shaped incision in middle. Pygofer slender, ovipositor and ovipositor sheath longer than pygofer.

Length: 5.5-6.5 mm.

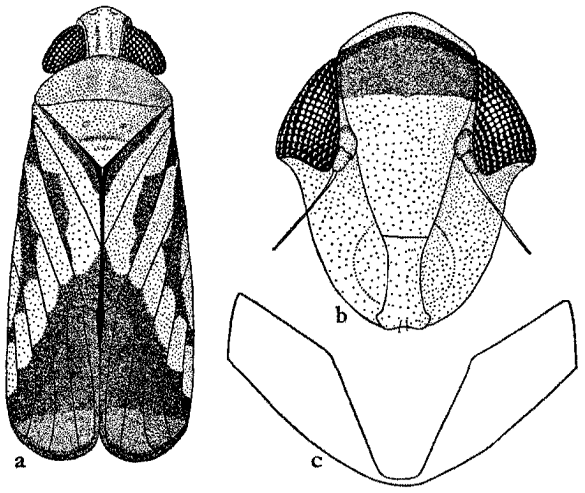

FIGURE 28.—*Tharra rubrovittata:* **a**, dorsal view; **b**, face; **c**, seventh sternite of female. (After Metcalf.)

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. ROTA: Two, near Sabana, July 1946, Townes. GUAM, 18: Haputo Pt., on *Morinda citrifolia,* Mar. 1948, Maehler; Harmon Field, Jan. 1949, collector unknown; Machanao, June, Aug. 1936, Swezey; Mt. Santa Rosa, June 1945, Bohart and Gressitt; northern Guam, Apr. 1946, Krauss; Potts Junction, Oct. 1952, Krauss; Pt. Ritidian, Apr. 1936, E. H. Bryan, Jr.; Pt. Ritidian, May 1945, Dybas; Pt. Ritidian, May-Aug. 1945, Bohart and Gressitt; Pt. Ritidian, Oct. 1952, Krauss; Upi Trail, May 1936, E. H. Bryan, Jr., and Swezey.

HOST: *Morinda citrifolia.*

50. Tharra rubrovittata Metcalf (fig. 28).

Tharra rubrovittata Metcalf, 1950, B. P. Bishop Mus., Occ. Papers **20** (5): 75.

1953, Gressitt; Pata, Sabote-Epin, Mar. 1940, Yasumatsu and Yoshimura. Sis (Tsis): Oct. 1952, Beardsley. Totiu (Tarik): Jan. 1936, Ono.

HOSTS: *Cyrtosperma* sp., *Ipomoea* sp., *Wedelia biflora.*

52. Tharra flavomaculata ponapensis Linnavuori, n. subsp.

Male: Coloring as in nominate form, but elytra light brownish, darker only near fifth apical cell and outer subapical cell, red markings often more extensive, sometimes filling most of elytra, excluding apex.

General structure as in nominate form, but body somewhat larger and more robust.

Female: Elytra light brownish, with dark-brown, oblique, transverse band from middle of clavus to apex of elytra; same markings as in nominate form, but markings red as in male (very rarely yellow). Genitalia as in nominate form.

Length: Male 5.2-6 mm.; female 6 mm.

Holotype, male (US 63387), Ponape, Mt. Kupwuriso, 600 m., Mar. 10, 1948, Dybas; allotype, female (US), same locality, Mar. 8, 1948, Dybas.

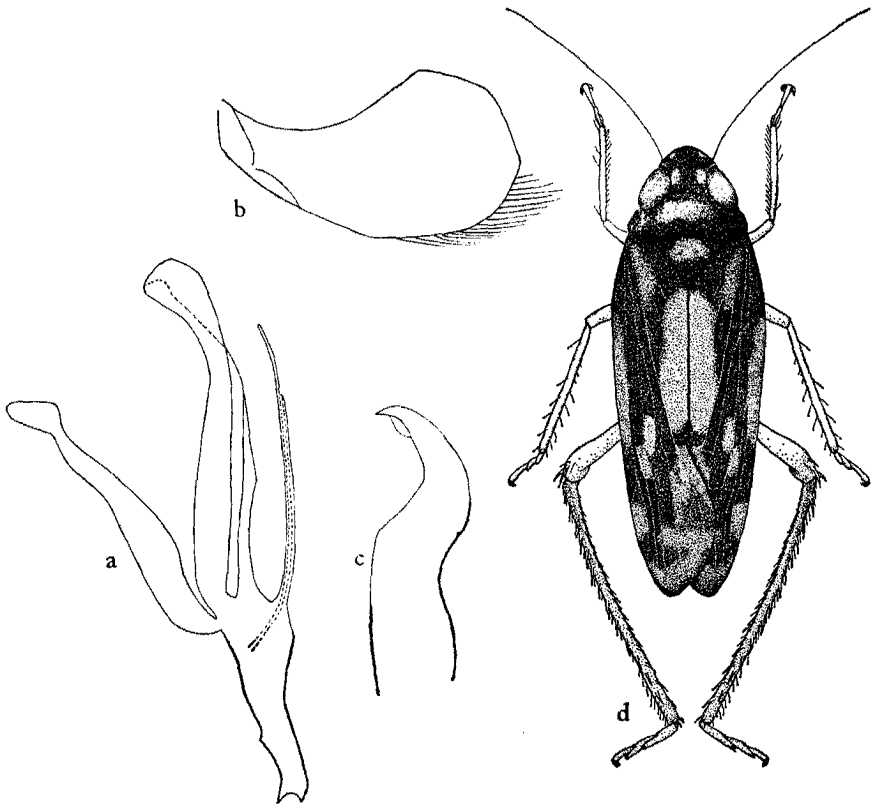

Figure 30.—**a-c,** *Tharra flavomaculata flavomaculata: a,* penis, lateral view; *b,* plate; *c,* apical part of style. **d,** *T. f. superba,* female, dorsal view.

Thirty-three paratypes (BISHOP, US, RL, KU, MCZ, CM), Ponape: Hydroelectric Plant, Colonia, Aug. 9, 1946, Townes; Paipalap Pk. (Sokehs), June-Sept. 1950, Adams; Dolen Net (Tolenot) Pk., June-Sept. 1950, Adams; Nanpohnmal, southeast, Jan. 12, 1953, Gressitt; Mt. Temwetemwensekir, 100-180 m., Jan. 11-19, 1953, Gressitt; Pehleng River (Palang), 15 m., from hill near mangrove, Jan. 10, 1953, Gressitt; Mt. Pairot (Beirut), June-Sept. 1950, Adams; Dolen Nankap, Aug. 10, 1946, Townes; Dolen Kiepw (Tolenkiup), June-Sept. 1950, Adams; Mt. Kupwuriso, Mar. 8-11, 1948, Dybas; Mt. Nahnalaud, Mar. 19, 1948, Dybas; One-Nihpit, July 1939, Esaki; Mt. Dolotomw (Tolotom), June-Sept. 1950, Adams; Kiti, Aug. 12, 1946, Oakley; Madolenihm (Matalanim) Plantation, June-Sept. 1950, Adams.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

This subspecies is like the nominate form, but it is larger and the female has red markings.

53. Tharra flavomaculata superba Linnavuori, n. subsp. (fig. 30, *d*).

Male: Undersurface and legs yellow, changing to orange. Crown yellow, with dark median stripe broadening basad. Pronotum orange with two faint, dark, longitudinal stripes broadening basad. Scutellum orange. Elytra red; veins concolorous; spotted with light-brownish, semitransparent, longitudinal stripes in basal part of corium; apex brownish semitransparent, dark-brownish transverse band across apical cells.

Body large and robust. Crown slightly more concave than in nominate form. Genitalia similar.

Female: Face pale yellow; frontoclypeus with dark central stripe and dark transverse band in upper part; lora and sides of anteclypeus dark. Crown black, pair of round, yellow spots in apex and in base near sides. Pronotum black, broad, bow-like band near fore margin. Scutellum black, large, pale-yellow median spot with pair of very small, dark spots in middle, apex brownish yellow. Elytra black brown; yellow or orange band in base of clavus along claval suture; another band along upper margin of clavus from scutellar margin to apex, sometimes totally filling apical part of clavus; broad, yellow stripe in middle of costal margin; a more or less broken, yellow transverse band from apex of clavus to fifth apical cell; other apical cells pale brown with more or less indistinct, dark-brown, transverse stripe. Yellow or orange color sometimes extensive, filling most of clavus and corium. Undersurface and legs yellowish, hind legs darkened.

Length: Male 5.5-6 mm.; female 6.5 mm.

Holotype, male (US 63388), Kusaie, Mt. Matante, Feb. 11, 1953, Clarke; allotype, female (US), same data. Forty-six paratypes (US, BISHOP), Kusaie: Malem River, 90 m., Apr. 27, 1953, Clarke; Malem River, Dec. 14, 1937, Esaki; Mt. Matante (Buache), 450-579 m., Aug. 19, 1946, Townes; Mt. Matante, Mar. 4, 1953, Clarke; Mt. Tafeayat, 240-360 m., Aug. 20, 1946, Townes; Lele I., Aug. 19, 1946, Oakley; Lele I., Jan. 25, 1953, Gressitt.

The U. S. National Museum collection also contains a specimen labelled as Tinian Is., July 9, 1946, Townes, which may be an error in labelling.

DISTRIBUTION: Eastern Caroline Is. (Kusaie); S. Mariana Is. (Tinian) ?.

This subspecies differs distinctly from the other forms in the bigger and more robust body and in the peculiar coloring.

54. Tharra flavomaculata palauensis Linnavuori, n. subsp. (fig. 31).

Male: General coloring much as in nominate form. Lateral margins of pronotum and scutellum black brown. Elytra black, not transparent, basal part with three broad, red bands: one in clavus from base to apical part, one in corium near claval suture from middle of clavus to apex of clavus, and one in costal margin from base to apex of clavus. Rarely the red is more extensive, filling most of basal part of elytra. Abdomen dark brown, legs and face dark yellow.

General structure and size as in nominate form.

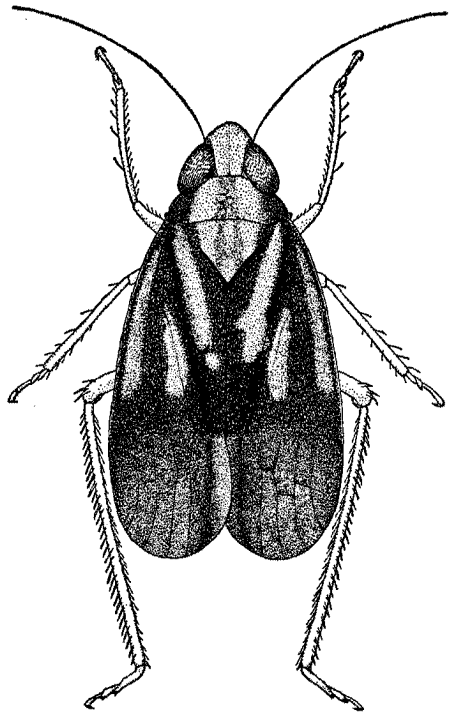

FIGURE 31.—*Tharra flavomaculata palauensis,* male, dorsal view.

Female: General coloring as in nominate form. Lateral margins of pronotum and scutellum dark brown. Elytra black brown, basal part with same three red bands as in male, apical part with about five round, red spots and whitish transverse band in apex. Undersurface pale yellow, genital segment dark brown.

Length: Male 4.5-5 mm.; female 5-5.5 mm.

Holotype, male (US 63389), Palau, Auluptagel, May 10, 1953, Beardsley; allotype, female (US), Peleliu I., Jan. 29, 1948, Dybas. Fifteen paratypes (BISHOP, US, RL, CM), Palau: Ngaiangl, Ngariungs, Dec. 16, 1952, Gressitt; Babelthuap, East Ngatpang, 85 m., Dec. 10, 1952, Gressitt; Babelthuap, Ulimang, Dec. 21, 1947, Dybas; Ngarmalk (NW Auluptagel), Dec. 13, 1952, Gressitt; Koror, Nov. 18, 1947, Dybas, Dec. 14, 1952, Beardsley, and Aug. 19,

1953, Beardsley; Auluptagel (Aurapushekaru), Jan. 14, 1948, Dybas, Dec. 19, 1952, Beardsley, Sept. 1952, Krauss, and May 10, 1953, Beardsley; Peleliu, Jan. 29, 1948, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

This subspecies differs from the nominate form in the dark ground coloring and in the dissimilar red markings of the elytra.

55. Tharra flavomaculata yapicola Linnavuori, n. subsp.

Male: General coloring much as in nominate form, but more brownish. Elytra light brown, dark brown apicad; veins mostly dark brown; sometimes red brownish apicad; costal margin with two reddish spots, one of them filling most of fifth apical cell; lighter, faint, transverse band across apical cells. Undersurface and legs yellow.

Body more gracile than in other forms. Genitalia similar.

Female: Face brownish, crown, pronotum, and scutellum ocher brown with dark-brown shadows. Elytra mostly dark brown; light brown in basal part; veins black brown, with three larger, light-yellow or orange spots: one in apical part of corium and two in costal margin; basal part of corium and clavus with irregular rows of light spots; apical part of elytra with about five orange spots above costal margin; appendix and first apical cell light brown.

Length: Male 5.5 mm.; female 6 mm.

Holotype, male (US 63390), Yap, Hill behind Yaptown, 60 m., Dec. 3, 1952, Gressitt; allotype, female (US), same data. Seventeen paratypes (BISHOP, US, RL), Yap, Yap Is.: Oct. 1952, Krauss; Mt. Tabiwol (Gillifitz), 150 m., Nov. 29, 1952, Gressitt; Mt. Madaade (Matade), 95 m., Dec. 1, 1952, Gressitt; Hill behind Yaptown, 60 m., Nov. 28, 1952, Gressitt; Kolonia, Aug. 1, 1949, on *Wedelia biflora,* collector unknown; Kolonia, 1954, Beardsley; Dugor, Aug. 1949, collector unknown.

DISTRIBUTION: Western Caroline Is. (Yap).

HOST: *Wedelia biflora.*

This subspecies is easily distinguished by its gracile body form and the brownish coloring with very sparse, bright, elytral markings.

Subfamily Deltocephalinae

Form variable, but never extremely elongate and depressed; anterior margin of head sometimes carinate but not foliaceous. Ocelli in fore margin of head, mostly rather near eyes. Face rather flattish; anterior tentorium branches bifurcate; lateral margin of cheek seldom strongly sinuate below eye. Lateral margins of pronotum usually short, not strongly carinate.

Male: Valve triangular or semicircular; basal lateral angles articulated with pygofer. Plates mostly triangular. Style with curved apophyse, more or less fused with posterior lateral angles of plates.

Key to Micronesian Tribes of Deltocephalinae

1. Submarginal vein of flying wings evanescent apicad; frons expanded laterally over base of antenna forming relatively deep, though inconspicuous, antennal pit; style with apophyse long and narrow basad, then strongly enlarged and boot-shaped, basal part of style slender; anterior tentorium branches falcate ..... **Xestocephalini**

Submarginal vein of flying wings present apicad; style with curved apophyse and broad, more or less rectangular basal part 2

2. No suture between ante- and frontoclypeus, side margins of latter indistinct terminating at antennal pits; antenna long; body elongate; crown much produced; in male, no distinct membranous fold in sides of pygofer basad ..... **Paraboloponini**

Not as above 3

3. Elytra with only one closed subapical cell; macrosetae of plates and pygofer mostly finely haired ..... **Macrostelini**

Elytra with two or three closed subapical cells; macrosetae always unhaired 4

4. Connective robust, Y-shaped; body often more or less robust ..... **Euscelini**

Connective slender, linear; slender species ..... **Deltocephalini**

Tribe XESTOCEPHALINI

Small, robust leafhoppers. Crown forms evenly curved surface with face and evenly rounded anteriorly; eyes small; ocelli in fore margin rather far from eyes; frontoclypeus ovate, extended laterally over base of antenna, forming relatively deep, though inconspicuous, pit. Pronotum nearly parallel-sided, wide laterally. Venation of elytra usually complete; flying wings with marginal vein absent apicad.

This is a separate subfamily [Linnavuori, 1959, Soc. Zool. Bot. Fenn., "Vanamo," Ann. Zool. **20** (1) : 35-36]. The distribution is worldwide, excluding the Palearctic Region.

Genus **Xestocephalus** Van Duzee

Xestocephalus Van Duzee, 1892, Am. Ent. Soc., Trans. **19** : 298 (type: *X. pulicarius* Van Duzee; N. America).—Matsumura, 1902, Term. Füzetek **25** : 402; 1912, Tohoku Imp. Univ., Jour. Coll. Agric. **4** : 199.—Melichar, 1903, Homopt.-Fauna Ceylon, 205.—Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3** : 51.—Distant, 1908, Fauna of India, Rhynch. **4** : 348.—Osborn, 1934, Insects of Samoa **2** (4) : 170.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11** : 25.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 84.

Myrmecophryne Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1** : 461 (type: *M. formiceticola* Kirkaldy; Queensland).

Small, relatively robust species. Head narrower than pronotum, fore margin bluntly rounded; crown distinctly longer in middle than next to eyes; coronal suture absent; ocelli in fore margin about three times their diameter from eyes; anteclypeus short, slightly broadening downward; frontoclypeus expanded laterally over base of antenna. Pronotum broad, lateral margins short. Elytra with small and narrow appendix; three closed subapical cells.

Male: Valve small, lateral margins parallel, hind margin slightly triangularly produced. Plates slender, tips lobe-like and compressed, a few macrosetae at about middle, numerous long, fine hairs laterally. Style long; apophyse long, narrow basally, apex enlarged and boot-shaped; basal part of style curved, only weakly fused with posterior lateral angle of plate. Connective short, Y-shaped. Penis simple or with appendages; with distinct basal *socle;* stem arising from ventral part of *socle;* gonopore on ventral surface,

either subapical or rather far from apex. Pygofer sclerotized, side lobes with several macrosetae, no membranous fold laterally near base. Anal tube small, weakly sclerotized. Female pygofer with numerous large setae, ovipositor and ovipositor sheath curved downward posteriorly.

The distribution is nearly worldwide.

KEY TO MICRONESIAN SUBSPECIES OF XESTOCEPHALUS IZZARDI

1. Larger form; length 3-4 mm.....**56. izzardi izzardi**
   Very small, slender forms; length 2-2.5 mm..... 2
2. Crown blunter; pronotum pale yellow brown, with no distinct markings.....**57. izzardi sodalis**
   Crown more produced; pronotum dark brown; fore margin with four, basal margin with two, whitish spots; whitish median line on disc.....**58. izzardi dissimilis**

56. Xestocephalus izzardi izzardi Metcalf, n. status.

Xestocephalus minutus Izzard, 1936, Ann. Mag. Nat. Hist. X, **17**: 598 [*nec X. minutus* (Distant), 1918, Fauna of India, Rhynch. **7**: 58].

