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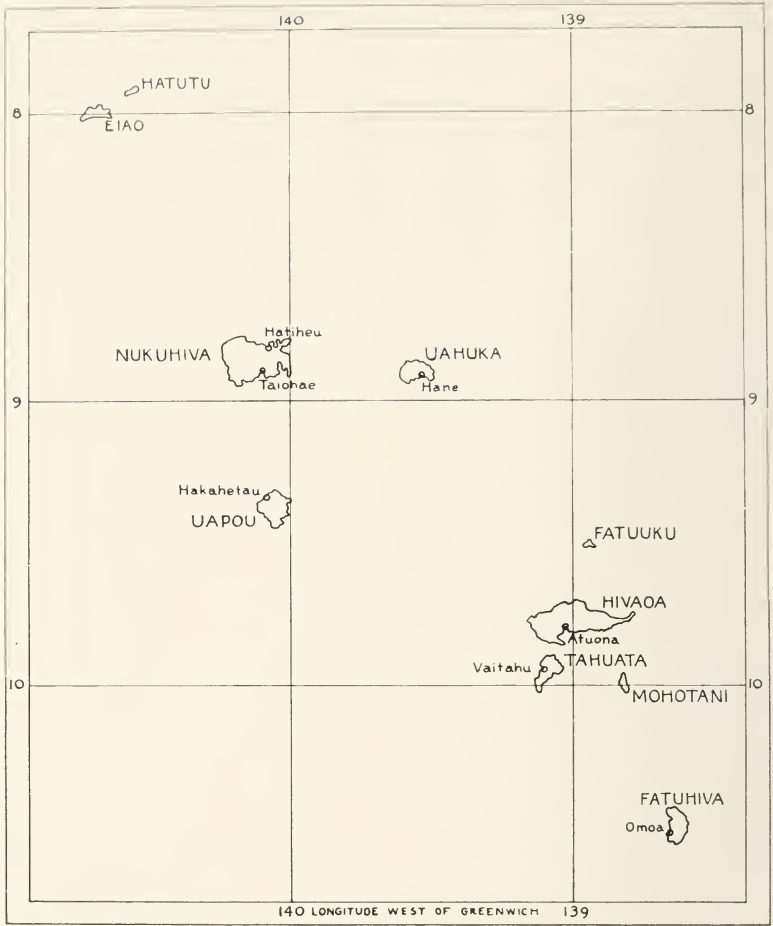
# MARQUESAN INSECTS—II

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BERNICE P. BISHOP MUSEUM  
BULLETIN 114

PACIFIC ENTOMOLOGICAL SURVEY  
PUBLICATION 7

HONOLULU, HAWAII  
PUBLISHED BY THE MUSEUM  
1935



MAP OF THE MARQUESAS ISLANDS



## MARQUESAN INSECTS—II

Bernice P. Bishop Museum, Bulletin 114, 1935

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1. Marquesan Insects—I, Bulletin 98, 1932.
2. Check list of Tipulidae of Oceania, by Charles P. Alexander, Occasional Papers, vol. IX, no. 21, 1932.
3. Check list of the Elateridae of Oceania, by R. H. Van Zwaluwenburg, Occasional Papers, vol. IX, no. 23, 1932.
4. Fresh-water fishes from the Marquesas and Society Islands, by Henry W. Fowler, Occasional Papers, vol. IX, no. 35, 1932.
5. The lizards of the Marquesas Islands, by Karl P. Schmidt and Walter L. Necker, Occasional Papers, vol. X, no. 2, 1933.
6. Society Islands Insects, Bulletin 113, 1935.
7. Marquesan Insects—II, Bulletin 114, 1935.
8. Marquesan Insects—III, Taxonomic papers (in preparation).

SOME ACALYPTRATE DIPTERA FROM  
THE MARQUESAS ISLANDS\*

By JOHN R. MALLOCH  
U. S. BUREAU OF BIOLOGICAL SURVEY

FAMILY MILICHIIDAE

Genus MILICHIELLA Giglio-Tos

This genus was inadvertently credited to Meigen by Bezzi.<sup>1</sup>

**Milichiella lacteipennis** Loew.

A very widely distributed species, occurring, as far as I am aware, in the Palearctic region, North and South America, the Malayan region and southward to Australia, including the Hawaiian, Fiji, and Society islands (A. M. Adamson).

Uahuka: Teuaua Island, September 21, 1929, 6 specimens, A. M. Adamson.

Eiao: above Vaituha, altitude 1,100 feet, September 28, 1929, 1 female, A. M. Adamson.

This species is a scavenger in the larval stages, which no doubt accounts for its wide dispersal. The flies are frequently found on flowers and foliage.

Genus HYPASPISTOMYIA Hendel

**Hypaspistomyia** species.

A smaller species than the next preceding one, very similar to *H. albipennis* Malloch described from Australia,<sup>2</sup> but the condition of the only specimen, which is considerably matted and discolored, prevents a definite specific determination.

Hatutu [Hatutaa]: center of island, altitude 1,010 feet, September 30, 1929, 1 specimen, Adamson.

No doubt a scavenger like the preceding species. The genotype, *H. latipes* Meigen, has about the same distribution as *Milichiella lacteipennis* and may yet be turned up in the Marquesas.

FAMILY EPHYDRIDAE

The members of this family are mainly aquatic, most of them living in the larval stages in slow-running streams or quiet bodies of water, the adults occurring on the margins of streams, lakes, or on the seashore.

<sup>1</sup> Bezzi, Mario, Diptera Brachycera and Athericera of the Fiji Islands, p. 162, 1928.

<sup>2</sup> Proc. Linn. Soc. New South Wales, vol. 49, pt. 3, p. 336, 1924.

\* Pacific Entomological Survey Publication 7, article 1. Issued February 27, 1933.

## SUBFAMILY CANACINAE

Recently this group has been given full family rank by Hendel and in this course he was followed by Becker in his treatment of the Palearctic Ephydriidae. I am not inclined to adopt the idea, and rank the group as a subfamily of Ephydriidae, there being so many points of similarity in the two groups.

Although a comparatively small group it is very widely distributed, occurring in Europe, Asia, the Orient, New Zealand, and North America. The species from the Marquesas is rather similar in most details to *Canace* Haliday, the epistome being transverse, the general armature of the head similar to that of the genotype, *C. nasica* Haliday, and the wing venation almost identical with that of the latter. The description of the genus below gives a summary of the main distinguishing characters of the new genus from the Marquesas.

## Genus NOCTICANACE, new genus

Head much as in *Canace*, but the ocelli are not on an elevation, they are much more widely separated, and very minute (fig. 1, *b*). Thorax with similar bristling to the other genera, differing from *Canace* in lacking the anterior notopleural and prescutellar acrostichal bristles; both the sternopleura and the mesopleura with one bristle and a number of strong setulose hairs.

Genotype, *Nocticanace peculiaris*.

**Nocticanace peculiaris**, new species.

## Male

Dull black, with grey dust on lateral margins of mesonotum anteriorly, the pleurae, and to a less extent on the abdomen, the face, cheeks, genae, and lower occiput white dusted. Wings greyish hyaline, veins fuscous. Legs black.

Head in profile as figure 1, *a*; aristae very short-haired; dorsal view of head as in figure 1, *b*; proboscis stout, when the apex is expanded there is a slender chitinous lateral marginal rod resembling a mandible on each side (fig. 1, *c*); antennae black; palpi fuscous, of moderate length, slightly clubbed, and with one subterminal hair.

Mesonotum brownish black except at anterior lateral angles where it is distinctly grey dusted, without distinct vittae. Dorsocentrals strong, four pairs, the third and last pairs closer together than any of the other pairs, surface without short hairs except on the region in front of the presutural and laterad of the anterior dorsocentral bristles; one or two fine hairs on humeri besides the strong bristle; scutellum convex, subtriangular, with four strong bristles. A few strong setulose hairs on the mesopleura and sternopleura besides the single bristle on each.

Abdomen narrow, subcylindrical, with six visible tergites in dorsal view exclusive of the rudimentary basal one and inclusive of the one forming base of hypopygium; the surface hairs short but strong; apex in profile as in figure 1, *d*.

Legs black, rather slender, fore femur with four or five strong posteroventral bristles which are quite widely separated, the other femora without well-developed bristles; all tibiae without a preapical dorsal bristle.



Wings greyish hyaline, slightly brownish along costa, the veins fuscous. Costa without distinct spines, merely setulose, all veins bare, inner cross vein almost directly below apex of subcosta and about three-sevenths from base of discal cell, ultimate section of fifth vein subequal to penultimate section of fourth and nearly half as long as ultimate section of the latter; section of costa between apices of second and third veins not over half as long as that between apices of third and fourth, the latter two about equally far in front and behind extreme apex of vein respectively.

Squamae and fringes fuscous. Knobs of halteres pale yellow.

#### Female

Similar to the male except in the structure of the abdomen, the apex of which is figured showing the bifid genital organ (fig. 1, *e-f*).

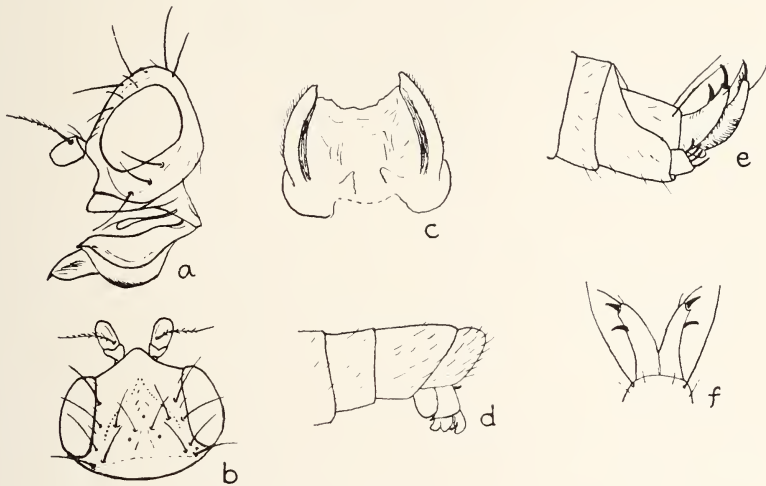


FIGURE 1. *Nocticanace peculiaris*: *a*, head in profile; *b*, head from above; *c*, apex of proboscis expanded; *d*, apex of abdomen of male in profile; *e*, apex of abdomen of female in profile; *f*, genital thorns of female from above.

Eiao: Vaituha, October 2, 1920, at light, type male, allotype, and two female paratypes, Adamson.

Nukuhiva, no data, 12 paratypes, L. E. Cheesman.

This is the first record of the occurrence of a member of this subfamily at light, and it would appear worth mention that the ocelli are exceptionally small in the species. In crepuscular Hymenoptera (Halictinae, Ophioninae) these organs are much larger than usual, but it is also the case that in most Diptera that are regularly active at night the ocelli are lacking (Culicidae, Chironomidae, etc.). The only species known to me as occurring in North America that are related to the one described above are active during the daytime and frequent in salt marshes. In the North American species *macateci* Malloch, the ocelli are of normal size, the genital organ of the female

ends in two long slightly upwardly curved chitinous simple thorns, and the fore femur in both sexes has a series of strong bristles on the apical half of the antero-ventral surface.

*Canacc nudata* Cresson, from the west coast of the United States, is very similar in general appearance and structure to the present species from the Marquesas, but it has a distinct though small anterior notopleural, and the disc of the scutellum has a few long erect setulose hairs which are lacking in the new species. The frons is also more weakly bristled, there are two long genal bristles instead of three, the ultimate section of the fifth vein is considerably shorter in comparison with the penultimate section of fourth, and the genital segments of the female differ in having the two hairs much shorter and in various details of the armature of the two apical spines and the penultimate lateral plates at their bases. The fore femur in *C. nudata* is very much less strongly bristled on the postero-ventral surface than in the new species, the bristles are closer together, and as they approach the middle there is a gradual increase until they become biserial or even triserial and mere hairs.

#### SUBFAMILY EPHYDRINAE

This subfamily differs from the preceding one in lacking the cross vein between the discal and posterior basal cells, and the anal cell and well-developed anal vein.

#### Genus SCATELLA Robineau-Desvoidy

This genus is one of the most widely distributed in the family, occurring from the far north to the extreme south in both hemispheres, several species having been described from New Zealand and Patagonia. The genotype *S. stagnalis* (Fallen) is one of the most generally distributed species and is amongst those from the Marquesas.

I append a key to the Marquesan species.

#### Key to the Species

1. Wings fuscous, each with five hyaline spots (fig. 2, *a*).....**stagnalis**  
Wings fuscous, each with six or more hyaline spots.....2
2. Wing with six hyaline spots (fig. 2, *b*).....**sexpunctata**  
Wing with seven hyaline spots.....3
3. Outer hyaline spot in submarginal cell close to the tip of the cell, not larger than the inner one in same cell, and, like the one at apex of first posterior cell, rather faint (fig. 2, *c*).....**septempunctata**  
Outer hyaline spot in the submarginal cell much larger than the inner one and quite conspicuous, the outer one in the first posterior cell not at apex of the cell (fig. 2, *d*).....**varipennis**

**Scatella stagnalis** (Fallen).

Face densely brown dusted, the frontal triangle slightly shining, very broad, and carried to the anterior margin; the antennae and palpi fuscous; mesonotum rather dull because of the presence of brownish dust, without a trace of vittae on mesonotum; lateral margins of mesonotum and pleura more greyish than brownish dusted. Abdomen more distinctly shining than the thorax, with brownish dust, and a bronzy tinge. Wings marked as in figure 2, *a*, the spots whitish hyaline. Halteres yellow.

Ocelli hardly elevated, all bristles including the genal one well-developed. Humeral lacking, both notopleurals well-developed; scutellum with two long apical bristles and a short fine hair in front of each but closer to the bristle than is the case when the basal pair of bristles are represented.

Legs black, without any abnormal armature, the fore femur with some very fine hair-like posteroventral bristles, and the fourth segment of the fore tarsus lacking strong apical bristles. Halteres with the knobs yellow.

Ejiao: Vaituha, near sea level, October 1, 1929, altitude 200 feet, October 3, 1929, Adamson.

Tahuata: Hanahevene Valley, sea level, July 17, 1930, LeBronnec and H. Tauraa.

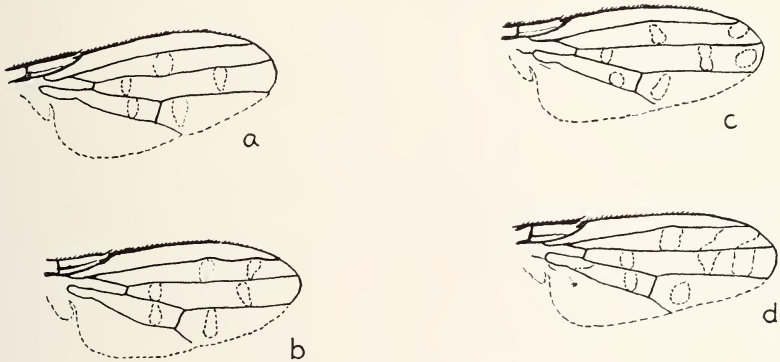


FIGURE 2. Wings, diagrammatic: *a*, *Scatella stagnalis*; *b*, *S. sexpunctata*; *c*, *S. septempunctata*; *d*, *S. varipennis*.

On both dates last listed and at the same localities along with the next species; apparently very common, as there are about 100 specimens in the collection.

This species is the genotype of *Scatella* as restricted by Hendel,<sup>3</sup> and is distinguished from *Lamproscatella* Hendel by the chaetotaxy of the mesonotum, having two pairs of strong postsutural dorsocentral bristles and one pair of well-developed acrostichals close to the suture, *Lamproscatella* having either two or three pairs of dorsocentrals and no outstanding acrostichal bristles close to the suture. In addition to this character the genal bristle is conspicuous in *Scatella* and undeveloped in *Lamproscatella*. Becker accepted

<sup>3</sup> Deut. Ent. Zeits., p. 42, 1917.

the latter as a subgenus and beyond pointing out the difference of treatment and the characters of the segregates I do not intend to go at this time, but will revert to the matter in dealing with the next following genus. All the four species placed in *Scatella* possess the characters cited by Hendel as criteria for the genus in the restricted sense.

All four species before me are rather similar in coloration, being entirely dark, with dark legs, the wings more or less infuscated and with whitish hyaline spots which are best seen when the wing is viewed from the tip towards the base at a low angle, almost horizontally and against the light. The figures given herein are diagrammatic, the hyaline spots being indicated in the cells by lines drawn round their approximate circumference.

### ***Scatella septempunctata*, new species.**

Very similar to the preceding species, differing essentially in the markings of the wings as shown in figure 2, *c*. The knobs of the halteres are yellow as in *S. stagnalis*. Length, 1.75 to 2.5 mm.

Type, allotype and 22 paratypes as follows:

Eiao: Vaituha, altitude 200 feet, October 3, 1929, type, allotype and 3 paratypes, Adamson.

Hivaoa: Tahauku, sea level, July 10, 1929, Mumford and Adamson.

Tahuata: Hanamenino Valley, sea level, July 17, 1930, LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 21, 1930, LeBronnec.

### ***Scatella sexpunctata*, new species.**

#### Female

A much more shining species than either of the two preceding, the head bronzy, with face much less distinctly dusted, the mesonotum almost glossy except on the anterior and lateral margins, the color deep blue or violet, and the dust on lateral margins and pleura dark brown and very dense; scutellum blue or violet; abdomen less noticeably blue, shining bluish black.

Head almost as in *S. stagnalis*, all the frontal and the genal bristles strong; face distinctly shining, becoming slightly dusted on sides, the lower marginal bristles longer than in *S. stagnalis*, genae brownish grey dusted, about one-sixth of the height of eye; arista short-haired.

Thorax as in *S. stagnalis* except in color.

Legs black. Fore femur with slightly stronger and more widely spaced posteroventral bristles; fore tibia with usually two apical ventral bristles; fourth segment of fore tarsus with a lanceolate bristle on each side at apex which are protruded forward close against the venter of the fifth segment almost to its apex.

Wing as in figure 2, *b*.

Knobs of halteres black.

Length, 2.5 mm.

Eiao: Vaituha, altitude 200 feet, October 3, 1929, type and four paratypes, Adamson.



**Scatella varipennis**, new species.

## Male

Similar to the next preceding species in general coloration, but the head is lacking from the type so that characters on that part can not be ascertained. The halteres have black knobs, a character separating this and the next preceding species from the first two dealt with herein.

One very striking character consists of the very dark part of the wing in the apices of the submarginal and first posterior cells beyond the large hyaline spots, this and the costal cells are dark brown, and the two hyaline spots in first posterior cell beyond the cross vein are almost fused though when viewed almost horizontally against the light only the inner one is whitish.

The specimen is so mounted that it is impossible to distinguish the fourth segment of the fore tarsus, so one can not say if the bristles present in the next preceding species are present here also.

Wing as in figure 2, *d*.

Length, 2.5 mm.

Eiao: Vaituha, altitude 200 feet, October 3, 1929, type, Adamson.

It may be of interest to note here that the North American *S. lugens* Loew is quite similar to *S. septempunctata*, but the mesonotum is distinctly vittate, which is not the case in the latter, and the American species has the arista pubescent instead of short-haired.

Genus **NEOSCATELLA**, new genus

This genus is distinguished from *Scatella* by the possession of three pairs of long dorsocentral and one long and one short anterior pair of acrostichal bristles. The aristae are more distinctly short-haired above than is usual in that genus, the wings lack hyaline spots in the genotype, and the scutellum has four well-developed bristles, the apical pair longer than the lateral pair.

Genotype, *Neoscatella atra*.

**Neoscatella atra**, new species.

## Male

An entirely shining black species, the face slightly brownish grey dusted, the mesonotum with a faint violaceous tinge, and the wings greyish hyaline, with black veins.

Head much as in *Scatella stagnalis*, the frons more declivitous anteriorly, but with the same bristles, the face similar, with short and rather dense hairs on entire surface of the central convexity, two or three moderately long outwardly curved bristles on each side of the convexity on upper half and a much longer similarly curved bristle on each side near lower margin, the epistome with a fringe of bristly hairs, one at each extremity longer than the others; gena about one-fifth of the eye height, the bristle long. Longest hairs on the arista fully twice as long as its basal diameter.

Thorax almost glossy, with very faint dust, the three pairs of dorsocentrals long and strong, about equally spaced, the anterior pair slightly presutural, the anterior acrostichals about half as long as the second pair, the latter behind the level of the anterior dorsocentrals; prescutellar acrostichals lacking; humeral undeveloped; both notopleurals long, posterior postalar undeveloped, anterior one long; mesopleura and sternopleura each with one long bristle and numerous hairs.

Abdomen colored as thorax, fourth visible tergite as long as the preceding two combined in male.

Legs black. Fore femur with four or five long bristles, very fine at apices; fore tibiae without exceptional hairing; mid tarsus of male with some very fine hairs along the anteroventral edge that are longer than those on the posteroventral, or either of these edges in the other tarsi; claws long, much curved; pulvilli well-developed.

Wings greyish hyaline, without a trace of hyaline or whitish spots, the veins black, costal vein rather thick, slightly thicker in male than in female, to apex of subcosta, at which latter point there is a short fine bristle as in *Scatella*, no costal spines beyond apex of first vein; inner cross vein proximad of apex of first vein, outer cross vein at less than its own length from apex of fifth vein; penultimate section of fourth vein about four-fifths as long as ultimate section, section of costa between apices of second and third veins more than half as long as the succeeding section.

Halteres yellow.

Length, 3 to 3.5 mm.

More than 300 specimens. Type, allotype, and paratypes as follows:

Hivaoa: Atuona Valley, altitude 330 feet, March 28, 1929, type, male, allotype and a large series of paratypes, Mumford and Adamson.

Tahuata: Amatea, altitude 2,000 feet, June 28, 1930; Hanatuuna Valley, altitude 1,000 feet, June 18, 1930, on wet rock by stream; LeBronnec and H. Tauraa.

Fatuhiva: Teaotu, Hanavave Valley, altitude 800 feet, September 9, 1930, on wet rock by stream, LeBronnec.

Nukuhiva: no data, L. E. Cheesman, British Museum; Vaioa, Hakau Valley, September 16, 1929, Mumford and Adamson.

Uahuka: Vaikivi Valley, altitude 1,000 feet, March 6, 1931, some resting on wet rock; Matapopo, Hane Valley, altitude 800 feet, February 27, 1931; LeBronnec and H. Tauraa.

Upou: Hakahetau Valley, altitude 2,000 feet, December 6, 1929, on wet rock by stream, Adamson.

I have ventured to erect a new genus for this species though I might have followed a different course and ranked *Lamproscatella* and this as subgenera of *Scatella* on the strength of the evidence of connecting links in the groups; *Scatella* with two pairs of dorsocentrals and a pair of anterior acrostichal bristles, *Lamproscatella* with two pairs, or three pairs, of dorsocentrals and no outstanding anterior acrostichal bristles, and *Neoscatella* with three pairs of long dorsocentrals and one or two pairs of well-developed anterior acrostichals. It may be noted here that Cresson has described a species from North America, *intermedia*, which appears to belong to *Neoscatella*. There is another segregate of the genus that has the costal vein ceasing beyond the apex of the third vein, but possibly that would fall within the genus *Scatophila* Becker. The last-mentioned genus has the costal vein ceasing at the apex of the third vein, and it would suggest itself to me as a proper course to pursue either to sink the genus or to erect another one for the connectant

form with the character intermediate between the two extremes. As this segregate is not in the present collection I merely draw attention to it for its significance in connection with the present discussion and make no attempt to name it.

There is a possibility that some of the Hawaiian species referred to *Scatella* may belong to *Neoscatella*, but they all differ from the genotype in having the wings spotted.

#### Genus PARALIMNA Loew

This genus contains a number of species in which the mid tibia has three long dorsal bristles, one close to base, a second basad of middle, and a third near apex, and the costal vein extending distinctly to apex of fourth vein.

The distribution is almost cosmopolitan, and the habits of the species are as in the preceding genus.

#### **Paralimna lineata** de Meijere.

I accept as this species a number of specimens that agree in all details with specimens from the Philippines, though there are some discrepancies between them and the description by de Meijere. Bezzi has recorded the species from Fiji and there is no doubt in my mind that this is the species he had before him. There is little to distinguish it from one now before me from the southwestern United States.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 21, 1930, nine specimens, LeBronnec.

The small size, 2 to 2.5 mm., black legs, and lack of developed postvertical bristles, are the outstanding characters of the species.

#### Genus HECAMEDE Haliday

This genus contains very few species, but is rather widely distributed in the Old World, extending from the Palearctic region southward to New Zealand. How many species there are is a debatable matter, though there are as far as I have seen personally at least three. One species which I described from New Zealand has the fore femur with a series of short stout closely placed bristles on the apical half of the anteroventral surface much as in many species of Sapromyzidae, and I have before me a specimen from Hawaii that has this same character and may be my *femoralis*. The other species known to me lack these fore femoral bristles, and the species from the Marquesas Islands differs from the Palearctic *albicans* Meigen, which is the genotype, in having the genal bristle minute. I assume that *grisescens* Becker has this bristle long, but in any event it has the mesonotum with four broad brown spot-like vittae on the anterior portion of the mesonotum, which character readily distinguishes it from the one now under discussion.

**Hecamede inermis**, new species.

## Male

Very similar to *lacteipennis* Lamb, described from the Seychelles, and to *nivea* de Meijere, described from the island of Simalur in the East Indies, differing from the first in having the frons much darker, the wings with darker veins, and the apical tarsal segment not darkened, and from *nivea* in the darker frons, and as de Meijere says that the legs are colored as in *albicans*, apparently by the unicolorous yellow tarsi.

Head brown or fuscous, densely grey dusted except on the central part of the facial convexity, which is glossy, and less densely dusted on the lateral anterior portions of the interfrontalia, which are distinctly yellowish brown; antennae yellow, third segment usually slightly darkened above; palpi yellow. Frons as in *lacteipennis*, the frontal triangle with two pairs of distinct proclinate bristles that are as long as the proclinate anterior pair of orbitals and of which the anterior pair are in line with these, the surface with a number of much shorter hairs; ocellar bristles of moderate length, just behind the level of posterior margin of the posterior ocelli; profile as in figure 3, *a*, the genal bristle very short; face bare except for the three or four marginal bristles, the upper one on a small raised base; arista with four or five moderately long upper rays, bare below.

Thorax with the usual bristles, either almost uniformly grey dusted or with the mesonotum and upper part of the mesopleura and disc of scutellum largely yellowish brown dusted, and sometimes with minute dark brown dots at bases of the surface hairs and bristles.

Abdomen silvery grey dusted, elongate subtriangular, exclusive of the rudimentary basal tergite with only three visible dorsal segments, the surface with very few black hairs, fourth tergite over 1.5 as long as third; hypopygium as in figure 3, *b*.

Legs testaceous yellow, coxae and femora fuscous and grey dusted. Fore coxa with one anterior bristle near middle; fore femur with a series of rather short and fine closely placed posteroventral bristles and no armature on the apical half of the anteroventral surface, mid and hind femora with bristles on the anteroventral surface similar to those on the posteroventral surface of fore pair.

Wings whitish hyaline, veins brown, becoming paler behind.

Halteres yellow.



FIGURE 3. *Hecamede inermis*: *a*, head in profile; *b*, apex of abdomen of male from the side.

Hivaoa: Tahauku, sea shore, July 10, 1929, type and two male paratypes, Mumford and Adamson.

It is possible that this may really be *lacteipennis* Lamb, but I consider it safer to give it a name because of the distinctions between the specimens and the description given by Lamb. It may be worth noting that the genal



bristle in the specimens of *albicans* that I have examined is not nearly as long and strong as figured by Becker.<sup>4</sup>

### Genus *MOSILLUS* Latreille

In this genus I am placing a species which differs from the genotype and the other species properly referable here in having the face without small wart-like elevations at the bases of the hairs on each side. In other respects, however, it agrees very well with the definition of the genus. For other departures from typical forms see the description below.

#### *Mosillus marquesana*, new species.

##### Female

A rather dull black species with very little trace of bronzy sheen, the frons slightly shining, abdomen with greyish dust at bases of some of the tergites, legs black, tarsi testaceous yellow, apical segment darkened, wings hyaline, not whitish, veins fuscous, halteres dull brownish yellow.

Head much as in *Hecamede*, but the lateral bristles on the face much weaker, hair-like, more numerous, and not on raised bases, and the aristae almost nude (fig. 4, *a*). Frons smooth at vertex, about one-fourth of the head width, slightly narrowed to anterior margin, its width at vertex a little less than equal to its length in center, the surface with thin yellowish dust except narrowly along the sides where the dust is much denser and more conspicuous; triangle very feebly indicated, extending to anterior margin; inner incurved vertical bristles rather short but distinct, outer verticals lacking; post-verticals lacking; a pair of proclinate divergent bristles on the triangle slightly anterior to the front ocellus and about in longitudinal line with the posterior pair; a reclinate orbital in line with these bristles, and one or more very short proclinate hairs in front of it; back of head slightly emarginate from dorsal view, the ocelli close to vertex; genal bristle lacking.

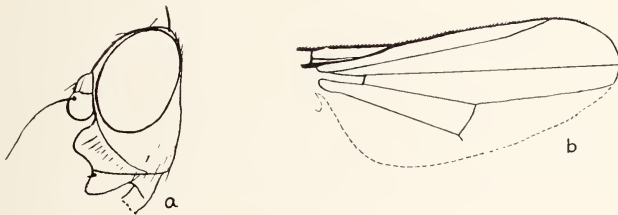


FIGURE 4. *Mosillus marquesana*: *a*, head in profile; *b*, wing.

Thorax entirely covered with sparse yellowish dust, the hairs very short, the usual large triangle marked off by incised lines at the suture on each side, the bristles rather poorly developed, only the posterior notopleural, posterior pair of dorsocentrals, and one postalar distinct; scutellum slightly flattened on disc, subtriangular, with a pair of apical closely placed, and a pair of basal, bristles, and the disc and sides with many stiff black hairs; mesopleura with short decumbent black hairs and two fine post-marginal bristles, scutellum with short hairs and one bristle.

Abdomen colored as mesonotum, with four distinct dorsal segments in addition to

<sup>4</sup> Die Fliegen der Paleark. Reg., 10, p. 18, 1926.

the rudimentary basal one, the second and third with a transverse patch of grey dust on each side at base.

Fore coxae brownish in front and with one fine anterior submedian bristle; fore femora without well-developed posteroventral bristles.

Wing as in figure 4, *b*.

Length, 2.25 mm.

Hivaoa: Tahauku, seashore, July 10, 1929, type, Mumford and Adamson.

It is very probable that some other systematist would place this species in a different and new genus on the basis of the lack of facial elevations at the bases of the hairs, and the different frontal sculpture, or rather lack of the latter, but it appears to me that there are already too many quite poorly defined genera in this immediate group in the family and that the erection of more would merely further complicate the classification which is already quite badly confused.

#### Genus NEOHYDRELLIA, new genus

Differs from *Hydrellia* in the strict sense in having the eyes very sparsely short-haired, the arista with very short hairs above, frons with a shining triangle that almost fills the area, and only the incurved pair of verticals and the ocellar pair of bristles developed; face very slightly convex and glossy in center on entire height, the sides densely dusted and with a few hairs; mesonotum with a pair of long dorsocentrals about two-thirds of the length from suture to hind margin, one short postalar, and one long notopleural, the surface with very few microscopic hairs; pleura bare except for one fine bristle near upper posterior angle on mesopleura; scutellum with two long apical and two much shorter and finer lateral bristles; wing as in figure 5, *b*.

Genotype, *Neohydrellia hivaoae*.

#### *Neohydrellia hivaoae*, new species.

##### Male

Head black. Frontal triangle distinctly shining, occupying almost all of the frons except a very narrow side strip, which is enlarged anteriorly into a deep velvety black triangle; frons at vertex not sharp, distinctly rounded, its length in center about equal to half its vertical width, only the inner incurved vertical and divergent proclinate ocellar bristles present; ocelli in a triangle on a slightly raised central base, distance across posterior pair hardly more than half that from either to nearest point of eye; no orbital bristles, merely a few very minute hairs on each side of anterior half; triangle appearing to merge into the similarly colored lunule and interantennal carina, the latter not prominent. Head in profile as in figure 5, *a*; face glossy black in center, with microscopic transverse striae on lower half, the upper half slightly more sharply convex; parafacials densely brassy yellow dusted, and the sides of face narrowly, but more silvery, dusted, the strip on each side with the inner margin straight so that the width becomes greater as the face widens below the eye; each side of face with four or five very fine hairs in a series on lower half; epistome transverse; labrum retracted. Antennae brownish black, lower third of third segment fulvous yellow; second segment with some fine hairs, longest at apex below; third segment downy, over 1.5 as long as wide, with upper apical angle more narrowly rounded than the lower one; aristae with the longest hairs on

upper surface about twice as long as its basal diameter, those on lower surface shorter.

Thorax shining black, mesonotum with brown dust on disc, more greyish dusted on sides, the pleura more densely grey dusted. Mesonotum in addition to the pair of strong dorsocentrals with a series of very minute hairs running forward from them to, or nearly to, the anterior margin, and with one or two similar hairs only in the acrostichal series.

Abdomen colored as mesonotum, less distinctly dusted, and with a slight coppery sheen.

Legs honey yellow, apices of tarsi slightly browned, no outstanding bristles present.

Wings brownish hyaline, veins brown (fig. 5, *b*).

Knobs of halteres honey yellow.

Length, 1.5 mm.

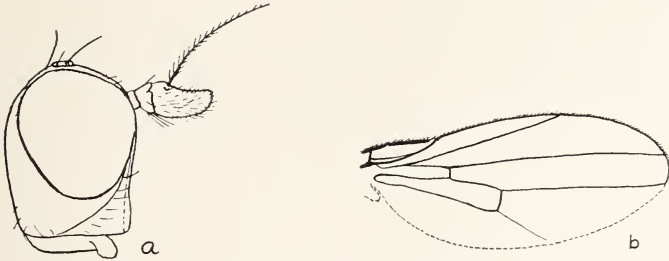


FIGURE 5. *Neohydrellia hivaoae*: *a*, head in profile; *b*, wing.

Hivaoa: Tahauku, near shore, July 10, 1929, type and one paratype, Mumford and Adamson.

This genus is similar in some respects to *Hyadina* Haliday, especially the segregate containing the two New Zealand species, but the latter though having the same cephalic and thoracic bristling have the wings marked and the face with the entire surface dusted.

#### Genus PHILYGRIOLA Hendel

This genus was erected in 1917 for the reception of *picta* Fallen, a European species which has been recorded also from North America. The distinguishing characters separating it from *Philygria* Stenhammer (= *Hyadrina* Robineau-Desvoidy) as given by Hendel and afterwards accepted by Becker in his paper on the Palearctic species lie in the presence of but two instead of three pairs of dorsocentrals, and the short-haired upper side of the arista. There is one species in the Marquesas Islands material which is evidently undescribed.

#### **Philygriola monticola**, new species.

Female

A small species with black thorax and abdomen bearing whitish dusted markings, fuscous marked wings (fig. 6, *b*), and black and yellow legs.

Head discolored in type, but the face showing yellowish centrally below, and the frons deep black in center and grey dusted on sides. Profile as in figure 6, *a*; frons nearly one-half of the head width, very short in center, where it is much depressed in front and roundly emarginate behind, both pairs of vertical bristles present and quite long, the inner pair longer than the outer, ocellars about as long as the outer verticals, orbits without distinct bristles, with one or two microscopic hairs. Antennae fuscous, third segment fulvous yellow, darkened on upper margin; aristaе much longer-haired above than in the genotype; labrum and palpi dark.

Thorax greasy, but with traces of pale grey dust on mesonotum. The anterior pair of long dorsocentrals close behind suture, both notopleurals rather weak, no acrostichal hairs evident in type; scutellum with one long apical, and one shorter lateral, pair of bristles; mesopleura with one hind marginal bristle.

Abdomen brownish black, with whitish grey dusting, the second to fourth tergites each with a central and a lateral black mark on dorsal exposure.

Legs brownish black, fore tibiae and tarsi, a narrow median ring on hind tibiae, and the basal four segments of mid and hind tarsi, whitish yellow. No bristles developed.

Wings greyish hyaline marked with fuscous as in fig. 6, *b*, the spots in submarginal cell not constant, and some of them, notably the one from apex of second vein, the one in second posterior cell, and the one on center of fifth vein, usually with more or less distinct spur veins inclosed.

Length, 1.25 mm.



FIGURE 6. *Philygriola monticola*: *a*, head in profile; *b*, wing.

Hivaoa: Kopaafaa, altitude 2,800 feet, February 25, 1930, beating on *Sclerotheca* species, type, Mumford and Adamson.

The different hairing of the upper side of the aristaе and the spur veins of the wings might be utilized as generic criteria by some workers, but I prefer to give a wider scope to the genera rather than to erect others, unless too much violence is done to the system by the former course, so leave the species in *Philygriola*.

#### FAMILY TETHINIDAE

This family is rather doubtfully entitled to the rank given it by Hendel, but owing to the small amount of importance attached to the occurrence of the single species in this collection I prefer not to go into the matter of its status herein.

The character of the frons is the principal one distinguishing it from most of the related groups dealt with in this paper, the interfrontalia having

crossed central bristles extending from the anterior ocellus to the anterior margin. This is a character met with in some members of the preceding family, but the wing venation is more complete here.

I cannot identify the following species as having been described by previous writers on the group and present a full description below.

**Tethina lasiophthalma**, new species.

Male

A fuscous species, with the thorax and abdomen rather densely grey dusted, the head mainly orange-yellow, third antennal segment dark above, and the legs yellow except the dark apical segment of the tarsi. Wings hyaline.

Head orange-yellow, ocellar spot, vertex, and upper half of back of head fuscous, the latter with two white dusted marks just above neck in center, frontal orbits narrowly grey dusted, third antennal segment more or less broadly infuscated above and at apex, arista fuscous, palpi yellow; all hairs and bristles black. Frons at vertex over one-third of the head width, each orbit with three strong bristles, the upper one less distinctly outwardly curved than the other two and very slightly higher than the anterior ocellus, the anterior two markedly outwardly curved and stronger than the upper; interfrontalia with a slightly differentiated greyish stripe on each side of central line, convergent anteriorly, and with some fine hairs and two stronger incurved or cruciate bristles; orbits with two series of minute hairs, the inner curved inward, the outer curved outward; all four verticals and the ocellars strong, postvertical minute, divergent; eyes densely short-haired, occupying almost all the side of head, the parafacials showing as a mere line in profile, gena about one-eighth of the eye height; third antennal segment a little longer than wide, broadly rounded at apex; arista with the longest hairs fully as long as its basal diameter; two or three of the marginal genal bristles immediately behind the vibrissa upwardly curved and stronger than it; proboscis stout.

Thorax fuscous, densely grey dusted and but slightly shining, the humeri, sutures of pleura, and generally the margin of the scutellum showing slightly tawny yellow, no mesonotal vittae. Dorsocentrals 1 + 3, humeral, notopleural, presutural, and prescutellar acrostichal, bristles well developed; prealar short but distinct; mesopleura with two hind marginal bristles, sternopleura with one; stigmatal and propleural bristles present; basal pair of scutellars almost as long as the apical pair; intradorsocentral setulae in six series; all hairs and bristles black.

Abdomen colored as thorax, the apices of the tergites brownish yellow. Hairs and bristles black.

Legs yellow, apical segment of all tarsi fuscous. Hairs black.

Wings greyish hyaline, veins brown. Inner cross vein below or slightly proximal of level of apex of first vein and not over two-fifths from base of discal cell, ultimate section of fifth vein subequal to penultimate section of fourth, the latter not over half as long as ultimate section of fourth.

Halteres yellow.

Length, 2 to 2.5 mm.

Hivaoa: Tahauku, seashore, July 10, 1929, type, male, allotype, and three male paratypes, Mumford and Adamson.

Other paratypes as follows:

Tahuata, Hanahevane Valley, seashore, July 15, 1930, LeBronnec and H. Tauraa.



Fatuhiva: Omoa [Oomoa] Valley, near seashore, August 21, 1930, Le-Bronnec.

Fiao: Vaituha, October 2, 1929, at light, Adamson.

All the species as far as known frequent the seashore and possibly this one will be found on other islands in the group with Hivaoa, and even in the other group.

Both the species described by Lamb from the Seychelles and placed in *Rhinoëssa* are much paler in color, with yellow or ferruginous bristles and hairs; Bezzi has placed *Rhinoëssa ferruginea* Lamb as a synonym of *sexseriata* Hendel in his paper on the Diptera of Fiji, the latter having been described from Formosa. The Australian species *nigriseta* Malloch has quadriseriate intradorsocentral setulae and the basal pair of bristles on the scutellum about half as long as the apical pair in addition to several other distinguishing characters.

#### FAMILY AGROMYZIDAE

I have found but one genus of this family amongst the Marquesan material and of this but one species, represented by a single much-damaged specimen. It is possible that intensive collecting, and especially in the larval stages in mines in leaves, will produce a number of native species.

#### Genus MELANAGROMYZA Hendel

This genus is rather poorly differentiated from the other segregates into which Hendel recently separated the old genus *Agromyza* Fallen, the character of the subcostal vein being distinct or fused with the radial vein being difficult to determine, but in the matter of relationships it appears to me that the species that have the knobs of the halteres black are more closely related to each other than any of them are to the groups in which these organs are yellow, so I accept the name herein, though with reservations as to its claim to distinct generic rank. The species in the collection lacks a well-defined central carina between the bases of the antennae, and has but one bristle on the vibrissal angles instead of a fasciculus so that it may be separated from those that are referable to *Ophiomyia* Brash., in which group such species as *Agromyza lantanae* Froggatt fall. I have some hesitation in describing the following species because of the fragmentary condition of the specimen, but it appears to be distinct from any other known to me, and having been reared it may be the more probably subsequently identified so I am giving it a name for future use in connection with the fauna of the islands.

**Melanagromyza marquesana**, new species.

## Male

An entirely black species, with shining black abdomen and thorax, and greyish hyaline wings.

Head including the antennae and palpi entirely black, hairs and bristles concolorous. Profile as in figure 7; aristae bare; face with a narrow central vertical carina which widens between the bases of the antennae, but is nowhere prominent; frons in type partly collapsed so that it is not possible to be exact in either its proportions or armature, but it is apparently distinctly longer than its width at vertex, the frontal triangle does not extend to middle, and the orbits are rather glossy and narrow.

Thorax glossy black, with two pairs of postsutural dorsocentrals, one pair of pre-scutellar acrostichals, and eight or ten series of intradorsocentral setulose hairs.

Abdomen shining black, tapered to apex, sixth tergite about 1.5 as long as fifth, and twice as long as the basal swollen segment of hypopygium.

Legs black, rather stout, fore femur without well-developed posteroventral bristles; mid tibiae broken off so that it is impossible to tell if there are any posterior median bristles.

Wings greyish hyaline, veins black, only the base of one wing present, which shows the venation as follows: discal cell ending well before the middle of wing, inner cross vein distinctly beyond apex of first vein and at one-third or less from apex of discal cell, the outer cross vein at not over its own length from inner and about one-third as long as discal cell.

Squamae dark grey, with fuscous margin and fringe. Halteres with black knobs. Length, 2 mm.

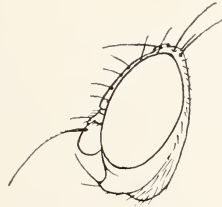


FIGURE 7. *Melanagromyza marquesana*, head in profile.

Hivaoa: Kopaafaa, February 26, 1930, type, pupa in leaf of *Sclerotheca* species emerged March 1 to 5, 1930, Mumford and Adamson.

Apparently nearly related to *alysicarpus* Bezzi, but larger, with more numerous intradorsocentral setulose hairs, and wider frons. Bezzi's species was described from Fiji, where the larvae were taken mining the leaves of *Alysicarpus vaginalis* D. C. Another closely related species is *phascoli* Coquillett, the widely distributed Oriental bean-fly, but the latter has a more greenish or bluish body and white squamae.

## FAMILY DROSOPHILIDAE

I have in a preceding paper reported on a few of the more interesting species of this family, but have as yet not had the time available to make identifications of the large number of specimens in the collection, particularly

of those belonging to the genus *Drosophila* Fallen in the wide sense. I present below some additional data on the family.

It may be of interest to note here that the Marquesan fauna is, on the basis of this collection, less diversified in so far as this family is concerned than that of the Samoan or Hawaiian groups. There is, however, a much greater diversity of the forms related to and belonging to *Scaptomyza* than is the case in either of the other two island groups, a fact that will be more emphasized when I publish my report<sup>5</sup> on the Samoan species.

#### Genus MYCODROSOPHILA Oldenberg

##### ***Mycodrosophila halterata* Malloch.**

This species, which is closely related to *gratiosa* de Meijere, was originally described from Society Islands, the type and one other specimen from there being now before me.

Tahuata: Tehue Valley, altitude 800 feet, May 27, 1930, 5 specimens, sweeping over grasses, LeBronnec and H. Tauraa.

Possibly searching on fungi would reveal this species, and perhaps others, in numbers, as the related species stick rather closely to the vicinity of their food plants and are more readily obtained from the under sides of fungi than by any other manner of collecting.

#### Genus DROSOPHILA Fallen

Within recent years Dr. O. Duda has proposed a number of new genera and subgenera for the reception of species previously placed in *Drosophila*, and besides the latter in its restricted sense there is before me one of the named segregates, *Spinulophila* Duda, which group contains a number of species all having the apical half of the anteroventral surface of the fore femora in both sexes furnished with a series of short but stout closely placed black spines. I am using for the segregate the first name proposed for it by Duda, although later on he changed it to *Acanthophila*.

##### ***Drosophila (Spinulophila) nasuta* Lamb.**

General color tawny yellow, with the frontal orbits generally whitish dusted in the male, and in well-preserved specimens also in the female; when seen against the light the entire frons of the male is usually whitish dusted, and there are no definite dark marks on the abdomen. The outer cross vein of the wing is very slightly clouded. Apart from the fore femoral armature of both sexes there is no abnormal armature of either the tibiae or the tarsi.

Length, 2 to 3.5 mm.

A very large number of specimens from various islands as follows:

Hivaoa: Tanaeka Valley, altitude 1,450 feet, June 4, 1929; Atuona Valley, altitude 325 feet, July 6, 1929; Mumford and Adamson.

<sup>5</sup> Insects of Samoa, manuscript in preparation.



Tahuata: Vaitahu Valley, altitude 100 feet, June 11, 1930; Tehue Valley, altitude 650 feet, May 27, 1930; LeBronnec and H. Tauraa.

Fatuhiva: Teavaitapu Valley, altitude 350 feet, August 23, 1930, LeBronnec.

Uahuka: Pouau, Hokatu Valley, altitude 500 feet, March 9, 1931, LeBronnec and H. Tauraa.

In addition to the above there are specimens from Tahiti, Society Islands, Papenoo Valley, 10 kilometers from the sea, altitude 150 meters, October 23, 1928, A. M. Adamson.

Originally described from the Seychelles, and probably distributed over most of the Pacific islands.

I am accepting as this species one that is very common in the collection and appears to be quite widely distributed, as there are specimens that appear to belong to it in material I have examined from Samoa, Society Islands, and the Marquesas. I have a very strong suspicion that this is also the species described by Duda as *albovittata* and by Bezzi as *bilimbata*, the latter being from Fiji. As the larvae feed in decaying fruits, there is a likelihood that it is generally distributed throughout the Indo-Australian region.

***Drosophila (Drosophila) ampelophila* Loew.**

This very widely distributed species is readily known in the male sex by the presence of a comb of short, stout, glossy, black bristles on the apical half of the outer side of the fore metatarsus. The female lacks this comb and is less readily distinguished from such species as the next one listed herein.

Hivaoa: Matauuna, altitude 3,700 feet, March 2, 1930, Mumford and Adamson.

Tahuata: Hanamiai, altitude 150 feet, May 28, 1930, on rotten mangoes, LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 18, 1930, 1 doubtful male specimen, at light, LeBronnec.

***Drosophila (Drosophila) errans*, new name.**

*Drosophila similis* Lamb, Trans. Linn. Soc. London, 16, pt. 4, p. 347, 1914; not Williston, 1896.

This species resembles *D. ampelophila* but lacks the comb on the fore metatarsus, and has the dorsal hairs and preapical dorsal bristle on the fore tibia in the male more erect, longer, and slightly curled. The two basal segments of the fore tarsi in the same sex have the ventral setulae arranged in transverse series that are quite conspicuous when seen transversely and as well figured by Lamb in the paper in which he originally described the species from the Seychelles. This same figure shows the peculiar curved dorsal hairs of the fore tibia, although these are not mentioned in the description.

Apparently a common species, occurring with *D. nasuta*, some of the specimens of both species bearing labels stating that they were taken on horse manure and rotten mangoes.

On the islands Fatuhiva, Hivaoa and Tahuata, from near sea level to an elevation of 2,150 feet (Fatuhiva, August 25, 1930).

It is quite possible that this species has been described by some other worker besides Lamb, but I have been unable to identify it as any such species, and having been unable also to discover any new name having been proposed for the species I am substituting for *D. similis* Lamb, the new name given above.

### Genus SCAPTOMYZA Hardy

I have already presented a summary of the more typical species of this genus occurring in the Marquesas Islands, and now describe a species that differs from the others very markedly in possessing a pair of strong acrostichal bristles close to the suture on the mesonotum. In the structure of the face and the hairing of the central area of the mesonotum it agrees with the genotype, but there are other differences that will be noted in the description of the species given below.

#### *Scaptomyza mumfordi*, new species.

##### Male

A dark species, with yellowish grey frontal triangle and orbits, yellow antennae of which the third segment is almost white, yellowish to brownish grey dusted trivittate mesonotum, glossy brownish black abdomen, yellow legs except the femora, which are fuscous, and hyaline wings.

Head brown, frontal orbits and triangle yellowish, with grey dust, paler in front, the orbits widened at anterior margin and the triangle carried to center of frons, the intervening parts of the interfrontalia reddish brown, forming a broad V. All four vertical, the ocellar, and upper reclinate orbital, bristles long, the postvertical pair about as long as the proclinate orbital, the anterior orbital a short hair, nearer to proclinate than to reclinate bristle and slightly nearer to eye than the former, no hairs on anterior margin of interfrontalia. Face with a narrow central vertical carina which is widened below, but separated from the epistome by a distinct transverse furrow, general color black, the parafacials yellow, carina greyish on center. Width of face at vibrissae hardly more than half of that at bases of antennae; epistome convex, not higher than lower extremity of carina, both slightly visible in profile. Gena linear, yellow; vibrissa rather short, a fine setula below it and the lower genal margin with some fine hairs. Eye higher than long, the lower half of hind margin slightly emarginate, the facets almost uniform in size, the hairs dense, erect and stiff, longer in front, tapered off behind. Antennae yellow, third segment almost white; aristae dark, with five or six rays above and one or two below. Palpi fuscous.

Thorax fuscous, densely yellowish to brownish grey dusted, the mesonotum with three dark brown vittae, the usual bristles present, the acrostichal hairs in two series, with a pair of quite conspicuous bristles at or close to the suture, the prescutellar acrostichals undeveloped, dorsocentrals two pairs, with a much weaker anterior pair usually present, one humeral, and the posterior notopleural and postalar short; scutellum flattened above and with a slight marginal rim.

Legs normal, hairs on dorsal surfaces of fore tarsal segments slightly longer than on the other tarsi.

Wings hyaline, veins brown, slight clouds over both cross veins and in marginal cell below apical third of first vein, inner cross vein slightly beyond apex of first vein, penultimate section of fourth vein a little less than half as long as ultimate one, subequal to penultimate section of costa and 1.5 as long as ultimate section of fifth, ultimate section of costa half as long as penultimate.

Halteres yellow.

#### Female

Differs from the male in having the frontal orbits, triangle, and parafacials brownish yellow, and the third antennal segment also brown.

Length, 2 to 2.5 mm.

Uapou: Hakahetau Valley, altitude 1,000 to 2,000 feet, January 29, 1930, type, male, allotype, and a large number of paratypes of both sexes, on the wing, Whitten.

Other paratypes as follows:

Hivaoa: Tanaeka Valley, altitude 1,100 feet, June 4, 1929; Tapeata, east slope of Mount Ootua, altitude 2,500 feet, May 25, 1929, on *Papsalum conjugatum*; Ootua Spring, altitude 2,500 feet, February 13, 1930, in flowers of *Zingiber* species; Mumford and Adamson.

Tahuata: Hanamiai Valley, altitude 1,000 feet, May 28, 1930; Tehue Valley, altitude 800 feet, May 27, 1930, sweeping over grasses; Hanamiai Valley, altitude 1,300 feet, June 4, 1930, and altitude 1,600 feet, May 28, 1930; LeBronnec and H. Tauraa.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1,600 feet, August 29, 1930, sweeping herbage, LeBronnec.

Uapou: Hakahetau Valley, altitude 1,200 feet, December 6, 1929, Adamson.

#### FAMILY BORBORIDAE

I have been unable to examine thoroughly the material in this family, but can report that it belongs entirely to the genus *Leptocera* Olivier in the wide sense, no species of *Borborus* Meigen or *Sphacrocera* Latreille, the two other most widely distributed genera, occurring, though at least the former ought to be found in the Marquesas.

The larvae of all the species are found in manure, decaying vegetation, or in a few cases in fungi or nests of Hymenoptera.

One small species that is present appears to be *Leptocera* (*Scotophilella*) *puerula* Rondani as identified by Duda, but the identification of the Marquesan specimens is only tentative. Bezzi has recorded the species from Fiji. There are no specimens of *Leptocera* (*Coprophila*) *ferruginata* Stenhammer, nor *Leptocera* (*Pocilosomella*) *punctipennis* Wiedemann, in the collection, both these being recorded from Fiji by Bezzi, and the last named

represented by many specimens in my hands from the Society Islands. It is very widely distributed over the tropical and subtropical portions of both hemispheres. Although *L. ferruginata* is found commonly in more northern latitudes in both hemispheres, it also is widely distributed in subtropical portions as it is a more general feeder, frequently feeding in the larval stages in dead fish and carrion. Both these species may be expected to occur in the Marquesas group.

As far as I can determine at present there are three species in the collection, all less than 1.5 mm. in length on the average. One of these is represented by only two females, and belongs to the subgenus *Coprophila*; it appears to be undescribed, but I leave it aside pending receipt of more material and specimens of the male. The other one is a *Scotophilella*, closely resembling *S. albinervis* Duda, but there are some points in which it differs from that species, and meanwhile I prefer to leave it as a possible undescribed form, hoping later to return to it in connection with a survey of the family from other groups of Pacific Islands.

#### FAMILY SAPROMYZIDAE

When I made my preliminary report on the above family from the Marquesas I had three specimens before me that required some further study before I cared to commit myself to a generic identification, and in the hope that more specimens would be found before a final disposition had to be made of them I refrained from making an attempt to work out their relationships. Now in order to record the occurrence of these specimens I have been compelled to attempt their elucidation without further additions, and present my deductions.

In the family much weight has been placed upon the presence or absence of the posthumeral or presutural bristles on the mesonotum in distinguishing genera in one of the subfamilies, and as a general rule the bristle is either invariably present or invariably absent in certain genera which as a rule are readily distinguishable also on the basis of other characters. In *Trigonometopus* Meigen the presutural bristle is absent, while in *Sapromyza* Fallen and similar genera it is present and generally quite strong. It must be borne in mind that genera are merely convenient means of segregating groups of more or less closely related species in accordance with the ideas of certain specialists in classification, and that the acceptance of one or more structural characters for such separations by the original describer of a genus does not necessarily bind subsequent workers to accept the same characters for that purpose, though of course any redefinition of any particular genus must of necessity be such that it will admit the genotype. In my recent paper on the Oriental species of this family I attempted to bring together in key form



the genera related to *Trigonomctopus* Meigen, and in another key those related to *Trigonometopsis* Malloch. In the first-mentioned group those species that lacked the presutural bristle were listed, and in the other those that possessed it were included. In the two groups the venation of the wings is identical with that of *Sapromyza*, having the costa to apex of fourth vein and the short closely placed black setulae ceasing about midway between the apices of second and third veins, instead of at apex of third as in *Homoneura* Van der Wulp. All genera related to *Trigonometopsis* have the dorsocentral bristles on the mesonotum in three pairs, the anterior pair presutural, the others postsutural. Included in the latter group there were four genera in addition to *Trigonometopsis*, namely, *Maquilingia* Malloch, *Kerteszmomyia* Malloch, *Panurgopsis* Kertész, and *Chaetolauxania* Kertész. The two species now before me do not lend themselves readily to assignment in accordance with the characters listed above. One of them has the presutural bristle present, though it is not very strong and is slightly nearer to the central line of the mesonotum than usual, and the other lacks this bristle. Thus we are faced with the problem of placing the species in one of the old genera despite the fact that one of them will not fit perfectly into the scheme, or else erecting one or two genera for their reception. A careful study of the species convinces me that they are closely related, and they must be accepted as congeneric, the variation in the development of the presutural bristle notwithstanding. My conviction is that the two species are offshoots from the stem from which *Prochaetops* Bezzi was derived, and that they are not at all closely related to *Trigonometopus*. I consequently erect for their reception the new genus described below.

#### Genus **CHILOCRYPTUS**, new genus

Head much as in typical *Sapromyza*, all the bristles well developed, both pairs of orbitals reclinate; postvertical pair well below vertex; third antennal segment a little longer than wide, rounded at apex, basal segment shorter than second; arista bare. Mesonotum with 1 + 2 pairs of dorsocentrals; the presutural lacking or rather short; scutellum flattened and bare on disc, subtriangular, with four bristles; sternopleurals 2, anterior one shorter than the posterior one; propleural long. All tibiae with well-developed preapical dorsal bristle; fore femur without apical anteroventral comb. Wing venation as in *Sapromyza*; upper and lower surfaces of the costal vein both with a series of fine setulae in addition to the series on the anterior edge. Claws of fore tarsi of males minute, almost hidden.

Genotype, *Chilocryptus bilincatus*.

The two species may be distinguished as follows:

- A. Head including the antennae and palpi pale stramineous, only the ocellar spot faintly brownish; mesonotum with a dark brown line from base of the anterior pair of dorsocentrals to hind margin; scutellum entirely yellow.....**bilineatus**
- AA. Head stramineous, with brown or fuscous marks as follows: on ocellar triangle, on outer side of basal segment of antennae and at insertion of the arista on third segment, apices of palpi, and a central spot on face; mesonotum with four fuscous vittae, the inner pair along the lines of dorsocentrals, but much wider than in the above species and carried along the sides of the scutellum, but not round the apex, the outer vittae between these and the lateral margin.....**quadrilineatus**

### *Chilocryptus bilineatus*, new species.

#### Male

A very pale yellow species, with the mesonotum marked by two dark lines from anterior dorsocentrals to hind margin.

Head in profile as in figure 8, frons at upper angles of eyes, which are almost in transverse line with the posterior ocelli, over one-third of the head width, narrowed to anterior margin, where it is barely two-thirds as wide, the surface with a few short hairs on anterior half or less; all the bristles long, and, like the hairs, pale yellow.

Thorax stramineous, with the two vittae well defined, but mere lines which do not extend in front of the presutural dorsocentrals nor beyond hind margin; all the bristles except the presutural (posthumeral) well developed, the latter short and fine and rather nearer to dorsocentrals than usual, possibly only occasionally present; prescutellar acrostichals lacking; intradorsocentral hairs in four series in addition to the one in line with the dorsocentrals, the outer one on each side irregular; all hairs and bristles yellowish brown, or yellow.

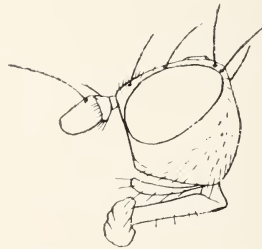


FIGURE 8. *Chilocryptus bilineatus*, head in profile.

Abdomen stramineous, tapered apically, with yellow hairs and bristles; hypopygium small, with two finger-like processes.

Legs stramineous, with pale hairs and bristles, the claws on mid and hind tarsi brown, the apical segment of fore tarsus produced somewhat shelf-like over the claws and with a series of marginal setulose hairs that are as long as the segment, the pulvilli also enlarged and with dense downy hairs, the claws minute, almost invisible between the fifth segment of tarsus and the pulvilli.

Wings hyaline, the veins yellow, the apical section of third, fourth, and all of fifth a little darker. Costal vein with the usual series of short closely placed stout spinules on the upper anterior edge from near humeral cross vein to beyond apex of second, a more widely spaced series of longer and much finer hairs on the lower anterior edge, and two series of short, rather widely spaced setulose hairs, one in center below and the



other in center above on the same extent as that of the stout spinules. Inner cross vein almost below apex of first vein and slightly beyond middle of discal cell; first posterior cell not narrowed at apex; ultimate section of fourth vein about 2.5 as long as penultimate; ultimate section of fifth vein not entirely attaining margin of wing, as long as outer cross vein.

Squamae and halteres yellow.

Length, 3 mm.

Uahuka: crest of north ridge, altitude 2,000 feet, September 29, 1929, type, miscellaneous sweeping, Adamson.

### **Chilocryptus quadrilineatus**, new species.

#### Male

A rather larger and more robust species than the foregoing one, with four dark mesonotal vittae, the head marked with fuscous, and the bristles and hairs, especially on the head and thorax, fuscous.

Structure of head and its chaetotaxy as in *C. bilineatus*, but the arista longer.

Thorax differing in the presence of four dark vittae, the one along each series of dorsocentrals much wider, extending slightly in front of the presutural dorsocentrals and along the sides of the scutellum to the bases of the apical bristles, and the intra-dorsocentral hairs more distinctly quadriseriate.

Wing veins a little darker than in *C. bilineatus*, the outer cross vein very faintly clouded with pale brown.

In other respects similar to the genotype, the fore tarsi similarly formed.

#### Female

Differs from the male in having a larger dark central spot on the face, the abdomen stouter and more tapered to apex, the fore tarsi with the claws of moderate length and similar to those of the mid and hind pairs, and both cross veins slightly clouded with brown.

Length, 3.5 to 4 mm.

Nukuhiva: Puokoke, Tunoa Ridge, altitude 3,485 feet, October 22, 1929, type, male, on shrub, field number 565, Mumford and Adamson.

Uahuka: Hitikau Crest, altitude 2,850 feet, March 4, 1931, allotype, on *Weinmannia* species, LeBronnec and H. Tauraa.

I have very little hesitation in associating the sexes above as one species, but subsequent collecting may disprove my determination.

## FAMILY CHLOROPIDAE

I have already submitted a partial report on this family, but have a number of additional species before me and now present some data on these. All of the genera so far submitted to me belong to the subfamily Oscinosominae. This is as might be expected, the Chloropinae being much rarer in the Indo-Australian region than the other subfamily, and this is especially the case in the Pacific islands.

## Genus CADREMA Walker

This is the same generic concept as *Hippelates* Loew, though there is some doubt about the synonymy. Several recent writers on the family have accepted the present assignment and it appears better to follow this course than to revert to the old generic name which was proposed for a North American species, in which region the genus is very well represented. I have recently described one species from New Zealand and several from Australia. As far as I know now the genus is almost cosmopolitan in its distribution, though the records of its being a pest to man in the habit of settling on the face, and especially in the eyes, are reported only from North America.

**Cadrema bicornis**, new species.

Male and Female

A yellow species, with black markings on head and thorax, and most of the abdomen glossy black. Wings hyaline.

Head in profile as in figure 9, honey yellow, with a dark mark on each side of occiput,



FIGURE 9. *Cadrema bicornis*, head in profile.

a small central mark over ocelli, the arista, and antennae above a line drawn from lower edge of arisal insertion to base of third segment in line with the lower level of apex of second segment black. Frons at vertex as wide as long in center, gradually but slightly narrowed to anterior margin, the four vertical bristles moderately long, ocellars short, erect, and cruciate, each orbit with three or four rather well-developed bristles and a number of minute hairs, all black, triangle almost filling the vertex, extending to anterior margin, with a series of black hairs along each side, the two near apex longer than the others. Face narrowed below; eyes with rather sparse, but quite evident, pale hairs; vibrissae and genal hairs yellow; palpi yellow; third antennal segment reniform; arista, haired.

Thorax glossy yellow, with the usual three black vittae fused and forming a large discal mark, which is incised slightly on each side at suture and tridentate on hind margin, only the central tooth extending to posterior margin; humeri yellow; pleura without dark markings; scutellum flattened on disc, with a slight marginal rim, slightly emphasized by the dark edges against the yellow disc, the surface hairs short and set in slight punctures, as are those on the mesonotum, the marginal bristles consisting of two at apex and one shorter on each side, notopleurals 1 + 2 as usual, postnotum black in center.

Abdomen glossy brownish black, narrowly yellowish at base.

Legs yellow, fore femora usually slightly browned above centrally. Femora not noticeably thickened; hind tibial spur about as long as diameter of apex of tibia.

Wings hyaline, venation normal, third vein slightly upwardly curved at apex so that the first posterior cell is widened at tip.

Halteres yellow.

Length, ♂ to 2.5 mm.

More than 50 specimens. Type, allotype, and paratypes as follows:

Uahuka: Putataua, Vaipae Valley, altitude 880 feet, September 20, 1929, type, male, allotype and two paratypes, Adamson.

Hivaoa: Mt. Temetiu, altitude 2,800 feet, August 3, 1929; Atuona Valley, altitude 325 feet, July 6, 1929; Mumford and Adamson.

Fatuhiva: Hanavave Valley, altitude 50 feet, September 9, 1930, sweeping over *Paspalum conjugatum*; Teavaitapu Valley, altitude 350 feet, August 23, 1930; LeBronnec.

Society Islands, Tahiti: up to 1,000 feet, September and December, 1928, Mumford and Adamson.

### Genus TRICIMBA Lioy

This genus is closely similar to *Oscinosoma* Lioy, differing from it in having the mesonotum with two or three well-developed longitudinal sulci.

**Tricimba adamsoni**, new species.

#### Male

A very small brown species, with yellow legs and centrally browned femora.

Head dark brown, anterior third of the frons orange-yellow, more narrowly so on sides; face dark brown, shining; genae brownish yellow; antennae brown, third segment becoming yellow below; palpi testaceous yellow; hairs and bristles yellow. Thorax fuscous, densely grey dusted, slightly shining, the mesonotal sulci brownish behind; scutellum colored as mesonotum. Width of frons at vertex about equal to its length, slightly narrowed to anterior margin, the bristles very short, surface with a few very short hairs, those along the orbits rather close, but inconspicuous. Antennae of moderate size, third segment disc-like; arista nude or almost so and not over 1.5 as long as width of third antennal segment; palpi normal; face without a definite central carina; eyes with very sparse short hairs; gena about half as high as width of third antennal segment and equal to postocular orbits near middle of eye. Mesonotum with but two sulci, which are shallow, impunctate, and present only behind suture, narrow in front and widened behind, the surface with short, yellow, stiff hairs, three series between the sulci posteriorly. Scutellum flattened above, about 1.5 as long as its basal width, tapered to apex, where it is not one-third as wide between the apical bristles as it is at base, the surface with many short, decumbent, stiff, pale bristles, those on the edges longer, and the apex with two stronger rather closely placed bristles.

Abdomen brown above, pale below, tapered to apex, with very short hairs which are finer than those on the mesonotum.

Legs testaceous yellow, mid and hind femora distinctly browned in middle.

Wings hyaline, veins dark brown, first posterior cell slightly widened at apex, outer cross vein oblique, ultimate section of fifth vein subequal to penultimate section of fourth, third section of costa about 1.5 as long as fourth and over one-half as long as second.

Halteres yellow.

Length, 1.25 mm.

Eiao: near center of island in coconut plantation, altitude 1,450 feet, October 1, 1929, type, Adamson.

The smallest species of the genus known to me. Differs from the Seychelles species *trisulcatus* Lamb in size, lack of central mesonotal sulcus, and

other characters, and from the Australian species in lack of a facial carina and several other characters.

#### Genus OSCINOSOMA Lioy

I have already described one species of this genus from the Marquesas and below I add one other.

#### *Oscinosoma bicoloripes*, new species.

##### Male and Female

A glossy black species, with the coxae and femora black and the tibiae and tarsi clear yellow. Wings hyaline.

Head black, anterior margin of frons, sides and lower part of face, and bases of antennae yellowish, third antennal segment infuscated except at base; palpi fuscous; all hairs and bristles fuscous. Frons at vertex much widened from upper angles of eyes backward, at the latter, which are almost in line with the posterior ocelli, the width is about two-fifths that of head and as great as its length in center, the surface with numerous stiff black hairs, longer in front, the orbits each with four well-developed setulose hairs; triangle largely glossy black, slightly dusted in front, the sides almost straight, tip acute, at anterior margin of frons; ocelli forming a very small triangle; vertical bristles well developed, rather pale; ocellars short, erect, and cruciate. Eyes in profile almost twice as high as long, with sparse, short, fine, pale hairs; gena linear, vibrissa small, but distinct; head from in front more than 1.5 as wide as high, wider than thorax, the face dusted, concave in center, the epistome very slightly carinate, width at vibrissal angles hardly more than half that of eye on same plane. Antennae of moderate size, third segment higher than long, broadly rounded in front; aristae with short hairs.

Thorax entirely glossy black, mesonotum slightly and microscopically shagreened or alutaceous on disc, the hairs rather pale, numerous and decumbent, upper posterior notopleural undeveloped, scutellum convex on disc, rounded in outline, disc haired, margin with two apical and two shorter subapical bristles.

Abdomen shining black.

Legs clear yellow, coxae and femora shining black, the apices of latter in the male narrowly yellow.

Wings hyaline, veins pale brown.

Length, 1.5 to 2 mm.

Type, allotype, and fourteen paratypes as follows:

Eiao: Vaituha, altitude 200 feet, October 3, 1929, type, male, and allotype; near center of island, altitude 1,665 feet, September 28, 1929, altitude 1,400 feet and 1,855 feet, September 29, 1929, Adamson.

Hivaoa: Tahauku, near shore, July 10, 1929, Mumford and Adamson.

Fatuuku: September 19, 1930, H. Tauraa.

Uahuka: Putatauaa, altitude 880 feet, September 20, 1929, Adamson.

#### FAMILY PHORIDAE

The great majority of the members of the family Phoridae are either carnivorous or fungivorous in the larval stages, but some of them are parasitic on insects. The few that are present in the Marquesan material are of

the first listed class, one species of *Dohniphora* being possibly a feeder on dead molluscs or similar matter.

Genus DOHRNIPHORA Dahl

**Dohniphora** species.

A male specimen with black mesonotum and scutellum, yellow pleura, black spots on each side of second to fifth tergites, which are narrowly separated in center, and a broad black apical margin on sixth tergite, the remainder of the abdomen and all of the legs yellow. Wings hyaline, venation similar to that of *D. concinna* Meigen, the costal fringe very short. Halteres yellow. Hind tibia without a basal bristle.

Length, 2 mm.

Hivaoa: Tahauku, seashore, July 10, 1929, Mumford and Adamson.

Genus MEGASELIA Lioy

**Megaselia** species.

A male specimen of a small yellow species, with dorsum of abdomen dark brown. The mesopleura lacks hairs or setulae on the upper posterior angle, and the costal fringe is long, while the third vein extends to beyond the middle of the wing.

Length, 1.75 mm.

Nukuhiva: Teuanui, Toovii, altitude 1,900 feet, October 16, 1929, Mumford and Adamson.

Probably an undescribed species, but it is not desirable to describe it on the basis of the single specimen in rather poor condition.

**Megaselia** species.

A rather larger and stouter species than the one above, and shining black, with the tibiae and tarsi yellow in varying degree.

Length, 1.5 to 2 mm.

Hivaoa: Kopaafaa, altitude 2,770 feet, August 2, 1929, six specimens. Mumford and Adamson.





# ANTHTRIBIDAE FROM THE MARQUESAS ISLANDS\*

By

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The collection of Anthribidae made in the Marquesas Islands by the Pacific Entomological Survey and submitted to me for study contains six species: a new genus *Aethessa*, represented by two species, and a new subspecies of *Phloeobius gigas*, which are described below; the widely distributed *Araecerus vieillardii* and *Mauia subnotatus*; and *Proscopus veitchi*, previously known only from Samoa and Fiji. Of the 165 specimens submitted to me, no less than 150 belong to one species, *Araecerus vieillardii*, which presumably occurs on all of the islands visited by the Survey and perhaps also on all the Pacific islands with the exception of New Zealand.

## Distribution

	ENDEMIC	OTHER	
		PACIFIC ISLANDS	INDIAN OCEAN
1. <i>Phloeobius gigas</i> .....	....	....	×
2. <i>Proscopus veitchi</i> .....	....	×	....
3. <i>Mauia subnotatus</i> .....	....	×	×
4. <i>Aethessa mumfordi</i> .....	×	....	....
5. <i>Aethessa adamsoni</i> .....	×	....	....
6. <i>Araecerus vieillardii</i> .....	....	×	....

Species 2, 4, and 5 are presumably restricted to the Pacific islands; species 6 is essentially Pacific, but is also known from New Guinea and the Philippines; species 1 and 3 are distributed over a large portion of the Oriental region, their ranges extending to Madagascar and the Mascarene Islands. All the anthribids collected in the Marquesas are of an Indo-Pacific type.

With the above collection, specimens representing four species were submitted to me from the Society Islands; my report on these is being published by Bernice P. Bishop Museum. Two of the four species, *Mauia subnotatus* and *Araecerus vieillardii*, were included in both collections.

### ***Phloeobius gigas horaeus*, new subspecies.**

Almost indistinguishable from *P. gigas cervinus* Klug 1833, from Madagascar and the Mascarenes; elytra more diffusely grey, less spotted, the cinnamon lines occupying interspaces II, IV, VI, and so forth, narrower and inconspicuous, apical area more uniformly grey, segment II of all tarsi for the greater part black.

\* Pacific Entomological Survey Publication 7, article 2. Issued March 17, 1933.

Tahuata: Hanahevane, seashore, July 16, 1930, on *Thespesia populnea*; Hanamenino, altitude 30 feet, July 17, 1930, 2 males, 1 female, type male; LeBronnec and H. Tauraa.

Hivaoo: Atuona, May 27, 1929, 1 female, Mumford and Adamson.

In the Papuan and Malaysian *P. gigas gigas* Fabricius 1775, the white spots and cinnamon stripes of the elytra are much more conspicuous.

### **Proscopus veitchi** Jordan.

*Proscopus veitchi* Jordan, Nov. Zool., vol. 31, p. 256, 1924 (Fiji); Insects of Samoa, pt. 4, fasc. 2, p. 164, text-figs. 2, 3, 1928 (Samoa).

Nukuhiva: Teuanui, Tovii [Toovii], October 25, 1929, 2 males, 1 female, Mumford and Adamson.

Hivaoo: Atuona Valley, February 25, 1929, 1 female (2.7 mm.), Mumford and Adamson.

Fatuhiva: Tapuhiva, Hanavave, altitude 500 feet, August 23, 1930, and September 9, 1930, on *Elephantopus mollis*; Otomahe, Omoa [Oomoa] Valley, August 20, 1930, 1 male, 2 females, LeBronnec.

The 2 males from Teuanui are larger than the one from Fatuhiva, with the antenna three times as long as the body and segment IX twice as long as I, being as long as X and XI. Size of brown markings variable, often confluent along suture and along outer margin. Described from Fiji and also recorded from Samoa.

### **Mauia subnotatus** (Boheman).

*Araacerus subnotatus* Boheman: Eugenie's Resa, p. 116, 1859 (Keeling).

*Mauia satelles* Blackburn: Roy. Soc. Dublin, Trans., vol. 3, p. 195, 1885 (Maui).

*Contexta murina* Jordan: Deutsche Ent. Zeitschr., p. 78, 1902 (Ceylon).

Eiao: altitude 1500 feet, April 23, 1931, 1 female on dead wood of *Pisonia* species, LeBronnec and H. Tauraa.

Widely distributed in the tropics of the Old World.

### Genus **AETHESSA**, new genus

Near *Misthosimella* Jordan 1914 and *Misthosima* Pascoe 1859; differs from both in the eye being longer than broad, farther away from the base of the antenna, the anterior edge of the antennal groove at the extreme base of segment I elevated as a tubercle, and the rostrum very short in front of this tubercle, much shorter than segment I of the antenna is broad.

Eye entire. Mandible with large subapical tooth; labiophore not separated from gula by a transverse depression. Antenna thicker than in the allied genera, reaching (in male) at least beyond the base of the elytra,

III much longer than II, club broadish, symmetrical, beneath flattened and hairy, IX and X triangular, about as long as broad, or IX a little longer, XI elliptical. Pronotal carina subbasal, angle obtuse, lateral carina not reaching middle, lateral longitudinal carinula oblique, forming with dorsal carina inwardly an obtuse angle, outwardly a very acute one. Base of elytra somewhat incurved from shoulder to shoulder. Legs long. Genotype, *Aethessa mumfordi*, new species.

***Aethessa mumfordi***, new species (fig. 1).

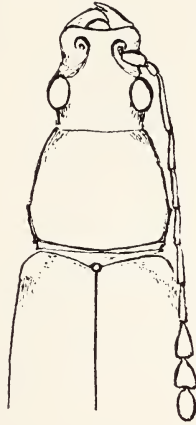


FIGURE 1.—*Aethessa mumfordi*, new species,  $\times 15$ .

#### Male

Rufescent brown, antenna and legs paler, pubescence clayish grey, variegated with brown on the elytra. Nearly two and one-half times as long as broad (head excluded). Antennal groove large, much encroaching on the upper surface of the rostrum, the interspace at the narrowest point about one-third the width of the frons. Pubescence of head sparse, except at eyes, and in the near middle of occiput. Middle half of apical margin of rostrum very feebly incurved, rostrum in front of antennal groove equalling in length the width of the tuberculiform base of antennal segment I. Antenna reaching beyond middle of elytra, segment I much thicker and much longer than II, which is short, III longest of all, one-half longer than IV, IV to IX about equal in length, X and XI shorter, X a little shorter and broader than IX and triangular, a little longer than broad, XI elliptical, all segments more or less hairy, IX to XI somewhat woolly beneath.

Pronotum one-fifth broader than long, dorsally depressed, median line somewhat raised, pubescence at each side of this slight ridge directed forward-inward, which enhances the elevation of the ridge; densely reticulate, the meshes very distinct, but their centers not deep, the posterior ridge of each mesh somewhat higher than the anterior ridge, giving the surface the appearance of being granulate-reticulate; dorsal carina feebly concave, very slightly convex at sides, lateral angle obtuse, rounded off.

Elytra nearly twice as long as broad (23:41), flattened above in posterior two-thirds, punctate-striate, variegated with brown, whitish grey and luteous grey, the white pubescence forming diffuse rounded spots in posterior half, subbasal swelling very dis-

tinct, in the depression behind it a large diffuse whitish grey patch. Pygidium rounded-triangular, broader than long.

Pubescence of underside whitish grey, dispersed, somewhat condensed on mesepisternum and at apices of metepisternum and metepimeron, punctures on sterna deep, on abdomen shallow and smaller, except some at bases of segments, sides of abdomen almost smooth apart from the granules bearing the pubescence. Legs pale rufous, middle of femora, of tibiae and of tarsal segment I darker, foretibia nearly as long as the pronotum is broad, longer than femur, foretarsal I more than one-half the length of the tibia (4:7), in all tarsi I longer than II to IV together.

Length (head excluded), 3.5 mm.; width, 1.4 mm.

Nukuhiva: Puokoke, T'unoa Ridge, October 22, 1929, one male on shrub F. no. 564. Mumford and Adamson.

*Aethessa adamsoni*, new species (fig. 2).

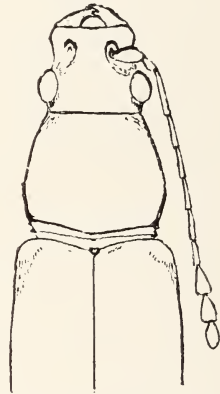


FIGURE 2.—*Aethessa adamsoni*, new species,  $\times 15$ .

Shorter than the previous species, with shorter antenna and denser pubescence. Rufescent brown, pubescent luteous grey, the brown derm showing through in places, especially on the elytra, which are variegated with brown and grey.

Interspace between the antennal grooves somewhat wider than in the previous species. Antenna not reaching to middle of elytra, hairy, segment III one-third longer than IV, IV to VI about equal in length, the following shorter, club a little narrower than in the preceding species. Pronotum a little less distinctly depressed, pubescence concentrated in middle and towards sides, almost forming three stripes; lateral carina shorter and more slanting than in *A. mumfordi*, the angle being larger.

Elytra less elongate (23:38 instead of 23:41), subbasal swelling less prominent. Pygidium more rounded, densely grey.

Foretarsal segment I less than half the length of the foretibia, segments III and IV of all tarsi deep brown like the tips of segments I and II and of tibiae.

Length, 3.3 mm.; width, 1.4 mm.

Hatutu [Hatutaa]: middle of east side, September 30, 1929, 1 male, Adamson.

**Araecerus vieillardii** (Montrouzier).

*Urodon vieillardii* Montrouzier, Ent. Soc. France, Ann., p. 873, 1860  
(New Caledonia).

Club of antenna symmetrical, mesocoxa of male with prominent conical tooth, tibiae spotted with brown, foretibia of male with strong apical tooth and smaller teeth along inner surface, the teeth varying in size according to the size of the specimens, the teeth being vestigial in small males. A Pacific species which has extended its range westward to the Philippines.

Hiva'oa: Mount Temetiu, northeast slope on trail, altitude 2000 feet, May 27 and 29, 1929, 3 males on decaying fruit of *Freycinetia* species; Kopaafaa, altitude 2770 feet, August 2, 1929, 1 male, 1 female, on *Freycinetia* species; Vaiepoepo, altitude 2300 feet, June 2 and 3, 1929, 2 males; Teava Uhia i te Kohu, altitude 2100 feet, February 15, 1930, 2 males, 2 females, sweeping over *Paspalum conjugatum*; Mumford and Adamson.

Tahuata: Vaitahu Valley, altitude 90 feet, June 2, 1930, 15 males, 16 females, 120 feet, June 16, 1930, 29 males, 13 females, on *Gossypium* species; Hanamenino Valley, sea level, July 7, 1930, 1 male; Faanui, altitude 1500 feet, June 12, 1930, 1 male; Hanahevane Valley, altitude 150 feet, July 7, 1930, 1 male, 3 females; Tehue Valley, altitude 80 feet, May 27, 1930, 1 male, 3 females, sweeping over grasses; LeBronnec and H. Tauraa.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1600 feet, August 29, 1930, 1 male, beating on *Metrosideros collina*, LeBronnec.

Mohotani: above Anaoa, altitude 325 feet, August 13, 1929, 4 males and 4 females, on *Eugenia rariflora*, Adamson; altitude 1400 feet, February 1, 1931, 1 male, LeBronnec and H. Tauraa.

Fatuuku: altitude 860 feet, November 19, 1930, 3 males, 1 female, H. Tauraa.

Uahuka: Putatauuu, Vaipae Valley, altitude 880 feet, September 20, 1929, 1 male; crest of north ridge, altitude 2000 feet, September 29, 1929, 1 male, miscellaneous sweeping, Adamson.

Uapou: Hakahetau Valley, altitude 1000 to 1200 feet, January 22, 1930, 2 males, sweeping, Whitten.

Eiao: near center, altitude 1665 feet, September 28, 1929, 5 males, 8 females, on *Hibiscus tiliaceus*; altitude 1450 feet, October 1, 1929, 4 males, 3 females, miscellaneous sweeping in coconut plantation; above Vaituha, altitude 800 feet, September 29, 1929, 1 male, Adamson. Altitude 1700 feet, April 23, 1931, 2 males, 6 females, on *Canthium odoratum*, LeBronnec and H. Tauraa.

Hatutu [Hatutaa]: middle of east side, altitude 1080 feet, September 30, 1929, 3 males, 3 females, Adamson; altitude 1500 feet, April 28, 1931, 1 male, 2 females, beating on *Canthium barbatum*, LeBronnec and H. Tauraa.





# ARAIGNEES DES ILES MARQUISES \*

Par

LUCIEN BERLAND

MUSÉUM NATIONAL D'HISTOIRE NATURELLE, PARIS

Nos connaissances sur les Araignées des îles Marquises se résumaient, jusqu'à présent, à une courte note que j'avais publiée en 1927 dans le Bulletin du Muséum <sup>1</sup>, et où je signalais 4 espèces envoyées par le P. Siméon Delmas, de Taiohae; et encore 3 d'entre elles étaient cosmopolites, de sorte que je me demandais, en conclusion, si cet archipel avait une faune aranéenne endémique. Les récoltes faites depuis par MM. Mumford et Adamson, du Pacific Entomological Survey, aidés par MM. Whitten, LeBronnec et Tauraa, lèvent tout doute à cet égard, puisque grâce à eux nous connaissons maintenant 38 espèces d'Araignées marquisiennes, dont 16 sont spéciales.

Cet heureux résultat est dû à la méthode employée par MM. Mumford et Adamson: ne se contentant pas de récoltes faites sur la côte, où dominent les espèces artificiellement introduites, ils ont exploré de préférence la partie montagneuse de l'intérieur des îles, d'un accès difficile, mais où vivent, et peut-être se sont réfugiées, la plupart des espèces vraiment endémiques.

L'ensemble des Araignées connues des îles Marquises peut se résumer dans la liste qui suit:<sup>2</sup>

## DYSDERIDAE

*Ariadna lebronneci*, sp. n..... Pacifique ouest et est, non central,  
Hawaii (affinités)

## SICARIIDAE

*Scytodes striatipes* L. Koch..... Tout le Pacifique  
*Scytodes marmorata* L. Koch..... Toute l'Océanie

## OONOPIDAE

*Gamasomorpha loricata* L. Koch..... Samoa, Australie, Lord Howe

## DRASSIDAE

*Poecilochroa rollini*, sp. n..... Endémique

## THOMISIDAE

*Misumenops delmasi* Berland..... Endémique

## CLUBIONIDAE

*Corinna cetrata* Simon..... Nouvelle-Calédonie, Tahiti, île de Pâques  
*Clubiona alveolata* L. Koch..... Samoa

<sup>1</sup> Notice sur les Araignées recueillies aux îles Marquises par le R. P. Siméon Delmas: Mus. National d'Histoire Nat., Bull., t. 33, n. 5, pp. 366-368, 1927.

<sup>2</sup> Les localités marquées signifient que l'espèce citée s'y trouve, ou bien qu'on y rencontre des espèces voisines; le mot Endémique se rapporte à des espèces endémiques, dont il est difficile de déceler les affinités parce qu'elles appartiennent à des genres universellement répandus, comme le genre *Theridion*.

\* Pacific Entomological Survey Publication 7, article 3. Issued May 26, 1933.

## SPARASSIDAE

Heteropoda regia F.....	Cosmopolite
Heteropoda nobilis L. Koch.....	Samoa, Tahiti

## SALTICIDAE

Bavia acriceps Simon.....	Malaisie, Tahiti, Samoa
Plexippus paykulli Audouin.....	Cosmopolite
Menemerus bivittatus Dufour.....	Cosmopolite
Mollica microphthalma L. Koch.....	Tahiti, Nouvelle-Calédonie, Loyalty, Hawaii
Thorellia ensifera Thorell.....	Malaisie, Tahiti, Samoa
Athamas whitmei Cambridge.....	Samoa, Tahiti, Loyalty
Sandalodes calvus Simon.....	Australie (Queensland)
Sandalodes triangulifer, sp. n.....	Affinités avec Hawaii
Sandalodes nigrolineatus, sp. n.....	Affinités avec Hawaii
Sandalodes flavipes, sp. n.....	Affinités avec Hawaii
Sandalodes nigrescens, sp. n.....	Affinités avec Hawaii
Sandalodes magnus, sp. n.....	Affinités avec Hawaii

## PHOLCIDAE

Physocyclus gibbosus Tacz.....	Cosmopolite
Smeringopus elongatus Vinson.....	Cosmopolite
Pholcus ancoralis L. Koch.....	Samoa, Tahiti

## THERIDIIDAE

Theridion rufipes Lucas.....	Cosmopolite
Theridion fatuhivaensis, sp. n.....	Endémique
Theridion mendozae, sp. n.....	Endémique
Theridion 7-punctatum, sp. n.....	Endémique

## ARGIOPIDAE

Dyschiriognatha nigromaculata, sp. n.....	Samoa, Japan, Bornéo, Ceylan, Egypte
Leucauge mendanai, sp. n.....	Endémique
Tetragnatha nitens Audouin.....	Nouvelle Zélande, Australie, Afrique, Méditerranée
Tetragnatha macilentata L. Koch.....	Samoa, Tonga
Cyclosa taurai, sp. n.....	Endémique
Araneus theisi Walckenaer.....	Cosmopolite

## PISAURIDAE

Dolomedes adamsoni, sp. n.....	Endémique
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## ULOBORIDAE

Uloborus geniculatus Olivier.....	Cosmopolite
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## DICTYNIDAE

Syrorisa mumfordi, sp. n.....	Nouvelle Calédonie, Australie
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Cette liste se décompose ainsi qu'il suit : cosmopolites, 8; polynésiennes, 14; endémiques, 16. Le chiffre total est nettement inférieur à celui que donnent les Samoa (plus de 80 espèces), et encore plus à celui des Hawaïi (plus de 100 espèces) ou de Nouvelle-Calédonie (plus de 150). Même en admettant que ce chiffre de 36 pourra être augmenté, on doit constater le fait assez bien connu d'un appauvrissement des faunes en allant de l'Ouest vers l'Est, ce qui s'accorde avec la notion, dont il sera parlé plus loin, d'un peuplement venant de Malaisie : les vagues de migration auraient perdu de leur force à mesure qu'elles s'éloignaient de leur point de départ, et en allant vers l'Est auraient laissé des faunes de plus en plus amoindries.

Il est intéressant d'analyser cette faune, et de voir ce qu'elle peut donner aux problèmes de biogéographie.

Espèces cosmopolites.—Ces espèces, banales partout, et qu'il convient d'éliminer tout de suite, appellent cependant quelques remarques. Leur nombre est assez élevé, comme il l'est toujours sur les îles, et montre bien que leur introduction est due entièrement au trafic maritime. Les cosmopolites des Marquises sont toutes des cosmotropicales, c'est à dire ne s'écartant pas des tropiques; les pancosmopolites, qui peuvent vivre sous tous les climats, telles que *Theridiou tepidariorum*, *Teutana grossa*, *Pholcus phalangoides*, n'y ont pas encore été introduites. Il est bon de le noter aujourd'hui, car elles s'y trouveront un jour ou l'autre, et nous assistons à un peuplement qui se fait sous nos yeux.

Affinités polynésiennes.—Les Marquises contiennent un bon nombre d'Araignées qui ne leur sont pas spéciales, mais se rencontrent sur d'autres archipels, et les affinités les plus marquées sont avec les Samoa et l'archipel de la Société; cette affinité est indiquée surtout par un certain nombre de Salticides, dont on peut dire qu'elles sont vraiment polynésiennes, telles que *Bavia aericeps*, *Mollica microphthalma*, *Thorellia ensifera*, *Athamas whitmeei*, mais aussi par une Pholcide, *Pholcus ancoralis*, et une Sparasside, *Heteropoda nobilis*.

Affinités plus lointaines.—On constate, par quelques espèces, à la vérité peu nombreuses, des rapprochements avec des parties plus lointaines du Pacifique. C'est ainsi que *Coriuna cetrata* est connue non seulement de Tahiti, mais encore de Nouvelle-Calédonie, et même de l'île de Pâques; parmi les Salticides citées plus haut, *Mollica microphthalma* et *Athamas whitmeei* se retrouvent jusque dans la région calédonienne; il est d'un grand intérêt d'avoir trouvé aux Marquises une Araignée cribellate: *Syroris munfordi*, d'un genre connu seulement de Nouvelle-Calédonie et d'Australie. Enfin on verra au cours de cette note le cas très curieux d'une Salticide: *Sandalodes calvus*, décrite du Queensland, et existant en nombre aux Marquises. Certaines espèces indiquent même des affinités plus lointaines, notamment avec la Malaisie.

Affinités avec les Hawaii.—D'après les renseignements qu'a bien voulu me donner M. Mumford, les insectes du groupe des Hémiptères-Homoptères auraient témoigné d'affinités, assez inattendues, avec les Hawaii. Or les Araignées en fournissent un autre cas, avec le genre *Sandalodes*, précédemment cité. Ce genre, en effet, compte des espèces dans l'Inde, à Célèbes, en Australie, et aux Hawaii; or j'ai reconnu sa présence dans le matériel des Marquises, avec un développement presque égal à celui des Hawaii, puisqu'il y compte cinq espèces spéciales; outre le *S. calvus* cité plus haut, et qui présente cette particularité d'être commun à l'Australie et aux Marquises, une espèce *S. triangulifer*, est extrêmement voisine d'une espèce hawaïenne; ce genre s'est donc développé, avec une force à peu près égale, aux Hawaii et aux Marquises, mais est tout à fait inconnu du restant du Pacifique, et il faut aller jusqu'en Australie pour trouver ses proches parents.

On a parlé souvent de l'énigme des Hawaii, et la faune de cet archipel est considérée comme tout à fait isolée et sans aucune parenté. Les Araignées ne concordent pas tout à fait avec cette croyance commune. Je donne ci-après un tableau, que je crois assez instructif, et où l'on voit la comparaison entre les Araignées des Samoa, des Hawaii, et des Marquises; j'ai choisi ces trois archipels parce que, dans le Pacifique central, ils sont les mieux connus. Or, si l'on excepte la famille des *Thomisidae*, qui a acquis aux Hawaii un développement extraordinaire, et qui n'a de comparaison nulle part, on voit un développement des faunes assez parallèle, les différentes familles étant presque également représentées dans chacun des archipels, compte tenu de la pauvreté relative des Marquises. Ce sont dans chacun des trois archipels les mêmes familles qui se développent, dans une proportion à peu près égale, et si des familles manquent dans l'un des archipels, elles ne sont représentées dans les autres que par de rares espèces et y sont, pourrait-on dire, plutôt exceptionnelles. Aussi n'y a-t-il aucune difficulté à reconnaître aux Hawaii une origine commune aux autres archipels du Pacifique central, la différenciation constatée ne résultant que d'un isolement plus ancien.

Conclusions.—Les Marquises appartiennent à un bloc uniforme centre-pacifique, comprenant les îles de la Société, les Samoa, et les Tonga, et qui a reçu ses éléments fauniques très probablement de la Malaisie. Les affinités avec l'Australie et le groupe néo-calédonien sont très faibles; les affinités avec l'Amérique sont absolument nulles. Il y a une certaine ressemblance avec les Hawaii, qui ont dû recevoir leur faune de la même provenance, mais ont été plus complètement isolées.

Une comparaison des espèces d'Araignées connues de Samoa, Hawaii, et des îles Marquises suit :

FAMILLES	SAMOA	HAWAII	MARQUISES
Dysderidae .....	0	2	1
Sicariidae .....	4	1	2
Oonopidae .....	1	0	1
Drassidae .....	0	0	1
Thomisidae .....	1	27	1
Clubionidae .....	8	0	2
Sparassidae .....	2	1	2
Salticidae .....	12	12	12
Zodariidae .....	1	0	0
Pholcidae .....	4	2	3
Theridiidae .....	15	17	4
Argiopidae .....	22	28	6
Agelenidae .....	1	1	1
Pisauridae .....	1	0	0
Lycosidae .....	2	9	0
Uloboridae .....	5	0	1
Dictynidae .....	1	0	1

Les familles suivantes manquent totalement dans les trois archipels : toutes les Mygaloides et Liphistoides ; les Caponidae, Telemidae, Leptonetidae, Ochyroceratidae, Prodidomidae, Platoridae, Ammoxenidae, Palpimanidae, Urocteidae, Archaeidae, Mimetidae, Senoculidae, Oxyopidae, Filistatidae, Eresidae, Hypochilidae, Oecobiidae, Zoropsidae. Ces familles, sauf celles constituant les Mygales, sont somme toute fort peu importantes, tant en genres qu'en espèces, et beaucoup d'entre elles sont très localisées ; toutes les familles importantes sont représentées.

#### FAMILLE DYSDERIDAE

##### Genre *ARIADNA* Audouin

*Ariadna lebronneci*, species nova (figs. 1-5).

##### Femelle

Couleur : Céphalothorax fauve pâle, rembruni sur les côtés et antérieurement ; chélicères et pièce labiale fauve rouge assez foncé ; sternum, pattes et lames-maxillaires jaune très pâle, les tarses de la patte-mâchoire et des paires I et II plus foncés, ainsi parfois que les métatarses I ; abdomen : face dorsale grise avec une série de lignes transversales brunes, fusionnées sur la ligne médiane, face ventrale testacée.

Yeux égaux entre eux, les médians se touchant étroitement, les latéraux des deux lignes un peu surélevés et se touchant par un point, les latéraux séparés des médians par un diamètre de ces derniers.

Chélicères coniques, un peu divergentes, pourvues près de la base, du côté externe, d'un petit tubercule conique, marge antérieure armée de 4 dents obtuses (fig. 2), postérieure d'1 dent.

Pattes : patte-mâchoire, patella avec 2 épines basilo-antérieures, tibia avec 5 épines, tarse 6 du côté antérieur (fig. 3) ; patte I (fig. 4), fémur avec 3 épines en ligne apico-antérieure (fig. 5) plus 1 sub-apicale à la face supérieure, tibia avec 2 séries de 13 grandes épines couchées de taille inégale, métatarse avec 2 séries pareilles de 11 épines ;



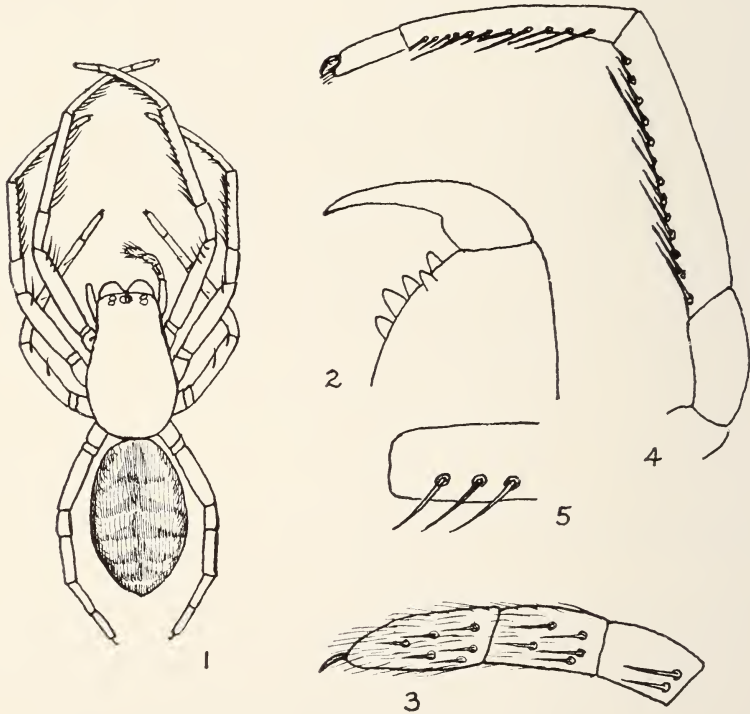
patte II comme I, mais fémur inerme à la face antérieure et avec 2 épines sub-apicales; patte III avec quelques épines éparses bien plus faibles qu'aux paires précédentes; patte IV totalement inerme.

Longueur totale: 8 mm.; céphalothorax, long. 4 mm., larg. 2.7 mm.

Uahuka: mont Hitikau, 1000 m. d'alt., 3 mars, 1931, 1 ♀ (type), LeBronnec et H. Tauraa, dans tiges de *Angiopteris*; même localité, LeBronnec et H. Tauraa, 2 jeunes.

Hivaoa: mont Temetiu, 1200 m. d'alt., 24 juillet, 1929, Mumford et Adamson, 2 ♀, 5 jeunes.

Fatuhiva: Vallée Omoa [Oomoa], 1000 m. d'alt., 21 août, 1930, LeBronnec, 1 jeune.



ARIADNA LEBRONNECI. Figure 1.—Femelle,  $\times 4$ . Figure 2.—Chélicère vue du côté interne. Figure 3.—Face antérieure de la patte-mâchoire. Figure 4.—Face antérieure de la patte I. Figure 5.—Face antérieure du fémur I.

Le genre *Ariadna*, presque cosmopolite, se trouve sur tout le pourtour du Pacifique; on le connaît du groupe canaque, de Juan Fernandez, des Galapagos, mais pas du centre du Pacifique, c'est à dire de Polynésie et Mélanésie; il existe cependant aux Hawaii sous le nom de *A. perkinsi* E. Simon, décrit



sur un curieux mâle à pattes déformées. Son existence aux Marquises est donc un fait nouveau et intéressant, qui accentue peut-être les affinités de cet archipel avec les Hawaïi, bien que d'une part on ne connaisse que le mâle, et de l'autre que les femelles. C'est avec *A. neocaledonica* Berland que l'espèce des Marquises paraît avoir le plus de ressemblance, notamment par le nombre et la disposition des épines aux pattes I et II, toutefois les épines du fémur I sont disposées d'une toute autre manière, et ce caractère paraît très constant, de plus *A. lebronnecci* présente toujours un dessin bien net sur l'abdomen, tandis que ce dernier est concolore chez *A. neocaledonica*.

Variation: le nombre des épines peut varier quelque peu, et aux tibias I et II il peut y en avoir 13, 12 ou 14; le dessin abdominal peut être plus ou moins net.

#### FAMILLE SICARIIDAE

#### Genre SCYTODES Latreille

#### **Scytodes striatipes** L. Koch.

*Dictys striatipes* L. Koch, Die Arachn. Australiens. Band 1, p. 294, pl. 24, fig. 5, 1871.

*Scytodes striatipes* Berland, Nova Caledonia, t. 3, p. 185, 1924.

Hivaoua: Tapeata, 800 m. d'alt., 25 mai, 1929, Mumford et Adamson, 1 jeune; Vaiepoepo, 800 m. d'alt., 3 juin, 1929, Mumford et Adamson 4 ♀ (avec 1 cocon).

Tahuata: Vallée Hanamiai, 420 m. d'alt., 4 juin, 1930, LeBronnec et H. Tauraa, 2 ♀; vallée Hanahevane, bord de la mer, 16 juillet, 1931, LeBronnec et H. Tauraa, 3 ♀.

Mohotani: 13 aout, 1929, Adamson, 1 ♀ avec son cocon; 4 février, 1931, LeBronnec et H. Tauraa, 3 ♀.

Hatutu [Hatutaa]: 30 septembre, 1929, Adamson, 1 ♀.

Uahuka: Penau, 700 m. d'alt., 27 février, 1930, LeBronnec et H. Tauraa, 1 ♀.

L'espèce a été décrite des Samoa, des Fidji et de Tonga: signalée depuis de Nouvelle-Calédonie, d'Australie, et de Funafuti (Rainbow), elle paraît habiter tout le Pacifique. La coloration est variable, et le dessin représenté par L. Koch n'est visible que chez les individus relativement jeunes, chez les individus plus âgés la coloration devient très foncée, les formes claires et foncées paraissant coexister. L'espèce tend alors vers celle qui est bien connue de Malaisie: *S. lugubris* Thorell. Je manque d'éléments de comparaison, mais je soupçonne cette dernière d'être synonyme de *S. striatipes*; ou tout au moins on a souvent appelé *lugubris* des exemplaires qui n'étaient que des *striatipes* très foncés.

**Scytodes marmorata** L. Koch.

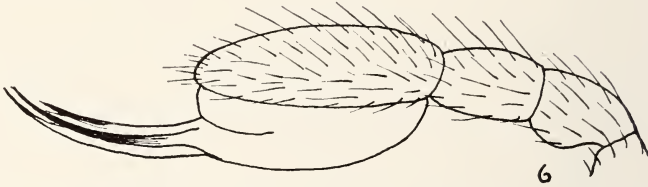
Hivaoa: vallée Vaitanu, juillet, 1929, 1 ♀.

Èspèce très largement répandue en Océanie; on la trouve souvent dans les maisons.

## FAMILLE OONOPIDAE

Genre **GAMASOMORPHA** Karsch**Gamasomorpha loricata** L. Koch (fig. 6).

*Oonops loricatus* L. Koch, Arachn. Australiens, Band 1, p. 449, pl. 35, fig. 3, 1873.



**GAMASOMORPHA LORICATA** L. KOCH. Figure 6.—Patte-mâchoire du mâle.

Èspèce décrite de Samoa: Upolu, signalée depuis de la côte est d'Australie et de l'île Lord Howe (Rainbow). L'exemplaire des Marquises correspond bien à la description de L. Koch, mais celle-ci pourrait s'appliquer à de nombreuses *Gamasomorpha*: on ne connaît jusqu'à présent que des femelles, et un seul mâle, dont je figure ici l'organe copulateur, aussi est-il impossible de dire actuellement s'il existe dans le Pacifique une seule espèce, ou plusieurs.

Hivaoa: Mounaofefe, 800 m. d'alt., 3 août, Mumford et Adamson, 1 ♀.

Fatuhiva: Ahuava, 610 m. d'alt., 19 août, 1930, LeBronnec, 1 ♀; vallée Hanavave, 300 m. d'alt., 9 septembre, 1930, LeBronnec, 1 ♂ (type du mâle), 1 ♀.

## FAMILLE DRASSIDAE

Genre **POECILOCHROA** Westring**Poecilochroa rollini**, species nova. (figs. 7-12).

## Femelle

Couleur: céphalothorax rougeâtre foncé, les côtés et le bord antérieur rembrunis; chélicères, pièces buccales et pattes I et II rougeâtres, pattes III et IV plus claires, sternum fauve rougeâtre, rembruni sur les côtés; abdomen gris-brun, éclairci en avant et avec une bande clair transversale au niveau du 1/3 postérieur, face ventrale gris clair, filières jaunâtres.

Céphalothorax très peu élevé, parti céphalique indistincte, une fossette thoracique.

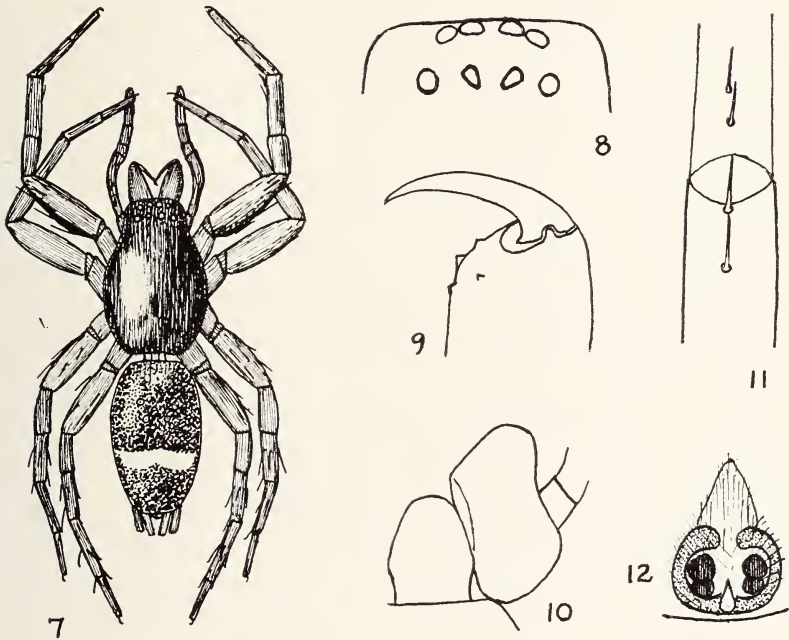
Yeux (fig. 8) : 1<sup>re</sup> ligne droite, ses médians arrondis, séparés entre eux de moins que leur rayon, et touchant les latéraux ; 2<sup>e</sup> ligne plus large que la 1<sup>re</sup>, légèrement récurvée, ses yeux égaux et équidistants, les médians triangulaires ; groupe des médians plus long que large, les médians antérieurs non sensiblement plus gros que les autres yeux.

Chélicères projetées en avant, coniques, la marge antérieure arrondie mais non franchement transverse, portant une petite dent à l'angle et de chaque côté de celle-ci une dent presque imperceptible (fig. 9) ; marge postérieure indistincte, avec une seule très petite dent.

Pattes I inermes, sauf aux fémurs la face supérieure, et la face antérieure avec 2-3 épines sub-apicales, tibia et métatarse sans dents ; pattes II, tibia avec en-dessous 2 dents en ligne, 1 apicale, l'autre sub-apicale, métatarse avec 2 dents en ligne près de la base (fig. 11) ; métatarse et tarse I et II avec une scopula peu dense, mais complète ; pattes III et IV assez fortement épineuses, sans scopulas.

Pièces buccales, figure 10. Épigyne, figure 12.

Longueur totale : 6 mm. ; céphalothorax, long. 3 mm., larg. 2 mm.



POEILCHROA ROLLINI. Figure 7.—Femelle,  $\times 6$ . Figure 8.—Groupe oculaire. Figure 9.—Chélicère, vu du côté interne. Figure 10.—Pièces buccales. Figure 11.—Face inférieure du tibia et du métatarse II. Figure 12.—Épigyne.

Eiao : plateau au dessus de Vaituha, 400 m. d'alt., 2 octobre, 1929, Adamson, 1 ♀ (type) avec une jeune blatte indiquée comme étant sa proie.

On connaît très peu de Drassides de Polynésie, la famille compte en Australie des groupes importants, qui s'étendent même jusqu'en Nouvelle-Calédonie et Nouvelle-Zélande, mais ne vont pas plus loin vers l'est. L'espèce

que je décris ici me paraît bien appartenir au genre *Poecilochroa*, qui cependant n'a pas de représentants dans le Pacifique, sauf aux Galapagos. Mais j'ai l'impression que nos connaissances sont encore très incomplètes sur ce point : c'est ainsi qu'il existe certainement des *Zelotes*, non encore signalés, en Polynésie.

Je suis heureux de dédier cette espèce au Dr. Rollin, médecin et administrateur des îles Marquises où il réside depuis plusieurs années et qu'il a fait connaître récemment par un livre remarquablement documenté.

#### FAMILLE THOMISIDAE

#### Genre MISUMENOPS F. Cambridge

**Misumenops delmasi** Berland (figs. 13-16).

*M. delmasi* Berland, Bull. Mus., p. 368, 1927.

Cette espèce, que j'ai dédiée au P. Siméon Delmas, missionnaire aux îles Marquises où il réside depuis plus de 40 ans, est très commune dans tout l'archipel, aussi bien sur la côte que dans l'intérieur.

Hivaoa: mont Temetiu, 1250 m. d'alt., 12 décembre, 1929, Mumford et Adamson, ♂ ♀ ; Matauuna, 1300 m. d'alt., 4 mars, 1930, Mumford et Adamson, ♂ ♀ ; Kopaafaa, 1000 m. d'alt., 25 février, 1930, Mumford et Adamson, ♀, jeunes ; Kopaafaa, 900 m. d'alt., 2 août, 1929, Mumford et Adamson ♂ ♀.

Tahuata: Amatea, 900 m. d'alt., 23 juin, 1930, LeBronnec et H. Tauraa, ♂ ♀.

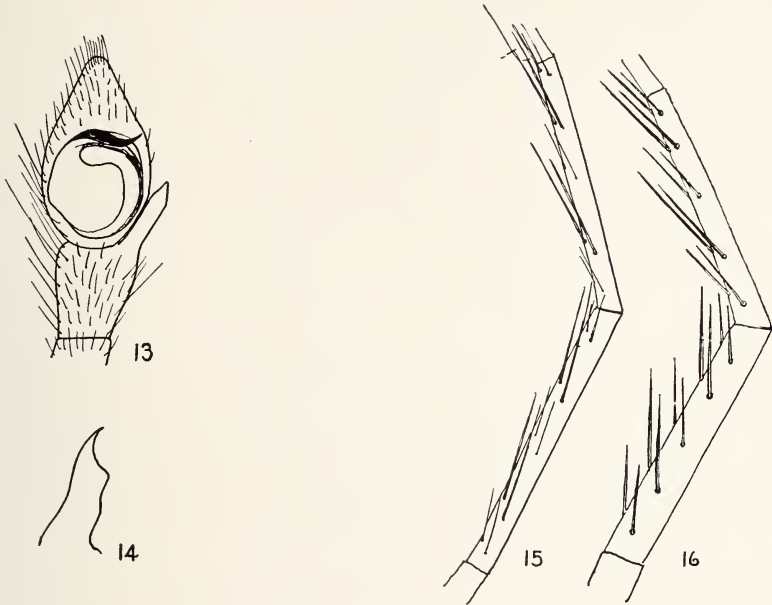
Fatuhiva: vallée Hanavave, 8 septembre, 1930; Tahuna, 700 m. d'alt., 3 septembre, 1930, LeBronnec, jeunes; vallée Omoa [Oomoa], 1000 m. d'alt., 28 août, 1930, LeBronnec, ♀, jeunes.

