# CICADELLIDAE OF THE MARQUESAS ISLANDS*

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The collections of leafhoppers made by the Pacific Entomological Survey which have come to me for study embrace more than 2000 specimens collected in the Marquesas and Society Islands, mainly by E. P. Mumford and A. M. Adamson. These contain many species of distinct interest not only as representing localities not previously explored but of special interest as indicating lines of distribution in the Polynesian region and possibly affinities with the faunae of the Oriental or Malaysian regions on one hand and South America or Hawaii on the other.

Most of the species noted are readily assigned to well-known genera, but many are too distinct in character to be assigned to known species and probably must be considered as offshoots which from long isolation have differentiated sufficiently from the parent stock, or, both parent stock and derivatives have diverged to form well-marked species. No particular lapse of time, of course, can be assigned for introduction of original migrants. This no doubt differed greatly for different forms, but factors of migration, adaptation to varied food plants, and other ecological conditions may be assumed as active agencies in modifications of greater and lesser degree in the different insect groups.

Little has been published concerning the leafhoppers of the Marquesas. Most of the papers available deal with India, Ceylon, Malay Peninsula, and Philippine Islands. The descriptions by Walker, Stål, Melichar, Signoret, Distant, and Kirkaldy cover the adjacent regions, but very few are given for the more scattered islands of the South Pacific.

With these considerations in mind and their relation to future studies in this field, it has seemed best to give descriptions under new specific names to forms which might by some allowance for geographic variation be referred to species known in other regions. It seems evident that these forms have been isolated for indefinite periods even in the different islands of such an island group as the Marquesas, and that varying food plants and the physical conditions of elevation, temperature, humidity, and wind prevailing on each island must furnish ample opportunity for selective evolution.

Taken as a whole it appears, on the basis of the rather small number of species and genera represented, that the Marquesan leafhopper fauna has its nearest affinities with the Malaysian region, and if an opinion is warranted

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we may consider the most probable source for original migrants to be the region including Malay Peninsula, Borneo, or the East Indian Archipelago with Fiji and Samoa as possible way stations for such forms as are found in some of the islands of these groups.

For instance, the abundant *Nephotettix plebeius,* common to Fiji, Samoa, and Society Islands, but not found in the Marquesas, may very probably have been distributed in various ways with the grasses that constitute its food. The species of *Nesosteles* with its close affinity to *Balclutha* may readily have come as offshoots from an ancestor of the Oriental region, although *Nesosteles* (*Eugnathodus*) is abundantly represented in the neotropic realm.

The species of *Jassus,* a genus found in Fiji and the Society Islands, not in the Marquesas, may also have their derivation from the Malaysian region, though at present the genus is most numerously known from the neotropic. *Jassus,* however, especially in the wider sense, seems to be a group well marked as an ancient stock, and its ancestral representatives may well be thought of as having been distributed at a time when land connections were far different from those prevailing in the recent past. It must be borne in mind that further collections may alter this interpretation, though it would appear that the collections in hand represent a pretty thorough and intensive survey for this region.

It is to be noted that no members of the subfamilies Cicadellinae or Gyponinae and very few Typhlocybinae (Eupteryginae) have been included in these collections, and for Bythoscopinae only *Bythoscopus* and *Idiocerus.* There are no *Agallia* or *Macropsis.* In the Jassinae a few genera of the dozens known from continental areas are shown, forcibly suggesting that the opportunities for migration of these insects to the Pacific islands have been limited and that only a very few have succeeded in passing the oceanic barrier and gaining a foothold on the islands.

No attempt has been made to determine the economic status of the Cicadellidae in the Marquesas, but it is quite evident from the large numbers collected in certain species that they may have an important relation to the plants they infest. Moreover, there is the constant possibility that by introduction to other localities or by some shift in host plant, or as vectors of some plant disease, they may assume an economic status of very vital importance.

I am pleased to acknowledge the indebtedness to Mr. Mumford for the opportunity to study these collections and a generous allowance to aid in the preparation of illustrations for which I thank the artistic skill of Mrs. Celeste Taft.

## Genus BYTHOSCOPUS Germar

*Bythoscopus* Germar: in Silberm., Rev. Ent., 1, p. 180, 1833. Lewis, Ent. Soc. London, Trans., 1, p. 48, 1836. Fieber, Zool. Bot. Ges., Wien, Verh., 18, pp. 450-456, 1868; Rev. Mag. Zool., (3), 3, p. 389, 1875. Kirkaldy, Hawaiian Sugar Plant. Assoc., Div. Ent., Bull. 1, p. 345, 1906. Van Duzee, Cat. Hemiptera, p. 588, 1917.

*Batrachomorphus* Lewis: Ent. Soc. London, Trans., vol. 1, p. 51, 1836.

*Stragania* Stål: Rio de Janeiro Hem., 2, p. 49, 1858.

*Pachyopsis* Uhler: U. S. Geol. Geog. Surv., Bull. 3, p. 466, 1877. Melichar, Hom. Faun. Ceylon, p. 152, 1903.

*Macropsis* Amyot et Serville: Hemip., p. 585, 1843. Ball (part), Psyche, 9, pp. 128-130, 1900. Van Duzee (part), American Ent. Soc., Trans., 21, p. 256, 1894.

*Gargaropsis* Fowler: Biol. Centr. Am., Rhynch. Hom. 2, p. 167, 1896.

The genus is characterized by the depressed body; the face much retracted; the vertex very short; the margins nearly paralleling the anterior border of the pronotum; ocelli below the anterior border; the colors mainly green or with suffusions of red or brown. Genotype, *B. lanio* (Linnaeus). The species from the Marquesas except *B. chlorophanus* have the head as wide or wider than the pronotum. Those known from other regions usually have a narrower head.

The genus is world-wide in distribution. The species are quite uniformly scattered with possibly a preponderance of species in the nearctic or neotropic regions. It would seem most probable that the South Pacific islands received their species from the Oriental region, though so far as nearness of affinity is concerned, they may have come from the neotropic.

**Bythoscopus chlorophanus** (Melichar).

*Pachyopsis chlorophanus* Melichar: Hom. Ceylon, p. 153, 1903.

*Bythoscopus chlorophanus* Distant: Fauna Brit. India, Rhyncota, vol. 4, pt. 1, p. 191, 1908.

In this species the head is scarcely as wide as the pronotum and the lateral border of the pronotum is longer. The elytra are greenish hyaline, minutely setose, the entire color pale green except a dark dot at tip of clavus. Length 4 mm.

Uapou: Tekohepu summit, altitude 3000 feet, November 27, 1931, beating on ferns, LeBronnec.

The single specimen referred to this species seems to agree fully with the description as given by Distant except that the dot at tip of clavus is very faint and it is perhaps slightly more slender than indicated in Distant's figure. Possibly additional specimens in both sexes might show specific differences.

**Bythoscopus pellucidus,** new species (fig. 1).

Head slightly wider than pronotum, broadly rounded in front; vertex scarcely longer at middle than at eye; front convex; face retracted; antennae under rather faint ledge; pronotum about two and one fourth times as long as vertex; elytra polished and transparent, sparsely punctate, veins prominent. Female last ventral segment with a broad notch at middle; male last ventral segment long, rounded behind; plates very slender, often hidden between margins of pygofer. Pale greenish, head, pronotum, and scutellum pale greenish yellow, center stramineous, legs green. Length, female, 6 mm.; male, 4.75 mm.

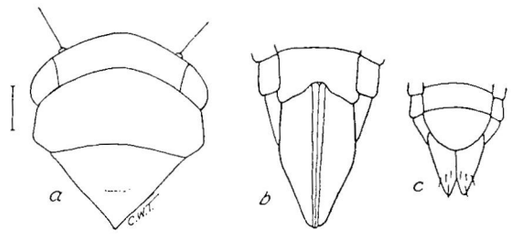


FIGURE 1.—*Bythoscopus pellucidus,* new species: *a,* dorsal view, head, pronotum, and scutellum; *b,* female, *c,* male genitalia.

Nukuhiva: Puokoke [Pukoke], Tunoa Ridge, altitude 3485 feet, October 22-29, 1929, 9 females, 1 male, holotype, allotype, and paratypes, Mumford and Adamson.

Hivaoa: Tepuna, altitude 3010 feet, August 1, 1929, on *Metrosideros collina,* 2 females, paratypes, Mumford and Adamson.

Tahuata: Haoipu summit, altitude 2700 feet, July 9, 1930, *Metrosideros collina,* 1 female, 1 male, paratypes, LeBronnec and H. Tauraa.

The male from Puokoke is sordid gray but otherwise close to the typical forms.

**Bythoscopus collinus,** new species.

Head broader than pronotum; eyes rather prominent; vertex scarcely as long at middle as at eye, broadly rounded to the front; ocelli a little below the anterior margin; front short, depressed above the clypeus; antennae beneath a rather distinct ledge; clypeus short, narrowing to the tip; lorae narrow; cheeks sinuate; pronotum about three times as long as vertex, minutely striate with an impressed edge behind the anterior border; elytra sparsely punctate. Female, last ventral segment half longer than the preceding with a shallow notch at the middle; male, last ventral segment elongate, twice as long as the preceding, rounded behind; plates elongate, enclosed between margins of pygofer, as long as last ventral segment, tapering to blunt points; abdomen relatively short, scarcely as long as elytra.

Female, pale green or suffused with rosaceous (variety ?) especially on the head and anterior part of the pronotum, in some specimens with a black area on front; male pale stramineous and often with black band on base of front and suffusion of rosaceous. Length, female, 5-5.2 mm.; male, 5 mm.