Xestocephalus izzardi Metcalf, 1955, Washington Acad. Sci., Jour. **45**: 266.

Male: Pale yellow brown. No markings on crown and pronotum. Scutellum with faint, dark, basal triangles. Elytra transparent, pale yellow brown with a few dark-brown spots: larger spot in apex of clavus, another below it in costal margin, one in fifth apical cell, and some smaller spots in clavus and corium. Undersurface pale yellow brown.

Body very small and slender. Head narrower than pronotum, broadly rounded apically. Genitalia as in *X. i. sodalis.*

Female: General coloring as in male, but with more distinct and extensive dark-brown markings in elytra, somewhat resembling *X. i. sodalis,* but much smaller. Genitalia as in *X. i. sodalis.*

Length: 2-2.5 mm.

DISTRIBUTION: Indian Ocean, Christmas I., western Caroline Is.

PALAU. Five. KOROR: Limestone ridge, Dec. 1952, Gressitt. NGARMALK (N. W. Auluptagel): Dec. 1952, Gressitt. PELELIU: Mt. Amiangal, Dec. 1952, Gressitt.

The specimens fit rather well with the original description, except that the crown is slightly narrower than mentioned by Izzard. This subspecies is easily identified by the very small size.

57. Xestocephalus izzardi sodalis Linnavuori, n. subsp. (fig. 32).

Male: Coloring very variable. General coloring usually light yellow brown. Face light; crown with two very indistinct, transverse stripes apically and some faint brownish shadows on disc. Pronotum brownish with very indistinct, roundish light spots. Scutellum light brown. Elytra semitransparent, pale yellow brown, more or less irregularly marked with dark brown, with larger dark-brown spots in middle of clavus, in costal margin, and in apical part; large, oblong, whitish spot in middle of costal margin. Undersurface and legs light yellow brown. In dark specimens coloring darker brownish. Face ocher brown; crown yellow brown, apex with two dark-brown transverse stripes including light transverse area in which ocelli are located; disc with two dark-brown spots. Pronotum dark brown, fore margin with six, middle of basal margin with two, roundish light spots; in some specimens, light spots united, forming light transverse band behind fore margin and

another in basal margin; sometimes pronotum totally dark brownish. Scutellum ocher yellow with dark-brown basal triangles. Dark-brownish markings in elytra more extensive and much more distinct; sometimes elytra nearly totally brown with only indistinct lighter markings.

Crown roundly produced, a little broader at base than long in middle; shape of crown somewhat variable. Pronotum a little longer than crown. Elytra longer than abdomen. Plates elongate with a few macrosetae and numerous long, fine hairs. Style with apex enlarged and boot-shaped. Penis simple; *socle* large; stem slender, curved dorsally; gonopore subapical on ventral surface. Side lobe of pygofer rounded, with several macrosetae.

Female: Seventh sternite about twice as long as sixth, hind margin somewhat incised.

Length: Male 3 mm.; female 3.5-4 mm.

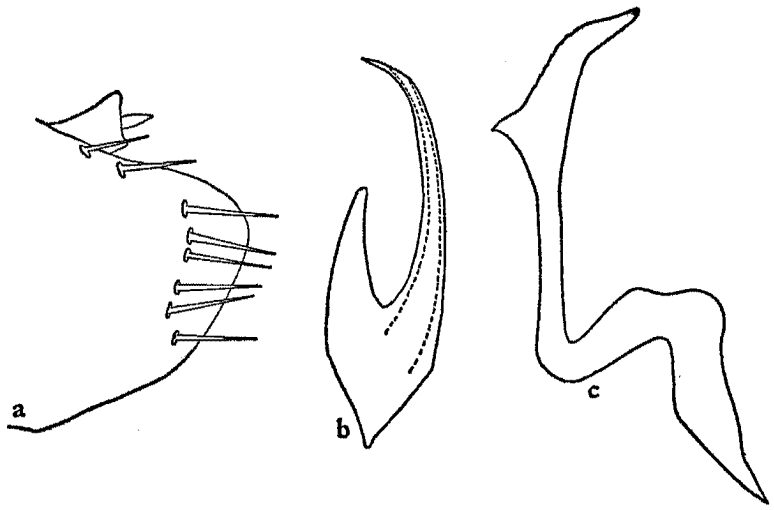

FIGURE 32.—*Xestocephalus izzardi sodalis:* a, side lobe, lateral view; b, penis, lateral view; c, style.

Holotype, male (US 65086), Mt. Nahnalaud, 600 m., Ponape, Mar. 18, 1948, Dybas. Allotype, female (US), Nanipil, Net District, Ponape, Feb. 25, 1948, Dybas.

Paratypes, all S. Mariana Is. Tinian: One, Dec. 1952, Beardsley. Guam: nine: Com. Mar. Hill, Jan. 1949, Maehler; Mt. Alutom, June 1946, Townes; Pt. Oca, Apr.-May 1945, Bohart and Gressitt; Pt. Ritidian, Aug. 1945, Bohart and Gressitt.

Eleven paratypes, all Palau. Babelthuap: Ngatpang, Dec. 1952, Gressitt; Ulimang, Dec. 1945, Dybas. Ulebsehel (Auluptagel): Sept. 1952, Krauss. Peleliu: Aug. 1945, Dybas.

Sixteen paratypes, all Yap. Yap: July-Aug. 1950, Goss; Kolonia, July-Aug. 1950, Goss. Gagil-Tomil: Gagil District, July-Aug. 1950, Goss; Kanif, July-Aug. 1950, Goss; Tomil District, July-Aug. 1950, Goss.

Nine paratypes, all Truk. Wena (Moen): May 1946, Townes; Civ. Admin. Area, Apr. 1949, Potts. Ton (Tol): Mt. Unibot, Dec. 1952-Jan. 1953, Gressitt.

Twenty-six paratypes, all Ponape: Mt. Pairot (Beirut), June-Sept. 1950, Adams; Mt. Dolen Nankap, Aug. 1946, Townes; Mt. Kupwuriso, Mar. 1948, Dybas; Mt. Temwetemwensekir, 180 m., Jan. 1953, Gressitt; same data as for allotype; Paipalap Pk., June-Sept. 1950, Adams; same data as for holotype.

Ninety-six paratypes, Kusaie: Hill 1010, Apr. 1953, Clarke; Lele, Dec. 1937, Esaki; Malem River, Apr. 1953, Clarke; Mt. Matante (Buache), Aug. 1946, Townes; Mt. Matante, Mar. 1953, Clarke; Mt. Tafeayat, Aug. 1946, Townes; Mutunlik, Jan. 1953, Clarke and Gressitt; Pukusrik, 1 m., mangrove, Apr. 1953, Clarke; Wakapp, Apr. 1953, Clarke.

DISTRIBUTION: S. Mariana Is. (Tinian, Guam); Caroline Is. (Palau, Yap, Truk, Ponape, Kusaie).

58. Xestocephalus izzardi dissimilis Linnavuori, n. subsp.

Male and female: Face brown; eyes gray; crown yellow brown; ocelli surrounded by bow-like, dark-brown stripe; disc with two large, dark-brown, quadrangular spots and small light spot between them in middle. Pronotum dark brown, four roundish or angular spots near fore margin and two in middle near basal margin, light middle stripe on disc. Scutellum ocher brown with dark-brown, basal triangles. Elytra dark brown with numerous oblong, light spots, costal margin with three larger, light spots. Undersurface and legs dark brown.

Body very small and slender as in the nominate form, but crown distinctly longer and narrower. Genitalia similar.

Length: 2-2.5 mm.

Holotype, male (US 63391), Palau, Babelthuap, Ulimang, Dec. 22, 1947, Dybas; allotype (US), same locality, Dec. 19, 1947, Dybas. Two paratypes (BISHOP, RL), Babelthuap, East Ngatpang, Dec. 8-10, 1952, Gressitt.

DISTRIBUTION: Western Caroline Is. (Palau).

Externally, this subspecies somewhat resembles *X. tutuilana* Osborn from Samoa, but it differs widely in the male genitalia.

Tribe PARABOLOPONINI

Head broad; crown much produced, acutely angled to frons. Ocelli in fore margin, not visible from above, rather far from eyes. Face flat; anteclypeus strongly broadening downward; no suture between ante- and fronto-clypeus; lateral sutures of frontoclypeus rather faint, terminating at antennal pits. Antenna very long. Pronotum finely transversely striate. General color greenish.

This tribe is distributed through Japan and Micronesia.

Genus **Oceanopona** Linnavuori, new genus

Type: *Oceanopona croceipennis* Linnavuori, n. sp., by present designation.

Head broader than pronotum; crown roundly produced, nearly twice as long in middle

as next to eyes, flat or slightly concave; coronal suture short; disc finely longitudinally striate; fore margin rather acute; ocelli in fore margin, not visible from above, distant from eyes nearly four times their own diameter. Face flat; anteclypeus strongly broadening downward; no suture between it and frontoclypeus; latter long, narrow, nearly parallel-sided, lateral margins rather indistinct, terminating at antennal pits; ocellocular area broad. Antenna very long; ledge above antennal pit. Pronotum slightly convex, transversely striate, sides very short, hind margin rather deeply sinuate. Scutellum large, as long as pronotum. Elytra with distinct appendix, two closed subapical cells. Spinulation of fore tibiae 1 + 4 (or 3 + 4, the two upper spines in the first row being very slight), of hind knees 2 + 1.

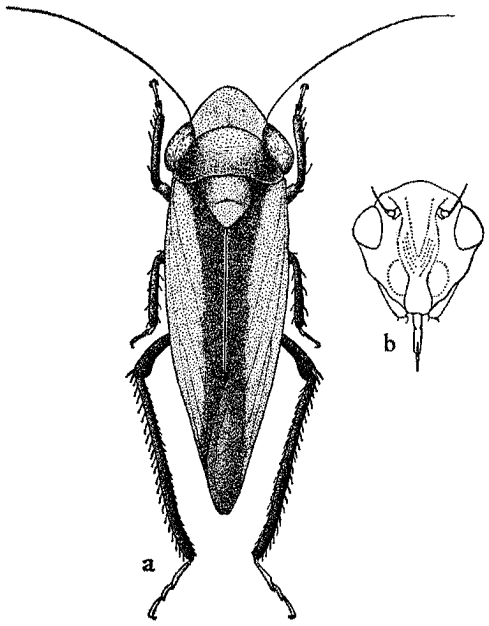

FIGURE 33.—*Oceanopona croceipennis:* a, male, dorsal view; b, face.

Male: Valve triangular, articulated with pygofer in posterior lateral angles. Plates long, triangular, macrosetae absent. Style with thick, distally truncate apophyse, basal part very broad, nearly rectangular, style fused distinctly and typically with basal lateral angle of plate. Connective Y-shaped, not fused. Penis symmetric; *socle* small; stem slender, arising from ventral part of *socle,* curving dorsad, ending in pair of slight apical processes; gonopore subapical on ventral surface. Pygofer sclerotized, very short; side lobes triangular, with stout spines, no appendage; ventral margin broadly horizontally turned mesad; no distinct membranous fold near base laterally. Anal tube small, membranous.

This genus is found in Ponape and Kusaie. This genus is apparently related to the Japanese genus *Yakunopona* Ishihara, but differs in the roundly produced crown and in the spinulation of the hind knees. The male of *Yakunopona* is unknown.

59. Oceanopona croceipennis Linnavuori, n. sp. (figs. 33; 34).

Male: Face light greenish shifting to orange; ocelli greenish, eyes gray; crown yellow, partly shifting to orange. Pronotum and scutellum orange in middle, sides brownish. Elytra orange, clavus with broad, dark-brown longitudinal band broadening to apex of elytra, apical cells dark brown. Undersurface yellowish. Legs dark brown, tarsi light.

Body elongate, somewhat depressed. Other characters mentioned in diagnose of genus.

Female: Face green; broad, orange, transverse band between eyes, eyes gray. Crown, pronotum, and scutellum greenish yellow, scutellum with faint, orange, middle stripe. Elytra yellowish green, veins concolorous, apex smoky. Flying wings whitish. Undersurface and legs green. Seventh sternite as long as sixth, hind margin faintly sinuate.

Length: 5-6 mm.

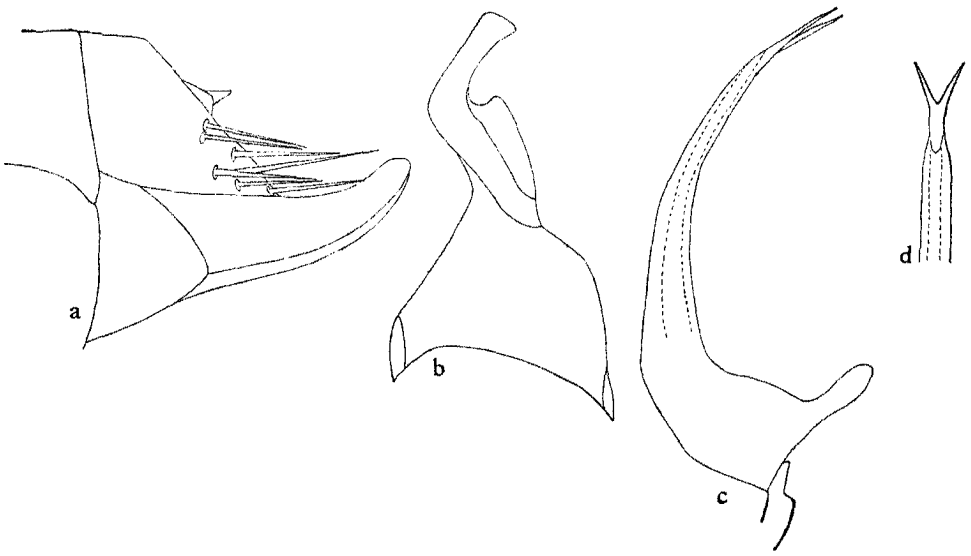

FIGURE 34.—*Oceanopona croceipennis:* **a**, genital segment, lateral view; **b**, style; **c**, penis, lateral view; **d**, apex of penis, ventral view.

Holotype, male (BISHOP 2233), Ponape, Mt. Temwetemwensekir, 180 m., Jan. 15-19, 1953, Gressitt; allotype, female (BISHOP), same data. Eight paratypes (BISHOP, US, RL), same data as for types, and Kusaie, Mutunlik (Yepan), 16 m., Jan. 23, 1953, Gressitt.

DISTRIBUTION: Eastern Caroline Is. (Ponape, Kusaie).

TRIBE DELTOCEPHALINI

Slender, elongate forms. Crown often distinctly produced. Elytra often with three, sometimes with two, closed subapical cells.

Male: Valve triangular, articulated with pygofer in lateral basal angles. Style with curved apophyse and broad basal part, fused with lateral basal angle of plate. Connective slender, linear; branches slender, parallel, often fused again apically. Pygofer with distinct membranous fold laterally near base.

KEY TO MICRONESIAN GENERA OF DELTOCEPHALINI

1. Outer subapical cell of elytra divided; clavus with extra cross veins..... **Deltocephalus problematicus**
   Outer subapical cell not divided; no extra cross veins..... 2
2. Anteclypeus parallel-sided; body more robust; spinulation of fore tibiae 3 + 4; penis with ventral ridge..... **Inemadara**
   Anteclypeus tapering downward; small, slender species, anterior margin of head without definite dark markings; penis without ventral ridge..... **Deltocephalus** subgen. **Insulanus**

Genus **Deltocephalus** Burmeister

Deltocephalus Burmeister, 1838, Genera Insectorum 1:49 (type: *D. pulicaris* Fallén; Europe).—Matsumura, 1902, Term. Füzetek **25**:390; 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**:208.—Melichar, 1903, Homopt.-Fauna Ceylon, 199.—Distant, 1908, Fauna of India, Rhynch. **4**:380.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**:45.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 95.

Small, but rather robust leafhoppers. Anteclypeus usually parallel-sided; frontoclypeus distinctly broadening dorsad; crown bluntly angularly produced, declivous near fore margin. Elytra usually with three closed subapical cells. Male plates small, roundish triangularly, macrosetae uniseriate. Penis and connective totally fused. Penis simple; gonopore apical. Anal tube totally membranous.

The distribution of this genus is nearly worldwide.

60. **Deltocephalus problematicus** Linnavuori, n. sp. (fig. 35).

Female: Face below eyes yellow brown; sutures and median stripe in anteclypeus dark brown; frontoclypeus and ocellocular area dark brown, former with light transverse stripes at sides. Eyes dark gray; crown grayish yellow, with large, dark-brown markings in apical part, disc with pair of broad, reddish-brown bands. Pronotum yellow gray, with some dark markings near fore margin, disc with four faint, reddish-brown longitudinal bands. Scutellum yellow brown, with dark basal triangles. Elytra light reddish brown, veins mostly whitish, broadly bordered with dark brown. Undersurface dark brown. Legs yellow brown, spotted with dark brown; femora basally dark.

Crown rather narrow, slightly convex, declivous anteriorly, bluntly angularly produced, nearly 1.5 times as long in middle as at sides; coronal suture long; ocelli large, in fore margin next to eyes; anteclypeus parallel-sided; frontoclypeus moderately broadening upward. Pronotum broad, nearly as long as crown. Elytra with distinct appendix, three closed subapical cells, outer subapical cell divided, some extra cross veins in clavus. Spinulation of fore tibiae 3 + 4. Seventh sternite as long as sixth; hind margin truncate at sides, shallowly sinuate in middle, with small, produced, bluntly-triangular, median lobe, sinuation and lobe bordered with black.

Length: 3.5 mm.

Holotype, female (US 63392), Palau, Babelthuap, Ngaremeskang, light trap, 30 m., Dec. 24, 1952, Gressitt.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is probably not congeneric with the species of the genus *Deltocephalus,* but I cannot place it more satisfactorily until males are obtained.

Subgenus **Insulanus** Linnavuori, new subgenus

Type: *Stirellus subviridis* Metcalf, by present designation.

