MARQUESAN INSECTS—I

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CONTENTS

FOREWORD

This bulletin is the first of a series of publications dealing with collections made in the Marquesas and the Society Islands by the Pacific Entomological Survey.

The series "Marquesan Insects" is planned to include taxonomic papers by specialists on insects and other terrestrial and fresh-water arthropods. Articles on other zoological collections made by the Survey in the Marquesas will appear as Occasional Papers or other publications of the Museum. The series will also include general papers by A. M. Adamson and E. P. Mumford describing such environmental factors as topography, climate and flora, and giving a résumé and analysis of the fauna, with a discussion of endemism, origin, and affinities. To avoid delay in publication, articles submitted by specialists are being published in chronological rather than in systematic order. Lists of papers issued to date will be given in subsequent numbers of the series.

The collections, including type specimens, which include representatives from the entire terrestrial and fresh-water fauna, are being deposited in Bernice P. Bishop Museum.

A note on the insect fauna has been published,[1] and a paper of more general scope was read before the International Congress of Entomology at a meeting held in Paris on July 15, 1932.[2]

The Pacific Entomological Survey is supported by grants from the Hawaiian Sugar Planters' Association, the Association of Hawaiian Pineapple Canners, and by contributions from various sources made available by Bernice P. Bishop Museum. It is administered by a committee representing the institutions concerned.[3]

As the first region for intensive study, the Committee chose the Marquesas Islands because of the rapid changes known to be taking place in the flora and believed to be occurring in the fauna as well, and also because the biology of this isolated archipelago seemed likely to be of great interest in the study of geographical relations. The only previous entomological collections of any importance were those of Cheesman,[4] and Collenette and Longfield.[5] Accordingly, A. M. Adamson and E. P. Mumford landed in the Marquesas Islands on January 20, 1929, and remained there until April 9,

[1] Mumford, E. P., and Adamson, A. M., Notes on the insect fauna of the Marquesas Islands. B. P. Bishop Mus., Bull. 94, pp. 51-54, 1932.

[2] To be published shortly under the auspices of the Société de Biogéographie.

[3] The scope, organization, personnel, and activities of the Pacific Entomological Survey are recorded in the reports of the Director of Bernice P. Bishop Museum for the years 1926-1931.

[4] Cheesman, L. E., A contribution towards the insect fauna of French Oceania, Ent. Soc. London, vol. 75, pt. 1, pp. 147-160, 1927.

[5] Collenette, C. L., The Arctiidae, Noctuidae, and Sphingidae of the St. George Expedition, from French Oceania. Ent. Soc. London, Trans., vol. 76, pt. 2, pp. 469-471, 1928.

1930. Collecting was continued until the end of the following year by G. LeBronnec, a French resident in the islands, who had by that time become familiar with the methods and technique adopted by the Survey. LeBronnec was assisted in the field by H. Tauraa from Tahiti. In the early spring of 1930, some assistance was received from R. R. Whitten.