Nukuhiva: Tapuaooa, altitude about 3000 feet, June 16, 1930, on *Metrosideros collina,* 7 females, holotype and paratypes, 2 males, allotype and para-

types; altitude 3500 feet, July 20, 1931, on *M. collina,* 5 specimens; Tovii [Toovii], altitude 2500 feet, August 4, 1931, beating on *M. collina,* 17 adults, 27 nymphs; Ooumu [Ooumi], altitude 3000-3200 feet, May 28, July 20 and August 6, 1931, 29 specimens; Muake, altitude about 3000 feet, August 3, 1931, 14 adults, 48 nymphs; Vaiotekea, altitude 2200 feet, August 6, 1931, *M. collina,* LeBronnec and H. Tauraa; ridge north of Teuanui, October 26, 1929, beating on *M. collina,* 3 females, 2 males, Mumford and Adamson.

Hivaoa: Temetiu Ridge and Mount Temetiu, altitude 3900 feet, January 14, 1932, 10 adults, 33 nymphs, LeBronnec.

Tahuata: Haaoipu summit, altitude 2700 feet, July 9, 1930, on *Metrosideros collina,* LeBronnec and H. Tauraa.

Uapou: Teavaituhai, Paaumea side, altitude 2020 feet, November 19, 1931, beating on *Vaccinium* and *Cyrtandra* species, 10 adults, 74 nymphs; Tekohepu summit, altitude 3300 feet, November 27, 1931, beating on *Metrosideros collina,* 23 adults, 78 nymphs; Hakahetau Valley, altitude 3029 feet, November 18, 1931, beating on *Vaccinium,* 6 adults, 19 nymphs, LeBronnec.

A large series of specimens which seem properly assembled under this description and which was largely augmented by a second sending from Honolulu has been the basis for this species. There are two pronounced color forms in the series. Although there are some intergrades, it seems probable that there may be some decisive ecological factor underlying these color variations. It would be very interesting to know whether they are associated with any discolorations of leaves or twigs on which the insects feed, especially as the color forms are abundantly represented among the nymphs from the earliest stages to those most mature and evidently the last instar in growth. There seems possibly some relation to season, as perhaps the greater number of the highly colored forms are credited to November or adjacent months. There does not appear to be any distinction based on species of plants; both forms are recorded for *Metrosideros collina,* which seems to be the favored host.

**Bythoscopus maculatus,** new species (fig. 2).

Head as wide as pronotum; vertex short, as long at middle as at eye; face distinctly retracted; front flattened or slightly depressed at base; ocelli well above base of antennae; antennae under a distinct ledge; pronotum distinctly striated and sparsely punctured; veins of elytra prominent. Female last ventral segment truncate, scarcely sinuate at center; male last ventral segment about twice as long as preceding, rounded behind; pygofer short not reaching tip of elytra.

Color dark brown; base of front and two bands across the elytra dark fuscous; elytra brown, somewhat suffused with reddish; abdomen mostly black; last ventral segment of male brownish. Length, female, 6 mm.; male, 5 mm.

Hivaoa: Kopaafaa, altitude 2800 feet, February 25, 1930, on tree field number 1008, 1 female (holotype), 2 males (allotype and paratype), Mumford and Adamson.

Tahuata: Haaoipu summit, altitude 2700 feet, July 9, 1930, 3 paratype males, beating on *Metrosideros collina*; Amatea, altitude 2700 feet, July 7, 1930, 2 females, 2 paratype males; altitude 2800 feet, June 28, 1930, beating on *Metrosideros collina,* 1 female; LeBronnec and H. Tauraa.

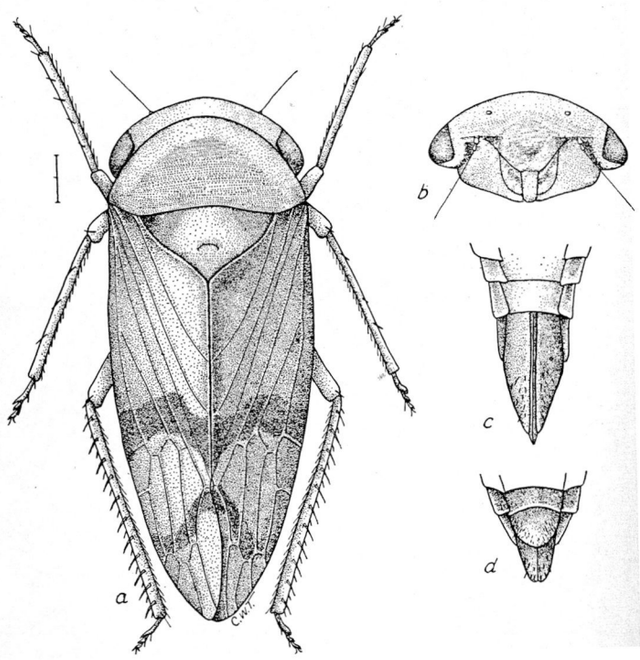


FIGURE 2.—*Bythoscopus maculatus,* new species: *a,* dorsal view; *b,* face; *c,* female, *d,* male, genitalia.

## Genus DRYADOMORPHA Kirkaldy

*Dryadomorpha* Kirkaldy, Haw. Sugar Plant. Assoc., Div. Ent., Bull. 1, p. 335, 1906.

Kirkaldy based the genus on the single species, *D. pallida,* from "Queensland, Bundaberg." He gives a long and detailed description for the genus, the most essential points of which are the produced head with ocelli below the vertex margin, the very long narrow frons apparently fused with clypeus, and the long clypeus widened at tip. He says "the venation of tegmina and wings is so feeble that I have been unable to interpret it; it seems to be phrynomorphoid."

**Dryadomorpha viridia,** new species (fig. 3).

Head distinctly produced; vertex long, acutely angulate, margin acutely angled to front; ocelli just beneath margin and distant from eye; front narrow, sinuate opposite

antennae, tapering gradually to clypeus; clypeus long, narrow, widened at apex. Pronotum as long as vertex, sides short, carinate, concave behind. Elytra long, narrowed at apex, the veins inconspicuous. Female last ventral segment short, truncate, about as long as the preceding. Color light green, elytra greenish hyaline suffused with fuscous at the tip; tarsi tinged with brownish. Length of female, 6.25 mm.

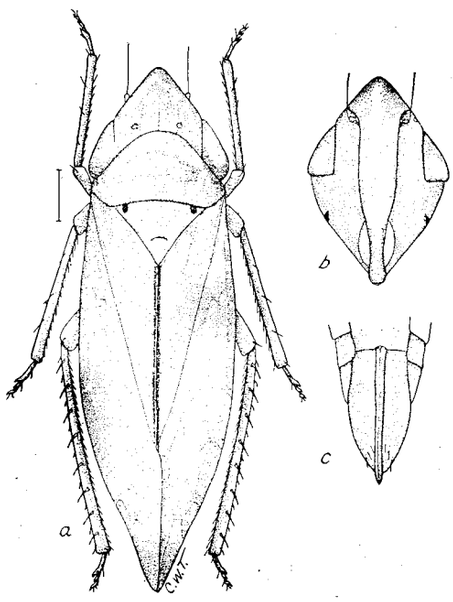


FIGURE 3.—*Dryadomorpha viridia,* new species: *a.* dorsal view; *b,* face; *c,* female genitalia.

Nukuhiva: Tovii [Toovii], altitude 2500 feet, August 4, 1931, beating on *Metrosideros collina,* holotype female, LeBronnec and H. Tauraa.

This species extends the range of the genus to the Marquesas but it is still limited to the South Pacific. It appears to be most nearly related to the *Thamnotettix* group and in general fasciae comes near the *Calotettix metrosideri,* but the structural details of the head differ widely from that species.

## Genus SCAPHOIDULINA, new genus

Head wide as pronotum; vertex angulate, flattened, margins obtusely angulate; ocelli on margin one third from eye to tip; frons long, narrow; clypeus long, sides parallel; cheek margin bisinuate; pronotum as long as vertex; elytral veins indistinct, apparently first sector forked beyond middle of disk, apical areoles three (?), short. Genotype, *S. obliqua* Osborn.

**Scaphoidulina obliqua,** new species (fig. 4).

Head as wide as pronotum; vertex flat angular before, scarcely longer at middle than width at base, half longer at middle than at eye; ocelli prominent, one-third distance from eye to middle of anterior border; front narrow, tapering from antennae to clypeus; antennae long; clypeus twice as long as wide, sides parallel, tip subtruncate; lorae ovate not reaching margin of cheek; cheek margin bisinuate. Pronotum as long as vertex, lateral margin short, carinate, hind border distinctly concave; elytra long, narrow, tips broadly rounded, veins indistinct and obscured by color pattern. Female last ventral segment short truncate, scarcely as long as preceding; pygofer ciliate on apical half.

Pale stramineous, two broken black lines on margin of vertex and base of front, the upper one enclosing the black ocelli; a prominent oblique fuscous dash from costa across nodal area to cross vein, a transverse fuscous bar in nodal areole, and a black spot in the outer apical areole margined inwardly by brown, the clavus and disk faintly suffused with brownish stripes. Length, female, 4.5 mm.

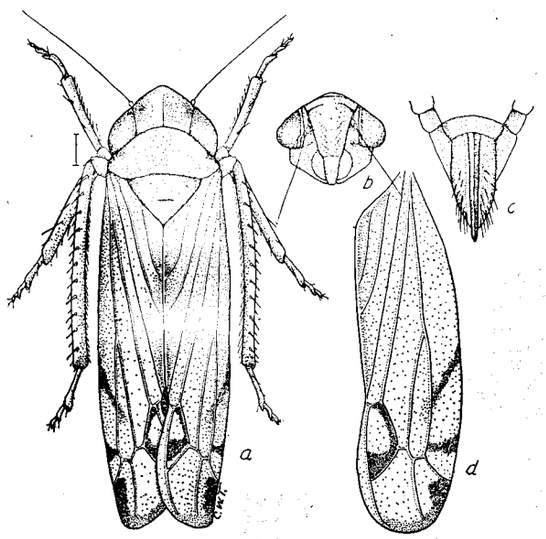


FIGURE 4.—*Scaphoidulina obliqua,* new species: *a,* dorsal view; *b,* face; *c,* female genitalia; *d,* elytron.