Small, slender subgenus. Coloring greenish. Head broader than pronotum; crown only bluntly angularly produced; anteclypeus distinctly tapering downward; ocelli large, in fore margin next to eyes. Elytra with two closed subapical cells. Spinulation of fore tibiae 1 + 4. Genitalia much as in *Inemadara;* style with apophyse more slender and curved; anal tube small, but sclerotized; penis slender, finger-shaped; gonopore rather small, subapical on dorsal surface. Other characters as in *Inemadara.*

Insulanus is closely related to the subgenus *Recilia* Edwards (1922, Ent. Month. Mag. **58**: 206, 207), differing, however, in the gracile body, in the

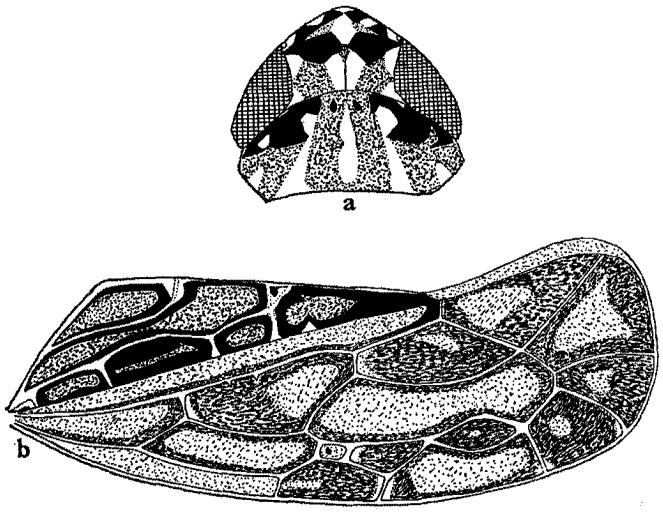

FIGURE 35.—*Deltocephalus problematicus:* **a,** head and pronotum; **b,** elytron.

light coloring often with a greenish tinge, in the absence of definite dark markings in the anterior margin of the head, in the somewhat dissimilar penis, and in the more tropical distribution.

This subgenus is distributed throughout Oceania.

KEY TO MICRONESIAN SPECIES OF SUBGENUS INSULANUS

1. Crown only roundly produced; elytra with distinct dark spot in subapical area; color often greenish.....**61. subviridis**

   Crown rather sharply angled; elytra usually with distinct dark spot in subapical area; color more grayish.....**62. hospes**

61. Deltocephalus (Insulanus) subviridis (Metcalf), n. comb. (fig. 36, *e-g*).

Stirellus subviridis Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 125-126.

Male and female: Very variable in coloring and in length of elytra and flying wings.

Macropterous form: General color above greenish testaceous; elytra translucent with greenish cast, veins whitish. Flying wings milky subhyaline. Below, including face and legs, chiefly testaceous with eyes and lateral pieces of abdomen fuscous. In dark specimens, coloring more brownish, elytral veins bordered by dark-brown shadows.

Head broader than pronotum; crown subangularly produced, fore margin rounded, disc with scale-like microsculpturing near fore margin. Elytra and flying wings much longer than abdomen. Valve triangular. Plates broad and short, lateral margin strongly curved, with a few stout macrosetae. Style with apophyse sharp, claw-like, curved; ventral arm long. Penis small, finger-shaped; gonopore rather small, subapical on dorsal surface. Pygofer with side lobes roundly triangular, with numerous, long, brownish spines. Seventh sternite of female about twice as broad as its median length, hind margin deeply and somewhat triangularly excavate.

Brachypterous form: Coloring yellow brownish; elytral veins surrounded by dark shadows. Crown totally microsculptured. Elytra much shorter than abdomen; flying wings much reduced.

Length: 2.5-3 mm.

DISTRIBUTION: S. Mariana Is., Caroline Is., Marshall Is.

S. MARIANA IS. SAIPAN: One, Chalan Kanoa, Aug. 1944, D. G. Hall; 68, As Mahetog area, Apr. 1945, Dybas. TINIAN: Two, Nov. 1952, Beardsley. AGIGUAN: One, on *Cynodon dactylon,* Aug. 1954, C. J. Davis. GUAM, 56: Agat, Apr. 1946, Krauss; Com. Mar. Hill, Mar. 1948, Maehler; Piti, Apr., Nov. 1936, Swezey; Pt. Oca, July 1945, Bohart and Gressitt; Pt. Ritidian, Oct. 1952, Krauss; Talofofo, Aug. 1952, Krauss; Upi Trail, May 1936, Swezey; Pago Bay, May 1945, Dybas.

PALAU. Thirty-seven. NGAIANGL: Dec. 1952, Gressitt. BABELTHUAP: Ngaremeskang-Ngchesar (Kaishar), Aug. 1939, Esaki; Ulimang, Dec. 1947, Dybas. KOROR: Nov. 1947, Dybas; Sept. 1952, Krauss; Sept. 1952, Jan.-Feb. 1953, Beardsley; 25 m., Dec. 1952, Gressitt. ULEBSEHEL (Auluptagel): Sept. 1952, Krauss. PELELIU: Mt. Amiangal, Dec. 1952, Gressitt.

YAP. Twenty-seven. RUMUNG: July-Aug. 1950, Goss. MAP: July-Aug. 1950, Goss. YAP: July-Aug. 1950, Goss; Oct. 1952, Krauss; Dugor, July-Aug. 1950, Goss; Kanif, July-Aug. 1950, Goss; Kolonia, Apr. 1954, Beardsley; Hill behind Yaptown, 50 m., Dec. 1952, Gressitt.

CAROLINE ATOLLS. PULO ANNA: Two, 1952, Krauss. SONSOROL: Three, Sept. 1952, Krauss. NGULU: Three, Ngulu I., Oct. 1952, Krauss. ULITHI: Seven, Fassarai I., Oct. 1952, Krauss; Mogmog I., Oct. 1952, Krauss. FAIS: One, Oct. 1952, Krauss. SOROL: One, Sorol I., Oct. 1952, Krauss. WOLEAI: Four, Utegal I., Feb. 1953, Beardsley. IFALUK: Four, Ifaluk I., Sept. 1953, Bates; Sept. 1952, Krauss; Feb. 1953, Beardsley. ETAL: One, Etal I., Nov. 1952, Beardsley.

TRUK. Fourteen. TONOAS (Dublon): Feb. 1948, Maehler. TON (Tol): Pata, Sabote-Epin, Apr. 1940, Yasumatsu and Yoshimura.

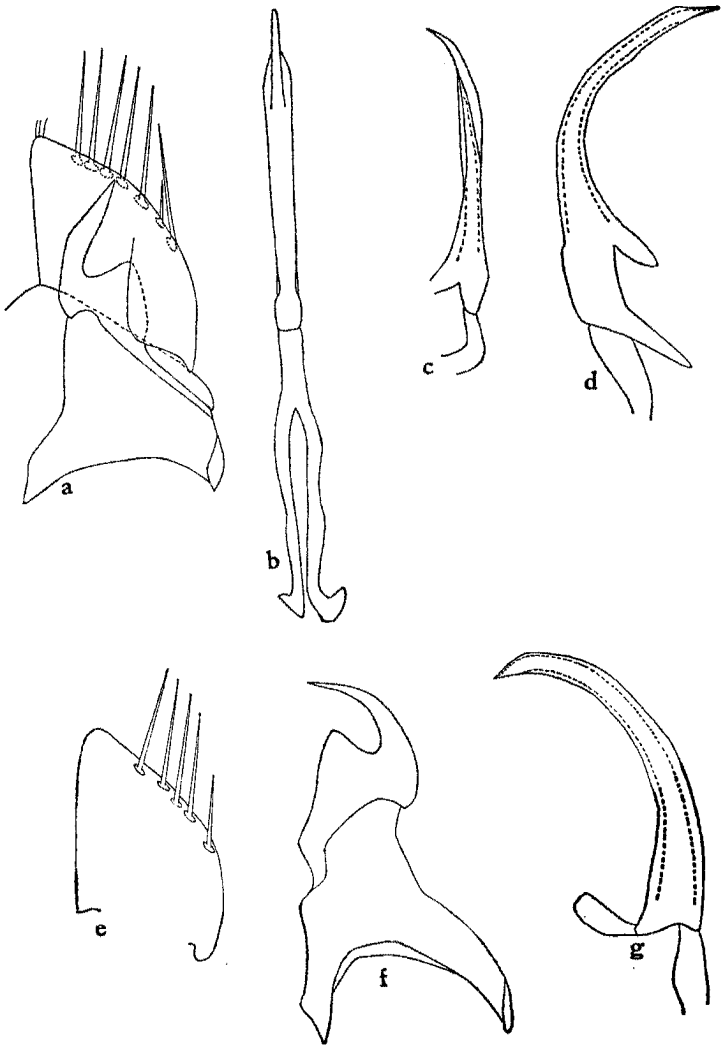

FIGURE 36.—**a-c,** *Inemadara distincta: a,* plate and style, dorsal view; *b,* penis and connective, ventral view; *c,* penis, lateral view. **d,** *Deltocephalus* (*Insulanus*) *hospes,* penis, lateral view. **e-g,** *D.* (*I.*) *subviridis: e,* plate; *f,* style; *g,* penis, lateral view.

PONAPE. One, Colonia, Feb. 1948, Dybas.

MARSHALL IS. UJELANG: Two, Ujelang I., Oct. 1953, Beardsley. UJAE: Two, Ujae I., Oct. 1953, Beardsley. NAMU: Two, Kaginen I., Oct. 1953, Beardsley. KILI: Two, Oct. 1953, Beardsley. NAMORIK: Four, Namorik I., Sept. 1953, Beardsley. EBON: Two, Ebon I., Sept. 1953, Beardsley. JEMO: Three, Jemo I., on *Lepturus,* Dec. 1951, Fosberg, No. 449.

HOSTS: *Cynodon dactylon, Lepturus* sp.

This species is one of the most common leafhoppers in Micronesia. It seems that the macropterous form is dominant in the western parts of Micronesia, e.g., in the South Mariana Islands, while the brachypterous form is dominant in the eastern areas and in atolls, e.g., all specimens from Truk. However, both forms occur together; in the material from Jemo Island, two of the specimens are macropterous and one brachypterous and in the material from Babelthuap, three specimens are macropterous and one brachypterous. There also occur intermediate forms between these two extreme forms.

62. Deltocephalus (Insulanus) hospes Kirkaldy (fig. 36, *d*).

Deltocephalus hospes Kirkaldy, 1904, Entomologist **37**: 177.

Phrynomorphus hospes, Kirkaldy, 1907, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **3**: 60; 1910, Fauna Hawaiiensis, Suppl. 2 (6): 576.

Stirellus hospes, Osborn, 1935, B. P. Bishop Mus., Bull. **134**: 55.—Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 125.

Coloring nearly as in *Inemadara distincta.*

Body form much as in *subviridis,* but crown distinctly longer than pronotum, sharply triangularly produced, disc in middle and basally slightly concave. Pronotum with less produced fore margin, therefore pronotum shorter and relatively broader. Elytra about as long as abdomen, two closed subapical cells. Male genitalia chiefly as in *subviridis,* but penis distinctly curved, with no ventral ridge, gonopore subapical on dorsal surface. Seventh sternite of female chiefly as in *subviridis.*

Length: 2.8-3 mm.

DISTRIBUTION: Hawaiian Is., Guam.

S. MARIANA IS. GUAM: Four, Pilgo River, May 1945, Bohart and Gressitt; Piti, May 1936, Usinger; Pt. Ritidian, June 1936, Usinger; Upi Trail, May 1936, Usinger.

Genus **Inemadara** Ishihara

Inemadara Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 48 (type: *Deltocephalus oryzae* Matsumura; Japan).

Rather robust leafhoppers. Color grayish or brownish. Head broad; crown bluntly or sharply angularly produced, flat, near fore margin scale-like microsculptured; coronal suture long; ocelli in fore margin next to eyes; anteclypeus parallel-sided; frontoclypeus flattish, rather broad. Elytra longer than abdomen; appendix rather narrow; three or two

closed subapical cells; claval suture and lower claval vein united by cross vein. Spinulation of fore tibiae 3 + 4.

Male: Valve triangular. Plates short, broadly triangular, lateral margin strongly rounded, macrosetae uniseriate. Style with long, slightly curved apophyse, basal part distinctly rectangularly produced laterally below apophyse. Connective linear, totally fused with the penis. Penis simple, without *socle,* stem slender, gonopore subapical on dorsal surface. Pygofer sclerotized dorsally, side lobes roundish triangular, with numerous, very long, stout spines, no appendage. Anal tube small, weakly sclerotized.

This subgenus is distributed throughout the Oriental Region, Japan, and western Micronesia.

63. Inemadara distincta (Motschulsky), n. comb. (fig. 36, *a-c*).

Deltocephalus distinctus Motschulsky, 1858, Études Ent. **7**: 112.—Melichar, 1903, Homopt.-Fauna Ceylon, 200.—Distant, 1908, Fauna of India, Rhynch. **4**: 382.

Male: Pale yellow grayish brown. Face more or less light; frontoclypeus dark brown with some light transverse stripes. Crown with six black-brown spots in fore margin which are often partly united, forming bow-like dark stripes, fore margin between them whitish, disc yellow grayish brown. Pronotum and scutellum yellow grayish brown, former often with four very indistinct, brownish, longitudinal stripes. Elytra semitransparent, veins whitish, bordered with dark-brown shadows, central subapical cell with dark-brown spot basally. Undersurface more or less dark brown, margins of segments light. Legs light brown, dark spotted.

Body broad, somewhat flattened. Head broad; crown flat, bluntly angularly produced, about as long as pronotum; anteclypeus parallel-sided. Elytra with two closed subapical cells. Valve triangular. Plates short and broad, side margin strongly curved, with long, stout macrosetae. Style with long, slightly curved apophyse, ventral arm of basal part rather short. Penis slender, stem nearly straight, apex sharp, turned dorsad, ventral surface with median ridge apically, dorsal surface somewhat scored, gonopore large, on dorsal surface. Pygofer with side lobes roundish triangular, with numerous, long, stout spines.

Female: Seventh sternite a little longer than sixth, hind margin shallowly sinuate, dark semicircular spot in middle.

Length: 3.4-4.5 mm.

DISTRIBUTION: Ceylon, western Micronesia.

S. MARIANA IS. SAIPAN: One, As Mahetog area, Apr. 1945, Dybas. GUAM: One, Pt. Oca, July 1945, Bohart and Gressitt.

PALAU. Eighteen. BABELTHUAP: Ulimang, Dec. 1947, Dybas. KOROR: Oct. 1947, Dybas, Jan.-Feb. 1953, Beardsley; Koror-Arabaketsu, June 1938, Murakami.

YAP. Seven. YAP: Kolonia, July-Aug. 1950, Goss; Hill behind Yaptown, 50 m., Dec. 1952, Gressitt; Kanif, July-Aug. 1950, Goss; Ruul Distr., July-Aug. 1950, Goss; Dugor-Kanif-Ruul, Sept. 1939, Esaki; Ruul-Nif, Sept. 1939, Esaki.

TRIBE EUSCELINI

Body form often robust. Elytra with two or three closed subapical cells. Connective robust, Y-shaped; branches distinctly diverging. Other characters as in Deltocephalini.

KEY TO MICRONESIAN GENERA OF EUSCELINI

1. Penis with two gonopores 2
   Penis with one gonopore 4
2(1). Penis simple; slender species ..... **Nesophrosyne**
   Penis with long basal appendages 3
3(2). Gonopores large, far from apex; phragma forming two large, rectangular plates; fore margin of crown turned up ..... **Satsumanus**
   Gonopores small, apical; crown very short, declivous ..... **Opsianus**
4(1). Plates without macrosetae; large robust species 5
   Plates with macrosetae 7
5(4). Basal appendages of penis very long, longer than stem; stem long, slender, curved; style with apophyse very thick, truncate distally 6
   Basal appendages of penis, if present, slender, shorter than stem; stem short, thick; style normal; broad, robust forms; fore margin of head with two parallel carinae ..... **Drabescus**
6(5). Gonopore subapical, on dorsal surface; penis with a pair of short apical processes ..... **Bhatia**
   Gonopore subapical, on ventral surface; penis without apical processes ..... **Jamitettix**
7(4). Crown narrow, conically produced, totally densely scale-like microsculptured; penis simple; slender, elongate species ..... **Aconura**
   Crown broad, only roundly produced; broad, robust species 8
8(7). Penis simple: side lobe of pygofer with a few very thick, black spines; appendix of elytra very broad, extending around entire apex; color grayish ..... **Exitianus**
   Penis with spines dorsally and a lateral paraphysis on each side; appendix not extending around entire apex; color green with black markings ..... **Nephotettix**

The species *Athysanus ogasawarensis* Matsumura is excluded from the key, as it cannot be placed generically only on the basis of the unsatisfactory original description.

Genus **Aconura** Lethierry

Aconura Lethierry, 1876, Soc. Ent. Belgique, Ann. **19**: 85 (type: *A. jakovlefi* Lethierry; south Russia).—Matsumura, 1902, Term. Füzetek **25**: 355, 385; 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**: 229; 1931, Ins. Matsumurana **6**: 191.—Melichar, 1903, Homopt.-Fauna Ceylon, 187.—Distant, 1908, Fauna of India, Rhynch. **4**: 378.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 45.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 172-175.

Body long and narrow. Head narrower than pronotum; eyes large; crown narrow basally, conically produced forward, disc flat, totally densely and strongly scale-like microsculptured; coronal suture short; ocelli in fore margin near eyes; anteclypeus long and parallel-sided; frontoclypeus long, convex. Pronotum short, broadening hindward, hind margin strongly sinuate. Elytra with narrow appendix; two long, parallel-sided, subapical cells, outer much shorter and narrower than central. Spinulation of fore tibiae 1 + 4, of hind knees 2 or 2 + 1.

Male: Valve long, sharp triangular. Plates triangular, rather short, macrosetae uniseriate. Style with apophyse rather slender and curved; ventral arm long. Connective

Y-shaped. Penis with distinct *socle,* stem arising from ventral part of *socle,* long, simple, nearly straight or slightly curved dorsad, gonopore subapical on dorsal surface. Pygofer sclerotized, side lobes roundish triangular, with numerous long spines and small black knob, no appendage. Ovipositor and ovipositor sheath of female very long, much longer than pygofer.

This genus is distributed throughout the Palearctic and Oriental Regions.

64. Aconura grandis Matsumura (fig. 37).

Aconura grandis Matsumura, 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**: 229.—Esaki, 1932, Iconographia Insectorum Japon. **1**: 1759.—Kato, 1933, Bunrui Genshoku Kontyu Zukan **4**: 23.—Miwa, 1943, List Injurious Insects Formosa, 73.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 45.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 173.

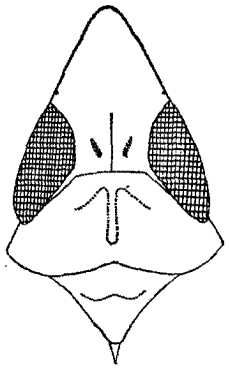

FIGURE 37.—*Aconura grandis,* head and thorax, dorsal view, Japanese specimen.

Male and *female:* Light ocher yellow brown. Eyes brown; elytral veins greenish. Abdomen dark brown dorsally, sides yellowish. Undersurface and legs ochraceous, central parts of venter and ovipositor dark brown.

Body long and narrow, broadening hindward. Head narrower than pronotum; crown sharply conically produced. Pronotum short, broadening hindward, hind margin strongly sinuate, disc finely punctate, with short central ridge. Elytra shorter than abdomen. Valve long, sharp triangular. Plate with about eight uniseriate macrosetae. Penis with stem very long and slender, curved dorsad. Seventh sternite of female as long as sixth, hind margin shallowly sinuate; ovipositor much longer than pygofer.