Nukuhiva: Tapuaooa, 1000 m. d'alt., 12 novembre, 1929, Mumford et Adamson, ♂ ♀ ; Tovii [Toovii], 930 m. d'alt., 26 octobre, 1929, Mumford et Adamson, ♂ ♀ ; Teuanui, 900 m. d'alt., 26 octobre, 1929, Mumford et Adamson ♂ ♀.

Uapou: Hapava, 13 décembre, 1929, Whitten, ♀ ; Hakahetau, 24 décembre, 1929, Whitten, ♀, dans des cellules de Guêpes dont l'Araignée est la proie.

Cette Thomiside est plus variable que je ne l'ai indiqué dans la description, basée sur un certain nombre d'exemplaires, mais qui provenaient d'une seule localité; la couleur fondamentale est blanc jaunâtre (peut-être jaune vif sur le vivant ?), mais souvent avec des dessins brunâtres sur le dos de l'abdomen, constitués parfois par des points noirs, ou plus fréquemment par un ensemble de lignes brunes transversales plus ou moins fusionnées.

Un caractère constant semble être fourni par les épines des tibias et métatarses I et II, représentés par les figures 15 et 16, comme on voit ces épines sont en principe au nombre de 5 paires, mais quelquefois une 6<sup>e</sup> paire de petites épines apicales vient s'y ajouter, et il peut même y en avoir d'intercalaires, chez un exemplaire ♀ le nombre d'épines n'est pas le même à droite et à gauche, mais c'est une anomalie, et dans l'ensemble la disposition figurée est assez constante. L'épigyne est très peu caractéristique.



MISUMENOPS DELMASI BERLAND. Figure 13.—Patte-mâchoire du mâle. Figure 14.—Apophyse tibiale droite du mâle, vu de côté. Figure 15.—Tibia et métatarse I du mâle. Figure 16.—Tibia et métatarse I de la femelle.

Le mâle était jusqu'à présent inconnu ; je donne ici le dessin de son organe copulateur (fig. 13) et de l'apophyse tibiale vue de côté (fig. 14). Il a l'aspect de la femelle, mais est plus petit, dans la même proportion que chez notre *Misumena vatia* ; le céphalothorax est rougeâtre, l'abdomen gris sans dessins, mais avec quelque crins noirs, assez souvent on remarque une ligne brune interrompue le long des fémurs I et II, à la face inférieure, les épines des pattes sont plus fines, plus longues et en outre inégales entre elles (fig. 15), les épines longues alternant avec de plus courtes.



## FAMILLE CLUBIONIDAE

## Genre CORINNA C. Koch

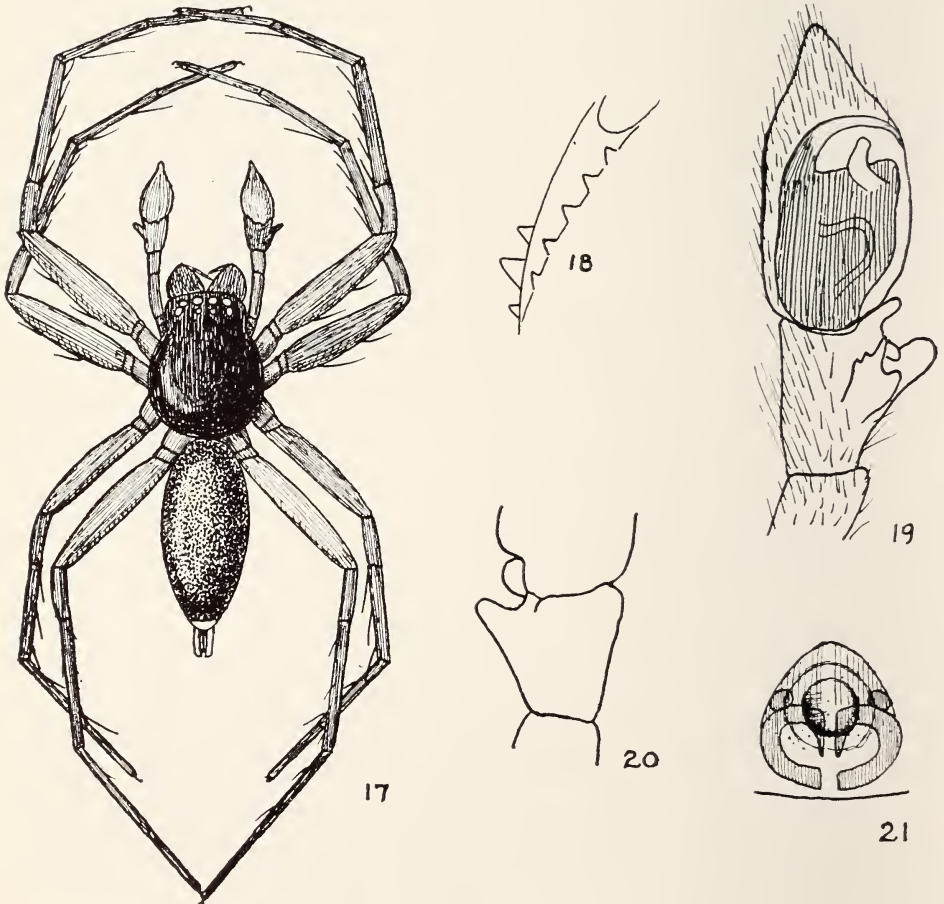
**Corinna cetrata** E. Simon (figs. 17-21).

*Crengas cetrata* E. Simon, Ann. Soc. Ent. France, p. 243 (Nouvelle-Calédonie), 1888.

*Corinna cetrata* E. Simon, Hist. Nat. Ar., t. 2. p. 196, 1898.

*Corinna tahitica* Strand, Arch. Naturgesch., Abt. 6, p. 120 (Tahiti) 1913.

*Corinna tahitica* Strand, Abh. Senckenberg. Naturf. Ges., Band 36, p. 252, 1915.



CORINNA CETRATA SIMON. Figure 17.—Mâle,  $\times 5$ . Figure 18.—Marges des chélicères du mâle. Figure 19.—Patte-mâchoire du mâle. Figure 20.—Tibia de cette patte-mâchoire, vu de dessus. Figure 21.—Épigyne.



*Corinna cetrata* Berland, Nova Caledonia, Zool., t. 3, p. 233, 1924.

*Corinna cetrata* Berland, Nat. Hist. Juan Fernandez and Easter Island, t. 3, p. 422, f. 3 (île de Pâques), 1924.

Hivaoa: Atuona, 1 ♀.

Uahuka: vallée Vaipae, 18 mars, 1931, LeBronnec et H. Tauraa, 2 ♂, 1 ♀.

Il n'y a pas de doute quant à l'identité des exemplaires marquisiens avec l'espèce de Simon—dont j'ai vu les types—non plus qu'avec celle de Strand, dont les dessins permettent de fixer les caractères de l'espèce. Il y a lieu de noter que les dessins donnés de l'épigyne (Strand 1915, Berland 1924) semblent quelque peu différents, mais cela tient sans doute à une interprétation particulière des parties vues par transparence.

L'espèce est connue de Nouvelle-Calédonie, de Tahiti, de l'île de Pâques, et des Marquises. Comme très peu d'Araignées présentent la même répartition, on peut se demander si elle n'aurait pu être transportée artificiellement, soit à une époque récente, soit lors des voyages des Polynésiens.

#### Genre CLUBIONA Latreille

##### **Clubiona alveolata** L. Koch.

*Clubiona alveolata* L. Koch, Die Arachn. Austr., Band 1, p. 421, 1873.

Fâthiva: Vaikoao, vallée Omoa [Oomoa], 500 m. d'alt., 30 août, 1930, LeBronnec, 1 ♀.

L. Koch a décrit de Samoa une *Clubiona alveolata* et récemment j'en ai fait connaître une seconde espèce de la même localité: *C. samoensis*. L'exemplaire des Marquises paraît très semblable à la première, autant qu'on en puisse juger sur une seule femelle, avec les petites différences qui suivent: chélicères un peu plus longues, formule dentaire un peu différente, à la marge antérieure la 2<sup>e</sup> dent à partir du bas est beaucoup plus forte que les autres, la marge postérieure compte 3 dents seulement au lieu de 4; les yeux médians postérieurs sont très fortement écartés l'un de l'autre, de plus de deux diamètres (L. Koch ne précise pas, pour son espèce il dit seulement; médians postérieurs plus écartés entre eux que des latéraux). Peut-être ces différences amèneront-elles, dans l'avenir, à considérer cette *Clubiona* marquisienne comme une espèce distincte, mais il serait imprudent de le faire actuellement, faute de documents suffisants, et de toute façon elle restera, je crois, très voisine de *C. alveolata*.

## FAMILLE SPARASSIDAE

## Genre HETEROPODA Latreille

**Heteropoda regia** Fabricius.

Cette grosse Araignée, abondamment répandue dans tous les pays tropicaux, se trouve presque partout dans les Marquises; je me contente de citer les localités:

Nukuhiva: Taiohae. Hivaoa: vallée d'Atuona. Fatuhiva: vallée Omoa [Oomoa]. Uahuka: vallée Hiniachi (au bord de la mer, sous une pierre); chaîne Penau, 700 m. d'alt.; vallée Hanakaua; vallée Vaipae; vallée Hane, Hanatekeo.

Les récoltes faites à Uahuka sont dues à MM. LeBronnec et H. Tauraa; elles montrent que, si cette espèce est avant tout domestique, fréquentant les habitations et les bateaux par le moyen desquels elle est constamment transportée, elle peut, sous des climats favorables s'en évader et vivre en plein air, comme c'est le cas d'ailleurs, pour d'autres espèces cosmopolites et également domestiques.

**Heteropoda nobilis** L. Koch.

*Sarotes nobilis* L. Koch, Die Arachn. Austr., Band 1, p. 664, pl. 54, fig. 2 (♂), 1875.

*Sarotes suspiciosus* L. Koch, Die Arachn. Austr., p. 665, pl. 54, fig. 3 (♀), 1875.

*Heteropoda suspiciosa* Berland, Ins. Samoa, pt. 8, p. 64, figs. 54-55 (♂), 1929.

Hivaoa: vallée Papuei, Taepu, 7 février, 1929.

Tahuata: Amatea, 7 juillet, 1930, LeBronnec et H. Tauraa; vallée Vaitu-paahei, 9 juillet, 1930, LeBronnec et H. Tauraa.

Fatuhiva: vallée Omoa [Oomoa], Vaikoao, 530 m. d'alt., 27 août, 1930, LeBronnec, nombreux exemplaires; vallée Hanavave, Ihiota, 10 septembre, 1930, LeBronnec; vallée Uia [Ouia], 2 septembre, 1930, LeBronnec, 1 jeune.

Nukuhiva: Tapuaooa, 12 novembre, 1929.

Cette espèce a tout à fait l'aspect de la précédente, qu'elle accompagne dans une bonne partie du Pacifique, car elle est connue de Samoa et de Tahiti; bien que nous manquions de renseignements, tout semble indiquer que les deux espèces se trouvent en même temps.

Je l'avais indiquée de Samoa sous le nom de *H. suspiciosa*, mais je me suis avisé par la suite que L. Koch avait décrit l'une après l'autre deux espèces de Samoa, dont la seconde (*suspiciosa*) n'est bien certainement que la femelle de la première (*nobilis*).

## FAMILLE SALTICIDAE

Genre **BAVIA** E. Simon**Bavia aericeps** E. Simon.*Acompse suavis* L. Koch, Die Arachn. Austr., Band 1, p. 1455, 1883.

Hivaoa: Atuona, août, 1929, Mumford et Adamson, 1 ♀.

Fatuhiva: vallée Uia [Otua], 2 septembre, 1930, LeBronnec, 1 ♀.

Cette espèce, décrite des Philippines, est connue de Malaisie, de Tahiti (L. Koch), Huahine, Raiatea (L. Koch), de Samoa (Berland).

Genre **PLEXIPPUS** C. Koch**Plexippus paykulli** Audouin.

Tahuata: vallée Hanahevane, au bord de la mer, 16 juillet, 1930, LeBronnec et H. Tauraa, 1 ♂, 1 ♀.

Espèce cosmopolite.

Genre **MENEMERUS** E. Simon**Menemerus bivittatus** L. Dufour.

Fatuhiva: vallée Omoa [Oomoa], 1 août, 1930, LeBronnec, 1 ♂.

Espèce cosmopolite.

Genre **MOLLICA** G. et E. Peckham**Mollica microphthalma** L. Koch.*Jotus microphthalmus* L. Koch, Die Arachn. Austr., Band 1, p. 1246, pl. 107, figs. 2-3, 1881.*Jotus microphthalma* E. Simon, C. R. Soc. Ent. Belg., p. 88, 1885.*Mollica microphthalma* E. Simon, Fauna Hawaiiensis, vol. 2, p. 512 1900.*Mollica microphthalma* Berland, Bull. Soc. Zool. France, p. 388, 1929.

Fatuhiva: Tahuna, 700 m. d'alt., 5 septembre, 1930, LeBronnec, 2 ♂ jeunes, 2 ♀ adultes.

Décrite de Tahiti, cette espèce a été signalée depuis de Nouvelle-Calédonie, des Loyalty, des Hawaii.

La collection Simon ne contient que des mâles, tandis que je n'ai que des femelles et 2 jeunes mâles, mais je crois pouvoir affirmer l'identité des exemplaires des Marquises.

A cette occasion je crois utile de signaler que les dessins donnés dans l'ouvrage de L. Koch sont un peu trompeurs, surtout pour les Salticides; visiblement ils ont été faits pour être colorés, et ne donnent qu'un aspect très simplifié des animaux.

## Genre THORELLIA Keyserling

**Thorellia ensifera** Thorell.

Hivaoa: vallée Atuona, 6 juillet, 1929, Mumford et Adamson, 1 ♂.

Tahuata: vallée Vaitahu, Faanui, 500 m. d'alt., LeBronnec et H. Tauraa, 12 juin, 1930, ♂ ♀; Tehue, 27 mai, 1930, LeBronnec et Tauraa, 1 ♂.

Fatuhiva: vallée Omoa [Oomoa], Punahitahi, 18 août, 1930, LeBronnec, 5 ♀, 1 ♂; vallée Hanavave, Ihiota, 19 septembre, 1930, LeBronnec.

Mohotani: Anaoo, 13 août, 1929, Adamson, 2 ♀; 4 février, 1931, LeBronnec et H. Tauraa, ♀.

Fatuuku: 19 octobre, 1930, H. Tauraa, 1 ♂.

Nukuhiva: Tovii [Toovii], 1200 m. d'alt., 25 octobre, 1929, Mumford et Adamson, ♀.

Uahuka: vallée Vaipae, 21 septembre, 1929, Adamson, plusieurs ♀; mont Hitikau, 4 mars, 1931, LeBronnec et H. Tauraa, ♂ ♀; Penau, 700 m. d'alt., 6 mars, 1931, LeBronnec et H. Tauraa, ♂ ♀; Putiovai, 500 m. d'alt., 23 mars, 1931, LeBronnec et H. Tauraa, ♀; Vaitiake, 300 m. d'alt., 24 mars, 1931, LeBronnec et H. Tauraa, ♀.

On voit que cette petite Salticide, si curieuse par la double corne que porte le mâle sur le bandeau, se trouve sur toutes les îles de l'archipel. Elle est d'ailleurs très répandue dans le Pacifique, où on la connaît de Tahiti, de Huahine, des Samoa, et aussi de Malaisie: Célèbes, Java, Amboine.

## Genre ATHAMAS Cambridge

**Athamas whitmeei** Cambridge.

Hivaoa: Kopaafoa, 1000 m. d'alt., 26 mars, 1930, Mumford et Adamson, 1 ♂.

Tahuata: sommet du mont Haaoipu, 900 m., LeBronnec et H. Tauraa, 3 ♀.

Fatuhiva: LeBronnec, 1 ♂, 2 ♀.

Uahuka: Putatauuu, vallée Vaipae, 21 septembre, 1929, Adamson, 1 ♂; Hitikau, 800 m. d'alt., 3 mars, 1931, LeBronnec et H. Tauraa, 3 ♀; Tauheeputa, 600 m. d'alt., 23 mars, 1931, LeBronnec et H. Tauraa, 1 ♀.

La couleur est variable, et les deux femelles de Hitikau sont presque entièrement noires.

L'espèce, de petite taille, est remarquable par la courbure des yeux de la première ligne qui rappelle les *Lysomanes*; décrite de Samoa, elle est connue aussi de Tahiti, et je l'ai signalée récemment des îles Loyalty.

## Genre SANDALODES Keyserling

Le matériel des Marquises contient, outre les espèces citées précédemment et dont aucune n'est spéciale à l'archipel, un bon nombre de Salticides du genre *Sandalodes*, dont il convient de dire quelque mots. Ce genre est connu de l'Inde, de Célèbes et d'Australie; E. Simon l'a signalé des Hawaii où il compte d'assez nombreuses espèces spéciales, et il se retrouve aux Marquises, dans une situation absolument comparable à celle des Hawaii, car toutes ses espèces ne sont connues de nulle part ailleurs, à l'exception d'une: *S. calvus*, qui a été décrite d'Australie. Il se trouve donc que ce genre, dont la répartition est par ailleurs très semblable à celle de quelques autres Salticides: Indo-Malaisie, Australie, Pacifique, s'est développé d'une façon identique aux Hawaii et aux Marquises en donnant de part et d'autre naissance à de nombreuses espèces endémiques, dont aucune n'est commune aux deux archipels, et dont la différenciation n'est pas en rapport avec l'isolement, car une espèce peut se trouver dans plusieurs îles et inversement l'une de celles-ci peut abriter plusieurs espèces. Ce genre nous donne un exemple—le seul—de ressemblance entre les Marquises et les Hawaii, et il pose un problème de biogéographie fort intéressant.

**Sandalodes calvus** E. Simon (figs. 22-26).

*S. calvus* E. Simon, Ann. Soc. Ent. France, t. 71, p. 389, 1902.

Hivaoa: Matauuna, 1300 m. d'alt., 3 mars, 1930, Mumford et Adamson, 1 ♀, plusieurs jeunes.

Tahuata: vallée Vaitahu, 16 juin, 1930, LeBronnec et H. Tauraa, 1 jeune; vallée Hanahevane, 17 juillet, 1930, LeBronnec et H. Tauraa, ♂, ♀.

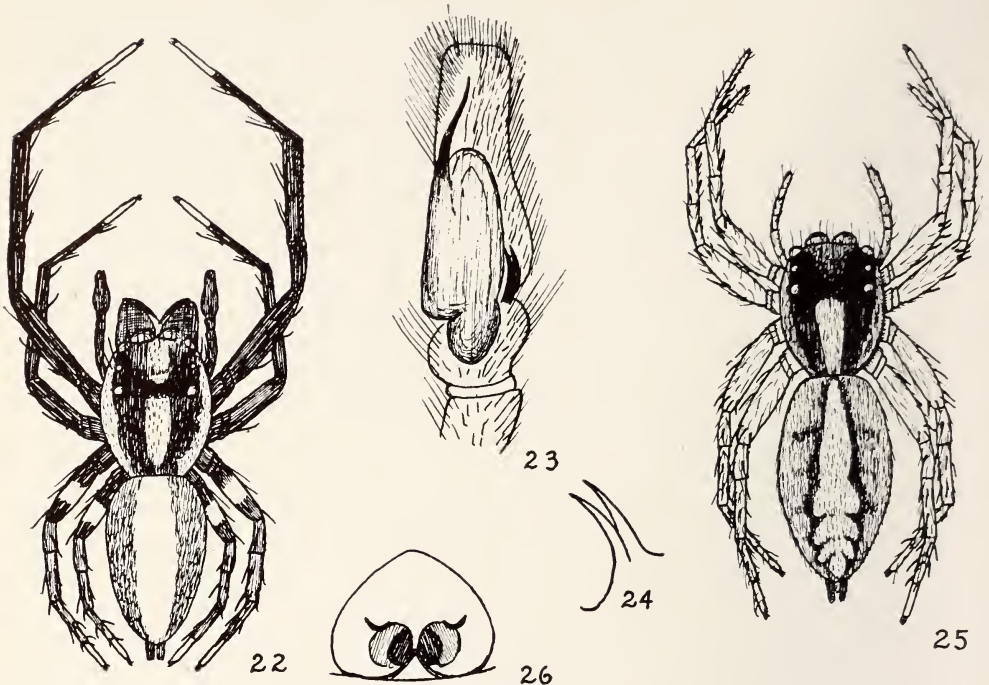
Nukuhiva: Taiohae, septembre, 1929, Mumford et Adamson, très abondante, plus de 100 exemplaires.

Uahuka: Tahoatikikau, 18 mars, 1931, LeBronnec et H. Tauraa, 1 ♂ plusieurs ♀: vallée Vaipae, 11 mars, 1931, LeBronnec et H. Tauraa, 1 ♀; Tenaei, 19 mars, 1931, LeBronnec et H. Tauraa, 1 ♂, 3 ♀; Tauheeputa, 23 février, 1931, LeBronnec et H. Tauraa.

Upou: Hakahetau, 24 décembre, 1929, Whitten.

L'espèce est décrite du Queensland (Cooktown) où elle a été trouvée en assez nombreux exemplaires. Il est assez singulier de la retrouver, extrêmement abondante, aux Marquises, mais la comparaison au type de Simon ne laisse pas de doute sur l'identité. On pourrait penser à une importation accidentelle, mais son existence sur plusieurs îles de l'archipel s'oppose à cette explication, et encore plus le fait que jusqu'à présent, elle n'a été trouvée sur aucun autre point du Pacifique, comme cela devrait être le cas si l'espèce se laissait aisément transporter: on devrait même la trouver en dehors de l'Océanie. Comme elle n'a pas encore été figurée je donne ici quelques dessins qui permettront de la reconnaître.





SANDALODES CALVUS SIMON. Figure 22.—Mâle,  $\times 4$ . Figure 23.—Patte-mâchoire du mâle. Figure 24.—Apophyse tibiale, vue de côté. Figure 25.—Femelle,  $\times 4$ . Figure 26.—Épigyne.

**Sandalodes triangulifer**, species nova (figs. 27-30).

Femelle (fig. 29)

Couleur: face dorsale du corps foncièrement grise ou même brunâtre (partie céphalique noire), avec des poils squamiformes blanc nacré appliqués, particulièrement nombreux sur la partie postérieure du céphalothorax et les côtés, où ils forment en outre une étroite bande marginale, sur la face antérieure des chélicères, les pattes-mâchoires, clairsemées sur les pattes; sur l'abdomen ces poils blanc nacré sont nombreux sur les flancs où ils forment des bandes transverses, à la face dorsale ils forment une bande en arc de cercle au bord antérieur, et dans la moitié postérieure une suite de triangles médians; en outre on remarque de longs poils blancs aux pattes-mâchoires et aux chélicères, ainsi qu'à la face ventrale de l'abdomen; cils rouge de feu, mais mêlés de poils blancs entre les yeux médians antérieurs ainsi qu'entre les médians et les latéraux; barbes blanches; sur la face dorsale du céphalothorax et de l'abdomen des poils roux mêlés aux blancs; en outre des poils noirs longs et dressés sur la partie céphalique et sur l'abdomen. Sternum gris; pièces buccales et chélicères brunes, hanches et base des fémurs testacé clair, le restant des pattes plus ou moins brunâtre, parfois jaune grisâtre, pattes non annelées; face ventrale de l'abdomen avec une grande bande brune allant du pli épigastrique jusqu'au stigmate trachéen, marquée de deux séries de taches rondes claires longitudinales, les premières plus grosses, les côtés de cette bande bordés de deux lignes claires à bords crénelés, ensuite gris moucheté de clair.



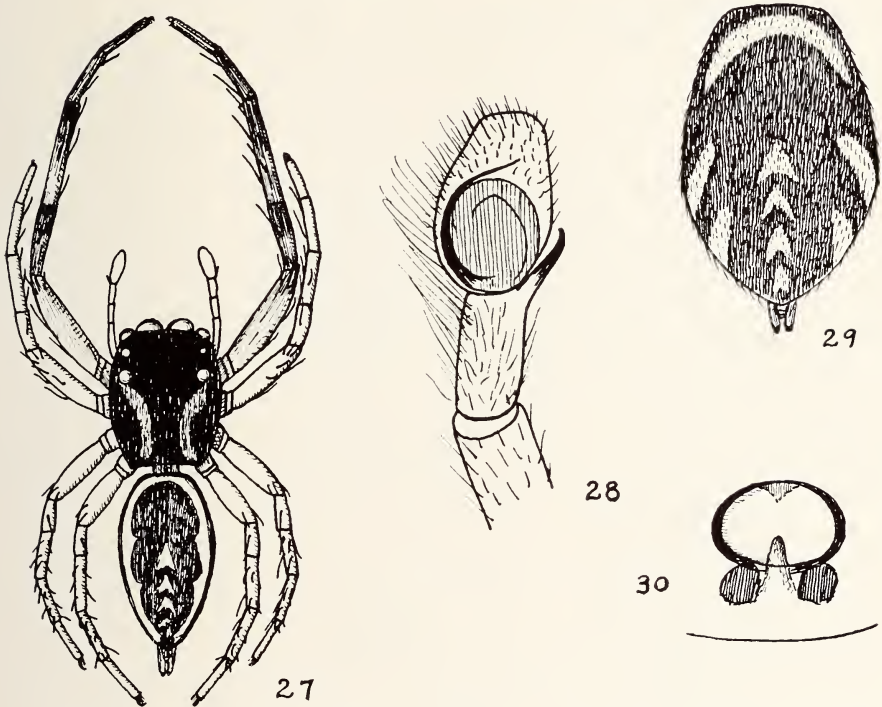
Dans les individus pas trop foncés, le tégument de la partie thoracique laisse voir deux bandes claires longitudinales mal définies, qui ne sont plus visibles chez les individus foncés.

Épigyne (fig. 30) en fossette bordée d'un anneau avec, du côté postérieur, une pièce conique s'avancant vers le milieu de la fossette.

Longueur totale, 8,5 mm.; céphalothorax, long. 3 mm., larg. 2,5 mm.

Tahuata: Amatea, 800 m. d'alt., 21 juin, 1930, LeBronnec et H. Tauraa, 1 ♀ (type), 2 ♀ (cotypes), 1 jeune.

Fatuhiva: vallée Omoa [Omoa], 1000 m. d'alt., 21 août, 1930, LeBronnec, 1 ♀ décolorée, sur *Freycinetia*.



SANDALODES TRIANGULIFER. Figure 27.—Mâle,  $\times 5$ . Figure 28.—Patte-mâchoire du mâle. Figure 29.—Abdomen de la femelle. Figure 30.—Épigyne.

Nukuhiva: Ooumu, 12 novembre, 1929, 1400 m. d'alt., Mumford et Adamson, 4 ♀, 1 ♂, 1 jeune; l'une des femelles a les poils squamiformes bien plus forts et plus nombreux que la plupart des exemplaires de l'espèce.

Mâle

Semblable à la femelle, mais dessin sensiblement différent (fig. 27): les deux bandes longitudinales de la partie thoracique sont bien visibles, et à l'abdomen la bande claire en fait tout le tour, les triangles sont à peine distincts; pattes claires, les pattes 1 plus foncées, et de plus sensiblement allongées. Patte-mâchoire, figure 28.

Hivaoa: vallée Atuona, 25 février, 1929, Mumford et Adamson, 2 ♂.

Nukuhiva: Ooumu, 1 ♂ (type du mâle), 2 ♂ jeunes.

Cette espèce est voisine de *S. albociliatus* Simon, des Hawaii, et en particulier l'épigyne en est très comparable; il est vrai qu'un certain nombre d'espèces de *Sandalodes*, en particulier celles qui suivent, ont un épigyne d'un type assez uniforme, et ce caractère permettrait difficilement de les distinguer, si on n'avait les caractères de la coloration, auxquels on est obligé d'avoir recours, l'espèce des Hawaii n'a pas de triangles sur l'abdomen, et ses cils sont blancs tandis qu'ils sont rouges dans l'espèce des Marquises.

**Sandalodes nigrolineatus**, species nova (figs. 31-33).

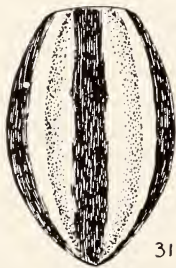
Femelle

Couleur: partie céphalique entièrement noire, thoracique fauve-clair, les côtés rembrunis; chélicères et pièces buccales fauve-clair; sternum et pattes jaune-clair, concolores; abdomen avec: une bande médiane brune à côtés sineux, entourée d'une bande claire mais rembrunie sur son bord externe, puis vient une bande très claire recouverte d'une pilosité blanche et ensuite une bande brune striée de clair (fig. 31); face ventrale entièrement testacée; barbes et cils blancs, poils squamiformes blanches sur la partie céphalique en deux bandes convergentes partant des yeux postérieurs.

Armure épineuse des pattes comme dans les autres espèces, mais aux tibias I, 3-4 épines au lieu de 3-3 qui est la formule normale (fig. 32); pas d'épines latérales aux patellas I, aux autres patellas une très faible épine.

Épigyne, figure 33, d'un type très voisin de l'espèce précédente.

Nukuhiva: Ooumu, 1 ♂ (type).



31



32



33

SANDALODES NIGROLINEATUS. Figure 31.—Dessin de l'abdomen de la femelle. Figure 32.—Patella et tibia I, vus par dessous. Figure 33.—Épigyne.

Espèce voisine de *S. triangulifer*, mais s'en distinguant par la coloration, et par l'épine supplémentaire aux tibias I.

**Sandalodes flavipes**, species nova (figs. 34-35).

Femelle

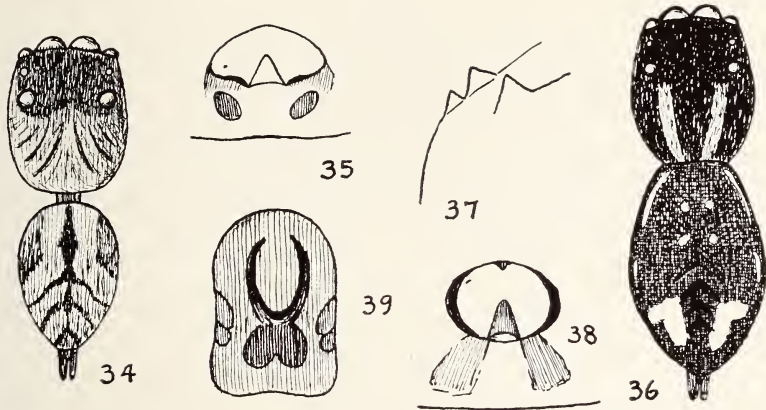
Couleur: partie céphalique entièrement noire, couverte de pubescence fauve gris, partie thoracique fauve-roux clair, avec des lignes brunes divergentes vers l'arrière,

les côtés tachés de noirâtre; chélicères et pièces buccales fauve très clair, sternum et pattes testacé-jaune très clair, concolores; abdomen fauve clair avec une bande médiane grisâtre d'où partent dans la 1/2 postérieure des lignes grisâtres arquées, les côtés de la partie antérieure teintés de gris, face ventrale fauve testacé très clair; barbes et cils blancs avec quelques cils rouges au-dessus des yeux; pas de poils squamiformes sur le corps (fig. 34).

Pattes comme dans l'espèce précédente: 4-3 épines infères aux tibias I (voir fig. 32) pas d'épines latérales aux patellas I.

Épigyne, figure 35.

Longueur totale 5 mm.; céphalothorax, long. 2.5 mm., larg. 1.5 mm.



SANDALODES. Figure 34.—*S. flavipes*, femelle,  $\times 7$ . Figure 35.—*S. flavipes*, épigyne. Figure 36.—*S. nigrescens*, femelle,  $\times 5$ . Figure 37.—*S. nigrescens*, chélicère. Figure 38.—*S. nigrescens*, épigyne. Figure 39.—*S. magnus*, épigyne.

Hivaoo: Mont Temetiu, 1300 m. d'alt., 27 mars, 1930, 1 ♀ (type), Mumford et Adamson.

**Sandalodes nigrescens**, species nova (figs. 36-38).

#### Femelle

Couleur générale beaucoup plus foncée que dans les autres espèces du genre; entièrement noire, surtout la partie céphalique, avec deux bandes plus claires sur la partie thoracique; chélicères et pièces buccales fauve-rouge, sternum fauve, rembruni sur les bords, hanches fauve clair, pattes entièrement brun foncé, plus claires par endroits mais sans anneaux; abdomen noirâtre, moucheté de taches blanches: 4 rondes en avant, 2 allongées de chaque côté, et 2 grandes, malléiformes, à la partie postérieure; de plus de nombreuses petites taches rondes claires, disposées en lignes elliptiques, en avant et sur les flancs, et dessinant plusieurs chevrons mal définis en avant; face ventrale testacé clair, teintée de gris en son milieu, et avec 2 lignes longitudinales de taches rondes claires légèrement convergentes vers l'arrière; filières brunes (fig. 36).

Pattes: tibias I et II avec 3-3 épines infères, patellas I et II sans épines latérales.

Épigyne du type habituel, figure 38.

Pilosité sombre, à reflets cuivrés sur la partie céphalique, barbes blanches, cils blancs, rouges au-dessus des yeux; pilosité de l'abdomen claismée, avec des poils blancs sur les espaces clairs.

Longueur totale: 8 mm.; céphalothorax, long. 3 mm., larg. 2.5 mm.

Tahuata: sommet du Haaopu, 900 m. d'alt., 9 juillet, 1930, LeBronnec et H. Tauraa, 1 ♀ (type), 1 ♀ (cotype).

Chez le cotype, les taches blanches abdominales sont plus réduites que celles du type.

**Sandalodes magnus**, species nova (fig. 39).

#### Femelle

Couleur générale très sombre: céphalothorax brun foncé, sans bandes longitudinales plus claires, mais avec seulement une région éclaircie au niveau et en arrière de la fossette thoracique; chélicères, pièces buccales et pattes brun foncé, sternum châtain un peu plus clair que les pattes; abdomen noirâtre, moucheté de petites taches rondes plus claires, plus ou moins disposées en lignes longitudinales ou obliques convergeant vers l'arrière, et aussi en chevrons dans la  $\frac{1}{2}$  postérieure, 4 taches plus grosses, indurées, en rectangle sur le milieu, sur la partie postérieure 2 taches blanches comme chez *S. nigrescens* (voir fig. 36) mais plus petites; flancs et face ventrale comme le dos, mais le ventre n'a plus que 2 lignes longitudinales et assez irrégulières de petites taches claires, parmi lesquelles 2 en avant sont plus grosses que les autres, plaques pulmonaires zébrées transversalement de clair; filières brunes. Pilosité brune sur le céphalothorax, mais avec quelques longues barbes blanc sale, et au-dessus des yeux quelques cils blanchâtres, ainsi que quelques poils de même couleur sur la partie céphalique; abdomen presque glabre.

Chélicères fortement géniculées à la base, hanches assez fortement gibbeuses au-dessus de leur insertion sur le sternum.

Pattes: tibias I avec 3-3 épines, patellas I et II avec 1 épine sur la face antérieure, III et IV avec 1 épine de chaque côté.

Épigyne, figure 39.

Longueur totale: 11 mm.; céphalothorax, long. 4.5 mm., larg. 3 mm.

Uapou: Vakaoaokee, 7 décembre, 1929, Whitten, 1 ♀ (type), 1 ♀ (cotype).

Cette espèce est assez différente des autres *Sandalodes*, dont elle se distingue par sa taille, sa couleur foncée (qui cependant la rapproche de l'espèce précédente, *S. nigrescens*), la forme de son sternum sensiblement plus étroit, les yeux de la 2<sup>e</sup> ligne également rapprochés des latéraux antérieurs et de la 3<sup>e</sup> ligne (chez les *Sandalodes* ils sont en général plus rapprochés des premiers), et la forme de son épigyne. Elle présenterait peut-être certains caractères des *Hyllus*, mais elle se rattache aux *Sandalodes* par la forme du céphalothorax, la denture des chélicères, la formule des épines des pattes.

En résumé, la famille des Salticidae, l'une des mieux représentées aux Marquises, y compte un certain nombre d'espèces connues du Pacifique, ou même d'Indo-Malaisie, et en outre, un groupe de formes appartenant au genre *Sandalodes*, qui est également très développé aux Hawaii; ce dernier a donné naissance à un certain nombre de formes spéciales, que je crois pouvoir con-



sidérer comme des espèces nouvelles, dans la création desquelles l'isolement dans les différentes îles ne semble avoir joué aucun rôle; ces espèces sont très voisines entre elles, mais toutefois assez bien différenciées par certains caractères, mais je ne les propose que sous réserve d'une étude future, car le matériel est actuellement insuffisant; en particulier, si l'on excepte une espèce: *S. calvus* qui est connue d'Australie, et *S. triangulifer* qui a bien des traits de ressemblance avec une espèce des Hawaii, les autres ne sont connues que par peu d'exemplaires, et leurs mâles qui permettraient peut-être de trancher la question, n'ont pas encore été trouvés.

## FAMILLE PHOLCIDAE

Genre *PHYSOCYCLUS* E. Simon***Physocyclus gibbosus*** Taczanowski.

Hivaoa: vallée d'Atuona, juillet, 1929, Mumford et Adamson, plusieurs exemplaires ♂ ♀; vallée Vaitamu, 11 juillet, 1929, Mumford et Adamson, ♂ ♀.

Nukuhiva: Taiohae.

Espèce cosmotropicale.

Genre *SMERINGOPUS* E. Simon***Smeringopus elongatus*** Vinson.

Hivaoa: Atuona, 2 juillet, 1929, 2 ♀; vallée Vaitanu, 11 juillet, 1929, Mumford et Adamson, 4 ♀.

Fatuhiva: vallée Omoa, 16 août, 1930, LeBronnec, 1 ♀.

Nukuhiva: Taiohae.

Uahuka: Teavamataiki, 19 mars, 1931, LeBronnec et H. Tauraa, ♂ ♀.

Espèce cosmotropicale.

Genre *PHOLCUS* Walckenaer***Pholcus ancoralis*** L. Koch.

Hivaoa: Atuona, 2 juillet, 1929, Mumford et Adamson, 1 ♀.

Tahuata: vallée Hanatuuna, 18 août, 1930, LeBronnec et H. Tauraa, 4 ♀.

Uahuka: Hanatakeo, 2 février, 1931, LeBronnec et H. Tauraa, plusieurs ♀.

Espèce décrite des Samoa, qu'il est intéressant de retrouver aux Marquises.

## FAMILLE THERIDIIDAE

Avec les Salticidae, et les Argiopidae, cette famille est une de celles qui se sont le plus développées aux Marquises.



## Genre THERIDION Walckenaer

**Theridion rufipes** Lucas.

Nukuhiva : Taiohae, 1 ♂, 6 ♀.

Espèce cosmotropicale, atteignant même en Europe et Afrique du Nord la région tempérée; dans le Pacifique, connue des Hawaii.

**Theridion fatuhivaensis**, species nova (figs. 40-41).

## Femelle

Couleur: céphalothorax, pièces buccales et sternum fauve clair uniforme, pattes jaune clair, sauf les pattes I qui ont le fémur, le tibia, la patella et la base du métatarse fauve rougeâtre plus foncé que le céphalothorax, abdomen entièrement gris concolore.

Céphalothorax régulièrement convexe, bandeau creusé sous les yeux, bord frontal très avancé.

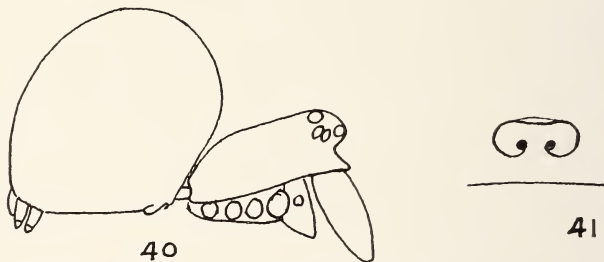
Yeux gros, presque égaux entre eux, les médians postérieurs légèrement plus gros que les autres; 1<sup>e</sup> ligne procurvée (vue de l'avant), les médians plus écartés entre eux (moins d'un diamètre) que des latéraux (moins d'un rayon); 2<sup>e</sup> ligne procurvée (vue de dessus), ses yeux presque équidistants (moins d'un diamètre).

Pattes I-II-IV-III, les pattes I très longues, l'ensemble: hanche + trochanter + fémur I égalant la longueur du corps.

Abdomen régulièrement globuleux (fig. 40), aussi long que large et que haut.

Épigyne (fig. 41) nettement en saillie sur le tégument.

Longueur totale: 4 mm.



THERIDION FATUHIVAENSIS. Figure 40.—Femelle, profil du corps. Figure 41.—Épigyne.

Fatuhiva: Vaikoao, vallée Omoa [Oomoa], 500 m. d'alt., LeBronnec, 29 août, 1930, 1 ♀ (type).

**Theridion mendozae**, species nova (figs. 42-44).

## Femelle

Couleur: céphalothorax, pattes, pièces buccales et sternum orangé clair uniforme, le sternum légèrement teinté de gris sur les côtés; abdomen testacé gris, avec un dessin noirâtre sur la face dorsale, composé (figs. 42, 43) d'une bordure antérieure, d'une série médiane formée de 2 taches géminées, d'une médiane et d'une postérieure allongée, et sur les côtés de 2 bandes rejoignant en arrière la tache médiane postérieure, et émettant des prolongements vers le milieu et les côtés; face ventrale testacée, sans tache, mais un peu grisée vers les filières, épigyne rougeâtre.

Céphalothorax très peu élevé. Yeux: 1<sup>re</sup> ligne droite (vue de l'avant), les médians très légèrement plus petits que les latéraux, et un peu plus rapprochés l'un de l'autre (moins d'un diamètre) que des latéraux; 2<sup>e</sup> ligne droite (vue de dessus), ses yeux subégaux, équidistants, leur écartement inférieur à un diamètre.

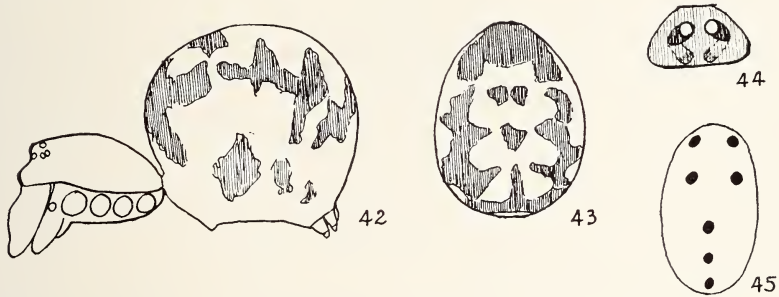
Pattes assez courtes, les paires I, II, IV à peu près égales entre elles, III légèrement plus courtes.

Abdomen globuleux, vu de dessus ovoïde, plus large en arrière (fig. 43).

Épigyne (figure 44) peu saillant.

Longueur totale: 4 mm.

Hivaoa: Kopaafaa, 1000 m. d'alt., 26 février, 1930, Mumford et Adamson, 1 ♀, (type); mont Temetiu, 1200 m. d'alt., 24 juillet, 1929, Mumford et Adamson, 1 ♀; Matauuna 1300 m. d'alt., 4 mars, 1930, Mumford et Adamson, 3 ♀.



ThERIDIION. Figure 42.—*T. mendozae*, femelle, profil du corps. Figure 43.—*T. mendozae*, abdomen vu de dessus. Figure 44.—*T. mendozae*, épigyne. Figure 45.—*T. 7-punctatum*, face dorsale de l'abdomen.

Je dédie cette espèce, dont l'aspect rappelle un peu *T. rufipes*, mais sans pouvoir être confondue avec celle-ci, à la Marquise de Mendoza, en l'honneur de qui l'archipel des Marquises reçut son nom du navigateur Mendana qui le découvrit.

### **Theridion 7-punctatum**, species nova (fig. 45).

#### Femelle

Couleur: entièrement blanc légèrement teinté de gris à l'abdomen, qui porte à la face dorsale 7 petites taches noires: 4 en quadrilatère dans la 1/2 antérieure, et 3 en ligne longitudinale médiane dans la 1/2 postérieure (fig. 45); en outre, une petite tache noire au milieu du céphalothorax.

Yeux petits, égaux entre eux, les médians des deux lignes, mais surtout ceux de la 1<sup>re</sup> ligne, plus écartés entre eux que des latéraux; 1<sup>re</sup> ligne droite (vue de l'avant), 2<sup>e</sup> ligne légèrement procurvée (vue de dessus); groupe des médians aussi large que long, un peu plus large en avant.

Pattes I-II-IV-III, fines et assez longues.

Abdomen ovale allongé, peu élevé.

Longueur totale: 3 mm.

Mâle comme la femelle, longueur 3.5 mm.

Nukuhiva: Ooumu, 1 ♀ non adulte (type), 1 ♂ à bulbe non encore ouvert.

Bien que les exemplaires ne soient pas adultes, je crois pouvoir décrire cette espèce comme nouvelle, son dessin abdominal étant tout à fait caractéristique.

FAMILLE ARGIOPIDAE

Genre *DYSCHIRIOGNATHA* E. Simon

*Dyschiriognatha nigromaculata*, species nova (figs. 46-48).

Mâle

Céphalothorax et pattes fauve clair, abdomen testacé avec des taches d'un noir intense, disposées de la façon suivante: au céphalothorax une tache englobant les yeux médians et une marginale de chaque côté, sur le sternum une tache à chacun des angles antérieurs, à l'abdomen une série médiane commençant un peu avant le milieu par 2 taches géminées puis à la suite 1-1 moyennes et 1-1 très petites, de chaque côté de cette série médiane 4 grosses taches dont la dernière touche presque les filières, sur les flancs 2 taches, 1 en avant, 1 vers le milieu, face ventrale avec 1 tache de chaque côté du milieu (fig. 46), en tout 18 taches en comptant pour 1 la médiane abdominale double; quelques petites taches argentées peu visibles entre les taches noires.

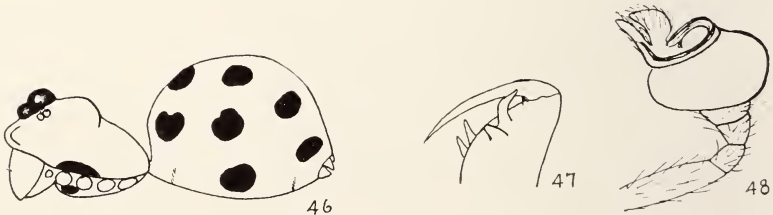
Yeux médians très gros, surtout les médians postérieurs dont le diamètre est au moins 5 à 6 fois celui des latéraux.

Chélicères: sur la face antérieure une grosse apophyse près de la marge, coudée vers l'insertion du crochet, au-dessus une apophyse plus courte et dirigée dans le sens inverse, en plus de longues dents sur les marges (figure 47, les dents de la marge postérieure ne sont pas figurées).

Patte-mâchoire globuleuse, figure 48.

Longueur totale: 1.5 mm.

Nukuhiva: Ooumu, 1350 m. d'alt., 13 novembre, 1929, Mumford et Adamson, 1 ♂ (type).



*DYSCHIRIOGNATHA NIGROMACULATA*. Figure 46.—Mâle, vu de profil. Figure 47.—Chélicère du mâle, face antérieure. Figure 48.—Patte-mâchoire du mâle.

Le genre *Dyschiriognatha*, voisin des *Pachygnatha* surtout par la patte-mâchoire du mâle, est connu d'Égypte, Japon, Ceylan, Bornéo, et d'Amérique du sud (par une espèce douteuse pour le genre); j'en ai récemment décrit une espèce des Samoa: *D. oceanica*, le genre est donc bien polynésien.

## Genre LEUCAUGE White

**Leucauge mendanai**, species nova (figs. 49-52).

## Femelle

Couleur: céphalothorax fauve clair concolore, ainsi que les chélicères, les yeux cernés de noir, sternum fauve clair, mais bordé de gris sur tout son pourtour sauf en face de la pièce labiale; pattes fauve clair, bordées de brun à l'apex des hanches, principalement les hanches I et II, rembrunies à partir de la patella; abdomen argenté surtout dans sa moitié antérieure avec une bande médiane, rameuse sur les côtés, dépourvue de plaques argentées, et dans la 1/2 postérieure un espace rectangulaire en partie teinté de gris et ne portant de plaques argentées que près de la ligne médiane; face ventrale et côtés dans leur 1/2 postérieure gris-brun, avec seulement quelques plaques argentées formant 2 lignes parallèles longitudinales (fig. 50).

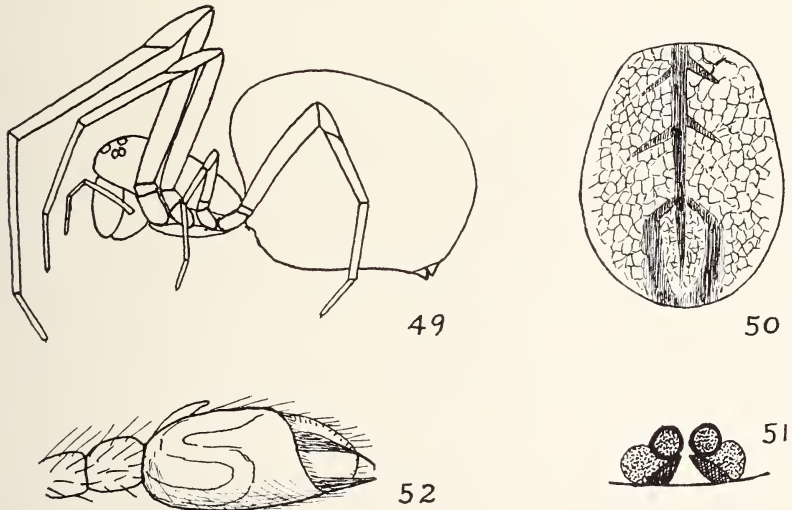
Yeux: 1<sup>re</sup> ligne droite (vue de l'avant), les médians très rapprochés l'un de l'autre (séparés de moins d'un rayon), beaucoup plus écartés des latéraux (plus d'un diamètre), 2<sup>e</sup> ligne droite (vue du dessus), ses yeux égaux et équidistants (environ un diamètre).

Abdomen (figs. 49-50) ovoïde court, tronqué en avant, à peine plus long que large, sans aucune saillie dorsale.

Épigyne (fig. 51) peu distinct.

Longueur totale, 2,5 mm.

Mâle comme la femelle, un peu plus petit, sans plaques argentées; patte-mâchoire, figure 52.



LEUCAUGE MENDANAI. Figure 49.—Femelle, vue de profil. Figure 50.—Femelle, face dorsale de l'abdomen. Figure 51.—Épigyne. Figure 52.—Patte-mâchoire du mâle.

Nukuhiva: Ooumu, 10 septembre, 1929, 1100 m. d'alt., Mumford et Adamson, 1 ♀ (type), 1 ♂ (type du mâle), 3 ♀ (cotypes).

Tahuata: Amatea, 900 m. d'alt., 10 août, 1930, LaBronnec et H. Tauraa, 4 ♀.

Fatuhiva: vallée Omoa [Oomoa], Vaikoao, 530 m. d'alt., 30 août, 1930, LeBronnec, 3 ♂, 3 ♀; crête d'Omoa, 1000 m. d'alt., 27 août, 1930, LeBronnec, 1 ♀; Teavaipuhiau, 700 m. d'alt., 25 août, 1930, LeBronnec, 1 ♂, 2 ♀; Teaoitu, Hanavave, 9 septembre, 1930, LeBronnec, 1 ♀.

Uahuka: Hitikau, 1000 m. d'alt., 4 mars, 1931, LeBronnec et H. Tauraa, 3 ♂, 4 ♀; Penau, 700 m. d'alt., 2 mars, 1931, LeBronnec et H. Tauraa, 1 ♂, 2 ♀.

Variation: la taille peut être un peu plus forte; les mâles jeunes semblent avoir des plaques argentées, qui disparaissent chez les adultes, ou ne subsistent qu'en un petit nombre de plaques, clairssemées.

On connaît plusieurs *Leucauge* du Pacifique, mais celle-ci ne se rattache à aucune; elle est remarquable par sa faible taille, son aspect ramassé, et son abdomen lisse, sans aucune saillie. Je la dédie au navigateur qui découvrit et baptisa les îles Marquises.

#### Genre TETRAGNATHA Latreille

##### **Tetragnatha nitens** Audouin.

Nukuhiva: Vaihakameama, 1000 m. d'alt., novembre, 1929, Adamson, 1 ♂, plusieurs ♀ (trouvés sur l'herbe au bord d'un petit lac).

Eïao: vallée Vaituha, 3 octobre, 1929, Adamson, 1 ♂, plusieurs ♀.

L'espèce est largement répandue dans toute la région méditerranéenne (y compris la France méridionale), presque toute l'Afrique jusqu'au Cap, l'Australie, la Nouvelle-Zélande, les îles Chatham; elle n'était cependant pas encore connue de Polynésie. Sa large répartition ne peut être interprétée comme un transport accidentel, d'autant plus qu'aux Marquises elle a été trouvée à l'intérieur de deux îles et non sur la côte, comme c'est en général le cas pour les espèces fortuitement introduites.

##### **Tetragnatha macilenta** L. Koch.

Tahuata, 900 m. d'alt., 19 juillet, 1930, LeBronnec et H. Tauraa, 1 ♂, 1 ♀.

Nukuhiva: 1 ♂.

Exemplaires très semblables à ceux décrits par L. Koch des Samoa et de Tonga, notamment par la chélicère du mâle et de la femelle, ainsi que par la forme de l'abdomen femelle, bossu vers le milieu; il y a toutefois quelques petites différences dans la formule dentaire, qui est d'ailleurs assez variable, ainsi que dans les yeux: les latéraux antérieurs étant plus petits que les latéraux postérieurs, ce qui ne semble pas concorder avec la description de L. Koch.



Genre *CYCLOSA* Menge***Cyclosa tauraa***, species nova (figs. 53-54).

## Femelle

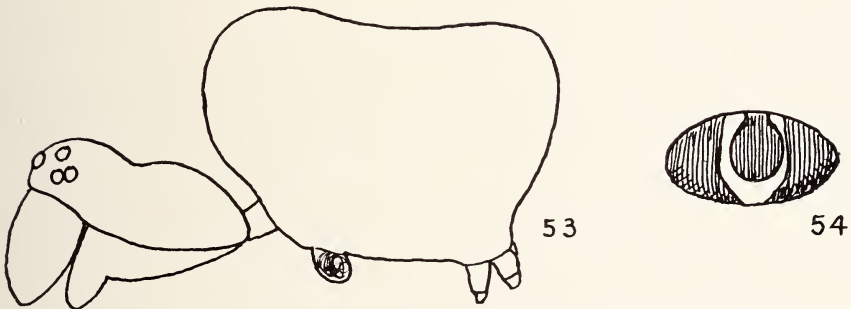
Couleur: céphalothorax testacé pâle, avec une tache brune médiane, à cheval sur le sillon transversal; chélicères et pièces buccales rembrunies, avec toutefois l'apex de ces dernières entièrement blanc; sternum brun en entier; pattes blanches, notamment les hanches, trochanters et fémurs (les fémurs I avec une tache brune), les autres articles annelés de brun, surtout à leur apex; abdomen fondamentalement blanc, taché de brunâtre: sur la face dorsale un folium mal défini, visible surtout par ses parties latérales, sur les flancs quelques fascies obliques, qui vont rejoindre de chaque côté une ligne brunâtre longitudinale; partie épigastrique brune ainsi que l'épigyne, face ventrale occupée par une bande brun foncé (de même couleur que le sternum), partant du sillon génital et atteignant les filières qu'elle entoure presque entièrement, filières brunes, le tubercule anal plus clair.

Abdomen encore moins prolongé en arrière que chez *C. conica*, sa partie postérieure arrondie (fig. 53).

Épigyne (fig. 54) en saillie, de forme ovale transverse, avec une pièce médiane en palette, n'atteignant pas le bord postérieur.

Longueur totale, 4 mm.

Uahuka: montagne Hitikau, 1000 m. d'alt., 4 mars, 1931, LeBronnec et H. Tauraa, 1 ♀ (type).



*CYCLOSA TAURAA*. Figure 53.—Femelle, vue de profil. Figure 54.—Épigyne.

Il est souvent téméraire de décrire une espèce sur un seul exemplaire, et j'ai hésité à le faire pour celle-ci. Cependant je m'y suis décidé, à cause de l'intérêt à signaler le genre *Cyclosa* des îles Marquises; de plus cette espèce ne correspond à aucune autre connue du Pacifique, non plus qu'à une des espèces à large répartition; d'ailleurs la situation de cette *Cyclosa* à une altitude élevée et en plein centre d'une île très peu fréquentée exclue à peu près totalement la possibilité d'une importation accidentelle.

Je suis heureux de dédier cette espèce à M. H. Tauraa, collecteur habile, à qui nous devons d'intéressantes captures, faites en compagnie de M. LeBronnec.

## Genre ARANEUS Clerck

**Araneus theisi** Walckenaer.

Espèce cosmotropicale, très commune dans tout le Pacifique. Il serait presque sans intérêt de citer toutes les localités des Marquises, car elle a été trouvée sur toutes les îles; je signalerai seulement qu'elle ne semble pas se trouver à l'intérieur de celles-ci, ni par conséquent sur les hauteurs, étant à peu près confinée au littoral, et aux vallées qui y aboutissent.

Quelques exemplaires constituent peut-être une variété, caractérisée par un abdomen moins ovale mais plutôt triangulaire, un céphalothorax plus allongé, une pilosité abdominale plus serrée et faite de poils plus raides et plus longs; mais par ailleurs les organes d'accouplement, et en particulier la patte-mâchoire du mâle, sont bien du type normal. Il y aurait intérêt à faire une étude de la variation de cette espèce, qui revêt des formes assez différentes, et une telle étude pourrait donner lieu à des remarques zoogéographiques importantes, mais le matériel est actuellement insuffisant.

## FAMILLE PISAURIDAE

## Genre DOLOMEDES Latreille

**Dolomedes adamsoni**, species nova (figs. 55-59).

## Femelle

Couleur: céphalothorax fauve clair, sans dessins, presque concolore, à peine rembruni à la partie antérieure; chélicères brun foncé, presque noirâtres, pièces buccales brun clair, l'apex blanc; sternum et pattes fauve clair, concolores, celles-ci sans anneaux; abdomen gris clair.

Céphalothorax large, cylindrique et tronqué droit en avant (fig. 55), la partie thoracique très peu élargie et à bords parallèles ou presque, à peine arrondis (fig. 56).

Chélicères fortement géniculées à la base, puissantes, leurs marges portant, l'antérieure trois dents contigues dont la médiane est la plus forte, la postérieure deux dents égales un peu séparées l'une de l'autre (fig. 57). Pièces buccales, figure 58.

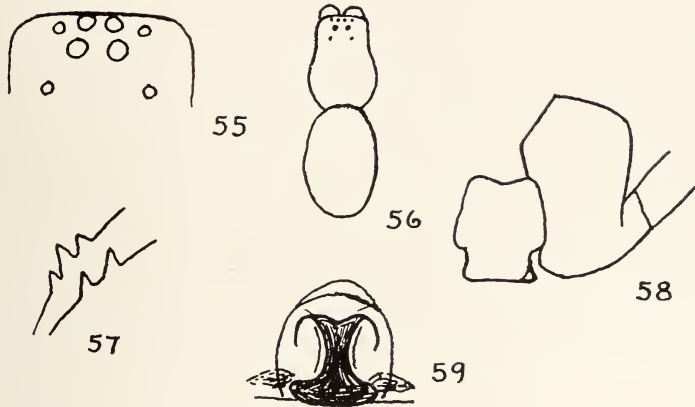
Yeux: 1<sup>re</sup> ligne droite, les médians presque double des latéraux, séparés entre eux par environ leur rayon, des latéraux par leur diamètre; 2<sup>e</sup> ligne fortement récurvée, plus large que la précédente, ses médians plus gros que les médians antérieurs (presque doubles en diamètre), séparés l'un de l'autre par un peu plus que leur diamètre, de sorte que l'espace qu'ils occupent est plus large que les yeux médians antérieurs, mais moindre que la 1<sup>re</sup> ligne, latéraux postérieurs beaucoup plus petits que les médians postérieurs, qui sont les plus gros de tous, et aussi que les médians antérieurs, à peu près égaux aux latéraux antérieurs, très reculés, séparés des médians postérieurs par au moins deux fois le diamètre de ceux-ci; groupe de médians plus large que long et plus étroit en avant (fig. 55).

Pattes modérément longues, portant, en dessous aux tibias I et II, 2-2-2 épines, aux métatarses I et II 2-2-3 épines, les 3 épines formant une ligne apicale; des scopulas bien nettes aux tarsi, moins précises aux métatarses.

Épigyne, figure 59.

Longueur totale: 9 mm.; céphalothorax, long. 4,5 mm., larg. 3 mm.; long. de la patte I, 13 mm.

Uahuka: Mont Hitikau, 1000 m. d'alt., 4 mars, 1931, LeBronnec et H. Tauraa 1 ♀ (type), 2 ♀ (cotypes).



*DOLOMEDES ADAMSONI*. Figure 55.—Femelle, groupe oculaire. Figure 56.—Silhouette du corps. Figure 57.—Marge des chélicères. Figure 58.—Pièces buccales. Figure 59.—Épigyne.

C'est avec doute, et d'une façon tout à fait provisoire, que je range cette espèce dans le genre *Dolomedes*, dont elle s'éloigne par plusieurs caractères, notamment l'aspect général, la forme du céphalothorax, et la formule dentaire des chélicères; par ailleurs elle se rapprocherait du genre *Anoteropsis*, sans toutefois y rentrer complètement. Il y aurait lieu probablement de créer un genre spécial pour cette espèce, mais je n'ai pas pensé pouvoir le faire tant que l'autre sexe ne sera pas connu.

FAMILLE ULOBORIDAE

Genre *ULOBORUS* Latreille

***Uloborus geniculatus*** Olivier.

Tahuata: vallée Hanamiai. Nukuhiva: Taiohae.

Espèce cosmotropicale.

FAMILLE DICTYNIDAE

Genre *SYRORISA* Simon, 1908

***Syrorisa mumfordi***, species nova (figs. 60-62).

Femelle

Couleur: céphalothorax fauve clair, indistinctement veiné de gris, un peu plus foncé dans la partie antérieure; chélicères, pièces buccales et sternum fauve rouge foncé, pattes fauve très clair, sans anneaux; abdomen gris souris uniforme.

Céphalothorax convexe, large en avant où il est tronqué droit (fig. 60).

Yeux (fig. 60): 1<sup>re</sup> ligne droite, les médians antérieurs beaucoup plus petits que les latéraux antérieurs, et plus rapprochés entre eux (environ 1/2 diamètre) que de ceux-ci (plus d'un diamètre); 2<sup>e</sup> ligne droite, les médians postérieurs un peu plus petits que les latéraux postérieurs, et plus rapprochés entre eux (un diamètre) que de ceux-ci (presque 2 diamètres); groupe des médians aussi large en arrière que long.

Chélicères (fig. 61) à peine géniculées à la base, leurs marges transverses, l'antérieure avec 2 dents, la postérieure avec une seule petite dent.

Pattes courtes, peu épineuses, autant que l'état assez défectueux de l'exemplaire permette de le distinguer, il y a: 1 dent antéro-apicale aux fémurs I et II, les tibias I portent, à la face inférieure 1 paire antéro-médiane, les métatarses I, 2-2-2 épines à la face inférieure.

Épigyne avec un bourrelet en fer à cheval (fig. 62).

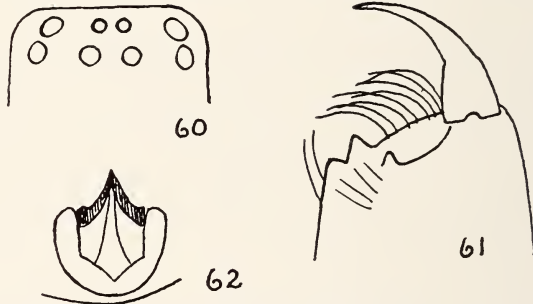
Cribellum divisé, calamistrum sur un rang.

Longueur totale: 6 mm.

Hivaoa: Aimoa, 500 m. d'alt., Mumford et Adamson, 12 septembre, 1929, 1 ♀ (type).

Uahuka: vallée Hanahaoua, 19 mars, 1931, LeBronnec et H. Tauraa, 1 ♀ (cotype).

Hatutu [Hatutaa]: 30 septembre, 1929, Adamson, 1 jeune.



SYRORISA MUMFORDI. Figure 60.—Groupe oculaire. Figure 61.—Chélicère, vue du côté interne. Figure 62.—Épigyne.

Le groupe des Amaurobiae, auquel se rattache cette espèce, n'était connu que de la région australo-calédonienne; il est intéressant de constater sa présence dans l'ouest du Pacifique, ce qui est à rapprocher du cas de *Corinna cetrata*, de *Sandalodes calvus*, et de quelques autres. L'espèce a certains caractères des *Syrorisa*, genre à laquelle je la rattache, mais elle en a aussi des *Epimecinus*, la distinction entre les genres de ce groupe étant d'ailleurs très faible.

# PSEUDAGRION DEMORSUM, NEW SPECIES, FROM THE MARQUESAS\*

By

JAMES G. NEEDHAM

CORNELL UNIVERSITY

In a previous paper<sup>1</sup> I described *Coenagrion interruptum* Needham and the nymph of *Hemicordulia assimilis* Hagen from collections made by the Pacific Entomological Survey in the Marquesas Islands. I have also reported on collections made in Tahiti by the same survey.<sup>2</sup> The examination of further collections has brought to light another new species.

## **Pseudagrion demorsum**, new species (fig. 1).

Length, 35 mm.; abdomen, 29 mm.; hind wing, 20 mm.

A slender blackish species with subhyaline wings and yellowish stigma; labrum olive green with a broad black basal cross stripe; face and top of head dull black with large but very obscure pale triangular postocular spots that are obsolete in the female.

Prothorax black above; synthorax greenish black above, with obscure antehumeral pale stripes that widen downward and are broadly interrupted above the middle in the male; in the female they are wider and continuous. Legs black externally and on the tips of the tarsal segments and claws paler within and at the base; the tibiae are all pale in the female. Wings subhyaline with brownish veins and a yellowish brown stigma; postnodal cross veins in the male 12 and 10 in fore and hind wing respectively; in the female 14 and 12 in fore and hind wing respectively; the line of cross veins that descends from the nodus is strongly angulate on vein *Rs* and continues unbroken thence to the hind margin; the stigma covers scarcely a single cell.

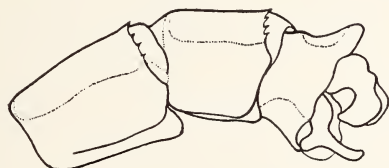


FIGURE 1.—Side view of end of male abdomen, *Pseudagrion demorsum*, new species.

Abdomen greenish black above, yellowish at the sides; segment 1 has a narrow brownish apical cross ring and 2 a broader one; the dorsum of segments 8 and 9 are mostly blue and a large middorsal round blue spot occupies most of the dorsum of the tenth segment; the apical margin of that segment is prolonged shelflike above the appendages and broadly rounded; superior appendages brownish, flexed strongly downward at one-third their length in a flat angulate plate that is recurved and angulated

<sup>1</sup> Needham, J. G., *Coenagrion interruptum*, new species, from the Marquesas, and nymph of *Hemicordulia assimilis* Hagen: B. P. Bishop Mus., Bull. 98, pp. 111-114, 1932.

<sup>2</sup> Needham, J. G., Odonata from Tahiti: B. P. Bishop Mus., Bull. 113, pp. 21-23, 1932.

\* Pacific Entomological Survey Publication 7, article 4. Issued May 17, 1933.



at its apex; inferiors more slender and parallel sided beyond their triangular base and rounded on the end, with a slight denticle on the upper apical margin; seen from above the deflexed bladelike tips of the superiors are slightly convergent downwards.

Nukuhiva: Tapuaooa, altitude 2,600 feet, May 30, 1931, 1 male; Ooumu, altitude 3,000 feet, May 28, 1931, 1 male; Le Bronnec and H. Tauraa.

Hivaoa: Mount Temetiu, slope north of summit, altitude 3,860 feet, December 27, 1930, 1 female, H. Tauraa.

## STAPHYLINIDAE OF THE MARQUESAS ISLANDS\*

By

MALCOLM CAMERON

Of the 21 species of Staphylinidae from the Marquesas, 13 are hitherto undescribed. They represent 15 genera of which one is new. It appears from the number of new species in this collection that a considerable degree of endemicity prevails, but from the absence of many genera of world-wide range, it is probable that the family has not received special attention and doubtless many more will subsequently be found.

### OXYTELINAE

#### PIESTINI

***Eleusis pacifica***, new species (fig. 1).

Shining, yellowish-red, the posterior two-thirds of the elytra blackish. Antennae and legs reddish-yellow. Length, 2.5 mm. Near *philippina* Bernhauer, but a little larger, the head not infuscate, the thorax with scarcely perceptible impression on either side of the middle posteriorly; the sculpture and structure of the antennae scarcely differ from *philippina*. Head in the male more transverse, suborbicular, broader than the thorax, the eyes moderate, much shorter than the postocular region and with distinct sulcus internally; in the female more orbicular, but also broader than the thorax; puncturation extremely fine and scattered, the ground sculpture very fine, uniform and wavy. Antennae slender, reaching the base of the thorax, the 7th to 10th joints scarcely differing amongst themselves, slightly transverse. Thorax slightly transverse, the sides evenly rounded, scarcely perceptibly dentate, along the middle with an extremely fine smooth line, the sculpture as on the head. Elytra about as long as broad, one-third longer than the thorax, each with a setiferous puncture on the disc, extremely finely and very sparingly punctured, the ground sculpture very fine, longitudinal. Abdomen practically impunctate, very finely transversely striate.

Eiao: near center, altitude 1300 feet, October 1, 1929, types, male and female, under bark of *Pisonia* species, Adamson.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 27, 1929, 8 specimens under bark of *Hibiscus tiliaceus*, Mumford and Adamson.

Uahuka: crest of north ridge, September 23, 1929, one specimen on *Piper latifolium*, Adamson.

***Paralispinus exiguus*** Erichson.

Hivaoa: Atuona Valley, altitude 325 feet, July 6, 1929, 1 specimen, in dead *Erythrina indica*; Anatuakina, altitude 1520 feet, June 1, 1929, 1 specimen; Kopaaftaa, altitude 2800 feet, February 25, 1930, 2 in dead twigs of *Crossostylis biflora*; Mumford and Adamson.

\* Pacific Entomological Survey Publication 7, article 5. Issued June 30, 1933.

Mohotani: west side near plantation, altitude 975 feet, August 13, 1929,  
 1 on *Miscanthus japonicus*, Adamson.

Widely distributed throughout the tropics.

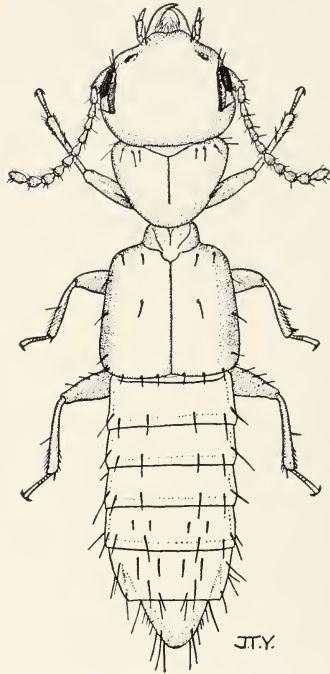


FIGURE 1.—*Elensis pacifica*, new species, type male from Eiao,  $\times 35$ .

**Lispinus subopacus** Kraatz.

Hivaoa: Atuona Valley, altitude 325 feet, July 6, 1929, 17 in dead  
*Erythrina indica*, Mumford and Adamson.

Taken by the Pacific Entomological Survey in Tahiti. Also found in  
 Ceylon, Sumatra, Philippines and New Guinea.

OXYTELINI

Genus **NANOLOBUS**, new genus

Facies of *Trogophloeus* and closely allied thereto, but at once distinguished  
 by the coarse uneven sculpture of the thorax and elytra, the 2d joint of the  
 tarsi produced into a narrow lobe underlying the 3d joint for about half its  
 length, its apex furnished with two long setae and the acute mesosternal  
 process having a fine keel and reaching about a third of the length of the

intermediate coxae. The mandibles are not prominent, slightly bifid at the apex, and the maxillary palpi as in *Trogophloeus*. In other respects also it agrees with this genus as far as can be seen without dissection of the mouth parts.

**Nanolobus pacificus**, new species (fig. 2).

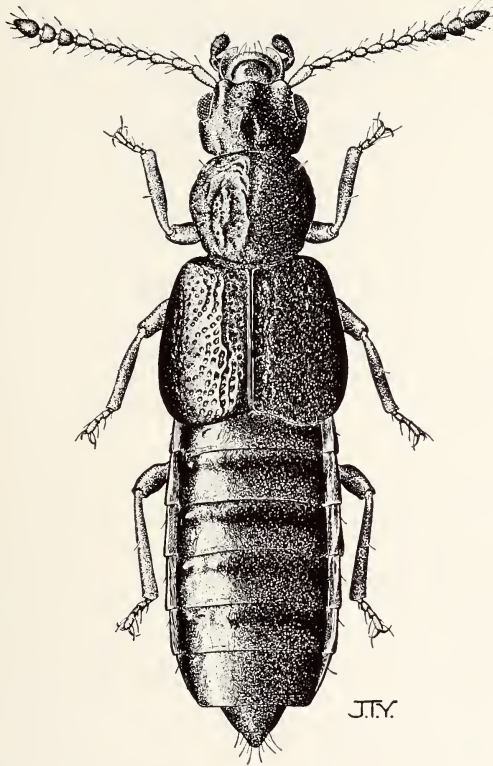


FIGURE 2.—*Nanolobus pacificus*, new species.

Moderately shining, the head and thorax darker or lighter ferruginous red, the elytra and abdomen black, the shoulders of the former rufescent, occasionally the elytra entirely ferruginous red. Antennae reddish-yellow, the last three joints black. Legs reddish-yellow, the femora and tibiae in the middle a little infusate. Length, 3 mm.

Head transversely suborbicular, narrower than the thorax, the eyes small, the evenly rounded postocular region twice as long; vertex with a short longitudinal groove in the middle, on each side of it with a small shining tubercle, the whole surface except the anterior margin and the tubercles strongly coriaceous, here and there with a few small superficial punctures. Antennae extending a little beyond the humeral angles, slender, finely setiferous, the 2d joint stouter but equal in length to the 3d, 4th orbicular, 5th

to 8th short, oval, 9th to 11th stouter, forming a club, the 9th and 10th transverse, broader than the preceding, 11th conical. Thorax slightly transverse, uneven, the sides rounded, more retracted behind, the angles rounded, on each side of the middle with a curved impression, at the middle of the base with a fovea and along the lateral margin somewhat obscurely impressed; sculpture as on the head but the scattered punctures larger and more apparent on the disc and along the lateral margins. Scutellum concealed. Elytra a little broader than long, broader and longer (5:3.5) than the thorax, with coarse, close, here and there confluent punctures. Abdomen nearly parallel, coriaceous, impunctate with a few very short fine hairs, the first two (visible) segments on each side of the middle of the base with an impression, the first four near the lateral margin each with a longitudinal one. Except for the few hairs on the abdomen the insect is glabrous.

Hivaoa: Matauuna, altitude 3700 feet, March 2 and 4, 1930, 4 specimens, including type, under dead leaves, Mumford and Adamson.

**Trogophloeus (Boopinus) mumfordi**, new species (fig. 3, *a*).

Near *indicus* Kraatz, but with the eyes a little smaller, the antennae longer and stouter, the first two joints pitchy, the thorax with the sides sinuate behind, before the middle of the base with a small crescentic impression, more anteriorly on each side with a small fovea not connected with the basal impression, the elytra longer, much more finely punctured, the sculpture of the head more strongly coriaceous, the punctures finer, the puncturation of the thorax much coarser towards the sides; abdomen more closely and more uniformly punctured throughout, more finely and more closely pubescent. The elytra a good deal longer than the thorax (5:3). Length, 2.5 to 2.75 mm.

Uahuka: Hane Valley, altitude 30 feet, March 13, 1931, at light, type, LeBronnec and H. Tauraa.

Also taken in Tahiti by the Pacific Entomological Survey.

**Trogophloeus (sensu stricto) funereus**, new species (fig. 3, *b*).

Black, the head and thorax dull, the elytra and abdomen shining. Antennae and legs blackish. Length, 3 mm.

Head transverse, almost as wide as the thorax (3.5:4) densely coriaceous and with a few fine scarcely perceptible punctures, the eyes small, the postocular region rounded and a little dilated, longer than the eye. Antennae with the 3d joint narrower and a little shorter than the 2d, 4th and 6th orbicular, 5th short, oval, 7th to 10th transverse, 9th and 10th much wider than the preceding, 11th conical. Thorax transverse (4:3), the sides rounded in front of the middle, straight and strongly retracted behind, the angles rounded, scarcely perceptibly impressed before the base, the sculpture as on the head. Elytra broader and longer than the thorax (5:3) with a short longitudinal impression at the base on each side of the suture, coarsely, closely, rugosely punctured. Abdomen nearly parallel, coriaceous, very sparingly, scarcely perceptibly punctured. Pubescence throughout very short and scanty.

Hivaoa: Matauuna, altitude 3700 feet, March 4, 1930, type, beating on *Sclerotheca* species; March 3, 1930, 1 in dead wood of *Cheirodendron* species; Mumford and Adamson.



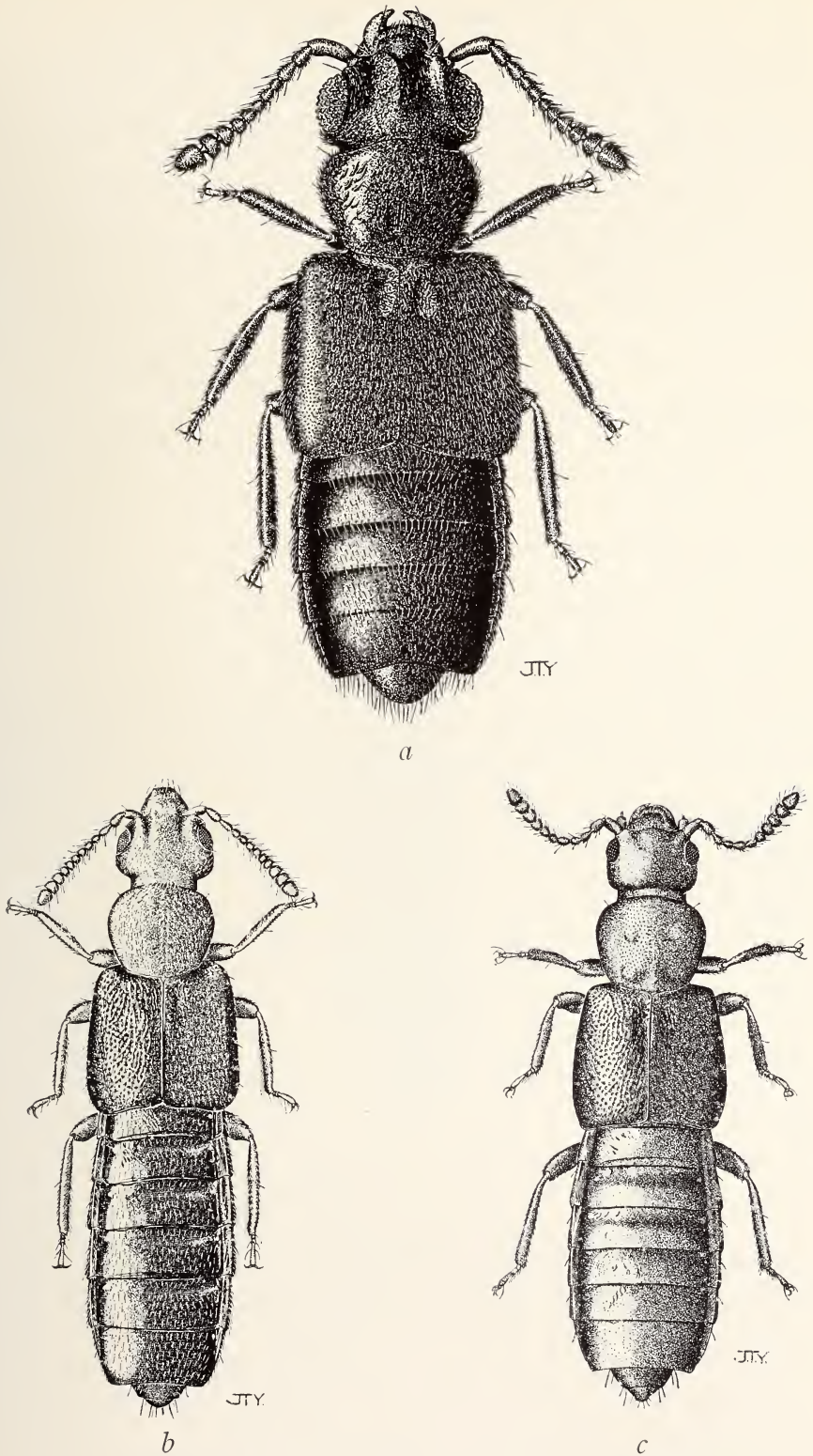


FIGURE 3.—*Trogophlocus*: a, *T. munfordi*, new species, type from Uahuka; b, *T. funereus*, new species, type from Hivaooa; c, *T. funeralis*, new species.

**Trogophloeus** (sensu stricto) **funeralis**, new species (fig. 3, c).

Closely allied to *funereus*, but smaller (2.3 mm.) and narrower, the thorax less transverse, less widened in front, the disc with trace of four impressions, the legs yellow, the tibiae blackish. In other respects similar to *funereus*.

Hivaoa: Matauuna, altitude 3700 feet, March 4, 1930, 2 specimens including type, beating on *Sclerotheca* species, Mumford and Adamson.

## PAEDERINAE

## PAEDERINI

**Acanthoglossa quadraticeps** Cameron.

Hivaoa: Aimoa, altitude 1665 feet, March 7, 1929, 3 on *Pandanus* species, Mumford and Adamson.

Also in Fiji.

**Medon adamsoni**, new species (fig. 4).

Moderately shining; head and thorax dark ferruginous red; elytra yellowish-red with ill-defined transverse brownish fascia across the middle; abdomen pitchy, the posterior half of the 5th (visible) and the whole of the 6th segment dirty yellow. Antennae and legs reddish-yellow. Length, 4 mm.

Head large, quadrate, as long as broad, as broad as the thorax, the base broadly, slightly emarginate, strongly coriaceous and covered with small, rather close, superficial punctures. Antennae reaching the anterior angles of the thorax, the penultimate joints distinctly transverse. Thorax transverse, trapezoidal, the angles rounded, along the middle with a very fine raised line, more distinct behind, on each side posteriorly near the middle, lightly impressed; puncturation rather less fine and a little closer than on the head, umbilicate, ground sculpture absent. Elytra a little broader and a fourth longer than the thorax, rather closely, moderately finely but roughly punctured. Abdomen rather closely, finely but roughly punctured. Pubescence throughout yellow; much closer on the abdomen.

Hivaoa: Mount Temetiu, northeast slope, altitude 2615 feet, July 24, 1929, type and 1 other specimen; altitude 2400 feet, May 24, 1929, cotype and 5 other specimens on *Freycinetia* species; altitude 2000 feet, May 27, 1929, 7 in decaying fruit of *Freycinetia* species; Mumford and Adamson.

Uapou: Tokohepu summit, altitude 3200 feet, November 28, 1931, under rotting bark of *Cheirodendron* species, LeBronnec.

## STAPHYLININAE

## XANTHOLININI

**Leptacinus**, new species.

Hivaoa: Vaiepoepo, altitude 2300 feet, June 2, 1929, Mumford and Adamson. Unique.

**Pachycorynus insularis**, new species.

Moderately shining, depressed, yellowish-red, the elytra yellow. Antennae and legs yellowish-red. Length, 4.75 mm. In build very similar to *P. dimidiatus* but smaller and narrower, differently colored, etc. Head subquadrate, a little wider than the thorax, eyes small, median frontal sulci fine, united behind and thence continued almost to the base as a fine median groove; the lateral sulci wider than the median, parallel to them, rather long; puncturation rather fine and sparing, the frontal region impunctate, the ground sculpture strong, more or less longitudinal. Antennae with the 3d to 10th joints transverse, not increasing in width after the 4th. Thorax a little longer than broad, widest in front, the sides retracted behind, the angles rounded, on each side of the middle with a somewhat irregular row of 9 or 10 fine punctures, externally with about 10 or 12 others; ground sculpture as on the head.

Elytra as long as the thorax, closely and finely punctured, finely yellow pubescent. Abdomen finely and very sparingly punctured, the ground sculpture transverse, much finer than that of the head.

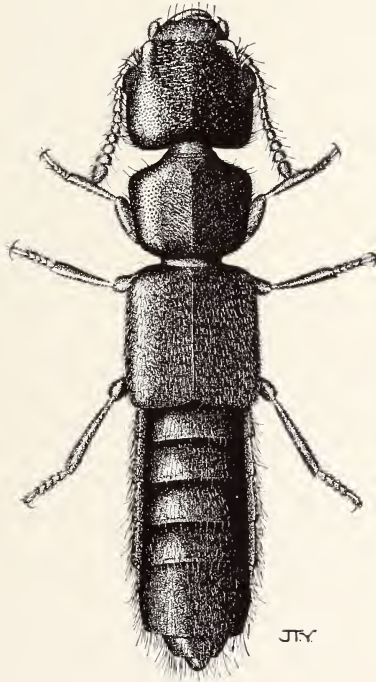


FIGURE 4.—*Medon adamsoni*, new species.

Eiao: Vaituha Valley, altitude 200 feet, October 3, 1929, 4 specimens, including type, under bark of *Pisonia* species, Adamson.

## STAPHYLININI

**Philonthus longicornis** Stephens.

Twenty-four specimens, as follows:

Hivaoa: Mount Temetiu, slope north of summit, altitude 3800 feet, December 27, 1930, beating on *Wcinnannia* species; Matauuna, altitude 3700 feet, March 3 and 4, 1930; Mumford and Adamson.

Nukuhiva: Tapuaooa, altitude 3100 feet, November 14, 1929; Ooumu, altitude 3800 feet, November 10, 1929, and altitude 4050 feet, November 13, 1929; Puokoke, Tunoa Ridge, altitude 3485 feet, October 22, 1929; Mumford and Adamson.

Uahuka: Hitikau Ridge, altitude 2900 feet, March 4, 1931, LeBronnec and H. Tauraa. Cosmopolitan.

## ALEOCHARINAE

## MYLLAENINI

**Myllaena curtipes** Sharp.

Hivaoa: Matauuna, altitude 3700 feet, March 4, 1930, 1 specimen among dead leaves, and March 2, 1930, 1 specimen in wet rotting leaves of *Crossostylis biflora*, Mumford and Adamson.

## BOLITTOCHARINI

**Coenonica insularum**, new species (fig. 5, a).

Fore-parts nearly dull, abdomen rather shining. Head black, thorax and elytra dark brown, the latter obscurely rufescent at the shoulders; abdomen pitchy-black, the posterior margin of the segments narrowly and obscurely reddish. Antennae reddish-yellow, the last four joints blackish. Legs reddish-yellow. Length, 2.75 mm.

In size and build somewhat resembling *Leptusa haemorrhoidalis*, but with the fore-parts much less shining. Head coriaceous, impunctate in front, posteriorly closely covered with small umbilicate punctures. Antennae with the 2d and 3d joints of equal length, 4th to 6th a little longer than broad, gradually decreasing in length, 7th to 10th transverse, gradually increasing in width. Thorax transverse, the sides rounded for the anterior two-thirds, retracted and a little sinuate behind, the posterior angles obtuse, before the scutellum with small, obsolete fovea, strongly coriaceous and without puncturation. Elytra about a third longer and a little broader than the thorax, convex, with moderately fine, close, rugose puncturation. Abdomen rather closely and rather finely punctured, more sparingly behind. The whole insect covered with a fine yellowish pubescence.

Hivaoa: Matauuna, altitude 3700 feet, March 2, 1930, 13 specimens, including type, under rotting leaves on ground; February 24, 1930, 1 specimen; March 3, 1930, 9 specimens among dead leaves; altitude 3900 feet, March 3, 1930, 2 specimens under dead leaves on ground; Mount Temetiu, altitude 3620 feet, July 24, 1929, 1 specimen; Mumford and Adamson.



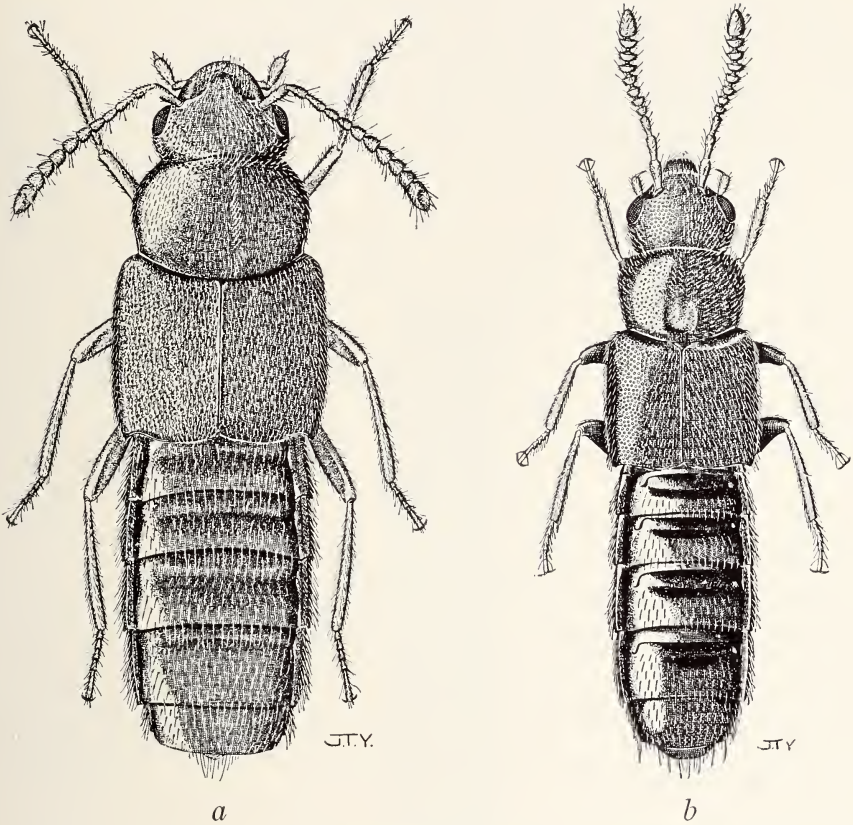
*Coenonica ferruginea*, new species.

FIGURE 5.—*Coenonica*: a, *C. insularum*, new species, type from Matauuna, Hivaoa,  $\times$  45; b, *C. affinis*, new species.

Moderately shining, dark ferruginous red, the elytra and 4th and 5th (visible) abdominal segments blackish, the former narrowly rufescent at the base. Antennae with the first 5 or 6 joints yellow, the rest blackish. Legs reddish-yellow. Length, 2.75-3 mm.

Very similar to *insularum* in build but with narrower head. Head feebly coriaceous, with rather close, very obsolete umbilicate punctures except in front which is impunctate. Antennae with the penultimate joints more transverse than in *insularum*, otherwise similarly constructed. Thorax with a small fovea at the middle of the base, ground sculpture as on the head, the puncturation scattered, fine and obsolete. Elytra about a third longer than the thorax, with fine, rather close, somewhat asperate punctures. Abdomen with fine asperate, not very close puncturation, more sparing behind.

Hivaoa: Mount Temetiu, altitude 3650 feet, May 27, 1929, 3 specimens, including type, in fern petioles; altitude 2440 feet, July 24, 1929, 2 specimens on *Freycinetia* species; Mumford and Adamson.



**Coenonica affinis**, new species (fig. 5, b).

Black, the elytra occasionally pitchy-brown, the fore-parts nearly opaque, the abdomen more shining. Antennae black, the first four joints reddish-yellow. Legs reddish-yellow. Length, 2.75 mm. Of the luster and build of *insularum*, but differently colored, the ground sculpture of the head and thorax similar and the head similarly punctured, but the thorax has a rather close obsolete puncturation whilst the elytra are also strongly coriaceous with an obsolete, moderately fine and moderately close puncturation, quite different from the sculpture of *insularum*, the abdomen is much less closely punctured and the penultimate joints of the antennae are more transverse.

Hivaoa: Mount Temetiu, altitude 2000 feet, May 27, 1929, 1 specimen, in decaying fruit of *Freyinetia* species, Mumford and Adamson.

Nukuhiva: Tapuaooa, altitude 3200 feet, November 10, 1929, 1 specimen, in fern petiole, Mumford and Adamson.

Uapou: Tekohepu summit, altitude 3200 feet, November 28, 1931, 2 specimens, including type, under rotting bark of *Cheirodendron* species, Le-Bronnec.

## MYRMEDONIINI

**Gnypeta variegata** Bernhauer.

Hivaoa: Kopaafaa, altitude 2770 feet, February 26, 1930, 1 specimen, under dead leaves; Tehueto Valley, altitude 500 feet, March 8, 1929, 1 specimen; Mumford and Adamson.

Also collected by the Survey in Tahiti. I believe this insect will prove to be the *Bolitochara insulana* of Fairmaire which was subsequently placed in the genus *Tachyusa* and originally described from Tahiti. Also in Samoa and Fiji.

**Atheta bicincta** Cameron.

Nukuhiva: ridge north of Teuanui, altitude 2800 feet, October 26, 1929, 1 specimen in fruit of *Freyinetia* species, 1 on *Metrosideros collina*, Mumford and Adamson.

Uahuka: crest of north range, altitude 2350 feet, September 24, 1929, 1 specimen, under bark of *Hibiscus tiliaceus*, Adamson.

Collected by the Survey in Tahiti. Also found in Fiji.

## ALEOCHARINI

**Phloeopora pacifica**, new species (fig. 6).

Elongate, parallel, black, moderately shining. Antennae black, the first three joints brownish-yellow. Legs reddish-yellow. Length, 3 mm.

Somewhat resembling the European *testacea* in build but differently colored, thorax a little narrower, elytra longer, antennae more slender, etc. Head a little narrower than the thorax, transverse, subquadrate, along the middle of the disc with a fine groove;

strongly coriaceous, between the antennal tubercles with a few fine punctures, elsewhere impunctate. Antennae with the 2d and 3d joints of equal length, 4th scarcely, 5th to 10th distinctly transverse, the penultimate about 2.5 times broader than long. Thorax transverse, the sides gently rounded in front, straight and retracted behind, the posterior angles obtuse and with a minute fovea adjacent, along the middle with an obsolete sulcus, the ground sculpture as on the head and with moderately close, fine obsolete punctures. Elytra a third longer and a little broader than the thorax, rather closely, finely and asperately punctured. Abdomen parallel, finely and moderately closely punctured, more sparingly behind.

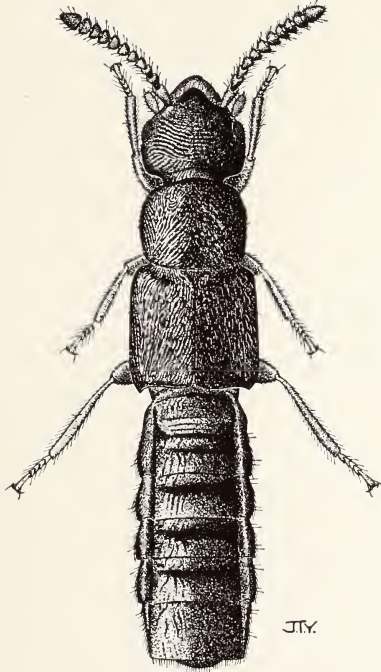


FIGURE 6.—*Phloeopora pacifica*, new species.

Hivaoa: Matauama, altitude 3700 feet, March 3, 1930, 3 specimens, including type, in dead wood of *Cheirodendron* species; Mount Temetiu, altitude 3650 and 3660 feet, May 27, 1929, 3 specimens, in fern petioles; Mumford and Adamson.

**Phloeopora**, new species.

Eiao: Vaituha Valley, altitude 200 feet, October 3, 1929, unique, under bark of *Pisonia* species, Adamson.



MYCETOPHILIDAE, CULICIDAE, AND CHIRONOMIDAE AND  
ADDITIONAL RECORDS OF SIMULIIDAE, FROM  
THE MARQUESAS ISLANDS\*

By

F. W. EDWARDS

BRITISH MUSEUM (NATURAL HISTORY)

In a previous publication in this series I have reported<sup>1</sup> on the Simuliidae from the Marquesas Islands in the collections of the Pacific Entomological Survey; the Tipulidae have been studied by C. P. Alexander;<sup>2</sup> and the Ceratopogonidae by J. W. S. Macfie.<sup>3</sup> This paper is a report on the remaining families of Nematocera thus far submitted to me, together with records of Simuliidae which I received since writing my earlier paper on that family.

MYCETOPHILIDAE

No species of this family has been reported from the Marquesas, and the present collection includes only a very few specimens, all belonging to the subfamily Sciarinae. Representatives of other subfamilies should occur, as the family is fairly well represented in Samoa, and endemic species of *Platyura* occur in Hawaii.

Genus *SCIARA* Meigen

*Sciara radicum* Brunetti.

Hivaoa: Tahauku, July 10, 1929, 2 females; Atuona Valley, altitude 325 feet, July 6, 1929, 1 male, 1 female; Adamson.

Eiao: Vaituha, 2 males, 2 females, Adamson.

This is a widely distributed species in the tropics, and has recently been found to occur also in hothouses in England.

*Sciara*, species 2.

A small species of rather distinctive coloring: mesonotum mainly ochreous, with a narrow dark brown border on each side which extends inwards above each wing-root, forming a pair of dark brown patches just before the scutellum; pleurae mainly dark brown on upper half, lower half pale yellowish. The three specimens are all much damaged.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 21, 1930, 1 female, LeBronnec.

<sup>1</sup> Edwards, F. W., Marquesan Simuliidae: B. P. Bishop Mus., Bull. 98, pp. 103-109, 1932.

<sup>2</sup> Alexander, C. P., New and little-known Tipulidae from the Marquesas: B. P. Bishop Mus. Bull. 98, pp. 87-92, 1932.

<sup>3</sup> Macfie, J. W. S., Ceratopogonidae from the Marquesas Islands: B. P. Bishop Mus., Bull. 114, 1933.

\* Pacific Entomological Survey Publication 7, article 6. Issued July 29, 1933.

Uahuka: Hanahoua Valley, altitude 250 feet, March 10, 1931, 1 female, LeBronnec and H. Tauraa.

Eiao: Vaituha, October 2, 1929, at light, 1 female, Adamson.

**Sciara**, species 3.

Another small species resembling the last two, but with distinctive coloring of thorax. Mesonotum ochreous-brown, with three dark brown stripes, middle stripe lighter than side stripes and including three narrow, slightly darker lines. Pleurae pale ochreous with three large dark brown patches, one on anepisternite, one on pleurotergite, and one occupying lower part of sternopleura. Four damaged specimens.

Nukuhiva: Tekao Hill, altitude 3250 feet, July 23, 1931, 2 females; Tapuaooa, altitude 2600 feet, July 18, 1931, 1 female; LeBronnec and H. Tauraa.

Uahuka: Vaipae Valley, altitude 150 feet, March 10, 1931, 1 female, LeBronnec and H. Tauraa.

Genus **PLASTOSCIARA** Berg

**Plastosciara pernicioso** Edwards.

Eiao: Vaituha, sea level, October 1, 1929, 1 male, Adamson.

A widely distributed species, first found in England, but afterwards reported from Samoa.

Genus **SCYTHROPOCHROA** Enderlein

**Scythropochroa** species.

Hivaoa: Hanaheka [Tanaeka] Valley, altitude 1100 feet, June 4, 1929, 1 male (much damaged), Mumford and Adamson.

This is possibly the male of *S. samoana* Edwards of Samoa and Fiji.

CULICIDAE

Only two species of this family are found in the Marquesas, both widely spread forms and evidently recently introduced.

Genus **AEDES** Meigen

Subgenus **STEGOMYIA** Theobald

**Aedes (Stegomyia) scutellaris** Walker variety **pseudoscutellaris** Theobald  
*Aedes variegatus* Bigot.

This has evidently been established on the islands for a considerable time, as it occurs throughout the group from sea level to above 2000 feet altitude. Material in the present collection is from the following localities:

Hivaoa: Atuona Valley; Hanaheka [Tanaeka] Valley, altitude 1100 feet; Mataovau; Tahauku; Tapeata, Mount Ootua, altitude 2500 feet.



Tahuata: Hanatuuna valley, altitude 1000 feet; Hanamiai Valley, altitude 1300 feet.

Fatuhiva: Ihiota, Hanavave Valley, altitude 600 feet; Tevaitapu [Teavaitapu] Valley, altitude 350 feet; Tepeia, Omoa [Oomoa] Valley, altitude 300 feet.

Mohotani: altitude 160-700 feet.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet; Vaioa, Hakau Valley; Vaiotekea, altitude 2200 feet.

Uahuka: Hane Valley, altitude 150 feet; Vaikivi Valley, altitude 900 feet; Matapopo, Hane Valley, altitude 800 feet; Penau Ridge, altitude 2000 feet and 2170 feet; Hitikau Ridge, altitude 2900 feet.

Eiao: Vaituha, sea level to 200 feet; altitude 1900 feet; uplands, north end, east side, altitude 1815 feet.

#### Genus CULEX Linnaeus

**Culex fatigans** Wiedemann (**quinquefasciatus** Say of American authors).

Hivaoa: March 7, 1930, Adamson.

Eiao: Vaituha, October 2, 1929, in house, Adamson.

Probably a more recently introduced species which has only been found near the coast.

#### CHIRONOMIDAE

No Chironomidae have hitherto been recorded from the Marquesan Islands, and the family is evidently very poorly represented in the archipelago, although examples of 10 or 11 species are present in the collection. Three of these are marine species, two at least being widely distributed; the third is new to science, but will probably be found to have a wide distribution in the Pacific. Seven species belong to one group of the genus *Spaniotoma*, and some or all of these may be truly endemic, although so little is known as yet of the smaller Chironomidae of the Pacific islands and New Guinea that no positive opinion on the point can be given.

#### Genus THALASSOMYIA Frauenfeld

This marine genus, until recently recorded only from European coasts, is now known to have a very wide distribution, and its occurrence in the Marquesas was to be expected, although it is somewhat surprising to find it represented by two distinct species, one of these having previously been found only on the East African coast.

**Thalassomyia pilipes** Edwards.

Eiao: Vaituha, October 2, 1929, one male at light, Adamson.

This species, recorded by me from Samoa, is most probably identical with *T. (Galapagomyia) longipes* Johnson of the Galapagos Islands. Since the description of *T. pilipes* was published, I have examined a number of *Thalassomyia* (all unfortunately lacking the abdomen) collected by Miss L. E. Cheesman in the Galapagos; these have long hair on the femora and tibiae and, so far as can be seen, agree in all respects with the Samoan type and with the specimen from Eiao.

***Thalassomyia africana* Edwards.**

Eiao: Vaituha, October 2, 1929, 3 males, 4 females, at light, Adamson.

I have compared these specimens carefully with the type male from Dar-es-Salaam and can find no specific difference. The male hypopygium is identical in structure, and differs in several respects from *T. frauenfeldi* or *T. pilipes*, notably in the form of the style which is scarcely swollen basally and not bilobed, the presence of a thumb-like, somewhat chitinized bare projection at base of coxite beneath and the numerous short but not flattened hairs at base of coxite above (on the morphologically ventral surface). *Thalassomyia africana* is easily distinguished from *T. pilipes* by its small size and by having the hair on the male legs quite short.

The female, hitherto unknown, has the cerci rather longer and more slender than in other species, gradually tapering from base to tip as in *T. pilipes*.

Genus TELMATOGETON Schiner

This genus includes marine species occurring in South Africa, Saint Paul Island (South Indian Ocean), and Chile, also fresh-water forms in Hawaii. The new species described below is presumably marine, as it was taken in company with *Thalassomyia africana*.

***Telmatogeton pusillum*, new species.**

Brownish; thorax with irregular greyish pruinescence shifting with incidence of light; scutal stripes moderately dark brown; scutellum, legs, and halteres yellowish. Antennae 7-segmented, last segment suddenly narrowed just before tip as in most other species. Dorso-central hairs of thorax of moderate length, about 20 in each row. Trochanters of male simple. Last tarsal segment with median terminal projection finger-like, not broadened towards tip, lateral projections in male very short, in female slightly longer, but still less than half as long as median projection. Claws of male short, equal, rounded at tip, with a small sharp tooth on inner side before middle, this tooth difficult to see and perhaps sometimes absent. Claws of female much longer than those of male, curved, simple, and sharp-pointed. Membranous plate arising from base of claw large in female, small or absent in male. Wings scarcely darkened, fully developed in both sexes; venation much as in other species of the genus, but  $R_1$  about half as long as  $R_{4+5}$  and  $Cu_2$  rather suddenly bent beyond middle, its distal portion reflexed and almost straight. Wing-length 2 mm.

Eiao: Vaituha, October 2, 1929, 6 males, 3 females, at light, Adamson.

This is the smallest species of the genus known, being slightly smaller

even than the Chilean *T. simplicipes* Edwards. It is well distinguished structurally by the short lateral lobes of the last tarsal segment and by the bent instead of curved vein  $Cu_2$ .

### Genus SPANIOTOMA Philippi

#### Subgenus SMITTIA (Holmgren) Edwards

The six or seven species of this subgenus represented in the collection all agree with my definition<sup>4</sup> in having the squama completely bare, wing membrane devoid of microtrichia and faintly brownish-tinged by transmitted light,  $R_{2+3}$  separate from  $R_{4+5}$ , and  $fCu$  well beyond  $r-m$ . They further agree with the European *S. brevifurcata* Edwards and *S. albipennis* Goet. in having bare eyes, no pulvilli, vein  $An$  terminating well before  $fCu$ , its tip usually followed by an oblique fold, and anal area of wing reduced.

This group of species apparently has numerous representatives in the tropics; it includes the Tahitian *Orthocladius brachydicanus* Edwards and the Samoan *O. macrobrachius* Edwards, in addition to some species described by Kieffer from the Seychelles Islands under the genus *Dactylocladius*.

The Marquesan material is in poor condition, and most of the species are therefore left unnamed, but brief diagnoses are given below.

#### **Spaniotoma (Smittia) maculiventris**, new species.

##### Male

Ground-color pale yellow, including prescutellar area, scutellum, most of abdomen, legs and halteres; scutal stripes and postnotum orange-brown, former fused; shoulders whitish; pleurae mostly dark brown; abdomen with a transverse blackish band on each of tergites 2-5, leaving all margins pale, a narrower dark band on tergite 8. Antennae 14-segmented as usual, but last two joints very indistinct, antennal ratio about 0.4. Pronotum well developed. Wings very narrow at base.  $R_{4+5}$  scarcely reaching beyond level of middle of  $Cu_1$ ; costa strongly produced, reaching level of tip of  $Cu_1$ ;  $Cu_2$  strongly bent in middle; no distinct transverse fold beyond  $Cu_2$ . Wing-length, 1 mm.

Uahuka: Putataua, Vaipae Valley, altitude 880 feet, September 20, 1929, one male on dead banana leaves, Adamson.

A species with extremely distinctive coloration.

#### **Spaniotoma (Smittia) species 2.**

A small black species, closely related to *S. brachydicanus* Edwards of Tahiti, but differing in having the thorax almost all black, and to *S. macrobrachius* Edwards of Samoa, differing in having the costa produced only a short distance beyond  $R_{4+5}$ , which ends above the tip of  $Cu_1$ ;  $Cu_2$  almost straight.

Tahuata: Amatea, altitude 2600 feet, June 28, 1930, beating on *Reynoldsia* species, 33 males (all much damaged), LeBronnec and H. Tauraa.

<sup>4</sup> Edwards, F. W., British Non-Biting Midges (Diptera, Chironomidae): Ent. Soc. London, Trans., p. 357, 1929.

**Spaniotoma (Smittia) species 3.**

Ground-color of thorax, also legs and halteres, yellowish. Scutal stripes separate and brown, lateral darker than median; abdomen entirely blackish. Antennal ratio in male about 0.9. Wings with  $R_{4+5}$  ending above or scarcely before level of tip of  $Cu_1$ ; costa strongly produced;  $Cu_2$  almost straight.

Hivaoa: Kopaafaa, altitude 2770 feet, August 2, 1929, 2 males, Adamson.

Nukuhiva: Ooumu, altitude 3700 feet, November 12, 1929, 1 male, Mumford and Adamson.

Eiao: Vaituha, altitude 200 feet, October 3, 1929, 1 female, Adamson.

**Spaniotoma (Smittia) species 4.**

Similar to species 3, but smaller,  $R_{4+5}$  shorter, ending little beyond middle of  $Cu_1$ , costa only about reaching level of tip of  $Cu_1$ .

Eiao: Vaituha, altitude 200 feet, October 3, 1929, 1 female, Adamson.

**Spaniotoma (Smittia) species 5.**

Thorax yellowish-brown, scutal stripes very little darker than ground-color; meso-sternum blackish. Abdomen blackish except for the ochreous cerci. Halteres yellow. Wings with  $R_{4+5}$  ending above tip of  $Cu_1$ , costa very long, reaching wing-tip;  $Cu_2$  almost straight.

Nukuhiva: Ooumu, altitude 3600 to 3700 feet, November 10 and 12, 1929, 2 females, Mumford and Adamson.

**Spaniotoma (Smittia) species 6.**

Resembles species 5, but rather larger (wing-length 1.7 mm.); thorax wholly orange-yellow; abdominal tergites 2-7 with basal yellow bands, sternites mainly yellow;  $R_{4+5}$  longer, reaching well beyond level of tip of  $Cu_1$ .

Nukuhiva: Ooumu, altitude 3600 feet, November 10, 1929, 1 female, Mumford and Adamson.

Specimens of this, or a closely allied species, have recently been collected in the Owen Stanley Range, New Guinea, by H. O. C. Littlechild.

**Spaniotoma (Smittia) species 7.**

Yellowish; abdomen scarcely darker than thorax. Wings much as in species 5.

Hivaoa: Tepuna, altitude 3010 feet, August 1, 1929, 1 female, Mumford and Adamson.

### Genus **CHIRONOMUS** Meigen

The only species of this genus in the collection belongs to a group which is widely distributed in the Oriental and Australian regions; the members of the group are closely allied to typical European species such as *C. dorsalis* Meigen, and specific differences are rather indefinite.

**Chironomus samoensis** Edwards, variety?

Hivaoa: Tahauku, July 10, 1929, 1 male, Adamson; Anatikaue, altitude 1750 feet, August 1, 1929, 2 males, Mumford and Adamson.

Nukuhiva: Tapuaooa, altitude 2500 feet, May 30, 1931, 1 female, and altitude 3100 feet, November 10, 1929, 1 female, Mumford and Adamson.

Uahuka: Hane Valley, altitude 30 feet, February 23, 1931, 1 female; and Teavamataiki, altitude 730 feet, March 24, 1931, 3 females; LeBronnec and H. Tauraa.

Eiao: Vaituha, October 2, 1929, 1 female at light, Adamson; altitude 1800 feet, April 22, 1931, 2 males, 3 females, LeBronnec and H. Tauraa.

The males differ from the Samoan form in having no dark marks on abdominal tergites 2-4, and much less obvious silvery dusting on abdominal tergites 5-8.

#### SIMULIIDAE

The following records are added to those made in my earlier paper<sup>5</sup>:

##### **Simulium buissoni** Roubaud.

Nukuhiva: Tapuaooa, altitude 2600 feet, June 2, 1931, females, and also larvae and pupae on stone in stream; Ooumu summit, altitude 3890 feet, July 28, 1931, females, on *Metrosideros collina*; Muake, north side, altitude 2500 feet, August 3, 1931, larvae and pupae; Tovii [Toovii] plateau, altitude 2500 feet, August 3, 1931, larvae; LeBronnec and H. Tauraa. Vaioa, Hakau Valley, November 16, 1930, females, Mumford and Adamson.

Uahuka: Tehaevea, Hane Valley, altitude 500 feet, February 27, 1931; Hitikau Ridge, altitude 2000 feet, March 3, 1931; Pouau, Hokatu Valley, altitude 500 feet, March 9, 1931; Hanahoua Valley, altitude 250 feet, March 10, 1931, and altitude 30 feet, on *Rhynchosia minima*; Haave [Haevei] Valley, altitude 250 feet, March 19, 1931; Matapopo, altitude 800 feet, February 27, 1931; LeBronnec and H. Tauraa.