Uapou: Teavaituhai, Paaumea side, altitude 3020 feet, November 19, 1931, beating on *Vaccinium* and *Cyrtandra* species, holotype female, LeBronnec.

This species has the aspect of *Nirvana,* but the head is much shorter. Resembles *Scaphoideus* for head, but the venation is different.

Genus **CALOTETTIX,** new genus

Similar to *Thamnotettix*. The head somewhat produced. Vertex flat, frons narrow, clypeus long, much expanded apically. Elytra with three anteapical and three or four short apical cells. Genotype, *C. metrosideri* Osborn.

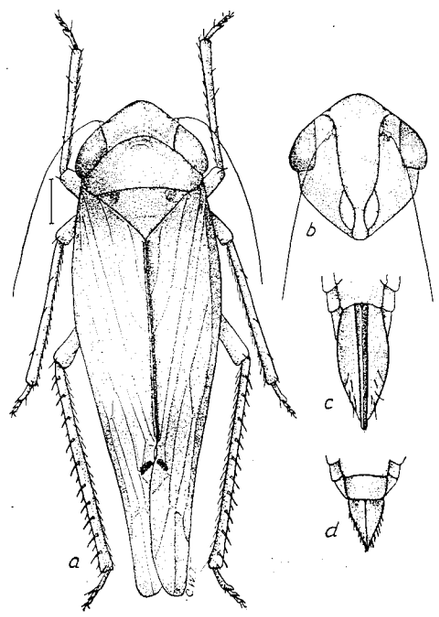


FIGURE 5.—*Calotettix metrosideri,* new species: *a,* dorsal view; *b,* face; *c,* female, *d,* male genitalia.

**Calotettix metrosideri,** new species (fig. 5).

Head wider than pronotum; eyes large, oblique; vertex twice as long at middle as next to eyes, obliquely angular, rounded in front, rounding to the frons; frons narrow; constricted opposite antennae; clypeus long, widening distinctly to the truncate tip; lorae large, acutely angulate above with a broad furrow below antennae; antennae in rather deep sockets, margin sinuate below the eyes; pronotum strongly arched, slightly angulate before lateral margins, short, not keeled, hind border concave; scutellum broader than long, apex right-angled; elytra long, extending considerably beyond the abdomen, smooth, polished, translucent or subhyaline, second sector forked on disk, venation indistinct. Female last ventral segment as long as preceding; slightly convex; infuscate at center. Male, last ventral segment somewhat produced, rounded; valve hidden or wanting; plates short, narrowed back of the middle, thickened, upturned, and with tips exceeding apex of pygofer.

Color variable, mostly pale green tinged with yellowish. Inner border of clavus margined with black with black triangular spot at base of inner apical cell. Beneath darker green, legs pale testaceous, hind tibia with fuscous dots at base of spines. Length of female, 6 mm.; male, 5 mm.

Hivaoa: Kopaafaa, altitude 2770 feet, August 2 and 3, 1929, on *Metrosideros collina,* 3 females, holotype and paratypes, 1 allotype male; Kopaafaa, altitude 2800 feet, February 25, 1930, beating on *Weinmannia* species, 1 male, altitude 2770 feet, a number of nymphs; Tepuna, altitude 3010 feet, August 1, 1929, miscellaneous sweeping, 1 female (red); Teava Uhia i te Kohu, altitude 2100 feet, February 15, 1930, beating on *Weinmannia* species, 6 paratypes (two of these have the pronotum deeply embrowned, the claval margin more broadly blackened, but otherwise they seem identical with the other specimens); Mumford and Adamson.

Tahuata: Vaitupaahei [Vaitupahai], altitude 2400 feet, July 8, 1930, 1 paratype female, LeBronnec and H. Tauraa.

Ten nymphs from Kopaafaa and three from Amatea (Tahuata), altitude 2700 feet; probably belong to this species.

Later sendings include:

Hivaoa: Kaava Ridge, altitude 2800 feet, January 7, 1932, 52 adult green and 22 variety *tincta*; Kakahopuanui altitude 2800 feet, October 27, 1931, 6 green and 6 red; Feani Ridge, altitude 3800 feet, *Weinmannia* species, 6 red; LeBronnec. Many nymphs were included in this collection.

**Calotettix metrosideri** variety **tincta,** new variety.

Similar to type form but with the pronotum, margin of scutellum, and border of clavus tinted with red or sometimes almost black and the legs bright red.

No intermediate forms are included in the 104 adult specimens and about 182 nymphs now in hand from later sendings, and there are no intermediates between green and tinted forms of nymphs. Examination of internal genitalia shows no basis for separation of species and both forms are recorded from the same host plants with the same dates.

## Genus NESORIELLA, new genus

With head characters resembling those of *Nesophrosyne* or *Nesorias* but with distinctly different elytral venation. Head about as wide as pronotum, subangulate, with a pair of impressed dots on the vertex, the ocelli quite near to the eye, the frons with parallel margins to antennal pits, then narrowing to a long narrow clypeus; the lorae elongate; cheeks subangulate; pronotum short; elytra with first sector forked at middle of disk forming an elongate anteapical areole, the nodal vein forming base of outer apical; four apical areoles. Genital segments of the ordinary pattern. Genotype, *N. maculata* Osborn.

**Nesoriella maculata,** new species (fig. 6).

Head as wide as pronotum, vertex short, subangulate, one-fourth longer at middle than at eye, about three times as wide as long with two faint depressed points on disk

rounded to front ocelli on margin about one-third the distance from eye to center, frons broad at base, the sides parallel to antennal pit narrowing uniformly from antennal pit to base of clypeus; clypeus long, narrow, sides nearly parallel, tip rounded; lorae elongate, reaching nearly to border of cheek; cheek margin convex, faintly angulate. Pronotum twice as long as vertex, lateral margin short, hind border slightly concave. Elytra with prominent veins, the two claval veins parallel and no cross vein; discal cross vein scarcely more than one-fourth the distance to tip, nodal vein oblique, apical areoles 4, the 2 at middle the longer and reaching tip of elytra, narrow at base and widening to tip. Female last ventral segment as long as preceding and truncate behind; ovipositor but slightly exceeding pygofer; pygofer with a series of short setae each side on distal half. Male valve triangular, half as long as plates; plates triangular, tapering to slightly rounded tips.

Color pale brown, a dark line across front of vertex and a narrow band between the eyes, the front with faint arcs at sides below and obscure pale fuscous band across the middle. Elytra with dark fuscous blotches on the apical areole at end of costal cell, two in second apical and one at end of anteapical, varying somewhat in different individuals. Length, female, 4.5 mm.; male, 4 mm.

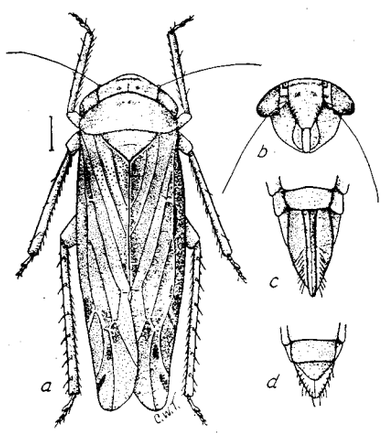


FIGURE 6.—*Nesoriella maculata,* new species: *a,* dorsal view; *b,* face; *c,* female, *d,* male genitalia.

Hivaoa: Mount Temetiu, altitude 2400 to 3200 feet, July 24 and September 13, 1929, 2 females, holotype and paratype, 1 paratype male; Kopaafaa, altitude 2770 feet, August 2, 1929, miscellaneous sweeping, 1 allotype male, 1 paratype female; Mumford and Adamson; Kakahopuanui, altitude 2500 feet, January 5, 1932, sweeping on ferns, 4 specimens; Kaava Ridge, altitude 2800 feet, October 27, 1931, beating on *Ageratum conyzoides,* 2 specimens, LeBronnec.

Uapou: Tekohepu summit, altitude 3000, 3300 feet, November 27, 1931, 1 specimen on *Weinmannia* species, 1 specimen on *Cyathea* species; Teavaituhai, Paaumea side, altitude 2030 feet, November 19, 1931, on *Cyrtandra* species, 1 specimen; Hakahetau Valley, altitude 1930 feet, November 21, 1931,

beating on ferns, 1 specimen; Teavanui Pass, altitude 2900 feet, November 26, 1931, at light, 1 specimen; LeBronnec.

The specimen from Teavanui Pass has a more pronounced brown color and the fuscous patches more extensive but is otherwise similar.

## Genus MARQUESIA, new genus

Related to *Cicadula* but with different venation and facial structure. Head broad; eyes large; ocelli distant from eyes; vertex broader than long; frons wedge-shaped, narrowing quite uniformly from antennal pits to clypeus; clypeus long and narrow, sides parallel, apex not dilated; lorae small; cheek broad with gently sinuate margins; elytra with first sector branched near the base, three apical cells and a narrow appendix. The female pygofer elongate, scarcely exceeded by the ovipositor. Genotype, *M. atra* Osborn.