Length: 6.2 mm.

DISTRIBUTION: Japan, Formosa, South China, Bonin Is.

BONIN IS. According to Esaki and Ito.

Genus **Exitianus** Ball

Exitianus Ball, 1929, Am. Ent. Soc., Trans. **55**: 5 (type: *Cicadula exitiosa* Uhler; North America).—Ribaut, 1952, Faune France **57**: 137.

Mimodrylix Zakhvatkin, 1935, Moscow Univ. Wiss. Ber. **4**: 108 (type: *Thamnotettix capicola* Stål; South Africa).—Ishihara, 1954, Matsuyama Agric. Coll., Sci. Rept. **14**: 6.

Head a little broader than pronotum; crown short, declivous, anterior margin bluntly rounded; ocelli large, in fore margin about their own diameter from eyes; anteclypeus tapering downward; frontoclypeus moderately broadening upward; ocellocular area rather broad. Pronotum broad, sides short, parallel, not carinate. Elytra with appendix large and extended around apex, two closed subapical cells. Spinulation of fore tibiae 4 + 4. Valve triangular. Plates long triangular, lateral margin straight, macrosetae uniseriate. Style small. Connective Y-shaped. Penis simple, with broad basal *socle,* stem robust, arising from ventral part of *socle,* slightly curved dorsad. Gonopore large, subapical on dorsal surface. Side lobes of pygofer with two to four long, thick, black spines, no other setae or appendage. Anal tube totally membranous. Ovipositor of female extending well beyond pygofer.

This genus is nearly cosmopolitan.

Key to Micronesian Species of Exitianus

1. Larger and more robust species, length 4.3-5.9 mm.; side lobe of pygofer with two black spines.....**65. capicola**
   Smaller species, length 3.5-4.2 mm.; side lobe of pygofer with four black spines.....**66. simillimus**

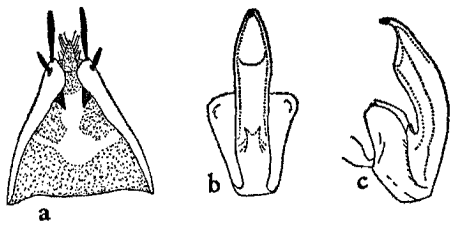

Figure 38.—*Exitianus capicola:* **a**, pygofer, ventral view; **b**, penis, ventral view; **c**, penis, lateral view. (After Ribaut.)

65. Exitianus capicola (Stål). (Figure 38.)

Athysanus capicola Stål, 1855, Öfv. K. Vet.-Akad., Förh. **12**: 99 *sensu* Matsumura, 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**: 186.—Matsumura, 1920, Manual Jap. Inj. Ins. **1**: 316; 1932, Conspectus Jap. Inj. Ins., 269.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 90.

Jassus fusconervosus Motschulsky, 1863, Moscow Soc. Nat., Bull. **36**: 97.

Athysanus taeniaticeps Kirschbaum, 1868, Nassauisch. Ver. Jahrb. **21**: 87.

Nephotettix plebeius Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1**: 331.—Osborn, 1934, Insects of Samoa **2**(4): 175; 1934, B. P. Bishop Mus., Bull **113**: 115.

Euscelis transversus Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 122, n. syn.

Exitianus taeniaticeps, Ribaut, 1952, Faune France **57**: 138.

Mimodrylix capicola, Ishihara, 1954, Matsuyama Agric. Coll., Sci. Rept. **14**: 6.

Male and *female:* General color light ochraceous buff. Crown usually ochraceous orange or ochraceous buff with broad, blackish, submarginal band between eyes; face ochraceous orange with more or less distinct fuscous arcs or side stripes. Pronotum and scutellum ochraceous buff. Elytra grayish, claval veins whitish, bordered with brown, other veins brownish.

Head broad; crown obtusely angulate. Elytra longer than abdomen. Penis with broad base; stem very stout, slightly curved dorsad, apex curved in dorsally; gonopore large. Style with apophyse slightly curved; preapical angle of style below apophyse rectangular. Side lobe of pygofer with two black spines. Seventh sternite of female with hind margin broadly triangularly notched on median line, posterior lateral borders shallowly excavate with posterior lateral angles somewhat produced.

Length: 4.3-5.9 mm.

DISTRIBUTION: Southern Europe, Africa, Palestine, Oriental Region, Japan, Micronesia, Samoa, Fiji, Society Is., South America.

S. MARIANA IS. SAIPAN: Nine, As Mahetog area, May 1945, Dybas; Aug. 1951, R. Bohart; Civ. Admin. Area, Jan. 1949, Maehler. TINIAN: Seventeen, July 1946, Townes. ROTA: One, July 1951, R. Bohart. GUAM, 31: Piti, Apr. 1936, Usinger; Pt. Oca, June 1945, Dybas, July 1945, G. Bohart and Gressitt, and Apr. 1946, Krauss; Pt. Ritidian, Oct. 1952, Krauss; Upi Trail, May 1936, Swezey; Tarague, May 1936, Swezey.

YAP. YAP: Two, July-Aug. 1950, Goss; central Yap, July 1951, Gressitt.

CAROLINE ATOLLS. SATAWAL: One, Satawal I., Sept. 1952, Krauss. NOMWIN: Four, Nomwin I., Feb. 1954, Beardsley. NAMA: One, Nama I., Feb. 1949, Potts. LOSAP: One, Oct. 1952, Beardsley. NAMOLUK: One, Namoluk, I., Nov. 1953, Beardsley. ETAL: One, Etal I., Nov. 1952, Beardsley. LUKUNOR: One, Nov. 1952, Beardsley. SATAWAN: Three, Nov. 1952, Beardsley. KAPINGAMARANGI, 65: Hare I., ex *Vigna* and *Ipomoea* along lagoon shore, Aug. 1954, Niering; Machiro I., Aug. 1946, Townes; Nunukita I., in grass, *Stenotaphrum* and *Asplenium,* Aug. 1954, Niering; Ringutoru I., *Nephrolepis* and grasses, Aug. 1954, Niering; Taringa I., low grass, *Thuarea involuta,* July 1954, Niering; Werua I., ex grass and low vegetation under breadfruit, July 1954, Niering. MOKIL: Five, Jan. 1953, Gressitt. PINGELAP: Two, July 1949, Owen.

TRUK. Thirty-six. WENA (Moen): May 1946, Townes; Mar. 1949, Potts; 1952, Beardsley; Mt. Chukumong (Teroken), Feb. 1953, Gressitt; south slope Mt. Tonaachau, Apr. 1949, Potts. TON (Tol): Pata, Sabote, Apr. 1940, Yasumatsu and Yoshimura.

PONAPE. Forty-seven. Agric. Exper. Sta., July-Sept. 1950, Adams; airfield, July-Sept. 1950, Adams; hydroelectric plant, Colonia, Aug. 1946, Townes, Feb. 1948, Dybas, and July-Sept. 1950, Adams; Mt. Pairot (Beirut),

July-Aug. 1950, Adams; Not Pt., July-Sept. 1950, Adams; Dolen Net (Tolenot) Pk., July-Sept. 1950, Adams; Nahpali, July-Sept. 1950, Adams.

KUSAIE. Five. Aug. 1946, Townes; Malem River, Dec. 1937, Esaki; Mutunlik (Yepan), 16 m., Jan. 1953, Gressitt; Mwot-utwe, Dec. 1937, Esaki.

MARSHALL IS. UJELANG: Four, Ujelang I., Oct. 1953, Beardsley. ENIWETOK, 42: Aomon, May 1946, Townes; Elugelab, Jan. 1951, Y. Oshiro; Igurin I., May 1946, Townes. BIKINI: Five, July-Aug. 1947, Cole. RONGELAP: Four, Rongelap I., Oct. 1953, Beardsley. WOTHO: 14, Wotho I., Oct. 1953, Beardsley. UJAE: 31, Ujae I., Oct. 1953, Beardsley. KWAJALEIN, 46: Kwajalein I., airfield, Aug. 1946, Oakley and Oct. 1953, Beardsley; Bennett I., Aug. 1944, Wallace; Loi I., Feb. 1945, Wallace. LAE: One, Lae I., Oct. 1953, Beardsley. LIB: 11, Oct. 1953, Beardsley. NAMU, 18: Namu, Oct. 1953, Beardsley; Kaginen I., Oct. 1953, Beardsley. AILINGLAPALAP: 12, Bigatyelang I., Aug. 1946, Townes. JALUIT, 45: Imej, Nov. 1937, Esaki; Imrodj I., Aug. 1946, Townes; Medyado I., Aug. 1946, Townes. KILI: 11, Oct. 1953, Beardsley. EBON: 11, Ebon I., Oct. 1953, Beardsley. NAMORIK: Six, Namorik I., Oct. 1953, Beardsley. POKAK: 17, Sibylla I., *Lepturus repens,* July 1952, Fosberg No. 1272. BIKAR: 76, Bikar I., *Lepturus repens,* Aug. 1952, Fosberg No. 1423. TAKA: 107, Watwerok I., *Lepturus repens,* Dec. 1951, Fosberg No. 268. JEMO: 17, *Lepturus,* Dec. 1951, Fosberg No. 383, 449. LIKIEP, 122: Lato I., grassy ground cover, Dec. 1951, Fosberg No. 328; Likiep I., Aug. 1946, Townes. WOTJE: One, Wotje I., Oct. 1953, Beardsley. MAJURO: Six, Aug. 1946, Townes. ARNO: 173, Ine I., July 1950, La Rivers. MILI: Five, Alu I., Oct. 1953, Beardsley.

GILBERT IS. TARAWA: Four, Mar. 1951, Catala. ONOTOA: 51, Buiartun I., ex grass, July 1951, Moul.

HOSTS: Grasses, *Asplenium, Ipomoea, Lepturus repens, Nephrolepis, Stenotaphrum, Thuarea involuta, Vigna.* Apparently a polyphagous grass-feeding species.

This species is the most common leafhopper of the family in Micronesia. It is probably of a southern Palearctic or Oriental origin and was apparently introduced by commerce and human migrations from the west to Micronesia and Polynesia.

66. Exitianus simillimus (Matsumura), n. comb.

Athysanus simillimus Matsumura, 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**: 185.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 93.

Mimodrylix simillimus, Ishihara, 1954, Matsuyama Agric. Coll., Sci. Rept. **14**: 7.

Coloring chiefly as in *E. capicola.*

Body as in *capicola,* but smaller and much more slender. Valve and plates nearly similar. Style with outer angle of basal part below apophyse obtuse. Penis more slender;

gonopore elongate oval. Side lobe of pygofer with four black spines. Seventh sternite of female with hind margin straight.

Length: 3.5-4.2 mm.

DISTRIBUTION: Formosa, Bonin Is., southwestern Caroline Is.
BONIN IS. (Ogasawara Jima). Several, Matsumura.
CAROLINE ATOLLS. PULO ANNA: One, Sept. 1952, Krauss.

Genus **Nephotettix** Matsumura

Nephotettix Matsumura, 1902, Term. Füzetek **25**: 378 (type: *Selenocephalus cincticeps* Uhler; Japan).—Melichar, 1903, Homopt.-Fauna Ceylon, 192.—Distant, 1908, Fauna of India, Rhynch. **4**: 359.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 39.—Esaki and Ito, Jap. Soc. Promotion Sci., Tokyo, 121.

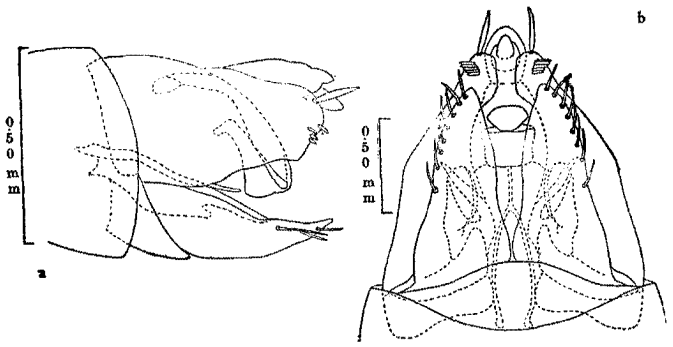

FIGURE 39.—*Nephotettix apicalis apicalis,* male genitalia: **a**, lateral view; **b**, ventral view. (After Metcalf.)

Color green with blackish markings. Head a little broader than pronotum; crown broad and short, blunt-roundish produced, transversely sulcate near cephalic margin; coronal suture distinct; ocelli in fore margin distant from eyes about their own diameter; face broad; anteclypeus tapering downward; frontoclypeus moderately broadening upward; ocellocular area rather broad. Pronotum broad, sides parallel. Elytra long; appendix distinct; two closed subapical cells, outer triangular, much shorter, and smaller than central. Spinulation of fore tibiae 4 + 4. Valve short, broad triangular. Plates triangular, heavily sclerotized, macrosetae uniseriate. Style well developed, apophyse long and rather thick; preapical angle of style below apophyse sharply triangularly elongate. Connective long, Y-shaped, fused. Penis with large basal *socle;* stem robust, arising from ventral part of *socle,* slightly curved dorsad, a short lateral paraphysis on each side a little below middle, dorsal surface somewhat scored, with weakly sclerotized median carina with a few spines directed apicad. Gonopore subapical on dorsal surface. Pygofer heavily sclerotized, side lobes short triangular with a few stout spines in apex, no appendage. Anal tube broad, nearly reaching the apex of pygofer, heavily sclerotized ventrally, weakly sclerotized dorsally.

This genus is closely related to *Exitianus,* but differs in the coloring, in the sulcation of the crown, and in certain details of the male genitalia. The range is Africa, the Oriental Region, and western Micronesia.

67. Nephotettix apicalis apicalis (Motschulsky). (Figures 39; 40.)

Pediopsis apicalis Motschulsky, 1858, Études Ent. **7**: 110.
Pediopsis nigromaculatus Motschulsky, 1858, Études Ent. **7**: 111.
Thamnotettix nigropicta Stål, 1870, Öfv. K. Vet.-Akad., Förh. **27**: 740.

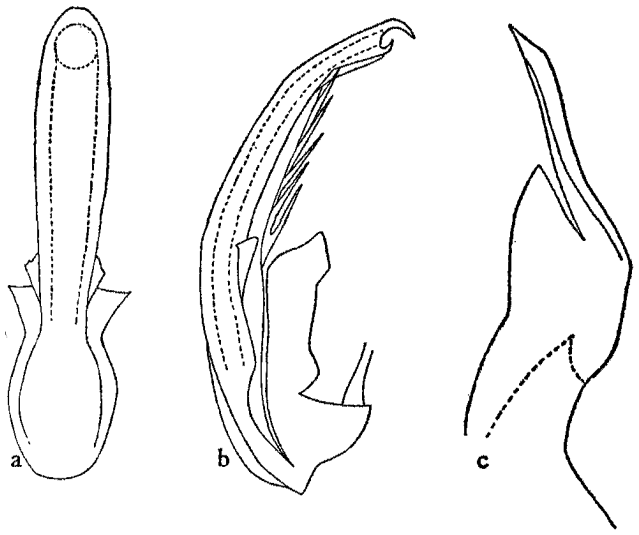

FIGURE 40.—*Nephotettix apicalis apicalis:* **a**, penis, ventral view; **b**, penis, lateral view; **c**, apical part of style.

Nephotettix apicalis, Melichar, 1903, Homopt.-Fauna Ceylon, 193.—Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1**: 333.—Matsumura, 1906, Sapporo Nat. Hist. Soc., Trans. **1**: 20, 37; 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**: 189; 1938, Ins. Matsumurana **12**: 149.—Distant, 1908, Fauna of India, Rhynch. **4**: 360.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 122.

Nephotettix bipunctatus Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 126, *nec* Fabricius, 1803, Syst. Rhyng., 78.

Male: Green. Face black, with two lighter spots on frontoclypeus and yellowish areas near ventral margin; crown with submarginal blackish fascia. Elytra bright green, apical part to apex of clavus blackish fuscous, blackish-brown macula along claval suture in corium, beginning from apex of clavus and obliquely triangularly broadening toward base of elytra. Undersurface blackish, borders of segments lighter.

Crown short and broad, about twice as broad as its median length, somewhat conically produced in front of eyes. Pronotum about three times as broad as its median length.

Valve short and broad, roundish triangular. Plates elongate, triangular. Style elongate; apophyse long and rather slender, nearly straight, median margin slightly sinuate near base, apex sharp. Penis elongate; stem long, slightly curved, relatively slender, lateral paraphyses short and broad triangular, carina on dorsal surface with about five spines, apex deeply sinuate dorsally. Side lobe of pygofer roundish, with some stout spines.

Female: Green. Elytra with basal two-thirds bright green, apical third greenish, milky subhyaline or slightly smoky. Undersurface buff; face with a few dark-brown transverse arcs. Seventh sternite nearly twice as long as sixth; hind margin broadly triangularly incised; margins of incision shallowly sinuate, lateral angles roundly produced, median area quadrately notched with anterior margin of notch produced in broad, triangular tooth.

Length: 4-5.2 mm.

DISTRIBUTION: Africa, Madagascar, Palestine, India, Ceylon, East Indies, Indo-China, Siam, China, Formosa, Philippine Is., Queensland, western Micronesia.

S. MARIANA IS. SAIPAN, 47: As Mahetog area, Apr.-May 1945, Dybas; Halaihai-As-Teo area, Jan. 1945, Dybas; Mt. Tagpochau, Jan. 1945, Dybas; southern Saipan, Jan. 1945, Dybas. GUAM, six: Com. Mar. Hill, Mar. 1948, Maehler; Inarajan, May 1936, Swezey and Usinger; Piti, Sept. 1936, Swezey; Pt. Oca, June-July 1945, Bohart and Gressitt; Umatac, Jan. 1948, Maehler.

PALAU. Three. BABELTHUAP: Ngaremeskang-Ngchesar (Kaishar), Aug. 1939, Esaki. KOROR: Aug. 1939, Esaki.

HOST: Rice.

68. Nephotettix apicalis yapicola Linnavuori, n. subsp. (fig. 41).

Male: Like the nominate form, but dark coloring much more extensive in elytra; apex entirely blackish to apex of clavus, the oblique-triangular spot along claval suture much larger, clavus entirely black brown, excluding a small, light, basal spot. Face almost entirely black, only sides of ante- and frontoclypeus lighter. Undersurface blackish.

Female: Like the nominate form, but apex of elytra mostly light brownish, often with faint trace of oblique-triangular spot along claval suture. Upper part of face dark brown.

Length: 4-5.2 mm.