Eiao: altitude 500 feet, May 1, 1931, LeBronnec and H. Tauraa.

##### **Simulium**, species uncertain.

#### Larva

Length of full-grown specimen about 6 mm., and therefore considerably larger than *S. buissoni*. Body blackish, much darker than *S. buissoni*. Head capsule mainly dark brown, dorsal markings consisting of a median blackish-brown line on each side of which is a single dark brown spot. Structural characters much as in *S. buissoni*, but apparently more rows of hooks in terminal circlet.

#### Pupa

Respiratory organ formed of ten branches; it is divided at the base into three portions, the branching of which is as follows: ventral division forking dichotomously very close to base; outer dorsal division forking at some distance from base, upper branch again forking some distance beyond first fork; inner dorsal division divided into three near its base, upper branch forking again near its base, middle branch simple, lower branch forking well beyond its middle. Cocoon as in *S. buissoni*.

<sup>5</sup> Edwards, F. W., Marquesan Simuliidae: B. P. Bishop Mus., Bull. 98, pp. 103-109, 1933.



Uapou: Vaikokoo, Paaumea Valley, altitude 2200 feet, November-December, 1931, one pupal skin and numerous larvae on stones in stream, LeBronnec.

Owing to their size it seems improbable that these larvae and pupae can belong to the form described as *S. buissoni gallinum*, which is the only species of adult *Simulium* hitherto found on Uapou. It is possible that they may belong to *S. mumfordi* or *S. adamsoni*, but perhaps more likely that they represent another new species of the same group.

## CERATOPOGONIDAE FROM THE MARQUESAS ISLANDS\*

By

J. W. S. MACFIE

The collection of Ceratopogonidae taken in the Marquesas by the Pacific Entomological Survey consists of 1461 specimens referable to 12 species, the majority of which appear to be hitherto undescribed. All the species belong to well-known genera, namely, *Forcipomyia* (2), *Atrichopogon* (5), *Styloconops* (1), *Dasyhelea* (3), and *Stilobezzia* (2). They do not call for any special comment except the note that one or two are widely distributed, perhaps cosmopolitan, forms. Some of the species are represented in the collection by very large numbers of specimens, for example *Atrichopogon jacobsoni* (890), one species of *Dasyhelea* (241), *Forcipomyia ingrami* (141), and *Styloconops albiventris* (137), but the majority by only a few. Whilst it may be assumed that the four species mentioned are abundant, it would probably be incorrect to infer from their proportional representation in the collection the general distribution of the other species in the islands, because the collection is largely composed of insects obtained by sweeping over vegetation. This may account, for instance, for the fact that no specimens of *Culicoides* are included.

As regards the terms used in the descriptions which follow, it should be explained that the antenna is regarded as composed of 15 segments, and that the parts of the hypopygia of the males are referred to by the names used in previous papers. The term "tarsal ratio" is used to express the ratio of the lengths of the first to the second tarsal segments of the hind legs. The measurements of radial cells are internal measurements, and do not include the thicknesses of the bordering veins. The unit used in the measurements is approximately  $3.6 \mu$ . Exact measurements when given refer to selected specimens examined after mounting in pure carbolic acid. They are therefore individual and not averages. The text figures are merely rough outline drawings made with the aid of a camera lucida from which all such details as hairs and bristles have been omitted.

I am indebted to Dr. F. W. Edwards of the British Museum, London, for the opportunity of examining this interesting collection, and I have pleasure in thanking him not only for this privilege, but also for much valuable assistance, and for permission to compare some of the species with specimens in his custody.

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\* Pacific Entomological Survey Publication 7, article 7. Issued July 29, 1933.

**Forcipomyia inornatipennis** (Austen)?

Fatuhiva: Ahuava, altitude 1800 feet, August 19, 1930, sweeping over *Paspalum conjugatum*, 1 male (much damaged, so? this species), LeBronnec.

**Forcipomyia ingrami** Carter.

Hivaoa: Tapeata, east slope, Mount Ootua, altitude 2500 feet, May 25, 1929, 1 female; Tahauku, July 10, 1929, 4 males, 1 female, the female and one male labeled "near shore"; Mount Temetiu, northeast slope, altitude 2600 feet, September 13, 1929, sweeping, 1 female; Kopaafaa, altitude 2800 feet, February 25, 1930, on tree, 1 female; Mumford and Adamson.

Fatuhiva: Ahuava, altitude 1800 feet, August 19, 1930, sweeping over *Paspalum conjugatum*, 1 male, 1 female, LeBronnec.

Uahuka: Matukuoha Pass, altitude 1550 feet, February 26, 1931, sweeping over grasses, 1 female; Penau Ridge, altitude 2010 feet, March 2, 1931, on ferns, 1 female; Hanahoua Valley, altitude 6 feet, March 9, 1931, beating on *Thespesia populnea*, 1 female; Tahoatikikau, altitude 780 feet, March 18, 1931, on *Sida* species, 39 males; Haave [Haavei] Valley, altitude 250 feet, March 19, 1931, 53 males, 14 females; LeBronnec and H. Tauraa; no other data, 21 males.

Uapou: altitude 3000 feet, December 8, 1929, on *Sclerotheca* species, 1 female, Adamson.

This species, originally described from specimens collected in West Africa, has also been taken in Samoa.<sup>1</sup>

**Atrichopogon jacobsoni** (de Meijere).

Hivaoa: Anatikaue, altitude 1750 feet, August 1, 1929, 1 female, Mumford and Adamson.

Tahuata: Hanahevane Valley, sea shore, July 15, 1930, on leaves of *Citrus aurantifolium*, 146 males, 97 females, and sweeping on *Citrus aurantifolium*, 51 males, 19 females, LeBronnec and H. Tauraa.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1600 feet, August 27, 1930, 18 females, LeBronnec.

Mohotani: altitude 100 feet, February 2, 1931, 8 males, 14 females; altitude 300 feet, February 3, 1931, on *Coreopsis* species, 1 female; altitude 700 feet, February 2, 1931, 1 male; altitude 900 feet, February 3, 1931, sweeping on *Coreopsis* species, 2 males, 10 females; altitude 1300 feet, February 1, 1931, 24 males, 20 females; LeBronnec and H. Tauraa.

Nukuhiva: Tapuaooa, altitude about 2500 feet, May 30, 1931, on *Weinmannia* species, 41 males, 15 females; altitude about 2750 feet, June 17, 1931, beating on *Metrosideros collina*, 18 males, 35 females and on *Hibiscus tiliaceus*, 22 males, 9 females; Keahaatiki, altitude about 2000 feet, June 6,

<sup>1</sup> Edwards, F. W., Nematocera: Insects of Samoa, pt. 6, fasc. 2, p. 51, 1928.

1931, beating on *Wickstroemia foetida*, 14 males, 51 females, and August 6, 1931, beating on *Metrosideros collina*, 2 males, 4 females; Ooumu Summit, altitude 3890 feet, July 20, 1931, on *Metrosideros collina*, 1 female; LeBronnec and H. Tauraa.

Uahuka: Penau Ridge, altitude 2170 feet, March 3, 1931, at light, 3 females, altitude 2000 feet, March 4, at light, 47 females, altitude 2200 feet, May 5, 1931, beating on *Weinmannia* species, 3 males, 2 females; Hitikau Crest, altitude 2950 feet, March 3, 1931, on *Hibiscus tiliaceus*, 31 males, 44 females; Vaikivi Valley, altitude 1000 feet, March 6, 1931, 16 males, 40 females; Hane Valley, altitude 150 feet, March 9, 1931, 1 female; Vaipae Valley, altitude 150 feet, March 10, 1931, on *Thespesia populnea*, 5 males, 5 females; Teanatuhiva, altitude 300 feet, March 18, 1931, on *Waltheria americana*, 1 female; Haave [Haavei] Valley, altitude 250 feet, March 19, 1931, 2 males, 1 female; LeBronnec and H. Tauraa.

Uapou: Hapava, altitude about 500-600 feet, December 13, 1929, on leaves of *Xylosma suaveolens*, 23 males, 22 females, R. R. Whitten.

Ëiao: altitude 1800 feet, April 22, 1931, 14 males, 6 females, LeBronnec and H. Tauraa.

The collections from the Marquesas and Society islands include nearly a thousand (989) specimens of this species, and it may therefore be inferred that it is abundant in these islands. They show a considerable range of variation in color. Some specimens are almost uniformly yellow (especially those preserved in alcohol); others are dusky brown. The abdomen is not always darker than the thorax. There are often traces of thoracic adornment. The last 2-3 tarsal segments of the legs are more or less infuscated in some specimens, but are never conspicuously black as they are in the allied but different species from Ceylon described by Edwards in 1913 and 1928.

### ***Atrichopogon pullatus*, new species (fig. 1).**

#### Male and Female

Length of wing, about 1.3 mm.; greatest breadth of wing about 0.4 mm.

Head almost black. Eyes hairy, broadly contiguous above in both sexes. Palpi darkish brown, lengths of last three segments in a male and a female about equal, namely 12, 8, and 9 units respectively, third only slightly inflated, with small pit in distal half. Antennae darkish brown. In male, segments 4-10 subequal in length, gradually narrowing, ranging in one specimen from 12 by 11 to 12 by 7 units, each bearing a whorl of hairs; 11-15 elongate, without whorls, 11-14 subequal, about 16 by 5 units in same male, 15 longer, about 26 (with stylet) by 6 units. In female, segments 4-10 subspherical, subequal, in one specimen about 7 by 7 units; 11-14 elongate, subequal, 16-18 by 6-7 units in same specimen; 15 longer, about 27 (with stylet) units. The combined lengths of segments 11-15, 4-10, and 3-10 in this specimen about 96, 50, and 62 units respectively.

Thorax almost black in dried insect, but showing when expanded the usual scutal adornment; bristles dark, stout, rather scanty. Scutellum and postscutellum almost black; the former bearing 4 bristles and a few (7 or 8) small hairs.

Wings unadorned, veins brownish. Macrotrichia very scanty: in male none, in female a very few at extreme periphery near tip and on end of vein *M*<sub>1</sub>. Costa extending about two-thirds of wing length. Venation as usual. Radial cells narrow, first slit-like; second about twice as long as first in female, scarcely longer than first in male. Petiole of *M* as long as cross-vein or longer. In female no line extending the petiole between the branches of *M*. Fork of *Cu* much distal to that of *M*, at about level of basal part of second radial cell. Angle formed by branches of *Cu* much less than right angle. Tip of *Cu*<sub>1</sub> well beyond level of end of costa. Halteres usually with brown knobs, but color varying from dark brown to creamy white according to the degree of infuscation.

Legs darkish brown, tarsal segments rather paler, and sometimes (especially in male) knees and tibio-tarsal joints narrowly yellowish. Segments, claws, and empodium normal. Tarsal ratio in both sexes about 3.

Abdomen dark brown, but not so dark as scutum. Spermatheca single, highly chitinized, not pitted, pyriform, total length about 67  $\mu$ , and greatest breadth about 56  $\mu$ . Hypopygium (fig. 1) darkish brown, but distal parts, claspers and end of ninth tergite, yellowish. Ninth sternite not excavated in middle line posteriorly, bearing in this position a transverse row of 6 bristles. Aedeagus somewhat of the usual form, not highly chitinized, with a large membranous expansion at its distal end.

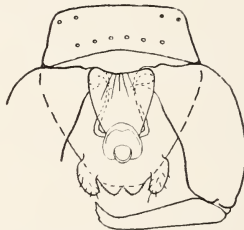


FIGURE 1.—Male hypopygium, ventral view, *Atrichopogon pullatus*, new species.

Nukuhiva: Ooumu, altitude 3200 to 4050 feet, November 12 and 13, 1929, beating on *Metrosideros collina*, beating on *Ascarina*? (F. no. 529), sweeping, and on shrub F. no. 587 and 580, 5 males, 7 females; Teivipakeka, altitude 2400 feet, October 16, 1929, beating on *Glochidion ramiflorum*, 1 female; Teuanui, Tovii [Toovii], altitude 2500 feet, October 25, 1929, 1 female; Mumford and Adamson. Ooumu, near summit, altitude 3890 feet, July 20, 1931, on *Cyrtandra* species, 1 female, LeBronnec and H. Tauraa.

Hivaoo: Matauuna, altitude 3760 feet, July 24, 1929, on shrub F. no. 497, 1 male; and August 1, 1929, 2 males, 3 females, some labeled "beating on *Rapanea* species," altitude 3700 feet, March 4, 1930, on *Vaccinium* species, 1 male, 1 female, and on *Sclerotheca* species, 1 male, 1 female; Teava Uhia i te Kohu, altitude 2100 feet, February 15, 1930, 2 males, 1 labeled "beating on *Hibiscus tiliaceus*"; Kopaaftaa, altitude 2800 feet, February 25, 1930, on tree F. no. 1008, 4 females; Mumford and Adamson.

A very dark brown, almost black species, with almost black scutellum, brown halteres, legs mainly dark brown, and wings almost devoid of macrotrichia. The antennae of the male have the last five segments elongate, the whorls of the plume being restricted to segments 4 to 10.



This insect appears to resemble in some respects *A. fortiserra* Kieffer, a European species which also is very dark in color, and has the wings almost (female) or quite (male) devoid of macrotrichia, and the second radial cell relatively short. In *A. fortiserra*, however, the legs are paler, "jaune clair," the petiole of *M* shorter than the cross-vein, and the antenna of the male of the usual form.

***Atrichopogon umbrosus*, new species.**

Male and Female

Length of wing about 1.3 mm.; greatest breadth of wing about 0.4 mm. Head almost black. Palpi darkish brown. Antenna of male darkish brown, plume blackish; segments of the usual type, 4-12 bearing whorls, 4-11 subequal in length but gradually narrowing, 12 drawn out distally, the length of the last five segments 10, 15, 32, 29, and 36 (with stylet) units respectively.

Throax, scutellum, and postscutellum almost black.

Wings unadorned. No macrotrichia. Costa extending about two-thirds of the wing length. Radial cells well formed; second fully three times as long as first. Petiole of *M* shorter than cross-vein. Line extending petiole of *M* between its branches present in both sexes. Fork of *Cu* distal to that of *M*, at about level of middle of first radial cell. Angle formed by branches of *Cu* less than right angle, acute. Tip of *Cu*<sub>1</sub> slightly beyond level of end of costa. Halteres with brownish knobs.

Legs almost uniformly darkish brown, not so dark as scutum; last two tarsal segments darker than the rest. Segments, claws, and empodium normal. Tarsal ratio about 3.

Abdomen dark brown in the dried insect, but not so dark as scutum. Details of structure of spermatheca and hypopygium not examined as the specimens were not mounted.

Hivaoa: Kopaafaa, altitude 2770 feet, August 2, 1929, miscellaneous sweeping, 1 male, on *Tectaria* species, 1 female, Mumford and Adamson.

This very dark brown, almost black species resembles the preceding species, *A. pullatus*, new species, but the wings are devoid of macrotrichia in both sexes, the second radial cell is longer, the petiole of *M* is shorter than the cross-vein, and the antenna of the male is of the usual form.

***Atrichopogon rubidus*, new species.**

Male and Female

Length of wing about 1.1 mm.; greatest breadth of wing about 0.4 mm.

Head rather dark brown, almost blackish in the dried condition. Eyes hairy, contiguous above. Palpi darkish brown; lengths of last three segments in one male and one female similar, namely 13, 8, and 10 units respectively; third not much inflated in either sex, with a small pit near middle. Antennae darkish brown; in male rather unusual, with plume poorly developed, whorls small, composed of few (4-6) hairs, and distinctly present only on segments 4 to 9; segments 4 to 10 ranging from about 10 by 8 to 7 by 5 units; 11 and 12 subequal, about 8 by 5 units; 13 and 14 subequal, 22-23 by 5 units; and 15 longer, 32 (with stylet) by 6 units. In female segments 4-10 subspherical, subequal, in one specimen about 7 by 7 units; 11-14 elongate, increasing slightly in length, from 17 to 21 by 6 units; 15 longer, 29 (with stylet) by 7 units. The

combined lengths of segments 11-15, 4-10, and 3-10 in this specimen 103, 49, and 58 units respectively.

Thorax mahogany-brown. Scutellum similarly colored, bearing 4 dark bristles, and about 8-10 small hairs (rather more in female than in male). Postscutellum rather darker.

Wings unadorned but slightly smoky: in both sexes devoid of macrotrichia. Costa extending about two-thirds wing length. Radial cells well formed; second about three times as long as first. Petiole of *M* shorter than cross-vein, and not prolonged distally between the branches in either sex. Fork of *Cu* much distal to that of *M*, at about level of vein (*R*<sub>2</sub>) separating radial cells. Angle formed by branches of *Cu* acute. Tip of *Cu*<sub>1</sub> slightly distal to level of costa in male, slightly proximal in female. Halteres with creamy or yellowish knobs.

Legs uniformly mahogany-brown, about same color as thorax. Segments, claws, and empodium normal. Tarsal ratio in both sexes about 2.5 or 2.6.

Abdomen mahogany-brown, about same color as thorax. Spermatheca single, highly chitinized, not pitted, oval, in one specimen about 50  $\mu$  by 45  $\mu$ ; the commencement of the duct chitinized for only a short distance, about 3-4  $\mu$ . Hypopygium without distinctive features. Ninth sternite only slightly excavated in middle line posteriorly, and bearing in this region a group of about 18 bristles. Aedeagus with the basal arch shallow.

Uapou: Teavaituhai, altitude 3000 feet, December 8, 1929, on *Sclerotheca* species, 1 male, 3 females, Adamson.

An almost entirely mahogany-brown species, with the wings in both sexes devoid of macrotrichia, and the petiole of *M* shorter than the cross-vein.

### **Atrichopogon**, species.

This abnormal specimen, with both male and female characters, is almost uniformly yellowish-brown, the head rather darker than the rest, and the scutum adorned with darker markings as usual. Palpi with lengths of last three segments 12, 7, and 9 units respectively; third not much inflated. Antennae yellowish-brown basally, darker apically, of the feminine form: segments 4-10 subspherical, without whorls, subequal, about 9 by 9 units; 11-12 darker, elongate, subequal, about 14 by 8 units; 13-15 missing. Scutellum about same color as scutum, bearing 4 bristles, and about 5 small hairs. Wings devoid of macrotrichia. Length about 1 mm., and greatest breadth rather less than 0.4 mm. Costa extending about two-thirds wing length. Radial cells slit-like, second about twice length of first. Petiole of *M* shorter than cross-vein, not prolonged distally between the branches. Fork of *Cu* much distal to that of *M*, at about level of base of second radial cell. Angle formed by branches of *Cu* acute. End of *Cu*<sub>1</sub> much distal to level of end of costa. Halteres with pale, creamy knobs. Legs uniformly yellowish-brown. Tarsal ratio about 3. Abdomen yellowish-brown. No spermathecae. Hypopygium with ninth sternite not deeply excavated, but bearing on its posterior margin a row of bristles.

Fatuhiva: ridge east of Omoa [Oomoa] Valley, altitude 3000 feet, August 28, 1930, 1 specimen, LeBronnec.

Compare *F. allocera* Kieffer. Edwards<sup>2</sup> has drawn attention to the occurrence of this and another type of intersex in Chironomidae.

### **Styloconops albiventris** (de Meijere).

Hivaoa: Tahauku, July 10, 1929, 107 females, some labeled "sea shore" or "near sea," Mumford and Adamson.

<sup>2</sup> Edwards, F. W., Ent. Soc. Lond., Proc., vol. 6, pp. 40-41, 1931, vol. 7, p. 32, 1932.

Nukuhiva: Taiohae, January 24, 1929, 30 females, Mumford and Adamson.

The collectors note that the native name for this insect is *nono purutia*.

***Dasyhelea pacifica***, new species (fig. 2, *a*).

Male and Female

Length of wing, 0.9-1.2 mm.; greatest breadth of wing, 0.3-0.4 mm.

Head almost black. Eyes densely hairy. Palpi dark brown, segments subcylindrical, third without pit, length of last three segments about 15, 8, and 8 units respectively. Antennae dark brown, segments sculptured. In male, plume very dark; segments 4-11 in one specimen ranging from 10 by 11 units to 10 by 8 units; 12-14 binodose, 12 and 14 subequal, about 21 units, 13 longer, about 25 units; 15 about 21 units, without stylet. In female, segments 4-10 subspherical to oval, in one specimen ranging from 7 by 8 to 9 by 5-6 units; 11-14 slightly longer, subequal, about 11-12 by 5-6 units; 15 about 15 by 6 units, without stylet. The combined lengths of segments 11-15, 4-10, and 3-10 in this specimen 61, 57, and 64 units respectively.

Thorax almost black. Scutellum usually almost black, scarcely or not at all paler than scutum, but sometimes paler brown in middle; bearing about 14-17 bristles and hairs.

Wings with veins forming second radial cell infuscated so as to give the appearance of a dark spot. Macrotrichia numerous, covering almost entire surface excepting radial areas and narrow zones on each side of veins, and extending practically to base between *M* and *Cu*. Costa extending about half wing length. First radial cell obliterated, second quite small, oblong, but in male shorter than in female and almost square. Petiole of *M* shorter than cross-vein. Fork of *Cu* at (female) or slightly distal to (male) level of end of costa. Halteres with brown to dark brown or almost black knobs.

Legs dark brown excepting first 3-4 segments of tarsi, which are paler, whitish. Tarsal ratio in both sexes about 2.5. Segments and claws normal.

Abdomen almost black in dried insect. Spermatheca (fig. 2 *a*) single, highly chitinized, subspherical, diameter about  $40\mu$ ; duct narrow, arising obliquely, chitinized for about  $5\mu$ . Hypopygium very similar to that of the West African species *D. inconspicua* Carter, Ingram, and Macfie, apparently indistinguishable from it.



FIGURE 2.—Spermatheca of *Dasyhelea*: *a*, *D. pacifica*, new species; *b*, *D. fulvicauda*, new species.

Hivaoa: Tapeata, eastern slope of Mount Ootua, altitude 2150 feet, May 25, 1929, sweeping over *Paspalum conjugatum*, 1 female; Tahauku, July 10, 1929, 1 male, 4 females, two labeled "near shore"; Matauuna, altitude 3760 feet, July 24, 1929, on *Weinmannia marquesana* variety *glabrum*, 1 female; Kopaafoa, altitude 2770 feet, August 2, 1929, 1 male, 1 female, on *Tectaria* species, and miscellaneous sweeping; northeast slope of Mount Temetiu, altitude 2600 feet, September 13, 1929, miscellaneous sweeping, 2 females; Mumford and Adamson.

Fatuhiva: Hanavave Valley, altitude 50 feet, September 8, 1930. sweeping over *Paspalum conjugatum*, 1 male, 3 females, LeBronnec.

Nukuhiva: Ooumu, altitude 4050 feet, November 12 and 13, 1929, 1 male, 7 females, miscellaneous sweeping, Mumford and Adamson.

Uahuka: Penau Ridge, altitude 2000 to 2200 feet, March 2-5, 1931, 17 males, 196 females, mostly on *Wcinmannia* species, some on ferns; Hanahoua Valley, altitude 6 feet, March 9, 1931, 1 female, beating on *Thespesia populnea*, LeBronnec and H. Tauraa; Putatauaa, Vaipae Valley, altitude 880 feet, September 20, 1929, 1 male, A. M. Adamson.

Uapou: Hakahetau, altitude 3000 feet, December 27, 1929, 2 females, R. R. Whitten.

Eiao: Vaituha, altitude 200 feet, October 3, 1929, 1 female, A. M. Adamson.

Also taken by the Pacific Entomological Survey in the Society Islands.

An almost black species, with scutellum almost black, halteres dark brown, and legs dark brown excepting the proximal segments of the tarsi which are somewhat paler.

Resembles closely the African species *D. inconspicua* Carter, Ingram, and Macfie, which differs, however, in being not so black, with femora and tibiae much paler, and in having the scutellum yellowish-brown and armed with only 6 bristles. As the hypopygium of the male is almost if not quite indistinguishable from that of *D. inconspicua*, it should perhaps be regarded as the Pacific race of that species. Further support is given to this view by the fact that a re-examination of the West African species shows that in some males, at any rate, the 13th antennal segment is slightly longer than the 12th, 14th, or 15th (which are subequal), and that the duct of the spermatheca arises obliquely.

### *Dasyhelea pacifica* variety *pallida*, new variety.

#### Male

Head dark brown; palpi almost colorless; plume and terminal segments of antenna rather dark. Thorax dark brown above, paler, yellowish-brown at sides; scutellum paler than scutum, yellowish-brown, paler in middle than at sides. Wings without dark spot due to infuscation of veins bordering second cell. Legs pale brown, almost colorless; the joints (especially knees) appearing as small dark spots. Abdomen darkish brown dorsally. Hypopygium mostly pale brown, but claspers dark brown; structure as in *D. inconspicua* or the species just described.

Hivaoa: Matauuna, altitude 3760 feet, August 1, 1929, 1 male, beating on *Rapanea* species, Mumford and Adamson.

This insect, of which there is only a single male in the collection, does not appear to differ from the preceding in any structural character, but is generally much paler in color.



**Dasyhelea fulvicauda**, new species (fig. 2, *b*).

## Female

Length of wing, 0.85 mm.; greatest breadth of wing, 0.35 mm.

Head dark brown. Eyes densely hairy. Palpi pale, yellowish; segments subcylindrical, third not inflated, without definite pit, length of last three about 10, 7, and 9 units respectively. Antennae dark brown, segments 4-14 forming an almost continuous series: segments 4-10 oval, in one specimen ranging from about 10 by 8 to 10 by 6 units; 11-14 subequal, about 12 by 5 units; 15 about 16 by 5 units, without stylet. The combined lengths of segments 11-15, 4-10, and 3-10 in this specimen 64, 70, and 80 units respectively.

Thorax yellowish-brown, but the scutum is adorned in the usual way with broad bands which are dark brown so that it appears dark with paler, yellowish-brown areas at the shoulders and immediately in front of the middle of the scutellum. Scutellum yellowish-brown, bearing 2 lateral and 4 centro-marginal bristles. Postscutellum dark brown.

Wings with distribution of macrotrichia and venation as in *D. pacifica* but with less infuscation of veins bordering second radial cell. Halteres pale, yellowish.

Legs uniformly yellowish-brown. Tarsal ratio about 2.3.

Abdomen with tergites dark brown, with posterior margins narrowly yellowish-brown, and with similarly colored semilunar basal markings on each side of the middle segments, and the rest (including the entire post-extremity) yellowish-brown. Spermatheca (fig. 2, *b*) single, highly chitinized, retort-shaped, the main part oval, about 55  $\mu$  by 33  $\mu$ , the duct oblique, tapering, chitinized for about 18  $\mu$ .

Hatutu [Hatutaa]: altitude about 800 feet, April 28, 1931, 2 females (one damaged), LeBronnec and H. Tauraa.

One female was also taken in the Society Islands by the Pacific Entomological Survey.

A mainly yellowish-brown species, with dark brown bands on the scutum, dark brown tergites, yellowish scutellum, and uniformly yellowish-brown legs.

This insect resembles in some respects the West African species *D. fuscipleuris* Carter, Ingram, and Macfie, and *D. flaviformis* Carter, Ingram, and Macfie, but may be distinguished from either, among other things, by the oval shape of the basal segments of the antenna, and by the form of the spermatheca.

**Stilobezzia tenebrosa**, new species (fig. 3).

## Male and Female

Length of wing about 1 to 1.2 mm.; greatest breadth of wing about 0.4 mm.

Head very dark brown. Eyes bare, separated above by a narrow space. Mandibles of female armed with seven strong teeth. Palpi dark brown, segments subcylindrical; third segment not inflated, without a definite pit, the length of the last three segments in one male and one female similar, namely about 10, 7, and 12 units respectively. Antennae dark brown. In male, segment 3 large, binodose, more than twice as long as 4; 4-12 subequal in length but gradually narrowing, measuring in one specimen from 9 by 6 to 9 by 3 units; 13-15 elongate, measuring in the same specimen 28, 35, and 50 units by 3-4 units respectively (but last segment not always quite so long). In female segments 4-10 subequal, measuring in one specimen from 10 by 5 to 10 by 4



units; 11-15 elongate, measuring in the same specimen 20, 22, 24, 27, and 36 units by 4-5 units respectively. The combined lengths of segments 11-15, 4-10, and 3-10 in this specimen about 130, 70, and 80 units respectively.

Thorax very dark brown. Scutellum and postscutellum almost black, the former bearing in both sexes 4 bristles, but no small hairs.

Wings unadorned, in both sexes without macrotrichia. Venation as usual: first radial cell well formed, rhomboidal, second about three times as long as first; cross-vein and distal part of  $R_1$  not in line; petiole of  $M$  much longer than cross-vein; fork of  $Cu$  almost at level of  $R_2$  in female, slightly more distal in male. Halteres with dark brown knobs in specimens from Society Islands; pale, almost colorless knobs in those from the Marquesas Islands.

Legs almost uniformly dark brown, but proximal tarsal segments and (especially in males) bases of tibiae paler than the rest. Segments normal. Tarsal ratio about 2 in both sexes. First tarsal segment of hind legs without a basal spine. Claws normal.

Abdomen uniformly very dark brown. Spermathecae two (and a rudimentary third), highly chitinized, very unequal in both specimens examined, the one sacular, about  $74\mu$  by  $48\mu$ , and the other subspherical, diameter about  $25\mu$ . The duct of the large spermatheca chitinized for only a short distance. Hypopygium (fig. 3) very dark, similar to that of *S. limnophila* but with shorter and stouter harpes.

Hivaoa: Matauuna, altitude 3760 feet, August 1, 1929, miscellaneous sweeping, 1 male, 1 female, Mumford and Adamson.

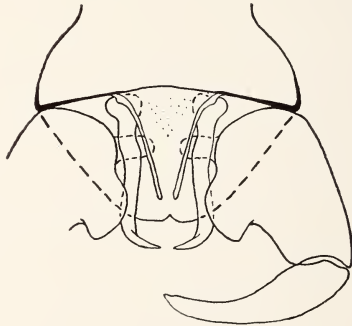


FIGURE 3.—Hypopygium of male, ventral view, *Stilobezzia tenebrosa*, new species.

Nukuhiva: Ooumu, altitude 3600 to 4050 feet, November 12 and 13, 1929, 4 males, 2 females, some labeled beating on *Heinmannia* species, beating on *Ascarina*? (F. no. 579), miscellaneous sweeping, and shrub no. 580, Mumford and Adamson.

Uahuka: Penau Ridge, altitude 2010 feet, March 2, 1931, on *Fragaria berteriana*, 1 female (? because paler colored), LeBronnec and H. Tauraa.

Also taken by the Pacific Entomological Survey in the Society Islands.

An almost entirely very dark brown species resembling in some respects *S. limnophila* Ingram and Macfie, but without trace of green coloration in the dried state.

***Stilobezzia maculipes*, new species.**

Female

Head dark brown. Palpi dark brown, segments subcylindrical, third without definite pit, lengths of last three about 14, 9, and 13 units respectively. Antennae mainly dark brown, but basal portions of segments 3-10 yellowish; 4-10 ranging from 11 by 6 to 13 by 5 units; 11-14 subequal, 26-28 by 4-5 units; 15 longer, 35 by 5 units. The combined lengths of segments 11-15, 4-10, and 3-10 about 144, 82, and 100 units respectively.

Thorax darkish yellow-brown. Scutellum similarly colored, bearing 4 bristles only.

Wings as in preceding species, but rather larger, length about 1.3 mm., and greatest breadth over 0.4 mm. Second radial cell three times as long as first. Halteres with brownish knobs.

Legs mainly yellowish-brown; but femora of forelegs slightly infuscated in middle, those of middle and hind legs with infuscated spot a little above knees; tibiae of four anterior legs dark brown excepting at bases, and those of hind legs with a dark brown zone covering apical quarter; terminal tarsal segments also somewhat infuscated. Tarsal ratio, 2. First segment of hind tarsus without basal barb.

Abdomen dark brown above and below. Spermathecae as in the preceding species.

Uapou: Hakahetau, altitude 3000 feet, December 27, 1929, 1 female, R. R. Whitten.

This species, of which there is only a single female in the collection, resembles the preceding species structurally, but is rather larger and lighter in color, the thorax and legs being mainly yellowish brown instead of very dark brown.



## THE DERMAPTERA AND ORTHOPTERA OF THE MARQUESAS ISLANDS \*

By

MORGAN HEBARD

The collection recently placed in our hands for study includes 38 species. To these should be added 3 endemic species of the Acrididae which have been studied and reported on elsewhere. Excluding 9 cosmopolitan species, we find that, of the 29 others, 15 are endemic as far as yet known, 6 are known to occur elsewhere only in Oceania, while 11 are also known from Melanesia, Australia, or Malaysia. Five new genera and 13 new species are here described.

Considering the information available for the other islands of Oceania, it is evident that the progress eastward of species of Melanesian, Australian, and Malaysian origin shows a progressive, marked reduction. Thus we are satisfied that a large number of such species will be found to occur in the Society Islands, when that area has been more thoroughly examined. The Samoan islands, which we believe have been fully as thoroughly examined from an orthopterological point of view as the Marquesas, have approximately twice as many such species. The islands of Fiji have apparently been much less thoroughly examined, but many forms from there are reported scatteringly through past literature and indicate that that group is inhabited by a much more extensive representation of Melanesian, Malayan, and Australian forms. So poorly is the Melanesian fauna understood that it is impossible to determine whether many of the Fijian species are endemic or have a vastly greater range in Melanesia.

Comparing the endemic orthopteran fauna of the Marquesas with that of Hawaii, we would note that three endemic species of Dermaptera are known from Hawaii (two labidurids and a labiid) but none from the Marquesas Islands. In the Orthoptera no mantids or phasmids are endemic. Hawaii has no endemic forms of blattids, but six such are present in the Marquesas, four of a common ancestral stock with *Mareta*, an ectobiine genus abundantly represented by species throughout the tropics of the Old World and particularly well represented also in Australia. The four Marquesan forms have, however, much closer affinity to each other than to any others known, and none of the *Maretae* reported from the Oceanic islands to the west show any affinity to them. Another blattid, belonging to the Pseudomopinae, is present in both the Marquesas and Society islands and though not yet known elsewhere may well occur also in Melanesia and even Malaysia.

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\* Pacific Entomological Survey Publication 7, article 8. Issued August 25, 1933.

In the Tettigoniidae, Hawaii has a number of distinctive endemic species of the copiphorid genus *Banza*, but the Marquesas possess instead four remarkable endemic conocephalids, of which one represents the widespread genus *Conocephalus* and the other three belong to two endemic genera which are widely distinct from any previously known. Another endemic species belongs to the listroscelids, but it is closely related to a Samoan species which in turn has affinities in Papua and Malaysia.

In the Gryllidae Hawaii has 24 or more endemic species, the majority belonging to *Paratrigonidium*, but several representing two most remarkable endemic genera of encopterids. The trigonidids of the Marquesas are represented instead by two extremely plastic species of *Metioche*, a Melanesian and Malayan genus. One of these is widespread in Oceania and Melanesia, but does not reach Hawaii; the other is known elsewhere only from Tahiti.

In the Dermaptera we find *Labia dubronyi* to be known only from Hawaii and the Marquesas, whereas in the Tettigoniidae the listroscelid *Xiphidiopsis lita* is found in Hawaii, the Marquesas, and Tahiti. Both of these species we believe will be found to have an extensive distribution in Oceania.

From this evidence we believe that the endemic Orthoptera of Hawaii and the Marquesas have been derived from very different sources. More than 34 endemic Hawaiian tettigoniids and gryllids are known, all of these representing only 5 different genera. Of the 14 most probably endemic Marquesan species, 4 represent 3 genera of the Blattidae, 3 represent 3 genera of the Acrididae, and 5 represent 4 genera of the Tettigoniidae. Not one endemic Hawaiian species belongs even to the same subfamily as an endemic Marquesan species.

In the Acrididae Hawaii has no endemic species, but three occur in the Marquesas. One of these is an acrydiine belonging to a genus known elsewhere only from Tahiti; the other two are cyrtacanthacrine, one belonging to an endemic genus, the other congeneric with and belonging to a group which includes Melanesian species.

Although the combination of characters shown by a number of endemic Marquesan species is unusual, relationship is often clearly traceable to certain Melanesian and Malayan forms; such is much less true of the endemic Hawaiian species.

## DERMAPTERA

### LABIDURIDAE

#### ***Euborellia annulipes* (Lucas).**

Hivaoa: Tapeata, Mount Ootua, altitude 2500 feet, in tree fern petiole, 1 juvenile female.



Tahuata: Kiinui, altitude 1210 feet, June 14, 1930, under horse manure, 1 female, 1 juvenile male, 2 juvenile females.

Fatuhiva: Otomahe, Omoa [Oomoa] Valley, altitude 290 feet, August 20, 1930, 1 large juvenile male.

Fatuuku, altitude 860 feet, November 19, 1930, beating *Morinda citrifolia*, 1 large juvenile female.

Nukuhiva: Tapuaooa, altitude 3100 feet, November 11 and 14, 1929, 1 male, 1 large juvenile female; Vaiotekea, altitude 2100 feet, August 6, 1931, 1 juvenile female.

Uahuka: Hanahoua, altitude 750 feet, March 10, 1931, in dead log of *Inocarpus edulis*, 1 large juvenile female; Hitikau Ridge, altitude 2300 feet, March 3, 1931, 1 large juvenile female.

Uapou: Hakahetau Valley, altitude 1000 feet, December 14, 1929, 1 juvenile female.

Eiao, altitude 1600 to 1855 feet, April 16 to September 29, 1929 and 1931, one under stone, 4 males, 6 females, 2 juvenile females.

This common circumtropical species was recorded from three of the islands of the Marquesas in 1928 by L. E. Cheesman.

#### LABIIDAE

##### **Sphingolabis hawaiiensis** Bormans.

Tahuata: Amatea, altitude 2500 feet, July 7, 1930, in rotting banana stalk, 1 adult; Hanamiai Valley, May 28, 1930, in rotting banana stalk, 3 males, 1 female, 1 juvenile.

Fatuhiva: Teavaione, Omoa [Oomoa] Valley, altitude 1700 feet, August 29, 1930, in rotting banana stalk, 1 male, 1 juvenile female; Vaikoao, Omoa [Oomoa] Valley, altitude 1500 feet, August 30, 1930, 1 male; Ahuava altitude 1840 feet, August 19, 1930, 1 female.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 25, 1929, in rotting banana stalk and under bark of *Hibiscus tiliaceus*, 1 juvenile female, 1 very small juvenile; Tapuaooa, altitude 3100 feet, November 14, 1929, 1 female.

Uahuka: Vaipae Valley, altitude 250 feet, March 18, 1931, 1 male, 2 females.

Uapou: Pepehitoua Valley, altitude 2700 feet, December 8, 1929, 1 large juvenile female; Vaiokokoo, Paaumea Valley, altitude 2500 feet, November 26, 1931, 1 male; Hakahetau Valley, January 29, 1930, in dried stem of "Fei," *Musa* species, 1 male, 3 females, 3 juveniles. This species was previously known from Hawaii, Tahiti, Samoa, the Philippines, and Lombok.

##### **Labia pilicornis** (Motschulsky).

Uapou: Hakahetau Valley, altitude 1000 to 2000 feet, January 29, 1930, in dead stem of "Fei," *Musa* species, 1 male, 6 females, 1 juvenile female.

The females are typical, though they show great size variation (length, including forceps, 6 to 8.1 mm.). The male agrees closely with others before us except in the form of the ultimate tergite and pygidium. The former is excised in the form of a symmetrical trapezoid above the latter, leaving sharp angles of very slightly greater than 90 degrees projecting above the base of the pygidium on each side. The pygidium is twice as wide as long, its margins convex-convergent to the small acute projecting apex. Had Borelli not described Philippine material of the species as having the male pygidium variable "acute-angulate, truncate or lightly notched" we would believe that a species related to, but distinct from *pilicornis* was represented. Such general agreement is shown, however, that with the available evidence it appears more probable that unusual individual variation is to be found in the male genitalia of *pilicornis*.

The present specimens are uniform dull yellowish brown in coloration and average large for the species. The species is known to range from Hawaii, Tahiti, and the Philippines to Ceylon. Color agreement is shown by the very different species *L. karnyi* (Borelli) (with synonym *abnormis* Hebard), *L. minor* (Linnaeus) and *L. lutea* Bormans.

**Labia curvicauda** (Motschulsky).

Hivaoa: Matauuna, altitude 3700 feet, March 2, 1930, under decaying leaves on ground, 1 female.

Tahuata: Amatea, altitude 2700 feet, June 28, 1930, 1 female.

Nukuhiva: Tekao Hill, altitude 3250 feet, July 23, 1931, in dead stipes of tree fern, *Cyathea* species, 1 female.

Uahuka: Hitikau Summit, altitude 2910 feet, March 4, 1931, in dead stipes of tree fern, *Cyathea* species, 1 male.

Eiao: near center of island, altitude 1300 feet, October 1, 1929, under bark of *Pisonia* species, 1 male.

The Eiao male has the head blackish brown, the pronotum ochraceous buff, the tegmina and wings almost as dark as the head with a metallic purplish sheen and the abdomen deep tawny, becoming darker laterad. The other specimens are much more uniformly brown, the pronotum as dark as the lighter brown tegmina, the head often even paler. The Eiao male represents *flavicollis* Bormans in Burr, described from Samoa, of which material is before us from Hawaii (Waiki Parker Ranch, Waimea, Hawaii, August 2, 1921, feeding among woolly aphis, 2 females, 1 juvenile female), Fiji (Mauson, 1 male), and a large series from Tahiti. This name was synonymized by Burr in 1912, at which time *rechingeri* Holdhaus from Samoa was also placed as a synonym. Certainly a most unusual and striking color phase occurs in Oceania and is apparently peculiar to that region. The species is circumtropical in distribution.

***Labia dubronyi*** Hebard (fig. 1, *a*).

Hivaoa: Mount Temetiu, 1 female.

Nukuhiva: Tapuaooa, altitude 3100 feet, November 11, 1929, 1 female.

Uapou: Hakahetau Valley, altitude 1000 feet, December 8 and 11, 1929, one from dead stipes of tree fern, *Cyathea* species, 1 male, 1 female.

These specimens agree closely with Hawaiian material, from which islands only the species was previously known.

## CHELISOCHINAE

***Chelisoches morio*** (Fabricius).

Hivaoa: Aimoa, March 7, 1929, altitude 1665 feet, 2 males, 1 female, 4 juveniles; Tapeata, Mount Ootua, altitude 2500 feet, May 25, 1929, in tree fern petiole, 1 juvenile; Kopaafaa, altitude 2770 feet, August 2, 1929, in dead stipes of tree fern, *Cyathea* species, 3 juveniles.

Tahuata: Vaitahu Valley, sea level, June 11, 1930, 1 male, 1 female; Amatea, altitude 2000 feet, June 28, 1930, 1 female.

Fatuhiva: Teavaione [Teavione], Omoa [Oomoa] Valley, altitude 1700 feet, August 29, 1930, in decaying banana stalks, 3 males; Hanavave Valley, altitude 1550 feet, August 23, 1930, 1 male; Vaikoao, Omoa [Oomoa] Valley, altitude 1600 feet, August 29, 1930, 1 juvenile.

Nukuhiva: Tapuaooa, altitude 3100 feet, November 11, 1929, 1 juvenile.

Uahuka: Hitikau Ridge, altitude 2950, March 3, 1931, one in dead stipes of *Angiopteris* species, others on fruit of *Freycinetia* species, 1 female, 4 juveniles; Penau Ridge, altitude 2000 feet, March 5, 1931, 1 male; North Ridge, altitude 2000 feet, 1 juvenile.

This is one of the commonest earwigs in Oceania and Papua, and material is before us from the Philippines, Java, and the coast of California (introduced).

## ORTHOPTERA

## BLATTIDAE

## ECTOBIINAE

Genus **MARETINA**, new genus

This is an endemic Marquesan genus, including two species here described, of which we select *M. hivaoa* as genotype.

The insects have the appearance of broad, brachypterous species of *Mareta* and show close affinity to that genus.

Separation is best made by the specialized dorsal surface of the male abdomen, other generic features being the following. Occiput rounding evenly into face. Interocular space very broad, lateral margins of face moderately convergent ventrad. Palpi with third and fourth joints (normally equal in

length) elongate and slender, fifth shorter but moderately elongate. Pronotum rounded symmetrically trapezoidal, surface evenly and weakly convex. (Tegmina considerably reduced, rounded rectangular pads in the two species known). Dorsal surface of male abdomen with distal (two or three) tergites extensively but very weakly concave, those areas roughened and supplied with microscopic short but stout spinulae. Supra-anal plate of male well produced, delicate, rounded triangular. Cerci with slender acute apical portion. Subgenital plate of female with a median cleft at apex, the distal portion normally carried curled upward and inward and usually not visible from below. Ventro-cephalic margin of cephalic femora armed with a row of piliform spines, terminating in two very elongate spines. Caudal metatarsus very elongate, decidedly longer than combined length of succeeding joints. Small distal pulvilli present on tarsal joints. Moderately large arolia present between the simple, strongly asymmetrical tarsal claws.

**Maretina hivaoa**, new species (fig. 1, *b*).

General coloration testaceous. Head with a broad interocular bar of cinnamon brown and a narrower band of the same between the antennal sockets which curves dorsad. Pronotum with disk buffy, not very conspicuously marked with cinnamon brown (as figured). Tegmina testaceous with intervals between veins and veinlets all dark cinnamon brown. Abdomen dorsad reddish brown faintly mottled with a paler shade. Palpi, limbs, and ventral surface buffy, the abdomen suffused laterad, mesad, and particularly distad with cinnamon brown in female.

Length of body, male 9.8 mm., female 10 mm.; length of pronotum, male 3.1 mm., female 3.1 mm.; width of pronotum, male 4.9 mm., female 4.9 mm.; exposed length of tegmen, male 3.8 mm., female 3.8 mm.; width of tegmen, male 3.4 mm., female 3.4 mm.

Male

Size medium, form broad for the group. Width between antennal sockets three-quarters that between eyes. Palpi with the very elongate third and fourth joints of equal length, fifth two-thirds as elongate as fourth. Pronotum with latero-caudal portions and tegmina with mediastine fields broad. Tegmina slightly overlapping, longer than wide, costal margin rounding more broadly into the transverse distal margin than does the sutural margin; venation distinct, with impressions between veins and veinlets definite. Wings minute, atrophied, concealed. Abdomen with fourth, fifth, and sixth tergites specialized as described above, a very blunt median carina indicated on each, roughening very fine and transverse, spinulae directed caudad; seventh tergite narrowly visible. Cerci terete proximad, then moderately moniliform, then with the two distal joints elongate and slender. Subgenital plate triangularly produced sinistrad and bearing a small node near base on its inner margin; dextral portion produced an equal distance in a finger directed to the sinistral projection and then parallel to it, its apex blunt and very minutely microscopically denticulate.

Female

Agrees very closely with male. Interocular space no wider. Palpi similar. Supra-anal plate triangularly produced with apex very broad, rounded, but showing a broad and very shallow median emargination.

Hivaoa: north crest of Mount Temetiu, altitude 3620 feet, July 24, 1929, type male, allotype female, Mumford and Adamson; altitude 3860 feet, December 27, 1930, 1 large, 1 small immature male, H. Tauraa.



**Maretina uahuka**, new species (fig. 1, c).

General coloration testaceous. Male intensive, female recessive. Head with marking similar to that of *hivaooa* in male, but the markings more conspicuous and the band between the antennal sockets rounded angulate instead of convex dorsad; these markings obliterated in female, apparently due to poor preservation. Pronotum of male with disk buffy, marked with chestnut brown as figured; these markings greatly reduced (even less extensive and less well indicated than in *hivaooa*) in female. Tegminal and abdominal markings as in *hivaooa*.

Length of body, male 8.8 mm., female 8.2 mm.; length of pronotum, male 2.8 mm., female 2.4 mm.; width of pronotum, male 4 mm., female 3.7 mm.; exposed length of tegmen, male 3.1 mm., female 2.7 mm.; width of tegmen, male 2.7 mm., female 2.4 mm.

## Male

The generic characters given above are not repeated, nor are those which are given for *hivaooa*, in which full agreement is shown by the present closely related insect. Size below medium, form only moderately broad for the group. Palpi proportionately slightly shorter than in *M. hivaooa*. Pronotum with latero-caudal portions and tegmina with mediastine fields broad but distinctly narrower than in *hivaooa*. Tegmina with impressions between veins and veinlets very feeble. Abdomen with fifth and sixth tergites alone specialized as given in generic analysis and description of *hivaooa*.

## Female

Similar to type but slightly smaller and slightly less broad. Palpi proportionately shorter (malformation is suggested as the left palpus is normal, but the right palpus has the fourth joint shortened and no longer than the elongate fifth joint). Supra-anal plate smaller than in *hivaooa*, with apex almost evenly broadly convex.

Uahuka: Hitikau Ridge, altitude 2900 feet, March 4, 1931, on *Cyperus* species, type male, LeBronnec and H. Tauraa; altitude 2850 feet, March 4, 1931, on *Weinmannia* species, allotype female, LeBronnec and H. Tauraa. Hebard Collection.

These species are compared under *M. hivaooa*. One immature male bearing the same data as the type and two male and one female immatures bearing the same data as the allotype show even heavier marking than the type, the dark brown latero-caudal bands of the pronotum being continued on mesonotum and metanotum with dots of the same in the area between them.

Possibly conspecific immatures are also from the island of Tahuata. These are best separated from certain richly marked immatures of *Aneurina* in that the caudal metatarsus is considerably longer, longer than the combined length of the succeeding tarsal joints.

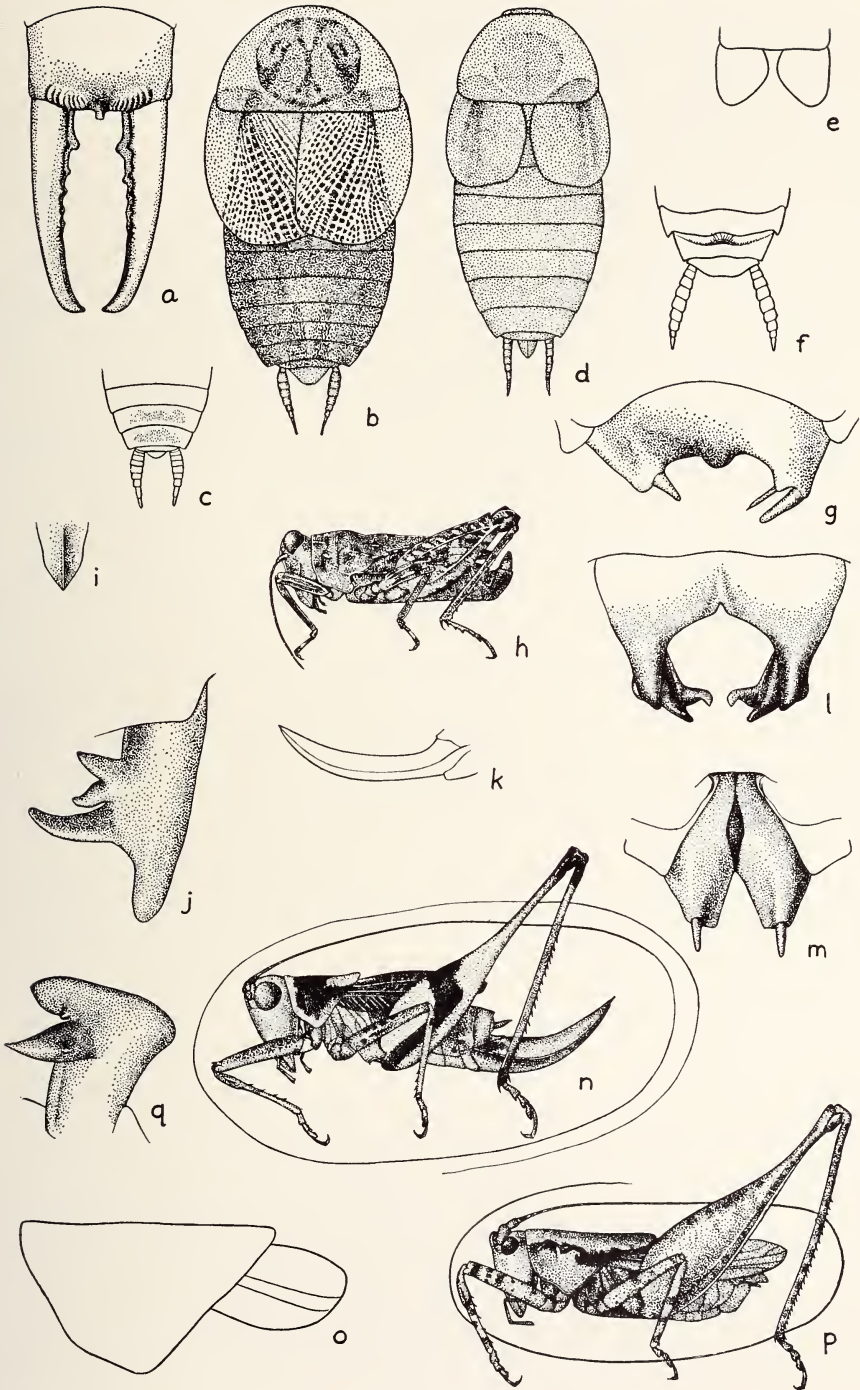
## Genus ANEURINA, new genus

This genus is erected to include a small group of Marquesan species, with *viridis* as genotype. It is clearly close to *Mareta*, but even closer to the Marquesan genus *Maretina* here described.

From *Maretina* it is best separated by the unspecialized dorsal surface of the male abdomen and smooth diaphanous tegmina in which the humeral



FIGURE 1. Marquesan Dermaptera and Orthoptera: *a*, *Labia dubronyi* Hebard, type female, dorsal view of ultimate tergite and forceps,  $\times 14$ ; *b*, *Martina hivaoo*, new species, type male, dorsal view showing specialization of 4th, 5th, and 6th tergites,  $\times 5$ ; *c*, *Martina uahuka*, new species, type male, dorsal view of distal portion of abdomen showing broader specialization of 5th and 6th tergites only,  $\times 4$ ; *d*, *Aneurina viridis*, new species, type male, dorsal view,  $\times 5$ ; *e*, *Aneurina tahuata*, new species, type male, dorsal outline of tegmina and caudal margin of pronotum,  $\times 5$ ; *f*, *Kuchinga remota*, Hebard, Society Islands, type male, dorsal view of distal portion of abdomen showing specialization of 8th tergite,  $\times 1\frac{1}{2}$ ; *g*, *Kuchinga remota*, Hebard, Society Islands, type male, ventral view of subgenital plate, greatly enlarged; *h*, *Hydrotetrix marquesana*, new species, allotype male, lateral view,  $\times 5$ ; *i*, *Hydrotetrix marquesana*, new species, type female, dorsal view of apex of pronotum,  $\times 6$ ; *j*, *Conocephalus tridens*, new species, paratype male, dorso-caudal view of cercus, greatly enlarged; *k*, *Conocephalus tridens*, new species, paratype female, lateral outline of ovipositor,  $\times 3$ ; *l*, *Fatuhivella colorata*, new species, type male, dorsal view of ultimate tergite and apices of cerci, which alone are exposed from above, greatly enlarged; *m*, *Fatuhivella colorata* new species, type male, ventral view of subgenital plate, same scale as *l*; *n*, *Fatuhivella colorata*, new species, allotype female, lateral view,  $\times 3$ ; *o*, *Fatuhivella marmorata*, new species, type female, lateral outline of pronotum and tegmen,  $\times 7$ ; *p*, *Nukuhivella agraccioides*, new species, type male, lateral view,  $\times 3$ ; *q*, *Nukuhivella agraccioides*, new species, type male, ventro-caudal view of cercus to show apex and its projections, shaft necessarily foreshortened, greatly enlarged.



trunk is weakly indicated, but other venation detectable only when the tegmina are held in certain lights and examined under a high-powered microscope. The insects appear more glabrous, with vertex broader, palpi and tarsal joints shorter and tegminal reduction slightly to distinctly greater. The same slender apical production of the cerci found in *Martina* is shown, this aiding in distinguishing these genera from *Mareta*. The shell-like tegmina (due to the almost obliterated venation), smooth and without tessellation, further distinguish the species of *Aneurina* from those of *Mareta*.

Other noteworthy generic features of *Aneurina* agree throughout with those here given for *Martina*. It shows the following differences probably of minor generic differential value from that genus. Head shorter with occipital width proportionately greater and lateral margins of face more decidedly convergent ventrad. Palpi short, with third and fifth joints about equal in length and fourth joint shorter. (Tegmina much reduced, broadly rounded quadrate or triangular pads.) Caudal metatarsus slightly shorter to slightly longer than combined length of succeeding joints.

***Aneurina viridis*, new species (fig. 1, d).**

Considerable modification has occurred in the species and decided variation in size and some variation in tegminal contour and palpal, cercal, and tarsal proportions is shown by the series.

The type is of about average size. Below are the extremes of the series as well:

	Length, body	Length, pronotum	Width, pronotum	Exposed length, tegmen	Greatest width, tegmen
Male					
Ooumu, Nukuhiva, type.....	8	2.9	3.8	2.6	2.7
Ooumu, Nukuhiva, paratype .....	7.6	2.1	3	1.8	1.8
Tekao Hill, Nukuhiva, paratype .....	9	2.8	3.8	2.7	2.5
Female					
Ooumu, Nukuhiva, allotype.....	7.4	2.3	3.1	1.8	2
Tapuaooa Hill, Nukuhiva, paratype ....	7.2	2.4	3.2	2	2.1
Tauamaka, Nukuhiva, paratype .....	8.9	2.8	3.9	2.7	2.7

The immatures are unicolorous, deplanate, and very delicate in structure.

The ootheca is carried vertically. It is short, thick and smooth, with suture showing a series of very feeble thickenings.

Male

The following features are given in addition to those considered of generic value. Size small for the group *Martetae*, form medium. Width between antennal sockets less than two-thirds that between the very widely spaced eyes. Palpi with third joint longest, large fifth joint slightly longer than fourth. Tegmina slightly overlapping, exposed portions as long as broad (varying to slightly longer than broad), costal margin rounding hardly less broadly into the distal margin than does the sutural margin and slightly (to scarcely) less produced so that the distal margin is weakly oblique; venation almost obliterated, the attingent (if in normal position) tegmina appearing like transparent and smoothly and weakly convex shells except that there is weak depression at the humeral trunk and the moderately broad mediastine field is flattened. Wings minute and atrophied, but visible through the tegmina. Abdomen smooth, convex, tapering, with disto-lateral angles of tergites very slightly produced at slightly less than a

right angle; seventh small with latero-caudal angles convex. Supra-anal plate delicate, triangularly produced, about two-thirds as long as basal width, with apex broadly rounded. Cerci as described for *Maretina hivaoa*. Subgenital plate with distal section deeply cleft, the flaps thus formed adjacent with ventral surfaces concave, each terminating dorsad in a small chitinous finger curving dorsad then caudad; inner margin of sinistral flap armed half way to its base with a curved spine as large as the apical finger, inner margin of dextral flap armed one-third way to its base with a minute rounded socketed style, no longer than broad.

#### Female

Differs from male as follows. Occiput more convex, the eyes less projecting laterad and width between antennal sockets three-quarters that between the less remote eyes. Palpi slightly but definitely shorter. Supra-anal plate triangularly produced with apex moderately bilobate (rarely truncate), slightly less than (varying to slightly more than) half proximal length.

Thirty-seven specimens examined—11 males, 9 females, and 17 immature individuals.

Nukuhiva: Tekao Hill, altitude 3020 feet, July 23, 1931, on *Metrosideros collina*, *Weinmannia* species, and *Rapanea?* species, 4 males, 1 female, paratypes, 4 juveniles, LeBronnec and Tauraa; Ooumu, altitude 3000-3890 feet, May 27 to 28, 1931, on *Weinmannia* species and *Cyrtandra* species, adults, 3 males, 1 female, type male (altitude 3000 feet, May 27, 1931, on *Weinmannia* species, LeBronnec and Tauraa), allotype female (altitude 3200 feet, May 28, 1931, on *Weinmannia* species, LeBronnec and Tauraa), paratype, 7 juveniles, Tauraa, Mumford, and Adamson; Tauamaka, altitude 2900 feet, November 10, 1929, on *M. collina*, 2 females, paratypes, Mumford and Adamson; Tapuaooa Hill, altitude 2500 to 3600 feet, May 30, 1929, to November 10, 1931, 3 males, 3 females, paratypes, 1 juvenile, Tauraa, Mumford, and Adamson.

Fatuhiva: Tahuna, altitude 2050 feet, September 3, 1930, on *M. collina*, 2 females and 2 juveniles, LeBronnec; Teavaipuhiau, altitude 2150 feet, August 25, 1930, on *M. collina* and *Weinmannia* species, 2 juveniles, LeBronnec.

Uahuka: Penau Ridge, altitude 2000 feet, February 27, 1931, 1 small juvenile, LeBronnec and Tauraa.

Tahuata: Haaoipu (summit), altitude 2700 feet, July 9, 1930, on *M. collina*, 1 male, 1 juvenile, LeBronnec and Tauraa.

This species is distinguished by its light green coloration, the occiput to between the antennae opaque buffy, the pronotal disk on each side sometimes with a suffusion of buff or orange yellow. The subgenital plate is brown in males, brown meso-distad in females.

In so delicately colored an insect, specimens sometimes turn greenish buff or brownish buff in drying, and this, naturally, is particularly true in immatures.



**Aneurina hivaoa**, new species.

Generally light clay color. Three specimens show traces of green, particularly on limbs and abdomen, indicating that in life some individuals may be more strongly tinged with that color. Pronotal disk immaculate (recessive) or with inconspicuous suffusions laterad with a few flecks of darker brown between. Head and tegmina immaculate. Dorsal surface of abdomen with lateral bands of chestnut brown, the bands breaking into a series of large spots in a few individuals and subobsolete in one specimen showing maximum recession. In the specimen of maximum intensive coloration there is also a medio-longitudinal series of dark brown flecks and the other portions of the abdomen appear slightly mottled. Ventral surface uniform light clay color, the abdomen proximad often suffused with brown, rarely with lateral margins narrowly and apex brown.

Size variation in the adults is moderate, those of the smallest female paratype being given before those of the allotype. Length of body, male 8 mm., female 6.8 mm. and 8.2 mm.; length of pronotum, male 2.3 mm., female 2.2 mm. and 2.3 mm.; width of pronotum, male 3.4 mm., female 3.5 mm. and 3.6 mm.; exposed length of tegmen, male 2 mm, female 1.9 mm. and 1.9 mm.; greatest width of tegmen, male 2 mm., female 2 mm. and 1.9 mm.

## Male

Very similar to *viridis* in the structural features here given, differing only as follows: Palpi slightly shorter. Tegmina showing slightly greater reduction, separated by a narrow interval, with distal convexity broader on both costal and sutural margins. Subgenital plate similar except that inner margin of sinistral flap is armed at one-third the distance to its base with a socketed style which is slightly longer than broad, and very similar to the apical production, a smaller socketed style present on inner margin of dextral flap one-quarter distance to base.

## Female

Very similar to male. Form slightly broader. Supra-anal plate as in *viridis*.

Fifteen specimens examined—3 males, 5 females, and 7 immature individuals.

Hivaoa: Mount Temetiu, altitude 3660 to 3860 feet, May 27, 1928, and December 27, 1930, 1 in fern petiole, 2 males, 4 females (altitude 3860 feet, December 27, 1930, type male, H. Tauraa, altitude 3660 feet, May 27, 1929, in fern petiole, allotype female, Mumford and Adamson) type, allotypes, paratypes, 7 juveniles, Mumford, Adamson, and Tauraa; Matauuna, altitude 3700 feet, March 4, 1930, 1 male, 1 female, paratypes, Mumford, Adamson, and Tauraa.

**Aneurina tahuata**, new species (fig. 1, *c*).

Generally light cinnamon buff above and below. Head, pronotum, and tegmina immaculate. Dorsal surface of abdomen in allotype (maximum recessive) almost immaculate, three female paratypes with brown lateral bands and with a much finer medio-longitudinal brown band, these bands in two broken into series of spots, minute flecks of brown also along the slightly paler buffy caudal margins of the tergites; type with lateral bands formed by larger spots of Prout's brown, but median band and flecks obsolete. Lateral margins of abdominal sternites suffused with brown in male type and two female paratypes.

Little size variation is shown by the series including 3 female paratypes and 14 immatures, of which the majority are very small. Length of body, male 7 mm., female 6.8 mm.; length of pronotum, male 2 mm., female 2 mm.; width of pronotum, male



3.05 mm., female 3.1 mm.; exposed length of tegmen, male 1.7 mm., female 1.7 mm.; greatest width of tegmen, male 1.7 mm., female 1.75 mm.

#### Male

Differs from *hivaoa* only as noted above. Tegmina decidedly reduced; separated at bases a distance over half basal tegminal width, sutural margin oblique produced to caudal margin of mesonotum, so that at that point the tegmina are less widely separated than proximad, sutural margin thence rounding into the almost straight oblique distal margin, the broadly rounded apex consequently nearer the costal margin. Styles slightly shorter. Subgenital plate similar. Generic features given in generic description.

#### Female

Very similar to male, slightly broader. Supra-anal plate slightly less than half as long as basal width (found to be variable in length in allied species).

Tahuata: Amatea, altitude 2700 feet, July 7, 1930, on *Metrosideros collina*, type male, allotype female, LeBronnec and Tauraa.

Closely related to *A. hivaoa*, this insect is distinguished by its smaller size and more reduced tegmina which are separated by wider intervals and have their distal margins distinctly oblique, retreating to the sutural margins.

#### **Graptoblatta notulata** (Stål).

Eiao, altitude 1500 feet, April 22, and 24, 1931, 3 males, 1 female.

Hivaoa: Tapeata, altitude 2500 feet, May 25, 1929, in tree fern petioles, 2 small juveniles.

Tahuata: Vaitahu Valley, altitude 90 to 120 feet, June 2 to 16, 1930, on cotton, *Gossypium* species, 2 males, 7 juveniles.

Fatuhiva: Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, 1 juvenile female.

Nukuhiva: Teuanui, altitude 1400 and 1800 feet, October 25 and 26, 1929, at light, 2 females; Tapuaooa Ridge, altitude 3000 feet, June 18, 1931, on *Metrosideros collina*, 1 female, 1 juvenile.

Uahuka: Penau Ridge, altitude 2000 to 2170 feet, March 4 and 5, 1931, 2 at light, 2 males, 1 female, 1 large juvenile male; Vaitiake, altitude 1000 feet, March 24, 1931, on *Canthium barbatum*, 1 female; Putiovae [Putiovai], altitude 1530 feet, March 23, 1931, on *Xylosma suaveolens*, 1 male; Vaipae Valley, altitude 880 feet, in banana leaves, 1 small juvenile.

This species is known from Hawaii, the Marquesas, and Tahiti to New Caledonia, New Guinea, Celebes, Borneo, Java, Sumatra, and the Malay Peninsula.

#### PSEUDOMOPINAE

#### Genus **MICROBLATTA**, new genus

This genus is erected to include the single species, *M. uapou*, here described. It may be recognized by the following characters. Size very small,

structure quite strongly chitinous. Head much deeper than wide, interocular space extremely broad, margins of cheeks weakly convergent ventrad below eyes. Palpi moderately elongate. Pronotum with convex surface showing no impressions, cephalic and caudal margins truncate. Tegmina represented by rounded quadrate pads, with venation subobsolete and anal sulcus obsolete. Wings vestigial. Male with surfaces of distal tergites very finely rugulose. Male subgenital plate broadly cleft with two projections on each side, maretoid. Femora stout, median and caudal with ventral margins well spined, cephalic with ventro-cephalic margin armed with an elongate row of short piliform spines, terminating in two elongate spines. Caudal metatarsus slightly longer than combined length of succeeding joints, its ventral surface with two rows of very minutely microscopic spines. Pulvilli obsolete. Arolia present between the delicate, simple symmetrical tarsal claws.

The male subgenital plate is of a maretoid type, but heavy spination of the ventral margins of the median and caudal femora indicate that the species belongs to the *Pseudomopinae*. The armament of the ventro-cephalic margins of the cephalic femora and simple symmetrical tarsal claws show that it is nearest *Ceratinoptera*, differing in the longer and differently proportioned palpi, decidedly heavier armament of the median and caudal femora, larger arolia, and entirely different type of male genitalic specialization.

### ***Microblatta uapou*, new species (fig. 2, a, b).**

General coloration shining blackish brown, lateral portions of pronotum and costal field of tegmina obscurely paler, obscure ochraceous tawny. Limbs and spines very dull hazel.

Length of body, male 6.2 mm. (abdomen extruded), female 6 mm.; length of pronotum, male 1.9 mm., female 2.06 mm.; greatest (caudal) width of pronotum, male 2 mm. (estimated), female 2.1 mm.; exposed length of tegmen, female 1.9 mm.; greatest (median) width of tegmen, female 1.77 mm.; length of caudal tibia, male 2.27 mm., female 2.27 mm. (by micrometer).

#### Male

Important characters given in generic description. Size very small, form comparatively moderately graceful. Interocular space equal to width across antennal sockets to their outer margins. Ocelli obsolete. Pronotum with cephalic margin transverse and very faintly convex, caudal margin much broader, transverse, but showing faint convexity mesad; cephalic and very broadly convex lateral margins cingulate. Tegmina probably much as in female (type damaged, tegmina missing). Wings atrophied pads, but extending distad beyond caudal margin of metanotum. Distal tergites very finely and irregularly rugulose, very minute short hairs present. Supra-anal plate triangular, less than half as long as wide, with apex broadly convex. Cerci with margins entire and apices blunt. Subgenital plate produced on each side in a bidentate lamella, the dextral much narrower than the sinistral lamella.

#### Female

Very similar to male, differing as follows: Interocular space slightly wider. Tegmina quadrate, slightly shorter than pronotum, large scutellar area exposed, production slightly greatest at sutural margin, distal costal angle very broadly rounded, slightly

oblique distal margin showing very weak convexity; surface smooth and shining, venation only apparent where light can shine through the tegmina. Surface of abdomen smooth. Supra-anal plate with margins very weakly convex convergent to the more sharply rounded apex, where there is a brief medio-longitudinal subchitinous line. Cerci more acute at apices. Subgenital plate destroyed.

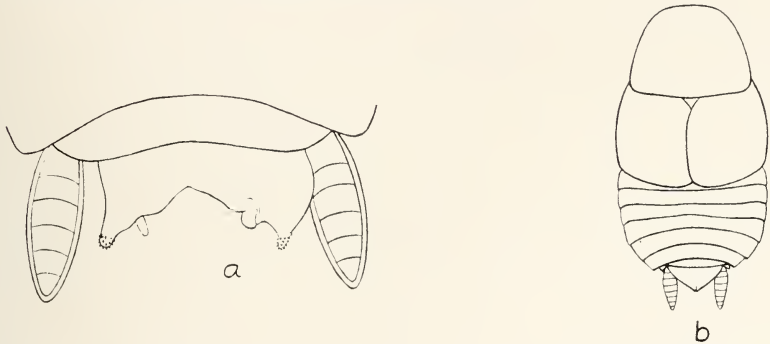


FIGURE 2. *Microblatta uapou*, new species: a, type male, ventral view of distal portion of abdomen (greatly enlarged); b, allotype female, dorsal outline,  $\times 6$ .

Uapou: Teavaituhai, Hakahetau Valley, altitude 3000 feet, October 19, 1931, type male, allotype female, LeBronnec.

This very small blackish brown insect is best compared with the Mexican *Ceratoptera tropaia* Hebard. It is even smaller, less robust, and darker, with the pronotum definitely truncate cephalad, tegmina shortest at costal instead of at sutural margin, and entirely lacking an anal sulcus, strikingly longer caudal tibiae and very distinct genitalia.

The armament of the ventro-cephalic margins of the cephalic femora is of a distinct type from that developed in *Temnopteryx*, *Anisopygia*, and their allies.

### **Kuchinga remota**, new species (fig. 1, f, g).

General coloration testaceous. Head with a suffused brown band between ocelli and below with two narrower bands of irregular intensity, strongly convex ventrad on face. These markings often reduced to weak flecks and obsolete in recessive specimens. Pronotal disk with two inconspicuous brown flecks mesad, in intensive individuals with two to four very minute brown dots meso-caudad. Tegmina and nodes on veins immaculate. Limbs immaculate, rarely with a fleck of brown dorso-distad on cephalic femora and brown at bases of dorsal tibial spines. Cerci with base, before apex and immediate apex brown. Ventral surface of abdomen laterad maculate with dark brown. Immatures heavily and strikingly tessellate with dark brown.

Little size variation is shown by the series. Length of body, male 6.8 mm., female 6.8 mm.; length of pronotum, male 1.7 mm., female 1.7 mm.; width of pronotum, male 2.3 mm., female 2.4 mm.; length of tegmen, male 6.8 mm., female 6.6 mm.; width of tegmen, male 2.2 mm., female 2.2 mm.

#### Male

Size very small, form medium. Head little flattened, moderately short, margins of cheeks very gradually convergent ventrad. Interocular space four-fifths that between

antennal sockets. Palpi only moderately elongate, fourth joint distinctly shorter than third, fifth elongate but distinctly shorter than fourth. Pronotum weakly convex, greatest width slightly caudad of the median line, caudal margin very faintly convex. Tegmina and wings fully developed. Tegmina normal, apices well rounded, discoidal sectors longitudinal and nodose (the bases of microscopic hairs). Wings normal, costal veins briefly and heavily clubbed, distad, ulnar vein with one (rarely two) continuous branch, intercalated triangle small but as broad as long. Eighth abdominal tergite with a raised transverse ridge, mesad, rounded obtuse angulate and pointing cephalad, its cephalic surface particularly mesad supplied with minute hairs. Supra-anal plate transverse, faintly sub-bilobate. Subgenital plate triangularly produced on each side with apices rounded, between concave particularly sinistral, with a small rounded projection mesad. From the inner surface of this projection, a curved spine lies along the upper surface of the plate, its point extending nearly to the apex of the sinistral style. Styles similar, simple, slender, tapering to sharply rounded apices, the sinistral slightly smaller than the dextral; sinistral at apex of sinistral projection, dextral on inner side of apex of dextral projection. Ventro-cephalic margin of cephalic femora with two proximal and two elongate distal spines, separated by a closely placed row of microscopic spinules.

#### Female

Very similar to male; very slightly broader with tegmina very slightly shorter. Supranal plate more strongly transverse. Subgenital plate very weakly bilobate distad.

Eleven specimens examined—5 males, 3 females, and 3 immature individuals.

Hivaoa: Teava Uhia i te Kohu, altitude 2000 feet, February 15, 1930, 1 female, Mumford and Adamson.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1500 feet, August 30, 1930, 1 male, 2 large juvenile males; Ihiota, Hanavave Valley, altitude 450 feet, 1 teneral female, LeBronnec.

Uahuka, Vaipae Valley, altitude 880 feet, September 20, 1929, in banana leaves, 1 juvenile, Adamson.

Described from the Society Islands.

Society Islands. Moorea: Faaroa Valley, altitude 1000 feet, 3 miles from sea, December 4, 1928, in dead banana leaves, 1 female allotype, Adamson. Tahiti: Hitiaa, 3 miles from sea, altitude 1500 feet, December 20, 1928, 3 males, type and paratypes; Papeari, altitude 900 feet, November 9, 1928, in *Freyinetia* species, 1 male paratype, Adamson.

This very small buffy species is very dissimilar in appearance from the genotype, *longealata* (Brunner) and its general testaceous coloration is much nearer *K. nimbata* (Shelford). In superficial appearance, however, *remota* agrees even more closely with certain New World species of *Cariblatta*.

The specialized dorsal surface of the male abdomen and shorter palpi may indicate generic differentiation, but until we better understand *Kuchinga*, we believe that step would be unwise. It certainly would, if that genus is found to include many and as diverse species as are now known to be referable to *Mareta*.



From the insufficient description, based only on the female sex, we note that *Margattea vermiculata* Hanitsch, described in 1928 from Siberut Island, Mentawi Islands, may be congeneric. From *remota* it is apparently distinguished by the dark vertex, vermiculate pronotal disk and ulnar vein of wings with four branches. Rehn has recently pointed out that *Margattea* has oblique tegminal discoidal sectors.<sup>1</sup> Hence the original generic assignment of *vermiculata* is incorrect.

### **Loboptera dimidiatipes** (Bolivar).

This species was described from the Philippines in 1890. A synonym is *Temnopteryx sakalava* Saussure, described from Madagascar in 1891. In 1909, Holdhaus recorded the species from Samoa as *Loboptera extranea* Perkins, a name based on Hawaiian material which we placed under *sakalava* in 1922. Holdhaus also added to the present synonymy by describing *Loboptera maculicornis* from Samoa in 1909, based on immature material of the present species, in which stages, but not in the adult, white antennal annuli are present. Brunner erected another synonym in 1916, *Temnopteryx ferruginca*, based on a recessive female from Fiji such as we have recorded from Penau Ridge, Uahuka. Still another synonym is *Temnopteryx bimaculata* described by Chopard from New Caledonia in 1924 (his figure shows the distinctive markings, but the insect is actually smoother and more compact in appearance). In 1927 the insect was reported as *Temnopteryx sakalava* by Caudell from Fiji and Tahiti, and in 1930 as *Temnopteryx bimaculata* by Chopard from Tahiti.

The species was evidently not recognized as extremely widespread, probably by commerce, through the South Seas.

Nukuhiva: Ooumu, altitude 3890 feet, July 30, 1931, 1 juvenile; Tapu-aooa, altitude 2600 feet, May 30, 1931, 5 males, 9 females, 2 juveniles.

Uahuka: Penau Ridge, altitude 1860 and 2000 feet, February 27, and March 5, 1931, 2 females (unusually pale, reddish brown in general coloration).

Hatutu [Hatutaa]: altitude 800 feet, April 28, 1931, under grass, 1 female.

The species is known from as far west as Tanganyika, Africa.

## BLATTINAE

### **Periplaneta brunnea** (Burmeister).

Hivaoa: Atuona, April 25, 1929, 1 female.

<sup>1</sup>Rehn, J. A. G., On the Blattid Genera *Abrodiaeta* Brunner (= *Allacta* Saussure and *Zehntner*) and *Margattea* Shelford (Orthoptera): Ent. Soc. America, Trans., vol. 57, p. 301, 1934.



**Periplaneta australasiae** (Fabricius).

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1500 feet, August 30, 1930, 2 juveniles; Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, 3 juveniles.

Nukuhiva: Teuanui, altitude 1800 feet, at light, 1 female.

Uahuka: Vaipae Valley, altitude 270 feet, March 18, 1931, under coconut fronds, 2 males, 1 juvenile.

Fatuuku: November 19, 1930, 2 females, 2 juveniles.

Mohotani: altitude 1200 feet, August 20, 1930, to February 2, 1931, 2 males, 2 females, 15 juveniles.

Hatutu [Hatutaa]: altitude 800 feet, April 28, 1931, under grass, 1 male, 2 females, 1 juvenile.

Ēiao: altitude 1000 feet, April 21, 1931, at light, 1 male.

**Periplaneta americana** (Linnaeus).

Hivaoa: Atuona, February 6, 1929, 1 male.

Nukuhiva: Taiohae, sea level, June 4, 1931, at light, 1 male.

These three species of *Periplaneta* are circumtropical and often a serious pest on the smaller ships sailing the South Seas.

**Cutilia soror** (Brunner).

Hivaoa: Matauuna, altitude 3760 feet, August 1, 1929, 2 males, 2 females, 1 large juvenile male; Tenatinaei, altitude 3760 feet, August 1, 1929, 1 large juvenile male.

Nukuhiva: Teuanui, Toovii, altitude 2000 feet, October 15, 1929, 1 large juvenile male; Tapuaooa, altitude 2600 feet, May 30, 1931, 2 males, 2 females.

Uahuka: Hanatea, altitude 100 feet, March 11, 1931, under stone, 1 male; Hane Ridge, altitude 1800 feet, February 26, 1931, 1 female; Vaitiake, altitude 1000 feet, March 9, 1931, under dead log, 2 males.

Hatutu [Hatutaa]: altitude 800 feet, April 28, 1931, under stone, 1 male.

This insect, representing a genus represented by numerous species in Australia and a number of species in Melanesia, has been recorded from Hawaii and Tahiti to Formosa, Ceram, and Amboina.

**Cutilia nitida** (Brunner).

We are satisfied that *C. fecjecana* Bruner, described in 1916, is a synonym, probably based on a teneral specimen. The width is given as 16 mm. In the series here recorded this dimension ranges from 14.6 to 15 mm. in females, but one from Ceram and one from the Philippines in the author's collection are as wide as Bruner's specimen.

Nukuhiva: Toovii, altitude 2500 feet, August 4, 1931, 4 males, 1 female.

Mohotani: altitude 1200 feet, February 1 and 2, 1931, 5 males, 6 females.

This species was previously known from Fakarava in the Tuamotus and Samoa to Formosa, the Philippines, Ceram, Amboina, and Australia.

## PANCHLORINAE

***Pycnoscelus surinamensis*** (Linnaeus).

Tahuata: Vaitahu Valley, altitude 120 feet, June 16, 1930, 1 female, 5 juvenile females; Kiinui, altitude 1210 feet, June 14, 1930, 1 juvenile female.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1600 feet, August 29, 1930, 1 juvenile female; Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, 1 small juvenile female.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 25, 1929, in banana leaves, 1 juvenile female.

Uahuka: Hane Valley, altitude 150 feet, March 15, 1931, 1 female; Vaitiake Valley, altitude 1000 feet, March, 1931, 1 juvenile female.

Fatuuku: altitude 860 feet, November 19, 1930, 2 females, 6 juvenile females.

Hatutu [Hatutaa]: altitude 1018 feet, October 30, 1929, 1 female.

Mohotani: altitude 700 feet, February 2, 1931, 1 female, 8 juvenile females.

This circumtropical species is evidently parthenogenetic in the Marquesas, as is the case over the great part of its distribution. In the Indo-Malayan regions, however, males are frequent.

## CORYDIINAE

***Holocompsa nitidula*** (Fabricius).

From Shelford's description and figures of his *H. capsoides* from Lower Ogowe, Africa, in 1911, and Chopard's record of a male from Samoa in 1929 which agreed fully with the type, we are satisfied that that name is a synonym.

Uapou: Hakahetau, December 31, 1929, at light, 1 female.

Common in tropical America and known to be widely distributed by commerce, we believe that *nitidula* has probably reached Oceania through importation from that continent.

The female is very different from the male, being of broader form, with pronotum cinnamon-rufous instead of black, and suffusion of the distal portion of the organs of flight slightly stronger.

## OXYHALOINAE

***Diploptera dytisoides*** (Serville).

Uahuka: Haave [Haavei] Valley, sea level, March 19, 1931, under bark, 1 male, 1 large juvenile female.

This insect, known to be sometimes injurious to trees, is apparently widely distributed in Oceania and has been reported from Hawaii to Australia, Singapore, Ceylon, and southern India.

A female from Ascension Island in the South Atlantic is in the author's collection, where the species was almost certainly introduced.

## PHASMIDAE

### PHIBALOSOMINAE

#### **Graeffea crouanii** (Le Guillou).

Described from Samoa, this name has priority over *coccophagus* as indicated by Kirby in 1904, but missed by Brunner in his monograph in 1908, where the synonymy of *Anophelepsis fulvescens* Saussure, described from Hivaoa, was, however, correctly established.

Hivaoa: Atuona, low level, July 12, and 19, 1929, 17 females (two brown phase, others green) 9 large juvenile females, 6 small juveniles.

The adults range from 106 to 116 mm. in length.

The species is widespread in Oceania as far north as the Marquesas and Samoa, west to the Solomon Islands and south to Australia. It is decidedly injurious to the coconut, and particularly so to young trees.

## ACRIDIDAE

### ACRYDIINAE

#### **Hydrotetrix marquesana**, new species (fig. 1, *h, i*).

General coloration dark brown, usually uniform, rarely with slightly darker patches laterad on disk back of shoulders and on dorsal surfaces of caudal femora beyond the median point. Cephalic and median tibiae slightly paler with very weaker defined dark annuli, which are strongest on the cephalic pair. Caudal tibiae dark brown, usually paler at base.

Little size variation is shown. Length of body, male 6.2 mm., female 7.8 mm.; length of antenna, male 3.7 mm., female 4.8 mm.; length of pronotum, male 4.8 mm., female 5.8 mm.; width of pronotum at shoulders, male 1.9 mm., female 2.1 mm.; length of caudal femur, male 4 mm., female 4.9 mm.

#### Female

Size small, form moderately graceful. Lateral ocelli in line with median portion of eye. Antennae elongate. Fork of frontal costa very narrow. Vertex without a transverse ridge back of the deeply bi-impressed portion. Pronotum not surpassing base of ovipositor; with a pair of short sharp carinae between shoulders and a pair of carinae meso-caudad which converge to join the median carina caudad. Pronotal lateral lobes with caudal angles rounded, not reflexed; scapular area prominent. Organs of flight absent. Ovipositor elongate and rather slender. Cephalic and median limbs moderately elongate, with margins scarcely undulate. Caudal femora elongate, with oblique rugae rather conspicuous. Caudal metatarsus considerably longer than combined length of succeeding joints.

#### Male

Very similar to female. Size smaller. Vertex narrower, slightly narrower than the dorsal ocular width. Pronotum extending to opposite base of subgenital plate.

Specimens examined: 49; 15 males, 24 females, and 10 immature individuals.

Fatuhiva: Ihiota [Iniota], Hanavave Valley, altitude 500 feet, September 10, 1930, on wet rocks beside stream, 5 males, 5 females, 3 juveniles; Teavaione, Omoa [Oomoa] Valley, altitude 1700 feet, August 29, 1930, on wet rocks beside stream, 8 males, 16 females, type female, allotype male, LeBronnec (B. P. Bishop Museum), paratypes, 7 juveniles.

This insect is closely related to *H. aspera* Uvarov of the Society Islands, differing in the pronotum having its median carina less distinctly elevated between the shoulders, but decidedly more pronounced caudad and its lateral margins more convergent caudad so that that caudal extremity is rather strongly acute-angulate. The vertex is slightly broader so that in the females it is as broad as the dorsal ocular width instead of being slightly narrower than that dimension. The rugosities of the pronotum are not conspicuous.

From the genotype *H. cheesmanae*, of the Society Islands, these species are quickly separable by the much shorter caudal tarsi.

The genus *Hydrotetrix* is apparently near *Mazarredia* Bolivar, though not as conspicuously a metrodorid as our recently described genus *Cingalena* from Ceylon.

#### CYRTACANTHACRINAE

Three endemic species of this subfamily occur in the Marquesas: *Ootua antennata* Uvarov on Hivaoa, *Valanga marquesana* Uvarov on Nukuhiva, and *Patanga pinchoti* Caudell on Eiao. The Survey's collection of these species has already been dealt with by Uvarov in a paper in this series.<sup>2</sup>

#### TETTIGONIIDAE

#### COPIOPHORINAE

#### ***Euconocephalus roberti* (Le Guillou).**

Walker's *Conocephalus insularis* was synonymized by Kirby in 1906. We recorded specimens apparently representing this species from the Philippines and Java as *sobrinus* in 1922, and now believe that name to be probably a synonym.

This species has been recorded as *E. australis* from many islands in Oceania, including Hivaoa in 1927. We are not convinced that that name is a synonym, though it was so placed by Chopard in 1929. It was described from New Caledonia and with *longiceps* (also described from that island) as a synonym, is apparently a species having a longer vertex (and sometimes more attenuate if correctly figured by Redtenbacher). Caudell's record of *Euconocephalus lineatipes* from Fatuhiva in 1932 certainly is based on a specimen of the present species.

<sup>2</sup> Uvarov, B. P., Acrididae from the Marquesas: B. P. Bishop Mus., Bull. 98, pp. 239-240, 1932.

Hivaoa: Mount Ootua, altitude 2500 feet, May 6, 1929, 1 female (green); Atuona, sea level, March 9 to July 12, 1929, 39 males, 4 females (14 males, 1 female, green, others brown); Mount Temetiu, altitude 3200 feet, September 13, 1929, 1 small juvenile (green); Tapeata, altitude 2250 feet, May 25, 1930, 2 juveniles (brown).

Tahuata: Kiinui Valley, altitude 1200 feet, June 14, 1930, 1 juvenile male (green); Vaitahu Valley, sea shore, June 5 to 16, 1930, 9 males (2 green, others brown).

Fatuhiva: Tapuhiva, Hanavave Valley, altitude 500 feet, September 9, 1930, 1 juvenile male (green); Omoa [Oomoa] Valley, sea level to 100 feet, August 21 to September 26, 1930, 1 female, 3 juveniles (all green); Hanavave Valley, altitude 30 feet, in *Paspalum conjugatum*, 1 small juvenile.

Nukuhiva: Taipivai, November 21, 1929, 8 males, 6 females, 4 juveniles (4 females and 1 juvenile brown, others green); Taiohae, November 26, 1929, 4 males, 2 females, 4 juveniles (2 males green, other brown); Tapuaooa, altitude 2600 feet, May 20 to June 19, 1931, 30 males, 1 female, 2 juveniles (10 males, 2 juveniles green, others brown); Vaihakameama, altitude 2600 feet to 3100 feet, June 19, 1931, 1 male, 1 female, 3 juveniles (2 juveniles green, others brown).

Uahuka: Vaitiake, altitude 1000 feet, March 24, 1931, 1 small juvenile (brown); Vaipae Valley, altitude 50 feet, March 19, 1931, 1 female (green); Tautheeputa, altitude 1770 feet, March 23, 1931, on *Abutilon* species, 1 juvenile male (green).

Uapou: Hakahetau Valley, December 18, 1929, 1 juvenile (brown), 2 females.

This insect is apparently distinguished from its allies by the longer vertex (except in the case of *longiceps*), which to the naked eye appears acute, and the short ovipositor. In none of the present series is the immediate costal margin of the tegmina darkened. It is apparently the only species of the genus which has extended its distribution into Oceania.

#### CONOCEPHALINAE

##### **Conocephalus affinis** (Redtenbacher).

Fatuhiva: Atipo [Atipu], altitude 2100 feet, September 3, 1930, in *Paspalum conjugatum*, 1 female; Omoa [Oomoa] Valley, near sea level, August 21, 1930, 1 male; Tapuhiva, Hanavave Valley, altitude 500 feet, September 9, 1930, in *P. conjugatum*, 4 juveniles; Hanavave Valley, altitude 1560 feet, August 23, 1930, 1 male, 2 juvenile females; Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, in *P. conjugatum*, 10 males, 4 females, 25 juveniles.

Nukuhiva: Tapuaooa, altitude 2600 feet, May 30, 1931, and November 11, 1929, 2 males, 4 females, 10 juveniles.



Mohotani: altitude 1400 feet, February 1, 1931, 2 juveniles.

The species is known also from Samoa, Fiji, the Society Islands, the Philippines, Banks Island, and the Aru and Kei islands.

**Conocephalus tridens**, new species (fig. 1, *j*, *k*).

General coloration light yellow brown, the dorsum of the head and pronotum margined laterally with yellow buff, this continued on the humeral vein of the tegmina for some distance. Area between on head and pronotum often darker than elsewhere. Antennae yellow brown, intersection of joints brown and occasionally one of these dark brown. Limbs and body discolored but apparently almost immaculate.

Considerable size variation is indicated, the measurements of the largest paratypes following those of the type and allotype. Length of body, male 14.5 mm. to 17.3 mm., female 14 mm. to 15.8 mm.; length of pronotum, male 3.7 mm. to 4.3 mm., female 3.8 mm. to 4.7 mm.; length of tegmen, male 14.7 mm. to 19.7 mm., female 15 mm. to 20.2 mm.; length of caudal femur, male 11.8 mm. to 14 mm., female 12 mm. to 14.7 mm.; length of ovipositor, 7.3 mm. to 8 mm.

Male

Size and form medium for the genus; macropterous. Head with dorsal outline very feebly concave, the vertex scarcely ascending. Fastigium narrow, distinctly less than half the width of the large proximal antennal joint, sides broadly concave to facial suture, depth over twice width. Eye small and not unusually prominent. Lateral lobes of pronotum longer than deep, cephalic margin broadly convex with angulation suggested, ventro-caudal angle situated slightly caudad of mesad and rounded rectangulate, caudal margin weakly convex to the broad but distinct humeral sinus, convex callosity broad but poorly defined. Tegminal stridulating field of normal size, about as broad as long. Ultimate tergite broadly produced, extending above cerci half the distance to inner teeth, its very broad apex very broadly concave. Supra-anal plate deflexed, divided into two rounded portions with their surfaces concave. Cerci stout, cylindrical; distal portion more slenderly cylindrical to the rounded apex; shaft armed just beyond median point ventrad on its inner surface with a flattened finger directed at a right angle to the shaft and curved slightly inward, this finger as long as the distal portion of the shaft; above this finger are two slightly curved spines, each about half as large as the finger, so arranged that in caudal aspect the cercus appears heavily tridentate. Subgenital plate with distal margin weakly angulate-concave between the very small, socketed disto-lateral styles. Prosternum unarmed. All femora with ventral margins and genicular lobes unarmed. Cephalic tibiae with rimate foramina, these and median tibiae with six pairs (including distal pair) of short spines. Caudal tibiae armed with numerous small dorsal spines and ventrad with much more widely spaced spines in distal portion only, apex with three pairs of spurs.

Female

Closely resembles male. Ovipositor short, broadly but distinctly curved dorsad; slightly but distinctly broader mesad than at proximal point of greatest constriction. Subgenital plate embracing ovipositor, triangular with apex showing broad concavity.

Twenty-one specimens examined—8 males, 7 females, 6 immature individuals.

Eiao: Vaituha, altitude 1200 feet, October 3, 1929, on *Cassia occidentalis*, type male; altitude 800 feet, September 29, 1929, allotype female, Adamson; altitude 800 to 1200 feet, September 29 to October 3, 1929, on *Cassia occidentalis* and *Dodonaea viscosa*, 4 males, 2 females, paratypes; near center of

island, altitude 1300 feet, October 1, 1929, 1 male, 1 female, paratypes; altitude 1700 to 1800 feet, April 16 and 22, 1931, on *Sida* species, 1 male, 1 female, paratypes, 2 juveniles.

Nukuhiva: Ooumu, altitude 3000 feet, May 28, 1931, 2 juvenile females; Tapuaooa, 3100 feet, November 11, 1929, 1 juvenile female.

Tahuata: Vaitupaahi, altitude 2300 feet, July 10, 1930, 1 female, paratype, 1 juvenile female; Amatea, altitude 2600 feet, June 27, 1930, 1 male, 1 female, paratypes.

Of the three other members of the genus found in Oceania, one is tropical American and has surely been introduced in Hawaii, one is Melanesian and Australian, and the other is Melanesian and Malayan. The present species is so distinctive in type of male genitalia, however, that we believe it to be not only endemic but peculiar to the Marquesas.

The unarmed prosternum may indicate that this species is referable to the subgenus *Conocephalus*.<sup>3</sup> We have noted the variation found in this feature in species we have referred to the subgenus *Xiphidion*. The narrow vertex, finely annulate antennae, tridentate male cerci, distinctly recurved ovipositor, and unarmed margins and genicular lobes of the caudal femora quickly separate this not strikingly marked species from all others.

#### Genus FATUHIVELLA, new genus

This genus is proposed to include two species, with *colorata* as genotype. It appears to be a more advanced development showing nearest affinity to the group of *Conocephalus* to which *melas*, *cognatus*, and *vestitus* belong, differing from all other species of that genus in having the stridulating vein of the male tegmina wholly concealed by the pronotum, the male ultimate tergite very greatly produced on each side above the unusually specialized cerci. The genotype agrees more nearly with *Conocephalus cognatus* but is very different from the normal forms of *Conocephalus* in being robust and stocky with caudal femora strikingly marked.

Though subgeneric rather than generic rank may eventually be proven, we think that to be unlikely.

The second species, *marmorata*, is known only from a female which differs decidedly from that sex of *colorata* in having the pronotum longer and more produced caudad but with caudal margin of disk almost as truncate, broadly convex. It lacks entirely the very strikingly contrasted markings found in the genotype and except for the evenly convex dorsal surfaces of the cephalic tibiae would seem to be nearer *Nukuhivella* here described.

Other features of generic significance are as follows. Size small. Fas-

<sup>3</sup> Hebard, Morgan, Studies in Malayan, Melanesian and Australian Tettigoniidae (Orthoptera): Acad. Nat. Sci. Phila., Proc., vol. 74, p. 248, 1922.

tigium not extending beyond antennal sockets, narrow. Pronotum with convex callosity of lateral lobes and humeral sinus very feebly indicated or obsolete. Mesosternal lobes rounded sharply acute angulate, metasternal lobes broadly rounded rectangular. Femora with ventral margins and genicular lobes unarmed. Cephalic tibiae with rimate foramina, dorsal surface unarmed and evenly convex, ventral margins with six pairs of short spines. Caudal tibiae with three pairs of distal spurs. Prosternum bispinose. Male cerci specialized, subgenital plate deeply emarginate between the small socketed simple styles. Ovipositor short, moderately curved dorsad, rather broad, tapering to the acute apex, unarmed—(more agraeoid than in *Conocephalus cognatus* or *tridens*).

**Fatuhivella colorata**, new species (fig. 1, *l-n*).

General coloration ochraceous buff strongly tinged with tawny. Antennae with proximal joints marked with black, other portions black. Pronotum with a shining black saddle including all but the cephalic margin of the prozona and lateral lobes to narrow caudal marginal border. Tegmina shining black with male stridulating field hyaline faintly tinged with buffy, anal field of female buffy. Wings smoky. Caudal femora with a broad longitudinal ventro-external band of black which becomes broader near apex of enlarged portion and there crosses to the dorsal surface; apices of caudal femora and bases and apices of caudal tibiae black. Other limbs with black flecks. Apices of male ultimate tergite and cerci black. Ovipositor darkened proximad, brown along margins and at apex.

The series shows little size variation. Length of body, male 11.1 mm., female 11.2 mm.; length of pronotum, male 3.2 mm., female 3.7 mm.; length of tegmen, male 5.5 mm., female 5.2 mm.; length of caudal femur, male 10.8 mm., female 11.8 mm.; length of ovipositor, 6.4 mm.

Male

Size small, form robust. Head large in proportion to size of body. Occiput convex, scarcely descending to the horizontal fastigium, the dorsal surface of which shows a very fine trace of medio-longitudinal sulcation. Fastigium about one-third as wide as the large proximal antennal joint, its sides faintly convex to the facial suture, slightly over three times as deep as wide. Eyes small, prominent. Pronotum with metanotal portion ascending caudad, its caudal margin truncate; lateral lobes longer than deep, cephalic margin straight to the rounded obtuse-angulate ventro-cephalic angle, thence straight to the rounded-rectangulate ventro-caudal angle which is situated mesad; caudal margin very feebly convex, then very feebly concave; convex callosity indicated by a moderately broad very feebly raised area. Tegmina coriaceous except in the hyaline stridulating field, scarcely tapering to the broadly rounded apices and reaching to the cercal bases; veins prominent, on the convex surface of the discoidal field with distinct cross-veinlets transverse proximad and moderately oblique distad, there forming a network; stridulating field small, all but distal portion concealed by the pronotum; marginal field moderately broad with mediastine vein paralleling discoidal vein to distal portion, numerous (twenty-one to twenty-two) regular costal veins present. Wings reaching almost as far as tegmina but probably incapable of flight. Ultimate tergite large, acute-angulate emargination with margins decidedly convex mesad; lateral portions produced as far as cerci in elongate convex fingers which embrace the cerci, these distad expanding slightly, there solid, tapering and slightly decurved to the apices. Supra-anal plate vertical, triangular, sulcate medio-longitudinally and with convergent sulci laterad. Cercus stout and straight, slightly slenderest mesad; apex external, a quadrate plate with angles

rounded directed inward and dorsad, a round chitinous projection on inner side at its base, apparently with a soft apex above which projects as far as the outer projection a very delicate plate with dorsal margin convex and ventral margin concave to its rounded apex. Subgenital plate deeply and roundly V-emarginate, surface deeply medio-longitudinally concave; lateral apices truncate, a moderately large socketed simple style at each lateral external margin. Caudal femora very stout proximad.

#### Female

Very similar to male except as follows: pronotum with metanotal portion very faintly ascending caudad. Tegmina moderately tapering and not covering apex of abdomen, mediastine vein much shorter, irregular; decidedly fewer, irregular, costal veins. Ovipositor falcate, broadest proximad, moderately recurved to the acute apex, margins unarmed. Subgenital plate with convergent sides rounding into the broadly truncate apex.

Thirty-six specimens examined—11 males, 11 females, and 14 immature individuals.

Fatuhiva: Teavaipuhiau, altitude 2150 feet, August 25, 1931, in *Paspalum conjugatum*, 7 males, 4 females, type male, allotype female, paratypes, 10 juveniles; Atipo, altitude 2100 feet, September 3, 1930, in *P. conjugatum*, 4 males, 7 females, paratypes, 1 juvenile and 3 very small juveniles.

This insect in some ways suggests *Lipotactes* Brunner, but may quickly be distinguished by many characters.<sup>4</sup> The present genus is clearly a member of the Conocephalinae, while *Lipotactes* is as readily referable to the Listroscelinae. Convergence is, however, shown by a number of characters. *Fatuhivella colorata* much more definitely resembles a heavy, strikingly marked species of *Conocephalus*. The black markings on this otherwise tan-colored insect are very striking and distinctive.

#### **Fatuhivella marmorata**, new species (fig. 1, o).

Size small, form very slightly less robust than in *F. colorata*. Agrees with that species in form of fastigium, meso- and metasternal lobes, ovipositor, subgenital plate, and limb armament; differing as follows: head proportionately distinctly smaller, normal. Pronotum more elongate, more produced caudad, with metanotal portion not ascending caudad and its caudal margin very broadly convex but not truncate; lateral lobes much longer than deep, cephalic margin straight to the very broadly rounded, very obtuse-angulate ventro-cephalic angle, thence straight to the rounded ventro-caudal angle which is slightly greater than a right angle and is situated slightly cephalad of mesad; caudal margin straight with humeral sinus and convex callosity obsolete. Tegmina represented by rounded pads, projecting a distance equal to the width of one of them, rather delicate in structure with distinct venation, separated by an interval equal to about one-quarter the width of one of them. Wings vestigial, distinctly shorter than tegmina. Prosternal spines elongate, distinctly better developed than in *colorata*. Caudal femora moderately enlarged proximad.

Head dull russet with occiput (but not fastigium) darker. Antennae mummy brown with irregular small annuli of ochraceous buff. Pronotum with disk russet, with traces of buff separating it from the deep Mars brown lateral lobes. Abdomen laterad Mars brown, dorsad paling to tawny olive flecked with Mars brown. Tegmina tawny olive

<sup>4</sup> Hebard, Morgan, Studies in Malayan, Melanesian and Australian Tettigoniidae (Orthoptera): Acad. Nat. Sci. Phila., Proc., vol. 74, p. 267, 1922.



with humeral trunk proximad, and a rounded suffusion proximad on sutural margin Mars brown. Ovipositor chestnut proximad, hazel distad. Limbs tawny olive very heavily overlaid, flecked and mottled with Mars brown. All of these markings are so fine and so vague in outline that the general appearance of the insect is dull, with marmoration conspicuous only under the microscope.

Length of body, 11.2 mm.; length of pronotum, 4.8 mm.; exposed length of tegmen, 1.8 mm.; length of caudal femur, 11 mm.; length of ovipositor, 6 mm.

Fatuhiva: ridge east of Omoa [Oomoa] Valley, altitude 3000 feet, August 28, 1930, type female, LeBronnec.

The unique female type is readily separated from that sex of *F. colorata* by its obscure marmorate coloration and annulate antennae as well as by the important structural features here given, particularly in the generic discussion.

#### Genus NUKUHIVELLA, new genus

The monotypic species, *N. agraccioides*, is clearly a highly aberrant member of the Conocephalinae, showing in some features an even higher specialization of the characters which distinguish *Fatuhivella marmorata* from *F. colorata*. The vertex and features of limb armament prove that it is a conocephalid, though the great production of the pronotum caudad was hitherto not known for this subfamily, but found in the related Agraeiinae, Listroscelinae, and Decticinae.

Agreement with *Fatuhivella* is shown in size, fastigium, unarmed genicular lobes of all femora and unarmed ventral margins of cephalic and median femora, foramina and armament of cephalic tibiae, bispinose prosternum, ovipositor and subgenital plate. Parallelism is also shown in some of the most striking features of the highly specialized male genitalia.

Distinctive generic features are the male pronotum strongly produced caudad to cover the entire stridulating field of the tegmina, tectate position of the tegmina when at rest, metasternum only slightly less strongly rounded acute-angulate produced than mesosternum, male ultimate tergite greatly produced on each side above the unusually specialized cerci (which rather suggest those of certain species of the Copiphorinae than of any previously known form of the Conocephalinae), male subgenital plate little emarginate between the simple socketed styles, dorsal surface of cephalic tibiae flattened between the very weakly and roundly elevated lateral margins, very finely serrulate ventral margins of the caudal femora, very finely and closely serrulate ventro-external margin of the caudal tibiae (an exceedingly remarkable feature).

#### **Nukuhivella agraccioides**, new species (fig. 1, *p*, *q*).

General coloration clay color, generally flecked with slightly darker (tawny olive) on body and more heavily flecked and annulate with much darker (mummy brown) on limbs. Antennae clay color with frequent irregular minute annuli of tawny olive.



Lateral lobes of pronotum with dorsal portions narrowly (but solidly in metazonal portion) marked with mummy brown, defining them from disk. Tegmina clay color, with proximal portions and venation tinged with brown.

Length of body, 11.7 mm.; length of pronotum, 6 mm.; exposed lateral length of tegmen, 6.8 mm.; length of caudal femur, 11.2 mm.; width of caudal femur, 3 mm.

#### Male

In addition to the generic characters given, the following are shown. Head normal, much as in *Fatuhivella marmorata*. Fastigium very slender, evenly convex dorsad, about one-fourth as wide as the large proximal antennal joint, its sides very faintly convex to the facial suture, slightly over three times as deep as wide. Pronotum with metanotal portion not ascending caudad, greatly produced caudad with apex convex and entirely concealing tegminal stridulating field; lateral lobes over twice as long as deep, cephalic very faintly convex, almost straight to the broadly rounded obtuse-angulate ventro-cephalic angle, thence broadly concave to the rectangulate rather sharply rounded ventro-caudal angle which is situated mesad, caudal margin faintly convex then very broadly concave, convex callosity obsolete. Tegmina rather delicate, tapering moderately distad to the rounded apices and briefly surpassing the cerci, almost vertical with dorsal margins narrowly curled inward and adjacent; venation prominent, position of veins much as in *F. colorata* but with oblique cross-veinlets more regular from ulnar vein to sutural margin and much fewer (12) similar costal veins. Wings reaching almost as far as tegmina. Ultimate tergite of same general type as in *F. colorata*, distal margin broadly obtuse-angulate and narrowly deflexed, mesad briefly cleft with lateral angles thus formed rounded; laterad produced to just before specialized apices of cerci in fingers which are broader proximad than in *F. colorata* but are narrower distad, strongly concave ventrad to embrace shaft of cerci to their rather narrowly rounded apices. Supra-anal plate vertical, triangular, with rounded apex and sulcation of surface weak. Cercus short, straight, distad suddenly directed slightly inward and dorso-cephalad and terminating in two processes, the dorsal of these lamellate with its ventral margin more convex than its dorsal margin, and the whole like a large curved spine, the ventral of these processes a stout spine of equal length, each of these furnished ventrad near its base with a minute but decided tubercle; angulation formed by ventral and distal margins of cercal shaft rounded at distinctly less than 90 degrees. Subgenital plate produced, ample, very delicate, convex; distal margin very broadly concave between the rather elongate simple-socketed styles. Prosternal spines elongate, even longer than in *F. marmorata*. Caudal femora even heavier than in *F. colorata*, but with proximal enlarged portion subsiding less suddenly.

Nukuhiva: Tapuaooa, altitude 3100 feet, November 11, 1929, type male. Mumford and Adamson.

Three immature females taken at Ooumu, Nukuhiva, altitude 3200 feet, May 28, 1931, and 4050 feet, November 12, 1929, show that the cephalic tibiae are similar dorsad and the pronotum is greatly produced caudad. The ovipositor is much as in *F. marmorata*, the coloration as dark in two and only slightly paler in one and very similar to that species. The caudal femora ventrad and caudal tibiae dorsad are unarmed, indicating that the minute teeth there found in the male type either appear only in adults or are developed only in the male sex of this extraordinary species, unless these immatures represent a distinct species, which we believe is improbable.

This light brown, not strikingly marked insect, represents one of the most distinctive new species we have ever encountered. Though a conocephalid,

the form of the pronotum, contour of dorsal surfaces of the cephalic tibiae, and thickly serrulate ventro-external margins of the caudal tibiae constitute features of very unusual specialization.

#### LISTROCELINAE

##### **Xiphidiopsis lita** Hebard.

Nukuhiva: Tovii [Toovii], altitude 2500 feet, August 4, 1931, 1 female, 9 juvenile females.

Tahuata: Hanamenino Valley, altitude sea level to 30 feet, July 17, 1930, 1 female, 1 juvenile female and 1 juvenile, possibly a male; Vaitahu Valley, altitude 90 feet, June 2, 1930, on cotton, *Gossypium* species, 1 juvenile female.

Of the thirty-six specimens of this species we have seen from Hawaii, the Marquesas and Tahiti, all, except possibly one, are females. The species is evidently parthenogenetic throughout Oceania as Swezey<sup>5</sup> has shown it to be in Hawaii.

It is probable that, though the genus is very large, this is the only species of *Xiphidiopsis* which occurs in Oceania.

##### **Phisis marquesana**, new species.

General coloration very light green. Males with node in anal field of tegmina usually purplish pink, other veins in stridulating area and narrow margin for a brief distance caudad very pale brown. Ovipositor buffy with margins, suture and apex. Prout's brown.

The series shows little size variation. Length of body, male 16.5 mm., female 15.4 mm.; length of pronotum, male 3.8 mm., female 3.8 mm.; greatest width of pronotum, male 2.7 mm., female 2.7 mm.; length of tegmen, male 24.7 mm., female 25.3 mm.; greatest (meso-distal) width of tegmen, male 2.8 mm., female 2.9 mm.; length of longest cephalic tibial spine, male 2 mm., female 2 mm.; length of cephalic femur, male 6.8 mm., female 7 mm.; length of caudal femur, male 12.2 mm., female 12.8 mm.; length of ovipositor, 10.7 (paratype 10.4) mm.

#### Male

Size medium, form slender, normal for the genus. Vertex very slender, feebly ascendant to the sharply rounded apex, medio-longitudinally finely sulcate. Palpi very elongate, last joint decidedly longer than fourth, very weakly sigmoid, moderately enlarged in distal two-fifths with dorsal surface concave in distal third. Pronotum with disk showing distinct sulci, briefly produced metanotum ascending caudad with cingulate caudal margin very broadly rounded obtuse-angulate emarginate, lateral lobes elongate, ventro-cephalic angle more sharply rounded than ventro-caudal angle, humeral sinus weak but distinct. Tegmina and wings fully developed, the former with a moderate convexity in anal field, stridulating veins well developed. Prosternum bispinose, mesosternum binodose, metasternum with rounded angles moderately projecting latero-cephalad. Cerci elongate, slender, curving broadly with apices overlapping, proximal section moderately thickened without an internal spine, other portions cylindrical. Ultimate

<sup>5</sup> Swezey, O. H., Parthenogenesis in a Phasgonurid, *Xiphidiopsis lita*, in Hawaii: Haw. Ent. Soc., Proc., vol. 7, p. 279, 1929.

tergite bilobate, fusing with supra-anal plate which is large, lamellate and horizontally produced, its sides distinctly divergent to the small rounded disto-lateral projections, the broad distal margin between weakly and broadly bilobate. Vertical plates on each side of supra-anal plate terminating ventro-mesad in a flattened finger directed ventrad and a similar finger of half its size just before it which is also directed ventrad. Subgenital plate large, the lateral margins convex, then briefly concave before short latero-caudal projections, the latter each surmounted by a small socketed style; distal margin broadly angulato-concave between these. Cephalic coxae with a minute dorsal spine. Median trochanters unarmed. Femoral genicular lobes with a single acute production. Cephalic femora with four internal and five external elongate and moderately curved ventral spines. Median femora with three smaller ventro-external and one or two much smaller ventro-internal spines, the latter followed, as in *P. pallida*, by very minute denticles. Caudal femora with very small ventral spines (two to five internal, seven to eleven external). Cephalic tibiae with auditory foramina inflated conchate, the large oval openings situated ventro-cephalad; armed ventrad with seven pairs of very elongate slender moderately curved spines which decrease in length distad and a pair of minute apical spines. Median tibiae unarmed dorsad, ventrad armed with the same number of much smaller spines. Caudal tibiae armed with numerous very small dorsal and less numerous larger ventral spines, and three pairs of small distal spurs.