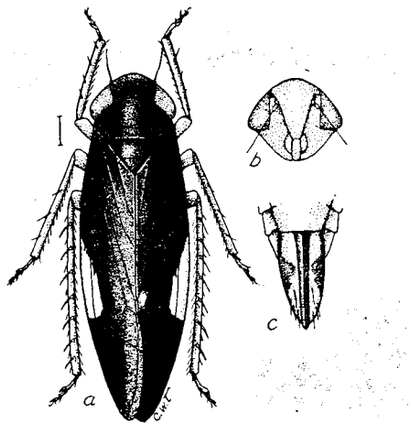


FIGURE 7.—*Marquesia atra*, new species: *a*, dorsal view; *b*, face; *c*, female genitalia.

**Marquesia atra**, new species (fig. 7).

Head slightly wider than pronotum; eyes large, oblique; vertex twice as wide as length, slightly longer at middle than at eye, rounding subangulate, rounded to front; ocelli halfway from eye to tip; clypeus twice as long as width, sides parallel, apex rounded; lorae small, distant from margin of cheek; cheek margin faintly sinuate; scarcely concave below the eye; pronotum twice as long as vertex, lateral margin very short, hind border scarcely concave; elytra long, passing abdomen, cross veins in clavus and corium wanting or invisible; three apical cells, the inner one short and trapezoidal; appendix narrow, extending around tip of middle apical cell. Female last ventral segment truncate.

Entirely black shiny above except an elongate, triangular, white spot on the costa. Beneath pale, pygofer whitish with blackish spots on sides; ovipositor black. Length, female, 4 mm.

Nukuhiva: Tapuaooa, altitude about 2750 feet, June 17, 1931, on *Piper latifolium*, holotype female, LeBronnec and H. Tauraa.

Genus **NESOPHYLA**, new genus

Related to *Marquesia* but with different venation and facial pattern, especially a more tumid frons. Head wider than pronotum, eyes large; ocelli near to eye and close to anterior margin of vertex, appearing above the margin in dorsal view owing to expansion of front. Vertex wider than long, front more or less tumid, sides narrowing to clypeus; clypeus wider at base than at tip, lorae narrow or oblong, approximating to edge of cheek; elytra with first sector forked beyond the middle, forming a narrow anteapical; four apical areoles, the inner one larger, a narrow appendix (not shown in fig. 8). Genotype *Nesophyla picta* Osborn.

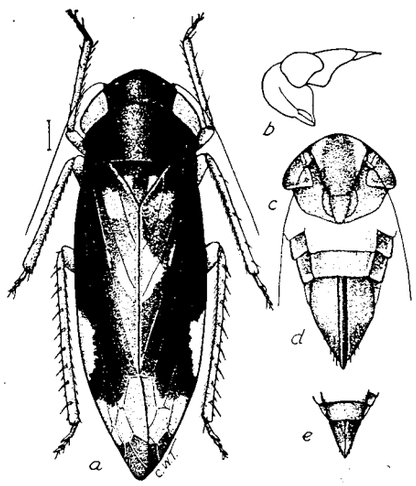


FIGURE 8.—*Nesophyla picta*, new species: *a*, dorsal view; *b*, profile; *c*, face; *d*, female, *e*, male genitalia.

**Nesophyla picta**, new species (fig. 8).

Head wider than pronotum; vertex twice as wide as length at middle, one-fourth longer at middle than at eye, obtusely angulate, rounded to front; ocelli nearly halfway from eye to center; front swollen, broad at base, narrowing from antenna to clypeus which is wide at base and tapers decidedly to narrow rounded apex; lorae narrow, lower end approaching border of cheek; cheek broad, margin sinuate under eye and broadly angulate. Pronotum nearly twice as long as vertex, slightly concave behind; elytra long, without cross-veins on clavus or disk, first sector forked near its distal end and forming a narrow anteapical cell which adjoins a short pentagonal areole; apical areoles short except the inner which extends from apex of clavus one-half the distance to the tip; appendix narrow. Female last ventral segment as long as preceding, truncate; pygofer short, broad, scarcely exceeded by the ovipositor; male valve wanting or hidden; plates elongate triangular, acute at tip, with short setae.

Black, with yellowish-white patches on clavus, a large costal spot and transverse band across hinder part back of clavus, apical areoles smoky. Male without white markings except ocelli, a dull patch on margin of vertex and nodal patch. Length, female, 4 mm.; male, 3 mm.

Nukuhiva: Ooumu [Ooumi], altitude 3700 to 4050 feet, July 20, 1931, 7 females, holotype and paratypes; 1 on *Cyrtandra,* 1 miscellaneous sweeping, (5 on shrub F. no. 580); LeBronnec and H. Tauraa.

Uahuka: Penau Ridge, altitude 2010 feet, March 2, 1931, on *Weinmannia* species, 1 allotype male; Hitikau Ridge, altitude 2900 feet; March 4, 1931, on *Weinmannia* species, 2 males, paratypes; LeBronnec and H. Tauraa.

The males from Uahuka agree with the females from Nukuhiva in so many points that I place them here in spite of different locality.

**Nesophyla variata,** new species.

Head slightly wider than pronotum, subangulate; vertex wider than long, half longer at middle than next the eyes, rounded distinctly to the front; front broad, narrowing abruptly to the clypeus; clypeus broad, short, narrowing to the apex, faintly carinate; lorae small, angulate below, nearly touching margin of cheek; cheek margin rather deeply sinuate; pronotum as long as vertex, lateral margins very short, hind margin slightly concave; scutellum broad; elytra with two claval veins, without cross-vein, corium with outer sector branched toward the tip, one anteapical areole. Female, last ventral segment short, hind border concave; pygofer with delicate cilia; ovipositor scarcely beyond tip. Male, valve short, hind border round, plates triangular, slightly convex on the outer margin terminating in acute points extending beyond tip of pygofer.

Pale yellow; vertex with a median line and two spots either side, the forward ones transverse, the posterior ones longitudinal, slightly curved; a band from eye to eye between vertex and front and anterior border and patches on the posterior part of pronotum; three spots on the scutellum, base and tip of clypeus, broad angulate band on corium reaching to apical cells, dark fuscous or blackish. Underneath face and legs yellow, base of abdomen blackish, pygofer yellowish with fuscous spots. The yellow spot on clavus forms a prominent saddle. In some specimens the extent of yellow on the elytra varies, the scutellum is yellow, and in one male the entire face is black. Length, female, 4 mm.; male, 3.75 mm.

Uapou: Teoatea, Hakahetau Valley, altitude 3020 feet, November 20, 1931, 2 females, holotype and paratype, 1 allotype male; Tekohepu summit, altitude 3200 feet, November 28, 1931, beating on *Metrosideros collina* and on *Cyrtandra* species, 4 specimens; LeBronnec.

Hivaoa: Temetiu summit, altitude 4160 feet, January 20, 1932, *Metrosideros collina,* 1 paratype male, LeBronnec.

Tahuata: Haaoipu [Haoipu] summit, altitude 2700 feet, July 9, 1930, on *Metrosideros collina,* 1 paratype male, LeBronnec and H. Tauraa.

The specimens from different localities differ enough in color, in both extent and pattern, to suggest separate species, but they agree so closely in essential structure that it seems best to consider them a variable species, possibly affected by different host plants or elevation.

**Nesophyla nigrifrons,** new species.

Head scarcely as wide as pronotum at its widest part; vertex rounded, faintly angulate, two depressed points on the disk; front slightly tumid, disk somewhat flattened; clypeus with sides nearly parallel, tip rounded; lorae broad, touching border of cheek; cheek obtusely angulate; pronotum as long as vertex, hind border scarcely concave; elytral veins prominent, apical cells short. Female, last ventral segment broadly rounded; pygofer narrow, scantily ciliate at apex; male valve long, angled; plates triangular, without cilia.

Dull ochreous; vertex with dark impressed dots; nearly all of front and clypeus, a transverse impressed line anteriorly on the pronotum, and the elytral areoles and abdomen above and below fuscous to black; lorae and lower border of cheek, veins of elytra, margins of abdominal segments and narrow border of pygofer pale. Length, female, 3 mm.; male, 2.75 mm.

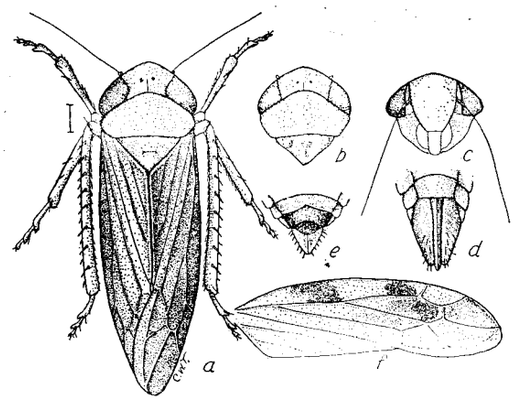


FIGURE 9.—*Nesophyla sordida,* new species: *a,* dorsal view; *b,* vertex; *c,* face; *d,* female, *e,* male genitalia; *f,* elytron.

Uapou: Teavaituhai, Hakahetau Valley, altitude 3020 feet, November 20, 1931, 8 females, holotype and paratypes, 5 males, allotype and paratypes; Teavaituhai, Paaumea side, altitude 3020 feet, November 20, 1931, beating on *Sclerotheca* species, 2 females, 3 males, paratypes; LeBronnec.

This species is close to *sordida* but differs in the black face, the black pygofer, and the fuscous areoles of the elytra.

**Nesophyla sordida,** new species (fig. 9).

Head slightly wider than pronotum; vertex obtusely almost roundly angulate; one-third longer at middle than at eye; ocelli nearly halfway from eye to tip; front tumid, narrowing uniformly from base to clypeus; clypeus narrowing to rounded tip; lorae a little longer than broad, nearly touching cheek; cheek margin sinuate, under the eye obtusely angulate; pronotum as long as vertex, lateral margin short, hind border concave; elytra with veins distinct, the first sector forked near the middle of the disk forming a long anteapical, a cross-vein forming the outer apical near its end; outer apical short, third longest, fourth trapezoidal; appendix widening apically. Female, last ventral segment truncate; pygofer robust, scantily ciliate on apical third; male valve small, triangular; plates short, triangular, margin slightly convex, finely ciliate, scarcely reaching tip of pygofer, which is also ciliate.