Holotype, male (US 63393), Yap I., Oct. 1952, Krauss; allotype, female (US), same data. Thirty-eight paratypes (BISHOP, US, RL, MCZ, CM). Yap: Same data as for holotype; S. Map I., July-Aug. 1950, Goss; west Rumung I., July-Aug. 1950, Goss; central Yap, July-Aug. 1950, Goss; Dugor, July-Aug. 1950, Goss; Gagil Distr., July-Aug. 1950, Goss; Kolonia, Mar. 28, 1954, Beardsley; Ruul Distr., July-Aug. 1950, Goss. Palau: Babelthuap, Dec. 11, 1947, Dybas, Oct. 1, 1951, Gressitt, and May 23-24, 1953, Beardsley; Koror, July 22, 1946, Townes, Nov. 21, 1947, Dybas, and June 8, 1953, Beardsley.

DISTRIBUTION: Western Caroline Is. (Yap, Palau).

Nephotettix apicalis has a very wide distribution. As a rice-feeding species, it has been easily transported by commerce and human migrations and is probably of an Oriental origin. The species is known as an insect pest of rice cultivation.

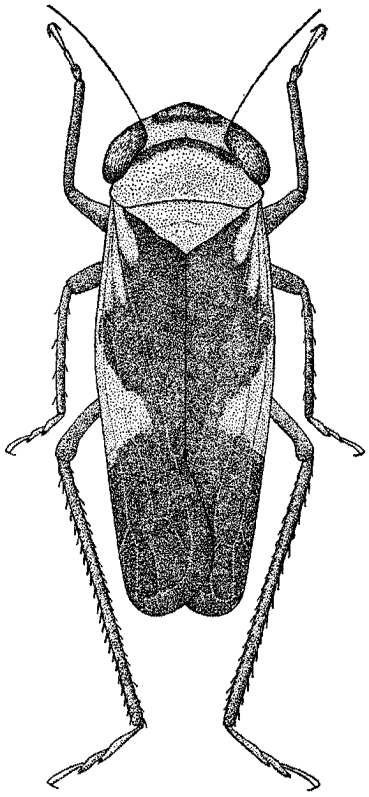

FIGURE 41.—*Nephotettix apicalis yapicola,* male, dorsal view.

Genus **Opsianus** Linnavuori, new genus

Type: *Euscelis picturatus* Metcalf, by present designation.

Short, robust species. Head broader than pronotum; crown very short, distinctly declivous, fore and hind margins parallel, fore margin rounded; coronal suture short, visible only near base; ocelli in fore margin close to eyes; anteclypeus broadening downward; frontoclypeus rather flat and broad; ocellocular area rather narrow; cheeks broad, outer margin somewhat angulate. Pronotum short and broad, hind margin nearly transverse, disc convex, smooth, and shining. Elytra well developed, with narrow appendix and two closed subapical cells. Spinulation of fore tibiae 1 + 4. Valve large, roundish triangular. Plates large, ending in narrow, weakly sclerotized, somewhat turned up apical part; macrosetae few, uniseriate. Style long apophyse long, slightly curved; preapical angle of style below apophyse sharply triangularly produced. Connective long, Y-shaped, not fused. Penis symmetric with large, nearly square basal *socle* in ventral aspect; stems arising from dorsal part of *socle,* rather thick, curved dorsad; pair of long, basal appendages arising between stems. Gonopores small, apical. Pygofer sclerotized, side lobes rounded with numerous spines, no appendage. Anal tube small, membranous.

This genus occurs in Guam. It differs from *Satsumanus* in the short, sloping crown, in the form of the style, and in the situation of the gonopores. It differs from *Opsius* Fieber in the position of the ocelli near the eyes, in the narrower ocellocular area, in the form of the anteclypeus, and in the shape of the style.

69. Opsianus picturatus (Metcalf), n. comb. (fig. 42).

Euscelis picturatus Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 123.

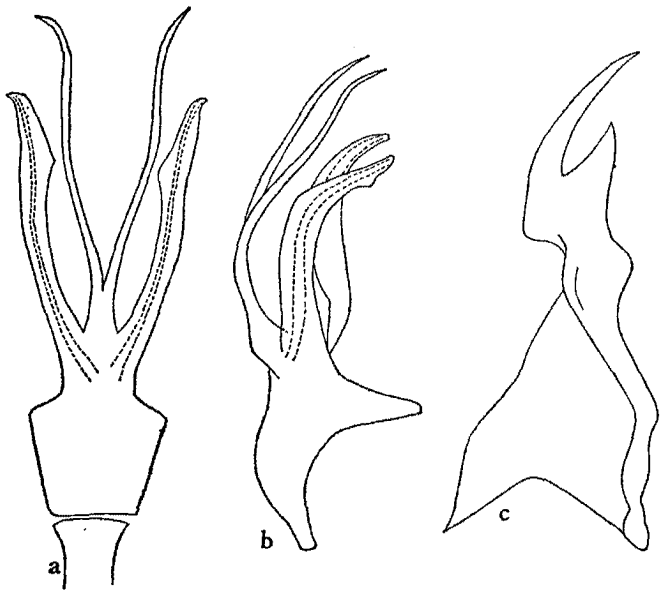

FIGURE 42.—*Opsianus picturatus:* **a**, penis, ventral view; **b**, penis, lateral view; **c**, style.

Male and *female:* Color variable. In paler specimens, crown, face, pronotum, and scutellum, and undersurface including legs light ochraceous buff with ventral part including face unmarked; crown with narrow, transverse, fuscous fascia between eyes above ocelli; pronotum with narrow, indefinite, ochraceous-orange fascia on anterior border and broad, more definite fascia on posterior border. Elytra chiefly ochraceous orange with large, nearly circular whitish spots. In darker specimens, predominant color black or blackish fuscous variously marked with ochraceous yellow and white. Crown ochraceous yellow with broad, black fascia between eyes; face chiefly ochraceous yellow; cheeks and anteclypeus blackish. Pronotum with anterior margin broadly blackish fuscous and broad posterior band of blackish fuscous with posterior border narrowly ochraceous yellow, anterior half of scutellum blackish fuscous, posterior half ochraceous yellow. Elytra blackish fuscous with a few circular spots of white. Abdomen blackish fuscous with margins of segments narrowly bordered with ochraceous yellow; fore and middle legs chiefly ochraceous yellow with tarsi fuscous, hind legs blackish fuscous.

Crown short and broad, nearly three times as broad as its median length, only about one-third as long as pronotum, anterior and posterior borders nearly parallel, disc smooth and shiny. Face smooth and shiny; frontoclypeus about as long as width between ocelli, lateral margins diverging to level of antenna and then converging to narrow anteclypeus; anteclypeus narrow at base, somewhat broadened, spatulate toward apex; cheeks broad, outer margins somewhat angulate. Pronotum about three times as broad as its median length, but a little narrower than head, anterior margin broadly curved, posterior margin nearly transverse, disc smooth and shining. Elytra rather thick and opaque. Valve large, triangular. Plates large, broad at base, ending in weakly sclerotized, narrow and turned-up apical part, a few macrosetae. Style elongate, with long, scythe-like apophyse; median margin with deep concavity below apophyse; the preapical angle of the style below apophyse strongly sharply triangularly prolonged. Penis with large basal *socle;* stems and appendages arising rather dorsally from *socle;* stems robust, curved dorsad, median margin somewhat broadly triangularly expanded before apex; appendages arising between stems, slender, longer than stems; gonopores small, apical. Side lobe of pygofer rounded, armed with numerous spines. Seventh sternite of female elongate, nearly as long as four anterior segments combined; posterior lateral angles projecting, then posterior border sloped slightly cephalad with central third projected in broad, triangular tooth with slight notch at apex.

Length: 3-3.6 mm.

DISTRIBUTION: Guam.

S. MARIANA IS. GUAM, 32: Machanao, June 1936, Swezey; Mt. Alifan, on *Macaranga,* May, June 1936, Swezey and Usinger; Mt. Lamlam, 400 m., Nov. 1952, Gressitt; Orote Peninsula, on *Psychotria,* May 1936, Usinger; Upi Trail, May 1936, Usinger.

HOSTS: *Macaranga, Psychotria.*

Genus **Satsumanus** Ishihara

Satsumanus Ishihara, 1953, Ent. Soc. Shikoku, Trans. 3: 193 (type: *Eutettix satsumae* Matsumura, 1914; Japan and China).

Broad, somewhat flattened species. Color brownish, with numerous ramose or vermiculate brownish false veins in elytra. Head broader than pronotum; crown slightly longer medially than next to eyes, disc declivous basally, fore margin distinctly turned up with shallow sulcation behind; coronal suture distinct; eyes large; ocelli in fore margin near eyes; face broad; anteclypeus long, slightly broadening downward; frontoclypeus broad and nearly flat; ocellocular area very narrow. Pronotum short and broad, fore margin semicircular, hind margin sinuate, sides very short. Scutellum rather large. Elytra with two closed, long, and more or less parallel-sided subapical cells, claval veins connected by cross vein, appendix narrow. Spinulation of fore tibiae 1 + 4. Valve short, broad triangular. Plates long, broad basally, ending in narrow, weakly sclerotized apical part, with several uniseriate macrosetae. Style small, apophyse short and rather thick; the preapical angle of the style below apophyse totally rounded. Connective long, not fused, Y-shaped, branches not strongly diverging. Penis with short but robust, square, basal *socle,* stems arising laterally from dorsal part of *socle,* pair of long basal appendages below stems; phragma forming two large, quadrangular plates. Gonopores large, somewhat oblique, on ventral surface rather far from apex. Pygofer sclerotized, but rather deeply incised behind anal tube, side lobes roundish triangular with several spines, no appendage. Anal tube membranous.

The range of this genus is Japan, China, Polynesia, and Micronesia. It is allied to *Opsianus* Linnavuori and *Opsius* Fieber. The differences between this

genus and *Opsianus* are described above. It differs from *Opsius* in the sulcate crown, in the position of the ocelli, the narrow ocellocular area, the large eyes, the false venation and narrow appendix of elytra, and in the structure of the male genitalia.

70. Satsumanus breviceps Linnavuori, n. sp. (fig. 43).

Male: Face light brown with numerous irregular dark-brown stripes and spots. Crown pale yellow, fore margin with two black, oblong, transverse spots, disc with two large, reddish-brown spots, coronal suture dark brown, eyes gray. Pronotum reddish brown with faint, irregular lighter markings. Scutellum pale yellow, with reddish-brown basal triangles and broad, orange, median stripe. Elytra whitish, with numerous reddish- or dark-brown, transverse, false veins, broad, broken, reddish-brown, transverse band in middle, another, more distinct band at apex of clavus, veins reddish brown, apex dark brown. Abdomen dark dorsally. Undersurface reddish brown, coxae dark brown, legs light brown.

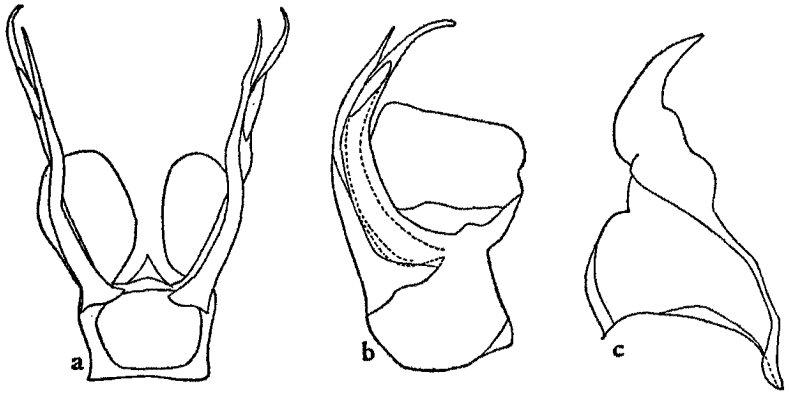

FIGURE 43.—*Satsumanus breviceps:* **a**, penis, ventral view; **b**, penis, lateral view; **c**, style.

Body broad and somewhat flattened. Head broader than pronotum; eyes large; crown of nearly uniform length. Pronotum short and broad, fore margin semicircular, sides very short. Elytra a little longer than abdomen. Valve short, broad triangular. Plates broad at base, ending in long, turned-up, weakly sclerotized apical part. Style small; apophyse short and thick, slightly curved; basal part broad. Penis with short but broad and robust *socle,* stems thick basally, ending in slender apex, distinctly curved dorsad; appendages shorter than stems; phragma forming two large rectangular plates. Gonopores large, obliquely on ventral surface, rather far from apex. Side lobes of pygofer roundish triangular, not notched near upper margin, with several spines.

Female: Seventh sternite a little longer than sixth, hind margin shallowly sinuate with rounded, produced lobe in middle.

Length: 3.2-4 mm.

Holotype, male (BISHOP 2234), Palau, Koror, Sept. 21, 1952, Beardsley; allotype, female (BISHOP), same locality, Jan. 1, 1953, Beardsley. Two paratypes (US, RL), same data as for holotype, and Kusaie, Mutunlik, 22 m., Feb. 3, 1953, Clarke.

DISTRIBUTION: Caroline Is. (Palau, Kusaie).

This new species differs from *S. satsumae* Matsumura in the shorter crown, in the form of the penis, and in the shape of the side lobes of the pygofer which are not notched near the upper margin.

Genus **Nesophrosyne** Kirkaldy

Nesophrosyne Kirkaldy, 1906, Hawaiian Ent. Soc., Proc. **1**: 160 (type: *N. perkinsi* Kirkaldy, 1904; Hawaiian Is.); 1910, Fauna Hawaiiensis, Suppl. 2 (6): 558.

Orosius Distant, 1918, Fauna of India, Rhynch. **7**: 85 (type: *O. albicinctus* Distant; south India).

Nesaloha Oman, 1943, Pan-Pac. Ent. **19**: 33 (type: *N. cantonensis* Oman; Canton Is.).

Head as broad as pronotum; crown more or less produced; disc flat or slightly convex; coronal suture and postfrontal suture distinct; fore margin before latter slightly turned up; ocelli in fore margin about their own diameter from eyes; anteclypeus parallel-sided; frontoclypeus only slightly broadening upward, rather flat. Pronotum broad, fore margin rounded, sides very short, hind margin slightly sinuate. Elytra well developed; appendix narrow; two closed subapical cells, outer much shorter and smaller than central, claval veins connected by short cross vein in middle. Spinulation of fore tibiae 1 + 4. Valve rather large, rounded or triangular. Plates broad at base, ending in narrow, weakly sclerotized, and turned-up apical part; macrosetae uniseriate. Style small but robust; apophyse straight and rather thick; the preapical angle of the style below apophyse distinctly rectangularly produced; basal part nearly rhomboidal. Connective rather short, not fused, Y-shaped. Penis symmetric; *socle* well developed; stems arising laterally from ventral part of *socle;* no appendages; gonopores small, near ventral margin on lateral side of stems rather far from apex. Pygofer heavily sclerotized, side lobes rounded, armed with several spines, no appendage. Anal tube small, sclerotized.

The range of this genus is the Oriental Region and Oceania. I have examined the type species of the genus *N. perkinsi* Kirkaldy from the Hawaiian Islands and found the similarities in the genitalia and the external structures between it and the species of *Orosius,* and have therefore synonymized these genera. The oriental species described as *Orosius* are usually smaller than most of the Hawaiian species and have dark-brown filigranous stripes on the pronotum and elytra which usually do not occur in the Hawaiian species. Possibly *Orosius* could be thought of as a subgenus of *Nesophrosyne,* but not without a thorough revision of the numerous Hawaiian species of the genus. The male genitalia of another Hawaiian genus, *Kirkaldiella* Osborn, as described by Osborn (1935, B. P. Bishop Mus., Bull. **134**: 14) seem also to be similar and probably this genus is also a subgenus or even a synonym of *Nesophrosyne.*

71. Nesophrosyne argentatus (Evans), n. comb. (fig. 44).

Thamnotettix argentatus Evans, 1940, Roy. Soc. Queensland, Proc. **52**: 11.

Orosius argentatus, Oman, 1949, Ent. Soc. Washington, Mem. **3**: 11, 15.

Male and female: Face grayish brown; frontoclypeus often with dark-brown transverse stripes at sides; ocelli red; crown yellow brown, fore margin with two black spots,

disc with two large, angular, black spots or transverse stripes before and two smaller behind. Pronotum yellow brown with dense filigranous net of dark-brown stripes. Scutellum yellow brown with irregular dark-brown spots. Elytra whitish, irregularly, and rather densely irrorated with dark-brown, fine transverse lines; veins concolorous or brownish; apex dark brown. In dark specimens, dark coloring more extensive, especially in clavus which may be nearly totally infuscate with only small, round, whitish spots. In pale specimens, on the contrary, dark irroration is much reduced and scanty. Abdomen dorsally dark brown. Undersurface grayish brown, more or less dark spotted. Legs grayish brown, black spotted.

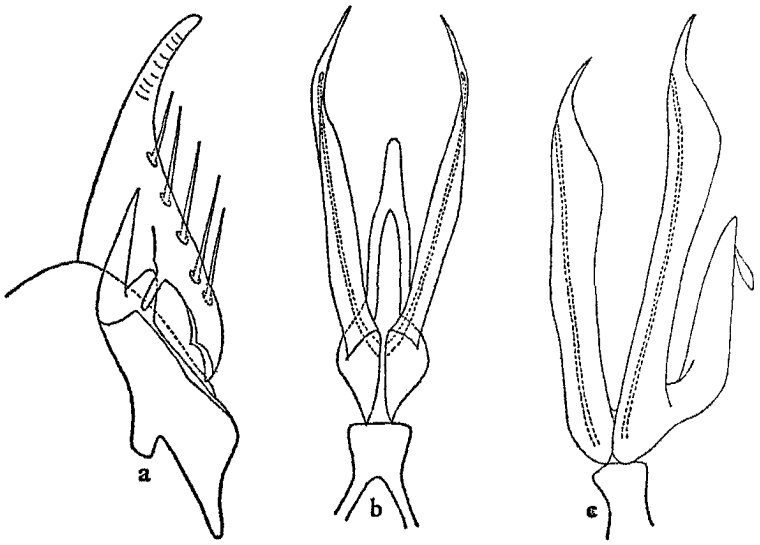

FIGURE 44.—*Nesophrosyne argentatus:* **a**, plate and style, dorsal view; **b**, penis, ventral view; **c**, penis, lateral view.

Body slender. Head as broad as pronotum; crown roundly produced, a little longer in middle than next to eyes, disc flat or slightly convex. Valve rather large, rounded. Plates long, ending in long, weakly sclerotized apical part, with about five macrosetae. Penis with stems flattened, band-like, ending in thin, curved apical part; gonopores small, near ventral margin on lateral surface of stems, rather far from apex. Side lobe of pygofer rounded, with numerous spines. Seventh sternite of female large, over three times as long as sixth, hind margin roundly truncate.

Length: 3-3.5 mm.

DISTRIBUTION: Philippine Is., Malaya, Australia, Polynesia, Micronesia.

S. MARIANA IS. SAIPAN: Two, Isely Field, canefield, Aug. 1944, Hall. GUAM, three: Pt. Oca, June 1945, Bohart and Gressitt; Talofofo, Apr. 1946, Krauss.