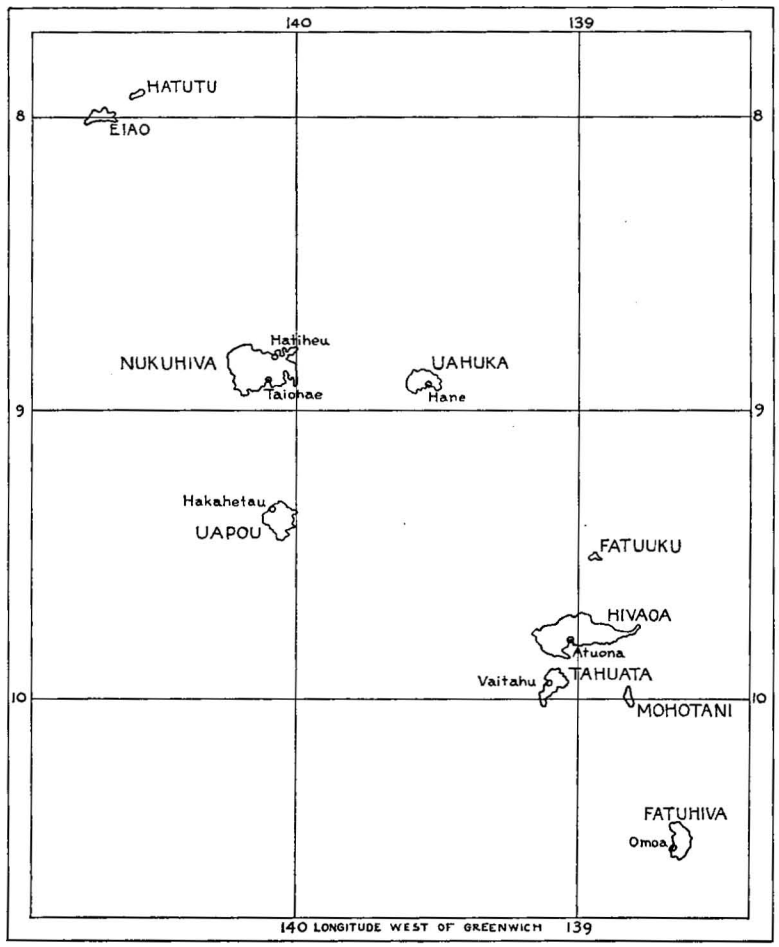
For permission to carry on these researches in French Oceania, the Survey is indebted to Messieurs les Gouverneurs Bouge and Jore in Papeete, Tahiti. For many courtesies graciously extended in the Marquesas thanks are due to the Administrators of the islands, Monsieur Aumont, and Messieurs les Docteurs Benoit, Rollin, and Quérie.

When away from its present headquarters in Hawaii, the Survey has, thanks to Dr. C. B. Lipman, Dean of the Graduate Division, and Dr. C. B. Hutchinson, Dean of the College of Agriculture, enjoyed the temporary hospitality of the University of California, among the Faculty members of which, the writer is especially indebted to Professors W. B. Herms, E. C. Van Dyke and S. F. Light.

For the part which they have played in the initiation and conduct of the entomological survey, thanks are due Dr. Herbert E. Gregory, Director, and Mr. Albert F. Judd, President of the Board of Trustees of the Bishop Museum. For professional advice and assistance, thanks are due to many entomologists in Hawaii and elsewhere, especially to Mr. O. H. Swezey. Thanks are also due to Mr. E. H. Bryan, Jr., Curator of the Bishop Museum, and to Dr. E. D. Merrill and Dr. F. B. H. Brown, who generously assumed the responsibility for the determination of the host plants.

For the constant and enthusiastic support which he has received in the work of the Survey at all times, the writer is indebted to the Committee-in-charge, which has included Dr. C. Montague Cooke, Trustee of Bernice P. Bishop Museum (Chairman), Dr. A. L. Dean (Vice-Chairman), Mr. John E. Russell, President of the Hawaiian Sugar Planters' Association (Secretary), Mr. Charles S. Judd of the Territorial Board of Agriculture and Forestry, Dr. Royal N. Chapman, Director of the Experiment Station of the Association of Hawaiian Pineapple Canners, Mr. George M. Collins, Trustee of Bernice P. Bishop Museum, Mr. C. E. Pemberton, Chief Entomologist at the Experiment Station of the Hawaiian Sugar Planters' Association and President of the Hawaiian Entomological Society, and Mr. C. R. Hemenway, Chairman of the Board of Regents of the University of Hawaii.