The female is dull stramineous or pale olivaceous, face paler, a fuscous line across apex of front; elytra smoky on apex, veins whitish; venter black, pygofer pale brown; ovipositor black; male with fuscous patches on costa separated by a whitish or orange-colored plaque, face with sutures and base of clypeus fuscous; abdomen black, margins of segments, tip of plates and pygofer yellow or orange. Length, female, 3 mm.; male, 2.75 mm.

Nukuhiva: Oumu, November 11, 1929, 2 females, holotype and paratype; altitude 4050 feet, November 29, 1929, beating on *Weinmannia* species, 2 males, allotype and paratype; Mumford and Adamson. Oumu, altitude 3000 feet, 2 males; altitude 3890 feet, July 20, 1931, on *Cyrtandra* species, 1 specimen, others from *Weinmannia* species and *Metrosideros collina*, LeBronnec and H. Tauraa; Tekao Hill, altitude 3250 feet, 5 specimens; Tapuaoa [Tapuoa], altitude 3000 feet, 1 specmien; Tovii [Toovii], altitude 2900 feet, June 20, 1931, LeBronnec and H. Tauraa.

Uahuka: Hitikau [Hitidau] Ridge, altitude 2900 feet, March 4, 1931, 2 specimens, LeBronnec and H. Tauraa.

Hivaoa: Kopaafaa, August 2, 1929, a mutilated specimen evidently belongs here, although pygofer is black.

Uapou: Vaikokoo, Paaumea Valley, altitude 2000 feet, November 26, 1931, LeBronnec.

**Nesophyla testacea,** new species.

Head scarcely as wide as pronotum, scarcely subangulate; vertex rounded, half longer at middle than at eye; frons slightly tumid, about as broad as long; clypeus with sides nearly parallel, tip rounded; lorae broad, nearly touching border of cheek; pronotum a little longer than vertex, concave behind; elytra long, appendix narrow. Female last ventral segment half longer than preceding, hind margin broadly rounded; male valve long, hind margin rounded, plates small triangular, margin delicately ciliate.

Dull testaceous, somewhat suffused with fuscous on elytra especially toward apex. Tergum and pygofer fuscous to black. Length, female, 3.25 mm.; male, 3 mm.

Hivaoa: Kaava Ridge, altitude 2000 feet, October 27, 1931, beating on *Sapindus saponaria,* 2 females, holotype and paratype, 2 males, allotype and paratype; Temetiu summit, altitude 4160 feet, January 20, 1932, beating on *Metrosideros collina,* 1 specimen; Feani summit, altitude 3900 feet, beating on *Weinmannia* species, 1 specimen; Kakahopuanui, altitude 2465 feet, January 5, 1932, beating on *Weinmannia* species, 1 specimen; LeBronnec. Kopaafaa, altitude 2770 feet, August 2, 1929, miscellaneous sweeping, 2 females, 2 males, paratypes; Kopaafaa, altitude 2800 feet, February 25, 1930, beating on *Sclerotheca* species, 1 male; Mumford and Adamson.

Uapou: Tekohepu summit, altitude 3000 feet, November 30, 1931, beating on *Weinmannia* species, 1 paratype female; Teavanui Pass, altitude 2900 feet, November 30, 1931, beating on *Cyathea* species, 1 paratype female; LeBronnec.

**Nesophyla uapouana,** new species (fig. 10).

Head broad, about as wide as pronotum; eyes large; vertex subangulate, nearly twice as wide as length at middle, one-fourth longer at middle than at eye; frons as broad as long; clypeus narrowing to blunt apex; lorae reaching close to margin of cheek; cheek margin angulate; pronotum short, scarcely as long as vertex, concave behind; claval veins without cross-vein, apical areoles short. Female last ventral segment truncate; pygofer with borders ciliate on distal half; ovipositor as long as pygofer, strongly curved; male valve short, rounded behind; plates short triangular, margin ciliate reaching to tip of pygofer.

Female, pale yellowish with faint greenish tinge, two large discal dots on vertex with smaller dots close to eye and narrow transverse dash close to apex, a triangle of dots at tip, two basal spots on clypeus, faint arcs at lower part of frons, hind margin of pronotum, sometimes a narrow stripe on 1st sector before the fork, the outer apical and apical part of other apical areoles fuscous; areoles of elytra somewhat suffused with greenish fuscous, veins greenish white. Beneath, pectus and venter and basal half of pygofer, fuscous. Male differs in color, the vertex disk largely black, covering discal spots, but picture on apex and frons similar. Pronotum, scutellum and elytra mostly black, the scutellum with a dash on the margins and the elytra with a broad costal spot yellowish white; face and legs whitish; abdomen above and below black, margin of segments yellow; plates, yellow or orange at tip. Length, female, 3.75 mm.; male, 3 mm.

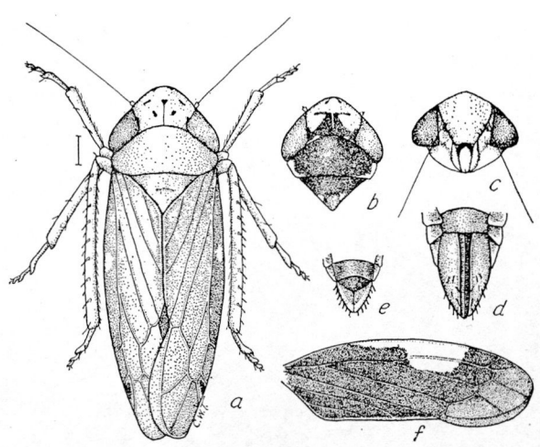


FIGURE 10.—*Nesophyla uapouana,* new species: *a,* dorsal view; *b,* vertex of male; *c,* face; *d,* female, *e,* male genitalia; *f,* elytron.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, beating on *Bidens lantanoides,* 3 females, 2 males, holotype, allotype, and paratypes; Tekohepu summit, altitude 3000 feet, November 28, 1931, 11 females (7, sweeping ferns and *Freycinetia* species), 9 males; Teavavanui, altitude 2900 feet, November 30, 1931, beating on *Angiopetris* species, 1 female; LeBronnec.

The sexes differ so much in color pattern and size that they would seem almost to belong to separate species, but aside from the agreements in pattern on vertex and face, the fact that they are recorded for same locality and date

and from the same host plant is very convincing evidence that they should be placed together.

**Nesophyla breviata,** new species (fig. 11).

Short, robust, head slightly wider than pronotum; vertex rounded before, nearly half longer at middle than at eye, rounded to tumid front; front broad, narrowing sharply to clypeus, clypeus broad at base, narrowing to rounded tip; lorae close to margin of cheek; cheek sinuate under eye; pronotum scarcely as long as vertex, side margin very short, hind border slightly concave; elytra short, barely exceeding the abdomen, apical areoles very short. Female last ventral segment truncate, pygofer robust, scarcely exceeded by ovipositor; male, valve short, triangular; plates elongate, triangular, about twice as long as valve, reaching tip of pygofer, the outer margin slightly convex and sparsely ciliate. Pale yellow, elytral veins concolorous, the outer apical areole with a prominent round black spot and the female ovipositor black. Length, female, 3.25 mm.; male, 3 mm.

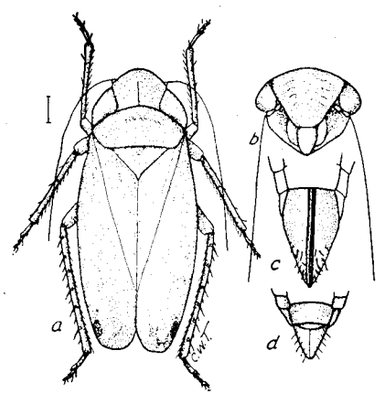


FIGURE 11.—*Nesophyla breviata,* new species: *a,* dorsal view; *b,* face; *c,* female, *d,* male genitalia.

Uapou: Teavaituhai, altitude 3000 feet, December 8, 1929, on *Sclerotheca* species, 3 females, 1 male, holotype, allotype, and paratypes, Adamson; Teavanui, altitude 2900 feet, November 26, 1931, at light, 1 paratype female; Tekohepu summit, altitude 3000 feet, beating on *Cyathea* species, 1 paratype male; Teavaituhai, altitude 3020 feet, November 20, 1931, beating on *Cyrtandra,* 1 female and 1 male, paratypes; LeBronnec.

This is a handsome little species, evidently distinctly marked by the prominent black spot in the outer apical areole. It has the appearance of a robust *Cicadula* or might be compared superficially with the nearctic *Neocoelidia tumidifrons.*

A nymph with same locality record as holotype but without host plant record is of same color and is probably from *Sclerotheca.*

**Nesophyla flavida,** new species (fig. 12).

Head slightly wider than pronotum, obtusely angular; vertex slightly depressed on disk, one-fourth longer at middle than at eye, rounded to front; front broad, narrowing from antennae; clypeus nearly twice as long as basal width, narrowing to rounded tip; lorae long approaching cheek margin; cheek margin obtusely angulate; pronotum longer than vertex, side margin short, hind border concave; elytral veins obscure. Female last ventral segment truncate; pygofer rather narrow, sparsely ciliate, scarcely exceeded by the ovipositor. Lemon yellow, the elytra pale toward the tip, unmarked in the holotype, with faint fuscous patch in one paratype and two conspicuous blackish patches in discal area in another. Length, female, 4.5 mm.