#### Female

Agrees closely with type, differing as follows: pronotal metazona less ascendant caudad with caudal margin showing even less emargination, humeral sinus very weak. Ovipositor moderately elongate, curved moderately dorsad, slightly widest meso-distad, margins very finely serrulate distad to the acute apex. Subgenital plate moderately elongate, lateral margins concave convergent to the truncate apex in allotype, but paratypes show shallow emargination, much as in the larger Moluccan species recorded by us as *pectinata* in 1922,<sup>6</sup> described as *P. hebardii* by Karny in 1931.

Fourteen specimens examined—5 males, 2 females, and 7 immature individuals.

Eiao: altitude 20 to 50 feet, April 24, 1931 (one male at light), 2 males, paratypes.

Nukuhiva: Muake, altitude 2500 feet, August 3, 1931, on *Metrosideros collina*, 1 large juvenile male.

Uahuka: Hane Valley, altitude 30 feet, at light, February 23, 1931, type male, altitude 150 feet, March 15, 1931, at light, allotype female, LeBronnec and Tauraa; Vaipae Valley, sea level, March 18, 1931, female at light, 1 female, paratype, 1 juvenile female.

Tahuata: Amatea, altitude 2000 feet, July 7, 1930, 1 male, paratype; Vaitahu Valley, sea shore, July 5, 1930, 1 male, paratype, 1 juvenile male; Hanateio Valley, altitude 1650 feet, July 25, 1930, 1 large juvenile male, 2 small juveniles; Hanamenino Valley, sea level, July 17, 1930, 1 juvenile female.

This species is extremely close to *P. pallida* (Walker), differing in that the male cerci lacks a proximo-internal tooth, the male supra-anal plate expands more decidedly distad with latero-caudal angles roundly projecting and distal margin broadly bilobate, in that the vertical adjacent plates ter-

<sup>6</sup> Hebard, Morgan, Studies in Malayan, Melanesian and Australian Tettigoniidae (Orthoptera): Acad. Nat. Sci. Phila., Proc., vol. 74, p. 266, 1922.

minate ventro-cephalad in two large tooth-like projections, and the female subgenital plate has the apex not broad but definitely concave-truncate.

Chopard in 1929 figured and distinguished *P. pallida* from *P. pectinata*. The former species is known from Samoa and Vavau Island just north of Tonga. It appears very probable that *pallida* also occurs in Fiji. Redtenbacher's *rapax* may be a synonym, though if that is the case, an error in counting the spines of the cephalic femora apparently occurred, as in all but that specimen (including Caudell's Fijian specimens recorded as *rapax*) the count is five external and four internal spines.

#### GRYLLIDAE

#### GRYLLINAE

#### **Gryllus oceanicus** LeGuillou.

Eiao: altitude 1200 feet, October 1, 1929, 6 juveniles, 1800 feet, April 22, 1931, 3 males, 2 females; above Vaituha, altitude 1200 feet, at light, October 3, 1929, 1 juvenile.

Nukuhiva: Taiohae, November 26, 1929, 2 males, 6 females.

Uahuka; Hanatea Valley, altitude 100 feet, March 3 and 11, 1931, 9 males, 8 females, 14 juveniles; Penau Ridge, altitude 1600 feet, February 26, 1931, 3 males, 8 juveniles; Teivipuhipuhi, Vaikivi Valley, altitude 1250 feet, March 6, 1931, 2 juveniles; Hanahoua Valley, altitude 150 feet, March 10, 1931, 1 female; Matukuoha, Hane Valley, February 26, 1931, 1 juvenile; Vaitiake, altitude 1000 feet, March 24, 1931, 1 male, 2 females; Teuacai, altitude 350 feet, March 19, 1931, 1 male, 1 female; Hanatea Valley, altitude 100 feet, March 2, 1931, under stone, 1 teneral female; Hane Valley, altitude 150 feet, March 15, 1931, 1 male.

Uapou: Ouhaupakea, altitude 500 feet, December 17, 1929, 1 male, 2 females; Hapava, altitude 500 feet, December 13, 1929, 1 male, 2 females.

Hivaoa: Atuona, sea level, July 12, 1929, 9 males, 6 females, 1 juvenile; Vaitumata, sea level, July 12, 1929, 4 males, 5 females, 1 juvenile; Mount Tapeata, altitude 2500 feet, May 25, 1929, 1 juvenile.

Tabuata: Vaitahu Valley, sea shore, June 10 to 12, 1930, 9 males, 11 females, 19 juveniles; Hanatetena Valley, altitude 350 feet, July 28, 1930, 1 male, 1 female, 1 juvenile.

Mohotani: altitude 1400 feet, February 1 and 2, 1931, 2 males, 2 females.

Fatuhiva: Teatapu, altitude 1400 feet, August 19, 1930, 3 males, 1 female, 4 juveniles.

This common species, for which the type locality is the island of Nukuhiva, is very widespread in Oceania and is also known from Japan and Malaysia.



**Grylloides sigillatus** (Walker).

Fatuhiva: altitude 860 feet, November 19, 1930, on *Morinda citrifolia*, 4 juveniles.

Uahuka: Teuacai, altitude 350 feet, March 19, 1931, 3 males.

Uapou: Ouhaupakea, altitude 500 feet, December 17, 1929, under horse manure, 1 male; Hapava, altitude 500 feet, December 13, 1929, 3 males, 7 juveniles.

Hatutu [Hatutaa]: altitude 700 feet, June 28, 1931, under stones, 3 males, 7 females, 2 juveniles.

Tahuata: Vaitahu Valley, July 12, 1930, sea shore, 1 female.

Mohotani: altitude 200 feet, February 4, 1931, 2 males, 3 females, 1 juvenile.

This series is very strikingly intensive in coloration when compared with material before us from the West Indies, Mexico, Costa Rica, Panama, and India. In fact only a few specimens are as weakly marked as these in the darkest individuals of that large series.

In most Marquesan material the general coloration is very dark, the pronotum with pale markings obliterated except for a narrow meso-caudal transverse band which, in a few of the darkest specimens, is almost obliterated. We noted color intensification in a Hawaiian adult and this condition appears to be much more decided in Oceania than elsewhere in the very wide distribution of the species. The present series also averages small for the species.

This insect has probably been distributed by commerce. It is also known from French Guiana, Nossi Bé, Mauritius, and Australia.

## TRIGONIDIINAE

## Genus METIOCHE Stål

A large series of the genotype, *M. vittaticollis* (Stål) from the Philippines, in the author's collection, shows that individuals with caudate tegmina and wings or with caudate tegmina alone have the tegmina delicate and not coriaceous and the cephalic tibiae with auditory foramina present on both faces, but individuals with abbreviate tegmina and no wings have the tegmina more convex, moderately coriaceous, and the cephalic tibiae without auditory foramina.

As a result, our *Litogryllus*,<sup>7</sup> described in 1926, with genotype *flavipes* (Saussure) falls as a synonym, as has been indicated by Chopard.<sup>8</sup> We do

<sup>7</sup> Hebard, Morgan, Dermaptera and Orthoptera: B. P. Bishop Mus., Bull. 31, p. 86, 1926.

<sup>8</sup> Chopard, L., Results of Dr. E. Mjöberg's Swedish Scientific Expeditions to Australia, 1910-1913: Arkiv. zool. 18A, no. 6, p. 32, 1925.

Chopard, L., Orthoptera: Ins. of Samoa, pt. 1, fasc. 2, p. 39, 1926.



not agree, however, with Chopard that names can here be used with propriety for either macropterous or micropterous conditions or for color phases. Moreover we do not believe that *flavipes* can be considered conspecific with *vittaticollis*, though it is undoubtedly closely related and both species show very great individual variation.

From Philippine material of *Rhynchogryllus fascipes* Chopard, described in 1925, we are further able to state that we believe that monotypic genus to be distinct from *Metioche*, though *Trigonidium tahitense* Saussure is referable to *Metioche* and not to *Rhynchogryllus* as was indicated by Chopard in 1930. Though the tegminal veins in *tahitensis* are normally much heavier than in *flavipes*, these species are uncomfortably close in agreement in all but size and length of ovipositor, and possibly do not share certain of the many color phases developed.

### **Metioche tahitensis** (Saussure).

Were the species of this genus not known to be so exceedingly variable, the six specimens here recorded might easily have been thought to represent three distinct species, differing as follows:

A. Head, proximal antennal joints, pronotum, tegmina, and abdomen black. Ocellar region of the head and in one specimen sides of pronotal disk dull deep purplish. Lateral lobes of pronotum with very narrow buffy ventral margins. Dorsal veins of tegmina heavy and bright yellow. Antennae and limbs testaceous.

B. Similar but proximal antennal joints testaceous. Sides of pronotal disk broadly testaceous with a purplish tinge. Lateral lobes of pronotum with broadly buff ventral margins. Tegmina buffy but infumate, with dorsal veins delicate and buffy.

C. Testaceous with head and pronotum fawn color. Dorsal veins of tegmina heavy.

Hivaoa: Kopaafoa, altitude 2770 feet, August 2, 1929, 1 female (A); Matauuna, altitude 3760 feet, August 1, 1929, 1 male, 3 females (male A, 2 females B, 1 female C); Mounaofefe, altitude 2000 feet, August 3, 1929, on *Premna tahitensis*, 1 female (A).

This species is known only from Tahiti and the Marquesas.

We distinguish this insect from *flavipes* by its larger size, longer and less decidedly curved ovipositor, and usually heavier and more evenly longitudinal dorsal tegminal veins.

### **Metioche flavipes** (Saussure).

Eiao: altitude 1600 and 1800 feet, April 22 and 24, 1931, on *Sida* species, 11 males, 5 females, 3 juveniles (generally buffy, head with a blackish band from interantennal protuberance to clypeal suture and one on each side from eye to clypeal suture, pronotum sometimes with two broad adjacent bands of brown on disk and a brown band on lateral lobes, tegmina often darkened with veins pale); Vaituha, 1200 feet, October 3, 1929, at light, 1 male, 1 female, very similar.

Hatutu [Hatutaa]: altitude 700 to 1500 feet, September 30, 1929, and

April 28, 1931, one on *Ageratum conyzoides*, 4 males, 4 females, very similar, two on *Canthium barbatum*.

Uahuka: Putatauaa, Vaipae Valley, altitude 880 feet, September 20, 1929, 1 male, 1 female (head without markings, female buff, head and pronotum purplish, male head and pronotum darker, tegmina blackish with buff veins); Hitikau Ridge, altitude 2700 feet, March 3, 1931, 1 male, 2 females (much like last male, one female with limbs purplish).

Hivaoa: Tahatuku, July 10, 1929, 2 males, 1 female (pair buff, one male darker, all with occiput and pronotum marked with brown, face immaculate).

Tahuata: Amatea, altitude 2700 feet, July 7, 1930, on *Weinmannia* species, 1 female (black, antennae beyond second joint, palpi and limbs alone buff).

Fatuhiva: Teaveipuhiau, altitude 2150 feet, August 25, 1930, on *Paspalum conjugatum*, 2 males, 1 female (one male with face, proximal antennal joints, pronotal lateral lobes and tegminal lateral fields black, occiput purplish brown, disk of pronotum same with pale lateral margins, dorsal fields of tegmina brown with slightly paler veins, antennae palpi and limbs buffy, the caudal femora with a medio-longitudinal suffusion of brown in proximal portion; pair similar but less recessive, face marked as in Eiao series, pale lateral margins of pronotal disk very broad, dorsal fields of tegmina buffy, female with longitudinal suffusion of caudal femora broad and percurrent); Vairokoao, Omoa [Oomoa] Valley, altitude 1500 to 1600 feet, August 29 and 30, 1930, 1 male, 1 female (male teneral, uniform pale buff, female much like recessive Teaveipuhiau male, but disk of pronotum without pale lateral margins and tegminal veins all dark).

## MOGOPLISTINAE

### Genus *CYCLOPTILUM* Scudder

Material representing a fully sufficient series of species referable to *Cycloptilum* proves that degree of curvature of the caudal margin of the male pronotum can not be used as a generic character. Chopard distinguished *Liphoplus* Saussure, described in 1877, from *Cycloptilum* Scudder, described in 1869, by that character alone.<sup>9</sup> We can find no other characters by which these genera can be separated, and therefore place *Liphoplus* in the present synonymy.

#### *Cycloptilum novarae* (Saussure).

Nukuhiva: Vaiotekea, altitude 2200 feet, August 6, 1931, from *Metrosideros collina*, 1 very small juvenile.

Uahuka: Putatauaa, Vaipae Valley, altitude 880 feet, September 20,

<sup>9</sup> Chopard, L., Orthoptera: Ins. of Samoa, pt. 1, fasc. 2, p. 35, 1929.

1929, 1 very small juvenile; Vaikivi Valley, altitude 1300 feet, March 6, 1931, 1 juvenile male; Teivipuhipuhi, Vaikivi Valley, altitude 1250 feet, March 6, 1931, 1 very small juvenile; Tauheeputa, altitude 1770 feet, March 23, 1931, on *Glochidion ramiflorum*, 2 very small juveniles; Vaitiake, altitude 1000 feet, March 24, 1931, 1 juvenile male, 1 very small juvenile.

Uapou: Hakahetau Valley, altitude 500 feet, December 27, 1928, 5 very small juveniles.

Hivaoa: Teava Uhia i te Kohu, altitude 2100 feet, February 15, 1930, on *Paspalum conjugatum*, 1 male.

Tahuata: Tehue Valley, altitude 800 feet, May 27, 1930, 1 juvenile male, 1 very small juvenile; Hanatuuna Valley, altitude 325 feet, July 19, 1930, 1 small juvenile; Faanui, altitude 1500 feet, June 12, 1930, 1 juvenile female; Vaitahu, altitude 90 feet, June 2, 1930, on cotton, *Gossypium* species, 1 male.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1600 feet, August 27, 1930, 1 female, 1 juvenile female; Teaotu, Hanavave Valley, altitude 700 feet, September 9, 1930, on *Eugenia* species, 2 very small juveniles; Tevaitapu Valley, altitude 300 feet, August 23, 1930, 1 very small juvenile; Uia [Ouia] Valley, altitude 100 feet, September 1 and 2, 1930, 2 females, 5 small juveniles; Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, from *P. conjugatum*, 1 juvenile female; Punahitahi, Omoa [Oomoa] Valley, altitude 650 feet, August 18, 1930, 1 juvenile female, 2 very small juveniles; Tetana, Omoa [Oomoa] Valley, altitude 500 feet, August 22, 1930, 1 juvenile male, 1 juvenile female, 6 very small juveniles.

Mohotani: above Anaoa, August 13, 1929, 1 male, 2 very small juveniles.

This species is also known from Tahiti, Samoa, Tonga, and Fiji and is apparently peculiar to Oceania.

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References to the numerous revisions and monographs in which appeared the original descriptions of a large proportion of the species of Dermaptera and Orthoptera occurring in Oceania are not given.

# A NEW SPECIES OF PONERA AND OTHER RECORDS OF ANTS FROM THE MARQUESAS ISLANDS \*

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In a previous paper<sup>1</sup> on a collection of ants taken by the Pacific Entomological Survey in the Marquesas Islands I reported upon 28 different forms, 13 of which had not been recorded hitherto from the Marquesas or the Society Islands.<sup>2</sup> Since then I have received from the Entomological Survey further collections including what I take to be a new species of *Ponera* and two other species of ant not previously recorded from the Marquesas. I am including with these further records of distribution of some of the commoner forms throughout the Marquesas.

## FAMILY FORMICIDAE

### SUBFAMILY PONERINAE

#### ***Ponera perkinsi* Forel.**

Mohotani: altitude 1000 feet, in dead *Pisonia* species, ♀ ♀ ♂, LeBronnec and H. Tauraa.

#### ***Ponera mumfordi*, new species.**

##### Worker

Length, 2 mm. Head of the usual shape, nearly one-fourth longer than broad, distinctly narrowed anteriorly, with slightly convex sides and feebly and broadly excised posterior border. Mandibles with 3 or 4 larger apical, and several minute, irregular basal teeth. Clypeus short, convex and subcarinate in the middle, depressed at the sides, its anterior border indistinctly bisinuate. Frontal carinae forming the usual flattened, approximated lobes; frontal groove very distinct, extending as a straight, uniformly impressed line nearly to the posterior border of the head. Eyes minute, consisting of only 3 or 4 indistinct facets, situated at the anterior fifth of the sides. Antennae stout; scapes not reaching the posterior border; first funicular joint as long as 2-6 together; joints 2-7 small and strongly transverse; remaining joints enlarged to form a club; 8-10 broader than long, the terminal joint nearly twice as long as broad. All the thoracic sutures, including the mesoepinotal well-developed. Pronotum and mesonotum in profile feebly and evenly convex. There is a distinct notch-like impression at the mesoepinotal suture as in *P. mocsaryi* Emery. Mesonotum from above transversely elliptical, slightly more than half as long as the pronotum without the neck. Epinotum in profile forming a

<sup>1</sup> Wheeler, W. M., Ants of the Marquesas Islands: B. P. Bishop Mus., Bull. 98, pp. 155-163, 1932.

<sup>2</sup> Wheeler, W. M., Ants from the Society Islands: B. P. Bishop Mus., Bull. 113, pp. 13-19, 1932.

\* Pacific Entomological Survey Publication 7, article 9. Issued August 30, 1933.



distinct obtuse angle, the base straight and horizontal, the declivity of the same length, sloping and very slightly concave below. Petiole from above transversely elliptical, somewhat broader than the epinotum, in profile twice as high as long and as high as the epinotum; the scale distinctly narrower above than below, with flattened anterior and posterior surfaces and horizontal dorsal surface; ventral surface of petiole with a prominent, laterally compressed projection which is semicircularly rounded anteriorly. Postpetiole rather distinctly marked off from the first gastric segment, trapezoidal, broader than long, sharply and rectangularly truncated anteriorly, with a minute, acute, anteroventral tooth. First gastric segment of the same length as the postpetiole but broader.

Shining; antennae and dorsal surface of head somewhat less so than the remainder of the body; mandibles very smooth and shining, with minute, sparse, piligerous punctures. Head, clypeus, and scapes finely, densely and distinctly, remainder of body and appendages more indistinctly and superficially punctate.

Hairs and pubescence white, the former few and sparse, visible only on the mandibles, clypeus, and tip of gaster; frontal carinae abundantly ciliate. Body and appendages covered with rather dense, slightly oblique pubescence, so that the surface has a pruinose appearance.

Brownish yellow; mandibles, antennae, and legs slightly paler yellow; dorsal surface of head, pronotum and mesonotum and median portions of gastric segments brown.

Uapou: Kohepu [Tekohepu] summit, altitude 3000 feet, November 30, 1931, 5 specimens, LeBronnec.

This species resembles the Papuan *P. mocsaryi* Emery in the distinct mesoepinotal impression, but it is smaller, the eyes consist of fewer facets, and the antennal clubs are much stouter. In this character and in size it is more like *P. pallidula* Emery, though obviously distinct.

#### SUBFAMILY MYRMICINAE

##### ***Pheidole megacephala* (Fabricius).**

Hivaoa: Kakahopuanui, Kaava Ridge, altitude 2600-2800 feet, 2 ♂ ♂, LeBronnec; Kaava Ridge, altitude 2800-2820 feet, 2 ♀ ♀, LeBronnec; Anatuakina, altitude 1525 feet, 2, Mumford and Adamson; Tenatinaei, Feani Ridge, altitude 3990 feet, ♀, LeBronnec; Feani Crest, altitude 3900 feet, 2 ♀ ♀, LeBronnec; Avaoa Valley, altitude 1350 feet, ♀ ♀, LeBronnec; Mount Temetiu, altitude 3900-4160 feet, 2 ♀ ♀, LeBronnec.

Nukuhiva: Vaiotekea, altitude 2100 feet, 2 ♀ ♀, LeBronnec and H. Tauraa; Muake, north side, altitude 2500-3000 feet, 2 ♀ ♀, LeBronnec and H. Tauraa; Tapuaooa Hill, altitude 2600-3500 feet, 2 ♀ ♀, LeBronnec and H. Tauraa; Ooumu, altitude 3000 feet, 2 ♀ ♀, LeBronnec and H. Tauraa; Vaihakameama, altitude 2600 feet, 2, LeBronnec and H. Tauraa.

Uapou: Vaihakaatiki, Hakahetau Valley, altitude 2500 feet, 2 ♀ ♀, LeBronnec; Kohepu [Tekohepu], summit, altitude 3000 feet, 2 ♀ ♀, LeBronnec; Hakahetau Valley, ♀, Adamson; Koputukea, Hakahetau Valley, 2 ♀ ♀, Le-

Bronnec; Kohepu [Tekohepu], summit, altitude 3300 feet, ♀, LeBronnec; Vaikokoo, Paaumea Valley, altitude 1850 feet, ♀ ♀ ♂, LeBronnec.

Eiao: altitude 1600 feet, ♀, LeBronnec and H. Tauraa.

**Pheidole oceanica** Mayr subspecies **nigriscapa** Santschi variety **tahitiana** Santschi.

A single soldier from Atuona, Hivaoa (A. M. Adamson), belongs to this variety, which has not been previously recorded from the Marquesas.

**Monomorium floricola** (Jerdon.)

Uahuka: Tauheeputa, altitude 1770 feet, ♀, on *Sida* species.

Eiao: altitude 1700 feet, ♀, on *Premna tahitensis*.

Hatutu [Hatutaa]: altitude 15 feet, ♀, LeBronnec and H. Tauraa.

This ant has not been previously recorded from the Marquesas.

**Cardiocondyla nuda** Mayr subspecies **neréis** Wheeler.

Uahuka: Matukuoha [Matuukuoha] Pass, altitude 1550 feet, ♀, LeBronnec and H. Tauraa; Haavei Valley, altitude 250 feet, ♀, LeBronnec and H. Tauraa; Tahoahitikau, altitude 780 feet, ♀, LeBronnec and H. Tauraa; Tauheeputa, altitude 1770 feet, ♀, on *Sida* species, LeBronnec and H. Tauraa.

Eiao: altitude 1700 feet, ♀, LeBronnec and H. Tauraa.

**Tetramorium guineense** (Fabricius).

Uahuka: Hanahoua Valley, altitude 30 feet, ♀, on *Rhynchosia minima*, LeBronnec and H. Tauraa.

Eiao: altitude 800-1700 feet, ♀ ♀, LeBronnec and H. Tauraa.

Hatutu [Hatutaa]: altitude 1400 feet, ♀ ♀ ♂, in *Pisonia* species, LeBronnec and H. Tauraa.

**Tetramorium simillimum** (F. Smith).

Uahuka: Hitikau, altitude 2900 feet, ♀, LeBronnec and H. Tauraa; Hanahoua, altitude 750 feet, ♀, LeBronnec and H. Tauraa.

Eiao: altitude 1600 feet, ♀ ♀, LeBronnec and H. Tauraa.

#### SUBFAMILY DOLICHODERINAE

**Tapinoma (Micromyrma) melanocephalum** (Fabricius) variety **australe** Santschi.

Uahuka: Hanahoua Valley, ♀, LeBronnec and H. Tauraa.

Eiao: altitude 1600 and 1700 feet, ♀ ♀, in *Thespesia populnea*, ♀ in *Premna tahitensis*, LeBronnec and H. Tauraa.

**Technomyrmex albipes** (F. Smith).

Hivaoa: Kakahopuanui, altitude 2600 feet, ♀ ♂, on *Hibiscus tiliaceus*, LeBronnec.

Uahuka: Penau Ridge, altitude 2000 feet, ♀ ♂, at light and ♂ on *Weinmannia* species, LeBronnec and H. Tauraa; Hitikau Ridge, altitude 2500 feet, ♂, in sweepings, LeBronnec and H. Tauraa; Teivipuhupuhi, Vaikivi Valley, altitude 1250 feet, ♂ on *Metrosideros collina*, LeBronnec and H. Tauraa; Hane Valley, altitude 150 feet, at light, LeBronnec and H. Tauraa.

#### SUBFAMILY FORMICINAE

##### **Anoplolepis longipes** (Jerdon).

Tahuata: Hanamiai Valley, altitude 500 feet, ♀, LeBronnec and H. Tauraa.

Nukuhiva: Taiohae, sea level, at light, ♀, LeBronnec and H. Tauraa.

Mohotani: altitude 700 feet, ♀ ♀, in *Pandanus* species, LeBronnec and H. Tauraa.

Uahuka: Hanahoua Valley, altitude 750 feet, ♀, LeBronnec and H. Tauraa; Vaikivi Valley, altitude 1300 feet, ♀, LeBronnec and H. Tauraa; Hanatekeo, Hane Valley, altitude 750 feet, ♀, LeBronnec; Vaitiake, altitude 1000 feet, ♀, LeBronnec and H. Tauraa.

Eiao: altitude 1400-1700 feet, ♀ ♀, LeBronnec and H. Tauraa; Plateau above Vaituha, altitude 1150 feet, ♀, Adamson.

##### **Paratrechina (Nylanderia) vaga** (Forel) variety **crassipilis** Santschi.

Uahuka: Penau Ridge, altitude 2010 feet, ♀, on *Weinmannia* species, LeBronnec and H. Tauraa.

Uapou: Teavaituhai, Hakahetau Valley, altitude 3000 feet, ♀, LeBronnec.

##### **Paratrechina (Nylanderia) bourbonica** (Forel) subspecies **bengalensis** (Forel).

Tahuata: Vaitahu, seashore, LeBronnec and H. Tauraa.

Uahuka: Hanahoua Valley, altitude 6 feet, ♀, LeBronnec and H. Tauraa; Hane Valley, altitude 30 feet, ♀, at light, LeBronnec and H. Tauraa.

# MARQUESAN TERRESTRIAL ISOPODA \*

By

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## INTRODUCTION

The collection of terrestrial isopods made by the Pacific Entomological Survey so far examined by me is of particular interest, as, up to the present, no species of woodlouse has been recorded from the Marquesas or Society Islands. Exploration of the Polynesian groups cannot be said to have more than commenced, although certain areas relevant to the present investigation have received some attention. One would particularly mention the important monograph by Verhoeff <sup>1</sup> on forms from New Caledonia and the Loyalty Islands. Stebbing <sup>2</sup> has reported on a collection from New Britain, New Guinea, and the Loyalty Islands; I have studied a small collection from the Samoan Islands <sup>3</sup>; and there are sporadic records by Dana <sup>4</sup> and Budde-Lund <sup>5</sup> from other localities.

Further afield, but still of interest regarding the fauna of these islands, is the work of Wahrberg <sup>6</sup> on Australia, Chilton on New Zealand and the Kermadec Islands, and numerous authors on the Dutch East Indies and Malay Peninsula.

The present collection from the Marquesas and Society Islands contains the following species, all, of course, new records for the locality, and five of them new: *Ligia vitiensis* Dana, *Philoscia (Setaphora) truncata* Dollfus, *Philoscia (Setaphora) fasciata*, new species, *Alloniscus oahuensis* Budde-Lund, *Porcellionides pruinus* (Brandt), *Porcellio (Mesoporcellio) laevis* Latreille, *Porcellio (Heminagara) tahitiensis*, new subgenus, new species, *Spherillo (Spherillo) montivagus* Budde-Lund, *Spherillo (Spherillo) testudinalis* Budde-Lund, *Spherillo (Spherillo) pygmaeus* Verhoeff, *Spherillo (Xestodillo) marquesarum*, new species, *Cubaris murinus* Brandt, *Echinodillo montanum*, new genus, new species, and *Tridentodillo squamosus*, new genus, new species.

All of the above were collected in the Marquesas, with the single excep-

<sup>1</sup> Verhoeff, K. W., *Isopoda terrestria von Neukaledonien und den Loyalty-inseln*: Sarasin und Roux, *Nova Caled. Zool.*, vol. 4, pt. 2, 1926.

<sup>2</sup> Stebbing, T. R. R., *Crustacea*: Willey's *Zool. Results*, pt. 5, 1900.

<sup>3</sup> Jackson, H. G., *Isopoda Terrestria*: *Insects of Samoa*, pt. 8, fasc. 1, 1927.

<sup>4</sup> Dana, J. D., *Crustacea*, U. S. Expl. Exp., vol. 13, pt. 2, 1852.

<sup>5</sup> Budde-Lund, G., *Crustacea Isopoda Terrestria*, Copenhagen, 1885; *Isopoda von Madagaskar und Ostafrika* . . . : Voeltzkow, *Reise in Ostafrika in den Jahren 1903-1905*, Bd. 2, 1908.

<sup>6</sup> Wahrberg, R., *Terrestrische Isopoden aus Australien*: *Arkiv. f. Zool.*, Bd. 15, no. 1, 1922.

\* Pacific Entomological Survey Publication 7, article 10. Issued September 15, 1933.

tion of *Porcellio (Heminagara) tahitiensis*, which was found only in 'Tahiti. The 'Tahitian collection, which will form the subject of a separate report, contained five species: *Spherillo montivagus*, *S. marquesarum*, *Cubaris murinus*, *Porcellio tahitiensis*, and *Philoscia fasciata*.

I would like to express my appreciation of the kindness of Mr. E. P. Mumford, the Director of the Pacific Entomological Survey, in allowing me to report on this most interesting collection, and to Mr. R. B. Brook-Greaves for his most able assistance in the preparation of the figures illustrating this paper.

#### DISTRIBUTION

The specimens recorded above occurred among the Marquesas Islands as is shown in the following table. The known distribution of the species is given after the name. Of these species, four are new: *Tridentodillo squamosus*, *Philoscia (Setaphora) fasciata*, *Echinodillo montanum* and *Spherillo marquesarum*.

##### Eiao

<i>Ligia vitiensis</i>	Fiji, British New Guinea
<i>Cubaris murinus</i>	Pacific
<i>Porcellionides pruinosus</i>	Cosmopolitan

##### Nukuhiva

<i>Spherillo testudinalis</i>	Asiatic and Australian Islands, Samoa
<i>Spherillo pygmaeus</i>	New Caledonia
<i>Cubaris murinus</i>	Pacific, etc.
<i>Tridentodillo squamosus</i>	Marquesas
<i>Porcellio laevis</i>	Cosmopolitan
<i>Porcellionides pruinosus</i>	Cosmopolitan
<i>Philoscia (Setaphora) fasciata</i>	Marquesas and Society Islands
<i>Philoscia (Setaphora) truncata</i>	Celebes, Formosa, Hongkong, Japan, New Britain, Shanghai, Sunda Islands

##### Uahuka

<i>Spherillo montivagus</i>	Australia, Samoa
<i>Cubaris murinus</i>	Pacific
<i>Echinodillo montanum</i>	Marquesas
<i>Alloniscus oahuensis</i>	"Indes," Comoro Island, Samoa
<i>Philoscia (Setaphora) fasciata</i>	Marquesas and Society Islands

##### Uapou

<i>Cubaris murinus</i>	Pacific
<i>Spherillo montivagus</i>	Australia, Samoa
<i>Spherillo marquesarum</i>	Marquesas and Society Islands
<i>Philoscia (Setaphora) truncata</i>	Celebes, Formosa, Hongkong, Japan, New Britain, Shanghai, Sunda Islands

##### Hivaoa

<i>Spherillo montivagus</i>	Australia, Samoa
<i>Cubaris murinus</i>	Pacific
<i>Porcellionides pruinosus</i>	Cosmopolitan
<i>Alloniscus oahuensis</i>	"Indes," Comoro Island, Samoa
<i>Philoscia (Setaphora) fasciata</i>	Marquesas and Society Islands



Tahuata		
	<i>Philoscia</i> ( <i>Setaphora</i> ) <i>fasciata</i>	Marquesas and Society Islands
Mohotani		
	<i>Cubaris murinus</i>	Pacific
	<i>Porcellionides pruinosus</i>	Cosmopolitan
	<i>Alloniscus oahuensis</i>	"Indes," Comoro Island, Samoa
Fatuhiva		
	<i>Philoscia</i> ( <i>Setaphora</i> ) <i>truncata</i>	Celebes, Formosa, Hongkong, Japan, New Britain, Shanghai, Sunda Islands
	<i>Philoscia</i> ( <i>Setaphora</i> ) <i>fasciata</i>	Marquesas and Society Islands
	<i>Cubaris murinus</i>	Pacific
Fatuuku		
	<i>Porcellionides pruinosus</i>	Cosmopolitan

It will be noted that such forms as are not peculiar to the Marquesas Islands or of universal distribution are related to the islands lying to the west of this group; no one is also found in the Hawaiian Islands. The species recorded vary greatly in abundance. In the nine islands on which collections were taken, *Cubaris murinus* occurred in 7 islands, *Philoscia fasciata* in 5 islands, *Spherillo montivagus* in 3 islands, *Porcellionides pruinosus* in 5 islands, *Alloniscus oahuensis* in 3 islands, *Spherillo marquesarum* in 1 island, *Philoscia truncata* in 3 islands, the remainder in one island each.

The ubiquitous *Porcellionides pruinosus* is thus the only non-Pacific form to be generally distributed; the remainder of the commoner forms are peculiar to Polynesia. *Cubaris murinus*, a common form in tropical countries, was in number of individuals and wideness of distribution by far the most common, although the endemic *Philoscia fasciata* runs it close.

The distribution in height is of interest, as woodlice have been rarely recorded from such high altitudes. Of the four endemic species of the Marquesas, *Tridentodillo squamosus* occurred at 3800-4000 feet, *Echinodillo montanum* at 2900 feet, *Spherillo marquesarum* at 1800-2700 feet, and the only species which was found at low altitudes and throughout the whole range was *Philoscia fasciata* which began at 100 feet and extended to 3800 feet.

The greatest height reached by species of wide distribution was 1600 feet by *Porcellionides pruinosus*; *Cubaris murinus* also stopped at the same altitude.

*Spherillo pygmaeus* and *Spherillo testudinalis*, the former recently described from New Caledonia, the latter of wide tropical distribution, were found at the considerable elevation of 4000 feet, but not intermedially. It seems likely that this is a mere freak of collecting without significance, but it is also open to the interpretation that these species are moving towards extinction in the islands.

It is of interest to note that, with the exception of *Philoscia fasciata*, all

specimens collected above 1600 feet belong to the armadillid type of organization, and that the two grotesque spiny forms were only found at the great heights of 2900-4000 feet. Are the latter gerontic forms which have found a last refuge on the heights of these inaccessible islands?

#### NOMENCLATURE

The large number of woodlice with highly developed powers of conglobation related to the "Spherillo-Armadillo" complex which occur in any collection from the Pacific make it desirable to define the attitude an investigator of such a collection takes to the tangled nomenclature. I propose to follow Budde-Lund, Dollfus, Verhoeff, and most of the more voluminous writers on the group in using the name *Armadillo* as the generic name of the group of species whose type is *A. officinalis* Duméril and Armadillinae for the subfamily containing it.

The question of the validity of this generic name was discussed fully, but not exhaustively, by Stebbing,<sup>7</sup> and it is unnecessary to recapitulate his arguments as there can be no doubt that, by all rules of nomenclature, the name is invalid several times over. Even if Stebbing is right in his contention that it is pre-occupied by a mammal (which is more than doubtful) it was undoubtedly first clearly proposed by Cuvier in 1792 for species of millipedes which Latreille in 1802 transferred to *Glomeris*, a genus of his own creating. It has priority, therefore, as the name of a genus of millipedes and not of Crustacea, and Latreille, who sinned in renaming it, did so yet again when in 1804 he employed the name *Armadillo* for a genus of terrestrial isopods.

However, he was not allowed to keep the name in the sense in which he proposed it, as Brandt in 1833 in the first critical work of real systematic value on the Oniscoidea, created *Armadillidium*, which he defined in terms which include Latreille's *Armadillo*, and used the name *Armadillo* for a species which had first received perfunctory mention under the style *Armadillo officinalis* in a dictionary by Duméril, published in 1804, the same year as Latreille's contribution to Buffon. He seems unaware of Latreille's two species of *Armadillo* which were included by Milne Edwards in 1840 under *Armadillidium* Brandt. In the sense in which it was used by Brandt, *Armadillo* has stubbornly retained its place, in spite of the overwhelming case against it.

If we seek for a substitute we at once encounter difficulties.

Brandt set up a section Cubaridea in opposition to Armadillidea (containing *Armadillidium*) and included in it the genera *Cubaris* (type *murinus*), *Armadillo* (type-*officinarum* = *officinalis* Duméril) and *Diplocochus* (type-*echinatus*). All these are perfectly good genera today, and it seems a retro-

<sup>7</sup> Stebbing, T. R. R., Crustacea: A. Willey's Zool. Results . . . 1895, 1896, 1897, pt. 5, p. 650. 1900.

grade step to replace *Armadillo* by *Cubaris*, as some authors have done, when the two genera are indubitably distinct. If a sacrifice must be offered to priority it would be better to follow Barnard's suggestion<sup>8</sup> and use Koch's *Pentheus* (1840) for the "*officinalis*" section.<sup>9</sup>

It would be better still if the whole matter were allowed to rest and the perfectly understood genus *Armadillo* were whitewashed of its past by the international commission and its use were to be continued in the sense in which it has been used since Brandt by all the more important writers on the group. There was no confusion in the nomenclature until some modern authors began to use *Cubaris* as a synonym for *Armadillo*, which it is not, and only further confusion would be caused by resurrecting the still-born *Pentheus* and attempting to substitute it for *Armadillo*.

In this paper I have made use of the genera proposed by Verhoeff in 1926, but I am not satisfied that these are entirely satisfactory or will stand detailed scrutiny. Barnard is probably right in considering that the articulating lappets, on which the system is primarily founded, do not constitute a real guide to affinity; but it is a convenient character and easy to follow. Most of these genera seem to be carved out of Budde-Lund's composite genus *Spherillo*, but one at least falls under the *Armadillo* group with slender penicilli on the maxilla. I have below identified *Nesodillo medius* Verhoeff with *Cubaris murinus* Brandt so that *Nesodillo* must be abandoned in favor of *Cubaris*. It should also be noted that *Sphaerillo* Verhoeff = *Spherillo* Dana and Dana's spelling of the genus must take precedence.

#### FAMILY LIGIIDAE

***Ligia vitiensis*** Dana (fig. 1).

*Ligia vitiensis*, Dana, Crustacea, U. S. Expl. Exp. vol. 13, pt. 2, p. 741, 1853.

*Ligia vitiensis*, Budde-Lund, Crustacea Isopoda Terrestria, p. 271, 1885;

Stebbing, Crustacea, A. Willey's Zool. Results, pt. 5, p. 646, 1900.

*Ligia hawaiiensis*, Jackson, Zool. Soc. London, Proc., p. 696, 1922.

A number of well-preserved specimens of both sexes of a species of *Ligia* were collected by A. M. Adamson at Vaituha, Eiao, from "wet rocks at base of waterfall, 200 feet," which had a general resemblance to *Ligia hawaiiensis*. In 1922 I decided, on the specimens at my disposal, that *L. vitiensis* Dana was a synonym of *L. hawaiiensis* Dana, but on examining these specimens I am inclined to lay more stress on the points of difference than formerly and conclude that Dana was right in placing his incomplete specimen from the "Feejees" as a separate species. I withdraw, therefore, my synonymy

<sup>8</sup> Barnard, K. H., Terrestrial Isopoda: South African Museum, Ann., 30, pt. 2, 1932.

<sup>9</sup> Since the above was set up I have received from Prof. Alceste Arcangeli (Bull. di Zool. III, 3, p. 123, 1932) a detailed discussion of the question of the validity of *Armadillo* which supports the plea for the retention of the name which I have put forward here.

and reconstitute the species *L. vitiensis* as a good one. The points of difference Dana mentions are well marked in these specimens and may be tabulated, with others, as follows:

LIGIA VITIENSIS

Surface quite smooth.

Antennal flagellum (male) reaching to hind border of last thoracic tergite; 28 moderately stout segments.

Coxal plates (male) very faintly marked on all segments; (female) deep and well marked on all segments.

Abdomen not contracted; postero-lateral angles drawn back sharply.

Telson fully twice as broad as long; postero-lateral processes acute and moderately long, reaching nearly to level of accessory processes.

Uropod propus with tooth on outer distal border; endopod with long horny terminal spine.

Distribution: Fiji, New Guinea, Marquesas.

LIGIA HAWAIIENSIS

Surface minutely granular.

Reaching to hind border of third abdominal tergite; 30 long segments.

Coxal plates (male) scarcely if at all separate; (female) deep on second and third somites, but exceedingly faint on others.

Abdomen abruptly contracted; postero-lateral angles little produced.

Telson not twice as broad as long; postero-lateral processes acute but short, not nearly approaching in length level of accessory processes.

Uropod propus without tooth; endopod without horny spine.

Distribution: Hawaii.

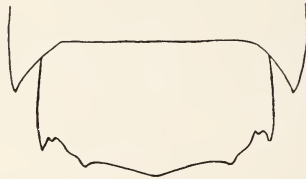


FIGURE 1. Telson of *Ligia vitiensis*.

It is of interest to note that Stebbing's specimens from British New Guinea were obtained "from face of cliff with fresh water species, far above tide mark," which agrees well with the habitat of these specimens from Vaituha, Eiao.

FAMILY ONISCIDAE

SUBFAMILY ONISCINAE

**Philoscia (Setaphora) truncata** Dollfus.

Fatuhiva: Hanavave Valley; Ihiota, altitude 410 and 450 feet, September 10, 1930; Teaotu, altitudes 100 and 1000 feet, September 9, 1930; Punahitahi, altitude 650 feet, August 18, 1930; Ahuava, altitude 1840 feet, August 19, 1930, LeBronnec.

Nukuhiva: Vaiotekea, altitude 2700 feet, 1200 feet, August 6, 1931, LeBronnec and Tauraa.



Uapou: Vaikokoo, Paaumea Valley, in log of *Hibiscus tiliaceus*, altitude 1850 feet, October 20, 1931, LeBronnec.

This species has been widely recorded from the Malay Peninsula and it is not surprising that it should be found on the islands of the Pacific. The specimens here recorded approach *S. notabilis* Herold<sup>10</sup> in the shape of the first pleopod of the male and the form of the telson, but I prefer to retain Dollfus' name as I am not satisfied that the differences are not due to the variability of the species, which was expressly remarked on by the author of the species. Herold's figure of *S. truncata baliensis* does not agree with Dollfus' original figures of his own species and the first pleopod of the male figured by Arcangeli<sup>11</sup> as belonging to *S. truncata* is intermediate between that figured by Herold for *S. truncata* and *S. notabilis*. Dollfus' description lacks many of the characters which a modern systematist would rely on, and in the circumstances I feel that the matter cannot be finally settled without a new critical examination of Dollfus' type specimens.

**Philoscia (Setaphora?) fasciata**, new species (fig. 2, a-j).

Length, male 4.5 mm., female 5.5 mm.; breadth, male 1.5 mm., female 2 mm.

Shape, elongate-oval. Surface, very smooth and shining.

Head discrete; eyes prominent but not large, 16 ocelli. Supra-antennal line well marked, sinuate between antennal sockets, probably confluent with marginal lines. Postfrons slightly convex but without tubercle. Lateral processes of clypeus narrow and long. The head is in general form typical of the genus.

Thorax. Tergites I to IV nearly transverse hind margins, remainder slightly concave. Posterolateral angles of VII nearly rectangular, not produced and scarcely exceeding second abdominal somite. Glands very weak or absent.

Abdomen. Epimera somewhat adpressed. Posterolateral angles visible from above but very weakly developed. Very abruptly contracted. Telson almost arcuate, median angle broadly rounded, sides slightly notched at base of uropod, sides free from last somite. About  $\frac{1}{3}$  length of thorax.

Appendages. Antenna very slender; flagellar segments equal, or third slightly longer, about equalling in length fifth segment, reaching to hinder border of tergite of V thoracic tergite in both male and female. Mandibles: right penicilli 1 + 1; left penicilli 1 + 2. Inferior seta slender. Maxillula: outer endite, 4 + 6 (1, 3, 4, 6 bifurcate, 2, 5 simple and slender), inner endite, minute spine, two long and bushy penicilli. Maxilla: outer lobe lamellate, bordered with exceedingly fine setae; inner lobe abrupt, moderately setose; three stout bristles between the two. Maxillipede: endite with two thornlike sessile spines on outer side of distal margin, one small spine on face, margin very minutely and sparsely setose; outer lobe of base with groups of minute setae set in rows. Pleopoda: distal border of first exopod of male slightly curved, endopod with row of small spines on outer side of point. Uropod: protopod massive and greatly exceeding telson, very shallow canal on outer border; exopod lanceolate, deeply canaliculate externally, about twice length of protopod; endopod set behind exopod, laterally compressed, reaches about halfway up exopod, but its entire length is about  $\frac{3}{4}$  exopod.

Color (in spirit). Hind border of each tergite of thorax and coxal plates dark purple brown, front of tergite yellow; above each coxal plate prominent longitudinal

<sup>10</sup> Herold, Werner, Land-Isopoden von den Sunda-Inseln: Arch. für Hydrobiologie, Suppl. Bd. ix, Bd. II, 1931.

<sup>11</sup> Arcangeli, A., Isopodi terrestri raccolti nell' Estremo Oriente: Lab. di Zool. gen. agr., Boll., vol. 20, 1927.



yellow stripe; posterolateral corners of each thoracic tergite white; first tergite of abdomen dark, second and third yellow except for narrow border of pigment; except for an incomplete median and lateral yellow stripes the remainder of the abdomen is dark. Head mottled on vertex; profrons and clypeus dark; antennae dark. Lower surface of body yellow, brown patches on ischios of each leg, pleopods brown. The general impression, to the eye, of the entire animal is that of strong zebra-like brown and yellow striping. The coloring given above applies particularly to the male and young female, the older females becoming more uniformly pigmented.

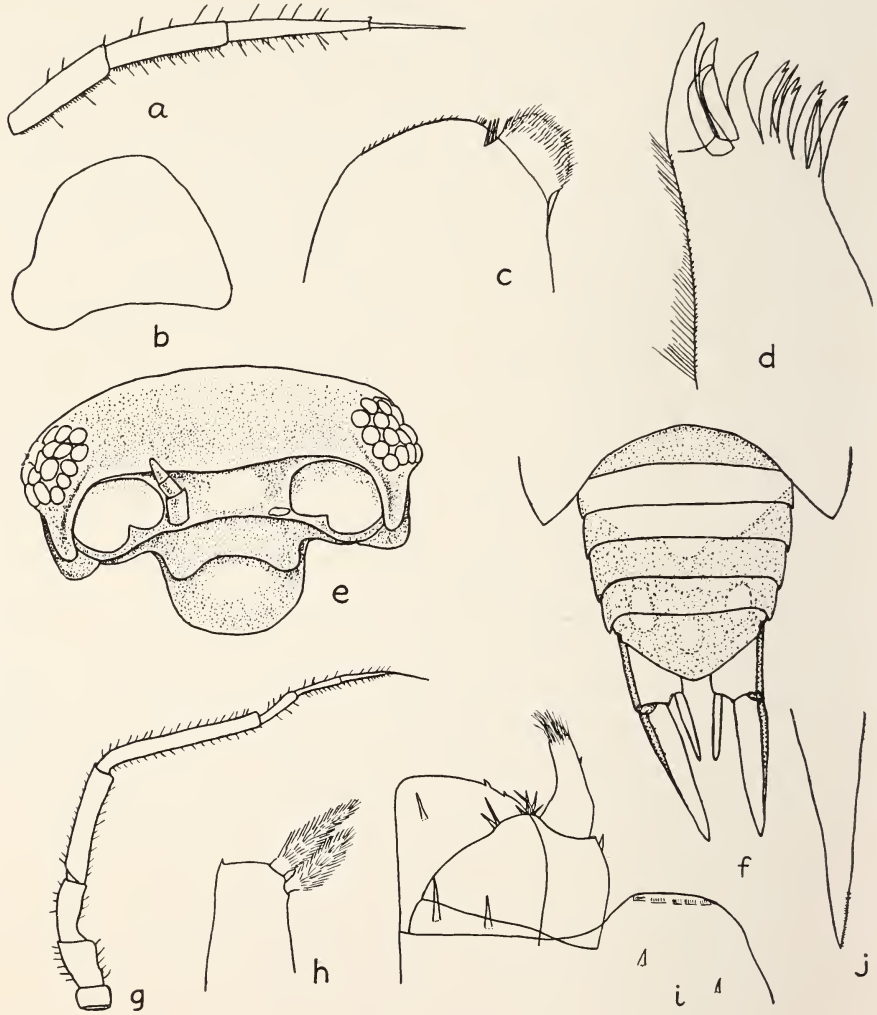


FIGURE 2. *Philoscia fasciata* new species: a, flagellum of antenna; b, 1st pleopod, male, exopod; c, maxilla; d, maxillula, outer endite; e, head from front; f, abdomen and uropods; g, antenna; h, maxillula, inner endite; i, maxillipede; j, 1st pleopod, male, tip of endopod.

Tahuata: Hanamiai Valley, altitude 1000 to 1200 feet, May 28, 1930, and June 4, 1930, LeBronnec and Tauraa.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, on ground, October 27, 1929; Oounu, altitude 3800 to 4000 feet, November 13, 1929, Mumford and Adamson.

Hivaoa: Mounaofefe, altitude 2010 feet, "Dead petioles of *Angiopteris*," September 14, 1929; Matauuna, altitude 3760 feet, "under dead leaves," August 1 and 27, 1929; Vaiepoepo, altitude 2430 feet, June 3, 1929; Tapeata, altitude 2250 feet, May 25, 1929; Tehueto Valley, altitude 500 feet, March 8, 1929; Mount Ootua, altitude 3032 feet, February 13, 1930; Mumford and Adamson. Temetiu Ridge, altitude 2900 feet, January 14, 1932; Mount Temetiu, altitude 3900 feet, January 20, 1932; Kaava [Kaara] Ridge, altitude 2720 feet, January 6, 1932, LeBronnec.

Fatuhiva: Teaotu, altitude 100 feet, September 9, 1930, LeBronnec.

Uahuka: Tauheeputa, altitude 1770 feet, April 25, 1931; Penau Ridge, altitude 2000 feet, "in moss," March 5, 1931; Penau, Hane Valley, altitude 1820 feet, "under dead leaves," February 27, 1931; Hitikau summit, altitude 2910 feet, "in dead stipes of tree fern (*Cyathea* species)," March 4, 1931; LeBronnec and H. Tauraa. North Range, September 24, 1929, Adamson.

Very widely distributed in the Marquesas, especially at high altitudes. Only two records are below 1000 feet, and the majority were taken over 2000 feet.

Specimens were collected also on Tahiti, at altitudes of 350 to 1800 feet.

I assign this species to *Setaphora* with hesitation. It satisfies Budde-Lund's diagnosis<sup>12</sup> in all but one respect—the structure of the endite of the maxillipede, which is defined by him, "apice levites hirsuta, spina mediocri et oculis 3 parvis munita." Here there are two thorn-like sessile teeth on the outer side (as in *Plymphiloscia* Wahrberg), and the setae clothing the distal margin are so fine and sparse as almost to escape notice. Some species of the genus are described as possessing a bushy penicillium in addition to the three spines. In spite of the exceedingly fine line between some of the subgenera of *Philoscia* which have been set up, this difference does not seem weighty enough to justify a further subgenus in view of the close agreement of all the other characters with *Setaphora*.

#### **Alloniscus oahuensis** Budde-Lund.

*Alloniscus oahuensis* Budde-Lund, Prospectus generium specierumque Crustaceorum Isopodum terrestrium, p. 1, 1879; Crustacea Isopoda Terrestria, p. 225, 1885.

<sup>12</sup> Budde-Lund, G., Isopoda von Madagaskar und Ostafrika . . . : Voeltzkow, Reise in Ostafrika in den Jahren 1903-1905, Bd. 2, 1908.

*Alloniscus brevis*, Budde-Lund, Crustacea Isopoda Terrestria, p. 226, 1885, in Voeltzkow, Reise in Ostafrika in den Jahren 1903-1905, Bd.

II, p. 298, 1908; Jackson, Insects of Samoa, pt. 8, fasc. 1, p. 6, 1927.

Hivaoa: Atuona Village, July 7, 1929, Mumford and Adamson.

Mohotani: February 2 and 3, 1931, LeBronnec and H. Tauraa.

Uahuka: Haahue Valley, March 20, 1931, LeBronnec and H. Tauraa.

The material upon which the above identification is based consists of 50 specimens from three localities. The relationship between the two species in the synonymy is of some complexity, but the number of specimens makes possible a statistical study which goes some way to clear up the difficulties. The material roughly divides itself up into very broad, intermediate, and narrow forms, of which 17 are male with a length-breadth ratio between 1.5 and 2.077 and 33 are females with a ratio between 1.632 and 2.167. A further analysis shows that 10 males and 1 female lie above 1.685 and that only three males and 26 females lie below 1.833. Below 1.875 there are but one male and 22 females. The three narrow males have a length of 7.0 mm. (2) and 6.75 mm., and all males but one above the 1.833 mark are longer than 7 mm.

If the specimens are arranged in order of length, they fall into groups with the following constitutions: 9.00 mm., 1 male; 8.50 mm., 3 males, 1 female; 8.00 mm., 3 males, 4 females; 7.75 mm., 1 male, 3 females; 7.50 mm., 4 males, 4 females; 7.25 mm., 1 male, 3 females; 7.00 mm., 2 males, 6 females. Of the remainder, all but two are females.

In each of these groups up to 7.00 mm., the males are broader than the females of the same group.

The following conclusions may be drawn from these facts:

1. The mature male is consistently broader than the mature female of the same age.
2. The males attain maturity at a length of about 6.75 to 7.00 mm., when the length-breadth ratio decreases rapidly and suggests heterogonic growth.
3. The females attain maturity at a smaller size than the male; the smallest with fully developed oöstegites (but no eggs) measured 5.5 by 3.00 mm.
4. Evidence as to the existence of breeding and non-breeding phases in the female is inconclusive. Twenty-one females were ovigerous or provided with well-developed oöstegites; twelve were not ovigerous. Every length group had ovigerous and the majority had also non-ovigerous females. Of the specimens collected in February and March on Mohotani and Uahuka, 15 were ovigerous and only 2 non-ovigerous. Of the specimens collected on Hivaoa in July, 6 were ovigerous and 11 non-ovigerous. These figures suggest

that the active breeding season is in February and March, and that in July breeding is either ceasing or recommencing for an autumn brood. From the haphazard variation in length and breadth of ovigerous and non-ovigerous females it is possible that alternative phases are passed through as in some other isopods.

5. As regards the identification of the species, the broad forms exactly correspond with Budde-Lund's (1885) and my (1921) descriptions of *Alloniscus brevis* Budde-Lund; the narrower ones are more variable but the majority represent Budde-Lund's description of *Alloniscus oahuensis* Budde-Lund (1885). The original descriptions were each drawn upon a single specimen of unnamed sex. I expressed doubt in 1921 of the separate identity of these two species, but it was not possible without the wealth of material here available to perceive the true relationship between them, which is that the males at any breeding stage are consistently broader than the females and that both belong to the same species.

As the name *Alloniscus oahuensis* Budde-Lund dates from 1879, it must replace *Alloniscus brevis* Budde-Lund.

#### SUBFAMILY PORCELLIONINAE

##### **Porcellio (Mesoporcellio) laevis** Latreille.

Nukuhiva: Taiohae, November, 1929, Mumford and Adamson.

A species which is found wherever civilization has penetrated.

##### **Porcellio (Porcellionides) pruinosus** Brandt.

Hivaoa: Atuona Village, July 7, 1929, Mumford and Adamson.

Mohotani: altitude 700 feet, February 2 and 3, 1931, LeBronnec and H. Tauraa.

Eiao: altitude 1665 feet, "under dung of cattle," September 28, 1929, Adamson.

Fatuuku: altitude 990 feet, November 19, 1931.

Nukuhiva: Taiohae, November 23, 1929, Mumford and Adamson.

Of world-wide distribution.

#### SUBFAMILY ARMADILLINAE

##### **Spherillo (Spherillo) montivagus** Budde-Lund.

Hivaoa: Mount Ootua, altitude 3032 feet, "at base of *Asplenium nidus*," February 13, 1930; Kopaaftaa, altitude 2900 feet, February 26, 1930, Mumford and Adamson.

Uahuka: Hitikau Ridge, altitude 2900 feet, "under dead leaves," March 3, 1931, LeBronnec and H. Tauraa; North Range, altitude 2350 feet, September 24, 1929, Adamson.



Uapou: Hakahetau Valley, altitude 2800 feet, "from dead fern stipes," December 6, 1929, Adamson, altitude 3000 feet, November 19, 1931, Le-Bronnec.

Taken also on Tahiti at 750 feet. Recorded from Samoa and Tonga.

**Spherillo (Spherillo) testudinalis** Budde-Lund.

Nukuhiva: Ooumu, altitude 4050 feet, "in wet humus," November 12, 1929, Mumford and Adamson.

Widely distributed in the islands of the Pacific and Indian Oceans.

**Spherillo (Spherillo) pygmaeus** Verhoeff.

Nukuhiva: Ooumu, November 12, 1929; Taiohae, November 23, 1929, Mumford and Adamson.

First recorded by Verhoeff in 1926 from New Caledonia.

**Spherillo (Xestodillo?) marquesarum**, new species (fig. 3, *a-f*).

Length, male 4.75 mm., female 5.5 mm.; breadth, male 2 mm., female 2.5 mm.

Shape, oblong-oval. Surface smooth, minutely scaly, shining.

Head. Eyes small, 12-13 ocelli. Shield turned back on vertex, but margin slightly raised from it; rather tumid laterally and in middle of face, recessed behind antennae; marginal line passing well to lateral side of eyes and projecting over genae, passing upwards on shield and nearly confluent with frontal line. Lateral processes of clypeus heavy and bluntly triangular.

Thorax. Tergite I very slightly sinuate, lateral margin tumid, posterolateral angle deeply cleft, cleft continued forwards on margin, but lost further forward; inner lamella thick and tumid, outer lamellate, exceeding inner posteriorly, but shorter than it laterally. II well formed blunt inner lamella. Posterior margins of all nearly transverse and only slightly sinuate at sides; posterolateral angles of IV-VII nearly rectangular. Pronotum broad, about  $\frac{3}{4}$ -breadth of segment.

Abdomen. Postero-lateral angles nearly rectangular; posterior border of V very slightly diverging at each side. Telson markedly coarctate, hind margin slightly curved.  $1\frac{1}{2}$  times longer than broad.

Appendages. Antenna slender; flagellum shorter than fifth segment, or with terminal brush of setae equal to it, second segment of flagellum three times longer than first. Mandibles: right penicilli 1 + 1; left penicilli 1 + 2. Maxillula: outer endite, 4 + 5, all simple; inner, 2 short bushy penicilli. Maxilla: typical of the genus. Maxillipede: endite with blunt spine on inner edge, near to it a triangular thorn-like spine; outer edge small sharp slender spine, near to it a long sharp spine; on face a very long sharp spine greatly exceeding the longest of the border spines. Uropod: protopod longer than telson, rectangular on inner posterior border and only slightly rounded on outer; exopod small, conical, set at proximal end of base towards medial border; length about  $\frac{1}{6}$  outer border in female, about  $\frac{1}{4}$  in male; endopod reaching nearly to hind border of telson.

Color in spirit irregularly mottled on yellow ground. Color of pigment of different specimens varies from delicate light violet to purplish brown. Female from Pepehitoua markedly rufous over epimera and on epistomial shield.

Uapou: Hakahetau Valley, altitude 2000 feet, "petioles of *Angiopteris*," December 6, 1929; Pepehitoua Valley, altitude 2700 feet, "ex dead petioles of *Cyathea* species," December 8, 1929, Adamson; Kohepu summit, altitude



3200 feet, November 28, 1931; Teavaituhai, altitude 3000 feet, November 20, 1931, Teavanui, altitude 2900 feet, December 27, 1931; Vaihakaatiki, altitude 3000 feet, November 18, 1931, LeBronnec.

Taken also in Tahiti at 1800 feet, Adamson.

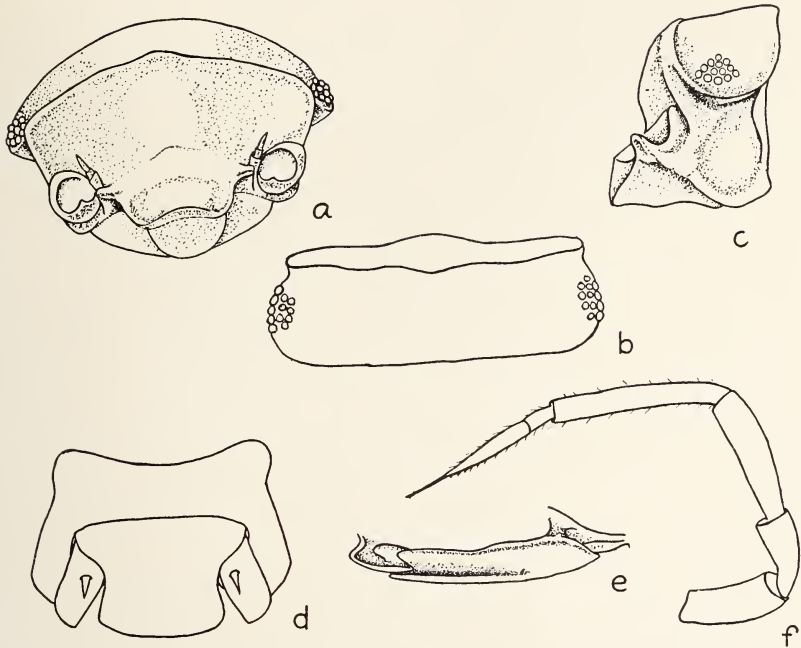


FIGURE 3. *Spherillo marquesarum* new species: a, head, from front; b, head, from above; c, head, from side; d, telson and uropods; e, lateral margin of 1st and 2nd thoracic tergites from below; f, antenna.

### **Cubaris murinus** Brandt.

*Nesodillo medius* Verhoeff, Sarasin and Roux, Nova Caledonia, Zool., vol. 4, L. 2, p. 287, 1926.

Nukuhiva: Taiohae, November, 1929, Mumford and Adamson.

Hivaoa: Anatuakina, altitude 1525 feet, "under dead bark," May 1, 1929, Mumford and Adamson; Mounaofefe, altitude 2010 feet, "dead petioles of *Angiopteris*," September 14, 1929, Adamson.

Fatuhiva: Teapotu, altitude 100 feet, September 9, 1930; Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, LeBronnec.

Uahuka: Hanatea Valley, altitude 100 feet, "under stones," March 11, 1931; Haahue Valley, altitude 260 feet, "under bark of *Sapindus saponaria*," March 20, 1931, and altitude 90 feet, "in dead log of *Sapindus saponaria*," March 20, 1931; Teavamataiki, altitude 730 feet, March 19, 1931, LeBronnec and H. Tauraa.

Upou: Teepotaootetoiki, Hakahetau [Hakapetau] Valley, altitude 120 feet, November 23, 1931, LeBronnec.

Mohotani: altitude 700 feet, "dead wood of *Cordia subcordata*," January 31, 1931; altitude 700 feet, February 2 and 3, 1931; altitude 200 feet, "under stones," February 4, 1931, LeBronnec and H. Tauraa.

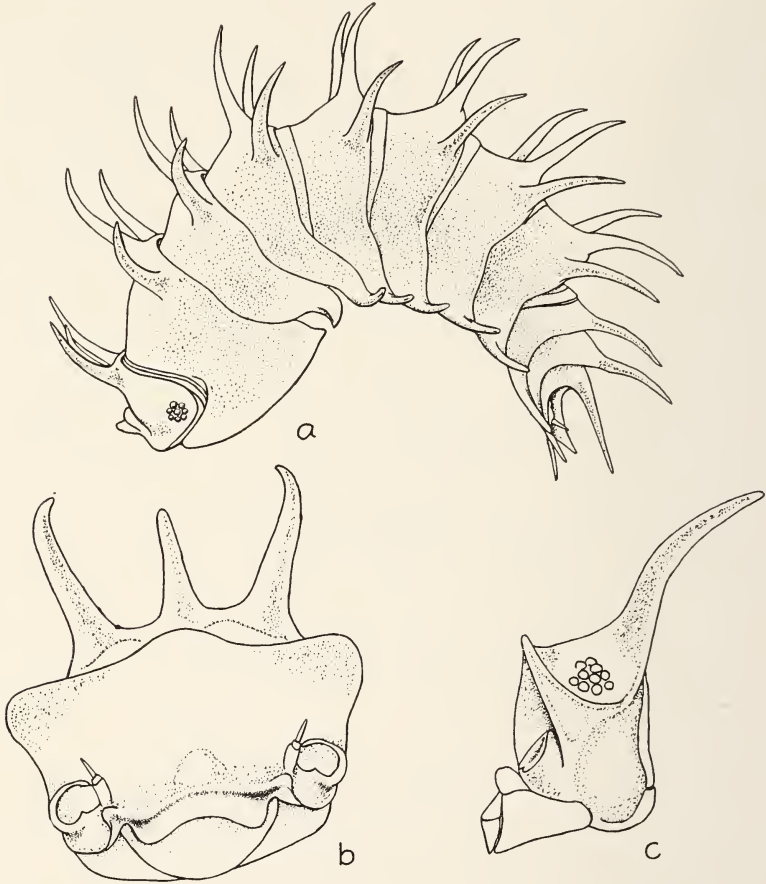


FIGURE 4. *Echinodillo montanum* new species: a, whole specimen, from side, excluding appendages; b, head, from front; c, head, from side.

Eiao: altitude 1665 feet, "under dung of cattle," September 28, 1929, Adamson; altitude 1600 feet, under bark of *Thespesia populnea*, March 21, 1931; altitude 1600 feet, under dead bark of *Pisonia* species, March 16, 1931; altitude 1800 feet, March 22, 1931, LeBronnec and Tauraa.

This species proved to be the characteristic armadillid of the collection. It was found in most of the islands, and I identified it, at first, with Ver-

hoeff's recently described *Nesodillo medius* from New Caledonia, as it satisfied his description in every detail. However, comparison of the specimens with examples of *Cubaris murinus* (which is nowhere well described) from numerous localities in the Budde-Lund collection in the British Museum (Natural History) proved it to be identical with that species. The genus *Nesodillo* must therefore be abandoned in favor of *Cubaris* Brandt. Figures of *C. murinus* may be found in Budde-Lund<sup>13</sup> (mouthparts), Barnard<sup>14</sup> (head and articulating lappets) and Verhoeff<sup>15</sup> (telson, uropoda, and pleopoda). Verhoeff gives a full description under *Nesodillo medius*, and the distribution is dealt with by Budde-Lund.

#### Genus ECHINODILLO, new genus

Frontal shield raised prominently from vertex, slightly produced in median line of margin. Coxal plates of all free somites but first of thorax and abdomen drawn out laterally into long recurved spines; anterior and posterior lateral angles absent. Head and each thoracic somite with 1 median and 2 lateral dorsal long recurved spines on hind borders. Median spines on third, fourth, and fifth segments of abdomen. Hind border of telson drawn out into long median spine, coarctate, narrow. Border of first thoracic tergite thin and concave, not split; small articulating lappets placed well back from border of first and second thoracic tergites.

#### *Echinodillo montanum*, new species (fig. 4, *a-c*; fig. 5, *a-h*).

Length: male, 7 mm.; female, 8 mm. Breadth: male, 4 mm.; female, 4.5 mm.

Shape, oblong-oval. Surface smooth but scaly, especially on spines.

Head. Eyes small, about 10 ocelli, placed well within marginal line. Shield prominent, lateral lobes slightly projecting and rounded, median bluntly rounded lobe; vertex with 3 long spines on posterior border, recurved, 2 lateral longer than median; marginal line confluent with frontal line on side of shield. Lateral processes of clypeus massive, somewhat conical, but not prominent.

Thorax. All tergites more or less sinuate on each side, 3 long recurved spines (2 lateral, 1 median) on hind border. Posterolateral angle of I drawn out into sharp spine, border thin and concave, articulating process set back from lateral border and not exceeding hind border, small and rounded. Articulating process of II sharp and tooth-like, not exceeding hind border. Lateral borders of all but I produced to form sharp curved spines, no angles, but anterolateral angle is faintly indicated on V, VI and VII. Pronotum broad, rather more than  $\frac{1}{4}$  tergite.

Abdomen: I hidden under VII of thorax; III, IV, V with long median spines, lateral borders produced as in thorax, anterolateral angles faintly indicated. Telson markedly coarctate, long and narrow, hind border broadly rounded and continuous with lateral borders; median posterior spine more than  $\frac{1}{2}$  length of telson.

Appendages: antennula, basal segments large and tubular, terminal segment slender.

<sup>13</sup> Budde-Lund, G., A Revision of "Crustacea Isopoda Terrestria"; 2 Spherilloninae. 3 Armadillo, Copenhagen, 1904.

<sup>14</sup> Barnard, K. H., Terrestrial Isopoda: South African Mus., Ann., vol. 30, pt. 2, 1932.

<sup>15</sup> Verhoeff, K. W., Isopoda terrestria von Neukaledonien und den Loyalty-inseln: Sarasin und Roux, Nova Caled., Zool., vol. 4, L. 2, 1926.

Antenna slender, flagellum shorter than fifth segment, proximal segment  $\frac{1}{2}$  length of flagellum. Mandibles: right penicilli 1 + 1; left penicilli 1 + 2 (?). Maxillula: outer endite, 4 + 5 all simple, the 5 inner spines long and slender; inner endite, 2 very short bushy penicilli, no spine.

Maxilla similar to *Spherillo*. Maxillipede: endite with thornlike tooth and two stout spines on distal border, small tooth to outer side; outer margin of endite crenulate. Inner bristle groups on inner side of endopod small, each bearing one very long spine, nearly attaining to height of endopod. Pleopoda all bearing tracheae. First pleopod of male small and of tracheal part only; of female vestigial. First endopod of male bearing tuft of setae on outer side of tip. Uropod: protopod shorter than telson, inner

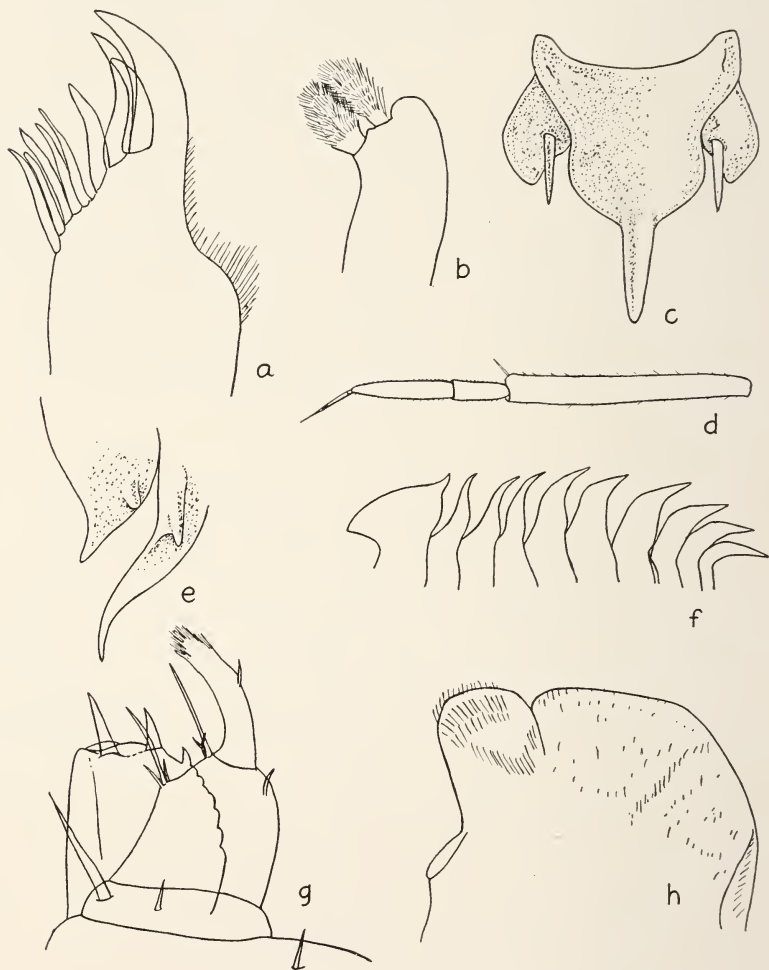


FIGURE 5. *Echinodillo montanum* new species: a, maxillula, outer endite; b, maxillula, inner endite; c, telson and uropods; d, antenna, 5th segment and flagellum; e, lateral margin of 1st and 2nd tergites from below, f, lateral margin of tergites of thorax and abdomen from above; g, maxillipede; h, maxilla.

angle more or less rectangular, outer and distal margins broadly rounded; exopod, long, slender and conical, greatly exceeding base and arising from its inner and upper angle, base plane at point of insertion, not forming investing roll or channel; endopod little shorter than base, much shorter than telson.

Color (in spirit) very uniformly mottled with grey brown pigment. Epimera rather lighter in color than back.

Uahuka: Hitikau Ridge, altitude 2900 feet, 1 male, 1 female, March 3, 1931; altitude 2900 feet, "under moss," 2 males, 1 female, March 4, 1931; LeBronnec and H. Tauraa.

Except for the great development of spines, this grotesque creature is in fundamental structure a "*Spherillo*."

#### Genus TRIDENTODILLO, new genus

Edge of frontal shield laminate and strongly raised from thorax, broadly triangular in middle. Lateral border of first somite thin and not split; on under side, distant from lateral margin, a long deep fold extending length of somite, drawn out posteriorly into strong semi-circular lappet. Articulating lappet on second somite caniniform, greatly exceeding hind margin of tergite. Antero- and posterolateral angles of first three coxal plates deleted so that lateral margin of plate is acute; margins of remaining free thoracic and abdominal somites sub-quadrangular, not produced. Head and each thoracic tergite bearing three very long slender curved spines on hind margin. Abdomen without spines.

#### *Tridentodillo squamosus*, new species (fig. 6, *a-d*).

Length, 7.5 mm.; breadth, 3.5 mm. Shape, oblong-oval.

Surface smooth and without rugosities, but very scaly.

Head. Eyes small, compact and very convex, but not deflecting marginal line or projecting over genae; 12 ocelli. Shield margin carried vertically above face, not at all depressed on to vertex, lateral lobes sharp, median lobe scarcely indicated by blunt triangular form of frontal line. Marginal line projecting over genae and confluent with frontal line. Profrons slightly tumid in middle and excavated at each side for antennae. Lateral processes of clypeus, blunt and somewhat triangular.

Thorax. Hind border of all tergites very slightly sinuate on each side, 3 very long slender spines (2 lateral and 1 median) on hind borders, length of each spine about  $\frac{1}{3}$  of whole body. Posterolateral angle of I rounded, lateral border thin and slightly concave, not split; articulating lappets and coxal plates as described under genus. Pronotum not broad, about  $\frac{1}{5}$  tergite.

Abdomen as described under genus. Telson pronouncedly coarctate, hind margin slightly rounded, slightly broader than long in the proportion 4.3.

Appendages: antennula minute, terminal segment slender; antenna slender, setose, flagellum shorter than fifth segment, distal segment nearly 3 times proximal, terminal brush of setae; maxillula and maxilla similar to *Echinodillo*; maxillipede absent in this specimen. Uropod: protopod slightly longer than telson, truncate, rectangular; exopod minute, inserted on distal inner border of base; endopod much shorter than telson.

Color (in spirit): irregular mottling with light brown pigment; epimera lighter and almost devoid of dark pigment; telson dark.



Nukuhiva: Ooumu, altitude 3800-4000 feet, "among wet herbage," November 13, 1929, 1 female, Mumford and Adamson; altitude 3890 feet, July 20, 30, 1931, LeBronnec and Tauraa.

Nearly related to, but very markedly distinct from the foregoing genus.

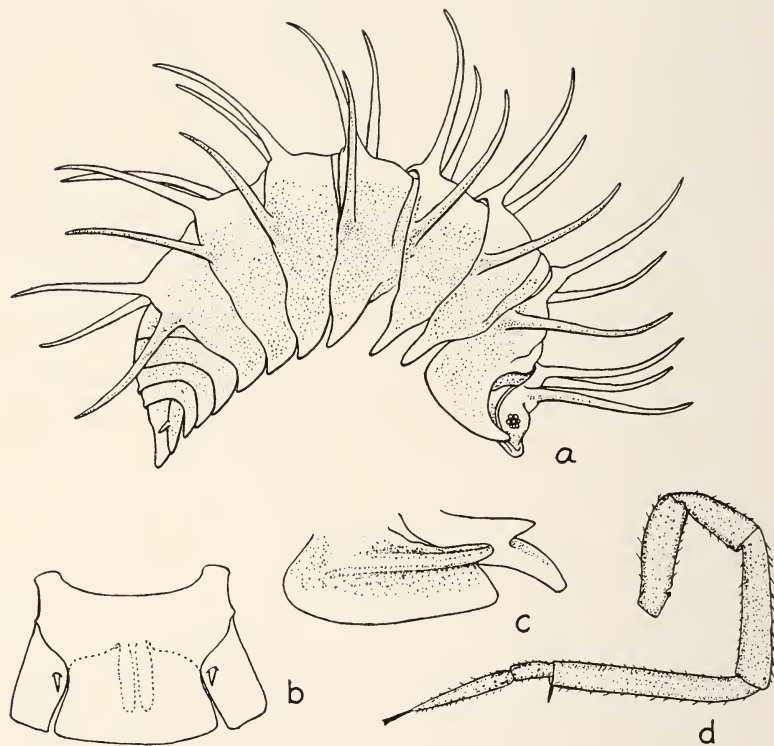


FIGURE 6. *Tridentodillo squamosus* new species: a, whole specimen, from side, excluding appendages; b, telson and uropods; c, lateral margin of 1st and 2nd tergites from below; d, antenna.

TWO NEW SPECIES OF CRYPTOTHRIPS (THYSANOPTERA)  
FROM THE MARQUESAS \*

By

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and

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In a previous report<sup>1</sup> on some of the Marquesan collections of the Pacific Entomological Survey, we described new species of *Isoneurothrips* and *Bolothrips*. Since that time we have received through the Survey further collections from the Marquesas Islands. These include the two new species of *Cryptothrips* described below. A full list of the species taken in the Marquesas will not be published until all of the collections are at hand.

TUBULIFERA HALIDAY

SUPERFAMILY PHLOEOTHRIPOIDEA HOOD, 1915

FAMILY PHLOEOTHRIPIDAE UZEL, 1895

SUBFAMILY PHLOEOTHRIPINAE KARNY

TRIBE HOPLOTHRIPINI PRIESNER

Genus **CRYPTOTHRIPS** Uzel: Mon. Ord. Thys., p. 228 (part), 1895

*Cryptothrips* Hinds: Mon. North. Am. Thys., p. 205, 1902.

*Cryptothrips* Priesner: Thys. Europas, p. 484, 1927.

**Cryptothrips constans**, new species (fig. 1, *a-c*).

Female

Color uniformly blackish brown including legs except fore tarsi and distal ends of fore tibiae, which are lighter. Antennae blackish brown with only extreme base of segment three and outer portions of three and four lighter.

Total body length 3.08 mm.; head length 0.32 mm., width 0.28 mm.; prothorax length 0.19 mm., width 0.42 mm.; tube length 0.294 mm., width at base 0.102 mm. Antennal segments: length (width) I, 43 (53); II, 66 (40); III, 96 (36); IV, 93 (40); V, 83 (40); VI, 66 (36); VII, 53 (30); VIII, 36; total 558 microns. Length of spines: postoculars 110 microns, on anterior angles of prothorax 43 microns, midlaterals 43 microns, on posterior angles outer 103 and inner 70 microns, on ninth abdominal segment and at tip of tube 190 microns.

Head one-seventh longer than wide, cheeks slightly arched and slightly narrowed behind; postocular spines long, pointed and placed 20 microns behind eyes, a second pair

<sup>1</sup> Moulton, Dudley, and Steinweden, J. B., New Marquesan Thysanoptera: B. P. Bishop Mus., Bull. 98, pp. 165-168, 1932.

\* Pacific Entomological Survey Publication 7, article 11. Issued September 15, 1933.

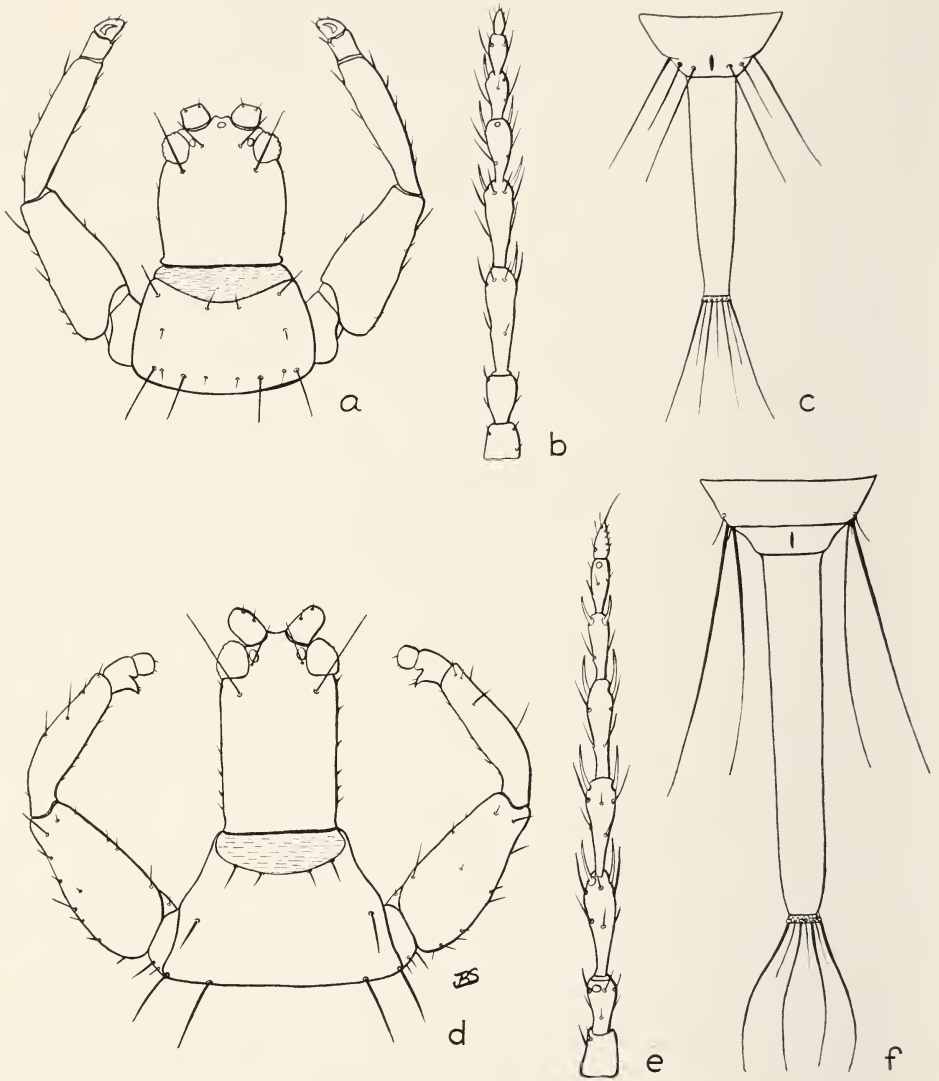


FIGURE 1.—*Cryptothrips constans*, new species: a, head and prothorax of female; b, right antenna of female; c, end of abdomen and tube. *Cryptothrips niger*, new species: d, head and prothorax of female; e, right antenna of female; f, end of abdomen and tube.

of smaller spines placed just behind posterior ocelli. Eyes rounded; ocelli very small, hardly larger than facets of eyes. Antennal segments 3-7 subclavate, eight slightly constricted at base and clearly separated from seven; sense cones on three and four comparatively short and pointed. Prothorax with normal spines which are pointed; fore femora slightly thickened, tarsi unarmed; wings wanting. Tube seven-eighths as long as head.

#### Male

Similar to female, somewhat smaller, each fore tarsus armed with a stout tooth.

Uapou: Hakahetau, female holotype, male allotype and four female paratypes, December 11, 1929, Whitten. Host unrecorded. Moulton nos. 4589, 4590. Types deposited in Bernice P. Bishop Museum.

*Cryptothrips constans* may be compared with *C. rectangularis* Hood, but is separated by its relatively shorter head which is slightly broader in front and slightly narrowed toward the back.

**Cryptothrips niger**, new species (fig. 1, *d-f*).

#### Female

Color blackish brown, only tarsi and leg joints lighter; antennae almost uniformly blackish brown with only extreme base of segment three and outer median portions of two and three indistinctly lighter; wings brownish, each with a darker streak extending to beyond middle.

Total body length 3.5 mm.; head length 0.48 mm., width 0.294 mm.; prothorax length 0.255 mm., width 0.480 mm.; tube length 0.52 mm., width at base 0.14 mm.; antennal segments: length (width) I, 50 (50); II, 76 (43); III, 143 (46); IV, 150 (50); V, 123 (42); VI 93 (36); VII, 73 (30); VIII, 50; total 700 microns. Length of spines: postoculars 190 microns; postocellars 106 microns; on anterior angles of prothorax 86 microns, midlaterals 100 microns, on posterior angles outer 166 and inner 150 microns; on ninth abdominal segment 510 microns, at tip of tube 340 microns.

Head 1.5 times longer than wide, with sides straight and almost parallel; cheeks with a few short spines; postocular spines long, pointed, placed 33 microns behind eyes; postocellar spines about half as long as postoculars. Antennal segments 3-6 subclavate; segment eight broadly joined to seven, not constricted at base; sense cones on three and four long, pointed and almost straight.

Prothorax with anterior margin semicircular, all normal spines developed, pointed; fore femora slightly thickened, each fore tarsus with a stout tooth which bears two spines on its anterior surface; wings fully developed, rather narrow, each fore wing with 38 double fringe hairs. Tube somewhat longer than head.

Hatutu [Hatutaa]: April 29, 1931, under bark of *Waltheria americana*, female holotype, 2 female paratypes.

Hivaoa: Atuona Valley, March 28, 1929, 1 female paratype.

Holotype and one paratype deposited in Bernice P. Bishop Museum, Moulton no. 5175, Steinweden no. T-110.

*Cryptothrips niger* may be separated from *C. carbonarius* Hood and *C. latus* Uzel by its uniformly dark color and relatively longer tube. The spines behind the ocelli in *C. carbonarius* are about as long as the postoculars with another well-developed pair in the middle of the head; the tube is about two-thirds the head's length. In *C. latus* the third antennal segment is yellowish and the eighth is clearly constricted at the base; the wings are broader and tube shorter than in *C. niger*.





# A NEW SPECIES OF DRAGONFLY AND OTHER NOTES FROM THE MARQUESAS ISLANDS\*

By

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In my first report on the collections of the Pacific Entomological Survey from the Marquesas Islands I described *Coenagrion interruptum* new species, and the hitherto little-known nymph of *Hemicordulia assimilis* Hagen<sup>1</sup>. Later I described from subsequent collections from the same source a new species of *Pseudagrion*<sup>2</sup>. Since that time I have received additional material including adult males of a new species of *Hemicordulia*, and a most interesting coenagrionine nymph. These are described below. As all of the Marquesan collections are not yet at hand it seems unwise to publish a list of records of other species at this time.

***Hemicordulia mumfordi***, new species (fig. 1, *b*).



FIGURE 1. *Hemicordulia*, male appendages: *a*, *H. oceanica*; *b*, *H. mumfordi*. Drawn by G. T. Lew.

Length 51 mm., abdomen 36 mm., hind wing 35 mm.

A beautiful metallic green, occiput brown, fringed with stiff black hairs. Vertex metallic green, same color covering most of the frons above and down the front to a limiting line of bright yellow. Clypeus olivaceous and mouth blackish.

Thorax wholly green in front and on the sides, lacking entirely the stripes of yellow that characterize the other species of the genus. Black on the collar and densely clothed with tawny hair above it. About the wing roots above and leg bases beneath, dull brown, legs black, front femora brown beneath, wings hyaline with brown stigma and with a golden tint overspreading the base of the anal triangle. Membranule and dilated base of costa greenish brown. Antenodal and postnodal cross-veins 7:8 and 6:9 in fore and hind wing respectively.

Abdomen metallic greenish black, becoming darker toward the end and with a shining brown ring on the apical margin of the second segment. Caudal appendages of the male black, as long as segments 9 and 10 together (fig. 1, *b*).

<sup>1</sup>Needham, J. G., *Coenagrion interruptum*, new species, from the Marquesas, and nymph of *Hemicordulia assimilis* Hagen: B. P. Bishop Mus., Bull. 98, pp. 111-114, 1932.

<sup>2</sup>Needham, J. G., *Pseudagrion demorsum*, new species, from the Marquesas: B. P. Bishop Mus., Bull. 114, pp. 71-72, 1933.

\* Pacific Entomological Survey Publication 7, article 12. Issued October 18, 1933.

Hivaoa: Mount Temetiu, from the slope north of the summit, altitude 3800 feet, December 27, 1930, 1 male, H. Tauraa; altitude 3860 feet, December 30, 1930, 1 male, H. Tauraa.

The second male has the inferior appendage a little shorter but appears to be otherwise identical.

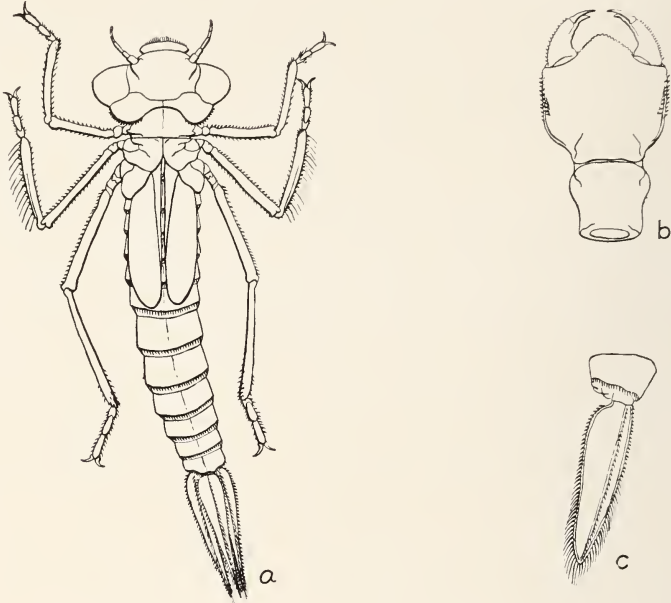


FIGURE 2. Unknown coenagrionine nymph from Hivaoa: *a*, whole figure; *b*, labium; *c*, a single gill. Drawn by W. D. Sargent.

### Coenagrionine, genus unknown.

Length 15 mm., tails 4 mm. additional; width of head 4 mm.

#### Nymph

Color nearly uniform pale brown (in these alcoholic specimens), probably greenish in life. Without pattern save for pale, longitudinal dashes in the intersegmental membranes of the abdomen. Head much wider than thorax and a little wider than long, smooth above, with broadly rounded, densely spinulose hind angles and with a wide straight-bottomed notch between these. Labium short and wide, its hinge reaching backward only between the front coxae: entirely destitute of raptorial setae; lateral lobes edged on their inner margins with minute, obscure crenulations. Middle lobe entire, obtusely triangular, regularly denticulate.

Prothorax flattened above with a prominent rounded shelflike lobe at each side toward the rear that is set off by a notch from the nearly straight hind margin. Legs short, stout, carinate, and minutely spinulose-serrate along the carinae. There is a suggestion of a subapical ring of darker color on each femur.

Abdominal segments about equal in length, or the tenth very slightly shorter. No lateral carinae. Gills half as long as the abdomen, tapering from near the base to their

blunt tips, strongly compressed, carinate, and minutely serrulate along the carinae. The hairs that arise singly between the denticulations increase in length from short spines at the base to long, soft pile at the tip.

Upou: Paaumea Valley, Vaikokoo, altitude 2200 feet, under stones in stream bed, December, 1931, 2 nymphs, one of them grown. LeBronnec and H. Tauraa.

Nukuhiva: Muake, altitude 2500 feet, under stone in stream, August 3, 1931, 1 nymph, LeBronnec and H. Tauraa.

This is a rather stout damselfly nymph with a wide head and short, sharply triquetral gills. It is peculiar among known coenagrionines in its entire lack of raptorial setae on the labium. If it should prove to be the nymph of my *Coenagrion interruptum*, which I very much doubt, then there would seem to be good reason for erecting another genus to contain it. The solution of the matter awaits further collecting.



## GEOMETRIDAE FROM THE MARQUESAS ISLANDS \*

By

LOUIS B. PROUT

The collections submitted to me by the Pacific Entomological Survey for examination consist of 323 specimens unequally distributed among nine species, more than half belonging to the single introduced geometrid which has not yet been taken in the Marquesas, *Gymnoscelis imparatilis* Walker.

Our previous knowledge of the Marquesan Geometridae was obtained exclusively from the St. George Expedition. From my report on the collection which was made on that occasion,<sup>1</sup> it will be seen that 9 species were recorded from the Marquesas; 2 *Scopula*, 3 *Chloroclystis*, 1 *Gymnoscelis*, and 3 *Cleora*. One of these, *Chloroclystis ambundata* Prout, was founded on two females, which remain its sole known exponents; another, *Scopula tersicallis* Prout, has not been rediscovered in its original locality nor in its original form, but is now shown to have two representative species—possibly local races—in other islands; seven species are found in both collections.

The Marquesas may therefore now be credited with 11 geometrid species, representing only four genera; the ten endemic species, indeed, belong to three genera only. Intensive collecting, especially at the higher altitudes, will probably be rewarded with a few further discoveries, but it is already manifest that the fauna is very poor.

The genus *Scopula* (subfamily Sterrhinae) is in some respects the most interesting. It is an exceptionally large genus of almost world-wide distribution and is not generally characteristic of high altitudes; on the contrary, Mr. H. M. Pendlebury, a good authority on collecting in the Malayan mountains, expressly associates it with "open country, especially cultivated areas, either in the plains or on hill stations."<sup>2</sup> But on Hivaoa it has only been found above 3000 feet, on Uahuka at 2850 feet, and on Uapou at 3200 feet. The combined influence of the two kinds of isolation, insular and vertical, has shown itself in the *tersicallis* group, which offers a clear example of island endemism, a condition already known to have developed to a high degree in other genera in the Marquesas.

The genus *Chloroclystis* (subfamily Larentiinae) has not yet shown any similar endemism. Its three representatives probably belong to three different

<sup>1</sup> Prout, L. B., The Geometridae of the St. George Expedition from French Oceania: Ent. Soc. London, Trans., vol. 77, pt. 2, pp. 265-277, 1929.

<sup>2</sup> Pendlebury, H. M., in Prout, L. B., On the Geometridae of Mount Kinabalu: Fed. Malay States Mus., Jour., vol. 17, pt. 1, p. 40, 1932.

\* Pacific Entomological Survey Publication 7, article 13. Issued January 30, 1934.



sections; *C. torninubis* Prout has been found on four islands, *C. coloptila* also on four, but I have not been able to discover racial peculiarities.

The genus *Cleora* (subfamily Geometrinae) comprises three Marquesan species. The individual variability of the first two renders their differentiation difficult and a delimitation of races still more difficult. Yet there are indications of "colonies" in some places, dependent perhaps more upon altitude than latitude or longitude. The remaining *Cleora*, *C. leucostigma* Prout has only been found in one locality, Feani Ridge, Hivaoa.

#### SUBFAMILY STERRHINAE

##### *Scopula oxystoma* Prout.

*Scopula oxystoma* Prout: Ent. Soc. London, Trans., vol. 77, pt. 2, p. 266, 1929.

Hivaoa: Temetiu Summit, altitude 3900 feet, January 20, 1930, at light, 1 male, LeBronnec.

A representative of the more primitive section of *Scopula*, sometimes regarded as a separate genus under the name *Pylarge* Herrich-Schaeffer, characterized by the retention of terminal spurs on the male hind tibia. *Scopula oxystoma* is not very similar to any other known species. The originals, 3 males, were captured at light on January 28, 1925, altitude 3500 feet.

##### *Scopula menytes*, new species.

Male, 23 mm. Antennal ciliation as in *S. tersicallis* Prout<sup>3</sup>; hind leg with tibia scarcely longer than femur, without spurs, tarsus one-third as long again as tibia. Body and wings decidedly more tinged with buff than in *S. tersicallis*. Forewing less strongly elongate than in *S. tersicallis*, shaped almost as in *S. oxystoma* Prout; markings distinguishable from those of *S. tersicallis* chiefly by the median shade, which is almost equally developed throughout—fairly broad, but ill defined—and has its acute angle at  $R^3$  instead of  $R^1$ . Hind wing with termen somewhat gibbous in the middle, very noticeably concave between  $M^1$  and  $SM^2$ ; cell dot relatively larger than in *S. tersicallis*, median shade broader, slightly more proximal, obsolescent anteriorly, postmedian also broader, both it and the subterminal more sinuous, bluntly angled outward about  $R^3$  and  $M^1$ .

Uahuka: Hitikau Ridge, altitude 2850 feet, March 4, 1931, 1 male, LeBronnec and H. Tauraa. Type in B. P. Bishop Museum.

It is regrettable that this and the following are only known from single specimens and *S. tersicallis* Prout only from three, the one male defective. They clearly represent a homogeneous group, and *S. menytes* may be accepted as giving evidence that, contrary to expectation, the leg structure differs from that of *S. oxystoma* Prout. The distinctions within the group, especially in shape, seem too great to be merely varietal, but it is necessary to add that the wings of *S. menytes* type are slightly crumpled, a condition which may

<sup>3</sup> Prout, I. B., The Geometridae of the St. George Expedition from French Oceania: Ent. Soc. London, Trans., vol. 77, pt. 2, p. 267, 1929.

indicate either that the specimen was killed before they were perfectly dry or that it is slightly crippled; there is sometimes an accompanying derangement of shape or markings.

**Scopula angusticallis**, new species.

Female, 23 mm. Smaller than *S. tersicallis* Prout, forewing less strongly elongate, the wing shape almost as in *S. oxystoma* Prout and with several further distinctions, as noted below. Foreleg mixed with fuscous on inner side. Forewing with the median and postmedian lines less extremely oblique, the latter more proximally placed, narrowing the clear band and scarcely marked with dark dots or dashes; well-defined lines or shades, bounding the subterminal proximally and distally. Hind wing with cell dot relatively larger; the markings beyond corresponding to those of the forewing.

Upou: Tekohepu Summit, altitude 3200 feet, November 28, 1931, at light, 1 female, LeBronnec. Type in B. P. Bishop Museum.

SUBFAMILY LARENTIINAE

**Chloroclystis torninubis** Prout.

*Chloroclystis torninubis* Prout: Ent. Soc. London, Trans., vol. 77, pt. 2, p. 267, 1929.

Hivaoa: Kakahopuanui, Kaava Ridge, altitude 2460 feet, January 5 and 6, 1932, at light, 3 males, 7 females; Tenatinaei, Feani Ridge, altitude 3970 feet, January 13 and 14, 1932, at light, 1 male, 3 females; LeBronnec.

Upou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 17, 1931, at light, 1 female, LeBronnec.

Eiao: above Vaituha, altitude 1200 feet, October 3, 1929, at light, 1 female, A. M. Adamson.

Founded on a long series from Hivaoa, chiefly at 3500 feet, but some recorded from near sea level, and a few from Tahuata at 500-850 feet.

The series now under review shows considerable variation. The most striking aberration is a female from Kaava Ridge with the entire median area of the forewing darkened into a band, the dark ternal suffusion very strong. This aberration is not yet known in the male.

**Chloroclystis coloptila** Prout.

*Chloroclystis coloptila* Prout: Ent. Soc. London, Trans., vol. 77, pt. 2, p. 268, 1929.

Hivaoa: Atuona, May 15, 1929, at light, 3 females, Mumford and Adamson; Kaava Ridge, altitude 2460 feet, January 5 and 6, 1932, at light, 3 females; Feani Ridge, Tenatinaei, altitude 3960 feet, January 14, 1932, at light, 1 female; LeBronnec.

Upou: Hakahetau Valley, altitude 1500 feet, December 26, 1929, 1 male, A. M. Adamson.

Eiao: above Vaituha, October 3, 1929, altitude 200 feet, 1 female; altitude 800 feet, 1 male, 3 females; altitude 1200 feet, 1 female, at light, A. M. Adamson.

The type series was from Nukuhiva, taken at low altitudes; the St. George Expedition also brought similar specimens from Hivaooa, sea level to 1200 feet. The Pacific Entomological Survey has added materially to our knowledge of its vertical distribution on the island and of its range in the Marquesas, but its variation is only slight.

***Gymnoscelis imparatilis* (Walker).**

*Botys imparatilis* Walker: List Lep. Ins., pt. 34, p. 1416, 1865.

*Gymnoscelis imparatilis* Prout: Insects of Samoa, vol. 3, pt. 3, p. 142, 1928.

Hivaooa: Atuona, May 15, 1929, at light, 1 male, Mumford and Adamson; Avaooa Valley, altitude 1350 feet, January 4, 1932, at light, 69 males, 29 females; Kakahopuanui, Kaava Ridge, altitude 2460 feet, January 5-7, 1932, at light, 7 males, 48 females; Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 6 males, 7 females; LeBronnec.

Nukuhiva: Taiohae, sea level, June 4, 1931, at light, 3 males, 2 females, LeBronnec.

I have published the synonymy and need not repeat it here. This very widely distributed *Gymnoscelis* has been found from India to the Society Islands and is the only Marquesan geometrid which may prove of economic importance. It "is probably . . . . a general feeder and adaptable in its larval habits . . . . At Pusa it has been bred from flowers of *Cassia fistula*. At Kuala Lumpur larvae of the *subtristigera* (Walker) form have been found boring in *Tabernaemontana* species. At Townsville the larvae of *G. delocyma* (Turner) fed on *Scyphiphora hydrophylacea*, turning over and fastening down the young foliage and feeding under cover like a pyrale."<sup>4</sup>

SUBFAMILY GEOMETRINAE

***Cleora collenettei* Prout.**

*Cleora collenettei* Prout: Entomologist, vol. 62, p. 255, 1929; Ent. Soc. London, Trans., vol. 77, pt. 2, p. 274, 1929.

Hivaooa: Atuona, May 15, 1929, 3 males, Mumford and Adamson; Avaooa Valley, altitude 1350 feet, January 4, 1932, at light, 2 males, LeBronnec.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 18, 1930, 2 males, LeBronnec.

Upou: Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 1 male, LeBronnec; Hakahetau Valley, altitude 1500 feet, December 26, 1929, 2 females, R. R. Whitten.

<sup>4</sup> Prout, L. B., The Geometridae of the St. George Expedition from French Oceania: Ent. Soc. London, Trans., vol. 77, pt. 2, p. 271, 1929.

Uahuka: Hane Valley, altitude 150 feet, March 8, 1931, at light, 1 male, LeBronnec and H. Tauraa.

Eiao: Vaituha, sea level, October 2, 1929, 1 male, 8 females, the male and 2 females taken at light, altitude 200 feet, October 3, 1929, at light, 1 female; above Vaituha, altitude 800 feet, October 3, 1929, at light, 4 males, 2 females; Adamson.

Moderately variable, perhaps more so in size than in markings. The series from Eiao includes the smallest specimen which I have seen, the female from above Vaituha at 800 feet measuring barely 26 mm.; except for one or two females the average size is perhaps small, but I do not see any palpable racial distinctions. The male from Uapou, noteworthy for the high altitude at which it was captured (2900 feet) is in very poor condition, but I do not feel any doubt regarding its determination. Its subterminal spots appear relatively well developed—probably an individual aberration, anyway not unique. Two of the males from Atuona and one from Avaoa represent the fine banded male aberration recorded from the same island in my report on the Geometridae of the St. George Expedition. The two specimens from Fatuhiva, both worn, do not admit of any generalization.

#### **Cleora esoterica** Prout.

*Cleora esoterica* Prout: Entomologist, vol. 62, p. 255, 1929; Hill Mus. Bull., vol. 3, no. 3, p. 214, 1929; Ent. Soc. London, Trans., vol. 77, pt. 2, p. 275, 1929.

The original form of male *C. esoterica* is not found in the Pacific Entomological Survey collection and may represent a strictly localized colony. Careful examination of the 53 mountain *Cleora* which most closely approach it, especially of the 32 males, shows that they cannot be merged in *C. colnettii* but have very nearly—sometimes almost exactly—the structural distinctions which I gave for *C. esoterica*. Yet these distinctions, slight at best, prove to be inconstant, though within narrow limits. The precise number of nonpectinate joints of the male antenna certainly varies, even within a single colony; so, too, does the exact relation of the hind-tarsal to the hind-tibial length. The genitalia have not yet yielded “tangible results;” the suggestion<sup>5</sup> that the tip of the valve is less narrowed than in *C. colnettii* holds as a generalization but cannot be over-pressed. There is evidence, therefore, of an assemblage of incipient species which will demand biological as well as morphological investigation. It is to be hoped that in the future workers may be found to devote to it the intensive study which is being bestowed on some parallel groups in Europe, such as *Zygaena* or *Oporinia*. Mr. Collette’s station at 3500 feet was not worked by M. LeBronnec but produced,

<sup>5</sup> Prout, L. B., A revision of the Indo-Australian *Cleora* of the alienaria group: Hill Mus. Bull., vol. 3, p. 215, 1929.



besides true *C. esoterica*, two or three small specimens which on account of their size I assumed to be *C. collenettei*; unless there be three Marquesan species of the group, I must perforce deal with them as a form of *C. esoterica*, forma *pusillanimis*.

***Cleora esoterica* forma *pusillanimis*, new form.**

Male, 30-34 mm.; female, 33-38 mm. Smaller than name-typical *C. esoterica*, especially the male. Antenna of the male perhaps generally with only 20-22 nonpectinate joints (nearly all broken, at least at the tips). Hind wing with termen less crenulate, sometimes scarcely more so than in *C. collenettei*. Coloration of the male in general much less dark, more variegated, the prevailing tone more drab or buffy brown, the bands which accompany the antemedian and postmedian lines generally inclining to tawny olive. Female at least as variable as the name-typical form, not yet sharply differentiable.

Hivaoa: Kakahopuanui, Kaava Ridge, altitude 2460 feet, January 5-7, 1932, at light, 19 males, 6 females, the typical series; Avaova Valley, altitude 1350 feet, January 4, 1932, at light, 2 males; Temetiu Summit, altitude 2900 feet, January 20, 1932, at light, 2 males; Feani Ridge, altitude 2960 feet, January 13-14, 1932, at light, those of the latter date labeled Tenatinaei, 6 males, 15 females; LeBronnec.

Fatuhiva: Vaikoao, altitude 1600 feet, August 21, 1930, at light, 1 male, LeBronnec.

Uapou: Tekohepu Summit, altitude 3200 feet, November 28, 1931, at light, 2 males, LeBronnec.

Type in B. P. Bishop Museum.

Probably some further separations may be possible with longer and fresher series. The Fatuhiva male is much rubbed and torn. The two from Uapou show wide disparity; one, expanding nearly 36 mm., is in fair condition, almost as dark as typical *C. esoterica*, of which, if *pusillanimis* be a separate species, it might be regarded as a less crenulate-margined race; the other, expanding only 30 mm., is poor, but seems closely like some Kakahopuanui *pusillanimis*.

A few clouded aberrations occur among the Hivaoa series. The most striking is one from Temetiu Summit; in it a broad median band on the forewing and the whole hindwing as far as the postmedian line are black-grey. The males from Feani Ridge, 3960 feet, show some tendency in the direction of racial differentiation; four of them are large (about equalling typical *C. esoterica*), of a warmer tone, and with a more or less pronounced pale area outside the antemedian line, in one specimen reaching the postmedian.

*Cleora collenettei* is generally very easy to distinguish from *pusillanimis* by its color. The male always and the female generally have a tulleul-buff



to vinaceous-buff ground color, with the bandlike shades merely a little darker (avellaneous to wood-brown) and with very little irroration; even when the female is whiter it is probably never entirely devoid of this tint. Its lines are generally weak, but arise from stronger blackish costal spots. The few strongly marked aberrations developed narrow dark shades in place of the avellaneous, as accompaniment to the antemedian and postmedian.

In the one locality, Avaoa Valley, 1350 feet, where the two were taken together, the color difference is clearly manifest. The female under side is very much less mottled than that of *pusillanimis* and commonly has a very characteristic, though shadowy, band near the termen of the forewing, conspicuously pale-edged distally.

**Cleora leucostigma** Prout.

*Cleora leucostigma* Prout: Ent. Soc. London, Trans., vol. 77, pt. 2, p. 276, 1929.

Male

Antenna rather long, pectination extremely long (perhaps 12), lax, inclined to curl about the shaft as in the preceding group, well ciliated; apical fifth nonpectinate, with single bristles. Hind tibia not dilated. Fovea moderate.

Hivaoa: Feani Ridge, altitude 3960 feet, January 13, 1932, at light, 2 males, 6 females; Tenatinaei, Feani Ridge, altitude 3960 feet, January 14, 1932, at light, 2 males, 27 females; LeBronnec.

This interesting species was founded on a single female, taken at light on Hivaoa, altitude 3500 feet, on January 28, 1925, by the St. George Expedition. It is now possible to add the male characters.

The structure confirms the generic position which I had given, but *C. leucostigma* remains a somewhat isolated member of Section B of my revision.<sup>6</sup>

Variability slight, consisting chiefly in the degree of development of the light spot outside the cell of the forewing; this spot is often very little paler than the ground color, occasionally almost concolorous therewith.

<sup>6</sup> Prout, L. B., A revision of the Indo-Australian *Cleora* of the alienaria group: Hill Mus. Bull., vol. 3, no. 3, pp. 179-222, 1929.



ADDITIONAL NEW SPECIES AND OTHER RECORDS OF  
ACALYPTRATE DIPTERA (SAPROMYZIDAE, ASTEIIDAE,  
DROSOPHILIDAE, EPHYDRIDAE AND TRYPETI-  
DAE) FROM THE MARQUESAS ISLANDS\*

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INTRODUCTION

In working on this material from the Marquesas I have been struck by the number of species in which sexual dimorphism is evidenced. In the Otitidae I have described *Perissonaura diversipennis* in which the wing venation is different in the sexes, and in *Prochaetops* I have noted distinctions in the wing markings and in the color of the body, in some species, apart from the normal distinctions due to sex. Here I again record similar features in yet other species and present descriptions of new species.

In the Marquesan material much interest attaches to such families as Sapromyzidae, Asteiidae, and Drosophilidae, and to those genera that are known from only this group of islands. In Sapromyzidae the one Marquesan species (*Homoneura hawaiiensis* Malloch) found outside of these islands occurs also in Hawaii, Samoa, and the Society Islands, having no doubt been distributed in commerce, though in just what manner it is impossible to conjecture. The discovery of the larval food habits may throw some light upon the matter. Ordinarily species of this family are quite limited in their range of distribution, and only a few, most of them in the same genus as the Marquesan example, of the same species are found in such widely separated regions as North America and Europe.

The taxonomist who limits his work to the fauna of a small region gradually acquires the ability to associate the sexes of dimorphic species either through the simultaneous field occurrence of the sexes or the discovery in his materials of the sexes taken in copula. But without these indicators the taxonomist who covers a large faunal scope is frequently at a loss to associate the sexes of such species reliably unless there should be but one or two species in the genus. In the Marquesas the genus *Prochaetops* has "run wild" in the matter of sexual diversity; there being more than a dozen species before me, it is difficult to associate the sexes in some. In *Chilocryptus* there

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\* Pacific Entomological Survey Publication 7, article 14. Issued January 30, 1934.

are similar difficulties, but the species are not so numerous. In the family Asteiidae I find an example of sexual dimorphism that, though not so striking, is still quite noteworthy in a family that is comparatively rarely met with and also poor in the number of species.

#### Family SAPROMYZIDAE

But three Marquesan genera of this family, which may be separated as in the key given below, are known.