PALAU. BABELTHUAP: Three, Ulimang, Dec. 1947, Dybas.

YAP. YAP: Two, Ruul Distr., July-Aug. 1950, Goss.

CAROLINE ATOLLS. ULITHI, four: Asor, Oct. 1952, Krauss; Falalop, Apr. 1952, Beardsley; Mogmog, Oct. 1952, Krauss. FAIS: 14, Fais I., Apr. 1954, Beardsley.

MARSHALL IS. POKAK: 32, Sibylla I., ex *Boerhavia,* July 1952, Fosberg No. 1277.

HOSTS: *Boerhavia,* tomato, and tobacco (after Oman).

This species resembles *N. filigranus* (Haupt), but is bigger and has the stems of the penis flattened and band-like. *N. argentatus* has been reported as an insect pest on tomato and tobacco cultivation (Oman, 1949, Ent. Soc. Washington, Mem. 3: 11).

72. Nesophrosyne argentatus var. **distans** Linnavuori, n. var.

Nesophrosyne sp., Bryan, 1926, B. P. Bishop Mus., Bull. **31**: 81.

Male and *female:* Coloring yellow gray, dark markings very scanty. Face with faint, dark, transverse stripes in male or totally unmarked in female. Crown, pronotum, and scutellum yellow gray, at most with very faint shadows on pronotum. Elytra semitransparent, yellow gray; veins yellow brown; dark irroration mostly very scanty, especially in female; apex infuscate. Undersurface and legs pale yellow gray. General structure as in nominate form, but body relatively more robust and broader. Genitalia similar.

Length: 3-3.5 mm.

Holotype, male (BISHOP 2235), Wake Atoll, July 30, 1923, E. H. Bryan, Jr.; allotype, female (BISHOP), same data. 413 paratypes (BISHOP, RL, US, CM), same locality as for holotype, July 28-Aug. 1, 1923, on *Boerhavia diffusa, Portulaca, Sesuvium,* and *Sida,* Bryan, and Nov. 15, 1953, C. R. Joyce; Wake Atoll, Peale I., Aug. 13, 1940, Lyons and Torrey.

DISTRIBUTION: Wake Atoll.

HOSTS: *Boerhavia diffusa, Portulaca, Sesuvium,* and *Sida.*

This variety differs from the nominate form in the relatively broader and more robust body and in the pale coloring with only scanty dark markings.

Genus **Athysanus** Burmeister

Athysanus Burmeister, 1838, General Insectorum **1**: 48 (type: *Cicada argentata* Fabricius, 1794; Europe).—Distant, 1908, Fauna of India, Rhynch. **4**: 343.—Matsumura, 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**:185.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 43.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 88.

Robust species. Head broader than pronotum; crown short and broad; fore margin bluntly rounded to front; anteclypeus rectangular; frontoclypeus large; ocelli in fore margin rather far from eyes. Pronotum short and broad. Elytra broad; appendix small; two closed subapical cells. Spinulation of fore tibiae 5 + 5. Penis symmetric, stem long, arising from ventral part of well-developed *socle;* gonopore subapical on ventral or dorsal surface. Connective Y-shaped. Style robust. Plates with macrosetae in disorder. Anal tube sclerotized.

The distribution of this genus is Holarctic.

73. Athysanus ogasawarensis Matsumura.

Athysanus ogasawarensis Matsumura, 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**: 189.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 43.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 91.

Female: Light brownish yellow. Crown with black transverse stripe at apex and another black stripe in fore margin of head between frontal and dorsal surfaces, disc with brownish spot on either side near basal margin. Face unmarked. Pronotum with six brownish, longitudinal stripes. Scutellum with black spot on either side. Elytra subhyaline, shifting to light brownish, veins whitish, cells often brownish, apex brownish. Last dorsal segment with median, black, longitudinal stripe. Undersurface and legs light brownish yellow, thorax and venter blackish at sides, fore and middle tibiae spotted with brownish, hind tarsi mostly blackish, excluding base of first and second joints.

Coloring resembles that of the Nearctic species, *A. comma* Van Duzee and *A. colon* Osborn and Ball.

Crown with anterior margin broadly rounded. Pronotum somewhat longer than crown. Elytra somewhat shorter than abdomen. Seventh sternite about twice as long as sixth, hind margin very shallowly sinuate on either side. Pygofer spotted with brownish, armed with light-brownish spines.

Length: 4.5 mm. (Description after Matsumura.)

DISTRIBUTION: Bonin Is.

BONIN IS. (Ogasawara Jima): Two females, Matsumura.

This species is unknown to me. It certainly does not belong to *Athysanus, s. str.* The systematic position is uncertain until males are obtained.

Genus **Bhatia** Distant

Bhatia Distant, 1908, Fauna of India, Rhynch. **4**: 357 (type: *Eutettix olivaceus* Melichar, 1903; Ceylon).—Evans, 1947, Roy. Ent. Soc. London, Trans. **98**: 230.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 94.

Melichariella Matsumura, 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**: 238 (type: *M. satsumensis* Matsumura, 1914; Japan).—Ishihara, 1954, Zool. Mag. Tokyo **63**: 243.

Large, robust species. Head wider than pronotum; anterior margin rounded to frons, with shallow, transverse furrow. Eyes small, narrower than one-half distance between them; ocelli distant from eyes about three times their own diameter. Frons slightly tumid, a little longer than distance between ocelli. Clypeus constricted near base, with distinct basal suture. Pronotum finely transversely striate. Elytra large and slender; appendix large; inner subapical cell open basally. Plates triangular, without macrosetae, distally attenuate and membranous. Anal tube not sclerotized dorsally at basal half. Pygofer setose distally. Connective short, Y-shaped. Penis not fused to connective, recurved dorsally, with two small terminal processes and with two slender basal paraphyses dorsad. Gonopore subapical, on dorsal surface. Style fairly large; apophyse very short and thick, apex enlarged laterad, truncate or slightly sinuate distally. Color sordid stramineous, generously marked with brown or fuscous, markings usually in form of vermiculate lines or small spots. (Description after Ishihara.)

The genera *Bhatia, Jamitettix,* and *Drabescus* belong to a separate subfamily, Drabescinae (Linnavuori, 1960, Acta Ent. Fenn. **15**: 36-37). This genus is distributed throughout the Oriental Region, Japan, and the Bonin Islands.

74. Bhatia boninensis (Matsumura).

Melichariella boninensis Matsumura, 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**: 238.—Ishihara, 1954, Zool. Mag. Tokyo **63**: 244.

Bhatia boninensis, Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 94.

Male: Dirty yellow, somewhat shifting to greenish. Face pale yellow, unmarked; crown with pair of roundish, black spots near hind margin. Pronotum and scutellum unmarked. Elytra hyaline, shifting to yellowish, veins concolorous, no markings. Flying wings grayish smoky, strongly iridescent, veins dark brown. Undersurface and legs pale yellowish, claws brownish.

Crown three times as broad as long in middle, transverse furrow as in *M. satsumensis.* Antennal flagellum nearly as long as body. Valve short. Plates much longer than valve, very broad at base, suddenly narrowing in middle, ending in narrow, turned-up apical part, with fine, whitish hairs.

Female: Seventh sternite distinctly longer than sixth, hind margin red brownish and with triangular notch on either side, in middle somewhat produced with slight median notch. Pygofer with short, yellowish spines apically.

Length: 6-7 mm. (Description after Matsumura.)

DISTRIBUTION: Bonin Is.

BONIN IS. (Ogasawara Jima): Several specimens, Matsumura.

Genus **Jamitettix** Matsumura

Jamitettix Matsumura, 1940, Ins. Matsumurana **15**: 40 (type: *J. kotonis* Matsumura, 1940; Formosa).—Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 119.—Evans, 1947, Roy. Ent. Soc. London, Trans. **98**: 219.

Large, robust, and elongate species. Head broader than pronotum; eyes rather small; crown very broad and short, of nearly uniform length, anterior margin rounded to frons, with two faint, irregular, transverse carinae below ocelli; ocelli in fore margin distant from eyes about three times their own diameter; face broad; anteclypeus broadening downward; frontoclypeus long and rather narrow; ocellocular area broad; cheeks distinctly sinuate below eyes; ventral margin of face blunt angular. Pronotum broad, fore margin roundly produced, sides short, hind margin shallowly sinuate, disc finely, transversely rugulous. Elytra long and slender, appendix broad, two closed subapical cells. Spinulation of fore tibiae 1 + 4, of hind knees 2 + 1. Valve rounded. Plates long, broad triangular basally, suddenly narrowing in middle and ending in long, narrow, turned-up apical part, without macrosetae. Style small but robust; apophyse very thick and short. Connective Y-shaped, not fused. Penis symmetric, with large, basal *socle;* stem long and slender, arising rather ventrally from *socle;* pair of long, slender, basal appendages; gonopore subapical on ventral surface. Pygofer heavily sclerotized, side lobes rounded, with numerous spines, no appendage. Anal tube large, as long as pygofer, apical part of dorsal surface sclerotized, basal part membranous.

This genus is distributed throughout Formosa and western Micronesia. *Jamitettix* is very closely related to *Bhatia* and might possibly be regarded as a subgenus or a synonym of *Bhatia.* No species of the latter genus are available to me for a thorough comparison between these genera.

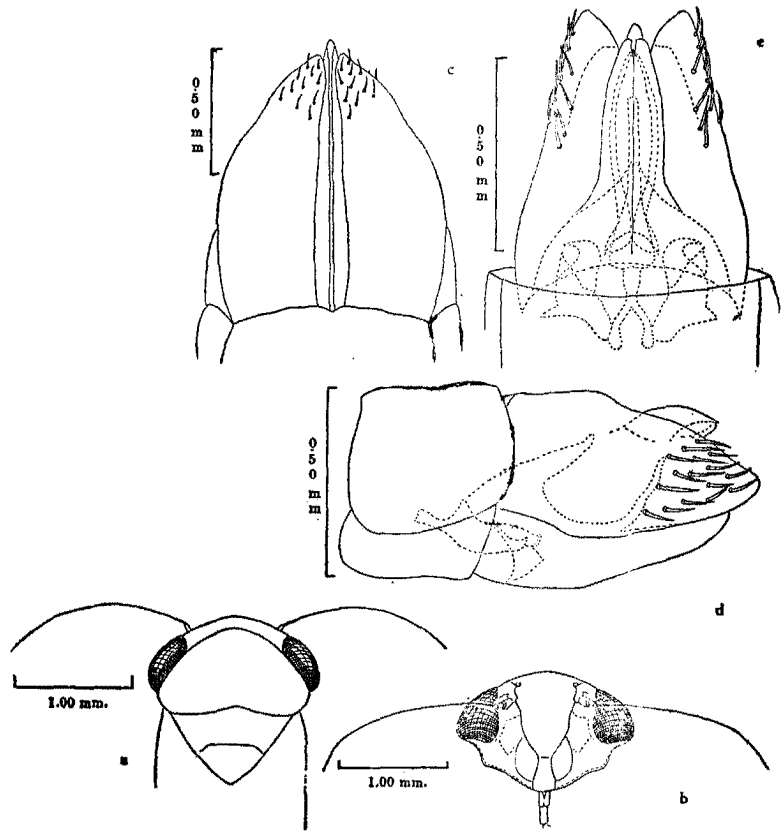

FIGURE 45.—*Jamitettix guamensis:* a, dorsal view of head and thorax; b, frontal view; c, ventral view of female genitalia; d, lateral view of male genitalia; e, ventral view of male genitalia. (After Metcalf.)

KEY TO MICRONESIAN SPECIES OF JAMITETTIX

1. Color darker; stem of penis straight basally, curved in apical part; apophyse of style very thick, truncate distally (Guam).....**75. guamensis**
   Color lighter; stem of penis strongly curved basally, straight in apical part; apophyse of style curved, not truncate distally (Palau, Yap).....**76. metcalfi**

75. **Jamitettix guamensis** Metcalf (figs. 45; 46, *a, b*).

Jamitettix guamensis Metcalf, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 119.

Male and *female:* General color olive buff with face, crown, pronotum, and scutellum heavily mottled with blackish fuscous. Elytra translucent, olive brown, veins brown. Venter and legs heavily spotted with blackish fuscous.

Head broader than pronotum; crown slightly conically produced in front, finely rugulous with rugae radiating from apex of crown, two faint, somewhat irregular, transverse carinae below ocelli, posterior margin broadly, circularly incised, nearly parallel to anterior

margin. Face faintly rugulous. Pronotum nearly twice as broad as its median length, disc finely transversely rugulous. Scutellum about twice as broad as long, anterior area smooth, posterior area finely rugulous. Valve rounded. Plates long, broad triangular at base, suddenly narrowing in middle, ending in long, narrow, turned-up apical part. Style with apophyse very thick, apex truncate distally, sharply tipped, projecting laterad; preapical angle of style below apophyse rounded. Penis with stem straight basally, curved dorsad in apical part; pair of long, strongly diverging, basal appendages. Side lobes of pygofer round triangular, with several spines. Seventh sternite of female but little longer than sixth, hind margin slightly notched at median line, posterior border shallowly crenulate.

Length: 5.5-6 mm.

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. SAIPAN: One, Garapan, May 1940, Yasumatsu and Yoshimura; two, As Mahetog area, Dec. 1944, Dybas; Papago area, Jan. 1945, Dybas. ROTA: One, near Sabana, native forest, 365 m., June 1946, Townes. GUAM, six: Haputo Pt., on *Morinda citrifolia,* Mar. 1948, Maehler; Machanao, June 1936, Swezey; Piti Pt., June 1945, Dybas; Sinajana, June 1936, Usinger; Upi Trail, May 1936, Swezey and Usinger.

HOST: *Morinda citrifolia.*

76. Jamitettix metcalfi Linnavuori, n. sp. (fig. 46, *c-e*).

Male and *female:* Coloring as in *guamensis* with following exceptions: General coloring lighter grayish, face black, fore margin of head with three black transverse bars, and brown mottling of pronotum more dense.

General structure as in *guamensis,* but size a little smaller and carinae in fore margin of head more indistinct. Genitalia chiefly as in *guamensis.* Style with apophyse short, strongly curved laterad, apex not truncate; preapical angle of style below apophyse distinct, nearly rectangular. Penis with stem strongly curved dorsad in basal part, apical part straight. Female genitalia as in *guamensis.*

Length: 5.5 mm.

Holotype, male (US 63394), Yap, Hill behind Yaptown, 50 m., Dec. 1, 1952, Gressitt; allotype, female (KU), Peleliu, Akarokuru-Ashiasu, Feb. 22, 1938, Esaki. Three paratypes (BISHOP, RL), Yap, Hill behind Yaptown, Dec. 1, 1952, Gressitt; Palau, Ngarmalk (NW Auluptagel), 25 m., Dec. 12-13, 1952, Gressitt.

DISTRIBUTION: Western Caroline Is. (Palau, Yap).

This species is named after the late Professor Z. P. Metcalf, who published some important contributions to the leafhopper fauna of Micronesia.

Genus **Drabescus** Stål

Drabescus Stål, 1870, Öfv. K. Vet.-Akad., Förh. **27**: 738 (type: *Bythoscopus remotus* Walker; Philippine Is.).—Melichar, 1903, Homopt.-Fauna Ceylon, 170.—Distant, 1908, Fauna of India, Rhynch. **4**: 304.—Matsumura, 1912, Tohoku Imp. Univ., Jour. Coll. Agric. **4**: 290.—Evans, 1947, Roy. Ent. Soc. London, Trans. **98**: 219.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 23.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 67.

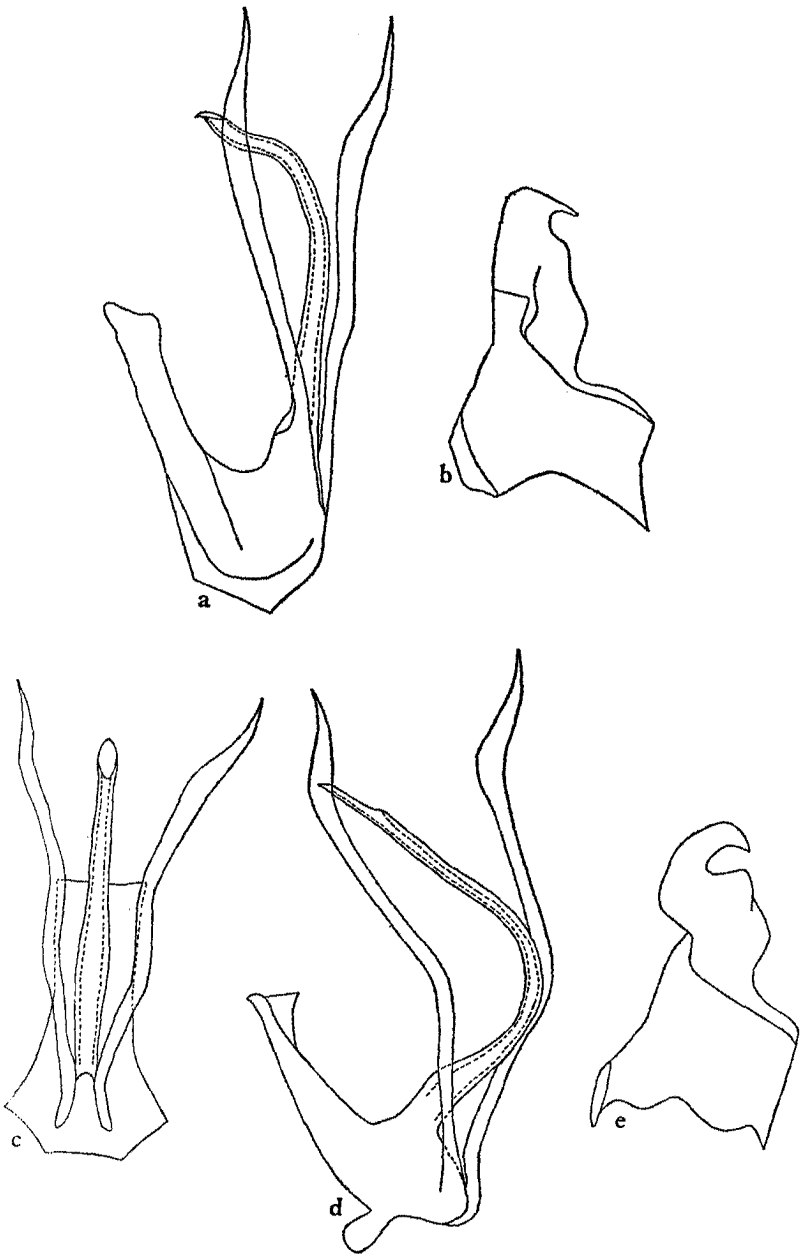

FIGURE 46.—**a, b,** *Jamitettix guamensis: a,* penis, lateral view; *b,* style. **c-e,** *J. metcalfi: c,* penis, ventral view; *d,* penis, lateral view; *e,* style.