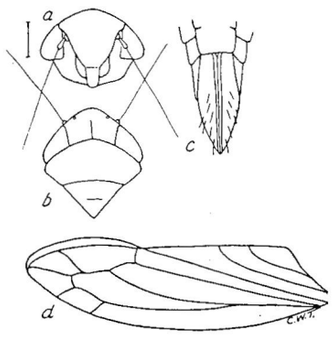


FIGURE 12.—*Nesophyla flavida,* new species: *a,* face; *b,* vertex, pronotum, and scutellum; *c,* female genitalia; *d,* elytron.

Hivaoa: Matauuna, altitude 3700 feet, March 3, 4, 1930, beating on *Sclerotheca* species, 2 females, holotype and paratype, Mumford and Adamson.

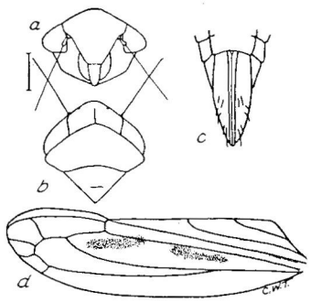


FIGURE 13.—*Nesophyla flavida,* variety *bimaculata: a,* face; *b,* vertex, pronotum, and scutellum; *c,* female genitalia; *d,* elytron.

**Nesophyla breviata** variety **bimaculata,** new variety (fig. 13).

Similar to the typical form, but there are two prominent blackish patches on the discal areole of the elytra, and the pectus, base of abdomen, and most of pygofer are black.

Hivaoa: Matauuna, March 4, 1930, beating on *Sclerotheca* species, type female.

The species is longer, elytra longer, and the shape of the pygofer different from *N. breviata,* and there is no trace of the spot in the outer apical areole; otherwise, as they are recorded from the same host plant, it would seem possible that they represent varieties or possibly dimorphic forms of the same species. The variety seems to be connected with typical form by traces of coloration in the paratype specimen.

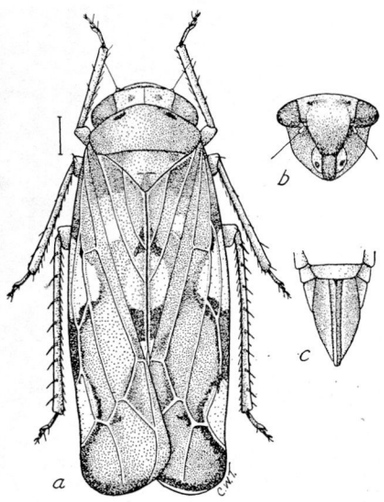


FIGURE 14.—*Cicaduloida pacifica,* new species: *a,* dorsal view; *b,* face; *c,* female genitalia.

## Genus CICADULOIDA, new genus

Body somewhat depressed; vertex broad, front slightly tumid; elytral venation similar to *Cicadula* but the costal areole is wide, the radial vein 1st sector remote from costa and without trace of outer fork or branch. Three apical cells, the outer one very broad; nodal areole widening apically; inner areole with narrow marginal appendix.

**Cicaduloida pacifica,** new species (fig. 14).

Head scarcely as wide as pronotum; vertex wider than long, scarcely longer at middle than at eye; front broad, narrowed abruptly to clypeus; clypeus tapering to broadly rounded apex; lorae broad, approaching margin of cheek; border of cheek slightly sinuate. Elytra subtruncate at apex; clavus with two veins, the inner curved and joining commissure at one-third distance to apex, no cross veinlets. Female last ventral segment as long as preceding truncate.

Light gray; vertex pale, face whitish touched with fuscous on clypeus and sutures;

pronotum gray tinged with fulvous; elytra gray, subhyaline with dark spots and prominent fuscous patch on distal part of costal areole; apical areoles dusky, bordered with fuscous, forming a blackish band at base; veins white or whitish; two large, milky, hyaline white spots on each side of the broad fuscous patch. Legs whitish. Length, female, 4 mm.

Uapou: Hakahetau Valley, altitude 1000 to 2000 feet, January 22, 1930, sweeping, 2 females, holotype and paratype, Whitten.

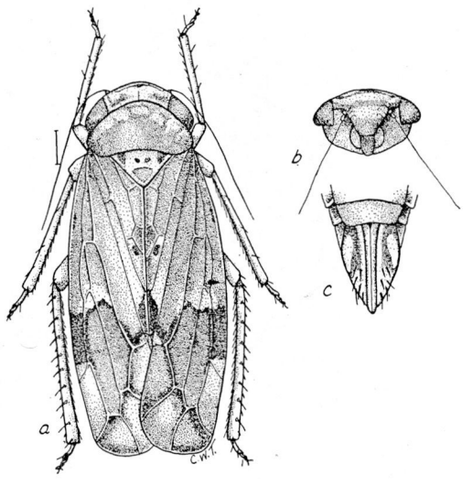


FIGURE 15.—*Cicaduloida monticola,* new species: *a,* dorsal view; *b,* face; *c,* female genitalia.

**Cicaduloida monticola,** new species (fig. 15).

Similar to *C. pacifica* but smaller, darker, and with distinct markings on vertex and face. Head as wide as pronotum; vertex slightly longer at middle than at eyes, front convex. Pronotum twice as long as vertex. Elytra a little longer than abdomen; apex broadly rounded, obliquely, faintly truncate. Clavus with two cross veins in anal area, the inner claval vein curved and joining commissure at halfway to tip of clavus, followed by an obscure veinlet giving appearance of four veinlets in anal area. Female last ventral segment as long as preceding, truncate.

Color brown, marked with fuscous and white. Vertex with two discal dots, a submarginal band and median line fuscous. Face, upper part pale with dark transverse band; lower part, to level of eyes, black. Pronotum brown, scutellum brown, basal triangle fuscous; elytra brown, veins mostly white. Two broad whitish hyaline spots on costa separated by black patch; apical areole brown bordered with black; beneath piceous, abdominal segment and pygofer bordered with light brown; femora piceous, tibiae and spines paler. Length, female, 4.5 mm.

Hivaoa: Mount Temetiu, altitude 2500 feet, northeast slope, July 24, 1929, miscellaneous sweeping, 2 females, holotype and paratype, Mumford and Adamson.

This might easily be considered a variety of *C. pacifica,* but the distinct claval veinlets with quite different coloration and different locality seem to warrant a separate name.

## Genus **PARACICADULA,** new genus

Resembling *Neocoelidia* but with venation of Cicadulini and with head more produced and conical than in typical species of that genus. Vertex as long as wide, somewhat pentagonal, lateral margins at base parallel, hind border scarcely concave, a distinct median impressed line; front slightly tumid, narrowed uniformly to the clypeus which is long, narrow and expanded at apex. Pronotum scarcely convex before, lateral borders long and nearly parallel; elytra long and narrow, 2 anteapical, 4 apical areoles, an obsolescent vein similar to that in *Nesosteles* is formed by a fork near the base of the outer sector; appendix very long and narrow. Genotype, *Paracicadula coniceps* Osborn.

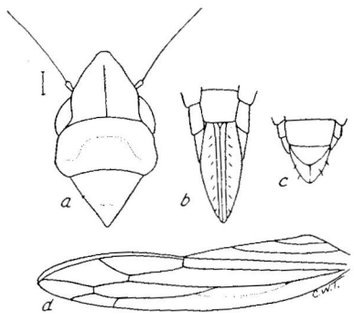


FIGURE 16.—*Paracicadula coniceps,* new species: *a,* dorsal view of head, pronotum and scutellum; *b,* female, *c,* male genitalia; *d,* elytron.

**Paracicadula coniceps,** new species (fig. 16).

Head narrower than pronotum, conical vertex produced; ocelli one-third distance from eye to tip; front narrowed evenly from base to clypeus; clypeus long, narrow, widening at apex. Pronotum four-fifths length of vertex; elytra long, narrow, costa slightly curved, venation distinct, appendix as long as clavus. Female last ventral segment as long as preceding slightly convex; male valve short; plates triangular, outer border convex, acute at tip, extending to apex of pygofer. Ivory white unmarked, elytra and wings milky hyaline. Length, female, 3 mm.; male, 2.75 mm.

Hatutu [Hatutaa]: center of island, altitude 800 feet, September 30, 1929, "peheatute" grass, 8 females, 4 males, holotype, allotype and paratypes; altitude 1010 feet, 1 female, 1 male; Adamson. Five nymphs from altitude 800 feet are slender, pale, with a wide vertex.

This striking little species seems to have affinities with both *Neocoelidia* and *Cicadula* but is smaller than most species in either of these genera and the venation and head characters afford a good basis for generic rank.

## Genus CICADULA Zetterstedt

*Cicadula* Zetterstedt, Ins. Lap., p. 296, 1838, 1840.
*Macrosteles* Fieber, Zool.-bot. Ges., Wien, Verh., p. 504, 1866.

Distant (1908) gave *C. variata* as the type of the genus, but Van Duzee (1917) gives *C. sexnotata* Fall as "logotype," probably on the ground that *C. variata* was not included in the genus at time of publication. Genotype, *Cicadula sexnotata* Fall.

This genus is world-wide in distribution and a difficult one to define, but the principal feature used has been the vestigial or obsolescent nature of the first or radial sector of the elytra. We have applied the name to the genus in Cicadulini as placed by Oshanin, Distant, Van Duzee, and others. Application of the name to a genus in Typhlocibinae, as was done by Woodworth and Kirkaldy, seems unwarranted.

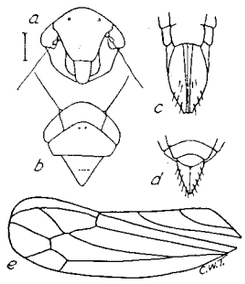


FIGURE 17.—*Cicadula dorsalis,* new species: *a,* face; *b,* vertex, pronotum, and scutellum; *c,* female, *d,* male genitalia; *e,* elytron.