#### Key to the Genera

1. The closely placed black microchaetae on the costal vein ceasing abruptly at apex of the third vein; mesonotum with three pairs of postsutural and no presutural dorsocentral bristles; fore femur with a series of very short, erect, closely placed black bristles on the apical half of the anteroventral surface..... **Homoneura** Van der Wulp  
 The closely placed black microchaetae on the costal vein ceasing about midway between the apices of second and third veins; mesonotum with two postsutural and one presutural pair of strong dorsocentral bristles; fore femur without a series of short, erect, closely placed bristles on the apical half of the anteroventral surface ..... 2
2. The presutural (posthumeral) bristle lacking..... **Chilocryptus** Malloch  
 The presutural (posthumeral) bristle present and well developed.....  
 .....(**Prochaetops** Bezzi) 3
3. Ocellar bristles lacking; anterior orbital bristle much closer to the posterior one than to the anterior margin of frons; gena with one or two outstanding long bristles..... **Subgenus Prochaetopsis** Malloch  
 Ocellar bristles quite distinct; anterior orbital bristle not closer to the posterior one than to the anterior margin of frons..... 4
4. Prescutellar pair of acrostichals well developed..... **Subgenus Prochaetops** Bezzi  
 Prescutellar pair of acrostichals undeveloped. **Subgenus Aprochaetops**, new subgenus

#### Genus PROCHAETOPS Bezzi

*Prochaetops* Bezzi: Dipt. Brach. Ather. Fiji, p. 120, 1928.

I have already given a review of the Marquesan species of this genus.<sup>1</sup>

Several characters appear to be worthy of mention apart from those noted in my first paper. One of these, and probably the most important, is the development of long, fine bristles on the under side of the proboscis. These occur on the heavily sclerotized ventral plate and are longer on the sides than in the center and as a rule much longer in the males than in the females. I have already noted that in some, not all, of the species in which the wings are marked the markings are found only in the males, a sexual distinction unknown to me in any other genus of the family though not at all uncommon in several others, notably the Dolichopodidae. In the Dolichopodidae the wing markings and leg adornments of the males are displayed before the

<sup>1</sup> Malloch, J. R., New species of Sapromyzidae from the Marquesas: B. P. Bishop Mus., Bull. 98, 1932.

female in courting, and it would be interesting to discover if any of the features peculiar to the males of *Prochaetops* are made use of in a similar manner.

In the material received since my paper on this genus went to press there is a remarkable new species in which the face of the male is much produced, noselike, and the wings instead of having a black mark near the apex in front have a narrow preapical strip on the membrane upon which the hairs are much denser than elsewhere, simulating a dark streak. This type of wing specialization is also found in other families, though not in this one as far as I know. Examples are met with in the males of some species of *Hydrotaea* Robineau-Desvoidy, and *Lispa* Meigen of the Muscidae. It would be of interest to find out if the female of the Marquesan species has the face produced as in the male. There are no females in this collection.

Subgenus **APROCHAETOPS**, new subgenus

Prescutellar pair of acrostichals undeveloped; frons of both sexes less than twice as long as its central width, the anterior orbital much nearer to the anterior margin than to posterior bristle.

Subgenotype, *Prochaetops* (*Aprochaetops*) *atricornis*, new species.

Keys to the Species

Males

1. Frons, antennae, and face entirely black, the frons with slight white dusting; mesonotum and scutellum black, the lateral edges of the mesonotum slightly yellowish..... **bicolor** Malloch  
 Frons and face largely or entirely yellow; mesonotum and scutellum not entirely black on disc..... 2
2. Wings entirely hyaline, and rounded at tips; antennae black; frons with the central third black, the sides yellow; legs yellow, femora almost entirely glossy black..... **atricornis**, new species  
 Wings with a more or less evident fuscous mark at apex of the costal margin, or if this is very faint the costa is almost straight from before the apex of second vein to apex of third, giving the wing a slightly angular apex; antennae yellow; frons entirely yellow, or with three faint brownish vittae; legs yellow..... 3
3. Apex of the wing subangular, the marginal cell quite abruptly narrowed and the dark costal cloud very faint and narrow; palpi yellow, with quite closely placed black bristles along the lower edges; the long bristles on edges of the proboscis dark brown to fuscous..... **adamsoni** Malloch  
 Apex of the wing narrowly rounded, the apex of the marginal cell elongate and pointed, the dark costal cloud moderately broad and conspicuous; palpi yellow, with tips fuscous, their lower edges sparsely setulose; the long bristles on the lateral edges of the proboscis fulvous yellow..... **bivittata** Malloch

Females

1. Black species, with the lower occiput slightly yellowish and the knees narrowly yellow, the frons evenly but slightly gray dusted; knobs of the halteres black..... **anthrax** Malloch



- Paler species, at least the head preponderantly yellow, and the mesonotum with a broad, conspicuous, densely grayish-white dusted central vitta that is continued over the disc of the scutellum; knobs of halteres brownish yellow..... 2
2. Legs black, only the knees narrowly yellow; a dark-brown mark on the gena below the eye..... *fusca* Malloch
- Legs yellow, coxae and femora almost entirely black; no dark mark on gena below the eye..... *atricornis*, new species

**Prochaetops (Aprochaetops) fusca** Malloch.

Two additional females of this species but still no males.

Hivaoa: Kaava Ridge, altitude 2750 feet, January 6, 1932, sweeping on ferns; Kakahopuanui, Kaava Ridge, altitude 2800 feet, October 27, 1931, beating on *Wcinmannia* species; LeBronnec.



FIGURE 1. *Prochaetops atricornis*, hypopygium of male in profile.

**Prochaetops (Aprochaetops) bivittata** Malloch.

Two additional males, but still no females.

Hivaoa: Kaava Ridge, altitude 2750 feet, January 6, 1932, swept from ferns; and altitude 2800 feet, January 7, 1932, beating on *Rapanca* species; LeBronnec.

**Prochaetops (Aprochaetops) atricornis**, new species (fig. 1).

Male

Head dull whitish yellow, the upper half of back with a large subtriangular black mark on each side and the frons with the central third black, the antennae, aristae, and palpi also black, and the labrum fuscous. Frons at vertex about one-third of the head width, slightly widened to anterior margin and about 1.25 as long as its width at vertex, the vertical and orbital bristles all long, strong, and black, the orbitals equally spaced and reflexed, the ocellar pair short and fine, black, the postvertical pair incurved, stout and short, yellow; a few microscopic black hairs on each side in front of the anterior orbital. Face very slightly convex; parafacial in profile very narrow; eye narrowed below; gena not as high as the width of third antennal segment, the latter fully twice as long as wide, its apex rounded below, slightly angulate above; arista with short pubescence; palpi slightly clubbed, with a few setulose longer hairs below and some shorter hairs amongst them; postocular cilia and genal hairs black, the hairs on lower occiput yellow.

Thorax brownish black, mesonotum with a yellow stripe along each lateral margin, and a densely whitish gray, uniformly wide, central vitta that extends to apex of scutellum under which the ground color appears to be yellow, propleura and part of the metapleura yellowish. Bristling normal; central gray vitta with the hairs in front biseriate and some additional hairs close to each series of dorsocentrals.

Legs testaceous yellow, all coxae and femora almost entirely black, apical two segments of each tarsus browned. Fore femur with a series of quite long posteroventral

bristles, the other armature very weak, no bristles on the anteroventral surface of the hind femur.

Wings brownish hyaline, veins brown. Inner cross vein before middle of the discal cell; fifth vein as usual not attaining margin.

Abdomen black, with a brownish yellow dorsocentral vitta that is connected with a narrow transverse fascia on each tergite at apex. Hypopygium as figure 1.

Squamae and halteres yellow.

Female

Similar to the male, but the type has been crushed and is greasy so that it is impossible to give minute details. The agreement in general color, and especially in that of the legs is, however, noteworthy, there being no indication of any sexual dimorphism.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 21, 1931, beating on ferns, type male; Teavanui, altitude 2900 feet, November 26, 1931, at light, allotype female, LeBronnec.

Subgenus PROCHAETOPS Bezzi

I have some doubts about the placing of the Marquesan and Fijian species in the same subgenus, but apart from the difference in the hairing of the arista, which is much less dense in the Marquesan species, and a few other characters, of which the most important is the presence of an anterior series of some rather well developed genal bristles in the Fijian species, there appears to be no barrier to the course adopted by me, at least on the basis of Bezzi's description of the genotype.

There are two segregates in the Marquesan species, one with the frons much as in the genotype and in *Aprochaetops*, not twice as long as its central width, and the other in which it is very distinctly more than twice as long as wide, very markedly so in the males.

Key to the Species

Males

1. Mid and hind femora with long and rather strong bristles on ventral surfaces, the mid pair with them on only the posteroventral, the hind pair with them on both the anteroventral and posteroventral surfaces; frons hardly longer in center than wide in front..... 2
- Mid and hind femora, or at least the mid femora with no long ventral bristles; frons much longer in center than its anterior width..... 3
2. Wings in both sexes largely dark brown..... **armatipes** Malloch
- Wings entirely hyaline..... **armatipes** variety **claripennis** Malloch
3. Face produced noselike (fig. 2, a); fore tarsus with the hairs very distinctly longer than usual giving a fringed appearance; wing with the hairs between the second and third veins near their apices denser and longer than usual, so that the membrane appears to have a dark streak on it before the apex of the submarginal cell (fig. 2, b)..... **nasuta**, new species
- Face not produced noselike, and the other characters not as above..... 4
4. Wings entirely hyaline, without an apical dark mark.... **immaculipennis**, new species
- Wings with a distinct apical or preapical costal spot or cloud..... 5

5. Apical wing mark consisting of a small deep black round spot over the apex of second vein that does not extend midway along costal vein to tip of third; hypopygium large, the inferior forceps dilated; frons with a broad central dark brown vitta.....**unipuncta** Malloch
- Apical wing mark consisting of a brown streak from below apex of second vein to or almost to apex of third that is hardly visible above the second and is widest along its lower edge, becoming faint towards apex of third; hypopygium rather small, the inferior forceps normal; frons entirely yellow.....**delicatula**, new species

## Females

1. Wing with a large dark brown mark on more than the apical half of anterior part; frons wider in front than behind and not twice as long as its anterior width; hind femur with some well-developed preapical anteroventral bristles.....**armatipes** Malloch
- Wings hyaline; frons not appreciably wider in front than behind and usually twice as long as the anterior width..... 2
2. All the femora with some widely separated and stout ventral bristles.....**setifemur** Malloch
- Mid and hind femora without well-developed ventral bristles..... 3
3. Ovipositor pronglike, dark brown, usually projecting.....**armiventris** Malloch
- Ovipositor not pronglike..... 4
4. Palpi entirely testaceous yellow; mesonotum with two complete dark vittae that are continued over the sides of the scutellum, leaving only a narrow central line yellow.....**delicatula**, new species
- Palpi distinctly infuscated at apices; mesonotum with two dark vittae, but the scutellum is paler on sides than in center..... 5
5. Scutellum conspicuously yellow on sides, brown on center of disc, and black at apex.....**immaculipennis**, new species
- Scutellum brownish black, slightly paler, yellowish on sides.....**unipuncta** Malloch

**Prochaetops (Prochaetops) armiventris** Malloch.

I have a number of additional specimens of this species before me, but as before they are all females. Below I describe a new species that has much in common with this one, but the female does not have the same type of ovipositor and it differs also in some less important details of color markings.

Hivaoa: Kaava Ridge, altitude 2750 feet, January 6, 1932, on ferns; Kakahopuanui, altitude 2500 feet, January 5, 1932, on ferns, LeBronnec.

**Prochaetops (Prochaetops) nasuta**, new species (fig. 2).

## Male

Head entirely lemon-yellow; antennae missing in all specimens available; palpi yellow. Profile as in figure 2, *a*. Vertical hairs and bristles brown, orbitals yellow.

Thorax darker than head, the mesonotum brownish yellow and rather dull, but the only dark mark consists of a black spot at apex of the scutellum. Mesonotal and scutellar bristles and the hairs on anterior part of mesonotum brown, pleural bristles and remainder of hairs paler, brownish yellow to yellow.

Legs yellow, apices of tarsi whitish yellow. Fore tarsus with rather dense dark hairs on posterior sides of all segments and anterior side of the apical two that are about three times as long as the diameter of the segments; mid and hind tarsi shorter than fore pair, slightly thickened, without long hairs and with the basal segment of each about as long as the other segments combined. Mid femur with the hairs on the anteroventral and posteroventral edges black and more conspicuous than elsewhere.

Wings hyaline, with a dark shade near apex caused by the greater density of the surface hairs than elsewhere, the part beyond the stripe almost bare (fig. 2, *b*).

Abdomen shining brownish yellow, with long brown bristles at apices of all the tergites. Hypopygium as figure 2, *c*. Squamae yellow, fringes brown. Halteres yellow. Length, 5-6 mm.

Hivaoa: Kakahopuanui, altitude 2500 feet, January 5, 1932, sweeping herbage, type and 2 paratypes; Kaava Ridge, altitude 2750 feet, January 6, 1932, sweeping on ferns, 2 paratypes, LeBronnec.

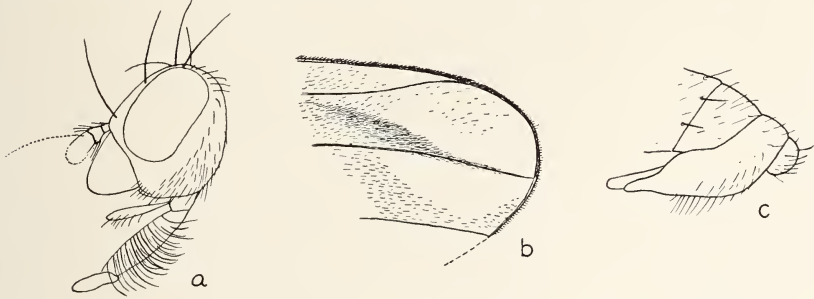


FIGURE 2. *Prochaetops nasuta*: *a*, head of male in profile; *b*, apex of wing of male; *c*, hypopygium of male in profile.

It is noteworthy that in recent keys to the genera of this family use has been made of the structure of the face in segregating groups. I have no fault to find with the application of this rule as far as previously known genera are concerned, but it appears to me that it can not be made use of in respect to the genus now under consideration. *Prochaetops nasuta* is undoubtedly congeneric with those with which it is associated herein; placing it with the forms with pronouncedly convex face in segregations of groups of genera would result in its removal to a section far from that in which it rightfully belongs. I have long held that in nature we find just so many colors, and just so many forms or types of structure, and that in diverging from an ancestral form species assume color markings or structural forms that must result in related or unrelated groups in the production of species closely similar in appearance. It is in the recurrence of such similarities that we find the so-called "mimicry" about which one reads much of late years, but I am disinclined to consider such cases as more than the mere recurrence of color markings or structures caused by the limitations of scope of variation and fail to accept the theory that such accidental mimicry can be of material benefit to the organisms involved. In any event, the noselike production of the face here is not unique in the family, nor can it be assumed that it can be of material benefit to this one species in a genus of a dozen or more closely related forms all living under similar conditions in a very restricted habitat.



**Prochaetops (Prochaetops) immaculipennis**, new species.

Head yellow, general color as in *P. nasuta*, but the structure quite different. The eye is not as elongate, and the face while convex is not prominently produced. The type specimen has the head damaged so that it is impossible to give its proportions, but the face in profile does not extend beyond the anterior margin of the eye a distance more than equal to the height of the gena. Palpi yellow, rather long and but slightly clubbed.

Thorax testaceous yellow, the mesonotum with traces of two brownish vittae, the scutellum darker centrally than on sides, the apex dark brown or black.

Legs testaceous yellow, the tarsi slightly paler apically, the fore tarsi with a few rather longer hairs on the posterior side of the apical two segments. Mid and hind tarsi not as stout as in *P. nasuta* and a little longer. Wings hyaline, without either markings or structural development from the normal.

Abdomen shining brownish yellow, with slight traces of darker paired marks on the tergites, the apical tergal bristles well developed, brown. Hypopygium smaller than in *P. nasuta*, of the same general form. Squamae and halteres brownish yellow. Length, 5.5 mm.

## Female

Differs from the male in having the apices of the palpi infuscated, the mesonotal vittae and central mark on the scutellum and the paired tergal marks on the abdomen more developed. Length, 5.5 mm.

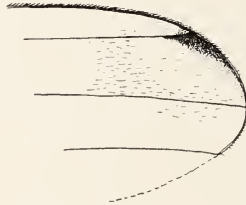


FIGURE 3. *Prochaetops delicatula*, apex of wing of male.

Hivaoa: Kaava Ridge, altitude 2750 feet, January 6, 1932, sweeping on ferns, type male; allotype, topotypical, altitude 2800 feet, January 8, 1932, on *Hibiscus tiliaceus*, allotype, topotypical, LeBronnec.

I am a little doubtful about the propriety of associating the female with the male as one species because of the difference in the color of the palpi, but pending the receipt of more material it appears wise to do so. There is also a striking resemblance between the female and that of *armiventris*, but no indication of the pronglike ovipositor in the specimen in hand.

**Prochaetops (Prochaetops) delicatula**, new species (fig. 3).

## Male

Head pale yellow, the orbits slightly pale dusted, all the frontal and vertical bristles golden yellow; antennae with the apex and upper margin of third segment fuscous; palpi yellow. Shape such as in *P. nasuta*, but the face is hardly visible beyond the eye in profile and it is not as high. Bristles on proboscis yellow and weak.

Thorax testaceous yellow, mesonotum slightly brownish, and gray dusted, the bristles brown except the anterior two pairs of dorsocentrals and those on the pleura, which are yellow. Scutellum entirely testaceous yellow.



Legs yellow, without abnormal form or armature, the hairs and bristles yellow except basally on the mid and hind femora.

Wings hyaline, with a dark-brown narrow costal mark at apex (fig. 3). Abdomen yellow, very similar to that of *P. immaculipennis*. Squamae and halteres yellow.

#### Female

Differs from the male in having the dorsal bristles dark brown, the mesonotum with two broad dark-brown vittae that are carried over the disc of the scutellum, leaving only a narrow yellow central line, and the dorsum of the abdomen largely dark brown with a yellow central and apical mark on each tergite. The wings are also unmarked. The palpi are entirely yellow. Length, 5.5-5.5 mm.

Uapou: Teoatea, Hakahetau Valley, altitude 1950-2000 feet, November 19-21, 1931, beating on ferns, type male, allotype female, 10 paratypes, Le-Bronnec.

#### Subgenus PROCHAETOPSIS Malloch

For the one species of this subgenus I present some additional records.

#### **Prochaetops (Prochaetopsis) tahuatae** Malloch.

I noted in my original description the striking sexual dimorphism in this species, though my association of the sexes was made on only the basis of the material in hand. I have now had this association verified by the receipt recently of a pair taken in copula and so mounted; the pale-colored male with dark apical mark on the wing and the much darker female with immaculate wing belong to the same species. It is noteworthy that in teneral specimens the dark apical wing mark in the male consists mainly or entirely of hairs which are denser and stronger there than elsewhere, but in matured specimens there is an additional pigmentation of the membrane of the wing which makes the dark mark much more conspicuous. I did not make any reference in my original description to the exceptionally long, slender, and bare arista of the species, but now include it in the diagnosis though possibly if there are other species that belong to the subgenus the arista may not be as distinctive.

Hivaoa: Kakahopuanui, altitude 2600 feet, January 5, 1932, 1 male in alcohol and 1 pinned; Kaava Ridge, altitude 2800 feet, January 7, 1932, 1 pair in copula and 2 pinned males on *Freyinetia* species, 1 female on *Hibiscus tiliaceus*, and 1 sweeping on herbage; LeBronnec. Kopaaftaa, altitude 2770 feet, August 2, 1929, Mumford and Adamson. The original type material was all from Tahuata.

#### Genus CHILOCRYPTUS Malloch

When I erected this genus I had two species before me, both of them distinguished from other Sapromyzidae by the lack of distinct fore tarsal claws in the males. Now I have a third species that has distinct fore tarsal claws in the male and some additional material in both the other species, so that a revision of the genus is called for.

The lack of the presutural thoracic bristle distinguishes the genus from the other two found in the Marquesas, and though it might be considered as associating it with *Trigonometopus* Meigen and others in which this bristle is also lacking, there do not appear to be any other characters that would justify this association, the general form of the head being quite distinct from that of *Trigonometopus* and its closest allies.

### Key to the Species

- |  |                                   |
|--|-----------------------------------|
| 1. Males .....   | 2                                 |
| Females .....  | 4                                 |
| 2. Fore tarsal claws moderately well developed and distinct; all the tarsi thickened and rather short, fourth segment of hind tarsus wider than long; mesonotum with four broad fuscous vittae.....  | <b>crassitarsis</b> , new species |
| Fore tarsal claws not developed, or minute and hidden; all tarsi rather slender, fourth segment of hind tarsus longer than wide; mesonotum with two vittae along the lines of dorsocentrals that are sometimes mere lines, the two sub-lateral vittae lacking or very short and faint..... | 3                                 |
| 3. Frontal and mesonotal bristles and hairs yellow; palpi yellow; mesonotum with at most two narrow dark lines along the series of dorsocentral bristles.....  | <b>bilineatus</b> Malloch         |
| Frontal and mesonotal bristles dark brown or fuscous; palpi dark at apices; mesonotum with four rather broad dark vittae, the inner pair most distinct and complete.....   | <b>quadrilineatus</b> Malloch     |
| 4. Tarsi very decidedly thickened, especially the basal segment, the dorsal hairs longer than usual; palpi blackened at apices; mesonotum with four broad fuscous vittae, the inner pair continued over sides of the scutellum.....  | <b>crassitarsis</b> , new species |
| Tarsi not at all thickened, normal both as to strength and hairing.....  | 5                                 |
| 5. Face with a central fuscous mark, and the basal antennal segment fuscous on the outer side.....   | <b>quadrilineatus</b> Malloch     |
| Face without a fuscous mark in center and the basal antennal segment yellow.....   | <b>bilineatus</b> Malloch         |

#### **Chilocryptus bilineatus** Malloch.

A large number of specimens of both sexes:

Uapou: Teavanui Pass, altitude 2900 feet, November 26, 1931, at light, 33 specimens; Tekohepu Summit, altitude 3300 feet, November 27, 1931, beating on *Metrosideros collina*, 2 specimens; altitude 3000 feet, 1 specimen; LeBronnec.

The female has the fore tarsal claws present though rather small, the palpi blackened at apices, the cephalic and thoracic bristles dark brown instead of yellow. The mesonotal vittae are rather variable in width.

#### **Chilocryptus quadrilineatus** Malloch.

Nukuhiva: altitude 2500 feet, August 4, 1931, beating on *Metrosideros collina*, 1 female, LeBronnec and H. Tauraa.

Uahuka: Hitikau Crest, altitude 2850 feet, March 4, 1931, on *Weinmannia* species, 1 female, LeBronnec and H. Tauraa.

**Chilocryptus crassitarsis**, new species (fig. 4).

Agrees in general color with the two preceding species, but the mesonotum has four broad blackish vittae, the inner pair of which extend over the sides of the scutellum.

Structurally similar in the sexes, the fore tarsal claws distinct, the tarsi all distinctly thickened, especially the basal segment, and with rather long hairs above. Frons as figure 4.

Hivaoa: Feani Ridge, Tenatinaei, altitude 3970 feet, January 4, 1932, at light, type male, allotype, and 7 paratypes; Temetiu Summit, altitude 4160 feet, January 20, 1932, 5 specimens; Kakahopuanui, January 5, 1932, at light; LeBronnec.

This species is rather aberrant in the genus in having distinct claws on the fore tarsi in the male. However, as it is so very similar in all other respects, and as the females of the other species have distinct fore tarsal claws, I do not care to consider it as other than congeneric with them.



FIGURE 4. *Chilocryptus crassitarsis*, frons of female.

The center of the frons is dark brown in both sexes. There is the same sexual difference in the color of the palpi in this species as is evident in the other two, the male having these organs entirely yellow whereas the female has them blackened on their apical halves.

The species seems to be readily attracted to lights. Whether the species flies in the evening or after dark is unknown, but it is rather notable that in the very many species of Diptera that are attracted to lights and also in some of the parasitic Hymenoptera, as the Ophioninae, the general color is yellow. Some writers have suggested an association between the yellow color of some flies and the attraction such insects find in lights. Possibly all species that are habitually active after dark or just at dusk may be attracted to lights as are most Lepidoptera with this habit, and the yellow color of certain species may be indicative of crepuscular or nocturnal flight habits.

**Homoneura hawaiiensis** Malloch.

Specimens from the following localities are to hand.

Hivaoa: Aavao Valley, altitude 1350 feet, January 4, 1932, on *Piper latifolium*; Kakahopuanui, altitude 2460 feet, January 5, 1932, at light; LeBronnec.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 21, 1931, beating on ferns, LeBronnec.

## Family ASTEIIDAE

Up to the present I have found in the Marquesan material representatives of but one genus, *Asteia*, but there is considerable difference in the structure of some of the species and possibly if less emphasis had been placed upon the wing venation and its basal structure and more on the chaetotaxy of the head and thorax by systematic writers a different alignment of the species would have resulted. However, the members of the family now under consideration are undoubtedly derivatives from a common source, and nothing is to be gained from the proposal of a new arrangement on this basis.

## Key to the Species

1. Mesonotum with but two pairs of strong dorsocentral bristles; a yellow species, with the epistome hardly paler than the remainder of the head, the latter in profile as figure 5, *a*; thorax, abdomen, and legs yellow; arista with some long hairs..... **marquesana**, new species
- Mesonotum with four pairs of moderately strong dorsocentral bristles; a yellow species, with the lateral angles of the epistome and the center of the labrum black, the frons, genae, and a large central mark on posterior margin of the mesonotum and the entire scutellum white, pleura paler than the mesonotum, with a black central mark; legs yellow; knobs of halteres black; arista bare..... **atriceps** Malloch
- Mesonotum with three pairs of strong dorsocentrals, the anterior pair presutural; a black species, the pleura sometimes at least partly yellow; arista with three or more long hairs..... 2
2. Frons with a yellow line on each side of the ocellar triangle that extends from the vertex to or beyond level of the anterior ocellus (males)..... 3
- Frons without yellow lines as described above (females)..... 5
3. Pleura and legs almost entirely testaceous yellow; fore tarsus not thickened or abnormally haired..... **minor**, new species
- Pleura and legs preponderantly black; fore tarsus thickened and rather long-haired ..... 4
4. Arista with four hairs including the apical one, that is with four free extremities..... **dimorpha**, new species
- Arista with five hairs including the apical one..... **tarsalis** Malloch
5. Pleura and legs entirely or almost entirely yellow..... **minor**, new species
- Pleura and legs preponderantly black..... 6
6. Arista with four hairs..... **dimorpha**, new species
- Arista with five hairs..... **tarsalis** Malloch

***Asteia tarsalis* Malloch.**

Hivaoa: Mount Temetiu, altitude 3200 feet, September 13, 1929, miscellaneous sweeping, 1 specimen, Mumford and Adamson.

***Asteia marquesana*, new species (fig. 5).**

## Male

Head entirely yellow, the frons with a small black mark between the ocelli, the epistome not noticeably paler than the face above it. Profile as figure 5, *a*; frons flat, dull except on the upper half of orbits and the ocellar triangle, the two lines that show

pale yellow in the males of the other species are evident when the frons is viewed from the side against the light as more glossy raised lines enclosing a dull incised line and they extend to or almost to the level of the orbital bristles; vertex with the same central emargination behind the ocelli as is found in *A. tarsalis*, and the incurved vertical bristle behind and slightly mesad of the outwardly curved one (fig. 6, *a*). This last character distinguishes this and the black species from the Marquesas from *A. atriceps*, providing another character besides the plumose arista for generic separation if one feels so inclined. Arista with four hairs.

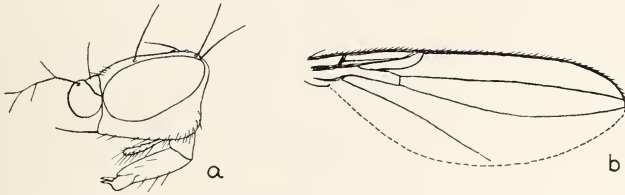


FIGURE 5. *Asteia marquesana*: *a*, head in profile; *b*, wing.

Thorax yellow, mesonotum more brownish and dull. Dorsocentrals 2 pairs, the anterior one close to suture; humeral and acrostichals lacking, a series of microscopic hairs in front of each anterior dorsocentral, both notopleurals present as well as one posterior intra-alar and one postalar; sternopleurals 2, both yellow; scutellum with two long bristles and in front of each a short hair; the mesonotal and scutellar bristles dark brown. Legs yellow and yellow-haired. No distinct bristles present; apical segment of all tarsi slightly enlarged and the claws somewhat irregularly scimitar-shaped, the hairs not exceptionally developed. Wings hyaline, veins yellow, the shape and venation normal for the genus (fig. 5, *b*). Abdomen brown, elongate, the hypopygium yellow, of moderate size. Knobs of halteres brown. Length, 2.25 mm.

Upou: Tekohepu Summit, altitude 3200 feet, November 28, 1931, at light, LeBronnec.

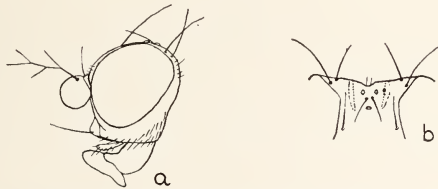


FIGURE 6. *Asteia dimorpha*: *a*, head of male in profile; *b*, frons of male.

### *Asteia dimorpha*, new species (fig. 6).

#### Male

Similar to the male of *A. tarsalis*, differing mainly in being larger and in having the arista with one less hair. The frontal bristling is the same as in *A. marquesana* (fig. 5), but the head is not as elongate (fig. 6, *a*), and the eyes being more rounded, the height of the gena is much reduced.

Thorax shining black, the sutures of the pleura narrowly brownish yellow. Chaetotaxy similar to that of *A. tarsalis*, differing from that of *A. marquesana* in having a pair of strong presutural dorsocentrals. All the bristles are black.



Legs black, trochanters, apices of tibiae, and all the tarsi testaceous yellow. Fore tarsi a little thicker than the mid and hind pairs, the latter not as thick as in *A. tarsalis*, nor as strongly haired. Wings distinctly browned, the venation similar to that of *A. marquesana*. Abdomen black, stouter than in *A. marquesana*, the hypopygium black. Knobs of halteres black.

#### Female

Differs from the male in having no indication of the two yellow frontal lines, the glossy black orbits being fused with the similarly colored triangle. The abdomen is narrowed apically, and the wings are slightly paler. Legs as in male. Length, 2.5-3 mm.

Upou: Tekehepu Summit, altitude 3000 feet, November 28, 1931, holotype male, allotype, and 11 paratypes, some beaten from *Cyrtandra* and others from *Freycinetia* species, LeBronnec.

#### *Asteia minor*, new species.

#### Male

Very like a small *A. dimorpha*, differing essentially in having the pleura and legs, including the fore coxae, entirely yellow.

Head differing from that of *A. dimorpha* in having the frons entirely shining, the central stripe or interfrontalia not dull black in front of the anterior ocellus, but distinctly shining though less glossy than the orbits, and no well defined anterior marginal reddish yellow transverse stripe, the anterior margin slightly and very narrowly brownish. Unfortunately in all the specimens available except two the antennae are broken off. In the two that have these organs intact, one has the arista with five, the other with six hairs, or free ends.

Thorax black, glossy, the pleura either entirely yellow or the sutures largely bordered with that color. Chaetotaxy as in *A. dimorpha*. Legs yellow, sometimes the femora, and rarely the tibiae largely blackened, the tarsi much less thickened and less haired than in *A. tarsalis*. Wings grayish hyaline, venation normal. Abdomen black, largely dull above, the hypopygium yellowish. Knobs of halteres fuscous.

#### Female

Differs from the male in lacking the two yellow frontal lines, and in having the abdomen more tapered apically and generally yellow on apical half.

Hivaoa: Kakahopuanui, altitude 2500 feet, January 5, 1932, sweeping herbage, male holotype and one paratype, LeBronnec.

Upou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 21, 1931, sweeping on ferns, allotype and 8 paratypes, LeBronnec.

#### Family DROSOPHILIDAE

As there are two apparently endemic genera in the Marquesas I am presenting below a generic key for their further elucidation. I also give some additional data on some of the already described species and the description of one new species of considerable interest from the point of view of generic limitations. I have no additional records of *Marquesia* and *Mycodrosophila*, which are represented in the Marquesas by one species each.

Key to the Genera

1. Mesonotum with three or four pairs of strong dorsocentrals, at least one of which is presutural..... 2  
 Mesonotum with but one or two pairs of strong dorsocentrals, all postsutural..... 3
2. Mesonotum with four pairs of strong dorsocentrals, and the intra-dorsocentral hairs in more than two series behind the suture; eye not longer than high.....  
 ..... **Marquesia** Malloch  
 Mesonotum with three pairs of strong dorsocentrals, and the intra-dorsocentral hairs biseriate on the entire length; eye much longer than high (fig. 7).....  
 ..... **Rosenwaldia**, new genus
3. Intradorsocentral hairs in at least six more or less irregular series..... 4  
 Intradorsocentral hairs in two or four regular series..... 5
4. Wing with a deep incision or notch in the costa at point where the subcostal vein should enter it and the costa deep black just before incision; thorax markedly convex above, the mesonotum glossy black, the scutellum also black, but its disc velvety; mesonotum with but one pair of strong dorsocentrals.....  
 ..... **Mycodrosophila** Oldenburg  
 Wing with but a slight notch at apex of subcostal cell and not black before it; thorax not markedly convex above, nor colored as above; mesonotum with two pairs of strong dorsocentrals.....  
 ..... **Drosophila** Fallen
5. Arista furcate, with but two free extremities, the two branches subequal in length, sometimes the lower branch with a very short preapical hair on upper side.....  
 ..... **Dicladochaeta** Malloch  
 Arista with at least two long upper hairs..... 6
6. Face evenly and rather prominently convex below on its entire width, sloping gradually to epistome..... **Bunostoma** Malloch  
 Face varying from almost flat to distinctly carinate, the carina separated from epistome by a distinct depression..... **Scaptomyza** Hardy

Genus **DROSOPHILA** Fallen

I did not present a key to the species of this genus in my previous paper and now do so in order to amplify my previous report.

Key to the Species

1. Fore femur with a series of short, black, closely placed bristles on the apical half of its anteroventral surface; mid tarsus with a short black bristle about one fourth from its base below (*Spinulophila*)..... **nasuta** Lamb  
 Fore femur without a series of short, closely placed bristles on apical half of its anteroventral surface; mid metatarsus without a ventral bristle about one fourth from base (*Drosophila*)..... 2
2. Fore tarsus of the male with a comb of short glossy-black spines on apical half of the posterior surface of its basal segment..... **ampelophila** Loew  
 Fore tarsus of male without a comb of spines as above, but the two basal segments with the ventral setulae more erect and longer than usual, arranged in transverse series that are quite conspicuous when the tarsus is seen from the side.....  
 ..... **errans** Malloch

**Drosophila nasuta** Lamb, **Drosophila errans** Malloch.

These two species are apparently found almost invariably in company with each other, generally on flowers or decaying fruits, and are evidently widely distributed throughout the Marquesas at all altitudes.

The species recorded from Fiji by Bezzi as *D. ananassae* Doleschall may be the same as *D. errans*, but Bezzi gives no details of the tarsal structure of the male.

### Genus SCAPTOMYZA Hardy

Three species of this genus from the Marquesas have been described, and here I give a key to these species, together with the description of a new one which is quite aberrant in that it is robust and very similar to many species of *Drosophila*; but there are only four regular series of intradorsocentral hairs, a character that, trivial as it may appear, is useful in distinguishing the two genera.

### Key to the Species

1. Mesonotum with four regular series of short, stiff setulose intradorsocentrals; general color black, the mesonotum slightly shining, with faint brownish dust and without a trace of dark vittae..... **quadriseriata**, new species  
Mesonotum with but two regular series of stiff setulose intradorsocentrals..... 2
2. Mesonotum with a pair of outstanding short bristles in the intradorsocentral series close to the suture, and the surface with four dark brown vittae ..... **mumfordi** Malloch  
Mesonotum without a pair of outstanding short bristles in the intradorsocentral series close to the suture..... 3
3. Arista with but two long hairs above and none below..... **biseta** Malloch  
Arista with more than two long hairs above and with at least one below.....  
..... **latifrons** Malloch

### *Scaptomyza quadriseriata*, new species.

Head black, face grayish dusted, the frons with the orbits and triangle slightly shining and brownish gray dusted, the triangle extending as far forward as the orbits, to beyond middle, back of head grayish dusted behind the ocelli; antennae and palpi fuscous. Proclinate orbital slightly in front of the level of the small anterior reclinate one and nearer to inner margin of orbit than it; all the bristles except the anterior reclinate one well developed, the postverticals moderately long. Eyes with minute stiff hairs. Face carinate, the transverse impression above epistome not very deep. Arista with rather variable hairing, but usually three above, and one near apex below.

Thorax black, slightly shining, the mesonotum with thin, even brownish dust and no trace of dark vittae. Dorsocentrals 2 pairs, humeral 1, the intradorsocentral hairs in four regular series between the lines of hairs anterior to the dorsocentrals and back to between the dorsocentrals; sternopleura with one long posterior and one very short anterior bristle.

Legs black, knees and tarsi testaceous yellow, the tibiae brownish. No exceptional armature present. Wings brownish hyaline, the costa rather distinctly broken at apex of subcostal vein where there are two distinct setulae. Inner cross vein distinctly beyond level of apex of first vein and at one third or a little more from base of discal cell. Abdomen shining black. Halteres fuscous. Length, 2.5 mm.

Hivaoa: Temetiu Summit, altitude 4160 feet, January 20, 1932, type female and 2 paratypes on *Piper latifolium*, allotype, and 1 paratype, on *Weinmannia*, and 1 paratype, beating on *Cheirodendron*, LeBronnec.

It is entirely probable that the occurrence of the species on these plants is not indicative of a direct association with them, as the larvae are very probably to be found in decaying fruits or vegetation, none of the species of the genus being restricted to one plant as far as we at present know.

Genus **DICLADOCHAETA** Malloch

**Dicladochaeta biseriata** Malloch.

This species which is the only one of the genus known at present is represented in my new material by two specimens.

Hivaoa: Temetiu Summit, altitude 4160 feet, January 20, 1932, *Cyrtandra* species and *Cheirodendron* species, LeBronnec.



FIGURE 7. *Rosenwaldia kaavae*, head in profile.

Genus **ROSENWALDIA**, new genus

This genus is named in honor of the Julius Rosenwald Fund, which has so generously contributed toward studies of Pacific insects in 1934.

This genus, though having the mesonotum with but two series of intradorsocentral hairs, is, I consider, not closely related to *Scaptomyza*, nor if the shape of the head is any indication is it closely allied to any other genus from the Marquesas. The head (fig. 7) reminds one very strongly of the genus *Stegana* of which I have not seen any representative from Oceania. The discal and basal cells are not separated by a cross vein, and there are three pairs of strong dorsocentrals on the mesonotum, the anterior pair slightly presutural. Genotype, *Rosenwaldia kaavae*.

**Rosenwaldia kaavae**, new species (fig. 7).

Female

Head whitish yellow below, the upper half from slightly below middle of the facial carina and from neck, including the frons, dark brown, the latter more grayish on the orbits and triangle which extend to anterior margin and are slightly shining, the antennae brown, second segment red; palpi with apices blackened. Armature of the frons as in *Drosophila*, but the proclinate orbital is slightly behind and distinctly mesad of the small anterior reclinate bristle; inner incurved vertical in front of the outer outwardly curved one. Facial carina quite prominent, and rather narrow.

Thorax yellowish brown, greasy in type, but showing three dark-brown vittae on the mesonotum; pleura dark brown on upper third, yellow below. Mesonotum with three



pairs of strong dorsocentrals, one humeral, and the intradorsocentral hairs in two regular series. Legs yellow, much obscured by the mounting medium in type, but showing brown at apices of femora and tibiae and bases of tibiae. Wings brownish hyaline, much as in *Scaptomyza quadriseriata*, but more pointed. Abdomen brownish black, with narrow yellowish apices to the tergites. Halteres brown. Length, 2.5 mm.

Hivaoa: Kaava Ridge, altitude 2820 feet, January 6, 1932, LeBronnec.

#### Family EPHYDRIDAE

I have not given a key to the genera of this family in my other papers on the Marquesan material but here present one that includes all genera known to me from these islands and the Society Islands.

There is considerable difference of opinion among workers on the Ephydridae as to the characters useful in dividing the family into subfamilies. Becker and Hendel have disagreed on the number of the subfamilies that ought to be recognized in Europe. I have accepted Canacinae as a subfamily, and the two writers just referred to considered it as a distinct family.

A careful study of the material available to me leads me to suspect that there are several segregates in the subfamily Ephydrinae as accepted by me, but that they are not distinguishable along the lines suggested by either Becker or Hendel. In the genus *Ephydra* Fallen and its closest relatives the prosternum and propleura are haired, the abdominal tergites have no trace of spiracles in their sides, and the pulvilli are rudimentary or lacking. In *Napaea* Robineau-Desvoidy (= *Parhydra* Stenhammer) and its relatives the prosternum and propleura are bare, the abdominal tergites have rudimentary spiracles near their lateral edges, and the pulvilli are present. In the remainder of the genera the spiracles are not visible in the tergites and the prosternum and propleura are bare. It appears to me extremely probable that ultimately the classification will take into consideration some if not all of these characters and that there will be a radical realignment of the genera.

In the Marquesan material there are no species related closely to the *Napaea* group. Although the lack of pulvilli in one genus in these islands and in another in the Society Islands might suggest to some taxonomists that they are related to the *Ephydra* group, I incline to the opinion that they are, rather, offshoots from the *Scatella* group, which is well represented in the Marquesas.

#### Key to the Genera

1. Discal and posterior basal cells separated by a cross vein, and the anal cell and anal vein distinct (*Canacinae*)..... **Nocticanace** Malloch
- Discal and posterior basal cells not separated by a cross vein, and the anal cell and anal vein undeveloped (*Ephydrinae*)..... 2
2. Mid tibia with one or more long bristles on posterior surface, if only one present it is close to base; disc of the scutellum haired..... **Paralimna** Loew
- Mid tibia with no strong posterior bristles..... 3



- |   |                                    |
|---|------------------------------------|
| 3. Scutellum haired on disc; each frontal orbit with one reclinate and one proclinate bristle almost transversely placed at middle; ocellar bristles in transverse line with the anterior ocellus.....          | <b>Discocerina</b> Macquart        |
| Scutellum with no discal hairs; frons not bristled as above.....  | 4                                  |
| 4. Face entirely covered with hairs on center, and usually some bristles near the sides, evenly convex, the mouth opening large.....  | 5                                  |
| Face not entirely covered with hairs, bare in center, usually with some bristles on the sides.....  | 8                                  |
| 5. Pulvilli small but distinct; face strongly haired, the hairs stronger above in center  | 6                                  |
| Pulvilli lacking; face with very fine short hairs which are not stronger above in center .....  | 7                                  |
| 6. Mesonotum with three pairs of strong dorsocentrals, the anterior pair presutural, and one long and one short pair of acrostichals near suture.....   | <b>Neoscatella</b> Malloch         |
| Mesonotum with two pairs of strong dorsocentrals and one pair of discal acrostichals .....  | <b>Scatella</b> Robineau-Desvoidy  |
| 7. Mesonotum with at least one pair of long acrostichals close to the suture; ocellars well-developed; costa with some widely separated bristles that are much longer than the diameter of the costal vein..... | <b>Chaetoscatella</b> , new genus  |
| Mesonotum without long acrostichals; ocellars minute; costa without long outstanding bristles.....  | <b>Apulvillus</b> , new genus      |
| 8. Face almost flat, not excavated below bases of antennae.....   | 9                                  |
| Face prominently produced either above or at middle or at epistome, in one case broadly convex below and depressed above.....   | 10                                 |
| 9. Face entirely covered with dust; arista long-haired above.....   |                                    |
| .....   | <b>Hydrellia</b> Robineau-Desvoidy |
| Face gray dusted on sides, glossy in center; arista very short-haired.....  |                                    |
| .....   | <b>Neohydrellia</b> Malloch        |
| 10. Arista without distinct hairs.....  | <b>Mosillus</b> Latreille          |
| Arista long-haired above, bare below.....   | 11                                 |
| 11. Face slightly and evenly convex on lower two thirds, with a slight eminence at upper central edge of the convexity and above that rather abruptly excavated....   |                                    |
| .....   | <b>Ilythea</b> Haliday             |
| Face with center or lower margin prominently produced.....  | 12                                 |
| 12. Face produced noselike in center, the tip of the protuberance shining, remainder densely gray dusted; gena more than half as high as eye.....   | <b>Hecamede</b> Haliday            |
| Face produced noselike at epistome; gena not more than one fourth as high as eye .....  | <b>Philygriola</b> Hendel          |

Of the genera included in the above key the following are before me from the Marquesas: *Nocticanace*, *Apulvillus*, *Ncohydrellia*, *Mosillus*, *Hecamede*, and *Philygriola*. The following genera are in material from both groups of islands: *Paralimna*, *Scatella*. The genera from the Society Islands are: *Chaetoscatella*, *Discocerina*, *Hydrellia*, and *Ilythea*. *Nocticanace* and *Apulvillus* are known only from the Marquesas and *Chaetoscatella* only from the Society Islands up to date.

Genus APULVILLUS, new genus

This genus has much in common with one described immediately below from the Society Islands, both lacking distinct pulvilli, having the face similar in structure and haired on disc, with some lateral bristles. The distinctions, however, are in my opinion of more than mere specific value, and

I erect a new genus for each of the species, which genera belong to the same section as *Scatella*. I have noted the principal distinguishing characters of this genus in the foregoing key to the genera; they consist in the main of the lack of costal bristles and the minute ocellar bristles which are distinguishable only with a high-power lens.

A quite remarkable feature of the species is that the female has the fore femur modified. When such a character occurs in species of this family it is almost invariably the male that has it and the female that has the femora normal. The differences in the wing structure of the sexes are not as remarkable, the greater thickening of the costal vein before the apex of the first vein being met with in the males of a few other species, notably in *Scatella*, though I do not remember any such modification of the wing tip and the veins of that section of the wing as is seen here.

Genotype, *Apulvillus bronnecki*.

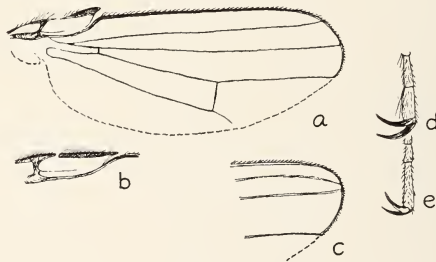


FIGURE 8. *Apulvillus bronnecki*: a, wing of male; b, base of costa of wing of female; c, apex of wing of female; d, apical two segments of fore tarsus of male; e, apical two segments of fore tarsus of *Chaetoscatella cheesmanae*.

### *Apulvillus bronnecki*, new species (fig. 8).

#### Male

A black species, with the face and sides of frons dull, brown dusted, the frontal triangle glossy and with a coppery to aeneous tinge, the thorax and abdomen shining, legs black, wings brownish hyaline with dark brown veins, and halteres black.

Head almost as in *Chaetoscatella*, but the facial hairs are shorter and weaker, the lateral bristles are usually two in number, the ocellars are sometimes entirely lacking, and at most consist of two microscopic hairs. The frons is about twice as wide as long, with a broad central glossy bronzy black triangle and the sides dull brown.

Thorax shining black, thinly overlaid with brown dust, the mesonotum uniformly colored, with two widely separated pairs of postsutural dorsocentrals, one well-developed presutural intra-alar, the anterior notopleural shorter than the posterior one, the intradorso-central hairs almost indistinguishable, and the scutellum with two long apical bristles basad of which there is one fine short hair on each side.

Legs black, the femora practically nude, the tibiae with less evident hairs than in *Chaetoscatella*, the fourth and fifth tarsal segments of the forelegs almost equal in length, the fourth with a pair of moderately long apical ventral bristles that lie close against the ventral surface of the fifth segment (fig. 8, d). Wings brownish hyaline, the veins thick and black (fig. 8, a). Abdomen black, lightly brownish dusted. Fifth tergite tapered apically, about twice as long as fourth, the latter distinctly shorter than third. No well-developed bristles in evidence. Halteres black.

## Female

Differs from the male in having the basal part of the costa less dilated on the costal vein (fig. 8, *b*), the wings less evenly rounded and more narrowed at tip and with the second and third veins more approximated at their apices (fig. 8, *c*). The fore femur is also slightly but distinctly emarginate at apex below, and the slight eminence before the emargination is rather densely short-haired. The tarsi are more slender and the claws less developed than in the male. Length, 3-3.5 mm.

Uapou: Vaikokoo, Paaumea Valley, altitude 2200 feet, November 26, 1931, resting on wet rocks, type male, allotype, and 11 paratypes, LeBronnec.

This apparently endemic species is named in honor of the collector.

Genus *CHAETOSCATELLA*, new genus

This genus has much the same appearance and general characters as *Apulvillus* but differs in the characters listed in the foregoing generic key, and in addition to these the wings and legs are the same in structure in both sexes, and the fifth tarsal segment is very much longer than the fourth, while the fourth has no pair of black bristles at its apex (fig. 8, *e*).



FIGURE 9. *Chaetoscatella cheesmanae*, head of male in profile.

***Chaetoscatella cheesmanae***, new species (fig. 9).

Entirely black, center of frons, the mesonotum and dorsum of abdomen shining, the face with dense brown dust. Wings brownish hyaline. Knobs of halteres black.

Head black, the frons with a broad central glossy greenish-black triangle that extends to anterior margin, laterad of which the sides are but slightly shining and densely brown dusted, the face densely brown dusted; antennae and palpi fuscous. Vertex with all four bristles well developed, the postverticals lacking, ocellars moderately long, erect and divergent, each orbit with two outwardly curved bristles and a few minute hairs. General form and armature as in figure 9.

Thorax shining black, with a slight aeneous tinge on mesonotum and scutellum, the mesonotum and upper half of the pleura rather densely brown dusted, the lower half of pleura partly gray dusted. Mesonotum with two pairs of long postsutural dorsocentrals in front of which there are some setulose hairs in the same lines, and one long and one or two shorter pairs of acrostichals, the long pair at suture, the others anterior to them; scutellum with four bristles, the anterior pair fully half as long as the posterior pair.

Legs black, the coxae slightly grayish white dusted. Fore femur in neither sex with abnormal form or armature; fifth segment of all tarsi distinctly longer than the fourth, longest in male, the fourth without long apical ventral bristles (fig. 8, *e*). Wings brownish hyaline, without markings, the costal vein broken beyond humeral cross vein and again at apex of subcosta, not particularly thickened in either sex between the breaks, and with a

series of widely spaced bristles on the anterior edge between the apices of first and second veins, most of the bristles very distinctly longer than the diameter of the vein. In other respects the wing is very similar to that of *Apulvillus*. Abdomen colored as thorax, much the same as in *Apulvillus*, the female with a pair of apical genital bristles that are fine and generally concealed. Halteres black. Length, 4-4.5 mm.

Society Islands: Tahiti, April 9, 1925, type male, allotype and 8 paratypes, L. E. Cheesman. Material submitted by the British Museum and to be returned to that institution.

**Neoscatella atra** Malloch.

Uahuka: Matapopo, Hane Valley, altitude 800 feet, February 27, 1931, LeBronnec and H. Tauraa.

Nukuhiva: Hakau Valley, Vaioa, November 16, 1929, Mumford and Adamson.

**Scatella septempunctata** Malloch.

Eiao: Vaituha, altitude 200 feet, 1 headless specimen, A. M. Adamson.

Family TRYPETIDAE

I have already recorded two species of this family from the Marquesas, one of which is an endemic species of *Dacus*, the other a species of the widely distributed genus *Trypanea* Schrank. Now I have to record a third species, this time one that is widely distributed over the Old World from Africa to Oceania, and also in the New World, where it is not uncommon in the United States.

Genus PAROXYNA Hendel

Many of the species included by Hendel in his genus have been described in *Oxyina* Loew, or in *Ensina* Loew.

**Paroxyna sororcula** Wiedemann.

I am not at all convinced that the synonymy given by Hendel in his paper on the Palearctic Trypetidae<sup>1</sup> is correct in all respects, as there are, in my opinion, at least two species involved in the complex in South America. However, this is not the place to discuss the matter and I accept the species before me as *P. sororcula* without committing myself to a definite opinion as to its being identical with the forms occurring in South America.

Uapou: Tekohepu Summit, altitude 3000 feet and 3200 feet, November 28, 1931; Teavanui, altitude 2900 feet, November 26, 1931, at light; LeBronnec. This record is noteworthy, as members of this family rarely come to light.

A large series of this species was also taken by the Pacific Entomological Survey in the Society Islands.

<sup>1</sup>Linder, Die Fliegen der palarktischen Region, 49, Trypetidae, p. 158.



# ARCTIIDAE, NOCTUIDAE, AND SPHINGIDAE OF THE MARQUESAS ISLANDS\*

By

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BRITISH MUSEUM (NATURAL HISTORY)

In the present paper are enumerated 18 species of Arctiidae, Noctuidae, and Sphingidae taken by the Pacific Entomological Survey in the Marquesas. Of these, *Lambula erema* and *Macroglossum marquesanum* are described for the first time. In addition, 6 species of Noctuidae, *Perigea serva* Walker, *Earias huegeli* Rogenhofer, *Hyphaetra discolor* Fabricius, *Hypena longfieldae* Collenette, *Hypena sanctigeorgii* Collenette and *Hyblaea puera* Cramer, 4 of which were taken during the St. George Expedition and 2 by Commander J. J. Walker in 1883, are listed in my paper of 1928, making a total of 24 species occurring in the archipelago.<sup>1</sup>

Among these 24 species, 16 are of wide distribution throughout the tropics, occurring also in Tahiti, and 5 of them extending to Hawaii. In addition, *Hyblaea puera* Cramer is found throughout the world in the warmer countries and has been taken in Samoa and Fiji, but it has not yet been recorded from Tahiti. Two other species have a limited distribution: *Earias huegeli* Rogenhofer, in Australia, Fiji, Samoa, and Tahiti; *Hypena longfieldae* Collenette, so far as is known, only in Rapa in addition to the Marquesas.

The remaining five species, *Lambula erema* Collenette, *Callopietria ouria* Collenette, *Achaea marquesanus* Collenette, *Hypena sanctigeorgii* Collenette, and *Macroglossum marquesanum* Collenette, are endemic, all of them taken above 1950 feet, the *Callopietria* having interesting island races. No close relationship is shown among these five species between the Marquesas and Hawaii, and no comparison is yet possible with Tahiti, as insufficient work has hitherto been done in the mountains of that island. All, however, have affinities with the Indo-Australian region and not with the neotropical region.

Whereas the Survey and St. George collections contained long series of the majority of the cosmopolitan species, 4 out of the 5 endemic species were taken sparingly. This was not entirely owing to the difficulty of working "light" at an elevation. There is little doubt that additional species remain to be discovered above 2000 feet in the larger islands, and it is to be hoped that future workers will endeavor to supplement the records in this direction.

In this paper the Comstock-Needham system has been employed for the

\* Pacific Entomological Survey Publication 7, article 15. Issued March 15, 1934.

<sup>1</sup> Collenette, C. L., The Arctiidae, Noctuidae, and Sphingidae of the St. George Expedition, from French Oceania: Ent. Soc. London, Trans., vol. 76, pt. 2, p. 469, 1928.



wing-venuration, and Ridgway's Color Standards and Color Nomenclature, 1912, for descriptions of color in new species.

I am indebted to Mr. W. H. T. Tams for kind assistance rendered during the writing of the paper.

## FAMILY ARCTIIDAE

### SUBFAMILY LITHOSIINAE

**Lambula erema**, new species (fig. 1).

#### Male

Palpus pinkish buff, beneath at the base Prout's brown. Antenna sayal brown. Head, thorax, and abdomen pinkish buff, mixed on the abdomen with fuscous black, the segments ringed distally with pinkish buff. Pectus, venter, and legs pinkish buff, mixed on the legs with sayal brown. Forewing Saccardo's umber mixed in the terminal and costal areas with cinnamon buff; fringe pinkish buff. Hindwing Saccardo's umber; fringe pinkish buff to cinnamon buff, these colors slightly invading the wing in terminal and apical areas. Under side of both wings as on upper side. Expanse, 18-19 mm.

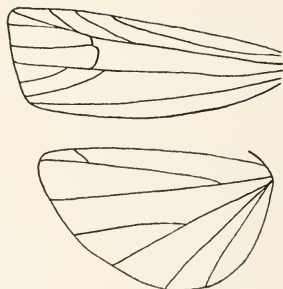


FIGURE 1. Venation of wing of *Lambula erema*, new species.

Hivaoa: Feani Summit, altitude 3970 feet, January 13, 1932, at light, holotype male and paratype male, LeBronnec.

The species of this genus range from Sula and New Guinea to Australia. The present species is the first to be described from the Pacific islands, but it is probable that others have been overlooked.

The illustration of the venation may be compared with those of the same genus<sup>2</sup> and the absence of a cross vein in the hindwing should be noted.

<sup>2</sup> Hampson, F., Catalogue of the Lepidoptera Phalaenae in the British Museum, vol. 2, pp. 98-101, 1900.

## FAMILY NOCTUIDAE

## SUBFAMILY HADENINAE

**Tiracola plagiata** (Walker).

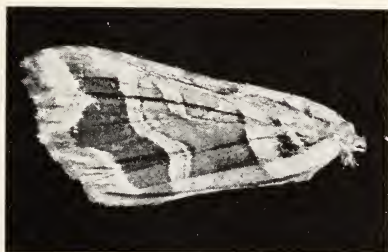
*Agrotis plagiata* Walker, List Lep. Ins. Brit. Mus., 11, p. 740, 1857.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 7, 1932, at light, 1 female; Avaoa Valley, altitude 2820 feet, January 6, 1932, 1 female; Feani Ridge, altitude 3970 feet, January 13, 1932, at light, 5 males, January 14, 1932, at light, 2 males; LeBronnec.

Uapou: Tekohepu Summit, altitude 3200 feet, November 28, 1931, at light, 1 male, 1 female; LeBronnec.



a



b

FIGURE 2. Forewings of *Callopietria ouria*: a, *C. o. nanodes*, new subspecies; b, *C. o. ouria* Collenette.

## SUBFAMILY ACRONYCTINAE

**Callopietria ouria ouria** Collenette (fig. 2, b).

*Callopietria ouria* Collenette, Ent. Soc. London, Trans., p. 472, pl. 21, fig. 3, 1928.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6-7, 1932, at light, 2 males, 3 females; Kakahopuanui [Kakaho Puanui], altitude 2460 feet, January 5, 1932, at light, 1 female; Feani Ridge, altitude 3970 feet, January 13,

1932, at light, 3 males, 3 females; Feani Ridge, Tenatinaei, altitude 3970 feet, January 14, 1932, at light, 17 males, 1 female; LeBronnec.

**Callopostria ouria nannodes**, new subspecies (fig. 2, a).

Male and Female

Differ from *C. o. ouria* Collette in smaller size and in pattern of forewing. In *C. o. ouria* the subterminal fascia is sharply angled inwards and produced to a point between veins  $M_1$  and  $M_2$ , while in *C. o. nannodes* the fascia at the same spot is rounded or produced only slightly to an angle. Furthermore, the postmedial fascia in *C. o. ouria* is, in nearly all specimens, more sharply angled in its course than is the case in the other subspecies. The genitalia do not appear to differ.

Expanse: *C. o. nannodes*, males, 33, 33, 33, 34 and 34 mm.; females, 32, 33, 34, 34, 35, 35, 35, and 35 mm. *C. o. ouria*, males 36, 37, 37, 37, 38, 38, 38, 38, 38, 38, 38, 38, 39, 39, 39, 39, 39, 39, 39, 40, 40, and 40 mm.; females, 36, 38, 39, 39, 39, 39, 39, and 40 mm.

Uapou: Tekohepu Summit, altitude 3200 feet, November 28, 1931, at light, 1 holotype male, 1 allotype female, 3 males and 6 females, paratypes; Teoatea, Hakahetau Valley, altitude 1950 feet, November 17 and 20, 1931, at light, 1 male and 1 female, paratypes; LeBronnec.

*C. o. ouria* has been taken in Hivaoa and Fatuhiva (St. George Expedition), *C. o. nannodes* in Uapou. Less collecting appears to have been done at an elevation elsewhere in the group, and the species has not been recorded from any of the remaining islands.

**Prodenia litura** (Fabricius).

*Noctua litura* Fabricius, Syst. Ent., p. 601, 1775.

Hivaoa: Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 1 female, LeBronnec.

Tahuata: Vaitahu, May 21, 1930, at light, 1 female; Amatea, altitude 2700 feet, June 26, 1930, 1 male; LeBronnec and H. Tauraa.

Eiao: altitude 50 feet, April 17, 1931, at light, 1 female, LeBronnec and H. Tauraa; above Vaituha, altitude 1200 feet, October 3, 1929, 1 female, A. M. Adamson.

**Spodoptera mauritia** (Boisduval).

*Hadena mauritia* Boisduval, Fauna Ent. Madag., p. 92, 1833.

Tahuata: Vaitahu Valley, seashore, June 17, 1930, 1 female, LeBronnec and H. Tauraa.

**Chasmina tibialis** (Fabricius).

*Bombyx tibialis* Fabricius, Syst. Ent., p. 578, 1775.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 7, 1932, at light, 1 male, LeBronnec.

Fatuhiva: ridge east of Omoa [Oomoa] Valley, altitude 3100 feet, August 28, 1930, 1 male, LeBronnec.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, 1 female, LeBronnec.

## SUBFAMILY ERASTRINIÆ

***Amyna octo*** (Guenée).

*Perigea octo* Guenée, Noct., 1, p. 233, 1852.

Tahuata: Hanahevane Valley, seashore, July 15, 1930, 13 males, 6 females, July 16, 1930, 7 males, 4 females; Vaitahu, May 21, 1930, at light, 2 males; Kiinui Valley, altitude 1100 feet, April 16, 1930, 26 males, 11 females, and altitude 1200 feet, June 14, 1930, 3 males, 3 females, LeBronnec and H. Tauraa.

Uapou: Hapava, altitude 500-600 feet, December 13, 1929, on bunch grass, 1 male; Hakahetau Valley, altitude 1000-2000 feet, January 29, 1930, 1 male; R. R. Whitten.

Nukuhiva [Nukahiva]: Taiohae, sea level, June 4, 1931, at light, 2 males, 1 female, LeBronnec and H. Tauraa.

Uahuka: Hanahoua Valley, altitude 45-60 feet, March 9, 10, 1931, 2 males, 4 females; Hane Valley, altitude 150 feet, March 9, 1931, 3 males; Vaipae Valley, altitude 250 feet, March 17, 1931, 1 female; Haavei Valley, altitude 270-300 feet, March 19, 1931, 4 males, 3 females, and (without record of height), March 19, 1931, 6 males, 1 female; Teanauhiva, altitude 300 feet, March 18, 1931, 9 males, 1 female, LeBronnec and H. Tauraa.

Eiao: altitude 50 feet, April 24, 1931, at light, 2 females, LeBronnec and H. Tauraa; Vaituha, altitude 200 feet, October 3, 1929, at light, 1 male, A. M. Adamson.

Hatutu [Hatutaa]: altitude 1500 feet, April 28, 1931, 4 males, 1 female, LeBronnec and H. Tauraa.

## SUBFAMILY CATOCALINÆ

***Achaea marquesanus*** Collenette.

*Achaea marquesanus* Collenette, Ent. Soc. Lond., Trans., p. 476, pl. 21, fig. 1, 1928.

Hivaoa: Kakahopuanui [Kakaho Puanui], altitude 2460 feet, January 5, 1932, at light, 2 males; Kaava Ridge, altitude 2460 feet, January 7, 1932, at light, 2 males; Feani Ridge, altitude 3970 feet, January 13, 1932, at light, 2 males; Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 1 female; LeBronnec.

This species was described from a single male, taken at 3500 feet on Hivaoa in January 1925. Three of the present males have the basal and distal thirds of the forewing colored pinkish buff, contrasting with the cinnamon brown or Prout's brown of the medial third. Expanse: males, 61-70 mm.; female, 68 mm.

**Achaea janata** (Linnaeus).

*Geometra janata* Linnaeus, Syst. Nat., Ed. 10, p. 527, 1758.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 7, 1932, at light, 3 females, LeBronnec.

Eiao: Vaituha, sea level, October 2, 1929, 7 males, 3 females; altitude 200 feet, October 3, 1929, at light, 1 male, 1 female, A. M. Adamson.

**Mocis frugalis** (Fabricius).

*Noctua frugalis* Fabricius, Syst. Ent., p. 601, 1775.

Fatuhiva: Uia [Ouia] Valley, altitude 100 feet, September 2, 1930, 1 female; Teatapu, altitude 1400 feet, August 19, 1930, 1 female; Hanavave Road, altitude 1560 feet, August 23, 1930, 1 female; LeBronnec.

**Mocis trifasciata** (Stephens).

*Catephia trifasciata* Stephens, Ill. Brit. Ent. Haust., 3, p. 128, 1829.

Hivaoa: Tahauku [Tahuaku], sea level, July 10, 1929, 1 male, 1 female, Mumford and Adamson.

Fatuhiva: Uia [Ouia] Valley, altitude 100 feet, September 2, 1930, 1 female, LeBronnec.

Uapou: Tekohepu Summit, altitude 3200 feet, November 28, 1931, at light, 1 female, LeBronnec.

Nukuhiva [Nukahiva]: Taiohae, sea level, June 4, 1931, at light, 2 males, LeBronnec and H. Tauraa.

Uahuka: Hane Valley, altitude 30-50 feet, March 13-16, 1931, at light, 1 male, 4 females; Hane Valley, altitude 150 feet, March 9-15, 1931, at light, 3 males, 3 females; Hanahoua Valley, altitude 60 feet, March 10, 1931, 1 male, 1 female; Haave [Haavei] Valley, altitude 270-300 feet, March 19, 1931, 6 males; Teanatuhiwa, altitude 300 feet, March, 18, 1931, 1 female; Hanatekeo, Hane Valley, altitude 950 feet, February 24, 1931, 1 male; LeBronnec and H. Tauraa.

Eiao: altitude 50 feet, April 17 and 25, 1931, at light, 2 females, LeBronnec and H. Tauraa.

## SUBFAMILY PHYTOMETRINAE

**Phytometra chalcites** (Esperance).

*Noctua chalcites* Esper, Nat. eur. Schmett., 4, pl. 141, fig. 3, 1789; p. 447, 1798.

Uahuka: Hane Valley, altitude 30 feet, March 15, 1931, at light in the laboratory, 1 male, LeBronnec and H. Tauraa; Hanahoua Valley, altitude 45 feet, March 9, 1931, 1 female, LeBronnec and H. Tauraa.



## SUBFAMILY OPHIDERINAE

**Anomis flava flava** (Fabricius).

*Noctua flava* Fabricius, Syst. Ent., p. 601, 1775.

Uapou: Tekohepu Summit, altitude 3200 feet, November 28, 1931, at light, 2 females, LeBronnec.

Nukuhiva [Nukahiva]: Tapuaooa, altitude about 2500 feet, May 30, 1931, 1 female, LeBronnec and H. Tauraa.

Eiao: Vaituha, sea level, October 2, 1929, 2 males, 1 female, A. M. Adamson.

The two males and one female from Eiao are rather small for the species, measuring in expanse respectively 29, 26, and 28 mm. The female from Nukuhiva measures 33 mm., and the two females from Uapou, 34 and 35 mm.

**Anticarsia irrorata** (Fabricius).

*Noctua irrorata* Fabricius, Spec. Ins., Append. 2, p. 506, 1781.

Uahuka: Hanahoua Valley, altitude 45-60 feet, March 9 and 10, 1931, 1 male, 1 female; Vaihaatiki, altitude 250 feet, March 11, 1931, 1 female; Haave [Haavei] Valley, altitude 270 feet, March 19, 1931, 1 female; Vaipae Valley, altitude 250 feet, March 17, 1931, 1 male, 2 females; Maninioa Valley, altitude 570 feet, March 11, 1931, 1 female; LeBronnec and H. Tauraa.

## SUBFAMILY HYPENINAE

**Simplicia caeneusalis** (Walker).

*Sophronia* (?) *caenusalis* Walker, List Lep. Ins. Brit. Mus., 16, p. 94, 1858.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 female, LeBronnec.

Tahuata: Vaitahu, seashore, June 3, 1930, 1 female, LeBronnec and H. Tauraa.

Uapou: Tekohepu Summit, altitude 3000 feet, November 30, 1931, beaten from *Weinmannia* species, 1 male, LeBronnec.

## FAMILY SPHINGIDAE

## SUBFAMILY ACHERONTIINAE

**Herse convolvuli** (Linnaeus).

*Sphinx convolvuli* Linnaeus, Syst. Nat., Ed. 10, p. 490, 1758.

Eiao: Vaituha, sea level, October 2, 1929, 2 males, A. M. Adamson; altitude 50 feet, April 24, 1931, at light, 2 males, 1 female, LeBronnec and H. Tauraa.

The red color of the metanotal and abdominal patches in these specimens is largely, but not entirely, replaced by warm buff.

SUBFAMILY PHILAMPELINAE

**Chromis erotus eras** (Boisduval).

*Dcilephila eras* Boisduval, Voy. Astrol., Lep., p. 185, 1832.

Hivaoa: Atuona, May 15, 1929, 1 female, May 24, 1929, 1 female, May 25, 1929, 1 male; Mumford and Adamson.



a



b

FIGURE 3. *Macroglossum marquesanum*, new species: a, type specimen, male; b, genitalia.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 18, 1930, 1 male, September 26, 1930, 1 male, 1 female, LeBronnec.

Nukuhiva [Nukahiva]: Taiohae, sea level, July 23, 1931, at light, 1 male, LeBronnec and H. Tauraa.

Uahuka: Hane Valley, altitude 150 feet, March 13, 1931, at light, 1 female, LeBronnec and H. Tauraa.

Eiao: altitude 50 feet, April 16, 1931, at light, 1 male, April 24, 1931, at light, 1 male, LeBronnec and H. Tauraa.

**Macroglossum marquesanum**, new species (fig. 3, *a*, *b*).

## Male

Palpus, head, and thorax brownish olive, the palpus lighter beneath. Antennal shaft sepia. Abdomen brownish olive, segments 3 and 4 with large Sanford's brown dorso-lateral patches and with small whitish lateral patches distally; segments 5 and 6 with large fuscous black dorsolateral patches, changing to Sanford's brown laterally; segments 2 to 7 with a narrow band of fuscous black distally, bordered narrowly with Sanford's brown; anal tuft brownish olive narrowly bordered with Sanford's brown. Pectus and legs brownish olive, the tarsi irrorated thickly with darker scales. Venter Sanford's brown, with a narrow band of fuscous black distally on each segment. Forewing bistre to brownish olive; three faintly defined straight bands across the wing, the antemedial and medial broader than the postmedial; between veins  $R_1$  and  $R_5$ , about 4 mm. from the apex, a faintly defined patch of Sanford's brown; fringe bistre. Hindwing and fringe Sanford's brown, the brownish olive of the abdomen slightly invading the base of the wing. Under side of forewing Sanford's brown, a terminal border of fuscous, broadening from apex to vein  $M_2$ , thence narrowing to a point at the tornus; fringe fuscous. Under side of hindwing Sanford's brown, basal area orange buff, costa bordered narrowly with fuscous; fringe Sanford's brown. Expanse: males, 60-65 mm.; length of antenna, 15-16.5 mm.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 7, 1932, at light, 3 males, LeBronnec.

This interesting endemic species appears to be most nearly related to *M. vacillans* Walker (1864), which has a range from Sumbawa eastwards to Queensland. The palpus is shorter and less pointed than in *M. vacillans*, the antenna thicker and nearly twice the length, the upper side of hindwing without dark marking. In the genitalia, the harpe of *M. marquesanum* is blunt-ended and much broader than in *M. vacillans*. *M. marquesanum* is rather widely separated in structure and appearance from *M. hirundo* Boisduval (1832) of Tahiti and other islands further west. The genus is not represented in Hawaii.

## MARQUESAN SIPHONAPTERA\*

By

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Very little is known of the siphonapterous fauna of the South Sea islands; therefore, even though no new species are included in the material reported upon in this paper, the collection is, nevertheless, interesting. The fact that no fleas were taken on the Marquesan *kioe enata* (so-called "native rat") is of particular interest in view of P. A. Buxton's<sup>1</sup> statement of his belief that *Mus exulans* "has no flea peculiar to it." With the exception of the *kioe enata* and a prehistoric breed of swine which may now be extinct, I am informed that all the Marquesan mammals are of comparatively recent introduction.

All the specimens reported herein were forwarded to me by Mr. E. P. Mumford, Director of the Pacific Entomological Survey, to whom I am indebted for information regarding the hosts. One family, three genera, and three species are represented in this collection.

### FAMILY PULICIDAE

#### Genus XENOPSYLLA Glinkiewicz

##### **Xenopsylla cheopsis** Rothschild.

Hivaoa: Atuona, February 11, 1929, 1 specimen; March 1, 1929, 2 specimens, from the recently introduced *kioe kai ehi* (*Rattus rattus?*) Mumford and Adamson.

#### Genus PULEX Linnaeus

##### **Pulex irritans** Linnaeus.

Uahuka: 1931, host unrecorded, 3 specimens, LeBronnec and H. Tauraa.

Tahuata: Vaitahu Valley, July 2, 1930, off *Canis familiaris*, 1 specimen, LeBronnec and H. Tauraa.

Hivaoa: Atuona, March 13, 1929, off *Canis familiaris*, 2 specimens, Mumford and Adamson.

Nukuhiva: Taiohae, October, 1929, off *Homo sapiens*, 2 specimens, Adamson.

#### Genus CTENOCEPHALIDES Stiles and Collins

##### **Ctenocephalides felis** Bouché.

Hivaoa: Atuona, February 12 and 13, 1929, off *Canis familiaris*, 91 specimens; July 20, 1929, off 2 specimens of *Canis familiaris* (70 specimens), and off *Felis domestica* (27 specimens); Mumford and Adamson.

Tahuata: Vaitahu Valley, July 12, 1930, off *Canis familiaris*, 15 specimens, LeBronnec and H. Tauraa.

Fatuhiva: Hanavave Valley, September 12, 1930, off *Canis familiaris*, 17 specimens, LeBronnec.

Eiao: Vaitahu, October 1, 1929, "probably left by dogs," 2 specimens, Adamson.

<sup>1</sup> Buxton, P. A., Siphonaptera: Insects of Samoa, pt. 7, fasc. 2, p. 53, 1928.

\* Pacific Entomological Survey Publication 7, article 16. Issued September 18, 1934.

# SOME TYROGLYPHINA (SARCOPTIFORMES) OF THE MARQUESAS ISLANDS \*

By

ARTHUR PAUL JACOT

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## INTRODUCTION

### GENOTYPES

A genus does not become valid until it is assigned a type. Thus the date of a genus is the date when it is assigned a type; previous to that it is a concept. The type makes the genus an individual.

Pierre André Latreille alone is responsible for the fixation of the types of all the earliest genera of mites. Oudemans<sup>1</sup> thinks that Latreille's use of the words "example" or "type" was dominated by "style" or "variety." I can not accept this idea, because Latreille did not use the word "type" or even "example" in his earlier publication,<sup>2</sup> and because a careful study of his three publications reveals that the type idea was a growing and developing concept in Latreille's mind. For example, in the earlier publication<sup>2</sup> he used no example whatever for two of his new genera (*Argas* and *Siro*); the rest of the time he used neither "example" nor "type." In the next work<sup>3</sup> he used the term "example" quite consistently. In the 1810 treatise we find the term "type" as well as the variety of designations pointed out by Oudemans. Finally, Latreille ended his work with a table in which a "type" is assigned to each genus. Nothing could be more complete or final, as far as type designation is concerned, and this is therefore fittingly the work from which we should derive the fixation of types (except the monotypes).

No type was assigned to the genus *Acarus* until 1810.<sup>4</sup> The first genus of mites definitely fixed by a type is *Atomus*.<sup>5</sup> Thus *Atomus* becomes type genus of the order of mites and should be used instead of *Acarus*.

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<sup>1</sup> Oudemans, A. C., Kritisch historisch overzicht der Acarologie, pt. 2: Tijds. voor Ent., vol. 72, suppl., pp. 33, 34, 1929.

<sup>2</sup> Latreille, P. A., Précis des caractères génériques des insectes, disposés dans un ordre naturel, 201 pp., Paris, 1796.

<sup>3</sup> Latreille, P. A., Histoire naturelle, générale, et particulière des crustacés et des insectes, vol. 3, Paris, 1802.

<sup>4</sup> Latreille, P. A., Considérations générales sur l'ordre naturel des (animaux composant les classes des) crustacés, des arachnides, et des insectes, p. 430, Paris, 1810.

<sup>5</sup> Latreille, P. A., Observations sur la variété des organes de la bouche des Tiques, et distribution méthodique des insectes de cette famille d'après les caractères, établis sur la conformation de ces organes: in Millin, Noël, et Warens, Magasin Encyclopédique, vol. 4. p. 18, 1795.

\* Pacific Entomological Survey Publication 7, article 17. Issued May 12, 1934.



## ABDOMINO-CEPHALOPROTHORACIC SUTURE

In earlier papers I have referred to the anterior edge of the notogaster or its indistinct remnant as the abdomino-cephaloprothoracic suture. For various reasons I no longer regard the anterior edge of the notogaster as the anterior edge of the abdomen. In brief, reference to such genera as *Belba* and *Oppia* show distinctly that this region is a midthoracic constriction passing between the second and third pairs of legs. This midthoracic constriction has developed in the mites as a result of the functional orientation of the legs: the anterior two pairs are directed forward and act as pullers; the hind two pairs are directed backward and act as pushers. This reverse motion of these double pairs has caused a reversal in the direction of the muscles attached to the epimera or apodemata so that the muscles of legs II and III become attached to the fused apodemata II and III. In the earlier stages of evolution in this group, this midthoracic fusion and concentration caused a considerable constriction which, in the higher Oribatidae, becomes almost entirely obliterated. I shall therefore refer to this area as the "midthoracic constriction," and to the anterior edge of the notogaster (which is the fused thoracic tergites III and IV and abdominal tergites) as the "midthoracic suture."

## THE UNGUIS

Probably because so many specialists on mites have had to work on highly specialized forms in parasitic or plant-injuring groups, a morphological character of some practical value in dividing the great order of mites with its 167 "families" seems to have been overlooked. This cleavage plane separates two strikingly different groups:

1. Mites with rather long, well-developed, cursorial legs having tarsi provided with two claws, usually accompanied by an arolium.
2. Mites with rather short, ambulatory legs having tarsi provided with one claw, often developed from a shaft and called the "unguis."

In both these groups there are, of course, many exceptions. The Opilioacaridae, Holothyridae, Mesostigmata, and Ixodoidea are typical of the first group. In most of these the legs are fairly long and the segments are more or less constricted at the ends. In the almost parasitic Uropodoidea the legs are shorter and the segments cylindrical. The Tarsonemoidea have two claws to tarsi II and III (the two conservative legs), and two to tarsi I in the immatures. Among free-living genera, *Labidostoma* has tarsus I with two claws, though other tarsi have three claws and *Caenonychus* has but a single claw. Throughout the mites, legs II and III are more conservative than legs I or IV. In the protostigmatal scaphbasket one finds a preponderance of two-clawed species, though these two claws are often masked by various modifications. For instance, in the Tetranychidae the arolium may be split into 2,

4, or even 6 hooks, and the claws may be similarly split into knob-tipped styles of a corresponding number or variously frayed at the base. All these modifications are reducible to three elements, a single ventral (typically an arolium) and two dorsal.

Among the ambulatorial mites (Sarcoptiformes) the nail also goes through many modifications, the commonest being to split on two sides to form three hooks. Although these three hooks are the regular thing in the highest Oribatoidea, the immatures and primitive genera have but a single hook. In one species both conditions occur. Irrespective of the number of hooks, there is only one basal (proximal) unit. The various modifications to be found in the parasitic forms are of no interest in this connection as being specializations away from the primitive condition. Legs I and IV, especially IV, are most susceptible to changes. That is, legs II and III are the most stable. It will be recalled that in both *Limulus* and the eurypterids the fourth leg is strikingly different from legs I to III.

#### NONSYSTEMATIC UNITS

A striking feature of the system of classification of the order as used in northern Europe is the use of such group names as cohorts (sub- and super-) and phalanx (sub- and super-), and the lack of such familiar divisions as subfamilies and superfamilies. Also the use of odd group names originally used to designate a certain category, but now used for entirely different categories. Rather than to retain this heterogeneous and additional assortment of terms, I will follow the simpler practice of using standard terminations of standard groups (tribes, subfamilies, superfamilies, and suborders) based on the oldest valid genus.

Among the Oribatoidea the various terms Diagastres, Syngastres, Macropylina, Brachypylna, Circummarginatae, Immarginatae, Pterogasterinae, Apterogasterinae, Ptyctima, Aptyctima, are interesting expressions of the presence or absence of certain structural characters, but have no rank in systematic nomenclature and only serve to clutter up classification.

The grouping of 37 subfamilies under 1 or 2 families is not an ideal mathematical arrangement, but it must be remembered that our knowledge of the evolution of this order is still almost a void.

Finally, it is easier to change terminations like -ini, -inae, -idae, -oidea, -ina, of standard well-known genera, than to sprinkle the group with foreign terms. After all, it requires no great mental effort to think of the Camisiinae instead of the Camisiidae, or to think of the one as including a few more (peripheral) genera than the other.

As knowledge of the fundamental lines of evolution develops, more valid families will be recognized. In the meanwhile it may be found more desirable

to sink many of the subfamilies into tribes, so that Camisiinae and Camisiini will also convey a greater or smaller number of genera. Such a system is a far more convenient sliding scale than one in which exotic terms are interpolated at frequent intervals. The day may dawn, 200 years hence, when a superman will demonstrate that the tribe is another term for supergenus.

Systematic units higher than the genus, based on the oldest valid genus, do not need author citations. As we are not interested in the definition of the group, it is of no importance who first used the term or when. The type genus stands for the definition. The type species bears the characters. The characters deemed of tribal or family importance will vary with each generation of specialists, though they will always be present in the type species. Thus the terms of higher category become purely mechanical contrivances.

#### SUBORDER TYROGLYPHINA (SARCOPTIFORMES)

Characters: unguis formed of a single unit as proximal end, terminating in a claw, distal end variously modified in parasitic species.

In 1796 Latreille instituted the genus *Tyroglyphus*<sup>6</sup> referring only *Acarus siro* Linné to it. Thus *Acarus siro* is monotype of *Tyroglyphus*. It was not until 1810<sup>7</sup> that a type was assigned to the genus *Acarus*. This type is *Acarus siro* Fabricius. As Fabricius was a compiler, his *A. siro* is *Acarus siro* of Linné (Fabricius' first bibliographic reference). Thus *Acarus* is a synonym of *Tyroglyphus*.

*Acarus siro* Linné 1758 was a composite animal. By page or area precedence it is *A. farinae*. Moreover, the habitat cited by Linné, "in flour," has a line's precedence over the other.

#### SUPERFAMILY TYROGLYPHOIDEA

Characters: skin of body of adult whitish; genital and anal apertures strict, not covered by separately sclerotized covers; tarsal unguis without shaft; mouth parts conspicuously exposed in dorsal aspect.

#### FAMILY TYROGLYPHIDAE

Characters: skin of adults smooth, not finely wrinkled.

#### SUBFAMILY TYROGLYPHINAE

Characters: mandibles chelate; tarsi without arolium (caruncle); body with midthoracic constriction; some of the body bristles at least half as long

<sup>6</sup> Latreille, P. A., Précis des caractères génériques des insectes, disposés dans un ordre naturel, p. 185, 1796.

<sup>7</sup> Latreille, P. A., Considérations générales sur l'ordre naturel des (animaux composant les classes des) crustacés, des arachnides, et des insectes, p. 425, 1810.

as body is broad; males with suckers near anus and often on tarsi IV; nuchal bristles on transverse plane of tarsi I, smooth or absent.

#### TRIBE RHIZOGLYPHINI

Characters: tarsi I with stout thornlike bristles on dorsal face, one of them immediately distad of the scent club; some males with legs III specialized.

#### Genus RHIZOGLYPHUS Claparède

*Rhizoglyphus* Claparède: Studien an Acariden: Zeit. f. Wiss. Zool., vol. 18, p. 506, 1869.

Characters: prothorax with only two bristles behind the cephalon; no bristles on mesal portion of post-thorax; posterior end of abdomen without plate.

Type, *Rhizoglyphus robini* Claparède: Zeit. f. Wiss. Zool., vol. 18, p. 506, 1869 = *Tyroglyphus echinopus* Fumouze and Robin: Jour. l'Anat. Phys. Robin, vol. 5, pp. 287-304, 1868.

#### **Rhizoglyphus natiformius**, new species (fig. 1, *a-e*).

Diagnostic characters: posterior end of abdomen bilobed; two long bristles on sides near oil gland region and another ventroposteriad of them; anal region of females with one pair of very long bristles; male tarsi IV with two suckers.

Description: size of females, body 0.787 by 0.39 mm., abdomen 0.36 mm. high; males slightly smaller; body pyriform, lobed posteriorly; cephalon an elevated, rectangular area which is finely granular on dorsal face, bearing two pairs of bristles, one pair (the rostral) rather long, fine, approximate, inserted close to anterior edge and median plane, the other (camerostomal) short, stout, mesally bent, inserted on lateral rim of camerostome; prothorax fitting about ventroproximal portion of cephalon, undulate at sides between legs I and II, dorsally bearing two pairs of bristles, one pair (nuchal) fine, mesally bent, inserted over coxae I, close to foot of curve descending from cephalon, the other pair (lateral) very long, stout, inserted where one would expect pseudostigmatic organs; post-thorax broader than prothorax and demarked by a slight constriction, dorsolaterally bearing two pairs of bristles, one pair long, fairly stout, the other short, fine, inserted anteromesad of the major pair; abdomen broader than thorax, completely fused to it, with a slight, indistinct, transverse demarcation across its middle; anterior half with two pairs of bristles inserted close to transverse line, the mesal pair long, fairly stout, the lateral pair short, fine, inserted near lateral edge of abdomen; posterior part of abdomen characteristically undulate, both at sides and behind (fig. 1, *a*), lateral lobe with two pairs of long bristles on dorsal face, posterior lobes with two pairs of long, stout bristles inserted at center of lobe, the lateral pair on a secondary more dorsal lobe, a fifth pair of long, fine bristles inserted on ventral face of sides of posterior lobes; finally a sixth pair of long, stout bristles inserted on ventral face of mesal edge of lobes each side of anal aperture, these being the longest and stoutest of all the bristles; between posterior lobes on dorsal face is a small median circle which has the appearance of a pore or opening.

Ventral face of thorax normal for the genus, that is, sternum articulating with coxae I, which bear a short bristle; parasterna I with a short bristle at center; parasterna II without bristle; coxae II articulating with apodemata both anterior and posterior to it, the posterior apodemata weak, forming posterior edge of midthoracic constriction; a



short bristle on these coxae; parasterna III and IV very oblique, III only with a bristle, as also coxae III; no bristle discernible on parasterna and coxae IV; a short bristle laterad of genital sucker region, another mesad of region of coxae IV.

Legs fairly short, legs I with unguis surpassing mouth parts, legs IV if stretched backward not reaching end of abdomen; legs I (fig. 1, *b*) with tarsi twice as long as broad; dorsal face with usual scent club directed laterad, laterad of it are two very small rodlike bristles; a long, fine bristle inserted laterad of base of anterior spine; a stout bristle inserted distad of dorsodistal spine, reaching nearly to apex of hook; a fine, fairly long bristle inserted proximad of base of hook; a similar one on mesal side; a fine, rather short bristle inserted distad of ventral spine. Tibiae shorter than high, dorsal face with major bristle curved strongly mesad; a ventrolateral spine inserted its length from distal edge. Genuals similar to tibiae; dorsal face with a short dorsolateral spine inserted on proximal edge; distal end with two bristles: a fairly long one, the other half as long, closely inserted. Femora with a long ventrodial bristle inserted a short distance from distal edge.

Legs II quite similar but without the long, dorsodistal bristle on genuals, long bristles somewhat shorter.

Legs IV of females (fig. 1, *c*) with tarsi nearly three times as long as high; with a single spine on dorsal face, inserted at distal third of segment; a very long, fine bristle inserted immediately proximad, a shorter one inserted laterad of this dorsal spine; ventral face with two spines, besides the spinelike process beneath the hook, a very short lateral spine between dorsal and ventroproximal. Tibiae longer than high; a stout, medium-long bristle inserted at dorsodistal edge; a short, slender spine inserted on ventral face near distal end. Genuals shorter than tibiae, without bristles. Femora with a fine bristle inserted at distal third of ventral face.

Legs III similar but tibiae with very much longer dorsodistal bristle; genuals with a short, stout, dorsodistal bristle; a short spine inserted at center of ventral face; no bristles on femora.

Legs IV of males (fig. 1, *d*) with sucker midway between proximal end of segment and long dorsal bristle which is shorter and broadened at distal end; another sucker in place of dorsal spine present in female; no lateral bristle. Tibiae with only the dorsodistal bristle, spinelike. Genuals without bristles. Femora with ventral face bristle better-developed. Legs III as in the female. Legs I with distal end of long bristles slightly flattened out.

Hivaoa: Matauuna, altitude 3900 feet, taken March 3, 1930, under rotting bark of *Cheirodendron* (near *platyphyllum*), several specimens, Mumford and Adamson, slide 33M17 (cotypes).

The chief chaetotaxial differences in the females of this species and *R. echinopus*<sup>8</sup> are that in this species the small bristle ventrad of the major post-thoracic is usually absent; the bristle anterior to the genital suckers is absent, but there is one mesad of coxae IV; the bristle laterad of the anterior end of the anus is absent; in legs I the small bristles laterad of the scent club are both close to the club; the long lateral bristle inserted close to the hook is a spinelike bristle; there are only two spines on ventral face; the bristle distad of the ventroproximal spine is short and very fine; the lateral bristle of the tibiae is absent; the major bristles of tibiae I and II are strongly curved mesad; the spines of the genuals are like those of the tarsus.

<sup>8</sup> Fumouze, Armand, and Robin, Charles, Observations sur une nouvelle espèce d'acariens du genre *Tyroglyphus*: Jour. l'Anat. Phys., Robin, vol. 5, pp. 287-304, pls. 20, 21, 1868.



*Rhyzoglyphus longipes*<sup>9</sup> from Tahiti has no spine before the scent club and has two collateral spines at center of ventral face of tarsi I with none at distal end. It therefore may be a *Caloglyphus*. *Rhyzoglyphus grossipes*<sup>9</sup> also from Tahiti has very stout legs.

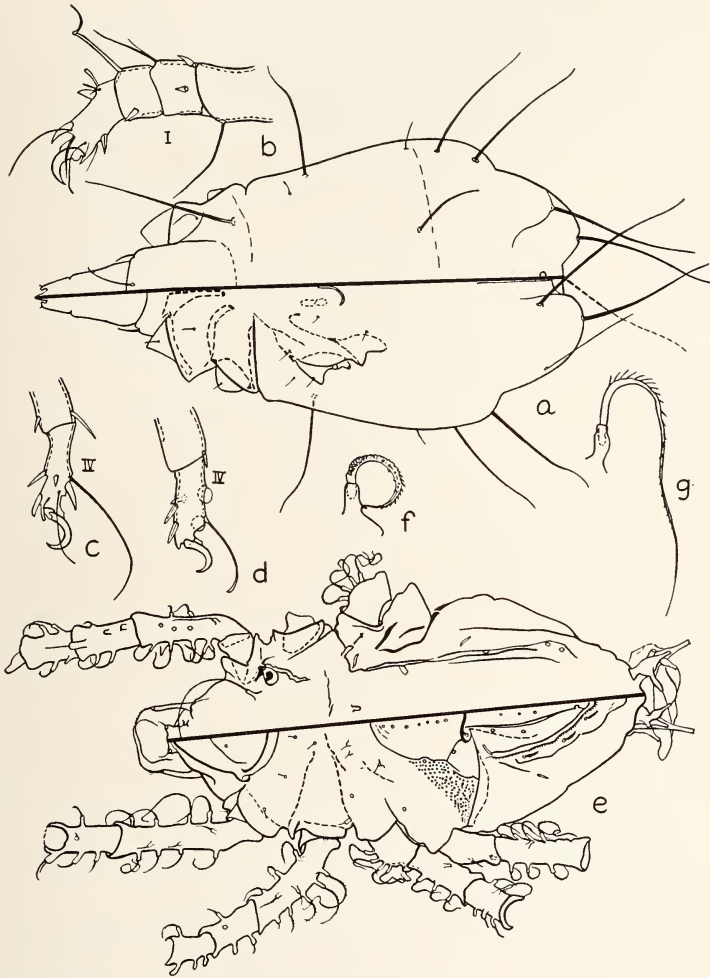


FIGURE 1. *Rhyzoglyphus natiformius*, new species, adult: *a*, dorsoventral aspects of female, legs omitted, mouth parts outlined, ratio  $\times 120$ ; *b*, legs I of female, ratio  $\times 200$ ; *c*, tarsi IV of female, ratio  $\times 200$ ; *d*, tarsi IV of male, ratio  $\times 200$ . *Acronothrus nukuhivae*, new species, adult: *e*, dorsoventral aspects, female, mouth parts omitted, ratio  $\times 60$ ; *f*, bristle of femur III, ratio  $\times 200$ ; *g*, bristle of trochanter III, ratio  $\times 200$ .

<sup>9</sup> Berlese, Antonio, Centuria quinta di Acari nuovi: Redia, vol. 14, p. 144, 1920.

## SUPERFAMILY ORIBATOIDEA

Characters: skin of body of adults yellowish to black; genital and anal apertures conspicuous, covered by separately sclerotized covers; tarsal unguis with well-formed shaft articulated to end of tarsus.

## FAMILY ORIBATIDAE

Characters: legs ventral or lateral, not capable of being withdrawn into anterior end of abdomen; if genital and anal apertures are widely spaced there is no transverse suture dividing the ventral plate, and the genital aperture is distant from apodemata IV; mouth parts usually quite hidden by extension of rostrum anteriorad and ventrad.

## SUBFAMILY CAMISIINAE

Characters: anal and genital apertures contiguous; in addition to the two genital covers, the two anal covers, the preanal, and the ventral plate, there are other plates; lamellae poorly developed. Type, *Camisia* Heyden; Isis von Oken, vol. 18, p. 612, 1825.

Genus **ACRONOTHRUS** Berlese

*Acronothrus* Berlese: Redia, vol. 12, p. 65, 1916.

Characters: Camisiinae with adanal covers distinct; anterior and posterior genital covers fused; parasterna and aggenital plates fused but distinct from the notogaster; pseudostigmata large, organs short, globular, not or barely protruding from pseudostigmata; rostrum entire.

Type, *Nothrus cophinaris* Michael: Linn. Soc. London, Jour., Zool., vol. 30, p. 142, pl. 19, figs. 13-16, 1908.

**Acronothrus nukuhivae**, new species (fig. 1, *e-g*).

Diagnostic characters: posterior apophyses reduced to two pairs, the one above the other, each apophysis branched; tarsi with well-developed apophyses on dorsal, lateral, and mesal faces, usually bearing a large hump of earthy matter which completely covers the dorsal part of the body, and often coats the legs as well.

Description: size of female 1.34 by 0.66 mm.; color brown when clean; cephaloprothorax smooth; rostrum produced as a rather square, flat-roofed gable, each corner produced as a rounded knob bearing a very short, rather stout bristle, center slightly convex (fig. 1, *e*); lamellae practically undeveloped, the slender horn from which the bristle springs being, as elsewhere in this species, a tubular apophysis, the bristles rather long, undulate, curved mesad then posteriad, somewhat barbed; interlamellar bristles inserted on a short horn, long, fine, smooth, curving gracefully across cephalon, thus being different from all other bristles of this species; pseudostigmata ovate, anterior edge flat, organ head ovate, larger half laterad of pedicel; prothorax smooth, barely distinguishable from post-thorax, with a sharp emargination between legs I and II, the walls built out as collars to shelter trochanters (coxae), collar of legs I very much emarginate dorsad of trochanters, an irregular ridge runs back from lateral edge of pseudostigmata, especially prominent along anterior rim of pseudostigmata; post-thorax separated from prothorax

at sides by a constriction (fig. 1, *e*) built out as a strongly protruding semicup for reception of legs IV; post-thorax entirely fused to abdomen in middle of dorsum, separated at sides by a more densely sclerotized band which passes ventrad to slip under the anal plate at anterior end of anal opening; a bristle apophysis on dorsolateral aspect of mid-thoracic constriction, a shorter apophysis each side of median plane, on same transverse plane; a long pseudoforamen posterior to latter; dorsum of abdomen sculptured by two or three longitudinal wrinkles midway between median plane and lateral edge of abdomen, these wrinkles bordered by four short, bristle apophyses or knobs; superior pair of posterior apophyses (fig. 1, *e*, upper half) with an ascending mesally directed branch, inferior pair (fig. 1, *e*, lower half) with two branches; these branches of the apophyses served to retain the posterior portion of the nymphal skins, and this accumulated complex serves to retain the pile of foreign matter which is found on many individuals.

Ventral plate not encroaching on labium, forming a sharp, open V with posterior edge of cephalon, ventrad of legs I, on a collar about their base; a similar collar developed about base of legs II, which juts out as a prominent ridge antieriad of coxae II (fig. 1, *e*, lower half); parasterna I with the three usual bristles, the sternal rather approximate; parasterna II with the more remote sternal bristles only; parasterna III with lateral bristle on anterior edge, projecting prominently; corresponding bristle of parasterna IV not discernible; middle bristle of parasterna III and IV nearer anterior than posterior edge of the parasterna; mesal bristles as in figure 1, *e*, the two close together on what appears to be the mesal end of parasterna III may be one from each parasternum; the single one on what appears to be the mesal end of parasterna IV may be a genital plate bristle while the other two are on the edge of the plate more posteriorly (compare with *Epilohmannia*); posterior edge of parasterna IV granular. Genital covers large, lateral edges not clearly defined, median edge with eight bristles. Pre-anal plate<sup>10</sup> vertical, undulate, ends pointed, posterior edge of genital plate curving around its ends. Circular area thus enclosed, including what has the appearance of a lenticular stigma, or broad pseudofissura. It is difficult to know whether the granular area is included by the genital plate or only the area posterolaterad of the genital aperture. Ventromesal edge of notogaster with three tuberculate bristles, on a liplike evagination of the edge (marked by a broken line in fig. 1, *e*, having the appearance of a chitin ridge in mounted specimens), a pseudofissura posterolaterad of anteriormost of these peripheral bristles. Adanal covers<sup>10</sup> with a pseudofissura at anterior margin, a bristle on transverse plane slightly posteriad, another on transverse plane of anterior bristle of notogaster periphery, and another close to posterior end of the cover; anal cover with the usual three marginal bristles.

Legs with trihomohamate ungues, and coarsely ciliate to tuberculate bristles (fig. 1, *f*, *g*) springing from tubular apophyses. Tarsi I long, gradually tapering; with a few sessile bristles on distal end of ventral face, 7 to 8 bristle-bearing apophyses along sides, with a broad dorsodistal apophysis giving rise to 2 or 3 long smooth bristles, 2 of which are equally long, closely inserted, curving over and beyond ungual hooks. Tibiae I very short; with a ventrolateral bristle each side, 2 on mesal, 1 on lateral and 2 on dorsal side; also a broad and longer dorsodistal apophysis bearing 2 smooth bristles. Genuals I longer, but armed very much like the tibiae, the major apophysis apparently bearing only 1 bristle. Femora I long and cylindrical; mesal face bearing 4 bristles, of which the second and third are most widely spaced, on one femur the proximal apophysis is dual and diverging; 3 rather closely spaced dorsolateral bristles; ventral face with 3 bristles, the anterior 2 somewhat lateral, the proximal 1 most widely spaced from the others; lateral face with 1 only (in fig. 1, *e*, lower femur somewhat canted showing the 3 dorsolaterals and the lateral bristle on lateral side). Legs II quite similar but femora with more bristles on lateral than mesal face.

Tarsi III and IV similar to I and II but the large dorsodistal apophysis and its bristles not so highly developed. Tibiae III and IV with a ventral bristle on each side, 2 dorsolateral and 3 dorsomesal, the proximal smaller, more erect, close to the middle one; the

<sup>10</sup> Grandjean, F. A., Observations sur les Oribates (4<sup>e</sup> sér.): Mus. d'Hist. Nat. Paris, Bull., ser. 2, vol. 5, p. 218, 1933.

only truly dorsal apophysis is the major one (on distal end). Genuals III and IV subequal to tibiae; armature similar but no third dorsomesal bristle. Femora IV with 3 dorsal bristles arranged as a crescent on distal half of segment; mesal face with 4 bristles arranged as a descending crescent on proximal two thirds of segment; lateral face with 3 bristles (fig. 1, *f*), the distal one most widely spaced; a single bristle on ventral face. Femora III similar but shorter; only 3 mesal bristles; the dorsal bristles occupying two thirds of the segment. Trochanters (coxae) IV with only one short, smooth bristle on ventrolateral face on a very short apophysis. Coxae III as IV but with 4 ciliate bristles (fig. 1, *g*) along lateral face. The type has tibia IV and genual IV of left side evidently shattered and regrown forming a single, irregular segment. The tarsal bristles have the granules widely spaced.

Nukuhiva: Tovii [Teovii], 2 miles northeast of Teuanui, altitude 2800 feet, October 26, 1929, on *Metrosideros collina*, holotype, Mumford and Adamson, slide 33M20.

### **Acronothrus nukuhivae hivaoae**, new subspecies.

Diagnostic characters: similar to the species but notogaster with only one longitudinal fold, the area immediately mesad weakly pock-marked; tarsi without apophyses, except the dorsodistal, the bristles almost sessile, those of distal half smooth, stout, rapierlike; dorsodistal apophysis of tibiae I bearing a stout bristle, and two unequal, slender bristles, the shortest as long as the apophysis; other bristles sessile, very finely burred; dorsodistal apophysis of genuals I bearing a stout bristle and a slender one, which is slightly longer than the apophysis; posterior apophyses of abdomen appear dwarfed and stunted, but may be broken off short.

Hivaoa: Mount Temetiu, altitude 3650 feet, May 27, 1929, from dead fern stipes, holotype, Mumford and Adamson, slide 33M19.

The Marquesan species of *Acronothrus* are most closely related to *A. unguifera*<sup>11</sup> but have more complex posterior apophyses.

### Genus UDETALIODES Jacot

*Udetaliodes* Jacot: American Micr. Soc., Trans., vol. 48, pp. 29-43, 1929.

Characters: Camisiinae with adanal and aggenital plates fused to each other, to parasterna, and to each other and behind anal aperture, thus forming a broad ventral plate; anterior and posterior genital covers distinct.

Type, *Liodes concentricus* Banks: American Ent. Soc., Trans., vol. 22, p. 15, 1895.

Trägårdh<sup>12</sup> quotes me as appointing *Oribata concentrica*<sup>13</sup> as type of this genus when I distinctly appointed as type, specimens which I had before me, as above indicated. Thus much that Trägårdh says is to no account and only serves to cloud the issue concerning the species that Hermann actually described, and not what subsequent writers thought he described.

<sup>11</sup> Michael, A. D., Unrecorded Acari from New Zealand: Linn. Soc. London, Jour., Zool., vol. 30, p. 144, 1908.

<sup>12</sup> Trägårdh, Ivar, Acarina from the Juan Fernandez Islands: Nat. Hist. Juan Fernandez and Easter Island, vol. 3, no. 55, pp. 558-559, 1931.

<sup>13</sup> Say, Thomas, An account of the Arachnides of the United States: Acad. Nat. Sci. Phila., Jour. vol. 2, p. 73, 1821.



**Udotaliodes hawaiiensis aculeatisetae**, new subspecies (fig. 2, *a-e*).

Differs from the species<sup>14</sup> and from *U. h. wakensis*<sup>14</sup> in that the interpseudostigmatic area is coarsely corrugate, as also the entire intercoxal area of the cephaloprothorax; rostral area finely, irregularly, transversely wrinkled; pseudostigmatic organ head entirely projecting from pseudostigmata (fig. 2, *d, e*); interlamellar bristles sessile, pointed, distal end curved laterad (fig. 2, *c-e*); anteromedian portion of notogaster with but 3 to 5 parallel incisions; anterolateral tubercles faint; posterior end of abdomen with 6 to 8 stylets like the interlamellar; all bristles with distal ends pointed by attenuation of one side (fig. 2, *b*), whence the subspecific name. Distal end of tarsus very broad, with a keel on both dorsomesal and dorsolateral angles, each keel with two bristles making up the two pairs usually found on dorsodistal half of tarsi I; besides the bristles figured (fig. 2, *a*) there is a short, fine bristle with the dorsoproximal triplet.

Nukuhiva: Ooumu, altitude 4050 feet, November 12, 1929, from leaf axils of *Cyperus*, 7 specimens, Mumford and Adamson, slides 33M13a and b (cotypes). This is an unrecorded habitat for this genus.

## SUBFAMILY CERATOZETINAE

Characters: Oribatidae with lateral edges of notogaster developed laterally as flat chitinous expanses or wings (pteromorphae) which do not extend anteriorly of posterior edge of cephaloprothorax; lamellae, when present, developed as slender ridges or narrow blades extending along sides of cephaloprothorax; interlamellar bristles never clavate; mandibles massively chelate.

## TRIBE SCHELORIBATINI, NEW TRIBE

Characters: Ceratozetinae without tectopodia I. Type, *Scheloribates* Berlese: Redia, vol. 5, p. 2, 1908.

## Genus SCHELORIBATES Berlese

Characters: Ceratozetinae with anterior edge of notogaster distinct; lamellae well-developed; no translamellae; pteromorphae confluent with body outline behind; tectopodia I not developed; distal end of lamellae with ridge (lamello-rostral) extending to rostral bristles and rim of camerostome; mesal end of apodemata IV fused to frame of genital aperture; sternum well-developed to camerostome; femora I without broad flange along ventral edge.

Type: *Oribates latipes* Koch: Deutschlands Crust., Myriap., und Arach., Regensburg, fasc. 38:14, 1844.

**Scheloribates fimbriatus whitteni**, new subspecies (fig. 1, *f, g*).

Differs from the species<sup>15</sup> in that the body is broad; pseudostigmatic organ head with single, long distal apicule and a few short cilia along dorsal edge (fig. 2, *g*); rostral

<sup>14</sup> Jacot, A. P., Concerning the genus *Neoliodes* (Oribatoidea-Acarina): American Micr. Soc., Trans., vol. 48, pp. 16, 31, 35, figs. 159-165, 1920.

<sup>15</sup> Thor, Sig., Einige Acarina, besonders Hydracarina aus Turkestan: Zool. Anz., vol. 88, Heft 7-8, p. 196, figs. 13, 14, 1930.



and interlamellar bristles few-burred; a cluster of porose areas over posterior part of notogaster; middle pair of sternal bristles on sternum; apodemata 1 short, hooklike; preanal bristles on anal aperture frame.

The interlamellar area and the postgenital area is sculptured by such irregular figures as may be made by pecking a smooth board with the point of a penknife. This sculpturing obliterates the position of the paramesal bristles. The one indicated in figure 2, *f*, is taken from the form.

Although legs 1 resemble most closely those of *Scheloribates muiri*<sup>16</sup> the general body characters are those of *Scheloribates fimbriatus calcaratus*<sup>16</sup> and *Scheloribates oahuensis*.<sup>19</sup> It is broader (relatively) than either, with a more rounded posterior end than *Scheloribates oahuensis*. The disposition of the bristles of the ventral area is very similar to *Scheloribates oahuensis*<sup>19</sup> but the anterior pair of sternals are laterad of the sternum; I found no cilia on the pseudostigmatic organ head in *Scheloribates oahuensis*. The porose areas are much larger in *Scheloribates fimbriatus whitteni*. Thus although the disposition of the bristles of the ventral area is so much like that of *Scheloribates oahuensis*, the other differences are considerable.

From *Scheloribates fimbriatus calcaratus* this species differs in the smoother cephalo-prothoracic bristles; reduced degree of ciliation of pseudostigmatic organs; very different apodemata 1; long apodemata 11-13; middle pair of sternal bristles on sternum; genital cover bristles spaced midway between lateral and median edges of covers; different porose areas; greater breadth of body; and more ventrally extended pteromorphae.

I believe it is closely related to *Scheloribates fimbriatus calcaratus*, but apodemata 1 are those of *Scheloribates oahuensis*. It is, therefore, of *Scheloribates fimbriatus* stock with reduced ciliation and other minor modifications.

Uapou: Hakahetau, altitude 2000 feet, December 14, 1929, in dead fruits of *Aleurites moluccana*, 3 specimens, R. R. Whitten, slide 33M6 (cotypes).

#### ***Scheloribates fimbriatus whitteni hivaooe*, new form (fig. 2, *h*).**

Differs from the subspecies in that the pseudostigmatic organ head apicule is shorter (fig. 2, *h*); preanal bristles more anterolaterad, setting them clear of the aperture frame; rostral and interlamellar bristles barbed to short ciliate; lateral postanal bristles more laterad, that is, more distant from aperture.

Hivaoa: Atuona Valley, February 28, 1929, 3 specimens, Mumford and Adamson, slide 33M3 (cotypes).

#### ***Scheloribates fimbriatus whitteni nukuhiva*, new form.**

Differs from the subspecies in that the broadest part of the abdomen is considerably behind the pteromorphae, making a broad posterior outline; middle sternal bristles on edge of sternum; preanal bristles beyond anal aperture frame; pseudostigmatic organs often carried under pteromorphae.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 29, 1929, under dead leaves, 12 specimens, Mumford and Adamson, slide 33M2a (cotypes). Figure 2, *i*, illustrates a parasite on the lamellar bristle of one of these specimens.

The very few specimens from each island make it impossible to determine if there is any size difference between the insular forms, but if there is, it is swamped by sex dimensurism. The males (from Uapou and Hivaoa) aver-

<sup>16</sup> Jacot, A. P., Some Hawaiian Oribatoidea: B. P. Bishop Mus., Bull. 121, figs. 69, 80, 88, 1934.

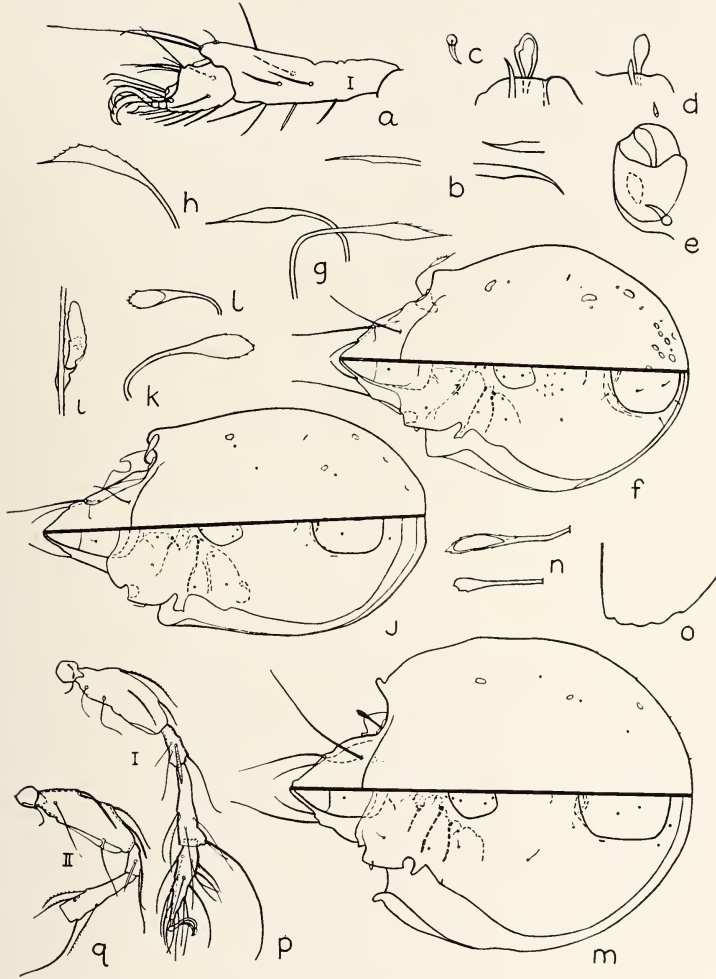


FIGURE 2. *Udetaliodes havaiiensis aculeatisetae*, new subspecies, adult: a, tarsus and tibia I, ratio  $\times 120$ ; b, leg bristles, to right of numeral from femora III, ratio  $\times 440$ ; c, interlamellar bristle, from above; d, pseudostigmata, lateral view, pseudostigmatic organ, and interlamellar bristle, ratio  $\times 150$  and  $\times 200$ ; e, pseudostigma, dorsal aspect, interlamellar bristle, and exopseudostigmal bristle, ratio  $\times 200$ . *Schcloribates fimbriatus whitteni*, new subspecies, adult: f, dorsoventral aspects, mouth parts and legs omitted, ratio  $\times 100$ ; g, pseudostigmatic organs, dorsal aspect, ratio  $\times 330$ . *Schcloribates fimbriatus whitteni hivaoae*, new form, adult: h, pseudostigmatic organs, lateral aspect, ratio  $\times 330$ . *Schcloribates fimbriatus whitteni nukuhivaee*, new form, adult: i, parasite on a lamellar bristle, ratio  $\times 440$ . *Schcloribates indicus marquesalis*, new subspecies, adult: j, dorsoventral aspects, mouth parts and legs omitted, ratio  $\times 120$ ; k, pseudostigmatic organs, ratio  $\times 330$ . *Schcloribates indicus marquesalis nukuhivensis*, new form, adult: l, pseudostigmatic organs, ratio  $\times 330$ . *Schcloribates (Paraschelobates) mumfordi*, new species, adult: m, dorsoventral aspects, mouth parts and legs omitted, ratio  $\times 60$ ; n, pseudostigmatic organs, below numeral foreshortened, as seen in dorsal aspect, above numeral as seen in lateral view, ratio  $\times 200$ ; o, oteromorphae, ventral half, ratio  $\times 75$ ; p, legs I, ratio  $\times 75$ ; q, femora, genuals and tibiae II, ratio  $\times 75$ .

age 0.44 by 0.646 mm., and the females (from Nukuhiva) average 0.476 by 0.72 mm.