Robust, broad, and flattened species. Head slightly broader than pronotum; crown very broad and short, only slightly longer in middle than at sides or of nearly uniform length, disc flat with fine, longitudinal striae; coronal suture distinct in basal part; cephalic margin flattened and delimited by primary margin of crown below and somewhat elevated secondary margin of crown above; between these margins a groove microsculptured by fine transverse striae and in which ocelli are situated rather far from eyes. Face broad; anteclypeus broadening downward, with faint, longitudinal, median carina; frontoclypeus flat and rugulous, slightly broadening upward, below cephalic margin somewhat concave; ocellocular area broad; cheeks broad, distinctly sinuate below eyes; antennal pits placed superior to middle of eyes, ledge above pits. Pronotum very broad, sides short, disc densely microsculptured by transverse furrows and sparsely punctate. Scutellum rugulous. Elytra with broad appendix, two closed subapical cells, veins dark with light spots, cells finely transversely rugulous. Fore and middle tibiae angular in section; spinulation of fore tibiae 1 + 4, of hind knees 2 + 1. Valve short, semicircular. Plates with broad base, then narrowing to slender, long apical part, without macrosetae. Style well developed; apophyse thick; preapical angle of style below apophyse distinct. Connective rather short, Y-shaped, not fused. Penis symmetric, *socle* rather small, stem short and rather thick, arising from ventral part of *socle,* with or without basal appendages; gonopore subapical on ventral

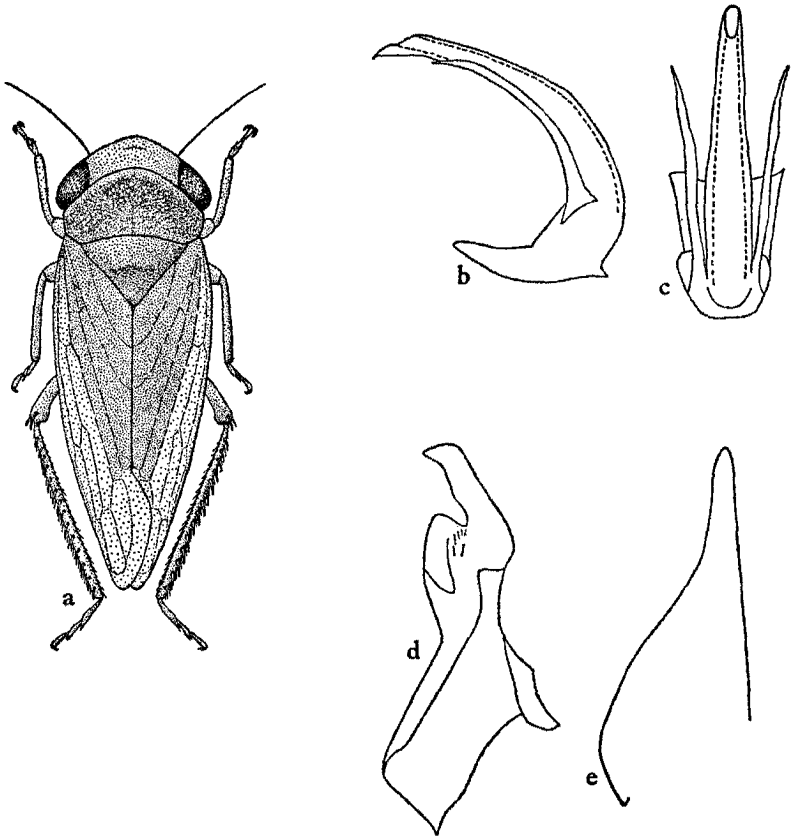

FIGURE 47.—*Drabescus flavicollis:* **a,** dorsal view; **b,** penis, lateral view; **c,** penis, ventral view; **d,** style; **e,** plate.

surface. Pygofer heavily sclerotized, side lobe rounded, with several spines, with or without a ventral appendage. Anal tube broad, nearly as long as pygofer, totally sclerotized or membranous basally.

This genus is distributed throughout Japan, the Oriental Region, Samoa, and Micronesia. The genus shows a relationship to *Bhatia* and *Jamitettix*.

KEY TO MICRONESIAN SPECIES OF DRABESCUS

1. Larger species, pronotum greenish yellow; penis with basal appendages....**77. flavicollis**
   Smaller, dark-brown species; penis simple.....**78. modestus**

77. **Drabescus flavicollis** Linnavuori, n. sp. (fig. 47).

Male: Face and crown black, cephalic margin yellow. Pronotum greenish yellow. Scutellum black brown basally, apex greenish yellow. Elytra colorless, hyaline, apex smoky, indistinct, fuscous, transverse band at apex of clavus, another shorter band at apical cross veins, veins black brown with sparse, oblong, whitish spots. Undersurface and legs black brown.

Head broader than pronotum; crown slightly longer in middle than next to eyes; ocellocular area, cheeks, and frontoclypeus microsculptured by fine longitudinal furrows; ocelli about five times their own diameter from eyes. Pronotum broad, disc densely microsculptured by transverse furrows, sparsely punctate. Scutellum rugulous. Valve short, semicircular. Plates long, broad at base, then distinctly narrowing and ending in slender apical part. Style with thick, blunt apophyse. Side lobe of pygofer rounded, with several spines, no appendage. Anal tube broad, nearly as long as pygofer, sclerotized.

Female: Lighter. Face brownish, upper part black. Crown yellow brown. Pronotum greenish yellow or mottled with brown. Scutellum light brown basally, apex greenish yellow. Brownish bands in elytra very faint or absent. Undersurface and legs mostly pale yellow. Seventh sternite as long as sixth, hind margin roundly truncate with deep V-shaped notch in middle.

Length: 6-8.5 mm.

Holotype, male (BISHOP 2236), Ponape, southeast Nanpohnmal, 70 m., Jan. 11, 1953, Gressitt; allotype, female (BISHOP), same data. Three paratypes (US, RL, KU): Ponape, Palikir-Colonia, Dec. 30, 1937, Esaki; southeast Nanpohnmal, native forest, Jan. 11, 1953, Gressitt; Mt. Temwetemwensekir, Jan. 17, 1953, Gressitt.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

78. **Drabescus modestus** Linnavuori, n. sp. (fig. 48).

Male: Dark yellow brown. Fore margin of crown whitish, bordered by black. Elytra barely transparent, brown, sometimes with dark shadows near costal margin, veins dark brown with rather dense, oblong, whitish spots, apex smoky.

General structure as in *flavicollis*, but crown shorter. Valve semicircular. Plates shorter and broader than in *flavicollis*. Style with apophyse more slender and sharper apically. Penis simple. Side lobe of pygofer rounded with several spines, no appendage. Anal tube sclerotized.

Female: Seventh sternite as long as sixth, hind margin sinuate.

Length: 6-6.5 mm.

Holotype, male (US 63395), Kusaie, Mt. Matante, 380 m., south slope, Mar. 4, 1953, Clarke; allotype, female (US), same data. Three paratypes,

Macrosteles erythrocephala, Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 161.

Male and *female:* Reddish yellow ochraceous. Elytra grayish yellow, somewhat shifting to reddish, veins lighter. Abdomen mostly dark brown, excluding sides. Undersurface of thorax mostly dark brown. Pygofer and legs yellow ochraceous.

Body slender, elongate. Head shorter than pronotum; crown roundish, bluntly angularly produced. Elytra much longer than abdomen. Valve triangular. Plates sharp triangular. Penis with large, ventrally rounded basal *socle;* stem thick and short, not distinctly broadening apicad, apex rather blunt, curved dorsad; gonopore large. Seventh sternite of female nearly truncate.

Length: 2.6-3.2 mm.

DISTRIBUTION: South Europe, Turkey, Caucasia, Iran, Japan, and Bonin Is.

BONIN IS. After Ishihara, 1953.

80. Irinula declivata Linnavuori, n. sp. (fig. 49, *c-h*).

Male: Stramineous, veins of elytra somewhat lighter.

Body rather broad, somewhat depressed. Head broad; eyes large; crown very roundish, bluntly angularly produced, slightly longer than pronotum, disc distinctly declivous, near fore margin with scale-like microsculpturing, other parts of disc finely longitudinally striate. Pronotum large and broad, somewhat declivous forward. Elytra longer than abdomen. Valve blunt triangular. Plates sharp triangular, but with apex slightly broader than in *I. erythrocephala.* Style with finger-shaped apophyse; basal part large, square. Penis with large *socle,* truncate ventrally, stem thick, slightly broadening apicad, apex sharp and straight. Gonopore very large. Side lobe of pygofer short, tapering apicad.

Length: 3.5 mm.

Holotype, male (US 63396), Tobi I., Sept. 12, 1952, Krauss.

DISTRIBUTION: Southwest Caroline Is. (Tobi).

Genus **Cicadulina** China

Cicadulina China, 1926, Bull. Ent. Res. **17**: 43 (type: *Cicadula bipunctella* Matsumura, 1908; North Africa); 1928, Bull. Ent. Res. **19**: 61.

Slender, fragile species. Head slightly broader than pronotum; crown somewhat declivous, only a little longer in middle than at sides, fore margin rounded; coronal suture distinct; ocelli in fore margin near eyes; anteclypeus parallel-sided; frontoclypeus rather convex. Pronotum rather broad, longer than crown. Elytra much longer than abdomen, appendix well developed. Spinulation of fore tibiae 1 + 3, of hind knees 2 + 2 + 1. Valve large, roundly produced. Plates long, ending in weakly sclerotized, narrow, turned-up apical part; macrosetae uniseriate. Style with apophyse short and thick, strongly curved laterad; preapical angle of style below apophyse rather distinct. Connective rather long, Y-shaped, not fused. Penis symmetric, small, *socle* well developed, stem thick and robust, arising from ventral part of *socle,* lamellate, somewhat triangular, lateral expansion on either side of apical part dorsally; gonopore subapical on ventral surface. Pygofer incised and membranous dorsally, side lobe rounded, with long, hook-shaped ventral appendage and several long spines. Anal tube membranous.

This genus is distributed through Africa, the Oriental Region, Australia, the Neotropical Region, and Micronesia.

81. Cicadulina bipunctella (Matsumura). (Figures 50, 51.)

Cicadula bipunctella Matsumura, 1908, Tokyo Imp. Univ., Jour. Coll. Sci. **23**: 12; 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**: 173.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 40.

Cicadulina bipunctella, China, 1926, Bull. Ent. Res. **17**: 43.—Zakhvatkin, 1935, Moscow Univ. Wiss. Ber. **4**: 111.—Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 134.—Oman, 1949, Ent. Soc. Washington, Mem. **3**: 11, 14.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 171.

Cicadulina zeae China, 1926, Bull. Ent. Res. **17**: 43.

Cicadulina bimaculata Evans, 1940, Roy. Soc. Queensland, Proc. **52**: 3.

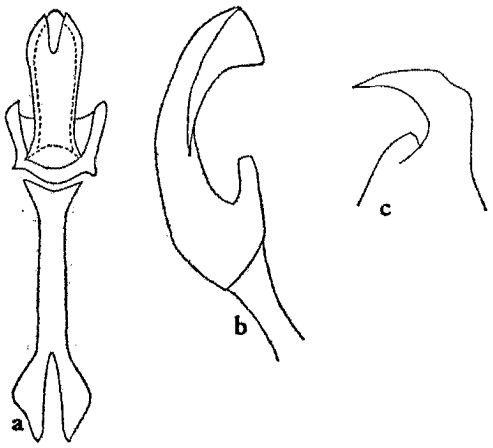

FIGURE 50.—*Cicadulina bipunctella:* **a**, penis and connective, ventral view; **b**, penis and connective, lateral view; **c**, apical part of style.

Male and *female:* Color dark yellow. Crown with two large, round, black spots. Elytra hyaline, shifting to yellowish, veins yellow. Abdomen dark dorsally.

Body slender and fragile. Head broader than pronotum; crown broad, fore margin rounded, only slightly longer in middle than at sides. Elytra much longer than abdomen. Valve very large, about 0.5 times as long as plates. Plates ending in narrow, weakly sclerotized, and turned-up apical part. Style with apophyse short and rather thick, claw-like. Penis with large, nearly square *socle,* stem thick, slightly curved dorsad; lateral, lamellate, somewhat triangular expansion on either side of apical part dorsally. Side lobe of pygofer with long, curved, apically hook-shaped appendage and with several long spines. Seventh sternite of female as long as sixth, hind margin slightly sinuate at sides, with broadly triangularly produced lobe with several stout spines in apical part; apex of ovipositor black.

Length: 3-3.5 mm.

DISTRIBUTION: Africa, Palestine, Turkey, Philippine Is., Formosa, Borneo, Australia, Micronesia.

BONIN IS. After Esaki and Ito, 1954.

S. MARIANA IS. SAIPAN: 20, As Mahetog area, Apr.-May 1945, Dybas. GUAM, 19: Dededo, May 1936, Swezey; Mongmong, June 1945, Bohart and Gressitt; Ordot, May 1945, Bohart and Gressitt; Piti, May 1936, Usinger; Pilgo River, May 1945, Bohart and Gressitt; Pt. Manell, May 1945, Bohart and Gressitt; Pago Bay, June 1945, Dybas; Pt. Oca, May-July 1945, Bohart and Gressitt; Pt. Ritidian, Aug. 1945, Gressitt.

PALAU. Five. BABELTHUAP: Ulimang, Dec. 1947, Dybas. KOROR: Sept. 1952, Krauss. PELELIU: Dec. 1945, Dybas. ANGAUR: Feb. 1948, Dybas.

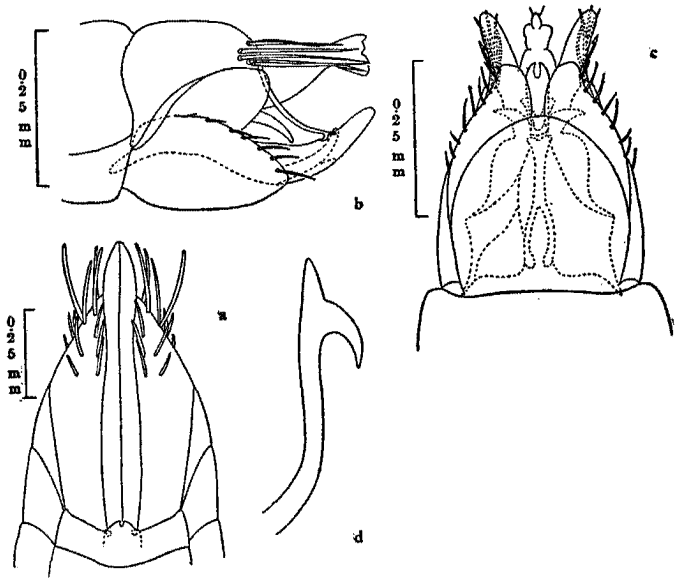

FIGURE 51.—*Cicadulina bipunctella:* **a**, ventral view of female genitalia; **b**, lateral view of male genitalia; **c**, ventral view of male genitalia; **d**, appendage of pygofer. (After Metcalf.)

YAP. Ten. MAP: Central Map I., Aug. 1950, Goss. YAP: Kanif, July-Aug. 1950, Goss; Kolonia, July-Aug. 1950, Goss, and Aug. 1954, Beardsley; Ruul Distr., Aug. 1950, Goss. GAGIL-TOMIL: Tomil Distr., Aug. 1950, Goss.

CAROLINE ATOLLS. SONSOROL: Three, Sonsorol I., Sept. 1952, Krauss. NGULU: Three, Ngulu I., Oct. 1952, Krauss. FAIS: One, Fais I., Aug. 1954, Beardsley. WOLEAI: Four, Utegal I., Feb. 1953, Beardsley. IFALUK: 12, Ifaluk I., Feb. 1953, Beardsley; Sept. 1953, Bates.

HOST: Maize.

This species is known as an insect pest on maize. It has a very wide distribution. Like the rice-feeding *Nephotettix apicalis,* it has been transported by commerce and human migrations and is probably of African or oriental origin.

Genus **Balclutha** Kirkaldy

Gnathodus Fieber (preoccupied), 1866, Zool.-Bot. Ges. Wien, Verh. **16**: 505 (type: *Cicada punctatus* Thunberg, 1784; Europe).—Melichar, 1903, Homopt.-Fauna Ceylon, 207.

Balclutha Kirkaldy, 1900, Entomologist **33**: 243 (type: *Cicada punctatus* Thunberg, 1784; Europe).—Distant, 1908, Fauna of India, Rhynch. **4**: 368.—Matsumura, 1914, Tohoku Imp. Univ., Jour. Coll. Agric. **5**: 165.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 36.—Esaki and Ito, 1954, Jap. Soc. Promotion Sci., Tokyo, 175.

Eugnathodus Baker, 1903, Invert. Pacifica **1**: 1 (type: *Gnathodus abdominalis* Van Duzee, 1892; N. America).

Nesosteles Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1**: 343 (type: *Nesosteles hebe* Kirkaldy, 1906; Fiji).—Osborn, 1934, Insects of Samoa 2(4): 188.—Ishihara, 1953, Matsuyama Agric. Coll., Sci. Rept. **11**: 36.

Anomiana Distant, 1918, Fauna of India, Rhynch. **7**: 109 (type: *Anomiana longula* Distant, 1918; India).

Agellus De Long and Davidson, 1933, Ohio Jour. Sci. **33**: 210 (type: *Eugnathodus neglecta* De Long and Davidson, 1933; N. America).

Head broad, wider or slightly narrower than pronotum; crown declivous, very short and broad, of nearly uniform length. Pronotum widest posteriorly. Elytra long, appendix well developed. Spinulation of fore tibiae 1 + 3, of hind knees 2 + 2 + 1 or 2 + 1 + 1. Valve roundish triangular. Plates broad basally, ending in slender, weakly sclerotized apical part; macrosetae uniseriate, haired. Style with finger-shaped apophyse, preapical angle of style below apophyse distinct. Connective Y-shaped, not fused. Penis symmetric, basal *socle* distinct, stem long and slender, bow-like; gonopore subapical on dorsal surface. Pygofer deeply incised dorsally, side lobes with or without sclerotized ventral process. Anal tube membranous.

The distribution of this genus is worldwide. It consists of a rather large number of species described from the western areas of Micronesia. However, the descriptions are generally insufficient for recognition of the species without examination of type specimens or topotypic material. It may be that some of the species described below as new species will later prove to be identical with some previously described forms. Being polyphagous grass-feeding leafhoppers, several species of the genus have been easily transported by commerce and now have a very wide distribution.