**Cicadula dorsalis,** new species (fig. 17).

Head scarcely as wide as the pronotum; vertex produced, obtusely angulate, rounded to front; one-third longer at middle than next the eye; front slightly tumid; clypeus with nearly parallel sides; cheeks rather deeply sinuate under the eye and obtusely angulate on the margin; pronotum one-fourth longer than vertex, widening to latero-posterior angles, hind border slightly sinuate; elytra longer than abdomen. Female, last ventral segment short, truncate or slightly sinuate. Male, valve small, triangular; plates elongate, triangular. Pale yellow with a broad dorsal stripe from near tip of vertex to tip of elytra covering all of scutellum, most of the clavus and a broad margin to inner border of elytra on the commissure. Length, female, 3.5 mm.; male, 3 mm.

Hivaoa: Kopaafaa, altitude 2700 feet, August 2, 1929, miscellaneous sweeping, 1 female, 1 male, holotype and allotype; Teava Uhia i te Kohu, altitude 2100 feet, February 15, 1930, beating on *Weinmannia* species, 1 para-

type male; Mumford and Adamson; Kakahopuanui, altitude 2465 feet, January 5, 1932, beating on *Weinmannia* species, 1 paratype female; Kaava Ridge, altitude 2800 feet, January 7, 1932, beating on *Metrosideros collina*, 1 paratype male; LeBronnec.

The species is very distinctly marked by the black dorsal stripe resembling superficially *Erythroneura dorsalis*.

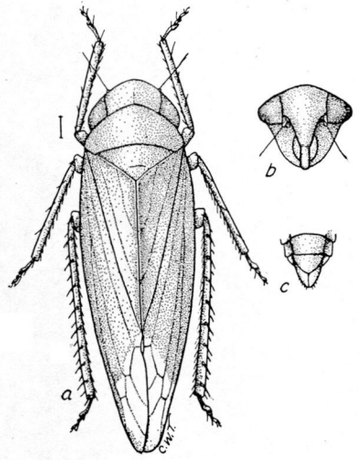


FIGURE 18.—*Cicadula tintorella*, new species: *a*, dorsal view; *b*, face; *c*, male genitalia.

**Cicadula minuta**, new species.

Very small, head as wide as the pronotum; vertex obtusely angulate, wider than long, one-quarter longer at middle than at eye; front convex, narrowing evenly to base of clypeus; clypeus short; lorae small; pronotum a little longer than vertex, lateral margins rounded to concave hind border; elytra exceeding tip of abdomen. Female, last ventral segment truncate; pygofer sparsely ciliate; male, valve long, angular; plates long, tapering to nearly acute tips. Ivory white unmarked except the black ovipositor of the female. Length, female, 2.5 mm.; male, 2.25 mm.

Hivaoa: Kopaafaa, altitude 2770 feet, August 2, 1929, miscellaneous sweeping, 1 female, 1 male, holotype and allotype, Mumford and Adamson.

This is a very minute species for the genus. Were it not for the distinct genitalia and the different locality it might be counted a very small *C. tintorella*.

**Cicadula tintorella**, new species (fig. 18).

Head scarcely wider than pronotum; vertex a little longer at middle than at eye, rounded before; ocelli on lower part of margin; front with margins slightly sinuate; clypeus a third longer than width at base, narrowing to rounded apex; lorae broad below and narrowing above; cheeks obtusely angulate; pronotum arched before, scarcely concave behind, scutellum nearly equilaterally triangular; elytra broad, passing abdomen,

four apical cells. Female last ventral segment truncate; pygofer short, thick, as long as ovipositor; male valve large, rounded behind; plates triangular, tips acute. Color varied, ivory white, yellow, and in many specimens deeply tinged with orange or orange-red, without markings except the ovipositor, which is black or at least black at tip. Length, female, 3 mm.; male, 2.75 mm.

Described from a large series.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 21, 1931, altitude 2000 feet, November 20, 1931, on *Histiopteris* species; Tekohepu Summit, November 28, 1931, on *Cyrtandra;* 198 specimens, female holotype, male allotype, and paratypes, LeBronnec.

Hivaoa: Kaava Ridge, altitude 2000 feet, October 27, 1931, beating *Sapindus saponaria,* 65 specimens; Kakahopuanui, altitude 2465 feet, January 5, 1932, on *Weinmannia* species, 5 specimens, LeBronnec. Matauuna, altitude 3740 feet, August 1, 1929, miscellaneous sweeping, 1 specimen, Mumford and Adamson.

**Cicadula colorata,** new species.

Similar to *C. tintorella* but darker red-brown and the abdomen black above. Head as wide as pronotum; vertex broadly rounded, one-fourth longer at middle than at eye; frons as wide as long; clypeus with nearly parallel sides; cheek margin sinuate; pronotum scarcely longer than vertex, hind border concave; elytral veins obscure. Female last ventral segment as long as preceding, truncate; pygofer robust, reaching tip of ovipositor. Entirely red-brown except the black ovipositor and a slight infuscation of the tips of the elytra. Length, female, 3 mm.

Uapou: Teavanui Pass, altitude 2900 feet, November 30, 1931, beating *Cyathea* species, 2 females, holotype and paratype, LeBronnec and H. Tauraa.

The paratype appears to be teneral but with well-developed structure.

## Genus NESOSTELES Kirkaldy

*Nesosteles* Kirkaldy: Hawaiian Sugar Plant. Assoc., Div. Ent., Bull. 1, p. 343, 1906.

*Eugnathodus* Baker: Inv. Pacif., vol. 1, p. 1, 1903.

*Egellus* Delong and Davidson: Ohio Jour. Sci., vol. 33, p. 210, 1933.

Kirkaldy established this genus to include the species *hebe* (designated as type) from "Viti Isles" and later included species from the Hawaiian islands. He gives a very short diagnosis for the genus as "allied to *Macrosteles,* but the radial is not obsolescent and the wing venation is different." The genus appears to be very close to or identical with *Eugnathodus* Baker, though his figure of the elytral venation shows a cell and cross vein not usually observable in that genus as heretofore recognized. The specimens examined disclose this distinctive vein, scarcely visible in both, and the genus may be retained as including a group of fairly well defined species. It certainly has close affinity with *Balclutha* and *Eugnathodus* and agrees with *Eugnathodus* in the broad

head, which is wider than the pronotum in the species included here. Examinations of the type material have shown that the type species, *N. abdominalis,* for *Eugnathodus* as given by Baker, was based on a species of *Balclutha* by misidentification. DeLong and Davidson have described the species as *neglectus* and erected the genus *Egellus* to include this as the type species. However, there seems to me to be no valid separation between this form and the *Nesosteles* of Kirkaldy, which has priority and for which the species *hebe* stands as type. The nearly obsolete vein which forks from the first sector near its base and rejoins the sector at the discal fork is to be detected by close examination in specimens of *N. neglectus,* and in all other respects the species seem congeneric.

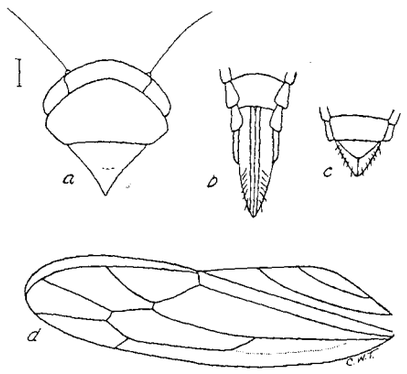


FIGURE 19.—*Nesosteles hebe* Kirkaldy: *a,* head, pronotum, and scutellum; *b,* female, *c,* male genitalia; *d,* elytron.

**Nesosteles hebe** (Kirkaldy) (fig. 19).

*Nesosteles hebe* Kirkaldy: Hawaiian Sugar Plant. Assoc., Div. Ent., Bull. 1, p. 343, 1906.

Kirkaldy's brief description of the species (from "Viti Isles") is as follows:

Head pale sordid testaceous, with a faint brownish longitudinal median line on the former (and sometimes two obsolescent submedian lines). Underside, legs, etc., pallid. Tegmina whitish grey, subhyaline, veins white; wings milky white, veins more or less smoky. Mesonotum and tergites blackish, genital segments more or less pale. Length, 4 mm.

The specimens which I believe correspond with the species have the following characters:

Head broader than the pronotum, the vertex broad, broadly curved, scarcely as long at middle as next the eye; front rather broad, tapering strongly to the clypeus; clypeus at sides nearly parallel, apex rounded; lorae broad and nearly touching margin of cheek.

Pronotum nearly three times as long as vertex, hind border truncate; scutellum with a curved transverse depression; elytra long, costa distinctly curved. Female last ventral segment longer than preceding, truncate behind. Male valve triangular, obtusely angled behind; plates short, outer margin convex and set with whitish bristles. Length 3.5 to 4 mm.

Uahuka: Hane Valley, altitude 30, 150 feet, March 13, 1931, 68 specimens; Tauheeputa, altitude 1770 feet, March 23, 1931, 98 specimens; Teautuhua, altitude 540 feet, March 18, 1931, on *Colubrina cristata,* 1 specimen; LeBronnec and H. Tauraa. Recorded on *Sida* species and *Glochidion ramiflorum.*

Tahuata: Vaitahu, sea level, June 17, 1930, 1 specimen, LeBronnec and H. Tauraa.

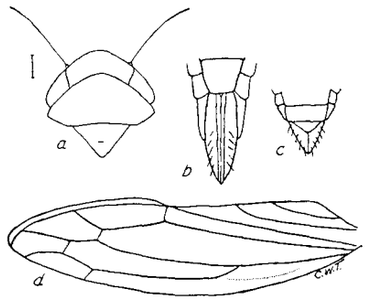


FIGURE 20.—*Nesosteles marquesana,* new species: *a,* head, pronotum, and scutellum; *b,* female, *c,* male genitalia; *d,* elytron.