**Scheloribates indicus marquesalis**, new subspecies (fig. 2, *j. k*).

Differs from the species<sup>17</sup> in being more slender; notogaster with sides almost parallel, posterior end flattened (fig. 2, *j*); pteromorphae projecting forward considerably beyond transverse plane on pseudostigmata; pseudostigmatic organ head more slender, very minutely barbed, barbs barely visible with magnification of 440; cephaloprothoracic bristles burred to weakly barbed; apodemata I very short, slender, with equally long posterior spur; parasterna II with a spinelike process running out from sternum; parasterna III much restricted by expansion of mesal end of apodemata IV; bristles of parasterna IV much more widely spaced; paramasal bristles much more distant from genital aperture; genitals I with major bristle extending nearly to tarsus.

Hivaoa: Atuona Valley, 1.5 miles from sea, altitude 300 feet, July 6, 1929, under rotting wood, 2 specimens, Mumford and Adamson, slide 33M1b (cotypes); February 28, 1929, 2 specimens, Mumford and Adamson, slide 33M3.

Another specimen on slide 33M1b has the body form and sternal area of *Scheloribates indicus* but has bristle 3 of genital covers midway between lateral and median edges of cover, and the distant paramasal bristles of *Scheloribates indicus marquesalis*. As I have but one specimen and consequently cannot determine its systematic status, I merely call attention to it.

One specimen from Uapou, Hakahetau, (altitude 2000 feet, December 14, 1929, in dead fruits of *Aleurites moluccana*, R. R. Whitten, slide 33M6), has the sternum slightly broader so that the middle pair of sternal bristles are on its edge.

**Scheloribates indicus marquesalis nukuhivensis**, new form (fig. 2, *l*).

Differs from the subspecies in that the posterior apophysis of apodemata I is poorly or not developed; the spine on parasterna II is less distinct; bristle 3 of genital covers is slightly more mesad; the pseudostigmatic organ head is distally somewhat pointed (fig. 2, *l*).

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 29, 1929, under dead leaves, 6 specimens, Mumford and Adamson, slide 33M2c (cotypes).

The average size of males is 0.3 by 0.5 mm., and of females, 0.34 by 0.56 mm. The breadth measurements include the pteromorphae.

One specimen from Eiao (altitude 1800 feet, April 30, 1931, under bark of *Aleurites moluccana*, LeBronnec) seems to be this form, but the genital cover characters are not discernible.

In *Scheloribates fimbriatus whitteni* the porose areas below the lamellae (acroleural porose areas) are larger than the pseudostigmata, while they are smaller in *Scheloribates indicus marquesalis*. The outstanding differences between the two species are the larger size and darker coloring of *Scheloribates*

<sup>17</sup> Jacot, A. P., Some Hawaiian Oribatoidea: B. P. Bishop Mus., Bull. 121, fig. 67, 1934.

*bates fimbriatus whitteni*. Both species are found on each of the same three islands.

Subgenus **PARASCHELOBATES**, new subgenus

Characters: as *Scheloribates* but with anterior edge and anteroventral corner of pteromorphae more developed; legs slender, femora II with very narrow flange at most.

Type, *Scheloribates (Paraschelobates) mumfordi*, new species.

**Scheloribates (Paraschelobates) mumfordi**, new species (fig. 2, *m-q*; fig. 3, *a-g*).

Diagnostic characters: body broad, almost as wide as long; cephaloprothorax broad, bristles long, stout, faintly few-burred; pseudostigmatic organ small, clavate, head small; anterior edge of pteromorphae thickened, recurved, forming a flaring lip (fig. 2, *m*); legs with long bristles; middle pair of sternal bristles at sides of sternum; genital cover bristles 3 midway between lateral and median edges of covers; paramesal bristles on transverse plane midway between apertures, more remote than breadth of anal aperture; genuals I and II with a fairly long, stout, burred spine inserted at center of lateral face.

Description: size of males 0.87 by 1.13 mm., of females 1.0 by 1.3 mm.; rostrum slender, distinct (fig. 3, *a*), distal end in certain aspects appearing lobed; lamellae projecting distinctly (fig. 3, *a*), far enough down on sides to completely cover sides of cephaloprothorax in dorsal aspect, lamellorostral ridges distinctly projecting (fig. 2, *m*); pseudostigmata barely extending beyond edge of pteromorphae, edges rounded (figs. 2, *m*; 3, *a*); pseudostigmatic organs held quite erect so that they appear quite foreshortened and the burrs are visible only as elusive undulations of the contour.

Pteromorphae extending broadly out from sides yet confluent with body outline behind, distal (ventral) end undulate, appearing nicked (fig. 2, *o*), the exact configuration of these undulations individually inconstant; porose areas small, bristle insertions few, the bristles minute, when present.

Ventral plate much broader in middle than anteriorly; tectopodia II well-developed, bristle at anterior third; tectopodia III slender, without angle or fold, tectopodia IV almost confluent with lateral outline; sternum well-developed, portion anterior to apodemata II equally wide and parallel-sided; only posterior bristles over it, the anterior pair as remote as middle pair; apodemata I short, with rounded mesal end; apodemata II-III similar, long; apodemata IV distant from II-III, well-developed; parasternal bristles normal to *Scheloribates*; genital aperture small, with strongly sloping anterior edge, joining lateral edge by a broad angle, posterior edge undulate; anal aperture large, with parallel sides; cover bristles unusually close to each other; preanal bristles near edge of aperture; lateral postanal bristles slightly more remote than diameter of aperture.

Legs slender, so that bristles are easily discernible, with triheterohamate, almost homohamate unguis; lateral hooks toothed at distal end (fig. 3, *f*). Legs I (fig. 2, *p*) with tarsus slender; the dorsoproximal quartette of bristles having the second one minute (in the figure the anterior one is the distal part of the lateral bristle of the tibia), arranged in crescent across dorsal face (fig. 3, *g*); dorsal bristle 5 long, extending well over unguis; the 3 dorsodistal pairs long, extending well out to ends of hooks (only the lateral bristles of the 2 dorsodistal pairs and the 2 ventrodistal pairs have been included in the figure); bristles of ventral face long, recurved; all bristles barbed except dorsoproximal quartette, the ventral bristles almost ciliate. Tibiae longer than their tarsi, with well-developed but not angular dorsodistal process; major bristle extending well over unguis, premajor bristle fine, smooth, rather short, all other bristles barbed, inserted as in figure 2, *p*. Genuals half length of femur, rather straight; dorsal bristle



smooth, extending nearly to insertion of dorsomesal of tibia; lateral bristle developed as a stout, burred spine, extending over a third of the tibia; other bristles fine, straight, barbed. Femora elongate oval, a slight keel along distal third of ventral edge; dorsal edge with 3 stout, barbed bristles, the proximal the longest, the distal the shortest; ventral edge with 2 fine, bent bristles, the proximal inserted near proximal end, the distal inserted proximad of center of segment. Trochanters (coxae) small with a small, smooth, curved bristle.

Legs II similar but tarsi with the dorsoproximal quartette as follows: proximal bristle long, weakly barbed, bristles 3 and 4 half as long, smooth, slightly recurved; lateral bristle on transverse plane of second dorsal; dorsodistal pairs strongly offset; the 2 single ventral bristles long, distant from each other, the distal one close to proximal pair, leaving a wide interspace to distal end; thus no fifth dorsal nor second ventral. Tibiae similar but no premajor, no dorsodistal process, and a shorter major. Genuals with lateral spine; a barbed dorsomesal bristle inserted at center of segment; a smooth dorsodistal bristle. Femora with three stout, burred, dorsal bristles, the middle one as far from dorsodistal as dorsodistal is from distal end; two subequal, normally fine, ventral bristles, the distal one almost as distad as dorsodistal, the proximal rather close to proximal end. Trochanters minute, with a small, smooth, curved bristle.

Legs IV as usual, but tarsi (fig. 3, *b*) with single dorsal bristle extending well out to center of extended hooks, the dorsal pair extending considerably further, these three very faintly barbed, the barbs appearing as scars in the single bristle; apical pair of ventral face inserted more proximally than the dorsoapical pair; ventroproximal pair also inserted more proximad than the dorsoproximal pair; all the ventral bristles conspicuously burred. Tibiae (fig. 3, *b*) with dorsal bristle inserted on transverse plane distad of ventrolateral and ventromesal. Genuals as long as half the tibia; lateral bristle inserted at center of segment. Femora with very slight keel; bristles inserted at center of segment, the dorsal very stout, the ventral very fine.

Legs III more robust, less modified. Tarsi (fig. 3, *c*) with all bristles barbed, two unpaired bristles on dorsal face, two on ventral, and a lateral, all on proximal half of segment; dorsal face with 3 pairs, ventral face with 2 pairs, inserted on distal half of segment. Tibiae (fig. 3, *c*) very similar, the lateral bristle less ventrad. Genuals shorter; lateral bristle inserted at center of segment, dorsal at distal end, smooth. Femora with 2 stout, burred, dorsal bristles, the distal one inserted at center of segment; ventral bristle longer and stouter than in femora IV. Trochanters with 2 faintly burred bristles, the proximal twice as long as the distal.

The femoral and genual spines form a cheval-de-frise under the pteromorphae that should discourage prying predators.

Figure 3, *d*, represents the trochanter with its broken articulation shaft at the right. The femoral articulation shaft is represented by cross-hatched walls. It has the appearance of being a distinct segment telescoped into the ends of the femur and of the trochanter, and functioning as a coupler. The dorsal side is short and curved so as to clip about the inside of the walls of its adjacent segments. In brief, it acts as a necklike, internal clip or coupler. The two trochanteral bristles are cut short so as not to interfere with the other figures.

Figure 3, *e*, shows the same coupler of legs IV (cross-hatched). I am not able to determine the exact point of fusion with the femur on ventral aspect. In both legs a well-marked heel is developed on the floor of the trochanter for articulation of the end of the femoral coupler. Although folds of chitin may give the chitin wall a discontinuous appearance, it is difficult to explain the structures figured where the coupler meets the femur wall.

The females bear 10 to 12 short, oval eggs.

Hivaoa: Mount Ootua summit, altitude 3000 feet, February 13, 1930, under bark of *Reynoldsia*, 19 specimens (cotypes), Mumford and Adamson,



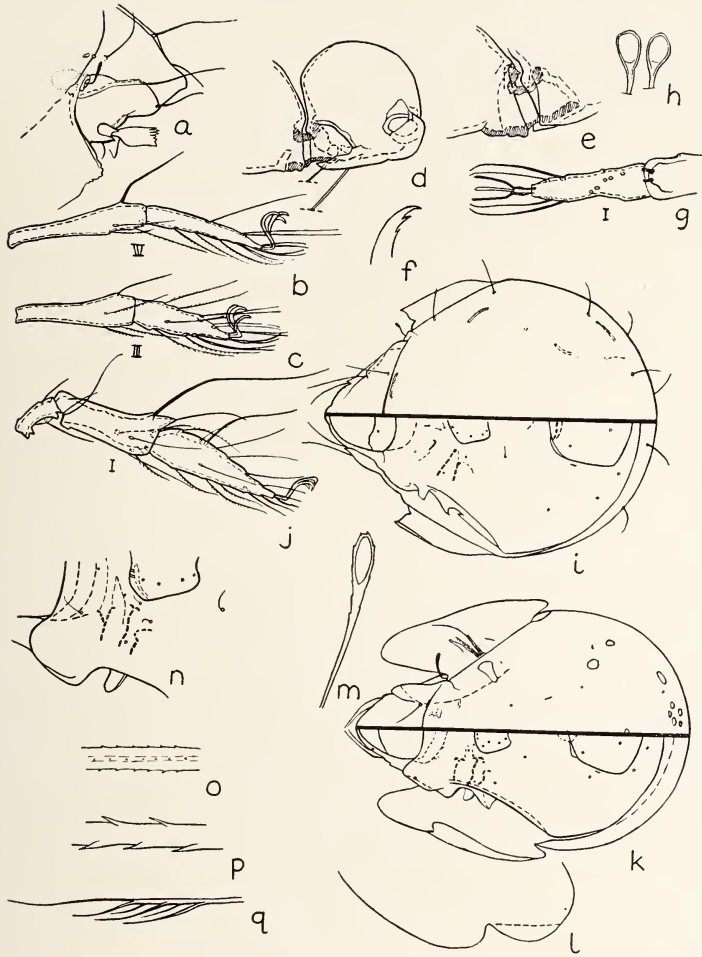


FIGURE 3. *Schelorbates* (*Paraschelobates*) *mumfordi*, new species, adult: *a*, dorso-lateral aspect of cephaloprothorax and pteromorphae, ratio  $\times 60$ ; *b*, tarsus and tibia IV, ratio  $\times 100$ ; *c*, tarsus and tibia III, ratio  $\times 100$ ; *d*, trochanters III, ratio  $\times 200$ ; *e*, femoral coupler (cross-hatched), somewhat tilted, ratio  $\times 200$ ; *f*, distal end of hook of tarsus IV, ratio  $\times 440$ ; *g*, dorsal aspect of tarsus I, ratio  $\times 120$ . *Schelorbates* (*Paraschelobates*) *mumfordi* *uapou*, new subspecies: *h*, pseudostigmatic organ of an individual from Hivaoo, Matauuna, to right of numeral, and one from Uapou to left, ratio  $\times 200$ . *Nesiotizetes adamsoni*, new species, adult: *i*, dorsoventral aspects, mouth parts and legs omitted, ratio  $\times 75$ ; *j*, tarsus to genu I, ratio  $\times 200$ . *Zetes bryani marquesi*, new subspecies, adult: *k*, dorsoventral aspects, mouth parts and legs omitted, ratio  $\times 100$ ; *l*, ventral edge of pteromorphae, ratio  $\times 150$ ; *m*, pseudostigmatic organ, burrs exaggerated, ratio  $\times 440$ . *Galunna hawaiiensis marquesana*, new subspecies, adult: *n*, genitosternal area, ratio  $\times 120$ ; sketches of bristles: *o*, burred; *p*, barbed; *q*, ciliate.

slides 33M18a and b. A fractured specimen from Hivaoa (Teava Uhia i te Kohu, above Puamau, altitude 2100 feet, February 25, 1930, from dead stipes of *Cyathea* species, Mumford and Adamson, slides 33M9) was used for the figures of the legs. The pseudostigmatic organs are lost.

An individual from Hivaoa (Matauuna, altitude 3900 feet, March 3, 1930, on ground under dead leaves, Mumford and Adamson, slide 33M8) is typical except for the broadly spatulate pseudostigmatic organ head and the approximate anterior pair of sternal bristles, which make it appear a hybrid with the next. If future collecting shows this difference to be constant in this locality it might be recognized as a distinct form.

Five large specimens from Hivaoa (Kopaafaa [Kopaataa], altitude 2770 feet, February 26, 1930, from dead stipes of *Marattia* species, Mumford and Adamson, slide 33M4) have a longer pseudostigmatic organ head and a very slender sternum anterior to apodemata I. Average size 1.2 by 1.5 mm. This possession of three distinct characters, if later found to be constant for one locality, mountain or valley, should also be recognized as a distinct form.

**Schelorbates (Paraschelobates) mumfordi uapoui**, new subspecies (fig. 3, h).

Differs from the species in the elongate (oval) form with posteriorly projecting pteromorphae; spatulate (bluntly ovate) pseudostigmatic organ head; sternum anterior to apodemata I very slender, irregular, to interrupted; anterior pair of sternal bristles as approximate as posterior pair, the middle pair twice as remote; lateral postanal bristles more anteriorly inserted, leaving more space between it and aperture. Size 0.83 by 1.2 mm.

Uapou: Kohepu [Kohapu] summit, altitude 3200 feet, November 28, 1931, under dead bark of *Cheirodendron* species, 51 adults (cotypes), 1 nymph, LeBronnec, slides 33M10a and b; altitude 3300 feet, November 27, 1931, on *Weinmannia parviflora*, 1 specimen, LeBronnec, slide 33M14.

One thinly sclerotized individual has two pairs of paramesal bristles, one laterad of the other.

The nearest related species seems to be *Chamobates marginidentata*<sup>18</sup> from Juan Fernandez. Figure 92<sup>18</sup> however shows no lamellorostral ridge, though figure 91 hints at one. Furthermore, figure 97<sup>18</sup> shows a large flange on femur II. The pseudostigmatic organs resemble those of *S. (P.) mumfordi*, but the body shape is that of *S. (P.) m. uapoui*. Thus, although placed in *Chamobates*, it is closely related to these common large Marquesan oribatids and suggests a South American relation.

TRIBE CERATOZETINI JACOT

Ceratozetini Jacot: B. P. Bishop Mus., Bull. 121, 1934.

Characters: Ceratozetinae with tectopodia I distinctly developed. Type, *Ceratozetes* Berlese: Redia, vol. 5, p. 4, 1908.

<sup>18</sup> Trägårdh, Ivar, Acarina from the Juan Fernandez Islands: Nat. Hist. Juan Fernandez and Easter Island, vol. 3, no. 55, p. 597, figs. 91-100, 1931.

Genus NESIOTIZETES, new genus<sup>1</sup>

Characters: anterior edge of notogaster distinct; pteromorphae developed as subtriangular ventrally deflected expanses of the notogaster; lamellae slender, far down on sides of cephaloprothorax, hiding the slender tectopedia I in dorsal view; notogaster with bristles; unguis triheterohamate.

Type, *Nesiotizetes adamsoni*, new species.

In *Indoribates*<sup>19</sup> there are no tectopedia I. Sellnick regards what he describes as a flat, short, chitin swelling, as a tectopedium. A tectopedium, however, is a ridge and when long enough to reach the rostral bristles is usually produced as a tooth or spine. I therefore regard *Indoribates punctulatus*<sup>20</sup> as lacking tectopedia I. Otherwise it is closely related.

*Peloribates*<sup>21</sup> is closely related, but no one can tell from Berlese's description and figure if tectopedia I are present. The rostral bristles seem too close together for relation to this group, the lamellae are unusually long, the notogastral bristles stiff (straight) and the unguis trihamate.

The present genus superficially resembles *Terrazetes*<sup>22</sup> but has the anterior edge of notogaster distinct and no hint of translamellar ridge or slope.

Finally, it differs from *Globozetes*<sup>23</sup> in that the lamellae are far down on sides of cephaloprothorax, hiding tectopedia I in dorsal aspect.

***Nesiotizetes adamsoni***, new species (fig. 3, *i, j*).

Diagnostic characters: pseudostigmatic organs erect, small, with small head; pteromorphae with anterior edge emarginate near juncture to abdomen; porose areas long, very slender; anterior and posterior sternal bristles subequally approximate, middle pair more remote, close to posterior pair; genital cover bristles close to lateral edge of covers; preanal bristles far laterad of aperture; lateral postanal bristles also far laterad of aperture but not as remote as paramesal; mesal postanals slightly more remote than diameter of aperture.

Description: body very broad; depressed; size 0.6 by 0.74 mm.; cephaloprothorax short, broad, blunt; rostrum not demarked in dorsoventral aspects, but with a slight impression each side of median plane making it slightly lobed in center; rostral bristles inserted rather far back, in anterior angle of tectopedia I; cephaloprothoracic bristles well-developed, the interlamellar faintly barbed; lamellae very low, distal end rounded, without cusp, lamellar bristles inserted at base, mesal buttresses faint; pseudostigmata projecting somewhat; pseudostigmatic organs with slender pedicel, slenderly clavate; tectopedia I forming a distinct anterior cusp in dorso/ventral aspects.

Notogaster broader than long; pteromorphae triangular, curving ventrad probably to insertions of legs, anteroventral corner well-developed; two notogastral bristles at base of pteromorphae; adalar porose areas rather posteriad of usual position; at least five other notogastral bristles as in figure 3, *i*. As the body is filled with rather opaque granular matter along a broad median band, it is not possible to determine to what extent the

<sup>19</sup> Jacot, A. P., Genera of pterogasterine Oribatidae (Acarina): American Micr. Soc., Trans., vol. 48, p. 429, 1929.

<sup>20</sup> Sellnick, Max, Javanische Oribatiden (Acar.): Treubia, vol. 6, p. 473, figs. 22-24, 1925.

<sup>21</sup> Berlese, Antonio, Elenco di Generi e Specie nuove di Acari: Redia, vol. 5, p. 3, 1908.

<sup>22</sup> Jacot, A. P., Genera of pterogasterine Oribatidae (Acarina): American Micr. Soc., Trans., vol. 48, p. 429, 1929.

<sup>23</sup> Sellnick, Max, Oribatei: Tierwelt Mitteleuropas, vol. 3, no. 9, p. 14, 1929.

notogaster bristles are present. The parts indicated by broken lines are present, but their exact relative positions are uncertain.

Ventral plate broadest posterior to pteromorphae, anterior portion quite narrow, tectopodia II poorly developed, posterior corner rounded, undeveloped, the bristle on posterior portion!; tectopodia III well-developed, rather broad, posterior corner sharp; tectopodia IV fairly well developed to cup over insertion of legs IV; apodemata I short, mesal end with short, anterior hook; apodemata II-III long, straight, mesal end simple; apodemata IV fairly long, oblique, mesal end somewhat curved posteriad; parasternal bristles as far as discernible as in figure 3, *i* (lower half); genital aperture with strongly bent anterior edge, lateral edges slightly incurved, posterior edge strongly undulate; genital cover bristles fairly evenly spaced and rather close to lateral edge; paramesal bristles as distant from aperture as greatest diameter of a cover, more remote than diameter of genital aperture; anal aperture situated rather far posteriad, leaving a narrow band of the ventral plate behind it, quite large, sides slightly converging anteriorly, anterior corner rounded, ample, posterior edge not strongly bent; anterior cover bristles close to anterior corners, posterior bristles quite approximate and near posterior edge; pseudo-fissurae short, anteriorly of center of aperture.

Legs slender, with rather long bristles, unguis triheterohamate, nearly homohamate. Tarsi I (fig. 3, *j*) with dorsoproximal bristle barbed, inserted less than diameter of segment from proximal end; bristle 2 as long as unguis hooks, fine; bristle 3 quite long, longest and stoutest of tarsal bristles; bristles 4 and 5 fine, smooth; other bristles much as usual, the single ventral barbed. Tibiae I (fig. 3, *j*) with broad proximal end, no distinct pedicel, dorsodistal edge produced as a conical cusp bearing well-developed premajor bristle on its apex; major bristle quite long, inserted some distance from premajor; dorso-lateral rather lateral in position. Genual bristles well-developed, dorsodistal long, barely reaching insertion of major of tibia. Femora with short low keel along distal half.

Femora II with well-developed flange along ventral face, similar to that of *Scheloriates* though probably not quite so deep. Legs otherwise not notably differentiated.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 29, 1929, under dead leaves, holotype, Mumford and Adamson, slides 33M2d and e.

#### SUBFAMILY GALUMNINAE

Characters: Oribatidae with pteromorphae hinged to sides of notogaster, extending far anteriorly of notogaster, completely covering legs when withdrawn into recess in side of body; lamellae slender blades, often reduced to flattened bands appressed to sides of cephaloprothorax and discernible as a slight projecting rim curving posteroventrad to tectopodia II; tectopodia I almost entirely internal.

#### Genus ZETES Koch

*Zetes* Koch: Uebers. des Arachn., vol. 3, Abt. 1, p. 99, 1842.

Characters: Galumninae with appressed, bandlike lamellae which curve posteroventrad to anterior end of ventral plate wings; pteromorphae with a transverse groove across mesal (inner) face, ventral edge emarginate; mid-thoracic suture (anterior edge of notogaster) distinct. Type, *Zetes elimatus* (Koch: Uebers. des Arachn., vol. 3, Abt. 1, pl. 11, fig. 55, 1842.



**Zetes bryani marquesi**, new subspecies (fig. 3, *k-m*).

Diagnostic characters: cephaloprothoracic bristles well-developed; lamellar bristles mesal; pseudostigmatic organs slenderly clavate (fig. 3, *m*), rather small; adalar porose areas cuneiform; median pseudoforamen present; anteroventral region of pteromorphae produced as a rounded lobe which extends beyond notch (fig. 3, *l*); genital cover bristles near longitudinal center of covers, forming a zigzag row; paranal bristles near center of sides of aperture; ventral plate wing small, posterior end of tectopedia II broadly exposed.

Description: size medium, males 0.39 by 0.57, females 0.41 by 0.59 mm.; body ovate, high; cephaloprothorax rather narrow; rostrum long but not differentiated, blunt; rostral bristles long, meeting on median plane, inserted below bulge of rostrum; lamellar bristles inserted near lamellae, stout, bent to meet near distal end of rostrum; lamellae distinct nearly to interlamellar bristles, projecting distinctly; tectopedia I not forming external ridge; interlamellar bristles not long, inserted almost over edge of tectopedia I; anterior porose areas small; pseudostigmatic organs barely extending halfway across pteromorphae, apparently smooth, sometimes seen to be faintly burred, the center often undehydrated.

Pteromorphae with groove clearly demarked, posterior rib long; pseudofissurae fine, bristle insertion and its groove distinct; mandible adductor scars distinct, forming an oblique row; mesonotic porose areas smaller than diameter of adalar, posterior larger; a pseudofissura between mesal adalar insertion and mesal mesonotic.

Ventral plate wings poorly developed, anterior end slender, posterior end broadly rounded off; tectopedia III broad; apodemata with well-developed ceriphs; apodemata II-III with posterior ceriph quite long; genital aperture with rather straight anterior edge, anterior corners well-rounded, posterior edge undulate; paramesal bristles in usual position; subanal muscle plate rather large, slightly ovate; anal aperture with strongly tapering sides, anterior edge strongly bent, posterior edge gently curved; anterior cover bristles quite close to anterior corners, posterior cover bristles quite approximate; pseudofissurae short, at center of sides, paranal bristles slightly anterioriad of pseudofissurae; postanal bristles subequally spaced, the lateral pair a short distance from corners of aperture.

Hivaoa: Atuona Valley, 1.5 miles from sea, altitude 3000 feet, July 6, 1929, under rotting wood, 7 specimens, Mumford and Adamson, slide 33M1a (cotypes).

Two specimens from Eiao (altitude 1800 feet, April 30, 1931, under bark of *Aleurites moluccana*, LeBronnec, slide 33M16), as far as I can see, are identical.

I place these Marquesan *Zetes* under *Z. bryani*<sup>24</sup> with considerable certainty. I regret not having noted the shape of the anterior lobe of the pteromorphae and of the shape of the ventral plate wings of *Z. bryani*. The latter I consider an important specific character.

**Zetes bryani marquesi matauuna**, new form.

Differs from the subspecies in the larger size, 0.48 by 0.695, the much larger mesonotic porose areas which are as large as diameter of adalar, and the larger anterior porose areas. In one specimen the adalar porose areas are short-triangular.

Hivaoa: Matauuna, altitude 3000 feet, March 3, 1930, on ground under dead leaves, 2 specimens, Mumford and Adamson, slide 33M8 (cotypes).

As there are no differences in the position of the bristles on the ventral plate, a matter of importance in distinguishing geographical races in North America, I regard this as a form rather than as a subspecies.

<sup>24</sup> Jacot, A. P., Some Hawaiian Oribatoidea: B. P. Bishop Mus., Bull. 121, figs. 126, 127, 1934.



**Zetes bryani uapoui**, new subspecies.

Differs from the species in that the pteromorphae are granular-sculptured along their ventral fourth; interlamellar bristles are longer and gracefully curved; pseudostigmatic organs longer, the head very short, lanceolate, pedicel curved proximad of head; adalar porose areas cuneate, large, curved; mesonotic porose areas joined to form a large, ovate, diagonal area (each side); posterior porose areas long; genital cover bristles 2 and 3 more widely spaced, arranged in a straight line.

Uapou: Hakahetau [Hakahetou], altitude 2000 feet, December 14, 1929, in dead fruits of *Aleurites moluccana*, holotype, R. R. Whitten, slide 33M6a.

Genus **GALUMNA** Heyden

*Galumna* Heyden: Isis von Oken, vol. 18, p. 612, 1825.

Characters: Galumminae with appressed, bandlike lamellae which curve posteroventrad to anterior end of ventral plate wings; pteromorphae with a transverse groove across mesal (inner) face, ventral edge emarginate; mid-thoracic suture (anterior edge of notogaster) lacking.

Type, *Notaspis alatus* Herman: Mém. Aptérol., p. 92, pl. 4, fig. 6, 1804.

**Galumna hawaiiensis marquesana**, new subspecies (fig. 3, *n*).

Differs from the species<sup>25</sup> in the absence of any cephaloprothoracic sculpture; much larger mandible retractor scars, situated directly behind interlamellar bristles, the two groups quite parallel to each other; anterior porose areas on transverse plane passing over anterior end of mandible retractor scar group; adalar porose areas much larger, elongate, irregular; a long pseudoforamen laterad, about diameter of area from it; median foraminal cluster lacking, an irregular, ill-formed porose area instead; genital cover bristles ranged in crescent formation almost halfway between lateral and median edges of covers; ceriph of apodemata IV very long, a bristle between ends of apodemata II-III and IV; ceriphs of other apodemata also somewhat longer, those of apodemata I quite widely spread on two levels; pseudofissurae of anal aperture much longer, curved; paranal bristles closer to aperture; mesal postanal bristles usually as approximate as posterior anal cover bristles. Size of females, 0.55 by 0.7 mm.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 29, 1929, under dead leaves, 4 specimens, Mumford and Adamson, slide 33M2b (cotypes).

## FAMILY PHTHIRACARIDAE

Characters: Oribatoidea with legs attached to a small V-shaped yoke, capable of being drawn into anterior end of body, and enclosed by cephaloprothoracic shield (aspis).

## SUBFAMILY PHTHIRACARINAE

Characters: Phthiracaridae with notogaster formed of a single unit; genital and anal covers approximate.

<sup>25</sup> Jacot, A. P., Some Hawaiian Oribatoidea: B. P. Bishop Mus., Bull. 121, figs. 128-135, 1934.

## TRIBE PHTHIRACARINI

Characters: Phthiracarinae with anogenital area about as broad (or broader) than length of any one of the four rectangular plates, and never as long as ventral face of abdomen.<sup>26</sup>

## Genus PHTHIRACARUS Perty

*Phthiracarus* Perty: Allg. Naturg., vol. 3, p. 874, 1843.

Characters: anal covers quite flattened, often completely retracted into body cavity, their median edge usually bearing but 2 or 3 well-spaced bristles; vertex bristles invisible or lying close to surface of aspis.<sup>26</sup>

Type, *Phthiracarus contractilis* Perty (monotype): Allg. Naturg., vol. 3, p. 874, 1843.

**Phthiracarus insularis**, new species (fig. 4, *a*, *b*).

Diagnostic characters: pseudostigmatic organs short, ovate; aspis high; rim very slender, not projecting beyond rostrum; rostral bristles rather high and long; notogastral bristles fairly long, sharply bent forward, a:1 rather distant from collar; genital cover bristles 1:1 and 1:2 rather long, sharply bent forward; genital covers without projecting rim.

Description: size medium (length of notogaster about 0.5 mm.), total length of aspis 0.27 mm., breadth 0.2, length anterior to pseudostigmata 0.168; color olive green; texture sanded; aspis high, tapering rapidly; rostrum tapering gradually into vertex; a slight impression on posterior part of vertex (fig. 4, *a*); carina, if present, very indistinct to lacking; rim as above described; vertex bristles long, remote; figure 5 of Sellnick's Javanese *Phthiracarus*<sup>27</sup> is so much like this species in the position of the aspal bristles that it will do for the present except that the rostral bristles are slightly more remote, there is no median ridge, and I found no exopseudostigmatic bristles.

Notogaster oval, long, not high, rising gently in front; collar broad; notch fairly well developed; bristles very fine, a:1 quite approximate, b:1 much more remote; others disposed as in figure 4, *a*. Ventral plate broad; rim not projecting ventrad, no denticles; the three bristles subequally spaced, VP2 and VP 3 distant from margin.

Anterior rim of accessory plate with recurved rim, aggenital bristle 1<sup>28</sup> seems to be present on one side, invisible on the other; in Grandjean's notation<sup>28</sup> of the marginal bristles, all the bristles are numbered as of one series. I think he is right in regarding my anterior and marginal bristles<sup>29</sup> as constituting one series. He definitely recognizes my outer series as distinct. I would, therefore, refer to the marginal series as bristles gm:1 to 5 (genitomarginal) and the outer as gl:1 to 4 (genitolateral). Gl:1 between gm:3 and gm:4, and just posteriad of rim of cover; gl:2 between gm:4 and gm:5 but more laterad; gl:3 and gl:4 widely spaced (fig. 4, *b*). Figure 4, *b* shows ventral edge of lapet slipped out from between accessory plate ("rebord antérieur" of Grandjean) and rim of genital cover, with ventral edge of ventral plate which fits over (ventrad of)

<sup>26</sup> Jacot, A. P., Phthiracarid mites of Florida: Elisha Mitchell Sci. Soc., Jour., vol. 48, pp. 238, 244, 1933.

<sup>27</sup> Sellnick, Max, Javanische Oribatiden (Acar.): Treubia, vol. 6, p. 462, 1925.

<sup>28</sup> Grandjean, F. A., Structure de la région ventrale chez quelques *Ptyctima* (Oribates): Mus. d'Hist. Nat. Paris, Bull., ser. 2, vol. 5, p. 312, fig. 3A, 1933.

<sup>29</sup> Jacot, A. P., Oribatid mites of the subfamily Phthiracarinae of the northeastern United States: Boston Soc. Nat. Hist., Proc., vol. 39, p. 222, 1930.

genital cover and curves down (dorsad) to lapet, thus enclosing anterolateral corner of genital cover between them. Nubbins of genital covers well-developed (fig. 4, *b*).

Anal covers with well-developed nubbins; crossbar broad (broken line). Grandjean's nomenclature<sup>30</sup> for these bristles as compared to mine is:  $I:1 = a_1$ ;  $I:2 = a_2$ ;  $I:3 = ad_3$ ;  $II:1 = ad_1$ ;  $II:2 = ad_2$ . I believe Grandjean's interpretation is correct and adopt his nomenclature as more descriptive. In the present species the bristles occupy their normal positions for the genus,  $ad_2$  being on transverse plane just anterior to  $a_2$ .

Nukuhiva: Teuanui, Toovii [Toovii], altitude 2000 feet, October 29, 1929, under dead leaves, holotype, Mumford and Adamson, slide 33M2g.

This species brings to mind the American *Phthiracarus bryobium*,<sup>31</sup> but it may be closer to Sellnick's Javanese species<sup>32</sup> in which the notogastral bristles are moderately long and posteriorly inclined. It is not related to *Ph. maculatus*<sup>33</sup> from Juan Fernandez Island.

#### TRIBE EUPHTHIRACARINI

Characters: Phthiracarinae with anogenital area much narrower than length of any one of its 4 or 6 straplike plates, one pair of which extends along entire ventral face of abdomen.

#### Genus INDOTRITIA Jacot

*Indotritia* Jacot: Psyche, vol. 35, p. 213, 1928.

Characters: Euphthiracarini without interlocking ridges at center of anogenital plate; and with genital covers fused to anogenital plate which according to Grandjean<sup>34</sup> are the fused aggenital and adanal plates; palps three-jointed.<sup>35</sup>

Type, *Tritia krakatauensis* Sellnick: Treubia, vol. 5, p. 372, figs. 1-3, 1924.

#### *Indotritia lebronneci*, new species (fig. 4, *c-h*).

Diagnostic characters: anterior portion of aspis thin, combed; pseudostigmatic organs pointed, medium-long, twisted; lid above pseudostigmata; bristles rather short; anterior edge of anogenital plate without flaring ridge; sides of aspis with but one keel; aggenital plate with but 2 bristles; anal covers with but 1 bristle at anterior end; adanal plates with pseudoforamen near middle bristle!

Description: aspis (fig. 4, *c, d*) quite long with flattened, lateral profile, distal edge sharp, combing fairly extensive, rostral bristles more approximate than in *I. kraka-*

<sup>30</sup> Grandjean, F. A., Structure de la région ventrale chez quelques *Ptyctima* (Oribates): Mus. d'Hist. Nat. Paris, Bull., ser. 2, vol. 5, fig. 3B, 1933.

<sup>31</sup> Jacot, A. P., Oribatid mites of the subfamily Phthiracarinae of the northeastern United States: Boston Soc. Nat. Hist., Proc., vol. 39, fig. 19, 1930.

<sup>32</sup> Sellnick, Max, Javanische Oribatiden (Acar.): Treubia, vol. 6, p. 461, 1925.

<sup>33</sup> Trägårdh, Ivar, Acarina from the Juan Fernandez Islands: Nat. Hist. Juan Fernandez and Easter Island, vol. 3, no. 55, p. 553, 1931.

<sup>34</sup> Grandjean, F. A., Observations sur les Oribates (4<sup>e</sup> sér.): Mus. d'Hist. Nat. Paris, Bull., ser. 2, vol. 5, p. 221, 1933.

<sup>35</sup> Grandjean, F. A., Structure de la région ventrale chez quelques *Ptyctima* (Oribates): Mus. d'Hist. Nat. Paris, Bull., ser. 2, vol. 5, pp. 309-315, 1933.

*tauensis*;<sup>36</sup> vertex and lateral bristles more nearly on the same transverse plane than in *I. bryani*;<sup>37</sup> lid broader than in the latter; pseudostigmata with many "chambers" (fig. 4, *d*); organs somewhat awl-shaped, twisted (fig. 4, *h*), bent close to proximal end, thus appearing stiff.

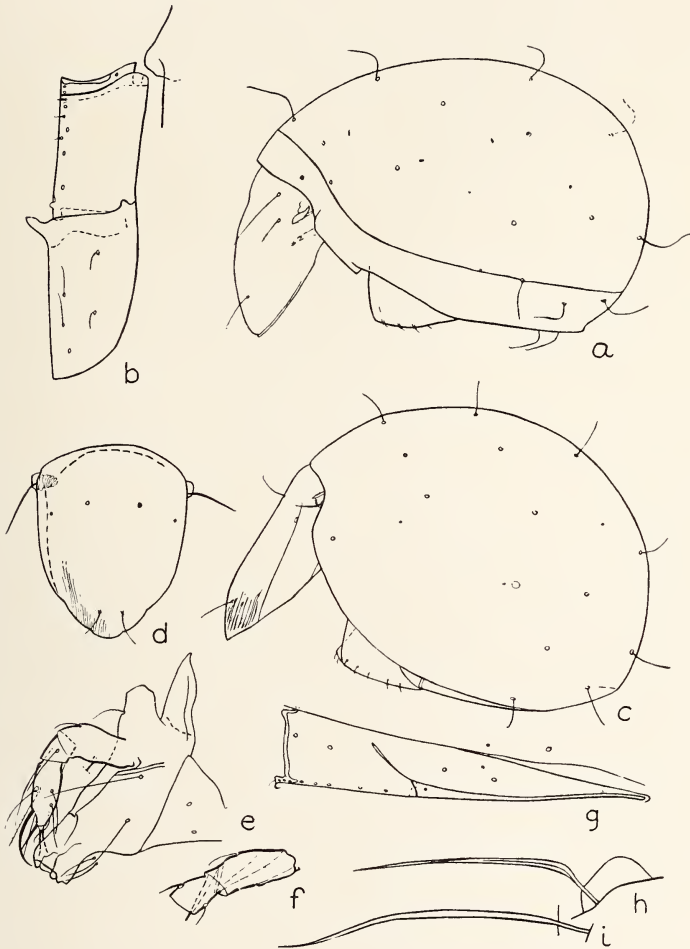


FIGURE 4. *Phthiracarus insularis*, new species, adult: *a*, lateral aspect, legs and mouth parts omitted, ratio  $\times 120$ ; *b*, genital and anal covers, with lower corner of lapet, which fits between genital cover and accessory plate, ratio  $\times 150$ . *Indotritia lebronneci*, new species, adult: *c*, lateral aspect, legs and mouth parts omitted, ratio  $\times 75$ ; *d*, aspis, ratio  $\times 75$ ; *e*, palp and adjoining maxilla, ratio  $\times 150$ ; *f*, proximal segment of palp to show composite nature, ratio  $\times 200$ ; *g*, anogenital area, ratio  $\times 100$ ; *h*, pseudostigmatic organ, ventral aspect, ratio  $\times 330$ . *Indotritia lebronneci crassiori*, new subspecies, adult: *i*, pseudostigmatic organ, ventral aspect, ratio  $\times 330$ .

<sup>36</sup> Sellnick, Max, Oribatiden der Insel Krakatau: Treubia, vol. 5, pp. 371-373, 3 figs., 1924.

<sup>37</sup> Jacot, A. P., Some Hawaiian Oribatoidea: B. P. Bishop Mus., Bull. 121, fig. 148, 1934.



Notogaster not steeply rising in front, somewhat rounded behind, thus more of the general shape of *I. krakatauensis* than of *I. bryani*. Thus this genus has a greater tendency to rounded posterior end than has *Oribotritia*. Bristles and porose areas as in figure 4, c; mesal row of bristles subequally approximate, except that anterior and fourth (d:1) are slightly more approximate than second (b:1) and fourth (c:1).

Anogenital area broad (fig. 4, g). I see no reason for not accepting Grandjean's interpretation of the fusions that have occurred in this region and of his terminology, except that I retain the term "covers" for the mesal pairs. Median edge of genital covers with 5 bristles, widest space between the third and fourth; 4 bristles on mesal apophysis; posterior bristle of adanal plate close to median edge. I interpret the adanal pseudoforamen to be the pseudofissura of the Oribatidae.

In 1930, I figured the mouth parts of *Euphthiracarus* and *Oribotritia*.<sup>38</sup> Stimulated by my somewhat terse English, Trägårdh later described the mouth parts of *Phthiracarus*<sup>39</sup> and, still later, of *Oribotritia* and *Tropacarus*.<sup>40</sup> My statement that the maxillae bear 3 long bristles<sup>38</sup> should be changed to 2, one of the bristles being labial. I now add the mouth parts of *Indotritia*.

Maxillae and labium normal for the subfamily; process posterior to palp (palpigerous process) well-developed; with a well-developed bristle. Palps three-segmented; proximal segment bearing usual 2 bristles (fig. 4, e). Trägårdh figures 3 for *Oribotritia decumana*.<sup>39</sup> Grandjean finds that the normal number for all oribatids examined but one is 2.<sup>41</sup> These bristles are immediately preceded by the fused second segment, which is usually without bristles. My figure 4, f, shows a diagonal muscle springing from proximal end of this thoroughly fused segment. Middle segment with usual 2 bristles, one of them quite long. *Oribotritia decumana* is figured with 3.<sup>39</sup> Distal segment with 6 normal bristles, a stout, strongly arched bristle near distal end; a short, stout bristle just beyond the chitinous distal edge; and a short, triangular hyaline apex bearing 2 equal, short, stout bristles. Thus there seem to be more bristles on the distal segment of the palp of this species than figured by Trägårdh for other genera<sup>42</sup> and by Grandjean for *Perlohmanna*.<sup>43</sup> The two pairs of bristles of the ligula are stout and strigose. The mandibles bear two bristles on the main segment.

Dimensions of only three measurable specimens: length of notogaster, 0.71-0.87 mm., of aspis 0.43-0.45 mm.; height of notogaster (largest), 0.68 mm., of aspis (average), 0.16 mm.; breadth of aspis (smallest), 0.34 mm.

Nukuhiva: Tekao Hill, altitude 3300 feet, July 23, 1931, 6 specimens, LeBronnec and H. Tauraa, slide 33M15 (cotypes).

### **Indotritia lebronneci flagelloides, new form.**

Differs from the species in that the pseudostigmatic organ is longer (164  $\mu$  contrasted to 113  $\mu$  in the species), not angled, more slender, flexile, lashlike; widest space between genital cover bristles is between bristles 4 and 5 (not 3 and 4).

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 29, 1929, under dead leaves, holotype, Mumford and Adamson, slide 33M2f.

<sup>38</sup> Jacot, A. P., Oribatid mites of the subfamily Phthiracarinae of the northeastern United States: Boston Soc. Nat. His., Proc., vol. 39, fig. 57, 59, 75, 1930.

<sup>39</sup> Trägårdh, Ivar, Concerning the mouth parts of the oribatids: Ent. Tids., vol. 52, figs. 1, 11, 1931.

<sup>40</sup> Trägårdh, Ivar, Further notes on the mouth parts of the oribatids: Ent. Tids., vol. 53, pp. 119-122, figs. 1, 2, 3, 1932.

<sup>41</sup> Grandjean, F. A., Etude sur le développement des Oribates: Soc. Zool. France, Bull., vol. 58, p. 34, 1933.

<sup>42</sup> Trägårdh, Ivar, Concerning the mouth parts of the oribatids: Ent. Tids., vol. 52, pp. 209-217, 12 figs., 1931. Further notes on the mouth parts of the oribatids: Ent. Tids., vol. 53, pp. 119-122, 5 figs., 1932.



**Indotritia lebronneci crassiori**, new subspecies (fig. 4, *i*).

Differs from the species in that the pseudostigmatic organs are held at right angles to aspis, proximal three fifths stiff, straight, distal two fifths stiff, flexuous, 148  $\mu$  long; rostral bristles not extending beyond distal end of rostrum in dorsal aspect (that is, shorter); anterior end of genital covers strongly bent dorsad and with a more densely sclerotized ridge at the bend; anterior aggenital bristles inserted on the bend; genital cover bristles 3, 4, and 5 subequally spaced; adanal cover bristles stout, posterior one distant from edge of cover; pseudofoamen almost on transverse plane of middle adanal bristle.

Hivaoa: Matauuna, altitude 3900 feet, March 3, 1930, on ground under dead leaves, holotype, Mumford and Adamson, slide 33M8b.

## GEOGRAPHICAL DISTRIBUTION

As special collecting methods must be employed to secure the free-living Acarina of any locality in representative numbers, the above-described forms represent only a small part of the total population occurring in the Marquesas. Small as the collection may be, it brings out the following phenomena.

## DERIVATION OF FAUNA

The relations of the fauna are with New Zealand (*Acronothrus nukuhivae*), South America (*Paraschelobates*), but chiefly with the East Indies and Hawaii. Unfortunately the fauna of the other island groups is unknown, so that no further conclusions concerning origins and migrations or trans-ports can be made.

## ENDEMISM

Endemism is prominently developed. For instance, East Indian species like *Schelorbates indicus* and *Schelorbates fimbriatus*, which have reached both Hawaii and the Marquesas, are represented by different subspecies in each archipelago. In the Marquesas these subspecies are further differentiated on each island. In my opinion these individual island populations should be recognized as forms, and this system has been generally used in this report except for species not yet recorded from other island groups, for in those instances the subspecies are not known.

Another phenomenon is the finding of different forms of the same subspecies on different hills of the same island. Examples of these local differences are to be found in *Schelorbates (Paraschelobates) mumfordi*, in which I find differences between individuals from Mount Ootua, Matauuna, and Kopaafaa [Kopaataa], all on Hivaoa. Another example is *Zetes bryani marquesi* from Atuona Valley, with a different form from Matauuna; the form from Atuona Valley also comes from Eïao. On the other hand, on the intervening island of Uapou there is a distinct subspecies. More material

<sup>43</sup> Grandjean, F. A., Observations sur les Oribates (4<sup>e</sup> sér.): Mus. d'Hist. Nat. Paris, Bull., ser. 2, vol. 5, pp. 215-222, 3 text figs., 1933.

from Eiao may prove the Eiao population to be morphologically distinct. *Indotritia lebronnci* also has two distinct forms on Nukuhiva, one on Tekao Hill, the other at Teuanui, Tovii [Toovii], as well as a subspecies on Hivaoa.

I have already presented observations setting forth a reason for such montane differentiation.<sup>44</sup> Briefly stated it is as follows.

Animals with positive rheotropic reactions ascend hills and mountains. Due to the conical shape of these elevations, the higher the individuals climb the more they become concentrated, until at the restricted, narrow tops the animals are densely aggregated (this is true of Mollusca on the deforested limestone hills of North China). In concentrating species on hills, positive rheotropism likewise causes segregation. For instance, individuals washed down the hill, or otherwise carried down, will reascend the same hill if it is the only available slope. Of eggs washed down, hatching on the lower slopes (unless carried out to sea), the young will likewise ascend the same hill. It is only in rare cases of species washed into streams and then drifted into a pocket at the foot of the opposite hill that possible mixtures of strains occur, and then the chances would be 50-50 for each hillside (brookside). The outstanding tendency is to isolate each lot to its own hill and concentrate it about the summit where the breeding takes place.

This aggregation through configuration brings about isolation. Isolation and concentration are of direct value in causing inbreeding, and thus the materialization or establishment of recessive mutational characters. Thus evolution should be much more rapid among hill species than among those which wander aimlessly, indeterminately about the plain.

It should be unnecessary to point out that the larger the hill or mountain, the greater the concentration and the greater the isolation.

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<sup>44</sup> Jacot, A. P., Rheotropism and evolution: Peking Nat. Hist. Soc., Bull., vol. 5, pp. 39-40, 1931.

## 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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\* Pacific Entomological Publication 7, article 18. Issued April 18, 1934.

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 **BYTHOSCOPIUS** 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 neotropical 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 neotropical.

**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.

Upou: '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.

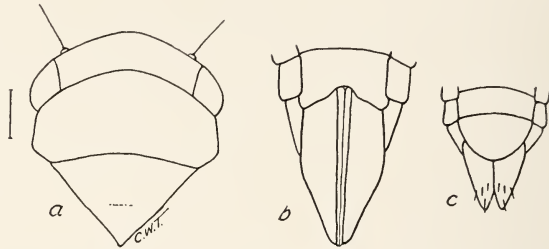


FIGURE 1.—*Bythoscopus pellucidus*, new species: *a*, dorsal view, head, pronotum, and scutellum; *b*, female, *c*, male genitalia.

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

Upou: 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: Haaopu 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.

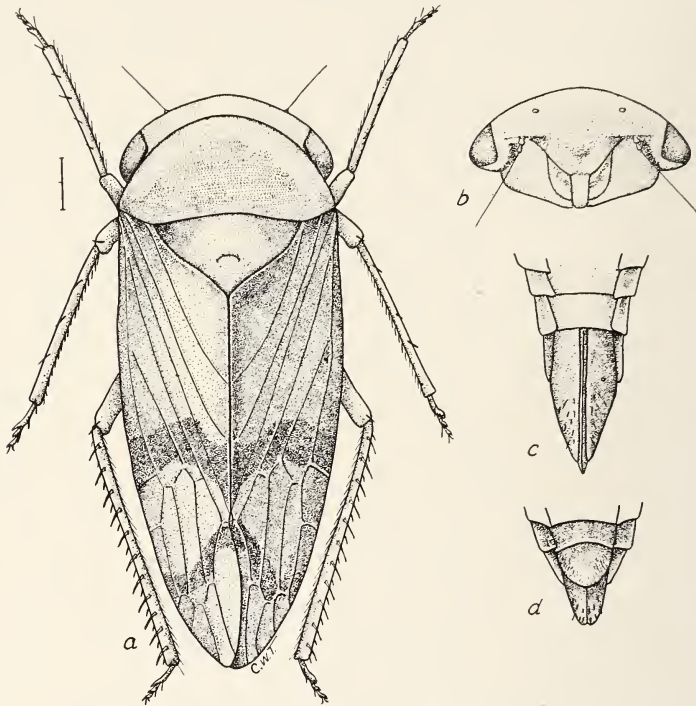


FIGURE 2.—*Bythoscopus maculatus*, new species: a, dorsal view; b, face; c, female, d, male, genitalia.

#### 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.

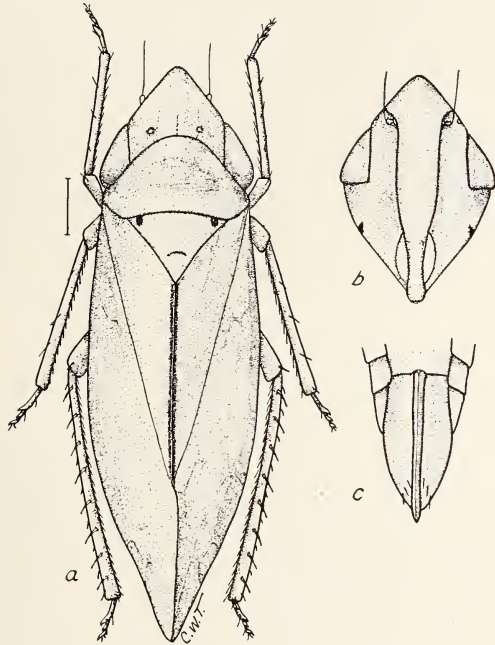


FIGURE 3.—*Dryadomorpha viridia*, new species: a, dorsal view; b, face; c, female genitalia.

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.

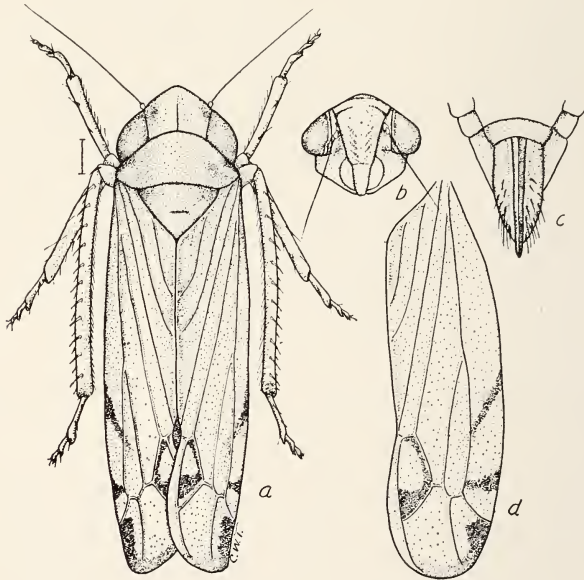


FIGURE 4.—*Scaphoidulina obliqua*, new species: a, dorsal view; b, face; c, female genitalia; d, elytron.

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

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.

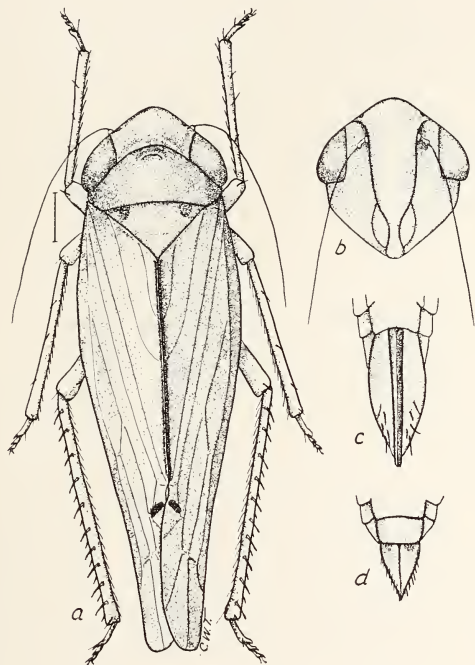


FIGURE 5.—*Calotettix metrosideri*, new species: a, dorsal view; b, face; c, female, d, male genitalia.

***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; infusate 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: Kopaaftaa, altitude 2770 feet, August 2 and 3, 1929, on *Metrosideros collina*, 3 females, holotype and paratypes, 1 allotype male; Kopaaftaa, 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 Kopaaftaa 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 *Nesoria* 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 antepical 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.

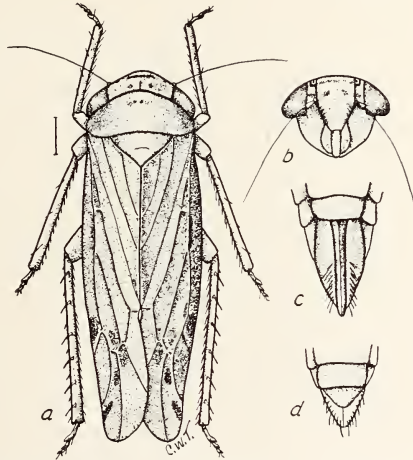


FIGURE 6.—*Nesoriella maculata*, new species: a, dorsal view; b, face; c, female, d, male genitalia.

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 *Cyathca* 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.

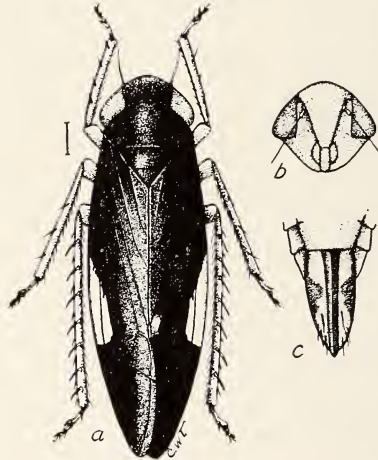


FIGURE 7.—*Marquesia atra*, new species: *a*, dorsal view; *b*, face; *c*, female genitalia.

***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.

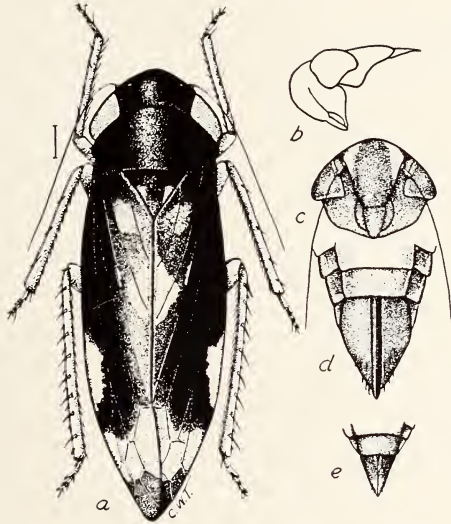


FIGURE 8.—*Nesophyla picta*, new species: *a*, dorsal view; *b*, profile; *c*, face; *d*, female, *e*, male genitalia.

***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 antepical 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: Haaioipu [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.

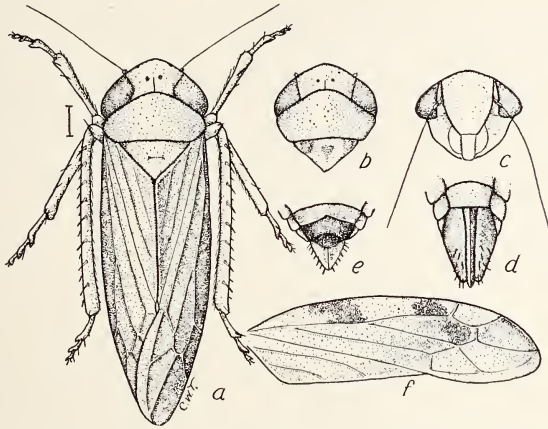


FIGURE 9.—*Nesophyla sordida*, new species: *a*, dorsal view; *b*, vertex; *c*, face; *d*, female, *e*, male genitalia; *f*, elytron.

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 antepical, 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: Ooumu, 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. Ooumu, 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 [Tapuooa], altitude 3000 feet, 1 specimen; 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: Kopaaftaa, 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. Kopaaftaa, altitude 2770 feet, August 2, 1929, miscellaneous sweeping, 2 females, 2 males, paratypes; Kopaaftaa, 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.

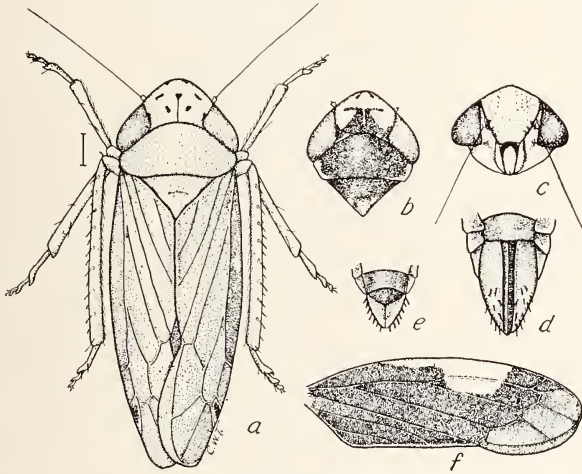


FIGURE 10.—*Nesophyla uapouana*, new species: *a*, dorsal view; *b*, vertex of male; *c*, face; *d*, female, *e*, male genitalia; *f*, elytron.

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.

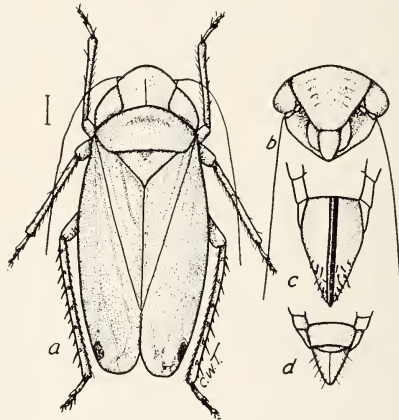


FIGURE 11.—*Nesophyla breviata*, new species: a, dorsal view; b, face; c, female, d, male genitalia.

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.

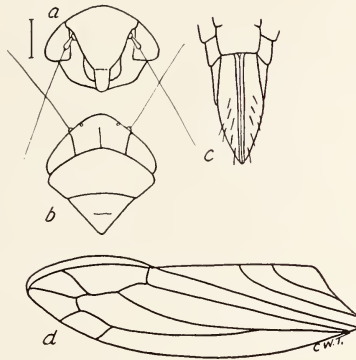


FIGURE 12.—*Nesophyla flavida*, new species: *a*, face; *b*, vertex, pronotum, and scutellum; *c*, female genitalia; *d*, elytron.

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

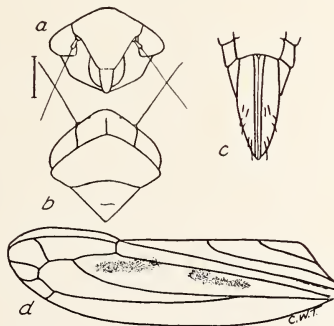


FIGURE 13.—*Nesophyla flavida*, variety *bimaculata*: *a*, face; *b*, vertex, pronotum, and scutellum; *c*, female genitalia; *d*, elytron.

**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.

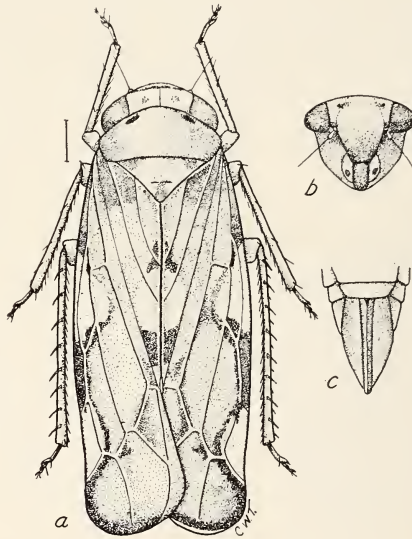


FIGURE 14.—*Cicaduloidea pacifica*, new species: a, dorsal view; b, face; c, female genitalia.

#### 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.

#### *Cicaduloidea 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.

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

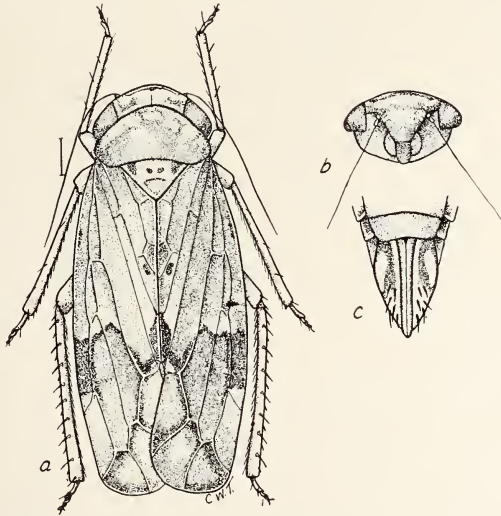


FIGURE 15.—*Cicaduloida monticola*, new species: a, dorsal view; b, face; c, female genitalia.

***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.

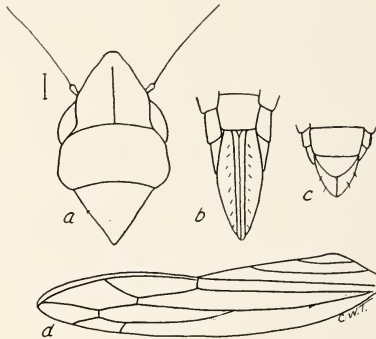


FIGURE 16.—*Paracicadula coniceps*, new species: *a*, dorsal view of head, pronotum and scutellum; *b*, female, *c*, male genitalia; *d*, elytron.

***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.

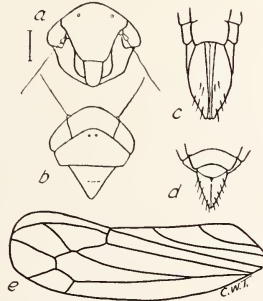


FIGURE 17.—*Cicadula dorsalis*, new species: a, face; b, vertex, pronotum, and scutellum; c, female, d, male genitalia; e, elytron.

***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*.

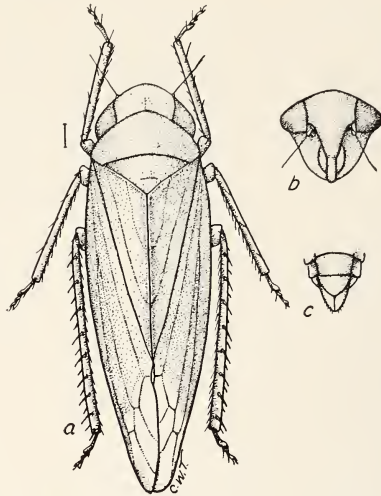


FIGURE 18.—*Cicadula tintorella*, new species: *a*, dorsal view; *b*, face; *c*, male genitalia.

### *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.

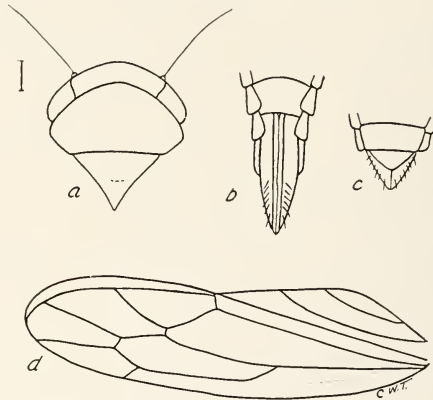


FIGURE 19.—*Nesosteles hebe* Kirkaldy: *a*, head, pronotum, and scutellum; *b*, female, *c*, male genitalia; *d*, elytron.

***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; Tauheputa, 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.

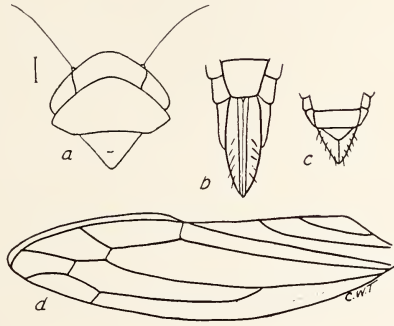


FIGURE 20.—*Nesosteles marquesana*, new species: a, head, pronotum, and scutellum; b, female, c, male genitalia; d, elytron.

***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; Teavaihiau [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.

Hiva'oa: 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; Hana-tuuna [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.

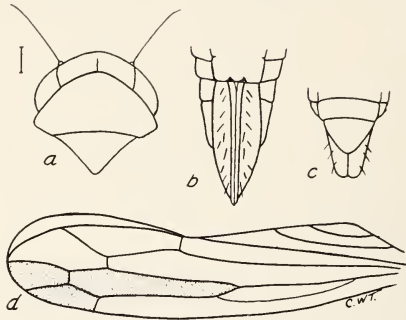


FIGURE 21.—*Nesosteles areolata*, new species: *a*, head, pronotum, and scutellum; *b*, female, *c*, male genitalia; *d*, elytron.

### *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*.

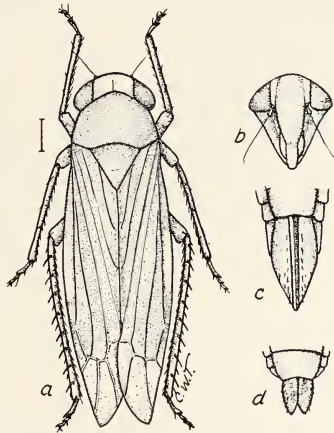


FIGURE 22.—*Empoasca marquesana*, new species: a, dorsal view; b, face; c, female, d, male genitalia.

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

Head scarcely as wide as pronotum; vertex short and round, scarcely as long as 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, LeBromec 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.

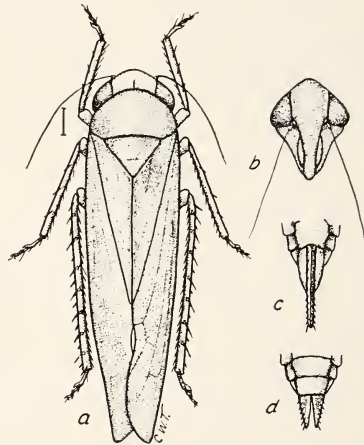


FIGURE 23.—*Empoasca nesolina*, new species: *a*, dorsal view; *b*, face, *c*, female, *d*, male genitalia.

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.



## MARQUESAN EMBIOPTERA \*

By

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The collection of Embioptera made in the Marquesas Islands by the Pacific Entomological Survey includes but one species, *Oligotoma vosseleri* Krauss, also recorded from Easter Island. This species was taken also by the Survey in Tahiti.

### ORDER EMBIOPTERA

#### FAMILY OLIGOTOMIDAE

#### **Oligotoma vosseleri** (Krauss).

*Aposthonia vosseleri* Krauss, Zoologica Bd. 33, Heft 60, p. 48, Taf. 2, fig. 14, a-g, 1911.

*Oligotoma vosseleri*, Enderlein, Coll. Zool. E. Selys Longchamps, fasc. 3, p. 101.

Hivaoa: Pouau, altitude about 1650 feet, 2 males; Atuona; Mumford and Adamson.

Females and young specimens from the following localities:

Hivaoa: Pouau, altitude about 1650 feet, March 5, 1929; Anatuakina, altitude 1520-1525 feet, June 1, 1929; Vaioa, altitude 1200 feet, July 26, 1929; Atuona, February 17, 1929; Tapeata, on east slope of Mount Ootua, altitude about 2500 feet, May 25, 1929; northeast slope of Mount Temetiu, altitude 2600 feet, September 14, 1929, Vaiepoepo, altitude 2420 feet, June 3, 1929; Mount Ootua summit, altitude 3032 feet, February 13, 1930; plateau above Atuona, altitude about 1500 feet, April 22, 1929; Tanaeka Valley, altitude 1100 feet, June 4, 1929; Mount Temetiu, northeast slope, altitude 1990 feet, July 26, 1929, Mumford and Adamson; Kaava Ridge, altitude 2500 feet, January 8, 1932, LeBronnec.

Uapou: Hakahetau Valley, altitude about 1000 feet, December 26, 1929; Hakahetau, altitude about 1000 feet, December 14, 1929, R. R. Whitten.

Fatuuku: altitude 990 feet, November 19, 1930, H. Tauraa.

Hatutu [Hatutaa]: altitude about 1000 feet, April 28, 1931, LeBronnec and H. Tauraa; near middle east side, altitude 1080 feet, September 30, 1929, A. M. Adamson.

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\* Pacific Entomological Survey Publication 7, article 19. Issued April 14, 1934.



Eiao: Vaituha Valley, altitude 200 feet, October 5, 1929, A. M. Adamson.

Nukuhiva: Tovii [Toovii], 2 miles northeast of Teuanui, altitude 2800 feet, October 26, 1929, Mumford and Adamson; Tekao Hill, altitude 3020 feet, July 23, 1932, LeBronnec; Tapuaooa, altitude 3100 feet.

Fatuhiva: Teavaione, Omoa [Oomoa] Valley, altitude 1700 feet, August 29, 1930, LeBronnec.

Tahiti: Papenoo Valley, altitude 650 feet, 6 miles from sea, October 29, 1928; Papenoo, altitude about 500 feet, October 25, 1928; A. M. Adamson.

# CERAMBYCIDAE FROM THE MARQUESAS ISLANDS\*

By

K. G. BLAIR

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The present paper deals with material collected in the Marquesas by the St. George Expedition, 1925, and the Pacific Entomological Survey, 1929-1931. The two collections are very similar in composition and contain no new species. The most striking feature of the cerambycid fauna of the Marquesas and of the Society Islands<sup>1</sup> is the very strong element, amounting roughly to half the total number, of introduced species, mostly of Central American origin, some of fairly long standing and now strongly established. Notes on the distribution and biology follow the records of each species.

Synonymy is given only in so far as that the name used by Fairmaire,<sup>2</sup> where different from that now used for the species, is listed.

## FAMILY CERAMBYCIDAE

### SUBFAMILY CERAMBYCINAE

#### **Xystrocera globosa** Olivier.

Nukuhiva: sea level, January 20, 1925, 1 example, at light (St. George).

Widely distributed in India, China, the Malay Archipelago, also Egypt, Madagascar, the Seychelles Islands and other groups of the Indian Ocean, and Hawaii.

Attacks not only growing trees of many species, but also cut timber and bamboo. Apparently of fairly recent introduction.

#### **Cylindera flava** Fabricius.

*Ceresium impuncticolle* Fairmaire.

Hivaoa: Atuona, May 12, 1929, 1 male, at light, Mumford and Adamson.

Uahuka: Hane Valley, altitude 150 feet, March 15, 1931, 1 male, at light, LeBronnec and H. Tauraa.

Éiao: above Vaituha, altitude 1200 feet, October 3, 1929, 1 male, at light, Adamson.

Tahuata: January, 1925, 1 example (St. George).

A West Indian species ranging into Florida, Mexico, and Guiana, and introduced into Hawaii and St. Helena. Fairmaire's *Ceresium impuncticolle* Fairmaire from Tahiti and Raiatea would appear, from the description, to be the same species.

\* Pacific Entomological Survey Publication 7, article 20. Issued May 16, 1934.

<sup>1</sup> Blair, K. G., Cerambycidae from the Society Islands: B. P. Bishop Mus., Bull. 113, 1934.

<sup>2</sup> Fairmaire, Léon, Essai sur les Coléoptères de la Polynésie: Rev. et. Mag. de Zool., vol. 2, pt. 2, pp. 57-64, 115-119, 1850.

Larvae that may belong to this species (or possibly to *Obrium gynandropsidis*) were obtained on Hivaoa, June 1, 1929, from *Xylosma suaveolens*, by Mumford and Adamson.

**Ceresium unicolor** Fabricius.

*Hesperophanes simplex* Schoenherr.

Nukuhiva: Taiohae, sea level, June 4 and August 4, 1931, 2 males, at light, LeBronnec and H. Tauraa; sea level to 1500 feet, January, 1925, on *Hibiscus* flowers, 3 examples (St. George).

Hivaoa: December 26, 1924, 1 example, at light on open hillside (St. George).

Uapou: Hakahetau, altitude 500 feet, December 17, 1929, larvae, in *Casuarina equisetifolia*, Whitten.

Uahuka: Hane Valley, altitude 150 feet, March 8 and 15, 1931, 3 males, at light; Penau Ridge, altitude 2170 feet, March 3, 1931, 1 male, at light; Putiovai, altitude 1530 feet, March 23, 1931, 1 male, on *Xylosma suaveolens*, LeBronnec and H. Tauraa; Haahue Valley, altitude 750 feet, March 20, 1931, larvae, in dead wood of *Sapindus saponaria*, LeBronnec and H. Tauraa.

Tahuata: January, 1925, 29 examples, at light, and in curled coconut fronds (St. George).

Eiao: altitude 50 feet, April 22, 1931, 2 males, at light; altitude 1600 feet, April 23, 1931, 1 female, in dead wood of *Cordia subcordata*; above Vaituha, altitude 200 and 1200 feet, October 3, 1931, 2 males, at light, LeBronnec.

Mohotani: altitude 900 feet, February 3, 1931, 1 male, LeBronnec and H. Tauraa.

The Fabrician type, from Amsterdam Island, is in the Banks Collection in the British Museum. The species has a wide distribution in the Pacific, occurring in Samoa, Tonga, Fiji, New Hebrides, Solomons, Hawaii, and Henderson Island. Fairmaire records it as common on *Artocarpus*.

**Ceresium guttaticolle** Fairmaire.

*Hesperophanes maculaticollis* Blanchard.

Nukuhiva: Teuanui, altitude 1800 feet, October 25, 1929, 1 female, at light, Mumford and Adamson.

Distribution similar to that of *C. unicolor*, extending further to Lord Howe Island but not recorded from Hawaii. Fairmaire records it from *Hibiscus tiliaceus*.

**Obrium gynandropsidis** Fairmaire.

Uahuka: Hanahoua, altitude 900 feet, March 10, 1931, 1 example on *Cordia subcordata*, LeBronnec and H. Tauraa.

Nukuhiva: January 24, 1925, 1 beaten (St. George).

Tahuata: altitude 850 feet, January 12, 1925, 5 examples, at light (St. George).

With type locality Tahiti, the species also occurs in Samoa, Tonga, Fiji, and the Ellice Islands. *Longipalpus palazyanus* Montrouzier from Lifu is the same species.

According to Fairmaire the beetle occurs on flowers of *Gynandropsis pentaphylla*. Larvae that may belong to this species (or to *Cylindera flava*) were found on Hivaoa in *Xylosma suaveolens*.

### **Cyllene crnicornis** Chevrolat.

Hivaoa: Atuona, altitude 20 feet, May 15, 1929, 13 examples (3 males), July 2, 1929, 19 examples (12 males), July 14, 1929, 27 examples (18 males), Mumford and Adamson; January 1925, 3 on flowering trees and flying in sun (St. George).

Tahuata: Vaitahu Valley, May 29, 1930, 1 male; seashore, June 9, and July 14, 1930, 26 examples (18 males); Hanateio Valley, altitude 1350 feet, July 24, 1930, 6 examples (5 males) on *Inocarpus edulis*; LeBronnec and H. Tauraa: January 1925, 4 examples flying in sun and beaten from trees (St. George).

Ranges from the southern United States to Venezuela and introduced into Hawaii and Rarotonga (Stephens in British Museum). It was apparently unknown to Fairmaire from Tahiti, but was collected by Commander Walker in 1883 and by Lord Crawford's expedition, April 14, 1903.

### **Cyllene guttata** Chevrolat.

Fatuhiva: Omoa [Oomoa] Valley, sea level, August 18, and September 22, 1931, 2 examples, LeBronnec and H. Tauraa, January 7, 1925, 1 example in flight (St. George).

Nukuhiva: Tapuaooa, altitude 3100 feet, November 12, 1929, 3 examples on *Hibiscus tiliaceus*; Taiohae, November 28, 1929, 1 example; Mumford and Adamson; January 1925, 4 examples on mango and *Hibiscus* flowers (St. George).

Uapou: altitude 1500 feet, December 31, 1929, 4 examples on *Hibiscus tiliaceus*; January 5, 1930, 1 example reared from dead wood; January 7, 1930, on *Sapindus saponaria*; Whitten.

Uahuka: Pouau (?), Hokatu Valley, altitude 500 feet, March 9, 1931, 5 examples on mango; Hanatekeo, Hane Valley, altitude 950 feet, February 24, 1931, 1 example; LeBronnec and H. Tauraa.

Occurs from Mexico to Venezuela and Peru (Chanchomayo) but is probably of more recent introduction to the Pacific than its congener since we have no records of it either from Hawaii or from the Society Islands.

The apparent segregation of these two species on different islands is very striking.

SUBFAMILY LAMIINAE

**Oopsis nutator** Fabricius.

Fatuhiva: Uia [Ouia] Valley, altitude 100 feet, September 2, 1930, 6 examples, sweeping, LeBronnec and H. Tauraa; February 1, 1925, sea level, 1 example, in flight (St. George).

Nukuhiva: Maauu [Meanu], altitude 1300 feet, October 22, 1929, 1 example, on *Ficus prolixa*, Mumford and Adamson; altitude 200 feet, 1 example, at light; altitude 2500-3000 feet, January 17, 1925, 1 example, beaten from ferns (St. George).

Hivaoa: Teava Uhia i te Kohu, altitude 2000 feet, February 15, 1930, 1 example swept, Mumford and Adamson; December 1924, 11 examples, at light and on oleander flowers (St. George).

Uapou: Teavaituhai, altitude 3000 feet, December 8, 1929, 1 example, Adamson and Whitten; up 270, 1000 feet, December 23, 1929, 4 examples reared from dead wood; Hakahetau, December 31, 1929-January 25, 1930, 24 examples reared from dead wood; Whitten.

Uahuka: crest of North ridge, altitude 2000 feet, September 29, 1929, 2 examples swept, Adamson.

Tahuata: Vaitahu Valley, altitude 120 feet, June 16, 1930, 3 examples on cotton, LeBronnec and H. Tauraa; January 1925, 19 examples, at light and on herbage (St. George).

Eiao: uplands, altitude 1875 feet, December 29, 1929, 12 examples on *Hibiscus tiliaceus*, Adamson.

Mohotani: altitude 1300 feet, February 2, 1931, 1 example, LeBronnec and H. Tauraa.

The type, from Tahiti, is in the Banks Collection. The species has a wide distribution in Oceania, occurring in Samoa, Tonga, Fiji, the Ellice Islands, and Hawaii. A specimen in the Fry Collection in the British Museum is labelled "Queensland" without further data.

**Acanthoderes quadrigibba** Say.

Nukuhiva: Teuanui, October 15 and 27, 1929, 1 example at light, 1 under bark of *Hibiscus tiliaceus*; Tapuaooa, November 14, 1929, 1 example; Mumford and Adamson. Tovii [Toovii], altitude 2000 feet, October 25, 1929, under bark of *Hibiscus tiliaceus*, Mumford and Adamson; January 15, 1925, 1 at light in pandanus swamp (St. George).

Hivaoa: Atuona, April 25, 1929, 1 example, Mumford and Adamson; December 27, 1924, 1 example on tree trunk (St. George).



Uapou: Hakahetau, December 20, 1929, 1 example at light; altitude 800 feet, December 23, 1929, 4 on dead log and reared from pupae, larvae from *Aleurites moluccana*; altitude 500 feet, January 22, 1930, 1 example; Whiten; Koputukea, altitude 1100 feet, November 16, 1931, in *Hibiscus tiliaceus*, larvae, LeBronnec.

Tahuata: Hanatetena Valley, altitude 1000 feet, July 23, 1920, 1 example. LeBronnec and H. Tauraa; altitude 200 feet, January 13, 1925, 1 example, at light (St. George).

Uahuka: Haahue Valley, altitude 750 feet, March 20, 1931, in *Sapindus saponaria*, larvae; Hane Valley, altitude 1300 feet, February 25, 1931, in *Aleurites moluccana*, larvae; LeBronnec and H. Tauraa.

Known from the eastern United States to Brazil, widely distributed. The Southern form, occurring from Mexico and the West Indies to Brazil, is usually separated as a distinct species, *A. circumflexa* Jacquelin du Val, but they have been placed together by Dr. C. J. Gahan in the British Museum collection. It is the latter form, of a warmer reddish tint, that has been introduced into the Pacific, where, in the Marquesas at least, it appears to be now well established.



TWO NEW SPECIES OF CYPRETTA (OSTRACODA) FROM THE  
MARQUESAS ISLANDS AND FLORIDA WITH NOTES ON  
THE DISTRIBUTION OF THE GENUS\*

By

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Genus CYPRETTA Vavra, 1895

*Cypridopsis* (*Cypretta*), Vavra, Beiheft zum Jahrb. der Hamburg. Wiss.  
Anstalten, vol. 12, p. 6, 1895.

*Cypretta*, G. W. Müller, Abhand. Senckenb. naturf. Ges., Frankfurt, vol. 21,  
p. 283, 1898.

Stout, boldly arched, tumid forms, less than 1 mm. long. Anterior margin of each valve with a more or less conspicuous row of radiating septa. Natatory setae of the second antenna well-developed, extending approximately to the tips of the terminal claws. Third masticatory process of the maxilla with two fairly strong spines. Terminal claw of the third thoracic leg strong, similar to *Cypridopsis* Brady. Furcal rami feebly developed, slender, each armed with two setalike claws, the dorsal seta generally present and the terminal often absent. Posterior portion of each ovary coiled in a spiral manner in the posterior valve chamber.

The genus is readily confused with *Cypridopsis* Brady from which it differs particularly in the row of septa along the anterior margin of each valve, and in the character of the furcal rami, each of which in *Cypridopsis* consists of a simple base, with or without a dorsal seta, and terminating in a single flagellum.

The male sex is very rarely encountered. In fact, reproduction in the genus has been considered to be exclusively parthenogenetic, as no males have previously been described. There is, however, one authentic species of *Cypretta* in which males are fully as common as are the females. This interesting form, occurring very abundantly in various pools and ditches of Florida, was collected in considerable numbers during August of 1932 by K. R. Salisbury. The female of this species rather closely resembles *Cypretta minna* (King), and the slightly smaller male is particularly characterized by the position of the testes which, similar to the ovaries of the female, are coiled in the posterior portion of the valve chamber. The name *Cypretta brevisaepta* is proposed for this remarkable species. A full account of its characters is given below. Vavra in 1895 described a form from Zanzibar,

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\* Pacific Entomological Survey Publication 7, article 21. Issued May 16, 1934.

with males as well as with females, which he named *Cypridella lemurensis* and which G. W. Müller later (1912) referred to the genus *Cypretta*. Vavra, however, rightly considered this species to be more closely related to such genera as *Cypricercus* Sars and *Eucypris* Vavra, chiefly because the furcal rami of the Zanzibar specimens more closely approach the condition peculiar to the latter genera. In addition to this, an examination of Vavra's figures for the male of *Cypridella lemurensis* shows that the testes originate as a spiral coil in the anterior portion of each valve chamber, similar to *Cypricercus* and in decided contrast to the condition found in the *Cypretta* from Florida. Consequently the species from Zanzibar should not be included in the genus *Cypretta*, but should be returned to *Cypridella*.

With the omission of *C. lemurensis* and in addition to *C. brevisaepta* from Florida and *C. uukuhivana*, the last being described in the present report, there remain 12 established species in the genus. The majority of these have been found along the eastern coast of Africa, in Madagascar, in Australia and New Zealand, in a few of the South Pacific islands, principally those near the Asiatic coast, and in Ceylon and China near by. Just how extensively the genus is distributed in the Americas is unknown, for very little investigation of the ostracod fauna of this part of the world has been carried on. One species, *Cypretta sarsi*, reported by G. S. Brady for St. Thomas Island of the West Indies, also occurs in Natal, on the southeastern coast of Africa. Another species, *Cypretta turgida* (Sars), common near Beaufort, North Carolina, has a very wide distribution, having been recorded for Australia, New Zealand, Sumatra, China, and Africa. There are no other American records except for a reference by R. W. Sharpe to *Cypris globulosa*, which should undoubtedly be referred to *Cypretta dubiosa* (Daday), and which was found very abundantly in certain tubs in a greenhouse of Madison, Wisconsin. These ostracods were undoubtedly brought into this locality along with water plants, and can hardly be considered native. R. Menzel reported a similar situation in the botanical gardens of Basel, where *Cypretta globulus* (Sars) and *Stenocypris malcolmsoni* (Brady), two species from Asia, Africa, and other localities, were found. The only other European record available is that of *Cypretta minna* (King). One adult female of this species was found by W. Klie in a collection from Bulgaria.

The presence of *Cypretta*, along with *Strandesia* Stuhlmann, *Stenocypris* Sars, and *Chlamydotheca* Saussure in the southern part of North America, in the West Indies, and in South America on the one hand, and in the South Pacific islands, in Africa, and along the Asiatic coast on the other, suggests the probability of a relationship between the faunas of these widely separated areas. If this be true, it would be expected that some of the species from the Marquesas, Samoa, and Hawaii would be rather closely related to certain

forms found in the Americas on the one side, and in Asia, Africa, and Australia on the other. Thus the presence on the island of Nukuhiva in the Marquesan archipelago of a species of *Cypretta* which closely resembles a species found in the West Indies and in Africa is not surprising. Similarly, *Chlamydotheca unispinosa* (Baird) has been reported in Hawaii and in Jamaica of the West Indies by Baird (1862), and in the *cenotes* of Yucatan by Furtos (1934); *Stenocypris malcolmsoni* (Brady) in Africa, Asia, in some of the South Pacific islands near the Asiatic coast, and also in the *cenotes* of Yucatan; and various species of *Strandesia* are similarly distributed. A more specific study of the ostracods of the Marquesas and near-by islands, with special reference to the relationship of the faunas present to the faunas of other parts of the world, is not possible at the present time, for only two species, including the record of the present report, have been described from these regions.

***Cypretta nukuhivana*, new species (fig. 1).**

Female

From the side: stout, boldly arched, height equal to about two thirds of the length, highest in the middle; dorsal margin evenly arched, with no indication of a mid-dorsal angle; extremities broadly and equally rounded; ventral margin somewhat sinuated; anterior margin of each valve with a conspicuous row of from 12 to 18 radiating septa, and a hyaline border, the border of the right valve being considerably wider than that of the left. From above: tumid, ovoid, the breadth greater than the height, broadest slightly behind the middle; right valve enclosing the left and projecting beyond the left at the pointed anterior extremity; posterior extremity broadly rounded, sinuate at the hinge line. Surface of the valves minutely pitted, the pits producing a granulated appearance; also very hairy, the hairs quite short except along the free margins, where they are rather long. Color undetermined, although traces of blue pigment on the preserved specimens indicate the probability of some sort of striping or other ornamentation. Length 0.60, height 0.45, breadth 0.50 mm. Natatory setae of the second antenna well developed, extending slightly beyond the tips of the terminal claws. Third masticatory process of the maxilla with two toothed spines, the teeth of which are long, narrow, closely applied to the sides of the spines so as to be scarcely visible; terminal segment of the maxillary palp cylindrical, about twice as long as broad. Antipenultimate segment of the second thoracic leg with a particularly long, strong seta extending to the proximal third of the terminal claw; terminal claw smooth except for a few delicate denticles near the tip. Terminal claw of the third thoracic leg rather stout, curved, pectinate, less than one half as long as the penultimate segment. Furcal ramus slender, approximately straight, 19 times longer than the width at the level of the dorsal seta, dorsal margin smooth; dorsal seta short, one fifth as long as the subterminal claw, and removed from the claw by the width of the ramus; claws setalike, smooth, the subterminal straight, slightly greater than one half the length of the gently curved terminal claw, the latter being about six sevenths as long as the ramus; terminal seta absent.

Male unknown. As several hundred females were collected, it is probable that there are no males for this particular species, reproduction being exclusively parthenogenetic.

Nukuhiva: Vaihakameama pond, altitude 2600 feet, very common, November 11, 1929, Mumford and Adamson.



The type specimen, a female, has been deposited in Bernice P. Bishop Museum, Honolulu. Paratypes are in the United States National Museum, and in the writer's collection. In the type, the valves are placed in a vial and the body parts on a permanent slide, and both given the same Bishop Museum catalog number.

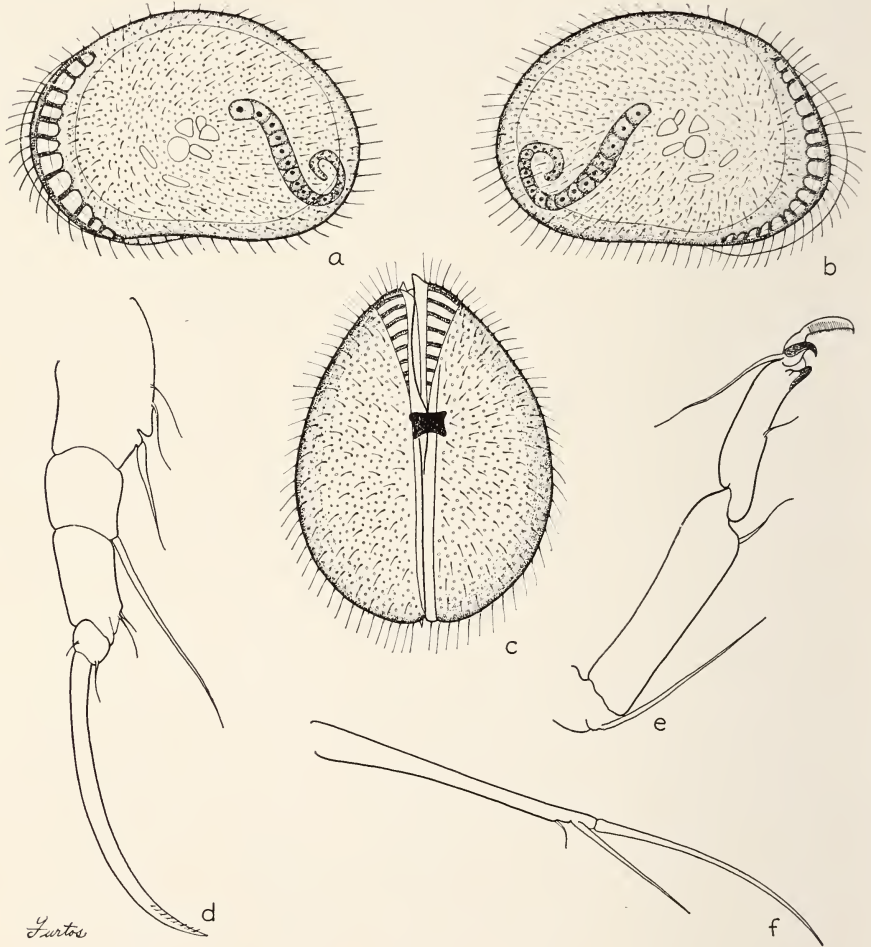


FIGURE 1.—*Cypretta nukuhivana*, new species, female: a, left valve; b, right valve; c, dorsal view; d, second thoracic leg; e, endopodite of third thoracic leg; f, furcal ramus.

This species may be readily confused with *Cypretta sarsi* Brady and *Cypretta globulus* (Sars), for which reason the three forms should be compared and the differences noted. *Cypretta sarsi* is a little larger than the species from the Marquesas, amounting to 0.77 mm. in length, but the valve

proportions and the character of the surface of the two forms are quite similar. The furcal ramus is without a dorsal seta in Brady's species, a character which constitutes the chief difference between *Cypretta sarsi* and *Cypretta nukuhivana*. Brady's drawings of the appendages of *Cypretta sarsi* are considerably distorted, indicating that he may have described the species from a single specimen, in which case the dorsal seta of the furcal ramus may have either been broken off or else hidden from view by the position of the furca. If this should prove to be correct, the species from the Marquesas would be referred to Brady's species and not be considered new. *Cypretta globulus* (Sars) is about the same size as *Cypretta nukuhivana* and the valves similarly pitted. The valves of Sars' species, however, are higher, with a moderate mid-dorsal angle that is entirely absent in *Cypretta nukuhivana*, and the furcal rami are each provided with a well-developed terminal seta.

### ***Cypretta brevisaepta*, new species (fig. 2).**

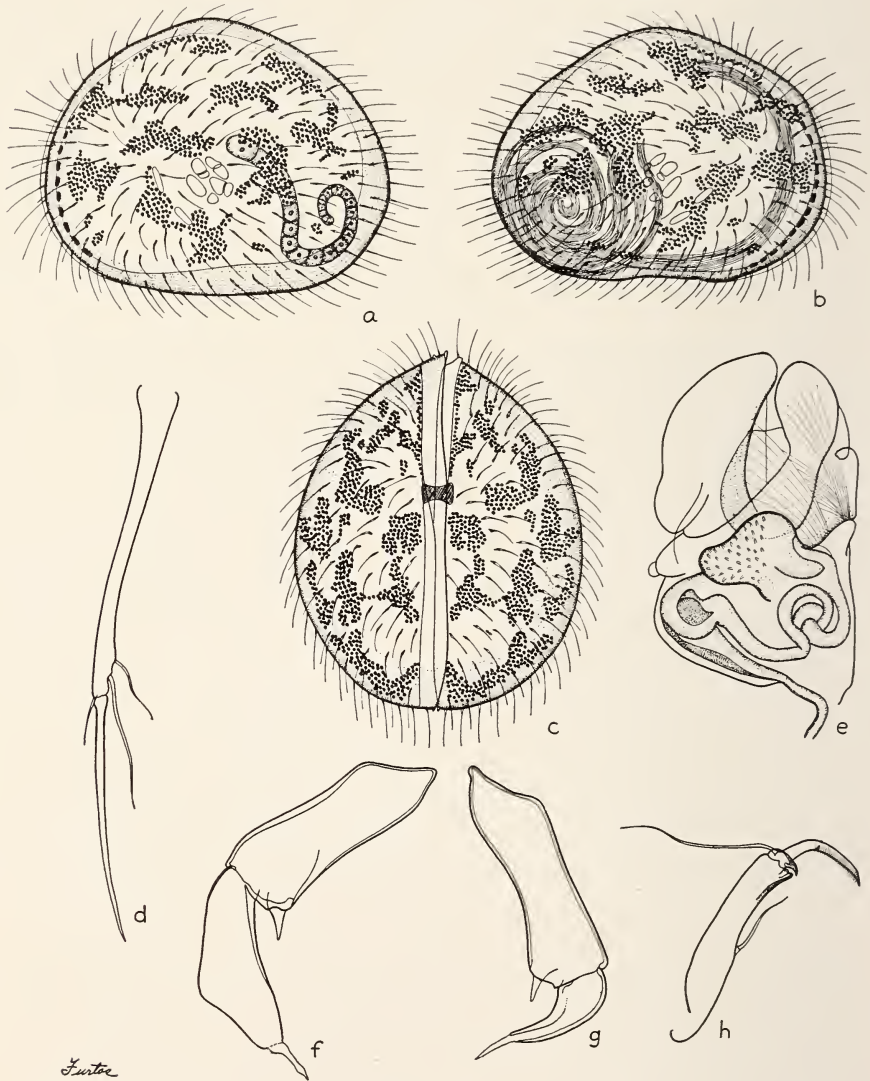
#### Female

From the side: stout, boldly arched, height greater than two thirds of the length, highest in the middle; dorsal margin with a slight sinuation in front of the moderately rounded mid-dorsal angle; extremities broadly rounded, the anterior clearly the broader; ventral margin of the left valve convex, that of the right slightly sinuated; anterior margin of each valve with from 9 to 13 short, inconspicuous, radiating septa, and a narrow hyaline border, the border of each valve of approximately equal width. From above: excessively tumid, ovoid, the breadth exceeding the height, broadest in the middle; left valve enclosing the right and projecting slightly beyond the right at the somewhat pointed anterior extremity; posterior extremity broadly rounded. Surface of the valves smooth, and with numerous short, blunt spinelike processes, each bearing a strong curved hair. Color light, with scattered dark-blue patches somewhat suggestive of dorsolateral bands. Length 0.85, height 0.67, breadth 0.70 mm. Natatory setae of the second antenna extend to the tips of the terminal claws or slightly beyond. Third masticatory process of the maxilla with two smooth spines; the terminal segment of the maxillary palp about twice as long as broad, very slightly narrowed distally. Terminal claw of the third thoracic leg well developed, curved and denticulated, slightly less than one half the length of the penultimate segment. Furcal ramus gently curved, slender, slightly broadened distally, 15 times longer than the width at the level of the dorsal seta, dorsal margin smooth; the dorsal seta a trifle greater than one half the length of the subterminal claw; the latter slender, curved, setalike, exceeding one half the length of the terminal claw; terminal claw strong, gently curved, about three fourths as long as the ramus; the terminal seta one fifth as long as the terminal claw.

#### Male

Smaller than the female, otherwise similar. Length 0.82, height 0.60 mm. The testes form a conspicuous spiral coil in the posterior chamber of each valve. Prehensile palps slender, unequal; propodus of the larger palp cylindrical, three and one half times longer than the narrowest width, and with the outer margin moderately inflated; propodus of the smaller palp more elongated, and the dactylus short, hooklike. Ejaculatory duct barrel-shaped, armed with about 18 crowns of slender spines, the crowns being very closely crowded together. Penis with two conspicuous terminal lobes and a small median lobe, the latter armed with a few short, inconspicuous spinous processes.

Very common in many wayside pools of Florida during August. Type locality: one half mile north of the railroad station, Buckingham, Florida. Collected by R. K. Salisbury, August 10, 1932. Specimens of this species have been deposited in the United States National Museum. Type female, no. 68157; type male, no. 68158. Paratypes, no. 68159.



*Furca*

FIGURE 2.—*Cypretta brevisaepta*, new species: a, left valve of adult female; b, right valve of adult male; c, adult female, viewed from above; d, furcal ramus, female; e, penis; f-g, prehensile palps; h, distal end of third thoracic leg.





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# A NEW SPECIES OF APHID FROM THE MARQUESAS\*

By

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Included in a collection of aphids taken by the Pacific Entomological Survey in the Marquesas Islands were four apterous forms of a hitherto undescribed species of doubtful affinities taken in the cloud zone on Hivaoa. This species is characterized by the conspicuously constricted cauda, the thickened body skin, and the sculptures on the dorsum.

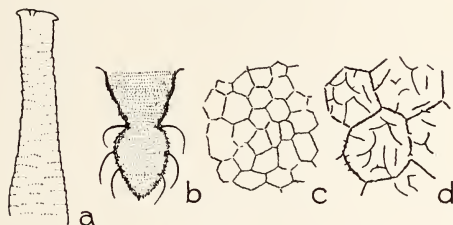


FIGURE 1.—*Aphis mumfordi*, new species (apterous viviparous female): a, cornicle; b, cauda; c, dorsal reticulations; d, dorsal reticulations and sculptures.

## *Aphis mumfordi*, new species (fig. 1).

Apterous viviparous female. In specimens treated with caustic potash, dark yellowish brown, head paler, antennae colorless, except on the basal two joints which are pale brownish, cornicles yellowish-brown, not dusky on the apex, cauda pale yellowish brown, legs colorless, slightly dusky on the distal parts of tibiae and on the tarsi.

Body oval, skin somewhat thickened, distinctly reticulated and with numerous minute irregular sculptures on the dorsum, except on the head and posterior part of abdomen, with a few very short setae hardly discernible. Head not imbricated, lacking spinules and granules. Frontal tubercles not developed. Eyes normal. Antennae slender, imbricated, much shorter than the body, 5- or 6-jointed, with a few very short setae; the 3d joint about 0.014 mm. wide at the middle, lacking sensoria; the penultimate segment with a rather small circular sensorium on the distal part; the relative length of joints (5-jointed antennae) approximately as follows: III, 38; IV, 20; V, 15 + 36; (6-jointed antennae) III, 26; IV, 17; V, 22; VI, 14 + 38 mm. Rostrum stout, obtuse at the tip, reaching the middle coxae. Prothorax and the 1st and 7th abdominal segments with a very small conical lateral tubercle. Abdomen with numerous minute spinules in many transverse rows on the posterior part; the segments not discernible except on the posterior part. Cornicles cylindrical, moderately expanded on the basal part, nearly straight, imbricated except on the distal small part, not reticulated, about 3.4 times as long as wide, about 1.7 times as long as the cauda, nearly as long as the 3d joint of the 5-jointed antenna, and with a flange; cauda distinctly constricted at the middle, the distal part nearly globular, rounded apically, a little longer than wide with 5 or 6 long curved bristles. Anal plate broadly rounded, with 6 very long, fine curved hairs. Tibiae rather slender, with some rather

\* Pacific Entomological Survey Publication 7, article 22. Issued May 14, 1934.

long setae especially on the distal half, stouter than the 3d antennal joint; tarsi imbricated, the basal joint with 2 setae on the distal part; hind tarsi nearly as long as the basal part of the last antennal joint.

Length of body about 1.0 mm. Width of head excluding eyes about 0.212 mm. Length of antenna about 0.56 mm.; cornicle about 0.175 mm.; cauda about 0.106 mm.; hind femur about 0.24 mm.; hind tibia about 0.42 mm.

Hivaoa: Matauuna, altitude about 3700 feet, March 4, 1930, 4 apterous forms, host unrecorded, Mumford and Adamson.

The type specimens are preserved in the collections of Bernice P. Bishop Museum, Honolulu, Hawaii; paratypes in the Department of Agriculture Research Institute, Taihoku, Formosa.

# FURTHER NEW SPECIES AND OTHER RECORDS OF MARQUESAN COLEOPTERA \*

By

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Since the completion of my previous report<sup>1</sup> in which I described some new varieties of *Cyphogastra bedoci* Théry, a buprestid peculiar to the Marquesas and apparently showing a strong tendency to the formation of insular races, and a new cisid and cantharid collected in the Marquesas, I have received further material of Heteromera (Tenebrionidae, Oedemeridae, and Xylophilidae) and Serricornia (Cleridae, Anobiidae, Bostrichidae, Lyctidae, Cisidae, and Buprestidae).

The types of new species are in Bernice P. Bishop Museum, Honolulu, with paratypes in the British Museum (Natural History).

## FAMILY TENEBRIONIDAE

### **Palorus austrinus** Champion.

Hivaoa: Atuona, May 12, 1929, in rice, 5 examples, Mumford and Adamson.

Described from northwest Australia, it occurs also in Queensland and New South Wales, in Samoa, the Gilbert Islands, Damma Island, and India, Dehra Dun. Evidently transported by commerce. This species has not been hitherto recorded from the Marquesas.

### **Palorus cerylonoides** Pascoe.

Tahuata: Hanamiai Valley, altitude 300 feet, May 30, 1930, 1 example, LeBronnec and H. Tauraa.

Occurs in New Guinea, India, Burma, Japan, and Fiji. Not previously recorded from the Marquesas.

### **Alphitobius laevigatus** Fabricius.

Eiao: above Vaituha, altitude 1200 feet, October 2, 1929, under stones, 5 examples, Adamson; altitude 1500 feet, April 21 and 23, 1931, under bark of *Pisonia* species and *Thespesia populnea*, 2 examples, LeBronnec and H. Tauraa.

Uahuka: Teuaua Islet, September 21, 1929, from Pacific sooty tern (*Sterna fuscata, oahuensis*), 3 examples, Adamson.

<sup>1</sup> Blair, K. G., New species and varieties of Coleoptera from the Marquesas Islands: B. P. Bishop Mus., Bull. 98, pp. 241-244, 1932.

\* Pacific Entomological Survey Publication 7, article 23. Issued July 10, 1934.

Uapou: Hakahetau, December 17, 1929, in horse dung, 6 examples, Whitten.

Also collected in the Society Islands by the Pacific Entomological Survey.

A cosmopolitan species, carried everywhere by commerce; evidently capable of occupying a variety of situations and often occurring as a warehouse pest.

#### FAMILY OEDEMERIDAE

##### **Sessinia livida** Fabricius.

Nukuhiva: Taiohae, sea level, August 4, 1931, at light, 1 example, LeBronnec and H. Tauraa.

A widely spread oceanic species, occurring also in Fiji and Tonga, Samoa, Ellice, Funafuti, and Henderson islands. Collected by the Survey on Tahiti and Moorea in the Society Islands.

##### **Ananca bicolor** Fairmaire.

Nukuhiva: Taiohae, sea level, June 4 and August 4, 1931, at light, 5 examples, LeBronnec and H. Tauraa.

Tahuata: Tehue Valley, altitude 650 feet, May 27, 1930, 1 example; Vaitahu Valley, seashore, June 18, 1930, 1 example; LeBronnec and H. Tauraa.

Eiao: Vaituha, September 29 and October 2, 1929, at light, 3 examples, Adamson.

Of similar distribution to *Sessinia livida*, though apparently not recorded from Fiji but occurring also in the New Hebrides. Collected by the Survey on Moorea, Society Islands.

##### **Ananca decolor** Fairmaire.

Nukuhiva: Taiohae, sea level, June 4, 1931, at light, 1 example, LeBronnec and H. Tauraa.

Tahuata: Vaitahu Valley, seashore, August 13, 1920, 1 example, LeBronnec and H. Tauraa.

Eiao: Vaituha, October 2, 1929, at light, 4 examples, Adamson.

Also of wide oceanic distribution.

It is noteworthy that of all the above, both sexes come to light and the females are taken in much greater numbers than the males.

#### FAMILY XYLOPHILIDAE

##### **Xylophilus marquesanus**, new species (fig. 1).

Small, brown, elytra with darker spots. Head much wider than thorax, almost as wide as elytra at base; eyes large and coarsely granulate, separated in front by a distance about equal to the length of the basal joint of the antennae. Antennae long and stout, extending much beyond base of elytra, joints 2 and 3 very small, subequal, together

about as long as and half the width of 4, which is subquadrate, 4 to 10 of equal thickness and almost equal in length. Elytra about twice as long as wide, rather strongly and evenly punctate, each puncture with a subdecumbent hair, intervals between punctures clothed with a dense short decumbent sericeous pubescence. The dark markings take the form of an oblique spot near the suture just beyond the middle, together almost forming a circle with the anterior median sextant wanting, and another oblique spot lateral to this, with further indistinct markings towards base and apex. Legs moderately slender, with hind femora strongly incrassate. Length 1.5 mm.

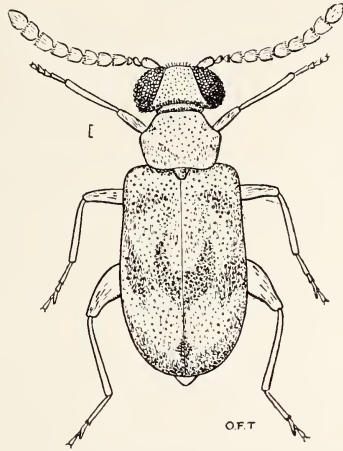


FIGURE 1.—*Xylophilus marquesanus*, new species.

Fatuhiva: Uia [Ouia] Valley, near sea level, September 2, 1930, on *Sida* species, 1 male, LeBronnec. Type in Bernice P. Bishop Museum.

Resembles *X. fijianus* Champion in form and to a great extent in color, but differs in antennal structure, in the simple anterior tarsi and the thickened posterior femora. Still more closely resembles *X. bigeminatus* Champion from Siam and Ceylon, but the latter is larger, with the eyes proportionately smaller and the antennae less thickened; these differences might be wholly or in part due to difference in sex and the Marquesan species ultimately prove to be identical with that from Siam, but in view of the wide difference in locality I prefer to consider it provisionally as new.

#### FAMILY CLERIDAE

##### *Cylidrus cyaneus* Fabricius.

Tahuata: Hanamiai Valley, altitude 500 feet, May 30, 1930, under dead bark, 1 specimen, LeBronnec and H. Tauraa.

Known from New Caledonia, Loyalty, Samoa, and Society Islands.

Predacious upon the bostrichid *Xylothrips religiosus* Boisduval.



**Necrobia rufipes** DeGeer.

Tahuata: Vaitahu Valley, seashore, June 18, 1930, 1 specimen, LeBronnec and H. Tauraa.

Eiao: altitude 1500 feet, April 23, 1931, from dead wood of *Pisonia* species, 1 specimen.

Well-known as the "copra beetle," and carried everywhere by commerce. Also collected by the Survey in the Society Islands.

## FAMILY ANOBIIDAE

Genus **DORCATOMIELLA**, new genus

Form short, contracted, clothed with dense depressed pubescence. Head deflexed until, when fully contracted, the jaws touch the metasternum; not excavated beneath for reception of the antennae; eyes entire; antennae 11-jointed, first joint very large, second also large, third to eighth very small, fifth and seventh slightly expanded on inner side, ninth to eleventh enlarged, together as long as the rest of the antenna. Prothorax convex above, lateral margins sharp throughout, coxae widely separate, allowing the antennae to pass between them into a cavity behind them, between them and the metasternum; intercoxal plate not produced behind; metasternum with anterior excavations for reception of the folded middle legs, also sulcate medially with a large elongate fovea near its anterior edge; anterior intercoxal lobe blunt, not produced; posterior coxae transverse, partly receiving the femora, widely separated; elytra nonstriate, finely and closely punctate. Abdomen of 5 visible segments, all sutures complete and straight in the middle, first segment not very much shorter than the rest, extending well behind margin of coxal cavity, intercoxal process broad and not separated off from the rest of the segment; elytra finely, closely and evenly punctate and pubescent, without discal or marginal striae. Genotype, *D. sericeovariegata*, new species.