Key to Micronesian Species of Balclutha

1(2). Elytra marked with red, third apical cell dark fuscous.....**84. rufofasciata**
Elytra without red pigment, third apical cell not darkened..... 2

2(1). *Socle* of penis unusually large, with three pairs of processes.....**87. hebe**
Socle of penis without processes..... 3

3(2). Stem of penis with pair of triangular processes.....**83. barbiventris**
Stem of penis simple..... 4

4(3). Side lobes of pygofer with distinct sclerotized lobe or process 5
Side lobes of pygofer without special sclerotization 6

5(4). Sclerotized lobes of pygofer with teeth ..... **85. spiniloba**
Sclerotized processes of pygofer simple ..... **86. rosea**

6(4). Head a little narrower than pronotum; crown slightly longer medially than next to eyes; penis as in figure 52, *a* ..... **82. trilineata**
Head as broad as, or broader than, pronotum; crown of uniform length 7

7(6). Stem of penis relatively short, straight apically ..... **91. incisa**
Stem of penis much longer, arched 8

8(7). Stem of penis very thin ..... **89. filum**
Stem of penis much thicker, nearly semicircularly curved dorsad, apex deflected ..... **88. flexuosa**

The species *Balclutha ogasawarensis* Matsumura is excluded from the key because it is unknown to me and the original description is incomplete.

82. **Balclutha trilineata** Linnavuori, n. sp. (fig. 52, *a*).

Male: Green. Eyes reddish brown; crown with faint-orange, transverse band. Pronotum with three faint-orange, longitudinal stripes. Elytra barely transparent, greenish; fourth and third apical cells, adjacent parts of corium, and apex of clavus infuscate. Abdomen dorsally green, margins of segments orange. Undersurface and legs green.

Head slightly narrower than pronotum; crown somewhat angularly produced, but of nearly uniform length. Pronotum about three times as long as crown, fore margin with side margins semicircularly curved, hind margin slightly sinuate. Plates triangular, lateral margin straight. Style about as in *rufofasciata.* Penis rather small, *socle* truncate ventrally, stem forming blunt angle ventrally with truncate ventral part of *socle,* apical part of stem rather straight. Side lobe of pygofer truncate, no ventral process.

Female: Seventh sternite long, hind margin truncate with very faint, roundly produced median lobe.

Length: 3-3.5 mm.

Holotype, male (US 63397), Yap, Hill behind Yaptown, Dec. 2, 1952, Gressitt; allotype, female (US), same locality, Dec. 1, 1952, Gressitt. Fifty-two paratypes (US, BISHOP, RL, CM): Same data as for holotype; Yap, Hill behind Yaptown, Oct. 1952, Krauss; Yap, Mt. Mataade, 60 m., Dec. 2, 1952, Gressitt; Palau, Babelthuap, Ulimang, Dec. 21, 24, 1947, Dybas; Palau, Koror, Dec. 2, 1947, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau, Yap).

83. **Balclutha barbiventris** Linnavuori, n. sp. (fig. 52, *b-d*).

Male: Face, crown, and fore part of pronotum dark green; eyes gray. Basal part of pronotum and scutellum greenish brown. Elytra semitransparent, brown, veins green, apically yellow brown, costal margin green. Flying wings brownish. Undersurface and legs dark green.

Head slightly narrower than pronotum; crown of uniform length. Pronotum rather large, sides rather long. Plates sharp triangular, with about seven macrosetae. Style large, as in *rufofasciata,* but apophyse straighter. Penis with large *socle,* stem with pair of lateral triangular processes on dorsal surface near base, apical part straight. Side lobe of pygofer with triangular lobe directed mesad and dorsad in middle of ventral margin.

Female: Seventh sternite long, strongly produced, with several long, brownish spines in apical part, hind margin rounded.

Length: 3-4 mm.

Holotype, male (US 63398), Yap, Map I., Oct. 22, 1952, Krauss; allotype, female (US), Babelthuap, Ulimang, Dec. 16, 1947, Dybas. Nine paratypes (BISHOP, RL, CM): Yap, Oct. 22, 1952, Krauss; Hill behind Yaptown, Dec. 3, 1952, Gressitt; Yap, Mt. Mataade, 60 m., Dec. 2, 1952, Gressitt; Yap, Map I., Oct. 22, 1952, Krauss; Palau, Babelthuap, Ulimang, Dec. 10-16, 1947, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau, Yap).

This species resembles the neotropical *B. fuscipennis* Linnavuori in coloring, but differs in the smaller size and dissimilar genitalia.

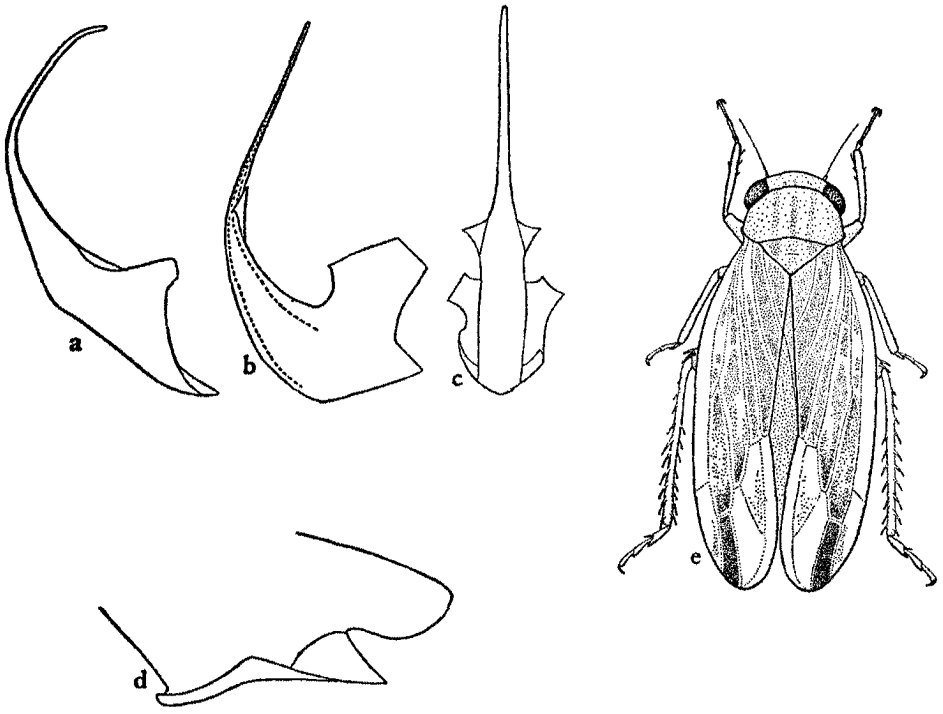

FIGURE 52.—**a**, *Balclutha trilineata*, penis, lateral view. **b-d**, *B. barbiventris: b*, penis, lateral view; *c*, penis, ventral view; *d*, ventral margin of side lobe. **e**, *B. rufofasciata*, dorsal view.

84. Balclutha rufofasciata Merino (figs. 52, *e*; 53, *a-c*).

Balclutha rufofasciata Merino, 1936, Philippine Jour. Sci. **61**: 381.

Male: Face and crown pale yellow, basal part of crown with two round, dark spots; eyes gray. Pronotum gray yellow, fore margin with indistinct brownish shadows, disc with three red, often faint, longitudinal stripes. Scutellum yellow with red basal triangles. Elytra whitish, veins white, cells filled by brick red (or dark brown in immature specimens), especially in clavus, but usually not near costal margin; third apical cell dark

smoky. Flying wings whitish. Abdomen and undersurface mostly dark brown. Legs pale yellow.

Body broad and somewhat flattened. Head as broad as pronotum; crown of uniform length. Pronotum broad, sides rather long. Plates broad triangular, membranous apical part short and turned up, with about eight macrosetae. Style large, apophyse rather thick, median margin with slight tooth before apex; the preapical angle of style below apophyse rather strongly produced. Penis with relatively small *socle,* stem long, apical part very slender. Side lobe of pygofer with short, thick, bifurcate appendage.

FIGURE 53.—**a-c,** *Balclutha rufofasciata: a,* penis, lateral view; *b,* ventral process of side lobe; *c,* apical part of style. **d, e,** *B. spiniloba: d,* penis, lateral view; *e,* side lobe. **f,** *B. rosea,* side lobe of pygofer, median view.

Female: Seventh sternite long, nearly twice as long as sixth, hind margin strongly produced with rather deep, V-shaped, median notch.

Length: 3.8-4 mm.

DISTRIBUTION: Africa, Polynesia, Central America, Philippines, western Caroline Is. (Palau, Yap).

PALAU. KOROR: Dec. 1952, Beardsley. ANGAUR: Jan. 1953, Beardsley.

YAP. RUMUNG: Southern part, July-Aug. 1950, Goss. MAP: Central part, Aug. 1950, Goss. YAP, 280: Oct. 1952, Krauss; Mar. 1954, Beardsley; Mt. Mataade, 60 m. and 95 m., Dec. 1952, Gressitt; Hill behind Yaptown, 60 m., Nov. 1952, Gressitt; Kolonia, July-Aug. 1950, Goss; Dugor, July-Aug. 1950, Goss; Dugor-Rumu, 10 m., Oct. 1952, Gressitt; Kanif, July-Aug. 1950, Goss; Mt. Gillifitz, 150 m., Oct. 1952, Gressitt; Ruul Distr., July-Aug. 1950, Goss; south Yap, July-Aug. 1950, Goss. GAGIL-TOMIL: Gagil Distr., July-Aug. 1950, Goss.

85. Balclutha spiniloba Linnavuori, n. sp. (fig. 53, *d, e*).

Male: Dull, pale yellow. Eyes red brown. Elytra yellowish, apically hyaline, veins concolorous.

Head a little broader than pronotum; crown of uniform length, about one-third as long as pronotum. Pronotum with rather long lateral margins. Plates broad triangular, lateral margin somewhat rounded. Style as in *rufofasciata,* but apophyse slightly thicker. Penis with broad, basal *socle,* stem relatively short, very slender, bow-like curved. Side lobe of pygofer with broad ventral process with four thick teeth.

Female: Seventh sternite long, twice as long as sixth, hind margin broadly V-shaped, notched in middle.

Length: 3.5-4 mm.

Holotype, male (US 63399), Palau, Babelthuap, Ulimang, Dec. 21, 1947, Dybas; allotype, female (US), same locality, Dec. 19, 1947, Dybas. Nineteen paratypes (BISHOP, RL, KU, CM, US): Same locality as for holotype, Dec. 21-26, 1947, Dybas; Palau, Babelthuap, Ngiwal, Dec. 16, 1952, Gressitt; Palau, Koror, 25 m., Dec. 5, 1952, Gressitt; Yap, Hill behind Yaptown, Dec. 2, 1952, Gressitt; Ponape, Colonia, Oct. 19, 1937, and Jan. 1, 1938, Esaki; Ponape, Colonia-Nampir, Jan. 2-5, 1938, Esaki.

DISTRIBUTION: Caroline Is. (Palau, Yap, Ponape).

This species resembles *B. hebe* but differs in the form of the penis and the seventh sternite of the female.

86. Balclutha rosea (Scott). (Figure 53, *f.*)

Gnathodus rosea Scott, 1876, Ent. Month. Mag. **13**: 83.

Eugnathodus guajanae De Long, 1923, Jour. Dept. Agric., P.R. **7**: 267.

Eugnathodus calcarus Davidson and De Long, 1933, Ohio Jour. Sci. **33**: 57.

Balclutha pulchella Lindberg, 1948, Comment. Biologicae **10**(7): 140.

Nesosteles guajanae, Caldwell, 1952, Univ. Puerto Rico, Jour. Agric. **34**: 82.

Male and *female:* Color variable, yellow, pinkish, or slightly embrowned.

External characters as in *B. spiniloba.* Male genitalia: Plates as in *spiniloba;* style with apophyse very prominent, curved outward; side lobe of pygofer with falcate process projected ventrad; penis with broad, basal *socle,* phragma forming pair of round, broad, lateral lobes to dorsal part of *socle,* stem rather thick and bow-like, curved. Seventh sternite of female truncate caudad, with faint median notch. When apical portion of this sternite is lifted from pygofer, it appears rounded apically and curling of lateral margins results in appearance of a strong median notch.

Length: 3.4-4 mm.

DISTRIBUTION: South Europe, Africa, Palestine, North, Central, and South America, Polynesia, Micronesia.

PONAPE. Two, Colonia, Nov. 19, 1937-Jan. 1, 1938, Esaki; two, Colonia-Nampir, Jan. 2-5, 1938, Esaki.

This species is distinguished from *B. spiniloba* by the form of the pygofer processes which are smooth and falcate (distinctly dentate in *spiniloba*) and in the dissimilarly shaped penis.

87. Balclutha hebe (Kirkaldy), n. comb. (fig. 54, *a-c*).

Nesosteles hebe Kirkaldy, 1906, Hawaiian Sugar Planters' Assoc. Exper. Sta., Ent. Bull. **1**: 343.—Osborn, 1934, Insects of Samoa **2**(4): 188; 1934, B. P. Bishop Mus., Bull. **114**: 264.

Cicadulina uniformis Metcalf, 1946, Insects of Guam II, B. P. Bishop Mus., Bull. **189**: 135, n. syn.

Balclutha hortensis Lindberg, 1948, Comment. Biologicae **10**(7): 140.

Male and *female:* Light yellow or grayish yellow. Eyes gray; coronal suture brown. Pronotum sometimes with faint, light-brown, longitudinal shadows. Abdomen dorsally dark brown. Elytra transparent, grayish yellow, veins whitish. Flying wings whitish. Undersurface and legs pallid.

Head broader than pronotum; crown broad, broadly curved anteriorly, of uniform length. Pronotum nearly three times as long as crown, hind border truncate. Plates broad, lateral margin somewhat rounded, with six macrosetae. Style chiefly as in *rufofasciata.* Penis much enlarged in ventral aspect, rhomboidal basally, with six sharp, triangular processes; stem arising dorsally, broad at base, apex relatively short and straight. Side lobe of pygofer rounded with broad ventral process with one long spine and some small, sometimes very small, teeth. Seventh sternite of female truncate or slightly sinuate.

Length: 3.5-4 mm.

DISTRIBUTION: Central and South America, Canary Is., Cyprus, Iraq, Samoa, Fiji, Marquesas Is., Micronesia.

VOLCANO IS. Iwo JIMA: One, Sept. 1945, Dybas.

S. MARIANA IS. SAIPAN: 12, Garapan, Apr. 1946, Krauss; Garapan-Sadog Tasi, May 1940, Yasumatsu and Yoshimura; east of Tanapag, Dec. 1944, Dybas; 53, As Mahetog area, Jan.-Apr. 1945, Dybas and Edgar; Mt. Tagpochau, Jan. 1945, Dybas. GUAM, 21: North Guam, Apr. 1946, Krauss; Agana, Sept. 1952, Krauss; Mt. Alifan, Apr. 1946, Krauss; Mt. Santa Rosa, May 1945, Bohart and Gressitt; Mt. Tenjo, May 1936, Swezey; Piti, May, July 1936, Swezey and Usinger; Pt. Ritidian, Aug. 1945, Gressitt; Talofofo,

Aug. 1946, Krauss; Tumon Bay, Apr. 1946, Krauss; Pago Bay, June 1945, Dybas.

PALAU. Twenty-one. BABELTHUAP: Ngeremeskang-Ngchesar (Kaishar), July 1939, Esaki. KOROR: Sept. 1952, Krauss; Feb. 1953, Beardsley. ULEBSEHEL (Auluptagel): Sept. 1952, Krauss. PELELIU: July-Aug. 1945, Dybas. ANGAUR: Angaur I., Feb. 1948, Dybas; Jan. 1953, Beardsley.

YAP. Thirty-six. RUMUNG: Oct. 1952, Krauss. MAP: Aug. 1950, Goss; Oct. 1952, Krauss. YAP: Kolonia, July-Aug. 1950, Goss and Apr. 1954,

FIGURE 54.—**a-c**, *Balclutha hebe: a,* penis, lateral view; *b,* penis, ventral view; *c,* ventral process of side lobe. **d**, *B. flexuosa,* penis, lateral view. **e**, *B. filum,* penis, lateral view. **f**, *B. incisa,* penis, lateral view.

Beardsley; Hill behind Yaptown, 60 m., Nov. 1952, Gressitt; north Yap, July-Aug. 1950, Goss.

CAROLINE ATOLLS. WOLEAI, two: Falalis, Feb. 1953, Beardsley; Utegal, Feb. 1953, Beardsley.

TRUK. Fourteen. WENA (Moen): Nov. 1952, Beardsley; Civ. Admin. Area, Mar. 1949, Potts. FEFAN: Mt. Iron, Jan. 1953, Gressitt. TON (Tol): Mt. Unibot, Jan. 1953, Gressitt; Olej-Foup, Apr. 1940, Yasumatsu and Yoshimura; Pata, Sabote, Apr. 1940, Yasumatsu and Yoshimura.

Male and *female:* General color pale grayish yellow. Face yellowish with indistinct light-brown shadows; eyes reddish gray; crown yellow gray with some indistinct, light-brown shadows; coronal suture brown. Pronotum gray with faint, darker, median stripe, sometimes with indistinct shadows also at sides. Elytra transparent, grayish, veins grayish-white. Abdomen dark dorsally. Undersurface and legs pale grayish.

Body very small and slender. Head broader than pronotum, of uniform length, fore margin rounded. Pronotum about 2.5 times as long as crown, short and broad, sides short, hind margin straight. Plates short, triangular, side margin straight, with about four macrosetae. Penis small, *socle* with distinct dorsal expansion, stem relatively short and straight. Side lobe of pygofer rounded, without ventral processes. Seventh sternite of female with hind margin sinuate and with brownish mark on each side of central lobe, giving it a toothed appearance.

Length: 2.5-3 mm.

DISTRIBUTION: Japan, Polynesia, North and South America, Micronesia.

S. MARIANA IS. SAIPAN: 26, As Mahetog area, Jan.-Apr. 1945, Dybas. GUAM, 11: Pt. Oca, May 1945, Bohart and Gressitt; Pt. Ritidian, Aug. 1945, Bohart and Gressitt.

PALAU. Ten. BABELTHUAP: East Ngatpang, 65 m., Dec. 1952, Gressitt; Ulimang, Dec. 1952, Dybas. KOROR: Sept. 1952, Krauss, Jan. 1953, Beardsley, and Apr. 1953, Beardsley; southwest Koror, 25 m., Dec. 1952, Gressitt.

YAP. Four. YAP: Kanif, July-Aug. 1950, Goss; Kolonia, Apr. 1954, Beardsley.

CAROLINE ATOLLS. TOBI (Tokobei): Three, Jan. 1938, Murakami. PULO ANNA: One, Sept. 1952, Krauss. ULITHI: Ten, Potangeras I., Nov. 1947, Dybas. SOROL: Two, Sorol I., Oct. 1952, Krauss.

MARSHALL IS. WOTHO: Six, Wotho I., Oct. 1953, Beardsley. KWAJALEIN: One, Kwajalein, Aug. 1952, Fosberg No. 1319. LIB: Two, Lib I., Oct. 1953, Beardsley.

This species is easily recognized by the small size and the grayish coloring.