**Nesosteles marquesana,** new species (fig. 20).

Vertex broad, as long at middle as at eye, less than half as long as pronotum; front rather narrow, tapering gradually to clypeus; clypeus slender; lorae narrow, merging below with border of cheek; pronotum with lateral margin short; hind border truncate; scutellum small; elytra with costal margin distinctly curved.

Female ultimate ventral segment long, truncate behind; pygofer short, slightly exceeded by ovipositor. Male valve broad, short, rounded behind; plates triangular, slightly acuminate, scarcely reaching tip of pygofer.

Color pale testaceous; the anteapical cell slightly margined with fuscous; apex slightly fuscous; abdomen browned or slightly infuscate above and below in front of the ultimate segment. Length, female, 3 mm.; male, 2.5 mm.

Uahuka: Hitikau Ridge, altitude 2500 feet, sweeping over grasses, 13 specimens; Hanahoua [Hauahuma] Valley, altitude 30 feet, March 9, 1931, on *Rhynchosia minima,* 1 specimen, LeBronnec and H. Tauraa.

Fatuhiva: Ihiota, Hanavave Valley, altitude 600 feet, September 10, 1930, sweeping; Teavaiuhiau [Teavaipuhine], altitude 2150 feet, August 25, 1930, sweeping over *Paspalum*; 22 specimens; LeBronnec. Vaikoao, Omoa [Oomoa]

Valley, altitude 1500 feet, 10 specimens, altitude 1600 feet, sweeping herbage, 13 specimens, LeBronnec.

Hivaoa: Hanaheka [Tanaeka] Valley, altitude 1100 feet, June 4, 1929, 1 specimen; Tapeata, east slope of Mount Ootua, May 25, 1929, 2 specimens; Mumford and Adamson.

Tahuata: Taamari, altitude 1500 feet, June 12, 1930, 2 specimens; Hanatuuna [Hananuana] Valley, altitude 1500 feet, June 4, 1930, sweeping over grasses, 2 specimens, LeBronnec and H. Tauraa.

Fatuuku: altitude 660 feet, September 19, 1930, beating in *Morinda citrifolia,* 1 specimen, H. Tauraa.

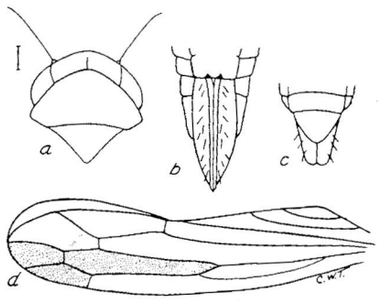


FIGURE 21.—*Nesosteles areolata,* new species: *a,* head, pronotum, and scutellum; *b,* female, *c,* male genitalia; *d,* elytron.

**Nesosteles areolata,** new species (fig. 21).

Head scarcely wider than pronotum; vertex short, broadly rounded; scarcely as long at middle as next the eye. Front slightly convex, polished; clypeus elongate, widened slightly toward the tip; cheek depressed; margin scarcely sinuate; pronotum somewhat produced in front; subangulate lateral margins short; hind border truncate, elytra with venation very distinct.

Female last ventral segment scarcely longer than preceding; hind border sinuate and with brownish mark on each side of the central lobe, giving it a toothed appearance. Male valve large, triangular, hind border obtusely angulate; plates short, broad, scarcely longer than valve; apex rounded, outer border minutely ciliate.

Color light gray. Vertex, pronotum, and scutellum unmarked or with very faint median line; elytra milky transparent with anteapical cell and two other apical cells smoky, also a faint smoky tint in the outer part of the subclaval vein. Length, female, 3 mm.; male, 2.75 mm.

Eiao: Vaituha, near sea level, September 2, 1929, at light; coconut plantation, altitude 1450 feet, October 1, 1929; altitude 1100 feet, September 28, 1929; Adamson.

## Genus EMPOASCA Walsh

*Empoasca* Walsh: Boston Soc. Nat. Hist., Proc., vol. 9, p. 315, 1864.
*Chlorita* Fieber: Kat. Europ. Cicad., p. 14, 1872.

This typhlocybine genus as here recognized has a submarginal vein and a single apical areole in the wing. The elytra are elongate and the subgenera as designated by DeLong are separated by the form of the vertex.

The genus thus restricted is world-wide in distribution and includes *Chlorita*.

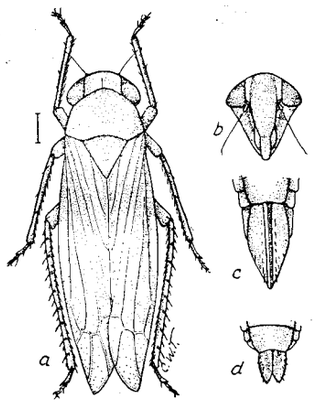


FIGURE 22.—*Empoasca marquesana*, new species: *a*, dorsal view; *b*, face; c, female, *d*, male genitalia.

**Empoasca marquesana,** new species (fig. 22).

Head scarcely as wide as pronotum; vertex short and round, scarcely as long at middle as next to eye; front somewhat tumid, one-half longer than the width between the eyes, narrowing from below antennae; clypeus broad, apex rounded; lorae narrow; cheeks narrow, depressed beneath the eye, margins slightly sinuate; pronotum twice as long as vertex, concave behind; elytral veins minutely setose.

Female, last ventral segment rounded behind; ovipositor and ventral border of pygofer strongly curved. Male, valves short, probably hidden when in normal position; plates elongate, tapering to up-curved, rather blunt tips; sparsely ciliate.

Color lemon yellow; the vertex, front, and pronotum in some specimens slightly tinged with golden yellow or orange. Eyes dark; elytra mostly hyaline, the clavus and part of the corium suffused with yellowish and whitish; a plaque of whitish translucent area on costal border of some specimens. Length, female, 4 mm.; male, 3.75 mm.

Hivaoa: Matauuna, altitude 3700 feet, March 4, 1930, beating on *Reynoldsia* species, 10 females, holotype and paratypes, Mumford and Adamson; Amatea, altitude 2700 feet, July 7, 1930, 1 allotype male, LeBronnec and H. Tauraa; Mount Temetiu, altitude 3620 feet, 1 male, Mumford and Adamson; Kaava Ridge, January 4, 6, 7, 1932, altitude 2720-2820 feet, beating on *Reynoldsia* species and *Cyathea* species and 3 on *Rozonea* species, 60 adults, 60 nymphs; Feani Crest and Feani Ridge, altitude 3970 feet, January 12, 1932, 73 specimens; Temetiu summit, altitude 4160 feet, January 20, 1932, beating *Synodosia* and *Weinmannia* species, 3 specimens; Temetiu Ridge,

altitude 3900 feet, January 14, 1932, beating on *Cheirodendron* species, 3 specimens; LeBronnec.

Tahuata, altitude 2600 feet, June 27, 1930, beating on *Reynoldsia* species, 1 specimen, LeBronnec and H. Tauraa.

This species belongs to the *obtusa* group of the subgenus *Kybos* as designated by DeLong. It approaches *E. smaragdula* in size but has no trace of fuscous marking on the sutural border and is more distinctly yellow in color.

**Empoasca nesolina,** new species (fig. 23).

Narrow elongate, head scarcely as wide as pronotum; vertex slightly produced and subangulate, one-third as long as pronotum, one-fourth longer at middle than at eye; frons long, tapering to narrow elongate clypeus; lorae elongate, cheek margin sinuate. Pronotum arched before, slightly concave behind; elytra long, narrow. Female last ventral segment truncate, ovipositor long, much exceeding pygofer. Male valve hidden or wanting, plates triangular, tips upcurved. Color pale greenish; head, pronotum, and scutellum tinged with fulvous; elytra hyaline tinged with yellow to the cross-veins. Length, 2.5 mm.

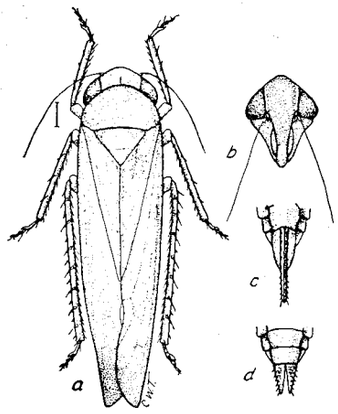


FIGURE 23.—*Empoasca nesolina,* new species: *a,* dorsal view; *b,* face, *c,* female, *d,* male genitalia.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2500 feet, October 25, 1929, 5 females, 3 males, holotype, allotype, and paratypes, Mumford and Adamson.

**Empoasca uapouensis,** new species.

Head broad, vertex short, scarcely longer at middle than at eye; slightly angulate, front tapering evenly to clypeus, apparently fused; clypeus narrow tapering to tip; lorae small, narrow; cheek deeply sinuate under eye; pronotum half longer than vertex; elytra narrow, long, much longer than abdomen. Female, last ventral segment produced, rounded behind; male, valve very small or hidden; plates elongate triangular, acutely pointed, margin finely ciliate, pale green; elytra hyaline, faintly tinged with greenish; lower part of face, distal part of tibiae, tarsi, and pygofer bluish green. Length, female, 2.75 mm.; male, 2.60 mm.

Uapou: Tekohepu summit, altitude 2900 feet, November 27, 30, 1931, beating on *Bidens lantanoides,* 5 females, 1 male, 3 nymphs, holotype, allotype, and paratypes; Teavavanui, altitude 2900 feet, November 30, 1931, beating on *Angiopteris* species, 1 female, 1 male, paratypes; LeBronnec.

Also 18 specimens referred here that appear to be teneral or bleached, lacking the distinctive green color but with similar locality and host plant records as the types.