Allied to *Dorcatoma* and *Caenocara* but differing from both in the 11-jointed antennae, in the intercoxal process of the metasternum not being expanded in front, the first abdominal segment being entire and broadly exposed behind the coxal cavities, and in the completely nonstriate elytra. From *Lasioderma*, to which it bears a strong superficial resemblance, it differs more widely in antennal and sternal structure. Both *Theca* Mulsant and Rey and *Metadorcatoma* Scott have similar 11-jointed antennae but have striate elytra and different undersides. The Hawaiian genus *Mirosternus* Sharp is also closely allied but has the deep sulci on the metasternum for the reception of the tarsi free, whereas in the present genus the tarsi though sunk are curved round the base of the coxa; *Mirosternus* also has a characteristic elevated plate on the middle of the first abdominal segment.

**Dorcatomiella sericeovariegata**, new species (fig. 2).

Dark castaneous brown, pubescence golden depressed, lying in various directions and so giving a marbled appearance. The most regular feature of this is formed by six lines of backwardly directed pubescence in the outer half of the elytra, but on the sutural half and posterior third these become confused. Length 2.5 mm.

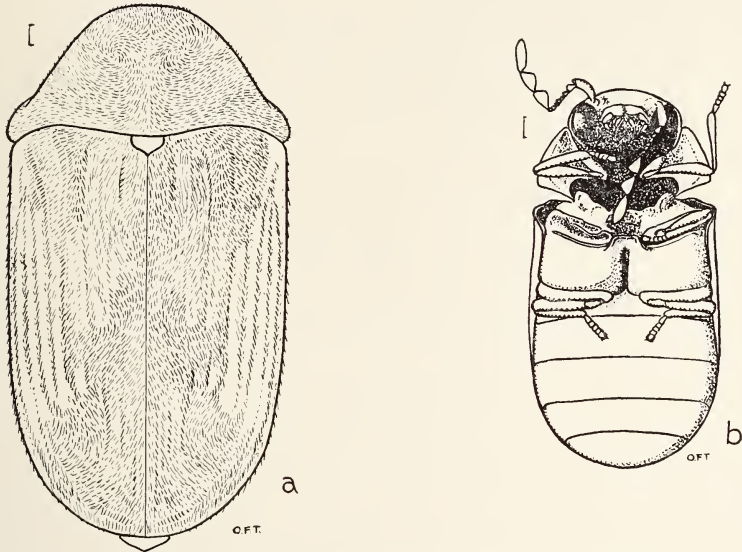


FIGURE 2.—*Dorcatomiella sericeovariegata*, new genus, new species: *a*, top view; *b*, ventral view (middle leg on left removed to show cavity for its reception).

Nukuhiva: Ooumu, altitude 3700 feet, shrub f. no. 592, 1 example, Mumford and Adamson.

Numerous examples were also collected by the survey on Tahiti: Faaa, altitude 300 meters, November 7, 1928, beaten from *Inocarpus edulis*, Adamson.

The specimen from Nukuhiva differs a little from the Tahitian typical series in the pubescence being shorter and more evenly directed, not forming the more or less distinct lines on the elytra mentioned above.

## FAMILY BOSTRICHIDAE

**Xylothrips religiosus** Boisduval.

Tahuata: Vaitahu Valley, seashore, June 18, 1930, 1 example, LeBronnec and H. Tauraa.

Of wide oceanic distribution, ranging from New Guinea and the northern part of Australia to the Austral Islands and Hawaii.

A wood borer in *Artocarpus incisa* and *Hibiscus tiliaceus*.

**Tetrapriocera oceanina** Lesne.

Eïao: Vaituha, October 3, 1929, at light, 1 example, Adamson.

Known only from the Marquesas.

**Dinoderus minutus** Fabricius.

Hivaoa: Atuona, May 12, 1929, in bamboo, 16 examples; Mataovau, altitude 370 feet, June 5, 1929, 1 example; Mumford and Adamson.

A common pest of bamboo throughout the warmer parts of the world. Not recorded hitherto from the Marquesas. Collected by the Survey in Tahiti.



FIGURE 3.—*Cis marquesanus* Blair, head and thorax from side.

## FAMILY LYCTIDAE

**Lyctus brunneus** Stephens.

Eïao, Vaituha, October 2, 1929, at light, 2 specimens, LeBronnec and H. Tauraa.

This destructive borer, commonly known as the "powder-post beetle," has been recorded from New Caledonia, Woodlark, Samoa, and the Society Islands.

## FAMILY CISIDAE

**Cis collenettei** Blair.

Uapou: Hakahetau Valley, altitude about 1000 feet, January 1930, at light and in dead wood, 5 examples, R. R. Whitten. Also collected by the Survey on Tahiti and Moorea.

The species was described from a single example from Hivaoa. The color varies from brownish testaceous to almost black. The male is distinguished by a large round patch of dense pile on the first abdominal segment.

**Cis cheesmanae** Blair.

Hivaoa: Aimoa, altitude 1515 feet, September 12, 1929, in bracket fungus, 1 example; under dead bark of *Pandanus* species, 1 example, Mumford and Adamson.

**Cis marquesanus** Blair (fig. 3).

Hivaoa: Aimoa, altitude 1515 feet, September 12, 1929, in bracket fungus, 4 examples; under dead bark of *Pandanus* species, 3 examples, Mumford and Adamson. Also collected by the Survey in Tahiti.

**Cis furcicollis**, new species (fig. 4).

Castaneous, apparently glabrous, moderately nitid. Head slightly projecting. In male the clypeus truncate with the angles obtuse but sharply cut and broadly upturned; in female the front margin swollen, as though marking the limit of its retractibility into prothorax. Thorax with sides rather strongly rounded, the borders almost concealed from above, anterior margin produced, in male forming two triangular upturned teeth, in female broadly rounded and hoodlike; puncturation moderately strong and even, becoming finer in front and in the female the interspaces duller. Elytra subparallel, nitid and glabrous, moderately strongly but somewhat unevenly punctate with traces of linear arrangement. Length 1.5 mm.

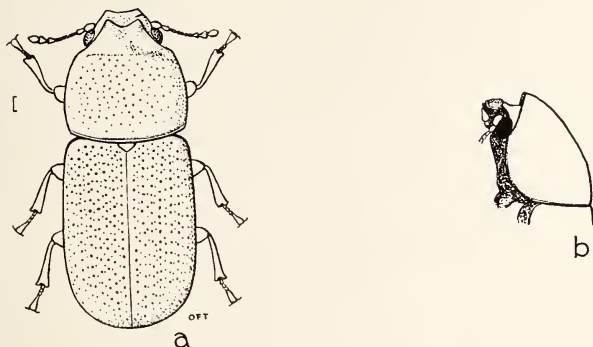


FIGURE 4.—*Cis furcicollis*, new species: a, male; b, female, head and thorax from side.

Hivaoo: Kopaafaa, about 2800 feet, on *Crossostyles biflora*, 1 male, 1 female.

The armature of the male recalls that of the European *C. quadridens* Mellé and *C. bilamellatus* Wood, but these are both distinctly pubescent, with different sculpture.

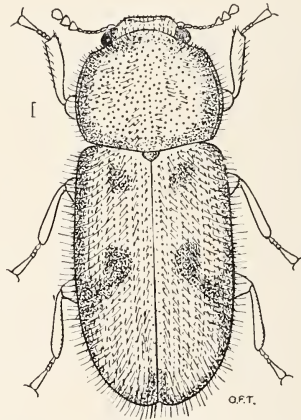
**Cis bisetosus**, new species (fig. 5).

Whitish stramineous with fuscous clouding along sides of thorax and elytra and a pair of spots obliquely placed near middle of each of the latter, strongly punctate with long erect black hairs intermingled with shorter golden hairs. Head deflexed with front border narrowly raised. Thorax transverse, feebly convex on disc, the sides rounded, visible from above, anterior margin scarcely produced; disc strongly and evenly punctate, the erect black hairs near the sides, the pubescence of the disc being shorter, golden in color and somewhat decumbent. Elytra subdepressed on dorsum, strongly and evenly punctate without obvious linear arrangement though the pubescence shows lines of long erect black hairs alternating with shorter more sloping golden hairs. Under side whitish with golden pubescence, legs testaceous. First abdominal segment with median tubercle (male). Length 2 mm.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1600 feet, August 29, 1930, beaten from *Metrosideros collina*, 1 example, LeBronnec.

## Key to Marquesan Species

1. Pubescence short or absent.....2  
 Pubescence long, of two kinds, erect black hairs intermingled with sloping golden hairs.....*Cis bisetosus*, new species
2. Head deflexed with frons exposed and convex.....3  
 Head sloping, covered to between eyes by prothorax.....5
3. Size large (nearly 3 mm.); little sexual dimorphism.....*Cis collenettei* Blair  
 Size smaller (1.5 mm. or less).....4
4. Short, brown, shining; thorax transverse; male with triangular lobe each side of clypeus.....*Cis cheesmanae* Blair  
 Black, more elongate, thorax as long as wide, duller than elytra.....*Cis adamsoni* Blair
5. Anterior margin of prothorax simple in male; lateral and anterior margins seen from the side, plainly distinct (fig. 3).....*Cis marquesanus* Blair  
 Anterior margin of thorax bidentate in male; lateral and anterior margins in female almost continuous (fig. 4, a, b).....*Cis furcicollis*, new species

FIGURE 5.—*Cis bisetosus*, new species.

## FAMILY BUPRESTIDAE

*Pleiona tayauti* Guérin.

*Pleiona tayauti*, Guérin-Ménéville, Rev. Zool., p. 7, 1847 (*Chrysodema*).

Kerremans, Mon. Buprest. 4, p. 159, pl. 25, fig. 1, 1909.

Hivaoa: altitude 450 feet, April 27, 1933, beaten from *Boehmeria* species.  
 23 males, 12 females, LeBronnec.

Has the general appearance of *Cyphogastra bedoci* Théry, especially of the duller form, *obscura* Blair, from Fatuhiva; from this, however, it differs in having the antennae black, the tarsi, except for the inferior lobes, dark metallic, the thorax more transverse and more trapeziform, and the elytra more evenly rounded to apex, with the apical teeth more numerous and more even in size, the sutural tooth scarcely larger or more prominent than its



neighbors. The structure of the under side is also different; in *Cyphogastra* the greatest thickness is at the posterior edge of the first abdominal segment, whence it falls away in an almost straight line to the anterior edge of the prosternum, with the mesosternum not raised above the level of the intermediate coxae. In *Pleiona* Deyrolle<sup>2</sup> the greatest thickness is at the mesosternum, which projects above the intermediate coxae, and abdomen and metasternum in lateral view form a continuous curve.

The present series shows much more range in color than is suggested by the description. Some specimens are, as described, of a brilliant green with the extremities reddish metallic, but frequently the thorax is more brassy and the elytra greenish bronze, with the apex coppery; but all intermediate stages are to be found in the series.

The rediscovery of this species of which the precise habitat had not been previously stated and which had not appeared in any of the collections recently made in the Marquesas is most interesting.

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<sup>2</sup> Soc. Ent. Belge, Ann., vol. 7, p. 12, 1864.



## BUTTERFLIES FROM THE MARQUESAS\*

By

E. B. POULTON AND N. D. RILEY

The small collection of Rhopalocera, containing only three species, was sent by Mr. Edward P. Mumford, Director of the Pacific Entomological Survey, to Mr. Edward Meyrick and by him entrusted to us for determination and record. The account of *Danaida* (*Danaus*) *plexippus* and *Hypolimnas bolina* was written by Professor Poulton, the description of *Atella marquesana*, new species, by Mr. Riley. In copying and confirming the numerous data very kind help was given by Mr. B. M. Hobby, and in studying the past history of *D. plexippus* and *H. bolina* considerable assistance was received from Commander J. J. Walker, whose experience has been of the utmost value.

### *Danaida plexippus*, Linnaeus.

The reasons for adopting the specific name *plexippus* in place of *archippus*, Fabricius, are set forth in a note by Riley<sup>1</sup> in which it is also shown that Aurivillius had come to the same conclusion.

The following records of the specimens of *D. plexippus* included in the collection are grouped under the various islands, following a general north to south arrangement.

Eiao: uplands toward south end, altitude 1,500 feet, October 1, 1929, 2 males, 1 female, Adamson; altitude 2,000 feet, April 21, 1931, 2 males, 2 females; altitude 1,700 feet, April 22, 1931, 2 females; altitude 1,800 feet, April 22, 1931, 3 females; altitude 1,600 feet, April 23, 1931, 1 female; altitude 1,600 feet, April 24, 1931, 4 males, 5 females; altitude 1,800 feet, April 30, 1931, 1 male, 1 female; LeBronnec and H. Tauraa.

Uahuka: Hane Valley, March 9, 1931, sea level, 3 males; altitude 150 feet, March 10, 1931, 4 males, 2 females; altitude 100 feet, March 12, 1931, 1 male; altitude 30 feet, March 15, 1931, 2 males; Vaipae Valley, altitude 300 feet, March 18, 1931, 2 males; LeBronnec and H. Tauraa.

Hivaoa: Atuona Valley, near sea level, July 22, 1929, 9 males, 9 females; "low level," July 22, 1929, 6 males, 1 female; Mumford and Adamson.

Mohotani: altitude 1,200 feet, February 1, 1931, 6 males, 1 female; altitude 1,000 feet, February 2, 1931, 8 males, 4 females; LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 22, 1930, 4 males, 1 female; Uia [Ouia] Valley, altitude 100 feet, September 2, 1930, 4 males, 4 females; LeBronnec.

<sup>1</sup> Riley, N. D., The Rhopalocera of the St. George Expedition, from French Oceania: Ent. Soc. London, Trans., pt. 2, pp. 454-455, 1928.

\* Pacific Entomological Survey Publication 7, article 24. Issued July 10, 1934.

The 95 specimens of *D. plexippus* (58 males, 37 females) with their precise data are of great interest when considered in relation to the earlier history of this species in the Pacific,<sup>2</sup> summarized in the following passage from the paper placed last in the footnote:

Commander Walker's two papers record the earliest observed appearance of *plexippus* and its food-plant, *Asclepias curassavica*, in the various islands, their increase and apparent establishment, except in New Caledonia, where both plant and insect suffered a decrease between 1881 and 1900. Mr. Collenette's paper shows that on the visit of the *St. George* in 1925 the butterfly was not seen on three islands in which Commander Waker found it commonly or plentifully in 1883. On one island (Fatuiva) it was fairly common in both years, on one (Hivaoa) abundant in 1883, almost absent in 1925. Finally, on two islands where it was seen in 1883 neither the insect nor the food-plant could be found in 1925.

Mr. Collenette concludes that "the present scarcity of the butterfly on these islands is due to the dying out of its food supply. It arrived in the wake of the *Asclepias*, and is suffering a temporary or permanent reverse with the disappearance of the plant." The cause of this disappearance is at present uncertain.

The same paper records that in 1925 *D. plexippus* was "fairly common on Fatuiva (where 7 males, 1 female were taken at sea level), but so rare on Hivaoa that the single male recorded . . . was the only specimen identified with certainty." The 15 males and 10 females captured on Hivaoa (July 22, 1929) by the Pacific Entomological Survey are in striking contrast with the above statement and, confirmed by the other data here tabulated, certainly appear to disprove the existence of any progressive decline in the numbers of the species.—E.B.P.

### **Hypolimnas bolina**, Linnaeus.

Specimens of *H. bolina* were obtained from only two islands.

Uahuka: Penau Ridge, altitude 1,570 feet, February 26, 1931, 1 female (*j*); Vaikivi Valley, altitude 1,150 feet, March 6, 1931, 1 female (*k*); Teivipuhpuhi, altitude 1,250 feet, 3 males, 1 female (*l*), altitude 1,350 feet, 2 males, 2 females (*m*, *n*); Hiniachi Valley, altitude 300 feet, March 10, 1931, 1 male; Hane Valley, altitude 150 feet, March 10, 1931, 1 male, March 15, 1931, 1 female (*o*); Vaipae Valley, altitude 200 feet, March 17, 1931, 1 male; Haave [Haavei] Valley, altitude 170 feet, March 19, 1931, 4 males; Tauheeputa, altitude 1,770 feet, March 23, 1931, 3 males, 1 female (*p*); LeBronnec and H. Tauraa.

Nukuhiva: Taiohe, sea level, July 26, 1931, 1 female (*q*), LeBronnec and H. Tauraa.

The above series of *H. bolina*, including 15 males and 8 females, affords

<sup>2</sup> Walker, J. J., *Anosia plexippus* L. (*Danais archippus*, F.), a study in geographical distribution: Ent. Monthly Mag., vol. 22, pp. 217-224, 1885. The Geographical Distribution of *Danaida plexippus*, L. (*Danais archippus*, F.), with especial reference to its recent migrations: Ent. Monthly Mag., vol. 50, pp. 181-193, 224-237, 1917.

Collenette, C. L., The present status of *Danaida plexippus*, L. in the Pacific islands: Ent. Monthly Mag., ser. 3, vol. 61, pp. 198-202, 1925.

Poulton, E. B., and Riley, N. D., The Rhopalocera of the St. George Expedition, from French Oceania: Ent. Soc. London, Trans., pt. 2, pp. 453-454, 1928.

an interesting comparison with the larger series of 28 males and 9 females collected by the St. George Expedition in 1925,<sup>3</sup> the females being compared with those taken by Commander Walker, March 10-11, 1883, in Fatuhiva. The St. George Expedition collected *H. bolina* in four of the Marquesas Islands: Hivaoa (12 males, 6 females), Fatuhiva (3 males), Tahuata (6 males, 2 females), and Nukuhiva (7 males, 1 female). As these nine 1925 females are indicated by the letters *a* to *i* in the paper in which they are recorded, the eight females of the present paper are lettered *j* to *q* in order to facilitate comparison.

The patterns of females *j-q* are either non-mimetic (*A.*) or male-like (*B.*), no example of the Polynesian mimetic form *euploeoides* Poulton (*C.*) occurring among them. This classification is proposed in a brief account of the patterns of Fijian and Polynesian female forms of *H. bolina* with a table and references to the original descriptions.<sup>4</sup> Figures of female forms quoted below are from the colored plates of this memoir, reproducing Miss Tassart's beautiful drawings; the accompanying page references may be found in the same publication.

The eight female forms recorded in the present paper are as follows: females *j*, *l*, *m*, and *o* are the female form *thomsoni* Butler (= *moscleyi*, Butler) and closely resemble plate 52, figure 1 (number 7 in family 6), described on page 660. The females differ from the figure in the apparent absence of any orange tinge in the submarginal markings, which are of a pale greyish tint, but the worn condition of *l* and *o* must be taken into account. In all four the white spots within the submarginal markings of the forewing are reduced in size and posteriorly in number, but faint traces of a hindwing series, absent from the figure, are visible in *o*. A very slight indication of "nerina red" (p. 652) can be detected on the forewing of *m*, similar to the reddish trace visible on plate 53, figure 2. The central blue patch of the hindwing is least developed in *o*, but both elements—opaque blue scales and iridescent blue "mirror"—can be recognized in a good light. The former element is strongest in *m*, the latter in *l*.

Females *k* and *n* are "male-like," resembling plate 48, figure 4 (number 4 in family 3), determined on p. 657 as the female form *narcsi*, Butler, but "with emphasized white patches." The pale spots within the submarginal markings of both wings, in the figure, are greatly reduced in the forewings of *k*, less so in *n*, and absent from the hindwings of both, which also differ in the greater development of marginal blue (especially in *n*) around the central white patch of the hindwing.

<sup>3</sup> Poulton, E. B., and Riley, N. D., The Rhopalocera of the St. George Expedition, from French Oceania: Ent. Soc. London, Trans., pt. 2, pp. 461, 462, 1928.

<sup>4</sup> Poulton, E. B., Mimicry in the butterflies of Fiji considered in relation to the euploeine and danaine invasions of Polynesia and to the female forms of *Hypolimnas bolina* L. in the Pacific: Ent. Soc. London, Trans., pts. 3, 4, pp. 564-691, 1923.



Females *p* and *q* resemble plate 47, figure 2 (number 7 in family 2), determined on p. 656 as "the form *montrouzieri* (Butler) but with less development of orange than in the type." There is apparently slightly less of this tinge in the subapical forewing area of *q*, as compared with the figure; also less in the submarginal region of the forewing and in the submarginal markings of both wings. In making this distinction between *p* and *q* it is necessary to bear in mind the difference in their condition, the former being far less worn. The series of small pale spots within the submarginal markings of the hindwing, present in the figure, are wanting in both specimens, while the white spots of the forewing series are, except for the two nearest the costa, reduced to points and evanescent or absent posteriorly. Also, when compared with the figure, the opaque blue scales are less developed in the central wing patch of both specimens.

Comparing these 8 females with the 9 St. George Expedition females, the general resemblance is evident. All the latter and half of the former were considered to be forms of *H. thomsoni*. In the greater prevalence of the "nerina red" marking and an emphasized marginal pattern, the St. George Expedition females (1925) are more brightly colored and strongly marked than those of the Pacific Entomological Survey (1931) although less so than the five taken by Commander Walker (1883) on Fatuhiva more than 40 years earlier. Allowing for the limited amount of material available for study and the fact that nearly all the females were collected on different islands in each of the three visits (1883, 1925, and 1931), we are led to the tentative conclusion that the Marquesas were originally invaded by a form of *H. bolina* with *nerina* or *nerina*-like (*elliciana*, Fruhstorfer) females accompanied by or combined with the patterns of dark, orange-bordered *montrouzieri*-like females and that both these patterns are being and have largely been already replaced by the male-like patterns *naresi* and especially *thomsoni*.

—E.B.P.

### ***Atella marquesana*, new species.**

#### Male

Very similar to *A. gaberti* Guérin, but of a lighter fulvous ground color, above and below, and almost devoid of the somewhat olivaceous tinge which is a feature of that species.

On the upper side the black marginal border is as in *A. gaberti*, but the wavy submarginal line is much narrower on both wings, less sinuous, and not connected to the black border at the veins. The black postdiscal spots on both wings are very small, sharply defined, and mostly crescentic or somewhat subtriangular though variable in shape. The transverse discal band, which in *A. gaberti* extends generally in well-developed fashion from the costa to vein 2, is in *A. marquesana* very faint below vein 3; and the inner transverse band is narrower, especially anteriorly, where also it is much more strongly curved; a short black line lies just within and parallel to the discocellulars.

On the under side the ground color of the forewing is just a shade brighter fulvous than in *A. gaberti*, but the apical, costal (narrowly), and basal areas are more definitely greenish ochreous, as is also the hindwing, which in its general tone recalls strongly the underside of certain palaeartic *Argynnis* such as *A. aglaia*. The transverse markings of

the upper side are repeated beneath, and all are straighter and less sinuous than those of *A. gaberti* but at the same time rather less conspicuous, except the transverse cell markings of the forewing. These lines are black and prominent though narrow; the first two are joined top and bottom to form a rough oval; the third, however, runs parallel to an exactly similar line just beyond the discocellulars. Length of forewing (apex damaged) 24 mm.

Fatuhiva: Uia [Ouia] Valley, altitude 100 feet, September 2, 1930, holotype male, unique, LeBronnec.

It will be evident from the figure that this insect is indeed very close to *Atella gaberti*, which appears to be confined to Tahiti and Moorea, and is undoubtedly derived from the same stock. Among the 27 examples of the latter insect with which it has been compared in the British Museum, however, there is not one that makes any real approach to it in respect to the features described. Although the genitalia have not been dissected out, such portions of them as are visible—though imperfectly—suggest that a fuller examination would probably reveal slight differences in the shape of the extremity of the clasper in the two species, if not in other features as well. A more obvious structural difference is furnished by the palpi, in which the length of the third segment as compared with the second is far less in *A. marquesana* than in *A. gaberti*. (It is interesting to recall that another endemic Marquesan butterfly, *Libythea collenettei* Riley, differs markedly from all the other species of its genus by the smallness of its palpi.) The Marquesas are separated from the Society Islands by a distance of something like 1,000 miles, and there is little doubt that this separation has existed for a considerable period of time. In view of all the circumstances, there appears to be every justification for regarding *Atella marquesana* as a species distinct from *A. gaberti*.

The discovery of this endemic *Atella* in Fatuhiva lends further support to the view expressed by Meyrick and others, that the insect fauna of the Marquesas indicates that these islands represent the relics of some much larger land mass. Also it serves to confirm the accuracy of an observation made by Commander Walker in 1883,<sup>5</sup> to the effect that he had seen "an *Atella*?" in March on Nukahiva and Hivaoa, an observation once doubted by Riley, who considered that the supposed *Atella* was probably *Libythea collenettei*.

—N.D.R.

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<sup>5</sup> Walker, J. J., Presidential address: Ent. Soc. London, Proc., p. 106-107, 1919 (1920).



## MARQUESAN THYSANURA \*

By

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The collection of Thysanura made in the Marquesas Islands by the Pacific Entomological Survey includes only representatives of the family Lepismatidae in the suborder Ectotrophica. The Entrotrophica and the family Machilidae in the Ectotrophica appear to be absent from the Marquesas.

Of the four species of Lepismatidae, *Isolepisma mumfordi*, though closely related to *I. rouxi* from New Caledonia, must be described as new; *Acrotelsella producta* Escherich of northern Australia contains two forms hitherto undescribed; *Ctenolepisma reducta* Folsom, previously described from Porto Rico, and *Nicoletia (Auelpistina) mcinerti* Silvestri, widely distributed throughout the tropics and even grown in the greenhouses of Europe, were obviously introduced by man. The native forms, *Isolepisma mumfordi* and the two new varieties of *A. producta*, are typical of the Australian region.

### FAMILY LEPISMIDAE

#### **Ctenolepisma reducta** Folsom.

*Ctenolepisma reducta* Folsom, Ent. Soc. Wash., Proc., vol. 25, p. 170, pl. 14, 1923.

Fatuhiva: Omoa Valley, near sea level, September 20, 1930, 2 specimens, from dead log of *Hibiscus tiliaceus*, LeBronnec.

These specimens agree with the description of *C. reducta* Folsom from Porto Rico.

#### **Isolepisma mumfordi**, species nova (fig. 1).

##### Femina

Corpus (in alcohol) supra castaneum, subtus terreum antennis et cercis fulvescentibus.

Caput frontis margine, tractu mediano pone clypeum excepto nudo, macrochaetis numerosis, 1-2 seriatis instructis, macrochaetis 4 ab antennarum basi retrorsum oblique directis et macrochaetis 6 ad oculorum marginem anticum, clypeo setis numerosis brevibus et utrimque macrochaeta longa antica sublaterali; oculi parvi corneolis circa 12; antennae in exemplis typicis haud integris, parte majore sistente mm. 6 longa, 27-articulata, articulo primo parum longiore quam latiore, superficie supera mediana nuda, cetera setis brevioribus instructa, flagello gradatim attenuato articulis 3-20 trichobotrio apicali subtiliore brevi instructis, a decimo in articulinis duobus gradatim magis elongatis et a decimo quinto manifeste divisus et magis in articulis sequentibus ita ut vicesimus septimus in sectionibus duabus, singula in articulinis quattuor, divisus sit, setis et sensillis cfr. fig. 1; palpi maxillares tenues, palpi labiales articulo ultimo subaeque longo atque lato papillis sensitivis quinque subuniseriatis instructo.

\* Pacific Entomological Survey Publication 7, article 25. Issued July 10, 1934.

Thorax quam caput aliquantum, quam abdomen paullum latior, tergitis macrochaetis lateralibus singulis inter sese aliquantum remotis et margine postico etiam macrochaeta submediana singula; metasterni margine mediano postico late rotundato, pectine setis 5 robustis composito submediano.

Pedes robusti setis et macrochaetis vide fig. 1.

Abdomen partem posticam versus gradatim parum angustius, tergitis 1-7 pectinibus setis 2-3 utrimque duabus (laterali et sublaterali) et pro pectine submediano seta singula robusta (vel macrochaeta auctis), tergitem octavum pectine sublaterali destitutum, tergitem nonum setis robustis nullis; tergitem decimum circa  $1/6$  ad basim latius quam longius partem posticam versus gradatim parum angustatum postice late rotundatum, postice utrimque macrochaeta singula auctum.

Sternitum primum postice setis nullis, sternita 2-7 setarum trium pectine sublaterali instructa; urosternum octavum subcoxis angulo interno angulum externum parum super-

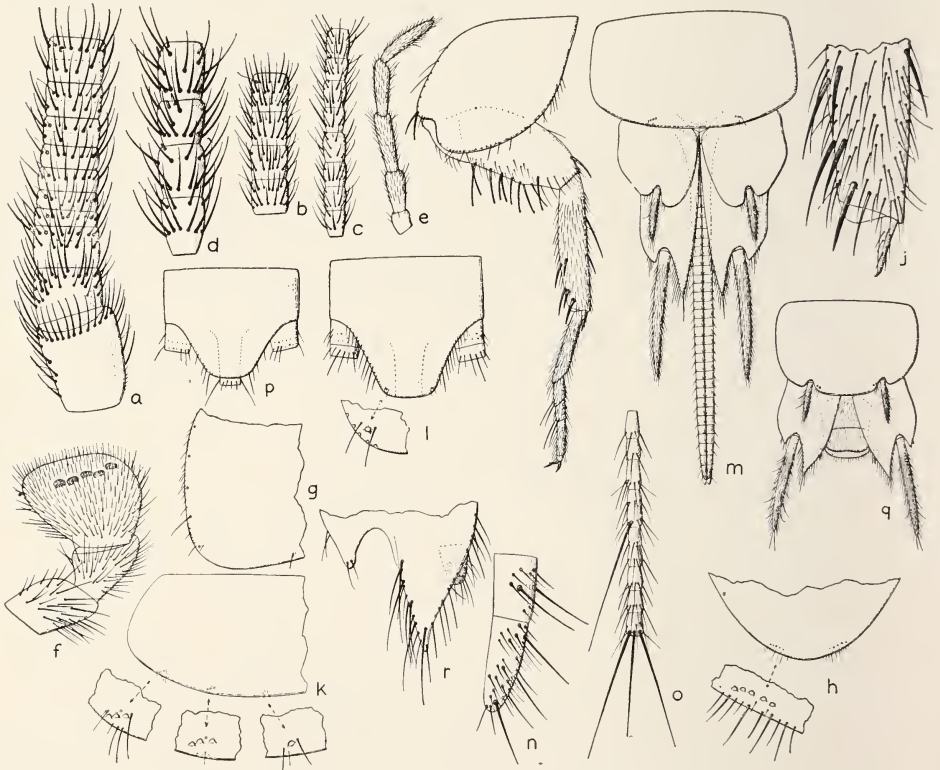


FIGURE 1.—*Isolepisma mumfordi*, species nova: a, antennae laevae pars proximalis supra inspecta; b, eiusdem antennae articulus vigesimus; c, eiusdem antennae articulus vigesimus septimus; d, articuli vigesimi septimi sectio secunda magis ampliata; e, palpus maxillaris; f, palpus labialis; g, mesonoti pars lateralis postica; h, metasterni pars postica; i, pes paris tertii; j, eiusdem tibiae pars distalis; k, urotergiti quinti dimidia pars laeva; l, feminae urotergitem decimum cum cercorum basi; m, feminae urosterna septimum ad nonum cum ovipositore; n, ovipositoris valvulae inferae pars distalis; o, cerci lateralis laevi articulus decimus quintus; p, maris urotergitem decimum cum cercorum basi; q, maris urosterna octavum et nonum cum pene; r, maris urosterni noni subcoxae pars postica.



ante late rotundato, nonum subcoxis angulo interno stili tertiam partem basalem aequante, gradatim angustiore acuto, angulo externo brevior acuto.

Stilorum paria duo in segmentis octavo et nono, noni quam octavi magis quam duplo longioribus, setis numerosis subtilibus brevioribus et setis nonnullis brevibus apicalibus auctis.

Ovipositor tenuis, pseudoarticulatus stilorum apicem mm. 0.90 superans, setis tantum subtilibus instructus.

Cerci in exemplis typicis pro parte abruptis, parte majore sistente mm. 6 longa articulis gradatim magis elongatis et in articulinis magis numerosis divisus, decimo quinto exempli gratia articulis 9, setis ut fig. 1, o, demonstrat.

Long. corporis ad mm. 10; lat. thoracis 2, long. antennarum ? (partis sistensis mm. 6); cercorum ? (partis sistensis 6).

#### Mas

Tergitum decimum quam feminae parum brevius; urosterni noni subcoxae angulo interno stilorum tertiam partem parum superante, angustiore acuta. Stilorum paria duo; penis brevis, paramera brevissima conica.

Nukuhiva: Ooumu, altitude 4,050 feet, November 12, 1929, among leaves of *mouku*, Mumford and Adamson.

Species haec, clar. E. P. Mumford dicata, *Isolcypismae rouxi* Silvestri ex Nova Caledonia perproxima est, sed antennis et stilibus magis elongatis, palpo labiali latiore papillis sensitivis subseriatis, urosternito primo setis posticis nullis bene distincta.

#### Genus ACROTELSELLA, genus novum

Genus hoc a generibus affinis in hac tabula synoptica expositis distinguendum est:

1. Thoracis sterna a subcoxis postice superata; prosternum setarum penicillo instructum ..... *Acrotelsa* Escherich
2. Thoracis sterna parte mediana libera, magna; prosternum setarum penicillo destitutum.
3. Urotergita 1-8 setarum pectinibus duobus (sublateralibus et laterali) et seta (macrochaeta) singula submediana (pro pectine) instructa; urotergillum nonum setarum pectine laterali auctum. Mas, paramera adsunt ..... *Allacrotelsa*, genus novum
4. Urotergillum primum setarum pectine uno laterali, urotergita 2-7 setarum pectinibus utrimque tribus (submediana, sublateralibus et laterali), urotergillum octavum setarum pectinibus utrimque duobus (submediano et laterali) instructum, urotergillum nonum setarum pectinibus destitutum. Mas, paramera nulla ..... *Acrotelsella*, genus novum  
Typi: *Acrotelsa collaris* (Fabricius); *Allacrotelsa spinata* (Packard); *Acrotelsella producta* (Escherich).

*Acrotelsella producta* varietas *procedens*, varietas nova (figs. 2, 3).

#### Femina

Corpus (in alcohol) griseo-castaneum supra, terreneum subtus, antennis et cercis nigrescentibus albo anulatis.

Squamae magnitudine varia, majores dorsuales subrectangulares ( $\mu$  19  $\times$  10), omnes creberrime radiatae, margine postico integro.

Caput clypeo setarum area postica laterali transversa sat magna utrimque instructo, fronte antice, media excepta, setarum seriebus longitudinalibus gradatim a submediana ad lateralem brevioribus et serie marginalibus instructa nec non setis praecocularibus sat numerosis; oculi sat magni; antennae in exemplis typicis haud integrae quam corpus paulum breviores gradatim attenuatae, articulo primo subcylindraceo circa duplo longiore quam latiore squamis induto et setis numerosis apicalibus marginalibus brevibus robustis, arti-

culo secundo brevior, articulis ceteris gradatim magis attenuatis serie transversa setarum brevium et seta sensillari (trichobothrio) apicali externa, articulis a duodecimo in articulinis duobus et gradatim in articulinis magis numerosis ita ut articulus vigesimus in articulinis 6, vigesimus septimus in sectionibus duabus, singula articulinis 7 composita (fig. 3, c, d); palpi maxillares tenues articulis tertio et quinto longitudine subaequalibus et singulo quam quartus aliquantum longiore; palpi labiales articulo ultimo aliquantum (apice) latiore quam longiore papillis sensitivis subapicalibus 5 instructo, uniseriatis.

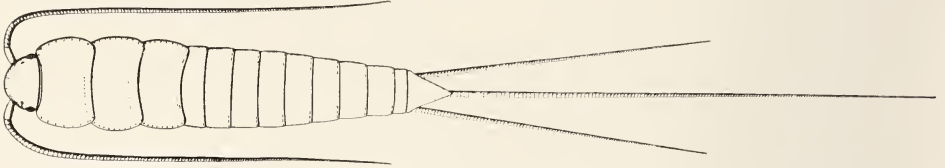


FIGURE 2.—*Acrotelsella producta* varietas *procedens*, varietas nova: corporis circumlithio.

Thorax quam caput aliquantum et quam abdominis basis paullum latior, quam abdomen circa dimidio brevior lateribus paullum convexis, tergito singulo setarum 2-3 pectinibus lateralibus 6-10 setis singulis nonnullis, nec non setarum 5-6 pectine postico sublaterali; sterna parte mediana margine, sterni metathoracis praesertim, late rotundato et pectinibus posticis lateralibus uno vel duobus.

Pedes robusti, tertii paris coxa depressa margine externo aliquantum convexo setis numerosis brevibus et brevioribus instructo, femore setis robustis apicalibus externis 5-6 et setis quattuor marginalibus internis sat longis et sat robustis, tibia margine interno setis brevibus robustis spinulosis 2, 2 et externis 1, 1, marginali postica 1 et setis nonnullis brevibus et brevioribus, calcare robusto setoso marginibus integris apice acuto, tarso articulo primo quam sequentes simul sumpti aliquantum longiore, praetarsi unguibus lateralibus similibus modice arcuatis, apice acuto, quam unguicula mediana fere duplo longiores.

Abdomen a basi ad apicem gradatim angustius, tergitem primum setarum 7 pectine laterali, tergita 2-7 setarum 5-7 pectinibus 3 + 3, tergito octavo pectinibus similibus 2-2, tergito nono pectinibus nullis; tergitem decimum triangulare acutum in situ mensum (parum deplanatum) fere  $1/3$  longius quam ad basim latius, setarum 2-3 pectinibus 5 lateralibus et setis singulis etiam instructum. Urosterna primum et secundum setarum pectinibus nullis, urosterna 3-7 setarum circa 10-14 pectine laterali instructa, subcoxis urosterni octavi angulo postico setarum pectine ut urosterna praecedentia, subcoxis urosterni noni parte postica ad stilorum latus internum tota elongata, tantum parte apicali parum angustiore, margine rotundato stilorum eiusdem segmenti apicem parum superante, sed si in positione naturali inspecta et non deplanata gradatim angustiore et apice acuto apparente, subcoxae eiusdem angulo externo brevissimo angustiore acuto.

Stilorum paria tria gradatim a segmento septimo ad nonum parum longiorum.

Ovipositor tenuis subcoaxarum 9 apicem vix vel haud superans, pseudoarticulatus tantum setis tenuis instructus.

Cerci attenuati, cercus medianus corporis longitudinem aequans (vel forsitan parum longior), cerci laterales (haud integri) quam medianus magis quam  $1/3$  breviores, setis et sensillis in exemplis typicis maxima pro parte abruptis.

Long. corporis ad mm. 11, lat. thoracis 2, 6, long. antennarum? (partis sistensis 7), long. pedum paris tertii 4, long. cerci mediani 11, cercorum lateralium? (partis sistensis 6, 5).

Mas

Urotergitem decimum quam feminae circa  $1/3$  brevius; stilorum paria tria, urosterni noni subcoaxarum angulus internus quam externus circa  $3/4$  longior gradatim angustior acutus, angulus externus etiam acutus; penis brevior cylindraceus; paramera nulla.

Hiva'oa: Atuona, type and paratype, plateau above Atuona, altitude about 1,500 feet, April 22, 1929, Mumford and Adamson; Anatuakina, altitude 1,500 feet, June 1, 1929, Mumford and Adamson; Tanaeka Valley, altitude 1,100 feet, June 4, 1929, male and female, Mumford and Adamson; Anatuakina, altitude 1,500 feet, September 1, 1929, Mumford and Adamson.

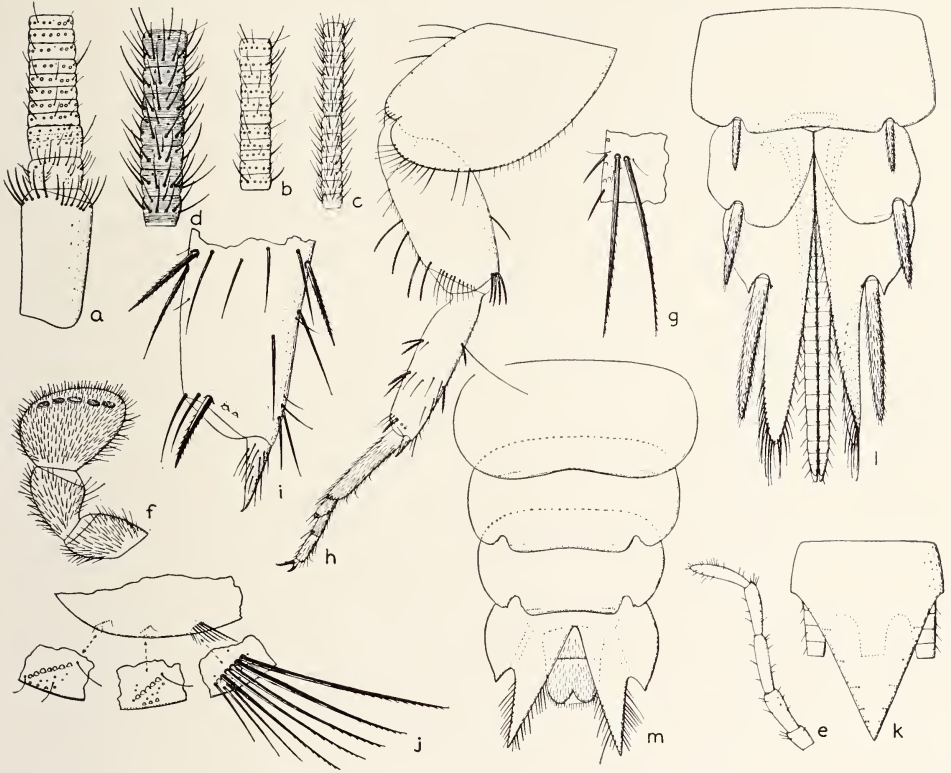


FIGURE 3.—*Acrotelsella producta* varietas *procedens*, varietas nova: a, antennae laevae pars proximalis; b, eiusdem antennae articulus decimus nonus; c, eiusdem antennae articulus vigesimus septimus; d, articuli praecedentis sectio secunda magis ampliata; e, palpus maxillaris; f, palpus labialis; g, mesonoti particula lateralis; h, pes paris tertii; i, eiusdem pedis tibiae pars distalis magis ampliata; j, urotergiti quinti dimidia pars lateralis laeva; k, feminae urotergitem decimum cum cercorum basi; l, urosternita septimum ad nonum cum ovipositore; m, maris urosternita sextum ad nonum.

Eiao: near middle of island, east side, altitude 1,650 feet, female, September 29, 1929, under bark of *Pandanus*, Adamson; altitude 1,600 feet, April 23, 1931, from dead wood of *Pisonia* species, LeBronnec and H. Tauraa.

Varietas haec saltem abdomine stilorum paribus tribus distincta est.

**Acrotelsella producta** varietas **pacifica**, varietas nova (fig. 4).

## Femina

Corpus (in alcohol) dorso griseo-castaneo, ventre terreo, antennis cercisque nigrescentibus.

Squamae magnitudine varia, majores (in exemplis typicis praesentes) subovales  $\mu 20 \times 14$  crebre pluriradiatae.

Caput clypeo setarum area postica laterali transverse subovali setarum circa 35 instructo, fronte, antice tractu mediano mm. 0.19 lato excepto, setarum seriebus longitudinalibus et aliis ut fig. 4, *a*, demonstrat instructa; antennae in exemplis typicis haud

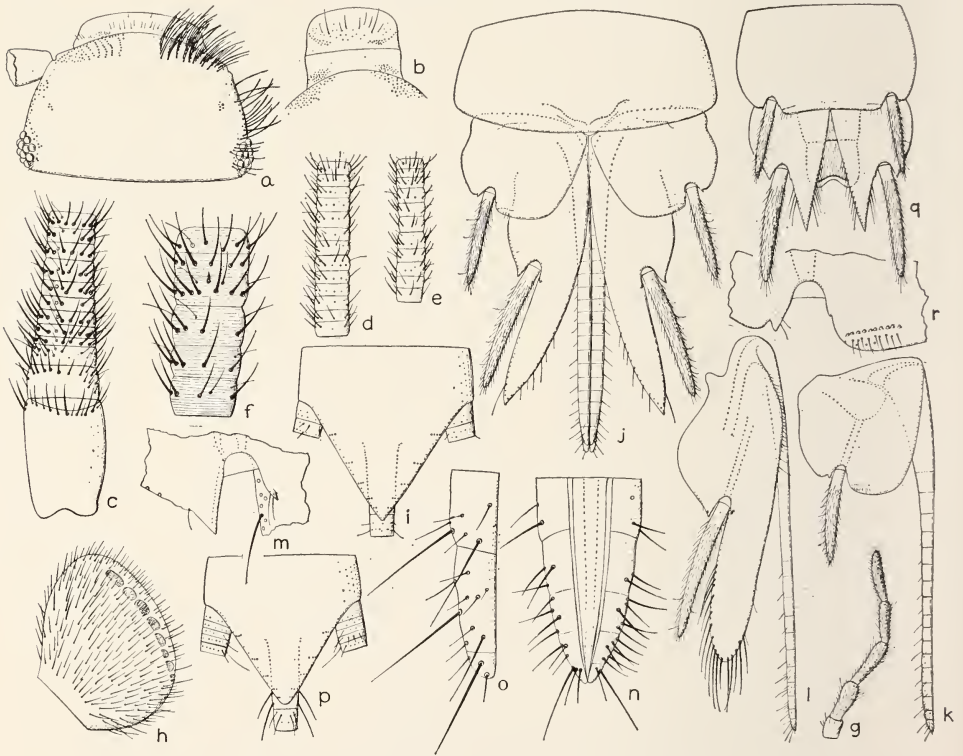


FIGURE 4.—*Acrotelsella producta* varietas *pacifica* varietas nova: *a*, caput primum; *b*, frontis pars antica cum clypeo et labro; *c*, antennae laevae pars proximalis supra parum oblique inspecta; *d*, eiusdem antennae articulus vigesimus; *e*, eiusdem antennae articulus vigesimi quarti sectio secunda magis ampliata; *f*, articuli vigesimi quarti sectio secunda magis ampliata; *g*, palpus labialis; *h*, palpi labialis articulus ultimus; *i*, feminae urotergitum decimum cum cercorum basi; *j*, feminae urosternita septimum ad nonum cum ovipositore; *k*, feminae subcoxa urosterni octavi cum ovipositoris valvula et stilo; *l*, feminae urosterni noni subcoxa cum ovipositoris valvula et stilo; *m*, eiusdem subcoxae pars ad stili basim; *n*, ovipositoris valvularum superarum pars distalis subtus inspecta; *o*, ovipositoris valvulae inferae pars distalis subtus inspecta; *p*, maris urotergitum decimum cum cercorum basi; *q*, maris urosterna octavum et nonum cum pene; *r*, maris urosterni octavi pars stilo adiacens magis ampliata.



integrae, parte sistente longiore mm. 5.5 longa, 25-articulata, articulis a secundo gradatim longioribus et angustioribus, a duodecimo in articulinis duobus, ceteris gradatim in articulinis magis numerosis ita ut vigesimus quartus in sectiones duas, singula articulinis 5-6 composita, divisus sit (fig. 4, *e-f*); palpi maxillares tenues articulis tertio et ultimo subaequalibus et singulo quam quartus parum longiore, palpi labiales articulo ultimo parum latiore quam longiore, papillis sensitivis subapicalibus 9 instructo, quarum duae externae minores sunt.

Thorax lateribus subparallelibus quam abdomen basis paullum latior, tergitorum setarum pectinibus lateralibus setis duabus compositis, pectine sublaterali postico setis 3-5; metasterni margine postico latissime rotundato, utrimque setarum 8-9 pectine sublaterali.

Pedes robusti eiusdem speciei praecedentis similes, in exemplis typicis setis maxima pro parte abruptis.

Abdomen a basi ad apicem gradatim angustius, setarum pectinibus generi typicis, in tergito secundo setis 5, 5, 8 (a submediano ad lateralem) compositis, in segmento octavo 6, 6, 10-11; tergitem decimum triangulare subaeque longum atque at basim latum, setarum pectinibus submarginalibus 5 parvis, setis 3, 3, 3, 3, 2.

Urosterna 2-7 pectine laterali setarum 9-13 composito instructa.

Urosternum octavum subcoxis angulo interno late rotundato, angulo externo acuto vix producto; urosternum nonum subcoxis angulo interno elongato latiusculo apice plus minusve angustato quam cerci eiusdem segmenti parum longiore, angulo externo brevior acuto.

Stilorum paria duo in segmentis octavo et nono, quorum noni quam octavi fere 1/3 longiores.

Ovipositor quam segmenti noni subcoxae parum longior tenuis pseudoarticulatus setis tantum subtilibus instructus.

Cerci in exemplis typicis maxima pro parte abruptis.

Long. corporis ad mm. 9; long. antennarum ?; cercorum ?.

#### Mas

Feminae similis; segmenti noni subcoxae angulo interno elongato, gradatim angustiore apice acuto dimidium stilum apice attingente.

Penis stili basis libellam parum superans.

Hatutu [Hatutaa]: near middle, east side, altitude 1080 feet, under bark of *Pisonia* species, September 20, 1929, Adamson; April 28, 1931, cotype, LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, from dead log of *Hibiscus tiliaceus*, September 20, 1930, LeBronnec.

Varietas haec ab *A. producta* typica facile palpi labialis papillis sensitivis numero distincta est.

#### **Nicoletia (Anelpistina) meinerti** Silvestri.

Hivaoa: Anatakina, altitude 1,500 feet, September 1, 1929; Vaiepoepo, altitude 2,200 feet, June 2, 1929, from dead log of *Alcurites moluccana*, Mumford and Adamson.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2,000 feet, October 25, 1929, in rotting banana stalk; altitude 2,000 feet, October 27, 1929; Mumford and Adamson.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1,600 feet, August 29, 1930, from rotting banana stem; altitude 1,600 feet, August 29, 1930, from



rotten wood of *Hibiscus tiliaceus*; Ihiota, altitude 450 feet, September 10, 1930, under dead bark of breadfruit; LeBronnec.

Uapou: Hakahetau Valley, December 10, 1929, in rotting banana trunk; altitude about 2,000 feet, December 14, 1929, from rotting fern stipes, R. R. Whitten.

Mohotani: altitude 500 feet, January 31, 1931, from dead log of *Pisonia* species; LeBromec and H. Tauraa.

Society Islands, Tahiti: Hitiaa, altitude 1,500 feet, November 19, 1928, from dead stem of *Pandanus* species, Adamson. Moorea: Faaroa Valley, altitude 1,000 feet, December 4, 1928, Adamson.

This species was first described<sup>1</sup> from specimens from Venezuela, Ecuador, and Europe (in greenhouses); later I recorded it from Hawaii and Para, Brazil.<sup>2</sup>

<sup>1</sup> Silvestri, Filippo, *Materiali per lo studio dei Tisanuri*: Redia, vol. 2, p. 114, 1905.

<sup>2</sup> Silvestri, Filippo, *Tisanuri finora noti del Messico*: Lab. Zool. Sci. Agr. Portici, Boll., vol. 6, p. 218, 1912.

# A SECOND REPORT ON HEMIPTERA-HETEROPTERA FROM THE MARQUESAS\*

By

E. P. VAN DUZEE  
CALIFORNIA ACADEMY OF SCIENCES

In 1932 I published a paper<sup>1</sup> describing one new genus and 13 new species of Hemiptera taken by the Pacific Entomological Survey in the Marquesas and adjacent islands. Since the preparation of that paper additional material from these islands has been submitted to me for study. The present paper is a complete report upon all of the Hemiptera-Heteroptera thus far received by me from this survey. Of the 27 species listed here 7 are described as new. All the types have been deposited in Bernice P. Bishop Museum.

The genera best represented in this collection are *Germalus*, which is characteristic of the islands of the south Pacific, and *Nabis*, with a somewhat similar distribution but more prominent in the Hawaiian fauna. The finding of a species of *Campyloneuropsis*, heretofore known only from a single species from East Africa, is noteworthy. A few species, such as *Geotomus pygmaeus*, *Cæcalia consocialis*, and *Nabis capsiformis*, have a wide distribution throughout Polynesia, whereas others, such as *Coleotichus adamsoni* and *Glaucias venusta*, have close relatives in adjacent island groups.

## FAMILY SCUTELLERIDAE

### *Coleotichus adamsoni* Van Duzee.

*Coleotichus adamsoni* Van Duzee: B. P. Bishop Mus., Bull. 98, p. 177, 1932.

Through an oversight the apical hook of the osteolar canal was described as "not attaining anterior margin of the mesosternum"; it should have read "not attaining the anterior margin of the metapleura." Four additional females are among this supplementary material.

Uapou: Tekohepu Summit, altitude 3200 feet, November 28, 1931, at light, LeBronnec.

Hivaoa: Kaava Ridge, altitude 2800 feet, January 7, 1932, from *Weinmannia* species, LeBronnec.

Eiao: altitude 1500 feet, April 22, 1931, on *Dodonaea viscosa*, LeBronnec and H. Tauraa.

Uahuka: Hane Valley, altitude 150 feet, March 1, 1931, LeBronnec and H. Tauraa.

<sup>1</sup> Van Duzee, E. P., New Hemiptera-Heteroptera from the Marquesas: B. P. Bishop Mus., Bull. 98, p. 177, 1932.

\* Pacific Entomological Survey Publication 7, article 26. Issued July 10, 1934.

## FAMILY CYDNIDAE

**Geotomus pygmæus** Dallas.

Uapou: Hakahetau, taken in horse dung, December 17, 1929, Whitten.

Tahuata: Hanahevane Valley, seashore, July 15, 1930, at light, 17 specimens; Vaitahu Valley, seashore, July 17, 1930, 6 specimens (4 at light); LeBronnec and H. Tauraa.

Hivaoa: Avaao Valley, altitude 1350 feet, January 4, 1932, at light, 1 specimen; Feani Ridge, altitude 3900 feet, January 20, 1932, 1 specimen; LeBronnec; Tahauku, altitude 130 feet, July 22, 1929, at light on seashore; Atuona, March 7, 1929, at light; Mumford and Adamson.

Hatutu [Hatutaa]: altitude 1500 feet, April 28, 1931, beating *Canthium barbatum*, 1 specimen, LeBronnec and H. Tauraa.

This is a very widely distributed and common insect throughout the Orient and South Pacific islands.

## FAMILY PENTATOMIDAE

**Glaucias venustus**, new species (fig. 1).

## Diagnosis

Related to *G. vitiensis* China<sup>2</sup> from Fiji but apparently distinct; grass-green, black-punctate; margin of head, pronotum, and base of elytra slenderly black with yellowish submarginal areas on pronotum and about the eyes; scutellum with subapical black points. Length to tip of membrane 17-20 mm.

## Description

Head flat, a little longer than width of vertex and one eye (36:60), surface transversely wrinkled across the middle and more coarsely so between the ocelli, the cheeks obscurely obliquely wrinkled on apical two fifths, median area of cheeks with a few small brown punctures; clypeus slightly exceeding the cheeks, polished and expanded at apex; antennal segments as 18:36:50:65:56, those of rostrum as 35:70:65:45; tip of rostrum attaining fore margin of ventral V; bucculae broadly sinuate, highest before base of rostrum; margins of cheeks feebly sinuated before the eyes; vertex with six longitudinal rows of punctures, the outer sometimes obsolete; head below impunctate.

Pronotum about a third longer than head, two and a half times as wide across the humeri as its median length (17:7); surface with a few large black punctures which become closer behind the middle and omit the callosities and anterior margin medianly; latero-anterior margins slenderly carinate. Scutellum nearly a fourth longer than broad (140:110), with large black punctures that become closer along the sides and obsolete at apex; apex behind the frenum a little longer than its width at the end of the frenum, the tip rounded. Elytra more closely and regularly black-punctate, these punctures forming rows along the sutures and becoming nearly obsolete at apex. Margins of pleurae and base of venter with small concolorous punctures. Osteolar canal long and slender, feebly curved but not quite attaining the anterior margin of the metapleura; mesosternal lamina two thirds as high as the median width of the second rostral segment (5:7), feebly arcuate, not produced free between the anterior coxae, a little thickened posteriorly; metasternal plate ovate, flat, its sides obtusely but feebly elevated, not at all tectiform; excavated behind to receive the subacute ventral spine.

<sup>2</sup> China, W. E., Notes on the genera *Glaucias*, Kirkaldy (Zangis, Stal), and *Plautia*, Stal (Hemiptera): *The Entomologist*, vol. 62, p. 15, 1929.

Male genital characters much as figured by China for *G. vitiensis* but with the median lobe narrower at apex, the styles narrower and linear to near their apex, the median notch of the pygofer more broadly and shallowly excavated, and the inflexed lateral angles of the pygofer with its inner member broader and passing the narrow outer member, with a deep rounded notch between them. Basal plates of the female genital segment prominent, strongly sinuate on either side more as in *G. samoanus* as figured by China<sup>3</sup>, the median valve also as in *G. samoanus*; lateral plates narrower than those figured for either of these species.

<sup>3</sup> China, W. E., Heteroptera: Insects of Samoa, pt. 2, fasc. 3, p. 94, 1930.

Color a clear grass-green shading to yellowish on apex of tylus, about the eyes, along the latero-anterior submargin of the pronotum, base of the costa, connexivum, and disk of the sterna and venter; sutures of the tylus, edge of head, latero-anterior margins of pronotum, and sometimes the base of costa slenderly blackish green; a small spot on either side of the scutellum before the apex, median line and apex of rostrum, a small tooth at apex of connexival segments, tip of tarsal claws, a line close above base of antennae and the margin of the stigmata, black; antennae yellowish, apical half of III and all of IV and V inclined to fulvous-brown.

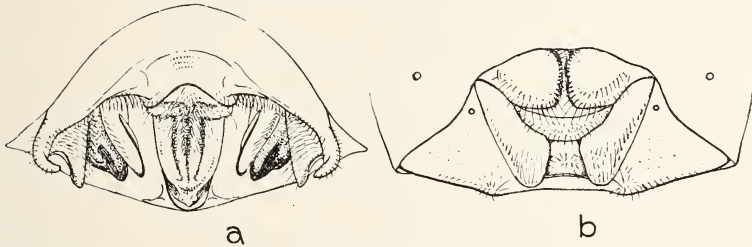


FIGURE 1.—*Glaucias venustus*, new species, genital segment: a, male; b, female.

Nukuhiva: Teivipakeka [Teivipakea], altitude 2400 feet, October 16, 1929, 1 male, Mumford and Adamson.

Uahuka: Putiovae [Putiovai], March 23, 1931, taken on *Xylosma suaveolens*, 2 nymphs (?), LeBronnec and H. Tauraa.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 2 specimens, LeBronnec; Hapava, altitude 500-600 feet, December 18, 1929, on leaves of *Wikstroemia foetida*, 2 females, Whitten.

Hivaoa: Mount Temetiu, altitude 3650 feet, March 23, 1929, 2 specimens, altitude 1670 feet, February 23, 1929; slope north of Mount Temetiu, altitude 3600 feet, February and March 1929, 1 male, 2 females; Atuona, May 11, 1929, 1 female; Mumford and Adamson.

Tahuata: Vaitahu Valley, March 1929, 4 specimens and several nymphs, holotype male, allotype female; Mumford and Adamson.

Although very near *G. vitiensis*, this species shows some good points for differentiation. The relative lengths of the antennal and rostral segments are obviously different; the rostrum is longer than in *G. marcidus* and *G. samoanus* (China does not give its length in *G. vitiensis*); the whole of segment IV of antenna is brownish, not apical half only; the black line above the base of the antennae is not mentioned in the description of *G. vitiensis*; the form

of the genital pieces shows obvious differences; and the size is materially larger. The fact that it inhabits a different group of islands should not be ignored. Miss Cheesman records *G. sulcatus* Montrouzier from the same island from which *G. venustus* was taken, and both species are reported as not uncommon there. This species, however, cannot be *G. sulcatus*, as Stål says the metasternal carina is produced in a free lamina between the anterior coxae, which is not true of *G. venustus*. However, this may yet prove to be the species identified as *G. sulcatus* by Miss Cheesman. The coarse black punctures of the dorsum are not mentioned by China in his description of *G. viticensis*, but they are conspicuous and characteristic in this species.

**Oecalia consocialis** Boisduval.

Uahuka: Hanahoua Valley, altitude 250 feet, March 10, 1931, on *Ocimum* species, 1 specimen; Hane Valley, altitude 300 feet, March 9, 1931, 1 specimen; Teanatuhiwa, altitude 300 feet, March 18, 1931, on *Waltheria americana*, 1 specimen; LeBronnec and H. Tauraa.

Uapou: Vakaoakee, altitude 300 feet, December 17, 1929, Whitten.

Tahuata: Hanahevane Valley, altitude 150 feet, July 17, 1930, on *Sida* species, 3 specimens; altitude 45 feet, July 16, 1930; LeBronnec and H. Tauraa.

Hatutu [Hatutaa]: altitude 800 feet, April 28, 1931, on *Melochia velutina*, 17 specimens; altitude 1500 feet, April 28, 1931, beating on *Canthium barbatum*, 1 specimen; altitude 1500 feet, April 24, 1931, 1 specimen; altitude about 700 feet, April 28, 1931, 1 specimen; altitude 1500 feet, April 28, 1931, beating *Desmodium heterocarpum*, 1 specimen; LeBronnec and H. Tauraa.

Eiao: altitude 1500 feet, April 24, 1931, 1 specimen; LeBronnec; altitude 1100 feet, September 28, 1929, altitude 800 feet, October 1, 1929, altitude 1200 feet, October 2, 1929, beaten from *Melochia velutina* and *Dodonaea viscosa*, Adamson.

Fatuuku: altitude 860 feet, September 19, 1930, beating on *Morinda citrifolia*, 2 specimens, H. Tauraa.

Mohotani: altitude 300 feet, February 4, 1931, on *Cassia occidentalis* and on *Corcopsis* species, 7 specimens, LeBronnec and H. Tauraa; above Anaoa, altitude 160-650 feet, August 13, 1929, sweeping, Adamson.

These specimens seem inseparable from those found in New Zealand and in Australia. Prof. W. B. Herms has taken this species on Fanning Island.

FAMILY COREIDAE

**Lioryssus hyalinus** Fabricius.

Uahuka: Vaipae Valley, altitude 250 feet, March 17, 1931, on *Ocimum basilicum*, 1 specimen, LeBronnec and H. Tauraa.



Also taken by the Pacific Entomological Survey in the Society Islands.

This common species has been reported from almost every faunal region. The present material is a little darker in color than most of the specimens from the United States, but on the whole the species shows very little tendency toward variation.

#### FAMILY ARADIDAE

##### **Ctenoneurus parallelus** Van Duzee.

*Ctenoneurus parallelus* Van Duzee: B. P. Bishop Mus., Bull. 98, p. 180, 1932.

Uapou: Vaikokoo, Paaumea Valley, altitude 1850 feet, November 30, 1931, on log of *Hibiscus tiliaceus*; Teoatea, Hakahetau Valley, altitude 1950 feet, November 21, 1931, in dead *Piper latifolium*; LeBronnec.

#### FAMILY LYGAEIDAE

##### **Germalus costalis** Van Duzee.

*Germalus costalis* Van Duzee: B. P. Bishop Mus., Bull., 98, p. 180, 1932.

Hivaoa: Temetiu Summit, altitude 4160 feet, January 20, 1932, beating on *Weinmannia* species, 1 specimen; Avaoa Valley, altitude 2820 feet, January 6, 1932, 1 specimen; Kakahopuanui, Kaava Ridge, altitude 2500 feet, January 5, 1932, sweeping on ferns, 1 specimen; Kakahopuanui, altitude 2500 feet, January 5, 1932, sweeping on ferns, 4 specimens, beating on *Cyathea*, 1 specimen; Kaava Ridge, altitude 2750 feet, January 6, 1932, sweeping and beating on ferns, 7 specimens; Kaava Ridge, altitude 2820 feet, January 6, 1932, 4 specimens (1 on *Weinmannia* species); LeBronnec.

##### **Germalus unicolor** Montandon.

Hivaoa: Kakahopuanui, altitude 2465 feet, January 5, 1932, beating on *Weinmannia* and *Bidens lantanoides*, 2 specimens; Feani Ridge, altitude 3900 feet, January 21, 1932, beating on *Cyrtandra* species, 1 specimen; LeBronnec.

These specimens agree in all respects with Montandon's description except that the base of antennals II and III and the exterior face of I are embrowned. Here the osteolar canal is short and broad, characters not mentioned by Montandon. I cannot consider it distinct without Javan specimens for comparison.

##### **Germalus infans** Van Duzee.

*Germalus infans* Van Duzee: B. P. Bishop Mus., Bull. 98, p. 183, 1932.

Nukuhiva: Ooumu, altitude 4050 feet, November 12, 1929, on sedge (*Carex* species), 2 specimens, Mumford and Adamson; altitude about 3000 feet, May 29, 1931, on *Weinmannia* species, 1 specimen, LeBronnec and H. Tauraa; Tapuaoa, altitude about 3000 feet, June 18, 1931, on *Weinmannia* species, 2 specimens, LeBronnec and H. Tauraa.

Uahuka: Penau Ridge, altitude 2000-2200 feet, February 27, March 2, 5, 1931, on *Weinmannia* species, 10 specimens; Teivipuhihihi, Vaikivi Valley, altitude 1250 feet, March 6, 1931, on *Metrosideros collina*, 5 specimens; Tauheeputa, altitude 1770 feet, March 23, 1931, on *Glochidion ramiflorum*, 4 specimens; Hanahoua Valley, altitude 250 and 750 feet, March 10, 1931, on *Ocimum* species, 3 specimens; Teavamataiki, altitude 730 feet, March 19, 24, 1931, on *Melochia velutina*, 2 specimens; LeBronnec and H. Tauraa.

Uapou: Teoatea, Hakahetau Valley, altitude 1950-2000 feet, November 16-19, 1931, beating on ferns, on *Metrosideros collina*, 5 specimens; LeBronnec.

Hivaoa: Temetiu Ridge, altitude 3900 feet, January 14, 1932, beating on *Cyrtandra* species, 10 specimens; Feani Ridge, altitude 3900 feet, January 21, 1931, beating on *Cyrtandra* species, 3 specimens; LeBronnec.

Hatutu [Hatutaa]: altitude 1500 feet, April 28, 1931, beating on *Canthium barbatum*, 34 specimens; altitude 800 feet, April 28, 1931, on *Melochia velutina*, 1 specimen; LeBronnec and H. Tauraa.

Eiao: altitude 1800 feet, April 22, 1931, on *Sida* species, 1 specimen; altitude 1600 feet, April 24, 1931, on *Vernonia cinerea*, on *Sida* species, 2 specimens; LeBronnec and H. Tauraa.

This species appears to be common and widely distributed on these islands. The individuals from Hivaoa are paler.

### **Germalus fuliginosus** Van Duzee.

*Germalus fuliginosus* Van Duzee: B. P. Bishop Mus., Bull. 98, p. 184, 1932.

Hivaoa: Temetiu Summit, altitude 4160 feet, January 20, 1932, beating on *Weinmannia* species, 4 specimens; Mount Temetiu, altitude 3900 feet, January 14, 1932, beating on *Metrosideros collina*, 1 specimen; Kakahopuanui, altitude 2465 feet, January 5, 1932, beating on *Weinmannia* species, *Cyathea*, and ferns, 6 specimens; Kaava Ridge, altitude 2000 feet, October 27, 1931, beating on *Sapindus saponaria*, 1 specimen, beating on *Glochidion ramiflorum*, 3 specimens; altitude 2750 feet, January 6, 1932, beating on ferns, 1 specimen, on ferns, 2 specimens, beating on *Cyathea* species, 1 specimen; Kaava Ridge, altitude 2820 feet, January 6, 1932, beating on *Metrosideros collina*, 1 specimen; Kaava Ridge, altitude 2800 feet, January 7, 1932, on *Pandanus*, 1 specimen; LeBronnec.

Tahuata: Vaitupaahi, altitude 2000 feet, July 8, 1930, 1 specimen, LeBronnec and H. Tauraa.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 16, 1931, beating on *Metrosideros collina*, 1 specimen; LeBronnec.

This species varies in the depth of the fuliginous shade on the elytra and in the extent of the dark markings on the head and pronotum.

***Germalus robustus***, new species (fig. 2).

## Diagnosis

Form of *G. fuliginosus* nearly, with somewhat similar fuscous markings; elytra whitish subhyaline with heavy black nervures. Length 5 mm.

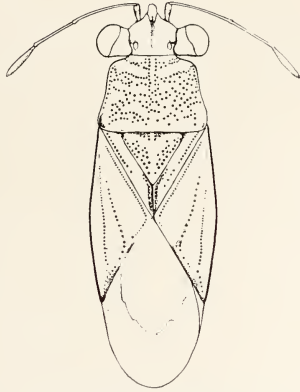


FIGURE 2.—*Germalus robustus*, new species

## Description

Head as in *G. fuliginosus*, well produced anteriorly, impunctate; vertex flat, opaque, obscurely shagreened; eyes strongly prominent, distinctly elevated and somewhat produced posteriorly; ocular peduncles as long as the width of the eye; ocelli more distant from one another than from the nearest margin of the eyes; antennals III and IV equal, shorter than II (11:15). Pronotum broad, less narrowed anteriorly than in the related species (21:25), its length to its humeral width as 18:25; sides moderately sinuate, about as in *G. maculatus*, its surface coarsely, distinctly black-punctate; callosities large, smooth as in *G. infans*. Elytra, greatest width of each to length of corium as 31:44. Rostrum attaining hind coxae, segment I reaching to prosternum. Osteolar canal comparatively broad, slightly curved forward apically but not quite attaining hind margin of mesopleura, blunt at apex. Female oviduct attaining but not modifying third ventral segment.

Color pale yellow becoming whitish or testaceous on pronotum posteriorly, apex of scutellum, and base of femora; pronotum, the callosities excepted, and scutellum coarsely black-punctate, the latter with the usual smooth Y well developed; vertex with a heavy black median line and slender black mark at posterior base of eyes, the clypeal sutures and a line above the base of the antennae black; elytra whitish hyaline, the disk often tinged with fuliginous; veins punctate and heavily marked with black, the commissural margin of clavus and apex of corium more broadly so; costa hyaline, narrower than in some of the Marquesan species, the edge with a slender black line; pronotal humeri blackish, the disk with three fuscous vittae, more or less distinct, the intermediate including a pale median line; beneath with a blackish lateral vitta, represented by black punctures on the pleurae; acetabulae, coxae, and base of femora pale; tibiae and tarsi infuscated, the femora strongly black-punctate beyond the pale base; apex of abdomen and oviduct of female fuscous; antennae infuscated, segment I beneath, apex of II and III and all of IV paler; hind margin of metapleura more or less distinctly whitish.

Nukuhiva: Tovii [Toovii], altitude 2500 feet, August 4, 1931, beating on *Metrosideros collina*, holotype male, allotype female, 2 paratypes; Tekao Hill, altitude 3020 feet, July 23, 1931, on *Metrosideros collina*, 3 specimens;

Ooumu, altitude 3000-3200 feet, May 28, 1931, on *Metrosideros collina*, on *Weinmannia* species, 2 specimens; Tapuaooa, altitude 3000 feet, June 18, 1931, on *Weinmannia* species, 1 specimen; LeBronnec and H. Tauraa.

This species has much the appearance of *G. fuliginosus*. It has the same form of head and antennae and the comparatively straight osteolar canal, but the pronotum is broader anteriorly, the elytra are whitish hyaline with a trace of fuliginous and with strong black veins and apical and commissural margins, and the femora are strongly spotted with black. *G. infans* is narrower anteriorly with pale elytral veins and its osteolar canal is long, thickened, and curved to meet the margin of the mesopleura, while *G. lateralis* is distinctly narrower throughout. The broad form, hyaline elytra, black veins, and narrow costal areole will distinguish this species.

**Germalus lateralis** Van Duzee.

*Germalus lateralis* Van Duzee: B. P. Bishop Mus., Bull. 98, p. 184, 1932.

Nukuhiva: Tekao Hill, altitude 3250 feet, July 23, 1931, on *Weinmannia* species, 3 specimens; Tapuaooa, altitude 3500 feet, July 20, 1931, on *Weinmannia* species, 1 specimen; Tovii [Toovii], altitude 2500 feet, August 4, 1931, on *Metrosideros collina*; LeBronnec and H. Tauraa.

Hivaoa: Kaava Ridge, altitude 2800 feet, January 7, 1932, beating on *Weinmannia* species, 1 specimen; LeBronnec.

**Germalus maculatus** Van Duzee.

*Germalus maculatus* Van Duzee: B. P. Bishop Mus., Bull. 98, p. 184, 1932.

No additional specimens of this species have come to hand. The type material was from the island of Tahuata.

**Neocymus insularis** Van Duzee.

*Neocymus insularis* Van Duzee: B. P. Bishop Mus., Bull. 98, p. 186, 1932.

Nukuhiva: Tapuaooa, altitude about 2600 feet, May 30, 1931, 1 specimen, LeBronnec and H. Tauraa.

Hivaoa: Teava Uhia i te Kohu, February 2, 1930, on *Paspalum conjugatum*, 1 specimen, Mumford and Adamson.

Uahuka: Penau Ridge, altitude 1700 feet. February 26, 1931, on *Weinmannia* species, 1 specimen; LeBronnec and H. Tauraa.

**Ptochiomera castanea** Van Duzee.

*Ptochiomera castanea* Van Duzee: B. P. Bishop Mus., Bull. 98, p. 186, 1932.

Uapou: Vaikokoo, Paaumea Valley, altitude 2000 feet, November 26, 1931, on *Weinmannia* species; Teavanui Pass, altitude 2900 feet, November 26, 1931, at light, 1 specimen; Tekohepu Summit, altitude 3300 feet, November 27, 1931, beating on *Metrosideros collina*, 2 specimens; Tekohepu Summit, altitude 3200 feet, November 28, 1931, beating on *Frcycinetia* species,



1 specimen; Tekohepu Summit, altitude 3000 feet, November 30, 1931, beating on *Freycinctia* species, 1 specimen; LeBronnec.

Hivaoa: Temetiu, slope north of summit, altitude 2000 feet, March 28, 1930, at light, H. Tauraa; Temetiu, slope north of summit, altitude 3860 feet, December 29, 1930, at light, 1 specimen, LeBronnec and H. Tauraa; Temetiu Ridge, altitude 3900 feet, January 14, 1932, beating on *Cyrtandra* species, 1 specimen; LeBronnec.

### **Paromius pallidus** Montrouzier.

Hivaoa: Teava Uhia i te Kohu, altitude 2100 feet, February 15, 1930, on *Paspalum conjugatum*; Mumford and Adamson.

Fatuhiwa: Omoa [Oomoa] Valley, near sea level, August 21-22, 1930, on *Cyperus*; Hanavave Valley, altitude 1550 feet, August 23, 1930, altitude 50 feet, September 8, 1930; Tapuhiwa, Hanavave Valley, altitude 500 feet, September 9, 1930; Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, on *Paspalum conjugatum*; Teavaipuhiau, altitude 2150 feet, August 25, 1930, on *Paspalum conjugatum*; LeBronnec.

Eiao: above Vaituha, altitude 1100 feet, September 28, 1929, Adamson; altitude 1600 feet, March 24, 1931, on *Ageratum conyzoides*, 1 specimen, LeBronnec.

Fatuuku, altitude 860 feet, November 19, 1930, beating on *Morinda citrifolia*, 3 specimens, H. Tauraa.

## FAMILY REDUVIIDAE

### **Ploiaria assimulatus**, new species.

#### Diagnosis

Runs to *floridana* in the key<sup>4</sup> but it is larger and quite distinct in many characters;<sup>5</sup> brownish testaceous with a few obscure areas; length 8.5 mm.

#### Description

Head with the eyes slightly wider than pronotum across anterior acetabulae (13:11); anterior lobe two and a half times as long as posterior (18:7); vertex a little wider than an eye (95:40); distance from eye to base of antennae a little greater than from eye to hind margin of head; anterior lobe slightly convex, posterior almost hemispherical, suture straight, but little anterior to the inner hind angle of the eyes. Pronotum as long as head (20:20); almost cylindrical, sides rectilinear, feebly constricted before the short flaring base; tuberculate anterior angles larger than in *P. carolina*; mesonotum a third shorter than pronotum (15:20), as wide posteriorly as long, median sulcus well developed, with a slender central carina, lateral carinae prominent. Wings attaining apex of abdomen, venation obscured but apparently similar to that of *P. varipennis* as figured by McAtee and Malloch (pl. 5, fig. 73). Antennal II distinctly shorter than I (107:124), other segments wanting. Anterior coxa three fourths as long as its femur, cylindrical; anterior femora slightly fusiform; series of spines reaching base, about four or five longer, the longest about equalling thickness of coxae; tibiae and tarsi together nearly as

<sup>4</sup> McAtee, W. L., and Malloch, J. R., Revision of the American bugs of the reduviid subfamily Ploiariinae: U. S. Nat. Mus., Proc., vol. 67, pp. 51, 59, 1925.

<sup>5</sup> The type of *P. floridana* when it got back to me was a mere fragment. The head, pronotum, and legs were wanting and the genital segment had been removed, the mesonotum and wings alone being left for comparison.



long as femur, the tarsi three fifths of the tibiae (15:25); tarsal incisures obscure but discernible, the basal segment almost equal to the next two together. Hind margin of prosternum slightly excavated. Dorsal spine of male pygofer slightly surpassing the claspers, the latter, as is usual in related species, curved upward and inward. Trochanters with two bristles, one below, subapical, the other on inner surface, the apex also produced in a spine.

Color an almost uniform brownish testaceous; an area before and one behind the eyes, sides of pronotum, and ventral aspect of genital segment more infuscated; median sulcus and lateral carinae of mesonotum a little paler; closed elytra appearing a little fuliginous with darker nervures; antennae castaneous, clothed with very minute hairs; eyes castaneous.

Hivaoa: Kopaafaa, February 26, 1930, altitude 2800 feet, in dead stipes of *Marattia* species, holotype male, Mumford and Adamson.

This species is quite distinct from *P. collenetti* Cheesman.

### **Polytoxus**, species.

One nymph of a saicine insect evidently belonging to this genus was taken at Hitikau, Uahuka, March 3, 1931, at 2900 feet, by LeBronnec and H. Tauraa.

## FAMILY NABIDAE

### **Nabis capsiformis** Germar.

Uahuka: on crest of north ridge, altitude 2000 feet, September 27, 1929, Adamson; Hanahoua Valley, altitude 45 feet, March 9, 1931, on *Rhynchosia minima*, 8 specimens; Hanahoua Valley, altitude 15 feet, March 9, 1931, on *Ocimum* species, 1 specimen; Hanahoua Valley, altitude 250 feet, March 10, 1931, on *Ocimum* species, 4 specimens; Vaitiake, altitude 1000 feet, March 24, 1921, on *Canthium barbatum*, 1 specimen; Tauheeputa, altitude 1770 feet, March 23, 1931, on *Sida* species, 5 specimens; Teuarei, altitude 350 feet, March 19, 1931, on *Waltheria americana*, 1 specimen; Penau Ridge, altitude 2000 feet, March 4, 1931, at light, 1 specimen; Vaipae Valley, altitude 250 feet, March 17, 1931, on *Ocimum basilicum*, 1 specimen; Hane Valley, altitude 150 feet, March 9, 1931, at light, 1 specimen; Haave [Haavei] Valley, altitude 270 feet, March 9, 1931, 1 specimen; LeBronnec and H. Tauraa.

Hivaoa: Tapeata, on east slope of Mount Ootua, altitude 2500 feet, May 25, 1929; Teava Uhia i te Kohu, altitude 2100 feet, February 15, 1930, on *Paspalum conjugatum*; Mumford and Adamson. Avaao, altitude 1350 feet, January 4, 1932, 1 specimen, LeBronnec.

Nukuhiva: Vaitokea, altitude 2200 feet, August 6, 1931, beating on *Metrosideros collina*, 1 specimen, LeBronnec and H. Tauraa.

Tahuata: Hanahevane Valley, altitude 150 feet, July 17, 1930, on *Sida* species, 3 specimens; Hanahevane, near seashore, on *Passiflora foetida* and by sweeping grasses; Vaitahu, seashore, June 17, 1930, at light, 1 specimen; Hanamiai, altitude 500-1000 feet, May 28, 1930; Kiimui, altitude 1100 feet, June 16, 1930; LeBronnec and H. Tauraa.

Fatuhiva: Uia [Ouia] Valley, altitude 0-500 feet, September 2, 1930, some on *Tephrosia purpurea*, LeBronnec.

Hatutu [Hatutaa]: altitude 1300 feet, April 28, 1931, on *Ageratum conyzoides*, 3 specimens; altitude 1500 feet, April 28, 1931, beating on *Desmodium heterocarpum*, 1 specimen; LeBronnec and H. Tauraa.

Eiao: altitude 1600-1800 feet, April 16-24, 1931, on *Sida* species (4 specimens), on *Ageratum conyzoides* (4 specimens), on *Abutilon menziesii*, on *Vernonia cinerea*, 10 specimens, LeBronnec.

**Nabis mumfordi** Van Duzee (fig. 3).

*Nabis mumfordi* Van Duzee: B. P. Bishop Mus., Bull. 98, p. 181, 1932.

Uapou: Teavaituhai, Paaumea side, altitude 3020 feet, November 20, 1931, 1 specimen; Tekohepu Summit, altitude 3200 feet, November 28, 1931, at light, 1 specimen; Teavanui Pass, altitude 2900 feet, November 30, 1931; LeBronnec.

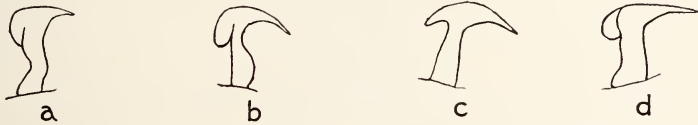


FIGURE 3.—*Nabis* species, left male hamus: a, *N. longipes* Van Duzee; b, *N. plicatulus* Van Duzee; c, *N. ancora*, new species; d, *N. mumfordi* Van Duzee.

**Nabis ancora**, new species (fig. 3).

Diagnosis

Very close to *N. mumfordi* Van Duzee, a little smaller and paler with different male claspers; length 7 mm.

Description

Length of head before the collum a little more than the width across the eyes; clypeus and antenniferous tubercles somewhat more prominent. Pronotum nearly as long as wide across the humeri (22:25)—in *N. mumfordi* the proportion is 24:28; sinuate lateral carina continued almost to the anterior margin of the collum—in *N. mumfordi* it becomes nearly obsolete on the collum; posterior lobe minutely punctate, the hind margin nearly straight. Elytra nearly two and a half times as long to the tip of the corium as wide at base (25:65). Rostrum attaining intermediate coxae. Antennae slender, segment I two thirds the length of II. Other characters about as in *N. mumfordi*.

Color yellowish testaceous; a curved line either side on the vertex, hooked at the ocelli, three obscure longitudinal vittae on the collum, a geminate median line and some vermiculate marks on either side on anterior pronotal lobe, the humeri, a slender median line and two vittae, connivent before the middle, on either side the posterior lobe and some marks on the elytral veins, brown; antennae brown, the incisures and about four annulae on segment II pale. Legs pale; anterior femora and tibiae with about four brown annulae, the femora with a row of brown dots above; intermediate and posterior femora with four brown annulae that are intensified apically; intermediate tibiae with five brown annulae, the posterior with seven. Body beneath pale with some brown clouds, more pronounced on the genital segment.

Hamus of male anchor-shaped at apex, the dorsal horn acute, projected at a right angle, the ventral shorter and blunt, apical margin regularly arcuate. In *N. mumfordi* the

hamus is distinctly sickle-shaped, its dorsal horn longer, oblique, and acute. Described from 20 examples.

Hivaoa: Kaava ridge, January 7, 1932, altitude 2800 feet, beating on *Weinmannia* species, holotype male, LeBronnec; Kaava ridge, January 6, 1932, altitude 2820 feet, beating on *Cheirodendron* species, allotype female, LeBronnec; Kaava ridge, January 6, 1932, altitude from 2750-2820 feet, sweeping on ferns, beating on *Weinmannia* species, in dead leaves *Cyathea* species, beating on *Reynoldsia* species, paratypes, LeBronnec; Kakahopuanui, altitude 2610 feet, January 5, 1932, beating on *Bidens lantanoides*, 1 specimen, LeBronnec.

Nukuhiva: Tapuaooa, altitude about 3000 feet, June 16, 1931, beating on *Metrosideros collina*, 2 specimens, LeBronnec and H. Tauraa.

Uahuka: Hitikau crest, altitude 2970 feet, March 4, 1931, ex dead stipes *Cyathea* species, 1 specimen, LeBronnec and H. Tauraa.

Mohotani: altitude 1500 feet, February 1, 1931, on *Ageratum conyzoides*, 1 specimen, LeBronnec and H. Tauraa.

**Nabis longipes** Van Duzee (fig. 3).

*Nabis longipes* Van Duzee: B. P. Bishop Mus., Bull. 98, p. 188, 1932.

Nukuhiva: Tapuaooa, altitude 3000 feet, January 1, 1931, taken under dead leaves, one brachypterous female, LeBronnec and H. Tauraa.

This female seems to belong here but it is paler colored and is more slender and possibly may represent a distinct species in the group without ocelli. The finding of a corresponding male would make the determination more certain.

FAMILY MIRIDAE

**Campyloneuropsis seorsus**, new species.

Diagnosis

Pale, dull yellow, marked and dotted with brown; scutellum with two broad fusiform vittae which diverge posteriorly; beneath marked with red along each side. Length 4.5 mm. to tip of elytra.

Description

Head about three fourths the humeral width (14:20); eyes large, vertical, very slightly sinuate anteriorly, posteriorly touching the collum; vertex horizontal, narrower than an eye (4:6); front somewhat swollen, with an obscure median sulcus, faintly, obliquely striate back to about the middle of the eyes; clypeus prominent, its base well distinguished from the front, in line with the base of the antennae; lorae small, tumid; cheeks narrow and tumid; rostrum attaining base of the intermediate coxae. Segment I reaching to apex of prosternum. Antennal I a little longer than an eye (10:8), one third the length of II; other segments wanting. Median length of pronotum one half the humeral width, hind margin rather deeply excavated, sides straight, callosities prominent, separated by a narrow sulcus, posteriorly delimited by a rather deep transverse sulcus that does not attain the margins; collum broad, nearly flat, bounded by a deep groove behind; posterior disk with a weak median depression. Anterior lobe of scutellum swollen, posterior forming a feeble ridge either side the depressed median line, tip flat. Elytra

narrow, nearly parallel (base 23, apex 25); embolium narrow, subcarinate to near the tip; cuneus narrow; membrane ample, larger areole right-angled at apex; abdomen attaining base of cuneus. Legs slender, clothed with long pale hairs, hind femora not attaining apex of membrane, their tibiae exceeding them by one third their length; tarsi slender, their joints poorly distinguished, I short, II and III subequal. Dextral clasper long, porrect, bent at about the middle, its tip polished, brown; sinistral clasper small; left dorsal angle of pygofer produced in an incurved hook. Whole upper surface of insect opaque, impunctate.

Color pale, dull lemon-yellow, brighter on head and anterior lobe of pronotum; elytra and posterior lobe of pronotum marked with rather large, irregularly spaced round brown dots; elytra with a subapical transverse brown band indicated, more strongly marked on costa and commissural margin behind tip of clavus; basal half of cuneus brown; membrane clouded, darker toward apex; nervure yellow; margin with a whitish spot behind the areole followed by a darker cloud running to the apex; antennae pale brown, the incisures and a broad median annulus on II pale; beneath with traces of a lateral sanguineous vitta and with a narrow red line on the cheeks; legs pale brown with the base of the femora and a broad median vitta on the tibiae pale; hairy vestiture pale yellow, longer on the margins and tibiae; eyes dark chestnut.

Hivaoa: Feani Ridge, January 12, 1932, altitude 3970 feet, holotype male, unique, LeBronnec.

This insect has much the aspect of an *Engytatus*, but the eyes are contiguous to the pronotum. It answers very closely to Poppius' description of his genus *Campyloncuropsis* except that the hairs are pale, scarcely a generic character. Viewed from before (below) the second antennal segment is about as thick on apical two thirds as the first, the basal third being thinner. Poppius described his genus and species<sup>6</sup> from East Africa. This seems like a somewhat unusual distribution, but the establishment of a new genus for the present species seems quite unnecessary.

### **Atractotomus collinus**, new species.

#### Diagnosis

Piceous black, cloth with white scalelike deciduous hairs with long brownish hairs on the head, pronotum, scutellum, and elytra, the incisures of the antennae and legs pale. Length 3 mm.

#### Description

Head vertical, viewed from in front wider across the eyes than long (10:14); facial angle a right angle; clypeus prominent, its basal suture obscure, in line with the antennal base. Antennae short; segment I elongate conical, attaining apex of head; II incrassate, elongate fusiform, thickest before the middle; III and IV slender, together but little longer than the head (12:10), III longer than IV. Rostrum attaining apex of intermediate coxae. Pronotum viewed vertically to plane of body one half as long as wide. Elytra together one fourth narrower at base than at cuneus (10:14); cuneus and membrane declined at angle of about 45. Hind femora nearly a third as wide as long (6:19). Body opaque, impunctate, clothed above and below with deciduous white scalelike hairs and longer scattering brown hairs, the latter more conspicuous on elytral margins; antennae pubescent.

Color piceous black; antennals I and II rufopiceous with their base and apex conspicuously pale; III and IV fuscous, their base and apex inconspicuously paler; membrane fuscous, becoming blackish at base, connecting vein and marginal vein of cuneus paler;

<sup>6</sup> Acta Soc. Sci. Fenn., vol. 44, p. 10, 1914.



coxae paler at apex; tronchanters tumid and pale; knees conspicuously pale, the hind tibiae paler by oblique light, bristles black; distal margin of corium sometimes paler. Described from 20 individuals representing both sexes.

Uapou: Tekohepu summit, altitude 3200 feet, November 28, 1931, holotype male, allotype female, LeBronnec; altitude 3000-3300 feet, November 27-28, 1931, beating on *Cheirodendron*, *Metrosideros collina*, *Weinmannia* species, ferns; Teavaituhai, Paaumea side, altitude 2020, 3020 feet, November 19, 20, 1931, beating on *Cyrtandra* and *Vaccinium* species, paratypes, LeBronnec.

Hivaoa: Temetiu Summit, altitude 4160 feet, January 20, 1932, beating on *Metrosideros collina*, *Cheirodendron* species, paratypes, LeBronnec.

This species is narrower than our American *hesperus*, the second antennal segment is narrower and the fuscous hairs are longer and more conspicuous. When not completely pigmented the color inclines to castaneous, especially on antennal II, and the tibiae may all be distinctly pale with the black bristles springing from black dots.

#### FAMILY HYDROMETRIDAE

#### *Hydrometra pacifica*, new species.

##### Diagnosis

A small, rather broad pale brown species, perhaps nearest to *H. mensor* White. Length 6 mm.

##### Description

Anteocular part of head one half longer than postocular (31:20), the whole head nearly one half the length of the entire insect (52:107), dorsally with two minute setigerous pits anteriorly and two larger, placed close to the hind margin; eyes small. Rostrum long, attaining base of intermediate coxae, the exerted setae reaching to base of abdomen. Antennal I shorter than II (5:7); III longer than I and II together (21:12); IV wanting. Intermediate coxae about midway between I and III. Pronotum nearly one half longer than wide (13:10), covering mesonotum, with two approximate dorsal pits anteriorly; metanotum short, its greatest length about one half its width (7:12); no wing pads visible. Abdomen nearly a third as wide as long to apex of segment VI. Anterior femora reaching almost halfway from eyes to base of antennae, their tibiae exceeding their femora by one sixth their length (30:35); hind femora slightly surpassing tip of abdomen, three fourths the length of their tibiae (36:50). Male genital segment nearly two thirds as wide as long (5:8), its dorsal apex regularly arcuate.

Color uniformly pale yellowish brown, slightly obscured on anterior femora and toward the apex of the head; eyes red; whole surface sparsely clothed with very minute pale pubescence.

Uahuka: Hitikau, altitude 2900 feet, March 3, 1931, holotype male, 1 paratype male, LeBronnec and H. Tauraa.

It is quite possible that these specimens are not fully mature, but their essential characters should be recognizable in the adults.



## NEW PLATYGASTERIDAE FROM THE MARQUESAS\*

By

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The material described in this paper was collected in 1929 by E. P. Mumford and A. M. Adamson of the Pacific Entomological Survey. As far as I am aware no species of Platygasteridae has hitherto been described from these islands, so it was not surprising that all material examined proved to be new. Five new species are described, one in *Synopeas*, two in *Prosactogaster*, and two in *Platygaster*. Type specimens are deposited in Bernice P. Bishop Museum.

***Synopeas levis***, new species (fig. 1, *a*, *b*).

Female

Length 0.93 mm. Head 1.85 times as wide as long, broadly elliptical viewed from above, slightly convex in front and behind, a little wider than the thorax, with a dense reticulate sculpture; lateral ocelli about twice their diameter distant from the eye margin; vertex separated from the occiput by a rounded ridge; antenna (fig. 1, *a*) with a 4-jointed club, the club joints apparently without colorless spines near apex but with elongated sense organs as in *S. daucicola* Kieffer; thorax 1.51 times as long as wide, 1.30 times as long as high, strongly convex above; mesonotum and pronotum, except pronotum below, finely reticulate; parapsidal furrows sharply indicated posteriorly, more faintly indicated anteriorly, meeting in a point in front of the scutellum, not quite reaching the front margin of the mesonotum; scutellum convex, about as wide as long, with a rather short, blunt, slightly curved projection apically; abdomen 1.68 times as long as wide, a little longer than the thorax, about as wide as the thorax, shaped as in *S. acuminatus* Kieffer except that the second segment is widest just before the apex; petiole very short, without pubescence above; second tergite as wide as long, without sculpture, without pubescence medially at front margin, with a row of very fine short white hairs across apical fifth; tergites 3, 4, and 5 broadly transverse, increasing in length in order named, with a faint reticulate sculpture; last tergite about as long as the three preceding combined, pointed apically, without distinct sculpture; propodeum, petiole laterally and ventrally, and base of second segment above and below (except medially above) with dense silvery pubescence; wings hyaline, with short cilia along costal and apical margins; black; scape except at apex, and legs, including coxae, reddish-brown; scape at apex and rest of antenna dark brown.

Male

Length 0.79 mm. Similar to the female; antenna as in fig. 1, *b*; thorax 1.28 times as wide as the abdomen, 1.25 times as long as the abdomen; abdomen subacute apically, the second tergite shaped as in the female.

Eiao: above Vaituha, altitude 1,100 feet, September 28, 1929, type, Adamson.

Hivaoa: Matauuna, altitude 3,700 feet, March 4, 1930, beating on *Sclerotheca* species, allotype and female holotype, Mumford and Adamson.

\* Pacific Entomological Survey Publication 7, article 27. Issued November 15, 1934.

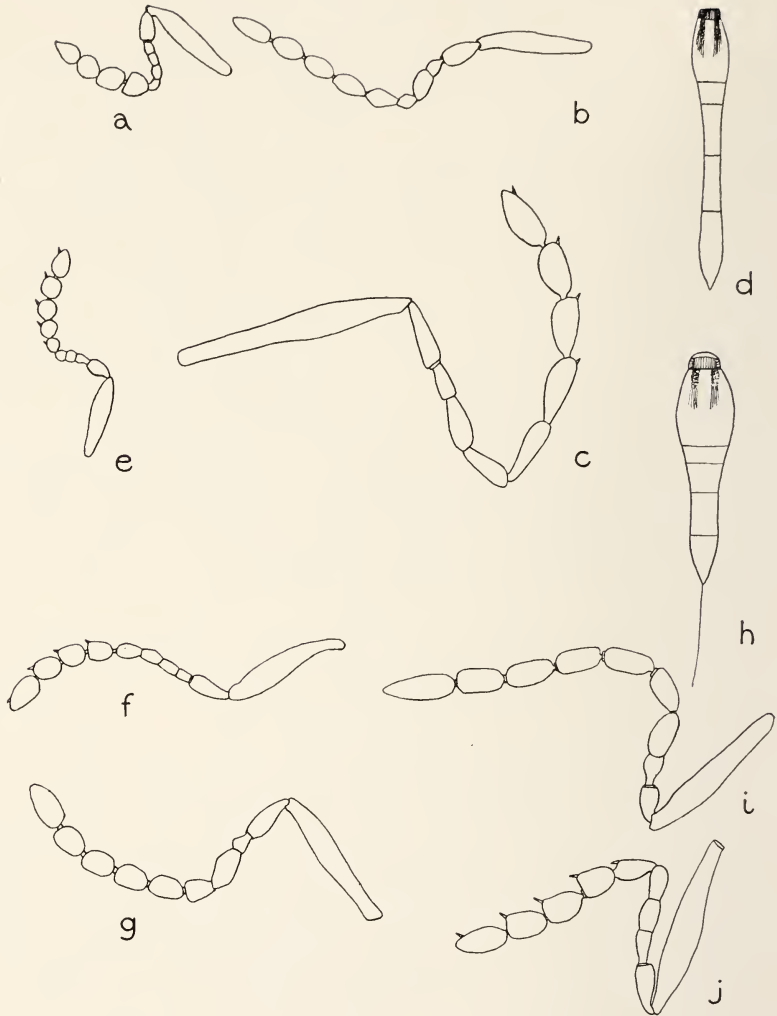


FIGURE 1.—Features of Marquesan Platygasteridae: a, antenna of *Synopeas levis* Fouts (female); b, antenna of *Synopeas levis* Fouts (male); c, antenna of *Prosactogaster insularis* Fouts; d, abdomen (dorsal aspect) of *Prosactogaster insularis* Fouts; e, antenna of *Platygaster compressus* Fouts; f, antenna of *Prosactogaster venustus* Fouts (male); g, antenna of *Prosactogaster venustus* Fouts (female); h, abdomen (dorsal aspect) of *Prosactogaster venustus* Fouts (female); i, antenna of *Platygaster mumfordi* Fouts (male); j, antenna of *Platygaster mumfordi* Fouts (female).

**Prosactogaster insularis**, new species (fig. 1, *c, d*).

## Female

Length 3.39 mm. Head twice as wide as long, a little wider than the thorax, 1.37 times as wide as the abdomen, convex in front, slightly excavated behind, the cheeks moderately full; frons without sculpture, smooth and shining, except a few fine transverse striae below; malar space likewise with a few transverse striae; cheeks without sculpture; vertex separated from the occiput by a sharp carina; occiput faintly aciculate; lateral ocelli separated from eye margin by about 1.5 times their diameters; antenna shown in fig. 1, *c*; club not differentiated; each of last four joints with a short colorless spine near apex; thorax 1.5 times as long as wide, 1.27 times as high as wide, 1.40 times as wide as the abdomen, strongly convex above; mesonotum finely reticulate on anterior half, without sculpture posteriorly; parapsidal furrows short, converging posteriorly, their junction forming a narrow lobe which projects over the scutellar fovea touching the scutellum; scutellum pillow-shaped, pubescent, especially laterally; figure 1, *d*, shows the dorsal view of the abdomen of one of the paratypes; in the type the abdomen is 4.2 times as long as the thorax, 8.1 times as long as wide; lengths of the tergites in the type are as follows: 12, 53, 18, 36, 64, 52; widths of the same: 18, 29, 24, 17, 14, 17; basal foveae as shown in figure, the striae extending about to apical fifth; tergites 3-6 inclusive with scattered punctures laterally; sheaths of ovipositor forming a thin round tube, protrude 0.7 times the length of the abdomen past the abdomen's apex; black; flagellum piceous; coxae black; legs dark brown, the tibiae and tarsi somewhat lighter; wings hyaline, reaching about to the apex of the fourth segment of the abdomen.

Hivaoa: Mount Temetiu, altitude 3,620 feet, July 24, 1929, type, 1 paratype; Matauuna, altitude 3,760 feet, March 1, 1929, beating on *Crossostylus biflora*, 3 paratypes; Kopaafaa, altitude 2,770 feet, August 2, 1929, beating on *Crossostylus biflora*, 1 paratype; Mumford and Adamson.

The specimen from Kopaafaa is somewhat smaller than the others, being only 2.27 mm. in length.

**Prosactogaster venustus**, new species (fig. 1, *f-h*).

## Female

Length 1.32 mm. Head twice as wide as long, a little wider than the thorax, 1.5 times as wide as the abdomen, shaped and sculptured as in *P. insularis* except that the malar space is not striate; antenna (fig. 1, *f*) without a well-defined club; pubescence on joints short; joints 7 to 10 each with a short spine on outer apical angle, apparently without elongate sense organs; thorax 1.56 times as long as wide, 1.21 times as high as wide, 1.27 times as wide as the abdomen, strongly convex above, without sculpture, smooth and shining; parapsidal furrows not present; the median lobe, however, is indicated by a broadly truncated and slightly swollen lobe which extends across the scutellar fovea and touches the scutellum; the structure is very similar to that found in *P. insularis* except that in that species the median lobe is narrower and is not swollen; abdomen shown in figure 1, *h*, very similar in form and structure to that of *P. insularis*, segments 3 to 6 (the sixth only basally) having scattered punctures; 2d sternite with a few short faint striae laterally just before middle; 3d sternite with a row of punctures across the base; 4th sternite with a few scattered punctures except along a median line; 5th and 6th sternites with a few extremely small scattered punctures, much smaller than those on the two sternites preceding; abdomen 2.1 times as long as the thorax, 4.2 times as long as wide; wings hyaline, extending a little way past the apex of the fifth abdominal segment; black; legs and antennae black to very dark brown, the trochanters and tarsi somewhat lighter.

## Male

Length 1.25 mm. Similar to the female; head 1.3 times as wide as the thorax, 1.4 times as wide as the abdomen; antenna shown in figure 1, *g*; thorax 1.21 times as wide as the abdomen; abdomen 2.25 times as long as wide, somewhat elliptical in outline as seen from above, widest at apex of the second segment; 1.2 times as long as the thorax; second tergite 1.29 times as long as wide, widest apically, with basal foveae on anterior half, the striae not distinct; tergites 3, 4, and 5 transverse, subequal in length, each with a row of punctures across it; 6th tergite shorter, also with a row of punctures; 7th tergite as long as 6th, triangular, without sculpture; segments 3 to 7 combined 0.55 times as long as the second; wings extending more than a third the length of the abdomen past its apex.

Eiao: above Vaituha, altitude 1,080 feet, October 2, 1929, on *Dodonaea viscosa*, 2 females, 9 males, Adamson.

**Platygaster mumfordi**, new species (fig. 1, *i*, *j*).

## Female

Length 1.45 mm. Head about twice as wide as long, 1.1 times as wide as the thorax, elliptical in outline as seen from above, subconvex in front and behind, slightly emarginate medially behind; frons without sculpture, smooth and shining; vertex with a fine aciculate sculpture; occiput separated from vertex by an inconspicuous carina, transversely finely striate; lateral ocelli as far from eye margin as from anterior ocellus; antennae shown in figure 1, *j*; joints 6 to 10 with a colorless spine near apex; thorax 1.64 times as long as wide, 1.23 times as high as wide, as wide as the abdomen, strongly convex above; pronotum above and mesonotum except on median lobe posteriorly with a faint reticulate sculpture; parapsidal furrows not indicated; median lobe projecting as a broad, flat, truncated lobe over the scutellar fovea and touching the scutellum; scutellum circular, highly convex, without sculpture, thickly pubescent except medially and anteriorly; abdomen elliptical seen from above, 2.16 times as long as wide, widest at apex of second segment, sharply pointed apically, the segments 3 to 6 becoming gradually narrower in order named, their sides oblique; petiole 1.36 times as wide as long, its surface sloping upward on anterior half, flat on posterior half, a median area twice as long as wide elevated and with three low ridges on it; second tergite 1.19 times as long as wide, widest apically, its sides slightly curved, with foveae on basal third, the usual striae extremely short and faint; second tergite 3.36 times as long as the first, 1.95 times as long as the following segments combined; tergites 3 to 6 increasing gradually in length, the third to fifth broadly transverse, the sixth about 1.75 times as long as wide, triangular, acute at apex; 3d, 4th, and 5th tergites each with a row of punctures across it; 4th tergite faintly reticulate, the others without sculpture except as indicated above; black; antennae dark brown; legs reddish-brown, the coxae and femora darker; wings brownish, extending about 0.4 the length of the abdomen past its apex.

## Male

Length 1.30 mm. Similar to the female. Antenna shown in figure 1, *i*; abdomen 1.9 times as long as wide, obovate, 1.2 times as long as the thorax; second tergite 1.14 times as long as wide, 2.2 times as long as the following segments combined; tergites following the second gradually decreasing in length, broadly transverse, all except the last one with a transverse row of small punctures; wings extending about a third the length of the abdomen past its apex.

Seven females and one male labeled as follows:

Hivaoa: Kopaafaa, altitude 2,770 feet, July 2, 1929, beaten from *Crossostylus biflora*, type, allotype, and 3 paratypes, Mumford and Adamson;

Matauuna, altitude 3,760 feet, August 1, 1929, beaten from *Crossostylus biflora*, 3 paratypes, Mumford and Adamson.

Several paratypes are slightly less than 1 millimeter in length.

**Platygaster compressus**, new species (fig. 1, *e*).

Female

Length 1.01 mm. Head 1.5 times as wide as long, 1.24 times as wide as the thorax, as wide as the abdomen, viewed from above strongly convex in front, broadly emarginate behind, full above and behind the eyes, without sculpture of any kind, smooth and shining; lateral ocelli as far from eye margin as from the anterior ocellus; antenna (figure 1, *e*) 10-jointed, without a well-defined club; thorax twice as long as wide, widest at tegulae, as wide as the abdomen, 1.24 times as high as wide, very highly convex above, appearing compressed laterally, without sculpture of any kind except a small faintly reticulate area anteriorly on the mesonotum; parapsidal grooves about as long as the scutellum, parallel; median lobe truncated posteriorly, touching the scutellum, flattened; scutellum convex, semicircular, pubescent laterally; abdomen 2.24 times as long as wide, elliptical in outline, pointed apically; 1.38 times as long as the thorax; petiole twice as wide as long, with numerous fine longitudinal grooves; second tergite 1.62 times as long as wide, widest at apex, 2.40 times as long as the petiole, 1.33 times as long as the segments following it combined, with two faintly striated foveae on basal fourth, the striae scarcely extending past their apices; tergites 3 to 6 subequal in length, gradually narrowing posteriorly, the sixth triangular, pointed at apex; black; antennae and legs dark brown, the tarsi somewhat lighter; wings tinged with brown, extending slightly past the apex of the abdomen.

Hivaoa: Matauuna, altitude 3,760 feet, August 1, 1929, beating on *Crossostylus biflora*, 2 specimens, Mumford and Adamson.

This species is remarkable because of its compressed thorax and almost entire lack of surface sculpture.





# PYRALES AND MICROLEPIDOPTERA OF THE MARQUESAS ISLANDS\*

By

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The Pyrales and Microlepidoptera taken in the Marquesas by the Pacific Entomological Survey, numbering about 1,537 specimens, were committed to me for study. For various reasons less attention was paid by the collectors to these groups of insects than to the other orders. Also, as many of the specimens were taken either at light or by sweeping, they were much damaged and denuded of scales (260 specimens) and could not be used for accounts of specific determinations.

In two papers<sup>1</sup> I included all the Marquesan species that I knew at the time, and I am aware of nothing added since. I will therefore assume knowledge of these papers as a basis, and avoid unnecessary repetition.

Three introduced species, *Phacellura indica*, *Achroia (Meliphora) grisella*, *Tinea despecta*, are recorded as Marquesan for the first time, but are of no particular interest, being domesticated. Two others, however, *Labdia leucorantha* and *Trissodoris honorariella*, though probably also artificially conveyed, are less familiar and more worthy of notice.

Two genera and 37 species are described as new to science; the type specimens of these are placed in Bernice P. Bishop Museum in Honolulu. Probably all of these are endemic, and I proceed to indicate the interesting features of this fauna. Before doing so, I would point out that 22 endemic species found by the collectors of the St. George Expedition, distributed in four islands, were not met with, and others appear to have occurred in very different ratio, some of the diversities being extremely curious. From a general consideration of these results I should infer that the number of species still awaiting discovery is much larger than might be supposed. Many are perhaps now much restricted in habitat and verge on extinction.

\* The disproportionate development of the two old Palaeonesian genera, *Dichelopa* and *Asymphorodes*, becomes still more striking. On comparison with the small group of Australian species which are the only other known representatives of *Dichelopa*, I am satisfied that they may be regarded as derivatives of a single form transported originally from Palaeonesia by a chance storm to the shores of Australia. I now perceive that my forecast of the probable extent of these two genera was an underestimate, and may reasonably be doubled. They are an example of unusual specific develop-

\* Pacific Entomological Survey Publication 7, article 28. Issued November 16, 1934.

<sup>1</sup> Meyrick, Edward, Micro-Lepidoptera of the St. George Expedition: Ent. Soc. London, Trans., pp. 489-507, 1928. Pacific Pyrales of the St. George Expedition: Ent. Soc. London, Trans., pp. 155-169, 1929.

ment on a narrow generic basis in the absence of competition, such as is found in very similar circumstances in the Mascarene Islands.

The identification of *Idioblasta* Warren with the Hawaiian genus *Mestolobes* Butler is of great interest. With the additions in this paper *Mestolobes* now contains 5 Marquesan species and about 30 Hawaiian, and is not known elsewhere. I take the opportunity to note that I now agree with Hampson that the peculiar Hawaiian genus *Orthomecyna*, which has curious points of resemblance to *Mestolobes*, is really an abnormal form of the Crambidae and not genetically related. On the evidence available there must, I think, have been at least 20 recent species of *Mestolobes* in the Marquesas, though they may not be all still in existence; they do not, however, show the curious development of secondary sexual structures possessed by many of the Hawaiian species. The genus appears to have most affinity with the *Scoparia* group, and as I have previously remarked the similarity of type between the Marquesan and Hawaiian species of *Scoparia*, it may well be that the Marquesan elements of these two genera were derived from the Hawaiian at about the same period of time.

The genera other than the four mentioned above which reached the Marquesas sufficiently long ago to have developed from a single immigrant form, several distinct species with structural as well as superficial differences, are *Ernophthora*, *Imma*, and *Decadarchis*, all of which doubtless have further representatives awaiting discovery. Of these, *Decadarchis* is an Asiatic genus which is more or less at home throughout the Pacific, and *Imma* is mainly attached to the figs (*Ficus*) and their allies, which it has followed in their tropical distribution; but the presence of *Ernophthora*, an unusually specialized form of recent development, seems to lack any adequate explanation. It is regrettable that no further evidence was obtained towards the solution of this problem; the discovery of new forms or of larval habits might have been helpful.

Setting apart the above seven genera, the remainder (whose number has been considerably augmented by the present collection) are represented by only one or perhaps two disconnected forms which in themselves afford no testimony of age. The absence of such testimony is no proof of the converse, as no species need break up into several, even in a very long passage of time, as such testimony may still turn up at any moment, and as its discovery in other parts of the Palaeonesian area would affect conclusions as to the Marquesan material. I think that the interesting genera *Gracilaria* and *Cosmopteryx* should be especially watched in this connection.

The proved existence of the two endemic genera (*Dichlopa* and *Asymphorodes*) with a large specific development over the area which I have termed Palaeonesia fully justifies my inference of the former greater develop-

ment of land surface over this area, which is the only possible explanation. It is associated in geological time with Hawaii, where there are similar endemic genera rich in species and of similarly unknown origin. It is with equal certainty dissociated from Samoa and Fiji, where the endemic genera are only monotypic. *Mestolobes* and *Scoparia* must now be regarded as referable to nearly the same period.

FAMILY PHYCITIDAE

Genus **ERNOPHTHORA** Meyrick

This genus is identical with and supersedes *Aspithra* Ragonot and *Mimistis* Hampson.

**Ernophthora denticornis** Meyrick.

Tahuata: Amatea, altitude 2000 feet, July 1, 1930, at light, 1 specimen, LeBronnec and H. Tauraa.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 17, 1931, at light, 24 specimens; Tekohepu Summit, altitude 3200 feet, November 28, 1931, at light, 10 specimens; Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 4 specimens; LeBronnec.

Hivaoa: Mount Temetiu, slope north of summit, altitude 3860 feet, December 29, 1930, at light, 15 specimens, LeBronnec and H. Tauraa; Kaava Ridge, altitude 2460 feet, January 5-6, 1932, at light, 78 specimens; Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 7 specimens; Temetiu Summit, altitude 3900 feet, January 20, 1932, at light, 5 specimens; LeBronnec.

As a rule the males are much darker in forewings, with less white marking, the hindwings more suffused gray. The females have more white markings on forewings and yellower hindwings, but there is much variation in these particulars.

**Ernophthora dryinandra** Meyrick.

Hivaoa: slope north of Temetiu, altitude 3860 feet, December 30, 1930, at light, 1 specimen, LeBronnec and H. Tauraa; Temetiu Summit, altitude 3900 feet, January 20, 1932, at light, 9 specimens; Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 36 specimens; Kaava Ridge, altitude 2460 feet, January 5, 1932, at light, 4 specimens; LeBronnec.

Nukuhiva: Tapuaooa, altitude 3000 feet, June 1, 1931, under dead leaves, 1 specimen, LeBronnec and H. Tauraa.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 1 specimen; Tekohepu Summit, altitude 3200 feet, November 28, 1931, 2 specimens, at light; LeBronnec.

**Ernophthora chrysur** Meyrick.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 specimen, LeBronnec.

Eiao: above Vaituha, altitude 1200 feet, October 3, 1929, at light, 1 specimen, Adamson.

**Phycita orthoclina** Meyrick.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 specimen, LeBronnec.

Eiao: above Vaituha, altitude 1200 feet, October 3, 1929, at light, 4 specimens, Adamson.

**Ctenomeristis ochrodepta** Meyrick.

Hivaoa: Kaava Ridge, altitude 2460 feet, at light, 1 specimen, LeBronnec.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 1 specimen; LeBronnec.

## FAMILY PYRAUSTIDAE

**Aulacodes eupselias** Meyrick.

Expanse, 19-21 mm. Forewings elongate-triangular; cilia whitish-fuscous, a gray sub-basal shade. Hindwings postmedian area ochreous-whitish, with short dark fuscous interneural dashes; sometimes a sixth smaller white mark in subterminal fascia at upper end, terminal area beyond this fascia tinged lilac-golden-metallic; cilia gray, with narrow whitish bars.

Uapou: Koputukea, Hakahetau Valley, altitude 1250 feet, November 16, 1931, at light, 1 specimen, LeBronnec.

Hivaoa: Avaao Valley, altitude 1350 feet, January 4, 1932, 4 specimens; Kaava Ridge, altitude 2460 feet, January 5-6, 1932, 23 specimens; Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, 3 specimens; all at light, LeBronnec.

**Bradina tormentifera** Meyrick.

Hivaoa: ridge northwest of Taaaoa, altitude 2800 feet, June 3, 1929, at light, 1 specimen, Mumford and Adamson; Mount Temetiu, slope north of summit, altitude 3860 feet, December 29, 1930, at light, 2 specimens, LeBronnec and H. Tauraa; Feani Ridge, altitude 3970 feet, January 13, 14, 1932, at light, 13 specimens; LeBronnec.

**Bradina perlucidalis** Hampson.

Fatuhiva: ridge east of Omoa [Oomoa] Valley, altitude 3100 feet, August 28, 1930, 1 specimen; Uia [Ouia] Valley, September 2, 1930, 1 specimen; Tahuna, altitude 2050 feet, September 3, 1930, 1 specimen; LeBronnec.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 21, 1931, beating from ferns, 1 specimen, LeBronnec.



**Tatobotys vibrata** Meyrick.

Hivaoa: Mount Temetiu, slope north of summit, altitude 3860 feet, December 30, 1930, at light, 1 specimen, LeBronnec and H. Tauraa.

**Piletocera signiferalis** Wallengren.

Uapou: Hapava, altitude 600 feet, December 13, 1929, bunchgrass, 1 specimen, Whitten; Koputukea, Hakahetau Valley, altitude 1250 feet; Teoatea, Hakahetau Valley, altitude 1950 feet, November 20, 1931, at light, 1 specimen; Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 4 specimens: LeBronnec.

Tahuata: Kiinui Valley, altitude 1200 feet, June 14, 1930, at light, 1 specimen, LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, sea level, 1 specimen; Vaikoao, altitude 1600 feet, August 21, 1930, at light, 1 specimen; LeBronnec and H. Tauraa.

Mohotani: altitude 1500 feet, February 1, 1931, at light, 1 specimen, LeBronnec and H. Tauraa.

Uahuka: Hane Valley, altitude 150 feet, March 9, 1931, at light, 1 specimen; Vaipae, altitude 250 feet, March 17, 1931, at light, 2 specimens; LeBronnec and H. Tauraa.

Eiao: altitude 1600 feet, April 23, 24, 1931, at light, 3 specimens, LeBronnec and H. Tauraa.

**Hymenia fascialis** Cramer.

Tahuata: Hanahevane, seashore, July 15, 1930, 8 specimens, LeBronnec and H. Tauraa.

Uahuka: Vaipae Valley, altitude 250 feet, March 17, 1931, 2 specimens; Hitikau Crest, altitude 2950 feet, March 3, 1931, 1 specimen, LeBronnec and H. Tauraa.

Eiao: altitude 1600 feet, April 24, 1931, 1 specimen, LeBronnec and H. Tauraa.

**Marasmia trapezalis** Guenée.

Nukuhiva: Tapuaooa, altitude 3100 feet, November 11, 1929, 1 specimen, Mumford and Adamson; Tapuaooa, altitude 2500 feet, May 30, 1931, 2 specimens; LeBronnec and H. Tauraa.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, 1 specimen, LeBronnec.

Hivaoa: Avaao Valley, altitude 1350 feet, January 4, 1932, 1 specimen, at light, LeBronnec.

Genus **CHRYSOPHYLLIS**, new genus

Face very oblique, with projecting hairscales on apical edge; tongue well-developed. Antennae 5/6, in male with long fine ciliations except near apex.

Labial palpi long, straight, porrect, loosely scaled, beneath with long dense rough projecting hairs throughout, terminal joint concealed. Maxillary palpi moderate, triangularly expanded with dense scales. Hind tibiae with outer spurs  $1/3$  of inner, basal joint of tarsi rough-scaled above. Forewings with costal area contracted and deflexed on basal half, beyond middle costal area suddenly expanded but contorted and somewhat rolled over downwards to  $4/5$ ; 2 from  $3/4$ , 3-5 approximated at base, 7 nearly straight, 8 and 9 stalked, 10 nearly approximated. Hindwings without cubital pecten, but area beneath cell clothed with hairs; 2 from  $2/3$ , 3-5 nearly approximated at base, 7 out of 6 near origin, anastomosing with 8 to  $1/3$ . Probably related to *Margaronia*.

**Chrysophyllis lucivaga**, new species.

Expanse, 33 mm. Head whitish, face grayish-ochreous. Palpi gray, base white beneath. Antennal ciliation three. Thorax whitish, shoulders brown. Abdomen whitish. Forewings very narrow anteriorly, appearing suddenly dilated beyond middle, costa bent at  $4/5$ , termen obliquely rounded; light gray, appearing violet-subhyaline in places but probably through accidental denudation, costal half suffused yellow-ochreous; a dark purple-fuscous streak along costa from base to near middle, thence obliquely across wing to lower margin of cell, and a similar median streak from base to near middle, space between these ochreous-orange; a transverse blue-purple blotch edged metallic golden-bronze on end of cell; rolled costal margin between middle and  $4/5$  clothed with raised pale lilac-gray scales; beyond cell an oblique blue-subhyaline fasciate patch narrowed downwards, finely gray-edged on sides; midway between this and termen a thinly scaled, pale, iridescent purplish straight streak nearly parallel to termen from near costa to dorsum, edged golden-metallic lines appearing dark fuscous in certain lights, and near beyond this a dark fuscous parallel line not reaching so far towards costa; terminal edge dark fuscous; cilia shining whitish. Hindwings subhyaline pale gray with violet-blue reflections; a straight, transverse, rather narrow, gray-yellowish fascia at  $2/3$ , finely edged blackish anteriorly and submetallic-gray posteriorly, and a broader, similar terminal fascia narrowed downwards and meeting it at tornus, edged submetallic-gray anteriorly and blackish on termen, enclosing a small black spot at its lower end; cilia submetallic-white.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 male, LeBronnec.

The specimen is partly rubbed and the description will require some emendation, but the species is unmistakable, and a very curious form. I believe the distortion to be natural and normal.

**Phacellura indica** Saunders.

Nukuhiva: Taiohae, sea level, August 4, 1931, at light, 1 specimen, LeBronnec and H. Tauraa.

**Margaronia euthalassa**, new species.

Expanse, 50-54 mm. Head green-whitish, lower angles of face ferruginous. Labial palpi ferruginous, lower half white. Maxillary palpi ferruginous. Thorax pale sea-green, shoulders ferruginous. Abdomen pale sea-green, apex in female pale ochreous, anal tuft of male blackish. Legs pale sea-green, hind tarsi green-whitish. Forewings elongate-

triangular, costa posteriorly moderately arched, apex obtuse, termen oblique, slightly bowed; pale sea-green; a moderate ferruginous costal streak, attenuated and suffused towards base; no discal spot or terminal dots; cilia pale greenish. Hindwings color and cilia as in forewings.

Hivaoa: Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 11 specimens, LeBronnec.

Closest to *M. nereis* Meyrick, but at once distinguished by absence of black discal spot and terminal dots.

### **Margaronia phormingopa**, new species.

Expanse, 31-34 mm. Head white, a gray median mark on face. Palpi white, second joint with two blackish bars. Thorax white, irregularly striped dark gray. Abdomen whitish, striped blackish-gray, anal tuft of male blackish with whitish median pencil. Forewings elongate-triangular, costa gently arched towards apex, termen obliquely rounded; violet-whitish tinged, pale yellowish near costa; markings taking the form of five pale ochreous-yellowish fasciae edged by strong dark-gray lines, first sub-basal, oblique, second near and parallel to this (representing first line), its dorsal end connected with the third, third and fourth representing the second line, of which the lower portion forms a completed circular loop rising to middle of disc and there connected by a transverse blotch with costa, a dark mark within this blotch and another within the circular loop, the small pale yellowish, dark-edged orbicular spot within the space preceding this, fifth fascia broader, terminal, its anterior edge waved, within it a series of dark-gray arrowheads between veins; cilia whitish, base within a grayish line pale yellowish. Hindwings violet-whitish; markings pale ochreous-yellowish edged by thick dark-gray lines, viz., a triangular discal blotch at  $1/3$  connected by a line with costa, a straight post-median fascia not quite reaching tornus but connected by two gray lines near dorsum with base, and a broad terminal fascia narrowed to tornus with thick dark gray central line as well as marginal; cilia as in forewings.

Hivaoa: Tenatinaei, Feani Ridge, altitude 3970 feet, January 13-14, 1932, at light, 10 specimens, LeBronnec.

Nearest the Hawaiian *M. cyanomichla* Meyrick, and therefore probably indicating the origin of that species.

### **Maruca testulalis** Hübner.

Hivaoa: Tahauku, near shore, October 7, 1929, at light, 1 specimen, Mumford and Adamson; Avaao Valley, altitude 1350 feet, at light, 7 specimens; Kaava Ridge, altitude 2460 feet, January 5, 6, 1932, at light, 61 specimens; Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 11 specimens; LeBronnec.

Tahuata: Hanateio Valley, altitude 1000 feet, at light, 1 specimen, LeBronnec; Vaitahu Valley, seashore, May 21, June 17, 1930, at light, 4 specimens, LeBronnec and H. Tauraa.

Fatuhiva: Tahuna, altitude 2050 feet, September 3, 1930, at light, 2 specimens; Ihiota, Hanavave Valley, altitude 450 feet, September 10, 1930, at light, 5 specimens; LeBronnec and H. Tauraa.

**Pachyzancla stultalis** Walker.

Hivaoa: Avaao Valley, altitude 1350 feet, January 4, 1932, at light, 1 small female, LeBronnec.

**Oeobia cleoropa**, new species.

Expanse, 35 mm. Head, palpi, thorax rather dark fuscous. Forewings elongate-triangular, costa posteriorly gently arched, termen bowed, rather oblique; rather dark fuscous, paler towards base; whitish-ochreous dots on base of costa and dorsum, and near base in middle; a rounded dark fuscous spot on end of cell, and one near before this, separated or partially edged by irregular marking of gray-white suffusion; second line about  $\frac{3}{4}$ , ochreous-white, interruptedly waved or dotted, more distinct towards costa, median third forming a moderate loop posteriorly, accompanied throughout by obscure spots of darker suffusion; an obscure subterminal series of indistinct ochreous-whitish dots; a terminal series of well-marked ochreous-whitish dots; cilia fuscous. Hindwings as forewings, but only a single smaller discal spot.

Hivaoa: Avaao Valley, altitude 1350 feet, January 4, 1931, 1 female; Kaava Ridge, altitude 2460 feet, January 6, 1932; at light, 1 female; Le-Bronnec.

**Oeobia phthorosticta** Meyrick.

Hivaoa: Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 1 specimen, LeBronnec.

Described as a *Pyrausta*.

Genus **MESTOLOBES** Butler

I have recognized that *Idioblasta* Warren is certainly identical with this considerable Hawaiian genus.

**Mestolobes acleropa**, new species.

Expanse, 14 mm. Head, palpi, thorax brownish-ochreous, base of palpi whitish. Forewings somewhat elongate-triangular, costa hardly arched, termen somewhat obliquely rounded; pale yellow-ochreous, irregularly speckled brownish-ochreous, especially towards base; a small brownish spot on end of cell; second line faintly brownish, hardly traceable, from costa at  $\frac{2}{3}$  to dorsum at  $\frac{3}{4}$ , rather excurved; a preterminal series of small brownish spots; cilia pale ochreous-yellowish, slightly sprinkled brownish. Hindwings ochreous-whitish; a narrow terminal fascia of pale ochreous suffusion on upper  $\frac{2}{3}$  of termen; cilia ochreous-whitish.

Eiao: above Vaituha, altitude 1200 feet, October 3, 1929, at light, 1 male, Adamson.

**Mestolobes isoterma**, new species.

Expanse, 15-16 mm. Forewings formed as in *M. acleropa*; almost wholly denuded, but apparently very pale ochreous sprinkled gray, origin of first line indicated by a slight grayish costal spot, second line whitish, from  $\frac{3}{4}$  of costa to  $\frac{4}{5}$  of dorsum, rather excurved, preceded by a grayish spot on costa, and followed by a terminal fascia of gray suffusion containing a series of small darker gray praeterterminal spots. Hindwings ochreous-yellow; a moderate dark fuscous marginal fascia round termen and dorsum throughout, broader at apex.



Fatuuku: altitude 860 feet, November 19, 1930, 13 specimens, H. Tauraa.

All these have the forewings extraordinarily denuded, probably not naturally but through being shaken up together. The species is recognizable by the hindwings.

**Mestolobes procellaris**, new species.

Expanse, 20 mm. Head, palpi, thorax pale yellowish, terminal joint of palpi gray. Forewings formed nearly as in *M. acleropa*; yellow-whitish, slightly sprinkled ochreous-yellow, a gray dot on costa at 2/3; an undefined terminal fascia of ochreous-yellow suffusion. Hindwings pale yellowish, suffusedly irrorated dark gray, dorsal area wholly gray; a broad blackish-gray terminal fascia occupying 2/5 of wing, a yellow-whitish streak along fold intersecting this; cilia yellow-whitish.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1500 feet, August 30, 1930, 1 female, LeBronnec and H. Tauraa.

The forewings in this insect are also partially rubbed, but apparently the absence of lines is natural; the species is easily known by the hindwings.

**Mestolobes lacteata** Warren.

Uapou: Hakahetau Valley, altitude 1500 feet, December 26, 1929, 15 specimens, Whitten.

In the hindwings 3 and 4 are usually stalked, sometimes only approximated; in one example the lines of forewings are almost obsolete.

**Scoparia citrocosma** Meyrick.

Uapou: Tekohepu Summit, altitude 3200 feet, November 28, 1931., at light, 11 specimens; Teavanui, altitude 2900 feet, November 28, 1931, at light, 4 specimens; LeBronnec.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 2 specimens; Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 6 specimens; Temetiu Summit, altitude 3900 feet, January 20, 1932, at light, 2 specimens; LeBronnec.

**Scoparia chrysomicta** Meyrick.

Hivaoa: Mount Temetiu, slope north of summit, altitude 3860 feet, December 29, 1930, at light, 1 specimen, LeBronnec and H. Tauraa; Kaava Ridge, altitude 2460 feet, January 5, 6, 1932, at light, 17 specimens; Tenatinaei, Feani Ridge; altitude 3970 feet, January 14, 1932, at light, 7 specimens; Temetiu summit, January 20, 1932, at light, 5 specimens; LeBronnec.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 1 specimen; Tekohepu summit, altitude 3200 feet, November 28, 1931, at light, 2 specimens; LeBronnec.

I am satisfied that *S. commercialis* Meyrick is not specifically distinct from this.



**Scoparia clerica** Meyrick.

Hivaoa: Mount Temetiu, slope north of summit, altitude 3860 feet, December 30, 1930, at light, 2 specimens, LeBronnec and H. Tauraa; Kaava Ridge, altitude 2460 feet, January 5, 6, 1932, at light, 53 specimens; Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 1 specimen; LeBronnec.

Uapou: Teoatea, altitude 1950 feet, November 17, 1931, at light, 1 specimen; Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 3 specimens; Tekohepu summit, altitude 3200 feet, November 28, 1931, at light, 1 specimen; LeBronnec.

**Scoparia spectacularis** Meyrick.

Hivaoa: Mount Temetiu, altitude 3860 feet, December 30, 1930, at light, 1 specimen, LeBronnec and H. Tauraa; Kaava Ridge, altitude 2460 feet, January 5, 6, 1932, at light, 80 specimens; Aavao Valley, altitude 1350 feet, January 4, 1932, 1 specimen; Tenatinaei, Feani Ridge, altitude 3970 feet, January 14, 1932, at light, 1 specimen; Temetiu summit, altitude 3900 feet, January 20, 1932, at light, 2 specimens; LeBronnec.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 1 specimen, LeBronnec.

**Scoparia officialis** Meyrick.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 specimen, LeBronnec.

Uapou: Hakahetau Valley, altitude 1950 feet, November 17, 20, 1931, at light, 2 specimens; Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 1 specimen; LeBronnec.

**Scoparia apostactis** Meyrick.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 1 specimen; Tekohepu summit, altitude 3200 feet, November 28, 1931, at light, 1 specimen; LeBronnec.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 specimen, LeBronnec.

## FAMILY PTEROPHORIDAE

**Marasmarcha pumilio** Zeller.

Fatuhiva: Tapuhiva, Hanavave Valley, altitude 500 feet, September 9, 1930, 1 specimen, LeBronnec and H. Tauraa.

## FAMILY ORNEODIDAE

**Orneodes** species.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 specimen, LeBronnec. Much damaged and unfit for determination, but resembles *O. pselioxantha* Meyrick from the Tuamotus.

## FAMILY GALLERIADAE

**Achroia grisella** Fabricius.

Fatuhiva: Oomoa, near sea level, September 20, 1930, 4 specimens, LeBronnec and H. Tauraa.

## FAMILY TORTRICIDAE

**Dichelopa argosphena**, new species.

Expanse, 14 mm. Head, palpi, thorax purplish-gray, face tinged whitish. Antennae fasciculate-ciliated ( $2\frac{1}{2}$ ). Abdomen dark gray, anal tuft ochreous-yellow. Forewings moderately broad, rather dilated, costa anteriorly moderately, posteriorly gently arched, apex somewhat prominent, termen hardly perceptibly sinuate beneath it, then somewhat obliquely rounded; dark gray irregularly mixed light reddish, some irregular small white marks on costa and dorsum; a small whitish spot in disc towards base; markings hardly darker, edged with blackish-gray striae; basal patch occupying  $\frac{1}{3}$  of wing, edge oblique, angulated below middle; central fascia broad, oblique, followed on costa by a wedge-shaped white blotch reaching half across wing, dorsal third ill-defined, preceded and followed by some whitish strigulation; a terminal series of small white marks; cilia gray. Hindwings 3 and 4 short-stalked; rather dark gray; cilia gray.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 5, 1932, at light, 1 male, LeBronnec.

**Dichelopa praestrigata** Meyrick.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, 1 specimen, LeBronnec.

**Dichelopa pyrsogramma**, new species.

Expanse, 8 mm. Head, thorax pale ochreous-bronzy, collar tinged reddish. Palpi pale brownish-ochreous mixed fuscous. Abdomen short-pointed. Forewings rather elongate-oblong, costa anteriorly gently arched, posteriorly straight, termen rather obliquely rounded; shining pale bronzy; markings not darker, but defined by slender crimson-orange streaks edged externally with scattered dark fuscous scales; basal patch occupying  $\frac{1}{4}$  of wing, edge straight, somewhat oblique; central fascia broad, rather oblique, anterior edge straight, posterior rather irregularly sinuate; a terminal band, broad on costa, narrowed to a point at tornus. Hindwings 3 and 4 connate; rather light bronzy-gray; cilia light gray.

Nukuhiva: Ooumu summit, altitude 3890 feet, on *Cyrtandra* species, July 20, 1931, 1 female, LeBronnec and H. Tauraa.

**Dichelopa orthiostyla**, new species.

Expanse, 16-19 mm. Head light brownish. Antennae whitish. Palpi dark gray. Thorax dark lilac-brownish. Apex of abdomen shortly attenuated, ovipositor short, slender, projecting. Forewings somewhat elongate-oblong, costa anteriorly moderately,

posteriorly slightly arched, termen rounded, little oblique; brown, somewhat sprinkled or strigulated gray; markings darker, edged by thick irregular dark brown striae; basal patch occupying  $\frac{1}{4}$  of wing, edge rather oblique, nearly straight; central fascia broad, rather oblique; three or four small spots on costa posteriorly, and a strong dark erect transverse stria from tornus; cilia brownish. Hindwings 3 and 4 connate; gray; cilia gray.

Hivaoa: Mount Temetiu, slope north of summit, altitude 3860 feet, December 30, 1930, at light, 9 females, LeBronnec and H. Tauraa.

None of these is in good condition, but the species is distinct.

**Dichelopa porphyrophanes**, new species.

Expanse, 17 mm. Head, thorax light purplish-gray. Palpi dark gray. Apical  $\frac{2}{5}$  of abdomen abruptly attenuated, with slender projecting ovipositor. Forewings sub-oblong, costa anteriorly moderately arched, posteriorly nearly straight, termen somewhat obliquely rounded; light purplish-gray; markings hardly darker, edged by brown striae with a few blackish specks; basal patch occupying somewhat more than  $\frac{1}{4}$ , edge straight, oblique; central fascia moderate, evenly broad throughout, straight, strongly oblique; costal patch confluent with terminal band, including one or two series of irregular strigulae; cilia purplish-gray. Hindwings 3 and 4 connate; light gray, some obscure darker strigulae; cilia whitish-gray, a gray sub-basal line.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 20, 1931, at light, 1 female, LeBronnec.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 female, LeBronnec.

**Dichelopa phalaranthes**, new species.

Expanse, 14-16 mm. Head, palpi, thorax whitish-yellow or yellow-whitish. Apical half of abdomen slenderly attenuated and acuminate, with linear projecting ovipositor. Forewings suboblong, costa anteriorly moderately arched, posteriorly straight, termen somewhat obliquely rounded; ochreous-whitish somewhat strigulated ferruginous; markings pale submetallic purplish, somewhat strigulated ferruginous, and edged by dark ferruginous striae; basal patch occupying about  $\frac{1}{3}$  of wing, edge angulated on fold; central fascia evenly broad, oblique, connected by broad bar above middle with a dark patch occupying apical fourth; cilia pale ochreous, on costa brown, on tornus light grayish. Hindwings 3 and 4 connate; gray, suffused darker toward apex; cilia light gray.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 female; Feani Ridge, altitude 3970 feet, January 13, 1932, at light, 2 females; LeBronnec. Two specimens much defaced.

**Dichelopa cirrhodoris**, new species.

Expanse, 17-18 mm. Head pale yellow-brownish, face browner. Palpi brownish. Thorax pale yellowish, shoulders or sometimes wholly suffused brownish. Apex of abdomen rather obliquely truncate. Forewings elongate-oblong, costa anteriorly moderately arched, posteriorly straight, termen somewhat obliquely rounded; pale yellowish, tinged or suffusedly strigulated ferruginous, but usually clearer yellow on costal half before and beyond central fascia; markings purplish-ferruginous edged dark ferruginous; basal patch occupying about  $\frac{1}{4}$  of wing, edge oblique, irregular, rather prominent in middle; central fascia broad, oblique, considerably dilated on dorsal half; costal patch triangular, confluent with a broad terminal fascia; cilia ferruginous-brown, on termen pale yellowish except base, on tornus suffused light gray. Hindwings 3 and 4 connate;

light gray or whitish-gray, termen grayer-suffused; cilia gray-whitish, a gray sub-basal shade.

Hivaoa: Avaova Valley, altitude 1350 feet, January 4, 1932, at light, 1 female; Kaava Ridge, altitude 2460 feet, January 5, 6, 1932, at light, 10 females; LeBronnec.

**Dichelopa castanopis**, new species.

Expanse, 16-30 mm. (the largest and smallest examples are females). Head chestnut-brown. Palpi rather dark fuscous, base whitish. Antennae of male fasciculate-ciliated (nearly 4). Thorax dark lilac-brownish. Apex of abdomen of female rather obliquely truncate. Forewings suboblong, costa anteriorly moderately arched, posteriorly nearly straight, termen somewhat obliquely rounded; rather light chestnut-fuscous, somewhat darker-strigulated; markings darker, edged by dark chestnut-brown striae; costa marked with short dark fuscous strigulae; basal patch occupying nearly  $\frac{1}{3}$  of wing, edge oblique, slightly prominent in middle or subconvex; central fascia broad throughout, oblique, becoming obsolescent dorsally, posterior edge angulated in middle, space before and beyond this in male more or less tinged or mixed whitish towards costa; costal patch triangular, well-defined anteriorly, suffused posteriorly, one or two indistinct interrupted striae from this towards termen; cilia fuscous. Hindwings 3 and 4 connate; rather dark gray, indistinctly mottled darker; cilia gray.

Uapou: Teoatea, Hakahetau Valley, altitude 2000 feet, November 19, 1931, 1 specimen, beating on *Metrosideros collina*; Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 6 specimens; Tekohepu summit, altitude 3200 feet, November 28, 1931, at light, 10 specimens, 1 specimen, beating on *Metrosideros collina*; LeBronnec.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 5, 6, 1932, at light, 3 specimens; Tenatinaei, Feani Ridge, altitude 3970 feet, January 13, 1932, at light, 20 specimens; LeBronnec.

**Dichelopa harmodes** Meyrick.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 19, 1931, at light, 4 specimens; Tekohepu summit, altitude 3200 feet, November 28, 1931, at light, 7 specimens; Teavanui, Paaumea Valley, altitude 2900 feet, November 30, 1931, 3 specimens, beating on *Metrosideros collina*; LeBronnec.

Hivaoa: Kaava Valley, altitude 2460 feet, January 6, 1932, at light, 2 specimens, LeBronnec.

Nukuhiva: Tapuaooa Hill, altitude 3500 feet, July 20, 1931, 1 specimen, on *Metrosideros collina*, LeBronnec and H. Tauraa.

FAMILY EUCOSMIDAE

**Acroclita eocnephaea**, new species.

Expanse, 11-13 mm. Head light gray, small pinky-whitish spots at base of antennae. Palpi 3, rosy ochreous mixed dark gray. Thorax grayish. Abdomen dark gray. Forewings elongate, somewhat dilated, costa gently arched, apex obtuse-pointed, termen slightly sinuate, somewhat oblique; dark gray, obscurely tinged rose-pink, especially towards costa and terminal area, tips of scales gray-whitish, forming a fine transverse

striolation; costa obliquely strigulated whitish and blackish-gray; posterior edge of central fascia indicated by irregular blackish-gray suffusion, oblique, slightly convex; a suffused blue-leaden preterminal striga, angulated near costa. Hindwings gray; cilia light gray.

Hivaoo: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 6 specimens, LeBronnec.

**Crociosema plebeiana** Zeller.

Eiao: above Vaituha, altitude 1200 feet, October 3, 1929, 15 specimens, Adamson.

Tahuata: Vaitahu, seashore, June 17, 1930, 8 specimens; Hanahevane, seashore, July 15, 1930, 79 specimens; LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, near seashore, August 18, 1930, 2 specimens, LeBronnec and H. Tauraa.

**Eucosma chaomorpha** Meyrick.

Eiao: above Vaituha, altitude 800-1200 feet, October 3, 1929, 2 specimens, Adamson.

**Argyroploce eumenica** Meyrick.

Hivaoo: Kaava Ridge, altitude 2460 feet, January 5, 6, 1932, 8 specimens, at light, LeBronnec.

These are all females, and the unique type was a male, but I am satisfied of their specific identity; there is no white blotch on the costa before central fascia, probably a normal sexual distinction.

FAMILY GELECHIADAE

**Stoerberhinus testacea** Butler.

Hivaoo: Atuona, May 15, 1929, 2 specimens, Mumford and Adamson; Avaoo Valley, altitude 1350 feet, January 4, 1932, 5 specimens, LeBronnec.

Tahuata: Vaitahu Valley, seashore, June 17, 1930, 13 specimens; Hanahevane, seashore, July 15, 1930, 5 specimens; LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, sea level, August 18, 1930, 6 specimens, LeBronnec and H. Tauraa.

Uahuka: Penau Ridge, March 4, 1931, 1 specimen; Hane Valley, March 8, 1931, 43 specimens; Vaipae Valley, altitude 150 feet, March 19, 1931, 1 specimen; LeBronnec and H. Tauraa.

FAMILY COSMOPTERYGIDAE

**Cosmopteryx**, species indeterminable.

Might be the nearly cosmopolitan *C. flavofasciata* Wollaston.

Hivaoo: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 specimen, LeBronnec.



**Labdia ceriocosma**, new species.

Expanse, 11 mm. Head dark bronzy, palpi broken. Antennae white lined black, becoming ringed on apical half. Thorax dark bronzy, four fine white lines. Abdomen dark fuscous, apex whitish. Forewings lanceolate, apex acute-produced; dark bronzy; a short white streak along base of dorsum; a very fine iridescent blue-whitish line from base beneath costa to  $1/5$ , then bent obliquely down and again continued longitudinally supramedian to  $2/5$ , a second line straight median from near base to  $1/3$ , and a third beneath fold from  $1/5$  to  $2/5$ ; posterior half of wing pale ochreous-yellow, limited anteriorly by a somewhat obliquely curved iridescent golden-whitish streak, its costal edge marked from near beyond middle to near apical projection with a fine sinuate whitish streak crossed by about 12 fine direct black strigulae, and having on tornus a small pale iridescent golden spot preceded by a small wedge-shaped whitish mark crossed by four similar black strigulae; apical projection dark fuscous, with a fine white line extended to tip of dark gray cilia. Hindwings dark fuscous; cilia gray.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 18, 1930, at light, 1 female, LeBronnec.

This interesting and very distinct species, allied to the Australian *L. deliciosella*, will not improbably prove to have been introduced, but is not known elsewhere at present.

**Labdia dicyanitis**, new species.

Expanse, 9 mm. Head, thorax leaden-metallic, face shining ochreous-whitish. Palpi white, anterior edge of terminal joint dark gray. Abdomen leaden-gray, dorsally ochreous-gray on basal half. Forewings very narrow, apex produced, acute; ochreous-yellow; a broad leaden-gray dorsal streak from base to first fascia, rather broad transverse antemedian and postmedian silvery-blue fasciae thickly edged blackish suffusion, connected by white costal edge extending to a small white spot preceding a blackish apical blotch; cilia dark gray, a white apical bar. Hindwings and cilia rather dark gray.

Uapou: Hakahetau, altitude 1000 feet, December 14, 1929, 1 female, reared from dead wood, Whitten.

Uahuka: Hane Valley, altitude 30 feet, March 13, 1931, 1 female at light, LeBronnec and H. Tauraa.

Hivaoa: Avaoa Valley, altitude 1350 feet, January 4, 1932, 1 female, at light, LeBronnec.

**Labdia leucoxantha** Meyrick.

Uapou: Teavanui Pass, altitude 2900 feet, November 28, 1931, 1 specimen, LeBronnec.

Hivaoa: Avaoa Valley, altitude 1350 feet, January 4, 1932, 6 specimens, at light, LeBronnec.

Also occurs in Samoa and Ellice Islands.

**Pyroderces lunulifera**, new species.

Expanse, 9-10 mm. Head, thorax gray-whitish, faintly pinkish-tinged. Palpi gray-whitish, terminal joint suffused dark gray anteriorly, sometimes tinged pinkish. Forewings very narrow, acute-pointed; grayish-flesh-colored, basal fourth slightly darker, limited by a slender, somewhat oblique white fascia edged with some black scales anter-

iorly, suffused posteriorly, expanded on costa and containing a black subcostal dot; a narrow irregular suffused direct white fascia beyond middle, preceded by an irregular black transverse mark below middle, not reaching dorsum, and sometimes a blackish dot above middle; costa posteriorly grayish; a suffused white spot on lower part of termen, preceded by a blackish-gray spot; a lunulate blackish mark across apex edged white suffused anteriorly; cilia light grayish, mixed white on costa. Hindwings gray, in male without expansible hairpencil; cilia light gray.

Hivaoa: Tapeata, Mount Ootua, east slope, altitude 2500 feet, May 25, 1929, at light, 1 specimen, Mumford and Adamson.

Eiao: Vaituha, sea level, October 2, 1929, at light, 2 specimens, Adamson.

Tahuata: Amatea, altitude 2000 feet, July 1, 1930, at light, 4 specimens, LeBronnec and H. Tauraa.

Fatuhiva: Vaikoao, altitude 1600 feet, August 21-27, 1930, at light, 34 specimens, LeBronnec and H. Tauraa.

Uapou: Tekohepu summit, altitude 3200 feet, November 28, 1931, at light, 1 specimen, LeBronnec.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, at light, 1 specimen, LeBronnec.

Allied to *P. anaclastis* and *P. incertulella*.

### **Trissodoris honorariella** Walsingham.

Fatuhiva: Vaikoao, altitude 1600 feet, August 21, 1930, 1 specimen at light; Teavaipuhiau, altitude 2150 feet, August 21, 1930, 1 specimen; LeBronnec and H. Tauraa.

Hivaoa: Kaava Ridge, altitude 2800 feet, January 8, 1932, beating on *Hibiscus tiliaceus* and from leaves of *Pandanus* species, 5 specimens, LeBronnec.

### **Stigmatophora spintheropa**, new species.

Expanse, 10 mm. Head, palpi, thorax, abdomen blackish. Forewings elongate-lanceolate; blackish; a narrow rather oblique snow-white fascia at  $1/5$  from costa to fold; a pale blue-metallic dot on costa in middle, one somewhat before it on fold, one somewhat beyond it in disc, and one on tornus; a small snow-white spot on costa at  $3/4$ ; a round snow-white apical dot, and smaller linear one on termen near it; cilia blackish-fuscous, opposite apex light fuscous on outer half. Hindwings and cilia dark gray.

Uapou: Tekohepu summit, altitude 3000 feet, November 30, 1931, beating *Freycinetia*, 1 female, LeBronnec.

Allied to the several species of the Indo-Malayan *faceta* group, but distinct.

### **Limnoecia astathopis**, new species.

Expanse, 8 mm. Head ochreous-whitish. Palpi whitish, anterior edge of terminal joint blackish. Thorax whitish, tegulae dark gray. Forewings blackish-gray; rather narrow, somewhat irregular transverse silvery-white fasciae at  $1/4$ , middle, and  $3/4$ , second and third slightly approximated dorsally; a white apical dot; cilia gray, round apex blackish-gray at base. Hindwings and cilia gray; frenulum of three discrete parallel bristles.

Hivaoa: Mount Temetiu, slope north of summit, altitude 3860 feet, December 29, 1930, at light, 1 female, LeBronnec and H. Tauraa.

Resembles Australian types.

**Asymphorodes (?) admiranda**, new species.

Expanse, 8 mm. Head whitish-yellowish, face whitish. Palpi white (terminal joint missing). Antennae whitish-yellowish. Thorax yellow-ochreous. Forewings yellow-ochreous, deeper towards apex; very oblique white wedge-shaped strigae from costa before and beyond middle, second edged fuscous anteriorly; two short curved blackish streaks from dorsum towards base; a finely pointed, curved oblique black streak from dorsum beyond middle reaching half across wing and meeting apex of second costal streak; a black apical longitudinal mark, white marginal spots above and below this; cilia ochreous-whitish, base suffused gray above apex and mixed dark fuscous beneath it, dark fuscous median and apical lines on costa. Hindwings dark gray; cilia yellow-whitish.

Uapou: Vaihakaatiki, Hakahetau Valley, altitude 3000 feet, November 18, 1931, 1 female, LeBronnec.

The superficial characters are strikingly peculiar, suggesting an erechthiid (which it is not); the (apparently) missing terminal joint of each palpus raises doubts and the condition of the unique specimen precludes correct ascertainment of the neuration, but I cannot place it otherwise.

**Asymphorodes coesyrius** Meyrick.

Tahuata: Vaitahu, seashore, June 17, 1930, 1 specimen; Hanahevane, altitude 45 feet, July, 1930, 2 specimens; LeBronnec and H. Tauraa.

Hivaoa: Avaoa Valley, altitude 1350 feet, January 4, 1932, 1 specimen, at light, LeBronnec.

Anterior half of thorax and a spot on base of dorsum sometimes also brown.

**Asymphorodes oculisignis**, new species.

Expanse, 11-12 mm. Head, palpi, antennae, thorax glossy ochreous-whitish, shoulders and inner side of tegulae sometimes grayish. Forewings glossy ochreous-whitish; markings variable, dark fuscous-gray, faintly purplish; sometimes a slender irregular streak across base, extended along costa and dorsum to first fascia; four irregular fasciae, first about 1/5, curved, oblique, slender or interrupted, second antemedian, rather oblique, broader, variably interrupted, in one specimen a discal dot between second and third, third postmedian, broadly expanded in disc, where it encloses a round ochreous-whitish spot centered with a round dark fuscous spot, fourth terminal, irregular, connected with third by a bar in disc; cilia gray becoming whitish towards tips, on costa dark fuscous on markings, ochreous whitish between these. Hindwings gray; cilia light gray.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 5, 1932, at light, 1 male, Temetiu summit, altitude 3900 feet, January 20, 1932, at light, 1 male, LeBronnec.

**Asymphorodes circopis** Meyrick.

Hatutu [Hatutaa]: middle of east side, altitude 1010 feet, 1 specimen on *Pisonia* species, September 3, 1929, Adamson.

Eiao: above Vaituha, altitude 1200 feet, October 3, 1929, 38 specimens, Adamson.

Tahuata: Vaitahu, sea level, June 18, 1930, 1 specimen, LeBronnec and H. Tauraa.

Uahuka: Hane Valley, altitude 150 feet, March 15, 1931, 1 specimen, LeBronnec and H. Tauraa.

Uapou: Tekohepu summit, altitude 3300 feet, November 27, 1931, beating *Weinmannia* species, 1 specimen, LeBronnec.

***Asymphorodes phaeochorda* Meyrick.**

Eiao: Vaituha, sea level to 1200 feet, October 2, 3, 1929, 59 specimens, Adamson.

Hatutu: middle of east side, altitude 1010 feet, September 30, 1929, on *Pisonia* species, 2 specimens, Adamson.

Tahuata: Vaitahu Valley, seashore, July 13, 1930, 3 specimens; Hanehevane, altitude 45 feet, July, 1930, 7 specimens; LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, sea level, August 18, 1930, 1 specimen, LeBronnec and H. Tauraa.

Uahuka: Hane Valley, altitude 150 feet, March 15, 1931, 15 specimens; Vaipae Valley, altitude 250 feet, March 17, 1931, 1 specimen; LeBronnec and H. Tauraa.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 5, 1932, at light, 1 specimen, LeBronnec.

***Asymphorodes ingravescens*, new species.**

Expanse, 13-14 mm. Head, palpi, thorax whitish, shoulders dark fuscous. Abdomen gray, anal tuft of male yellowish. Forewings glossy white, slightly iridescent; markings dark fuscous, variable in development; in the simplest form a short costal streak from base, and narrow fasciae at 1/3 and 2/3, others have an apical patch and the fasciae broader, in the darkest forms these are united by two thick longitudinal streaks, or almost the whole wing infuscated except median area; cilia ochreous-whitish or gray-whitish, in the darkest specimens basal half suffused dark fuscous. Hindwings and cilia gray, in male a thickened dark gray longitudinal streak above middle from base to 3/5; in male an expansible hairpencil of very fine light grayish hairs from base of costa.

Hivaoa: Mount Temetiu summit, altitude 3860 feet, January 20, 1932, at light, 10 specimens, LeBronnec.

Allied to *A. phaeochorda*.

***Asymphorodes xanthostola*, new species.**

Expanse, 11-13 mm. Head, palpi, thorax ochreous-yellow, seldom some fuscous irroration on shoulder. Antennae whitish-yellow. Forewings ochreous-yellow; markings lilac-gray; seldom a small spot on costa near base; sometimes a straight, narrow, slightly inwards-oblique fascia at 1/3, another more or less expanded in disc beyond 2/3, and one somewhat broader along termen, confluent on tornus, but all these markings often greatly reduced or entirely obsolete or absent; cilia light yellowish. Hindwings light gray; in male a thickened dark gray suprmedian streak from base to middle; cilia pale grayish.



Hivaoa: Mount Temetiu, slope north of summit, altitude 3860 feet, December 30, 1930, at light, 81 specimens, LeBronnec and H. Tauraa; Avaoa Valley, altitude 1350 feet, January 4, 1932, at light, 4 specimens; Kaava Ridge, altitude 2460 feet, January 5, 1932, at light, 1 specimen; LeBronnec.

Uapou: Teoatea, Hakahetau Valley, altitude 2200 feet, November 21, 1931, at light, 2 specimens; Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 1 specimen; Tekohepu summit, altitude 3200 feet, November 28, 1931, beating on *Metrosideros collina*, 2 specimens; LeBronnec.

Allied to *A. velligera*, which has more developed basal markings and dark fuscous tegulae.

#### **Asymphorodes xestophanes**, new species.

Expanse, 12 mm. Head, antennae, palpi pale iridescent whitish-ochreous. Thorax pale glossy grayish-colored. Abdomen rather dark gray. Forewings pale glossy submetallic grayish-ochreous, grayer towards apex; cilia light gray. Hindwings gray; cilia light gray.

Hivaoa: Avaoa Valley, altitude 1350 feet, January 4, 1932, at light, 1 female, LeBronnec.

#### **Asymphorodes ergodes**, new species.

Expanse, 6 mm. Head grayish-ochreous. Palpi blackish, apex of second joint and base of terminal white. Thorax dark gray. Ovipositor of female linear. Forewings dark fuscous, bases of scales gray-whitish, forming a minute striolation; second discal stigma forming a small blackish spot, preceded and followed by pale grayish-ochreous scales; cilia pale grayish-ochreous, in female more whitish, base mixed dark fuscous. Hindwings gray; cilia pale grayish-ochreous; in male an expansible pencil of very fine long hairs from base of costa.

Hivaoa: Avaoa Valley, altitude 1350 feet, January 4, 1932, at light, 3 specimens, LeBronnec.

#### **Asymphorodes acrophrictis**, new species.

Expanse, 7 mm. Head fuscous, face whitish. Palpi white, anterior edge of terminal joint dark fuscous. Antennae whitish ringed fuscous. Thorax rather dark fuscous, slightly sprinkled whitish. Forewings dark fuscous; small whitish spots on costa beyond middle and at 4/5; second discal stigma in one example dark fuscous ringed whitish; several small whitish marks on costa and termen towards apex, sometimes a fine oblique line across apex; cilia gray. Hindwings and cilia gray.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 17, 1931, at light, 1 male; Teavanui Pass, altitude 2900 feet, November 28, 1931, at light, 1 male, LeBronnec.

#### **Asymphorodes balanotis**, new species.

Expanse, 7-8 mm. Head, palpi, thorax dark fuscous. Antennae whitish, ringed dark fuscous. Anal tuft of male yellowish. Forewings dark fuscous; small sub-triangular white spots on costa about middle and 4/5; sometimes a small white apical dot; cilia gray. Hindwings and cilia pale grayish; in male an iridescent green-blackish swollen streak beneath costa on median third.



Eiao: above Vaituha, altitude 800 feet, October 5, 1929, at light, 1 specimen, Adamson.

Hivaoa: Avaao Valley, altitude 1350 feet, January 4, 1932, at light, 10 specimens, LeBronnec.

**Asymphorodes holoporphyra**, new species.

Expanse, 19-20 mm. Head pale bronzy-ochreous, crown centrally suffused light purple. Palpi pale ochreous, anterior edge of terminal joint dark fuscous. Antennae pale ochreous, barred dark fuscous above. Thorax purple. Forewings deep purple; cilia gray. Hindwings rather light fuscous gray; cilia light grayish-ochreous; in male a pale grayish-ochreous expansible hairpencil from base of dorsum.

Hivaoa: Mount Temetiu, slope north of summit, altitude 3860 feet, December 29-30, 1930, at light, 5 specimens, LeBronnec and H. Tauraa.

Allied to *A. porphyryarcha*.

FAMILY HELIODINIDAE

Genus **LISSOCNEMITIS**, new genus

Head smooth, forehead narrow, face very retreating. Antennae 4/5, in male serrulate, simple, scape moderately long, subovate, rather flattened, with small apical tuft. Labial palpi very long, recurved, slender, smooth, terminal joint rather shorter than second, acute. Maxillary palpi absent. Hind tibiae slender, smooth, tarsal joints with minute apical bristles. Forewings very narrow, apex caudate. Hindwings 1/2, linear-lanceolate, cilia 5. Neuration not determinable.

Apparently allied to *Pachyrhabda*, which it resembles in general characters, as far as ascertainable, but differs in legs.

**Lissocnemitis argolyca**, new species.

Expanse, 6 mm. Head, palpi, antennae, thorax, abdomen, legs silvery-white, face tinged ochreous. Forewings and hindwings silvery-white.

Hivaoa: Atuona Valley, altitude 300 feet, July 6, 1929, 1 male, Mumford and Adamson.

If really related to *Pachyrhabda*, this should be a fern-feeding species.

FAMILY GLYPHIPTERYGIDAE

**Inma catapsesta**, new species.

Expanse, 23-26 mm. Head pale ochreous. Palpi light ochreous-gray, posteriorly pale ochreous, terminal joint half second. Antennae of male dentate, fasciculate-biciliated (3). Thorax light ochreous-gray. Forewings moderate, rather dilated, costa gently arched, termen rounded, little oblique; 7 and 8 stalked, 8 to termen; light gray with faint yellowish tinge; a slightly irregular fuscous line from middle of costa to dorsum before tornus, obscurely pale-edged anteriorly, sometimes faint but with darker marks on costa and in middle; a scalloped dark fuscous terminal line; cilia whitish-gray, base sometimes spotted gray. Hindwings pale grayish, a suffused gray terminal fascia; cilia gray-whitish.

Fatuhiva: Vaikoao, altitude 1000 feet, August 21, 1930, at light, 1 specimen, LeBronnec and H. Tauraa.

Uahuka: Penau Ridge, altitude 2170 feet, March 4, 1931, at light, 1 specimen, LeBronnec and H. Tauraa.

Nukuhiva: Taiohae, sea level, June 4, 1931, 1 specimen, at light, LeBronnec and H. Tauraa.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 17, 1931, at light, 1 specimen; Vaikokoo, Paaumea Valley, altitude 1850 feet, November 30, 1931, at light, 1 specimen; LeBronnec.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 5, 6, 1932, at light, 3 specimens, LeBronnec.

Allied to *I. semiclara* Meyrick, but distinct by antennal structure as well as coloring. Probably the exceptional female from Tahuata mentioned under my description of *I. semiclara* was an example of this species. I am moreover of the opinion that the discrimination of the present species from *I. semiclara* shows that the other exceptional female from Hivaoa described in the same passage is likewise a good species, and now propose for it the name *I. ochrilactea*.

#### **Imma fulminatrix**, new species.

Expanse, 20-21 mm. Head dark fuscous, collar and sides of face ochreous-whitish. Palpi (broken) dark fuscous, suffused whitish posteriorly. Antennae of male dentate, fasciculate-biciliated (nearly 2). Thorax ochreous-whitish, suffusedly mixed fuscous and dark fuscous. Forewings moderately broad, rather dilated, costa gently arched, termen rounded, little oblique; 7 and 8 stalked, 8 to apex (indefinite); dark fuscous; base narrowly ochreous-whitish, in the female a broad streak of ochreous-whitish suffusion extended from base along submedian fold to middle, sending a short branch from near base to dorsum at  $\frac{1}{4}$ , the main streak confluent with an irregular, strongly dentate streak of ochreous-whitish suffusion from costa before middle to dorsum about  $\frac{2}{3}$ , in the male the wings are so badly denuded that these markings (except basal) are not discernible, but they are probably really less developed; a terminal series of darker markings indicated; cilia rather dark fuscous. Hindwings dark fuscous, rather lighter anteriorly; a whitish-ochreous oval blotch in disc beyond cell, larger in female; cilia ochreous-whitish, a gray basal line.

Hivaoa: Kakahopuanui, altitude 2460 feet, January 5, 1932, at light, 2 specimens, LeBronnec.

Both examples, but especially the male, are in much-damaged condition, but the species is easily recognized.

#### **Simaethis chelaspis** Meyrick.

Uapou: Tekohepu summit, altitude 3200 feet, November 28, 1931, 1 specimen, LeBronnec.

Hivaoa: Kaava Ridge, altitude 2460 feet, January 6, 1932, 1 specimen, LeBronnec.

## FAMILY GRACILARIADAE

**Gracilaria deltanthes**, new species.

Expanse, 12-13 mm. Head pale yellowish, crown suffused ferruginous. Palpi pale yellow. Thorax ferruginous. Forewings narrowly elongate-lanceolate, bronzy-purple; markings brassy-yellow, edged dark bronzy-fuscous scales; an oblique-triangular blotch nearly occupying basal fourth, touching base with one angle but otherwise not quite reaching margins anywhere; a large subtriangular patch extending on costa from  $\frac{1}{4}$  to beyond middle, narrow downwards, apex rounded and not quite reaching dorsum; a triangular spot on costa about  $\frac{3}{4}$  reaching half across wing, and a small spot on tornus opposite; cilia bronzy-purplish. Hindwings rather dark gray; cilia gray.

Uapou: Teoatea; Hakahetau Valley, altitude 2200 feet, November 20, 1931, 3 females, LeBronnec.

## FAMILY LYONETIADAE

**Opogona trissostacta**, new species.

Expanse, 11 mm. Head, thorax shining purple-gray, fillet whitish, scales behind fillet slightly rough, face pale silvery-gray. Palpi whitish, anteriorly light gray. Forewings purplish-slaty-gray, with bright purple-blue reflections especially towards base and dorsum; small white spots on costa at  $\frac{2}{5}$  and  $\frac{3}{4}$ , and on dorsum rather beyond first costal, sometimes a narrow white dorsal stripe from base to this; cilia gray. Hindwings and cilia dark gray.

Uahuka: Penau Ridge, March 4, 1931, 1 specimen, LeBronnec and H. Tauraa.

Hivaoa: Avaao Valley, altitude 1350 feet, January 4, 1932, 11 specimens; Kaava Ridge, altitude 2460 feet, January 5, 1932, 1 specimen; LeBronnec.

**Opogona aurisquamosa** Butler.

Eiao: above Vaituha, altitude 1200 feet, October 3, 1929, at light, 2 specimens, Adamson.

Fatuhiva: Tetana, Omoa [Oomoa], altitude 485 feet, August 22, 1930. 2 specimens, LeBronnec and H. Tauraa.

Uahuka: Vaipae Valley, altitude 150 feet, March 19, 1931, 1 specimen, LeBronnec and H. Tauraa.

**Decadarchis coleosema**, new species.

Expanse, 25-32 mm. Head yellow-brown. Palpi hairy anteriorly, brownish, externally suffused dark fuscous. Thorax dark fuscous, with a whitish-ochreous stripe on each side of back anteriorly, tegulae brown. Forewings very elongate, costa gently arched, apex obtuse, termen very obliquely rounded; dark bronzy-fuscous; a rather broad suffused light brownish-ochreous stripe along fold, dorsal area beneath this blackish, the pale streak projecting more or less into the middle of the dark area; a fine irregular pale ochreous terminal line from tornus to near apex; cilia dark brown, base somewhat suffused pale ochreous on terminal line. Hindwings gray; cilia light grayish-ochreous.

Hivaoa: Mount Temetiu, slope north of summit, altitude 3860 feet, December 26-30, 1930, at light, 4 specimens (type female), LeBronnec and H. Tauraa.

**Decadarchis rufimacula**, new species.

Expanse, 26 mm. Head light gray. Thorax brownish, shoulders suffused dark fuscous. Forewings very elongate, costa gently arched, apex obtuse, termen very obliquely rounded; ferruginous-brown, some scattered dark fuscous scales; basal third of costa suffused dark fuscous; a small blackish mark at base of dorsum; stigmata forming small dark brown spots, plical very obliquely beyond first discal, an additional spot obliquely before and beneath first discal, and one towards costa in middle; cilia reddish-gray. Hindwings gray; cilia pale grayish.

Uapou: Teoatea, Hakahetau Valley, altitude 1950 feet, November 17, 1931, at light, 1 male, LeBronnec.

As the example is in poor condition the description will require correction, but should be sufficient for recognition.

**Decadarchis percnomicta**, new species.

Expanse, 16 mm. Head fuscous. Palpi with rough hairscales anteriorly, gray mixed whitish, some black bristles. Thorax dark gray, somewhat mixed brown. Forewings elongate, costa gently arched, apex obtuse, termen very obliquely rounded; gray with faint reddish tinge, irregularly mixed blackish, accumulations of blackish scales appearing to indicate three or four oblique irregular fasciae, especially one from middle of costa reaching half across wing; some rough scales towards costa at  $\frac{3}{4}$ ; cilia gray suffused pale ochreous towards base and barred dark fuscous. Hindwings gray; cilia pale grayish-ochreous.

Eiao: above Vaituha, altitude 1200 feet, October 3, 1929, at light, 1 male, Adamson.

**Decadarchis simulans** Butler.

Tahuata: Vaitahu Valley, seashore, July 13, 1930, 2 specimens; Hanahevane, seashore, July 15, 1930, 1 specimen; LeBronnec and H. Tauraa.

Uahuka: Hane Valley, altitude 150 feet, March 8, 1931, 4 specimens, LeBronnec and H. Tauraa.

## FAMILY TINEIDAE

**Tinea despecta** Meyrick.

Hivaoa: Kakahopuanui, altitude 2460 feet, January 5, 1931, at light, 1 specimen, LeBronnec.





# NEW SPECIES AND VARIETIES OF *SIEROLA* FROM THE MARQUESAS\*

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The finding of representatives of the genus *Sierola* in the Marquesan collections of the Pacific Entomological Survey is interesting because it marks a new locality for these insects and extends the range of the genus considerably eastward. Other pertinent facts with regard to the genus are contained in the introductory part of a previous paper on *Sierola*, which may be referred to if additional information is desired.<sup>1</sup> I am describing here 11 species and 2 varieties as new species and varieties.

## ***Sierola depressa* variety *marquisensis*, new variety.**

Depressed to an extreme degree; shining black, legs (except tarsi) and antennae black also; tarsi yellowish brown, tips of mandibles reddish brown. Head and thorax to the propodeum with a microscopically fine and delicate surface sculpture, a little coarser on gula; finely, shallowly, and fairly closely punctate; clothed with short, fine, silvery white hairs. Head wider than the thorax, longer than wide by a half, length from eye to vertex equaling the width between the eyes; flat above and beneath; vertical margin straight, temples rounded; eyes flatly convex; antennae a little longer than head, all the segments longer than wide; antennal fossae shallow; clypeus extremely short, convex and without a carina, somewhat depressed apically, hardly projecting in front of the anterior margin of the head, which is curved rather than angulate, declivous at the sides; mandibles slender, curved, truncate apically and toothed, base touching the eye above; gula flat, hardly foreshortened, longer than wide, median groove nearly effaced, anterior margin straight, posterior margin arcuately concave; pronotum elongate, propodeum rugose; abdomen flatter than head, short ovate, apically acuminate, apparently smooth and polished; wings hyaline; length 2.75 mm.

Hivaoa: Tapeata, east slope of Mount Ootua, altitude 2,500 feet, May 25, 1929, on *Paspalum conjugatum*, type female, Mumford and Adamson.

## ***Sierola mumfordi*, new species.**

Female unusually large, shining black. Antennae except basal part of scape, anterior tibiae and tarsi, middle and hind tarsi brown, antennae fuscous outwardly, trochanters and base and apex of middle tibiae brown also. Head and thorax with microscopically fine reticulate surface sculpture, coarser on propodeum, fairly closely and finely punctate and hairy. Head not much wider than the thorax, a little longer than wide, width between the eyes greater than the length from eye to vertex, convex above and beneath, without great depth (less than half length and deepest below posterior end of eye), vertical mar-

<sup>1</sup> Fullaway, D. T., New species of *Sierola* with explanatory notes: B. P. Bishop Mus., Occ. Papers, vol. 7, no. 7, pp. 57-159, 1920.

\* Pacific Entomological Survey Publication 7, article 29. Issued November 25, 1934.

gin straight, temples rounded, eyes convex, antennae a little longer than head, all the segments a little longer than wide, the scape much longer than other segments and more than twice as long as wide, pedicel likewise longer, antennal fossae deep, clypeus reduced by erosion from the sides to a curved carinate ridge apically depressed, projecting slightly in front of the anterior margin of the head, sloping at the sides, the carina extending backward on the head beyond the base of the antennae; mandibles stout, curved, concavo-convex, truncate apically and toothed, base reaching the eye above; gula and sides of the head convex, gula very much foreshortened medially, transverse, anterior margin slightly curved (almost straight), posterior margin arcuately concave, median groove faintly impressed; abdomen long, ovate, apically acuminate, smooth and polished, sparsely clothed with silvery white hairs. Wings subinfusate with a faint yellowish brown pigmentation basally; length 3 mm.

Nukuhiva: Ooumu, altitude 3,700 feet, December 13, 1929, beating on shrub F. no. 592, 1 specimen, Mumford and Adamson.

Hivaoa: Kopaafaa, altitude 2,770 feet, August 2, 1929, sweeping on *Metrosideros collina* and miscellaneous plants, 3 specimens, type and paratypes, Mumford and Adamson.

Very similar to *S. osborni* described from Kilauea, Hawaii.

**Sierola adamsoni**, new species.

Female unusually large; shining black, the luster somewhat dulled on head, antennae brown, becoming dusky outwardly, the base of the scape dark; trochanters, tibia partially (front tibiae almost entirely) and the tarsi testaceous. Head and thorax to the propodeum with a microscopically fine reticulate surface sculpture, a little coarser on head than on thorax, rather closely, coarsely, and shallowly punctate on head, more finely on thorax, and hairy. Head nearly as wide as long, widest across the eyes, narrowing behind and in front, width between the eyes twice the length from eye to vertex, convex above, depressed in front, tumid beneath, deepest under the eye; vertical margin straight, temples rounded, eyes convex; antennae long, reaching the mesoscutum, the segments of the flagellum all longer than wide, the pedicel twice, the funicle three times as long as wide; antennal fossae deep, transverse, elliptical in outline; clypeus carinate, apically depressed and projecting somewhat in front of the anterior margin of the head, sloping at the sides; mandibles slender, curved, toothed apically, base not quite reaching the eye; cheeks narrow; gula and sides of the head convex, gula medially foreshortened, transverse, anterior margin arcuately concave, posterior margin incised, median groove nearly effaced; propodeum rugulose, opaque; abdomen short ovate, apically acuminate, smooth and polished; wings subinfusate, dotted with short fine hair on the disc; length 3.5 mm.

Nukuhiva: Puokoke [Pukoke], altitude 3,485 feet, December 22, 1929, beating *Glochidion ramiflorum*, 2 specimens, type and paratype; Ooumu, altitude 3,400 feet, November 11, 1929, beating on *Wcinnannia parviflora*, 2 specimens; Mumford and Adamson; Tapuaooa, altitude 3,000 feet, June 16, 1931, on *Metrosideros collina*, 1 specimen, LeBronnec and H. Tauraa.

Hivaoa: Kopaafaa, altitude 2,770 feet, August 2, 1929, miscellaneous sweeping, 1 specimen, Mumford and Adamson.

Very similar to *S. compacta* described from the Kilauea region, Hawaii.

**Sierola ooumuana**, new species.

Slender, somewhat depressed; shining black, rather brilliant, antennae predominantly brown, infuscated basally and apically; legs fuscous brown, the femora and the middle

and hind tibiae very dark, trochanters, tarsi and the front tibiae brown. Head and thorax with a microscopically fine reticulate surface sculpture, finely, shallowly, and somewhat remotely punctate and hairy. Head somewhat longer than wide, width between the eyes equalling the distance from eye to vertex, length in front of eyes not great; convex above and beneath, depressed in front, vertical margin straight, temples rounded, eyes flatly convex; antennae hardly longer than the head, pedicel and funicle a little longer than wide, following segments except the terminal one as wide as or wider than long; antennal fossae deep, extending transversely from the frontal carina to the inner margin of the eye; clypeus carinate, apically depressed and projecting slightly in front of the anterior margin of the head, sloping at the sides; mandibles slender but expanded somewhat at base and apex, curved, truncate apically and toothed, base touching the eye above; gula and sides of the head rather flat; gula medially foreshortened, almost as wide as long, a little convex behind, anterior margin arcuately concave, posterior margin incised; abdomen elongate ovate, apically acuminate, smooth and polished; wings subinfusate, with a dilute brownish pigmentation; length 2.5 mm.

Nukuhiva: Ooumu, altitude 4,050 feet, November 12, 1929, type female; Teuanui, altitude 2,000 feet, October 26, 1929, at light; altitude 1,500 feet, October 26, 1929, at light; Teivipakeka, altitude 2,900 feet, October 16, 1929, on *Glochidion ramiflorum*; Mumford and Adamson.

Hivaoa: Mount Temetiu, altitude 3,620 feet, July 24, 1929; Matauuna, altitude 3,700 feet, March 4, 1930, sweeping, Mumford and Adamson.

Uahuka: Penau Ridge, altitude 2,010 feet, on *Fagraea berteriana*, March 2, 1932, 6 specimens, LeBronnec and H. Tauraa.

Very similar to *S. glabra* of Hawaii.

### ***Sierola hivaoensis*, new species.**

Shining black, the head a little duller than thorax and abdomen, the antennae brown, fuscous apically and at the very base, legs brownish black, the trochanters, tarsi, and fore tibiae light brown. Head and thorax with a microscopically fine reticulate surface sculpture, very delicate on the pronotum and mesonotum, coarser on the head and propodeum, finely and fairly closely punctate and hairy. Head nearly as wide as long, widest across the eyes, narrowing behind and in front, width between the eyes twice the length from eye to vertex, length in front of the eyes about equal to the length behind, outline in front of eyes (viewed from above) roughly triangular; convex above, depressed in front, a little tumid beneath, vertical margin straight, temples rounded, eyes convex; antennae reaching the mesoscutum, all the segments longer than wide, pedicel and funicle more than twice as long as wide; antennal fossae deep, extending across the front of the head from the frontal carina to the eye margin; clypeus carinate, apically depressed and projecting slightly in front of the anterior margin of the head, declivous at the sides, the carina extending backward on the top of the head beyond the base of the antennae; mandibles slender, curved, truncate apically and toothed, base not quite reaching the margin of the eye above, gula double convex, with shallow median groove and impressed line, medially foreshortened and wider than long, anterior margin arcuately concave, posterior margin incised; abdomen short ovate, apically acuminate, with a smooth and highly polished surface; wings subinfusate; length 2.5 mm.

Hivaoa: Mount Temetiu, northeast slope, altitude 2,500 feet, July 29, 1929, miscellaneous sweeping, type female; Kopaafoo, altitude 2,770 feet, August 2, 1929, beating on *Crossostyles biflora*, 1 specimen (broken); Mumford and Adamson.

***Sierola freycinetiae***, new species.

Shining black, the head and pronotum a little duller, at least not brilliant like the abdomen and parts of the thorax, antennae brown, fuscous apically, the legs brownish black, the trochanters, tibiae, and tarsi brown. Head and thorax with a microscopically fine reticulate surface sculpture; finely, shallowly, and closely punctate on the top of the head, hairy clothing fairly long and conspicuous. Sides of the pronotum aciculate. Propodeum more coarsely sculptured. Head longer than wide by fully one half, widest across the eyes at middle, narrowing in front and behind slightly, width between the eyes 1.5 times length from eye to vertex, convex above, tumid beneath, depth greatest under hind quarter of eye and a little more than half the length; vertical margin slightly curved outwardly, temples rounded, eyes convex; antennae about as long as the head, first six segments longer than wide, following (except last) moniliform; antennal fossae deep, transverse but not quite reaching either the margin of the eye or the frontal carina; clypeus reduced by erosion at the sides to a carinate ridge, depressed apically and projecting a little in front of the anterior margin of the head, the carina extending backward on the top of the head beyond the base of the antennae; mandibles slender, curved, truncate apically and toothed, base nearly reaching the margin of the eye above; gula and sides of the head rather flat, the former medially foreshortened, narrowing behind, anterior margin arcuately concave, posterior margin incised, median groove very faint; abdomen elongate ovate, apically acuminate, smooth and highly polished; wings subinfusate with a faint yellowish-brown pigmentation; length 2.5 mm.

Hivaoa: Kopaafaa, altitude 2,770 feet, August 2, 1929, on *Freycinetia* species, type female; Tapeata, east slope of Mount Oootua, altitude 2,500 feet, May 25, 1929, on *Paspalum conjugatum*, 1 specimen, Mumford and Adamson.

***Sierola freycinetiae*** subspecies ***matauunaiana***, new subspecies.

Differing from the above in the following details: under side of the head sculptured like the upper and duller on that account. Mandibles moderately stout, bent at middle, base reaching margin of eye above; abdomen elongate and slender, length 3.00 mm.

Nukuhiva: Ooumu, altitude 3,600 feet, November 10, 1929, on shrub *F.* no. 580, 1 specimen (without abdomen), Mumford and Adamson.

Hivaoa: Matauuna, altitude 3,760 feet, August 1, 1929, sweeping, type female, Mumford and Adamson.

***Sierola tahuataensis***, new species.

Moderately large and thickset, shining black, the head and thorax duller, not brilliant like the abdomen; antennae brown to fuscous, trophi, trochanters, tibiae, and tarsi brownish; head and thorax to the propodeum with a microscopically fine reticulate surface sculpture, a little coarser on the head than on the thorax; rather closely, coarsely, and shallowly punctate and hairy. Head nearly as wide as long, widest across the eyes, narrowing behind and in front; width between the eyes almost twice the length from eye to vertex; convex above, depressed in front, tumid beneath, deepest under posterior end of eye, vertical margin straight, temples rounded; eyes convex; antennae reaching to mesoscutum, the segments of the flagellum all longer than wide, the first eight segments all more than twice as long as wide. Antennal fossae deep and wide, extending from frontal carina to eye margin; clypeus carinate, apically depressed and projecting a little in front of the anterior margin of the head, sloping at the sides; mandibles slender, curved, toothed apically, base not reaching the eye; cheeks very narrow; gula and sides of the head convex, the former medially foreshortened, transverse, anterior margin arcuately



concave, posterior margin incised, median groove nearly effaced; propodeum rugulose; abdomen short ovate, apically acuminate, smooth and highly polished. Wings subinfusate, with a yellowish-brown pigmentation; length 3.00 mm.

Uapou: Teavaituhai, Hakahetau Valley, altitude 3,020 feet, November 20, 1931, 1 specimen on *Cyrtandra* species, 1 specimen on *Sclerotheca* species; Paaumea side, altitude 3,020 feet, November 19-20, 1931, on *Vaccinium* and *Cyrtandra* species, 3 specimens; Teavanui Pass, altitude 2,900 feet, November 30, 1931, 14 specimens, 1 specimen on *Cyathea*; Tekohepu Summit, altitude 3,000 feet, November 27-28, 1931, on ferns and *Cyathea*, 2 specimens, paratypes; LeBronnec.

Tahuata: Haaioipu Summit, altitude 2,700 feet, July 9, 1930, type female, Mumford and Adamson.

Very similar to *S. compacta* from Hawaii.

### ***Sierola lebronnecii*, new species.**

Shining black, the legs and antennae brown to fuscous, trochanters, tarsi, and fore tibiae yellowish brown, pedicel and two funicle segments reddish brown; head and thorax to the propodeum with a microscopically fine reticulate surface sculpture, a little coarser on the head than on the thorax; coarsely, very shallowly and somewhat closely punctate and hairy; head longer than wide by a half, widest across posterior end of eyes, narrowing somewhat behind and in front, length in front of the eyes not great, shape angular; convex above, depressed in front, slightly tumid beneath at level of posterior end of eyes; depth less than one half length; vertical margin straight, temples rounded, eyes convex; antennae longer than the head, almost reaching mesothorax, all the segments longer than wide, the pedicel and following three segments twice as long as wide; antennal fossae deep, extending from close to frontal carina almost to margin of eye; clypeus carinate, apically depressed and projecting slightly in front of the anterior margin of the head, declivous at the sides, the carina extending backward on the top of the head a little beyond the base of the antennae; mandibles slender, curved, truncate apically and toothed, base touching the eye above; gula and sides of the head flatly convex, gula punctate and hairy, medially foreshortened, a little wider than long, anterior margin arcuately concave, posterior margin incised, smooth, and polished; abdomen ovate, apically acuminate, smooth and polished; wings with a straw-brown pigmentation; length 2.5 mm.

Hivaoa: Kopaafoo, altitude 2,770 feet, August 2, 1929, sweeping *Crossostylus biflora*, type female; Matauuna, altitude 3,760 feet, August 1, 1929, beating *Rapanea* species, 1 specimen; Mumford and Adamson.

### ***Sierola tauraaiana*, new species.**

Shining black, antennae brown, fuscous outwardly, legs mostly black, the trochanters and tarsi brownish. Head and thorax with a microscopically fine reticulate surface sculpture; finely, shallowly, and fairly closely punctate and hairy. Sides of the pronotum aciculate. Head wider than the thorax, longer than wide, width between the eyes greater than the length from eye to vertex by nearly one half, convex above, slightly tumid beneath, depressed in front, vertical margin straight, temples rounded, eyes convex; antennae a little longer than the head, all the segments longer than wide, pedicel twice as long as wide; antennal fossae deep, reaching the margin of the eye on one side but not quite to the frontal carina on the other; clypeus carinate, apically depressed and projecting slightly in front of the anterior margin of the head, sloping at the sides the carina extending backwards on the top of the head beyond the base of the antennae;



mandibles slender, widening outwardly, curved, concavo-convex, truncate apically and toothed, base touching the eye above; gula medially foreshortened, as long as or longer than wide, double convex, with a shallow median groove and impressed line, surface punctate, anterior margin arcuate, posterior incised; sides of the head rather flat and impunctate, narrowing behind somewhat; propodeum somewhat rugose on top, the sculpture rather aciculate; abdomen depressed, short ovate, apically acuminate, smooth and polished; wings infusate, with a yellowish-brown pigmentation; length 2.75 mm.

Hivaoa: Kopaafaa, altitude 2,770 feet, August 2, 1929, beating *Scaevola* species, type female; on *Frcycinctia* species, 1 specimen, resembles the type somewhat; Tepuna, altitude 3,010 feet, July 1, 1929, in miscellaneous sweeping, 1 specimen, resembles the type somewhat; Mumford and Adamson.

Nukuhiva: Puokoke [Puikoke], Tunoa Valley, altitude 3,485 feet, October 22, 1929, on shrub F. no. 565, 1 specimen, Mumford and Adamson. This specimen has the head smoother and more convex, legs less impunctate. It may constitute a different species but at present I consider it only a variety to which the name *pukokiana* is applied.

Resembles *S. lepida* from Hawaii.

### ***Sierola cookei*, new species.**

Shining black, the head and pronotum a little duller, at least not brilliant like the abdomen and parts of the thorax; antennae brown, fuscous apically, the legs brownish black, fore tibiae and middle and hind tarsi yellowish brown. Head and pronotum with a microscopically fine reticulate surface sculpture, finely, shallowly, and closely punctate on the top of the head, some distant pin punctures on the pronotum, hairy clothing fairly long and conspicuous, sides of the pronotum aciculate. Propodeum more coarsely sculptured. Head longer than wide by fully one half, width between the eyes greater (by nearly one half) than length from eye to vertex, convex above, depressed in front, slightly tumid beneath, greatest depth behind the eye, vertical margin straight, temples rounded, eyes flatly convex; antennae about as long as the head, all the segments a little longer than wide, the pedicel 1.5 times longer than wide; antennal fossae deep, transverse but not quite reaching either the margin of the eye or the frontal carina; clypeus reduced by erosion at the sides to a carinated ridge, depressed apically and projecting a little in front of the anterior margin of the head, the carina extending backwards on the top of the head beyond the base of the antennae; mandibles slender, curved, truncate apically and toothed, base reaching the margin of the eye above; gula and sides of the head rather flat, gula foreshortened, narrowing behind, anterior margin arcuately concave, posterior margin incised, median groove distinct; abdomen elongate ovate, apically acuminate, smooth and highly polished; wings subinfusate with a faint yellowish-brown pigmentation; length 2.5 mm.

Upou: Teavaituhai, Hakahetau Valley, altitude 3,020 feet, November 19, 1931, type female; Vaihakaatiki, altitude 2,800 feet, November 19, 1931, 1 female, paratype; LeBronnec.

Hivaoa: Temetiu Summit, altitude 4,160 feet, January 20, 1932, beating *Metrosideros* species, 1 specimen, LeBronnec; altitude 3,200 feet, September 13, 1929, and August 3, 1929, 2 specimens, Mumford and Adamson.

**Sierola gregoryi**, new species.

Shining black, rather brilliant; antennae brown to fuscous, legs black, only the tarsi brownish. Head and thorax polished, microscopic surface sculpture hardly visible; finely, shallowly and sparsely punctate and hairy. Head longer than wide by one half, widest across the posterior end of eyes, narrowing somewhat behind and in front, width between the eyes exceeded by length from eye to vertex, length in front of eye not great; convex above, depressed in front, tumid beneath; greatest depth, which is less than half the length, considerably behind the eye; vertical margin concave inward, temples rounded, eyes flatly convex; antennae just a little longer than the head, all the segments longer than wide, pedicel twice as long as wide; antennal fossae deep, elongate, and extending backward and outward from side of clypeus but not reaching margin of the eye; clypeus carinate, short, apically depressed, projecting a little in front of anterior margin of head, sloping at sides, carina extending backward on top of head beyond base of antennae; mandibles slender, curved, truncate apically and toothed, base reaching the margin of the eye above; gula rather flat and smooth, narrowing a little behind, as long as wide, anterior margin arcuately concave, posterior margin incised a little, median groove shallow; sides of the head a little convex; abdomen elongate ovate, apically acuminate, somewhat depressed, smooth and polished, posterior margin of the tergites conspicuously emarginate; wings subinfusate; length 2.25 mm.

Hivaoa: Temetiu Summit, altitude 4,160 feet, January 20, 1932, beating *Cheirodendron* species, type female, LeBronnec.

**Sierola bryani**, new species.

Dull black on head and thorax, abdomen shining black, polished; antennae brown fuscous outwardly, legs black or brownish black except trochanters, front tibiae, tip of femora, and base of tibiae of the hind legs and all the tarsi, which are brown to yellowish brown. Head and thorax with a microscopically fine reticulate surface sculpture; finely, shallowly, and closely punctate and hairy. Head longer than wide by more than one half, width between the eyes a little more than the length from eye to vertex, length in front of the eyes less; convex above, a little depressed in front, tumid beneath, greatest depth, less than half the length, just behind eye, vertical margin straight, temples rounded, eyes flatly convex; antennae longer than the head, all the segments longer than wide, the pedicel twice as long as wide; antennal fossae deep, extending backward and outward from side of clypeus to the margin of the eye; clypeus carinate, short, apically depressed, projecting a little in front of the anterior margin of the head, sloping at sides, carina extending backward on top of head beyond base of antennae; mandibles fairly stout, short, and curved, truncate apically and toothed, punctate and hairy on outer surface, base not reaching margin of eye; gula and sides of the head convex, gula narrowing a little behind but almost quadrangular, a little foreshortened, anterior margin slightly arcuately curved, posterior margin concave inwardly, median groove very indistinct, practically effaced; abdomen elongate ovate, apically acuminate, smooth and polished; wings subinfusate; length 2.5 mm.

Uapou: Tekohepu Summit, altitude 3,000 feet, November 20, 1931, beating on *Cyathca* species, type female, LeBronnec.



# MARQUESAN COLLEMBOLA \*

By

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The Collembola (springtails) collected by the Pacific Entomological Survey in the Marquesas comprise 14 species belonging to 10 genera. Seven of the species appear to be undescribed and new genera are suggested for three of them. Of the 7 other species, 3 are well-known insects with a wide distribution in both the eastern and western hemispheres; 3 are referred to species lately described by J. W. Folsom<sup>1</sup> from specimens collected in the Hawaiian islands; 1 is, I believe, identical with a Javan springtail. For the privilege of studying these very interesting wingless insects I desire to express sincere thanks to Mr. E. P. Mumford and his colleagues.

ORDER COLLEMBOLA

SUB-ORDER ARTHROPLEONA

FAMILY PODURIDAE

SUB-FAMILY NEANURINAE

Genus **MEGANURIDA**, new genus

Head with posterior ocular areas, eight eyes on each side. Cuticle finely granulated; claws of feet coarsely pitted, small empodium. Body elongate, with sixth abdominal segment narrow and tapering dorsally, hiding the relatively large subanal valves; fifth abdominal segment with large ventral genital aperture. Body and appendages with long bristles. Jaws concealed in buccal cone.

This genus resembles *Anurida* in general aspect, differing in the narrow sixth abdominal segment and the coarsely pitted foot claws which resemble those of *Pseudachorutes*. The type species is remarkable for its large size.

***Meganurida mumfordi***, new species (fig. 1).

Length 3.8 mm. Color mottled, dark blue and yellow. Upper surface predominantly dark with pale transverse bands before and behind second abdominal tergum. Foot-claws untoothed, pale, coarsely pitted except at the tip; empodium small and blunt (fig. 1, *d, e*). Eyes arranged with the first two outer and the first three inner forming an anterior

<sup>1</sup> Folsom, J. W., Hawaiian Collembola: Hawaiian Ent. Soc., Proc., vol. 8, pp. 51-80, pls. 1-12, 1932.

\* Pacific Entomological Survey Publication 7, article 30. Issued November 26, 1934.

group of five, the third and fourth outer with the third inner a posterior group of three (fig. 1, *b*); no postantennal organ apparent; a small convex sense organ at end of third antennal segment. A transverse row of six strong bristles on the trunk segments from first thoracic to third abdominal inclusive; strong lateral bristles on all segments, the sixth abdominal with three strong apical bristles (fig. 1, *a*). The fourth abdominal sternum with a large median pale area which extends forward in an acute angle beneath the third sternum. Genital opening on the fifth sternum with a median pale process directed backward (fig. 1, *f*).

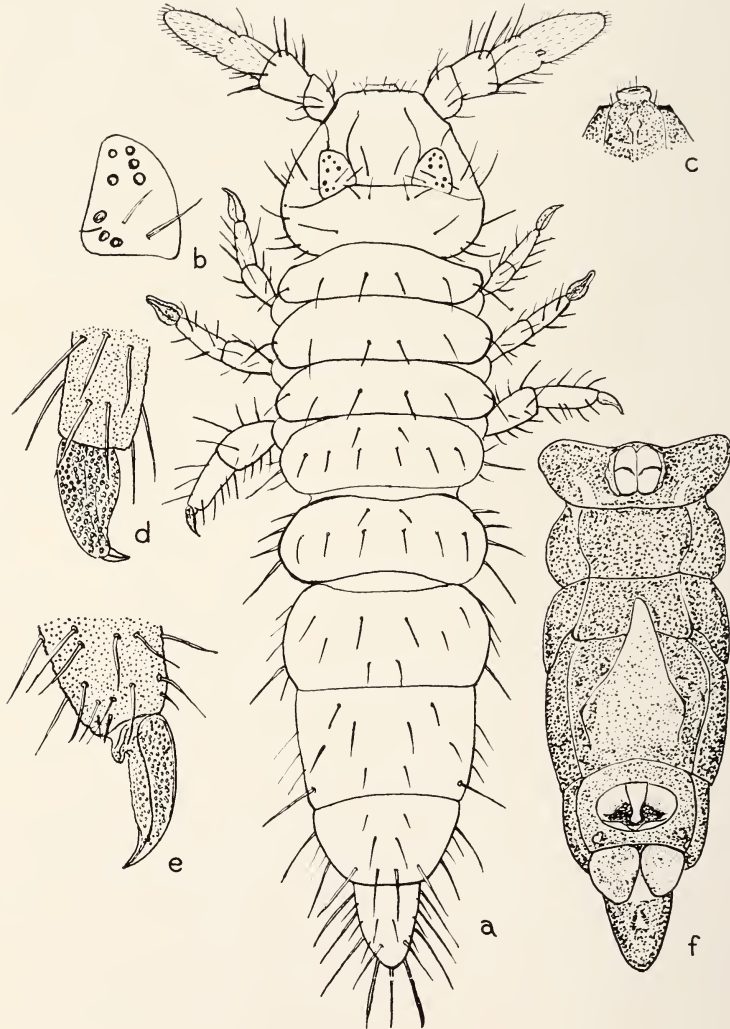


FIGURE 1. *Meganurida mumfordi*, new species: *a*, dorsal view,  $\times 30$ ; *b*, left ocular area,  $\times 74$ ; *c*, buccal cone and mouth,  $\times 30$ ; *d*, front foot (back view),  $\times 104$ ; *e*, hind foot (side view),  $\times 104$ ; *f*, ventral view of abdomen,  $\times 30$ .



Upou: Kohepu summit, altitude 3,200 feet, November 28, 1931, on dead stipes of *Cyathea*, 1 specimen, Le Bronnec.

This insect is the most remarkable of all the Marquesan Collembola. As there is only one specimen no examination of the jaws can be undertaken, but the suctorial buccal cone suggests that they are of the reduced, piercing type which is characteristic of several genera belonging to this group.

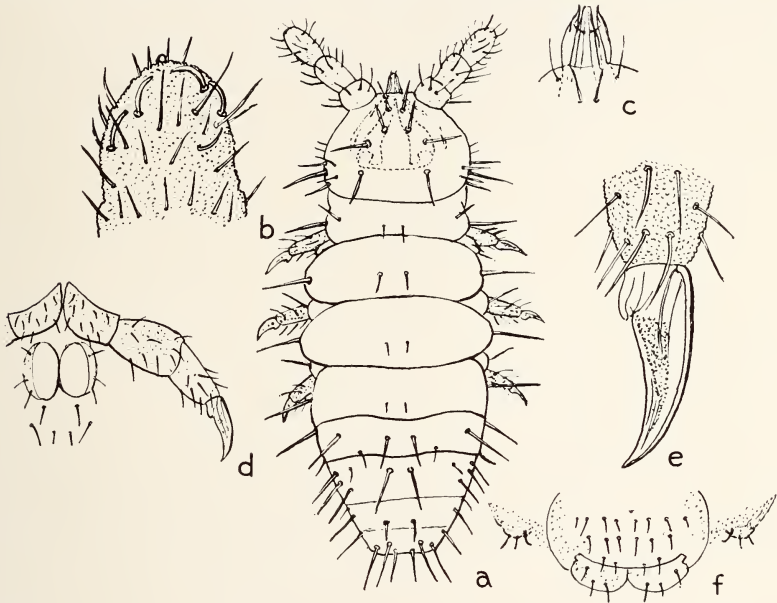


FIGURE 2. *Echinanura elegans*, new species: a, dorsal view,  $\times 30$ ; b, end of right feeler from above,  $\times 215$ ; c, buccal cone and jaws,  $\times 143$ ; d, left hind leg, and ventral tube,  $\times 72$ ; e, hind foot  $\times 215$ ; f, subanal valves, and ventral bosses of 4th abdominal segment,  $\times 90$ .

#### Genus ECHINANURA, new genus

Jaws as in *Neanura* (*Achorutes*). No eyes or postantennal organs. Cuticle finely granulated, no tubercles on head or body segments; segmentation of abdomen incomplete posteriorly; hinder end broadly truncated, subanal valves broad and short, lying beneath the fourth abdominal tergum; head and body with stout, strong spines. Foot claws with feebly pitted central area and short, blunt empodium.

#### *Echinanura elegans*, new species (fig. 2).

Length 2 mm. White, with delicate cuticle. Antennae as long as head; fourth antennal segment with four stout olfactory hairs and apical sense organ (fig. 2, b). Head with four pairs of dorsal spines and three lateral spines on each side. Thoracic and first abdominal segments with short dorsal and strong lateral spines; hinder abdominal

segments with strong dorsal, dorsolateral and lateral spines. Foot claw (fig. 2, *e*) without teeth.

Hivaoa: Matauuna, altitude 3,900 feet, March 4, 1930, 1 specimen, Mumford and Adamson.

Genus *SERICANURA*, new genus

Cuticle delicate, very finely granulated. Jaws hidden within short buccal cone. No eyes or postantennal organs. Head and body segments without tubercles, bearing long, flexible bristles. Segmentation of abdomen not apparent, indicated only by arrangement of bristles and the two short lobes of the terminal (sixth) segment. Foot claws with feebly pitted central area; empodium small and acute.

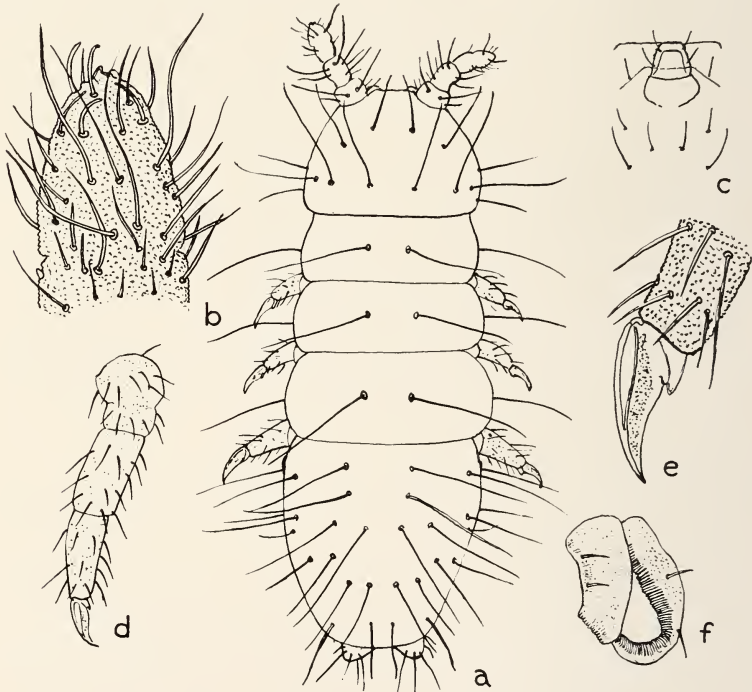


FIGURE 3. *Sericanura pacifica*, new species: *a*, dorsal view,  $\times 30$ ; *b*, tip of left feeler from above,  $\times 215$ ; *c*, buccal cone and jaws,  $\times 143$ ; *d*, left hind leg, and ventral tube,  $\times 107$ .

*Sericanura pacifica*, new species (fig. 3).

Length 2.8 mm. White. Antennae shorter than head; fourth segment with acute apical process, small discoid sense organ and five subapical olfactory hairs; a peglike sense organ near limit of third segment (fig. 3, *b*). Head with anterior dorsal and central dorsolateral pairs of bristles, and a hind row of three pairs of bristles besides two pairs situated laterally (fig. 3, *a*). Thoracic segments each with a dorsal and a lateral pair of very long bristles; first, second, and third abdominal segments each with

three pairs of long bristles; fourth with four pairs and fifth with two pairs; each lobe of the sixth segment with four bristles. Foot claw untoothed (fig. 3, *e*). Lobes of ventral tube with ridged margins (fig. 3, *f*).

Hivaoo: Matauuna, altitude 3,900 feet, March 3, 1930, under dead leaves on ground, 1 specimen, Mumford and Adamson.

The long flexible bristles give to this insect a characteristic silky aspect, expressed in the generic name, contrasting with the spiny armature of *Echinanura*, though *Sericanura* agrees with the genus in the smooth cuticle and the absence of segmental tubercles.

#### Genus NEANURA, Macgillivray

*Neanura* Macgillivray: Canad. Ent., vol. 25, pp. 127-128, 313-318, 1893.

*Achorutes* (in part) Templeton: Ent. Soc. London, Trans., vol. 1, 1835,

Börner: Naturhist. Mus., Hamburg, Mitt., vol. 13, 1906.

#### *Neanura hirtella* (Börner).

*Achorutes hirtellus* Börner: Naturhist. Mus., Hamburg, Mitt., vol. 23, pp. 170-171, 1906; Handschin: Treubia, vol. 8, pp. 452-453, fig. 3, 1926.

Uahuka: Putataua, Vaipae Valley, altitude 880 feet, September 21, 1929, on rotting banana trunk, 1 specimen.

This specimen agrees with Handschin's description and figures, the foot claw being without the tooth which is mentioned in Börner's description. The springtails studied by both these investigators were collected in Java.

#### *Neanura insularum*, new species (fig. 4).

Length 1.7 mm. Head with two small anterior tubercles, large ocular tubercles each with two eyes; and, behind, a feebly developed elongate central tubercle and two pairs of round tubercles (fig. 4, *a*, *c*). Feelers as long as head, an ovate sense organ at the edge of the third antennal segment, five olfactory bristles and a bilobed sense organ at the tip of the fourth segment (fig. 4, *b*). Body segments, prothorax to third abdominal inclusive, each with three pairs of tubercles, fourth and fifth abdominal each with two pairs of tubercles, sixth (terminal) segment with a pair of rounded lateral lobes, and truncate centrally (fig. 4, *e*). Foot (fig. 4, *d*) with untoothed claw and without empodium. Color (preserved specimens) pale yellow.

Eiao: altitude 1,600 feet, April 16, 1931, many on *Thespesia populnea*, types; altitude 1,800 feet, April 21, 1931, under dead bark of *Pisonia*, 3 specimens; altitude 1,800 feet, April 30, 1931, under bark of *Aleurites moluccana*, 4 specimens; LeBronnec and H. Tauraa; near middle of island, altitude 1,450 feet, October 1, 1929, under bark of *Thespesia populnea*, 2 specimens.

Uahuka: Putataua [Putataua], Vaipae Valley, altitude 880 feet, September 29, 1929, in rotting banana trunk, a few, Mumford and Adamson.

Hivaoo: Mounaofefe, altitude 2,010 feet, September 14, 1929, in dead stipes of *Angiopteris*, 8 specimens; Aimoa, altitude 1,515 feet, September 12, 1929, under rotting bark of *Pandanus*, 4 specimens; Mumford and Adamson.

Mohotani: altitude 500 feet, January 31, 1931, 3 specimens on dead *Pisonia*, LeBromec and H. Tauraa.

This species is nearly related to a Central American insect, *N. macgillivrayi* Denis from Costa Rica,<sup>2</sup> with which it agrees in the number of eyes, the untoothed foot claws, and the general arrangement of the tubercles; in *N. insularum*, however, the anterior median head tubercle is undeveloped and the posterior one very slight, while there is a pair of small but prominent outer hind tubercles not present in *N. macgillivrayi*. The form of the sixth

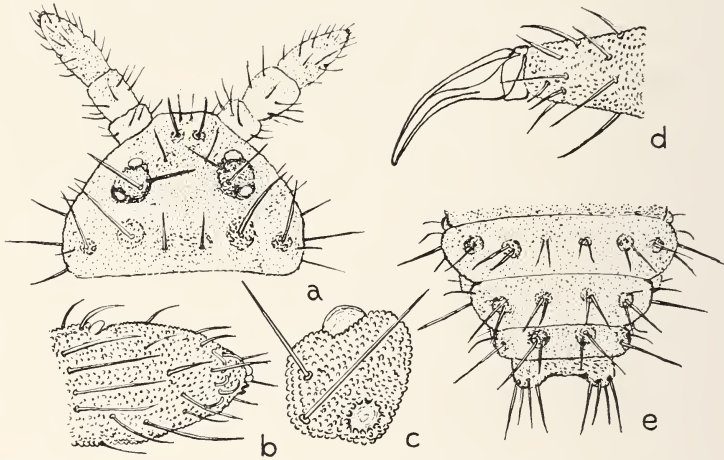


FIGURE 4. *Neanura insularum*, new species: a, head, dorsal view,  $\times 92$ ; b, tip of left feeler,  $\times 308$ ; c, right ocular tubercle,  $\times 308$ ; d, front foot,  $\times 381$ ; e, third to sixth abdominal segments, dorsal view,  $\times 92$ .

abdominal segment in *N. insularum* is intermediate between that in *N. macgillivrayi*—"presque rectiline" (Denis)—and that in another member of the same group, the Australian *N. rosacca* Schött,<sup>3</sup> the tail segment of which appears dorsally as a pair of very prominent subglobular lobes in contact with each other on the axis of the body. The North American *N. quadrioculata* Guthrie<sup>4</sup> agrees with *N. insularum* in the number of eyes and the form of the foot claws, but has much shorter feelers than this species. From the list of localities it will be seen that *N. insularum* is widely distributed through the Marquesas, while the number of specimens collected suggests that it may be the commonest member of the order inhabiting the archipelago.

<sup>2</sup> Denis, J. R., Collemboles de Costa Rica avec une contribution au species de l'ordre (2me note): Lab. Zool. R. Inst., Sup. Agrar. Portici, Boll., vol. 27, pp. 225-226, figs. 7-9, 1933.

<sup>3</sup> Schött, H., Results of Swedish Scientific Expedition to Australia, 1910-1913: 15, Collembola, Ark. Zool., vol. 11, p. 7, no. 8, 1917.

<sup>4</sup> Folsom, J. W., North American collemboles of the subfamilies Achorutinae, Neanurinae, and Poduridae: U. S. Nat. Mus., Proc., vol. 50, pp. 512-513, figs. 241-245, 1916.

## FAMILY ENTOMOBRYIDAE

## SUBFAMILY ISOTOMINAE

Genus **ISOTOMA**, Bourlet**Isotoma minor** Schäffer.

*Isotoma minor* Schäffer: Naturhist. Mus. Hamburg, Mitt., vol. 13, p. 182, fig. 63, 1896. Folsom: Hawaiian Ent. Soc., Proc., vol. 8, p. 63, figs. 67-71, 1932.

Nukuhiva: Teuanui, Tovii [Tevanui, Toovii], altitude 2,000 feet, October 24, 1929, 1 specimen, Mumford and Adamson, collectors.

This small, white, blind *Isotoma*, living usually in soil or under bark, is widespread in Europe and North America; it has lately been recorded by Folsom from Hawaii, where it occurred in cane soil near Honolulu.

Genus **ISOTOMURUS**, Börner**Isotomurus palustris** (Müller).

*Podura palustris* Müller: Zool. Dan. Prodr., p. 184, 1776.

*Isotoma palustris* Tullberg: Kong. Sv. Vet. Akad. Handl., vol. 10, p. 45, pl. 9, figs. 1-8, 1872. Schött: Kong. Sv. Vet. Akad. Handl., vol. 25, pp. 63-67, pl. 5, figs. 6-10, pl. 6, figs. 3-5, 1893.

*Isotoma balteata* Reuter: Soc. Fauna et Flora Fenn., Medd., vol. 1, pp. 82-86, 1876.

Nukuhiva: Teuanui, Tovii [Tevanui, Toovii], altitude 2,000 feet, October 24, 1929, on white sheet when collecting at night, several specimens; altitude 2,000 feet, a few; Mumford and Adamson.

This is a common and widespread species, ranging over Europe, North America, and the West Indies, and extending into Melanesia. Folsom<sup>5</sup> has lately recorded it from sugar plantations near Honolulu. Most of the Marquesan specimens belong to the banded variety *balteatus* of Reuter.

## SUBFAMILY ENTOMOBRYINAE

Genus **ENTOMOBRYA**, Rondani**Entomobrya lactea** Folsom.

*Entomobrya lactea* Folsom: Hawaiian Ent. Soc., Proc., vol. 8, pp. 65-66, figs. 76-78, 1932.

Eiao: north end, east side, altitude 1,590 feet, October 29, 1929, under bark of *Pandanus*, 1 specimen, Mumford and Adamson.

Hivaoa: Teava Uhia i te Kohu above Puamau, altitude 2,100 feet,

<sup>5</sup> Folsom, J. W., Hawaiian Collembola: Hawaiian Ent. Soc., Proc., vol. 8, p. 63, 1932.



February 15, 1930, from dead stipes of *Cyathea*, 1 specimen, Mumford and Adamson.

This is another of the springtails lately described by Folsom from Hawaii; his specimens were collected at Honolulu "behind sugar-cane leaf-sheaths".

**Entomobrya imminuta** Folsom.

*Entomobrya multifasciata* (Tullberg) variety *imminuta* Folsom: Hawaiian Ent. Soc. Proc., vol. 8, pp. 64-65, figs. 72-75, 1932.

Hivaoa: Mounaofefe [Mounaotete], altitude 2,100 feet, September 14, 1929, 1 specimen, Mumford and Adamson.

This specimen agrees closely with Folsom's description and figures of his types from Hawaii (Pupukea). He treats the form as a variety of the common European and North American *Entomobrya multifasciata* Tullberg, with which it agrees in color and markings. As, however, the fourth abdominal segment in *E. imminuta* is much shorter, the feelers much longer, the teeth on the foot claws differently placed, and the two inner proximal eyes very small in this form, as compared with the continental *E. multifasciata*, it may well be regarded as a distinct species.

Genus **SINELLA**, Brook

**Sinella coeca** (Schött).

*Entomobrya coeca* Schött: Calif. Acad. Sci., Proc., 2d ser., vol. 6, p. 178, figs. 14-16, 1896.

*Sinella höfti* Schäffer: Naturhist. Mus. Hamburg, Mitt., vol. 13, p. 192, figs. 102-105, 1896; Folsom: Hawaiian Ent. Soc., Proc., vol. 8, p. 66, figs. 79-81, 1932.

*Sinella coeca*, Linnaniemi: Soc. Sci. Fenn., Acta, vol. 40, pp. 214-215, pl. 14, fig. 13, 1912.

Uahuka: Putatauaa [Putatauuna], altitude 880 feet, September 21, 1929, in rotting banana trunks, 1 specimen, Adamson.

Nukuhiva: Teuanui, Tovii [Tevanui, Toovii], altitude 2,000 feet, October 25, 1929, in rotting banana stems, several, Mumford and Adamson.

Hivaoa: Mounaofefe [Mounaotete], altitude 2,310 feet, September 4, 1929, 1 specimen, Mumford and Adamson.

Mohotani: altitude 500 feet, January 31, 1931, on *Pisonia*, 1 specimen.

This species is well known in Europe and North America. Folsom records it from Hawaii, and I have identified specimens among the Pacific Entomological Survey's collection from Tahiti.

Genus **LEPIDOCYRTUS**, Bourlet**Lepidocyrtus inornatus** Folsom.

*Lepidocyrtus inornatus* Folsom: Hawaiian Ent. Soc., Proc., vol. 8, p. 68, figs. 92-93, 1932.

Hivaoa: Matauuna, altitude 3,900 feet, March 2, 1930, 1 specimen, Mumford and Adamson.

Nukuhiva: Teuanui, Tovii [Teunui, Toovii], altitude 2,000 feet, October 24, 1929, several specimens; October 20, 1931, a few; altitude 1,800 feet, October 26, 1929, a few; Mumford and Adamson.

These *Lepidocyrti* may all be referred to the Hawaiian species described by Folsom. They differ among themselves in the extent of the dark markings, some being almost uniformly pale, but no structural variation can be detected.

**Lepidocyrtus plumosus**, new species (fig. 5).

Length 1.5 mm. Mesonotum projecting far over head, twice as long as metanotum. Fourth abdominal segment four times as long as third. Claws of feet (fig. 5 *c*) evenly curved on outer edge, inner edge straight basally then curved, untoothed; empodial appendage half as long as claw, basally with parallel edges, then acuminate. Spring stout, more than half as long as body, dentes two thirds length of manubrium; dorsal aspect of dentes broad and very strongly corrugated, their distal half thickly clothed with large scales; mucro with sharp and prominent ante-apical tooth (fig. 5, *b*). Color generally yellow, the third and fourth antennal segments and the dentes of the spring purple.

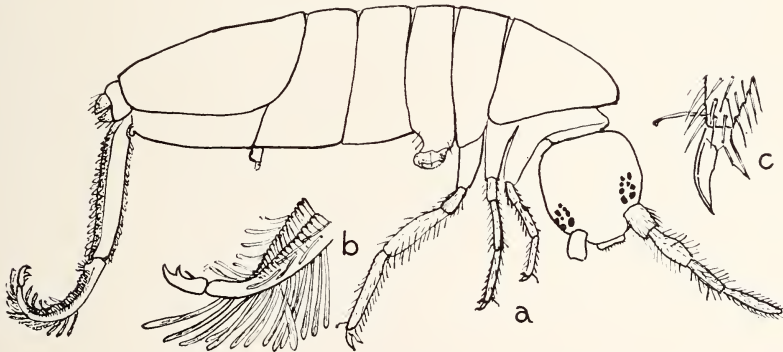


FIGURE 5. *Lepidocyrtus plumosus*, new species: *a*, side view (dorsal view of head),  $\times 90$ ; *b*, terminal part of dens, and mucro,  $\times 287$ ; *c*, hind foot,  $\times 287$ .

Hivaoa: Matauuna, altitude 3,900 feet, March 4, 1930, on ground under dead leaves, 3 specimens, Mumford and Adamson.

The dense scaling of the spring in this insect gives it a very characteristic appearance and suggests the specific name. I do not know of any nearly allied form.

## Genus LEPIDOCYRTINUS, Börner

*Lepidocyrtinus armatus*, new species (fig. 6).

Length 2.7 mm. Pale yellow with variable purple markings on head, body, legs and feelers. Feelers of adult normally three quarters as long as body. Mesothorax slightly longer than metathorax; fourth abdominal segment nearly five times as long as third. Legs elongate with tibio-tarsal joint usually indicated; all leg segments scaled and bearing feathered bristles, strong flattened spines on tibio-tarsi; tarsal tenent hair broad with marked distal expansion; foot claw with two pairs of small inner teeth, empodial appendage evenly lanceolate (fig. 6, *f, g*); mucro falciform, moderately elongate with apex sharp and vertical (fig. 6, *k*).

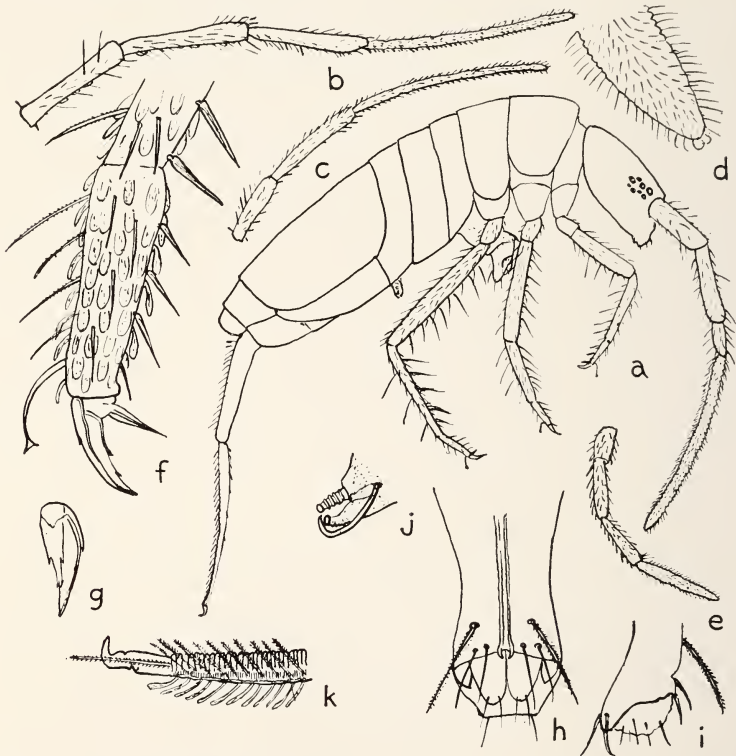


FIGURE 6. *Lepidocyrtinus armatus*, new species: *a*, side view,  $\times 46$ ; *b, c, e*, antennae of three specimens,  $\times 46$ ; *d*, tip of long antenna (*b*), with apical sense organ,  $\times 308$ ; *f*, terminal portion of hind leg,  $\times 295$ ; *g*, foot claw, inner face,  $\times 295$ ; *h*, ventral tube, front view,  $\times 148$ ; *i*, ventral tube, side view,  $\times 148$ ; *j*, catch (retinaculum), oblique view,  $\times 295$ ; *k*, terminal part of dens, and mucro,  $\times 295$ .

Nukuhiva: Ooumu, altitude 4,050 feet, November 12, 1929, on shrub, 3 specimens, types; in leaf axils of "mouku", 2 specimens; altitude 3,400 feet, November 11, 1929, on *Wcinnammia parviflora*, 2 specimens; Mumford and Adamson.

Hivaoo: Kaava Ridge, altitude 2,800 feet, October 27, 1931, on *Ageratum conyzoides*, 2 specimens, LeBronnec; Matauuna, altitude, 3,900 feet, March 14, 1930, on *Vaccinium*, 4 specimens, Mumford and Adamson.

Upou: Teavaituhai [Teavaituhi], altitude 3,000 feet, slope towards Paaumea, November 20, 1931, beating *Cyathea*, 1 specimen, LeBronnec.

Eiao: north end, east side, altitude 1,590 feet, September 20, 1929, under bark of *Pandanus*, 1 specimen, Adamson.

This species is characterized by the bladelike spines, which, with scales and feathered bristles, are conspicuous on the tibio-tarsi (fig. 6, *f*). The tibio-tarsal joint, evident in adult specimens, is not apparent in smaller individuals. In species of *Lepidocyrtinus*, the terminal antennal segment is subannulated with whorls of hair, and in *L. armatus* it may be nearly as long as the other three segments together (fig. 6, *b*). In some small specimens, however, which may be regarded as immature, the fourth segment is not annulated and only as long as the first and second segments together (fig. 6, *c*). I was at first disposed to regard these insects as belonging to the genus *Drepanocyrtus* of Handschin,<sup>6</sup> but as they agree with the others in the claws and armature of the feet and in the shape of the mucro, and occur in the same localities, all are probably conspecific. The annulation or simple condition of the terminal antennal segment in springtails of this group has been largely used as a character of generic value, as doubtless it often is. But the interesting series from the Marquesas now described suggest that it may also be an indication of comparative age. In some specimens a bifid sense organ (fig. 6, *d*) can be seen at the tip of the feeler.

The ventral tube in *Lepidocyrtinus armatus* has a pair of long, feathered bristles near the edge of the front face of the sheath (fig. 6, *h, i*). The catch (retinaculum) on the third abdominal segment has on the outer face of each of its component appendages four narrow transverse ridges and a prominent terminal knob, and bears in front a stout, curved bristle (fig. 6, *j*). The series of *Lepidocyrtinus armatus* shows great variation in color. Some are uniformly pale yellow, but usually the distal segments of feelers and legs are suffused with purple, as also the front of the head, the dentes of the spring, and the edges of the body segments. Some specimens have on the fourth abdominal segment a broad purple band which may extend on to the adjacent segments, or become, in some examples, broken up into narrow bands or small patches.

*Lepidocyrtinus armatus* is nearly related to a Sumatran species, *L. taeniatrus* Handschin,<sup>7</sup> which has a similar type of variable coloration but lacks the

<sup>6</sup> Handschin, E., *Beitrage zur Collembolefauna der Sundainseen*: Treubia, vol. 6, p. 236, 1925.

<sup>7</sup> Handschin, E., *Beitrage zur Collembolefauna der Sundainseen*: Treubia, vol. 6, pp. 240-241, figs. 23-27, 1925.

strong leg spines of the Marquesan springtail, from which it is further distinguished by a third pair of inner teeth on the foot claw and a narrower empodial appendage.



FIGURE 7. *Dicyrtoma insularis*, new species: a, side view,  $\times 43$ ; b, left feeler and ocular area,  $\times 160$ ; c, tip of right feeler,  $\times 200$ ; d, hind region of abdomen and spring, side view,  $\times 133$ ; e, hind foot,  $\times 453$ ; f, ventral tube, front view,  $\times 133$ ; g, terminal part of dens, and mucro,  $\times 266$ .

SUBORDER SYMPHYPLEONA

FAMILY SMINTHURIDAE

SUBFAMILY DICYRTOMINAE

Genus DICYRTOMA, Bourlet

*Dicyrtomina* Börner: Naturhist. Mus., Hamburg, Mitt., vol. 13, 1906.

***Dicyrtoma insularis***, new species (fig. 7).

Length 1 mm. Eyes on low, subconical prominences; feelers nearly twice as long as head; second and third segments almost equal in length, each five times as long as the



basal and four times as long as the tapering terminal segment (fig. 7, *b, c*), third segment with three drumlike terminal sensory organs (fig. 7, *c*). Foot claw (fig. 7, *e*) un-toothed with definite but narrow tunica; empodial appendage lanceolate and tapering, with internal tooth near base. Spring with dens two and three quarters as long as mucro with straight tapering margins and a minutely serrated edge (fig. 7, *g*). Color brown with a few purple patches.

Nukuhiva: Ooumu, altitude 4,050 feet, November 12, 1929, on shrub, 2 specimens, Mumford and Adamson.

It is of interest to know that the "globular springtails" are represented in the Marquesas, and by a genus which includes so familiar a British and European species as *Dicyrtoma minuta* (Fabricius). In its general aspect, small size, and short hairs the present species resembles rather *D. rufescens* Reuter<sup>8</sup>. Womersley<sup>9</sup> has recently described a species of this genus from Victoria, Australia. He regards some of the Australian Sminthuridae as endemic and others as introduced. The altitude of this insect's station suggests strongly that it may be regarded as a Marquesan "native".

#### NOTES ON DISTRIBUTION

The examination and identification of the Marquesan springtails open up a number of interesting problems in distribution. The first three species described in this paper represent new and remarkable generic types, and the high altitude at which each was found makes it certain that they belong to the indigenous fauna of the islands. The unique types of *Echinanura* and *Sericanura* were both found at the same locality and elevation on Hivaoa and were taken on succeeding days. They represent allied genera with certain common structural characters, yet each having a special type of bristly clothing.

*Neanura hirtella* and *Lepidocyrtinus armatus* indicate an Indo-Malayan affinity in part of the Marquesan insect fauna, whereas *Lepidocyrtus inornatus* and the two species of *Entomobrya* are definitely Hawaiian. *Neanura insularum*, though a new species, belongs to a worldwide group. The two isotomines and *Sinella coeca* are species of almost cosmopolitan range. It would require an intimate knowledge of the local conditions to discuss the question whether the presence of these species in the Marquesas is due to natural extension of range or to introduction through commerce and cultivation. Collembola, being primitively wingless, are insects unlikely to make long oceanic journeys, but as specimens of the order have been found in birds' nests on outlying British and Irish rock islets, it is likely that they

<sup>8</sup>Linnaniemi, W. M., Die Apterygotenfauna Finlands: Soc. Sci. Fenn., Acta, vol. 40, no. 5, pp. 323-324, 1912.

<sup>9</sup>Womersley, H., The Collembola-Symphyleona of Australia, a preliminary account: Commonwealth of Australia, Council for Sci. and Indust. Res., pam. 34, pp. 39-40, 1932.

may be carried across ocean tracts by birds. It is noteworthy that, except for the three new genera, *Neanura hirtella*, *Lepidocyrtus plumosus*, and *Dicyrtoma insularis*, each species of the Marquesan Collembola inhabits several islands of the archipelago.

The apparent absence from the Marquesan fauna of several large and widespread genera of springtails is noteworthy. Among the Poduridae, *Achorutes* (*Hypogastrura*) and its ally *Xenylla* are unrepresented, as well as *Pseudachorutes* and the well-nigh ubiquitous *Onychiurus*. Among the Entomobryidae the Paronellini are absent from this collection, though there is at least one species in the Hawaiian islands, and they are a characteristic feature of the general tropical fauna, in both hemispheres.











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