E. P. Mumford
Director, Pacific Entomological Survey.



MAP OF THE MARQUESAS ISLANDS

NEW SPECIES OF SAPROMYZIDAE FROM THE MARQUESAS *

By

JOHN R. MALLOCH

BUREAU OF BIOLOGICAL SURVEY, U. S. DEPARTMENT OF AGRICULTURE

Genus PROCHAETOPS Bezzi

This genus was erected in 1928 for the reception of a species from the Fiji Islands.[1]

In the material from the Marquesas submitted to me I find a number of species that are evidently congeneric with the Fijian species, agreeing in the most essential characters cited by Bezzi and shown in Terzi's fine figure of the head of the genotype, *nigriseta* Bezzi, but they differ variously among the several species in minor characters such as the hairing of the arista, the presence or absence of the prescutellar acrostichals and the genal bristles. It appears to me inadvisable to erect new genera for any of these segregates, but I propose to recognize one subgenus, the species having departed more from the typical form than any of the others before me.

In one female I find a remarkable form of ovipositor, possibly in some way connected with a particular method of oviposition, and as the male is not among the material available I deem it wise to allow it to remain in the same genus as others in which there is no exceptional development of this organ in the females. There is also some sexual dimorphism in certain species, or at least my assumption is that some of the species show this in my association of the males and females. I may be mistaken in this conclusion, but there is no means of testing deductions with pinned material. The systematist is at a decided disadvantage as compared with the field collector when it comes to finding out whether a certain male should or should not be associated with a particular female in the collections. Definite decisions on the relationships of some species must await further data obtained in the field, the results presented below being therefore, like many others, merely the summary of conclusions based on available material, conservatively arrived at.

Key to the Species

1. Ocellar bristles present, variously developed; jowls with some hairs, rarely strong, never with one or two outstanding bristles below eye; anterior fronto-orbital bristle nearer to anterior margin of frons than to the upper bristle (subgenus *Prochaetops* Bezzi) 2

   Ocellar bristles undeveloped; jowls with at least one long strong bristle below eye; anterior fronto-orbital bristle much closer to the upper bristle than to anterior margin of frons (subgenus *Prochaetopsis,* new) ..... **12. tahuatae**

[1] Bezzi, Mario, Diptera Brachycera and Athericera of the Fiji Islands, p. 120, London, 1928.

* Pacific Entomological Survey Publication I, article 1.

2. Frons entirely black, with rather dense white dust; prescutellar acrostichals undeveloped 3
   Frons entirely or partly yellow 4
3. Species entirely black, halteres yellow with black knobs; wing with a very faint indication of a cloud at apex of costa ..... **1. anthrax**
   Species black on dorsum; lower occiput, most of the pleura, venter of abdomen, legs, and halteres testaceous yellow; wing with a very distinct fuscous streak along apex of costal margin ..... **2. bicolor**
4. Prescutellar acrostichal bristles undeveloped 5
   Prescutellar acrostichal bristles well developed 7
5. Frons broadly black on center, only the orbits yellow; black species, the legs fuscous, only the knees distinctly yellow; wings neither abnormal in shape nor distinctly spotted, only a faint brown tinge along the costal margin at apex; arista pubescent ..... **3. fusca**
   Frons entirely yellow, or more or less distinctly trivittate with fuscous; thorax, abdomen, and legs at least partly yellow; wings either abnormal in shape or with a conspicuous dark mark at apex of costa 6
6. Arista pubescent, the longest hairs not so long as its basal diameter; palpi black at apices; wing normal in shape, with a conspicuous fuscous costal streak from before apex of second to beyond apex of third vein; thorax testaceous yellow, with a broad black vitta on each side of mesonotum which extends along the sides of the scutellum ..... **4. bivittata**
   Arista short haired, the longest hairs a little longer than its basal diameter; palpi yellow; wings abnormal in shape (fig. 1, *a*); thorax fuscous, densely grey dusted, the mesonotum with a narrow dark brown vitta along each series of dorsocentral bristles, a broader vitta along inner margin of each humeral callus which is discontinued a little behind the suture, and a linear vitta behind suture on the area between the two just described ..... **5. adamsoni**
7. Wing with a small round deep black spot on the tip of second vein (fig. 1, *d*); hind femur of male without distinct ventral bristles ..... **6. unipuncta**
   Wings without a small round deep black spot as above described, either entirely hyaline or with a much larger dark mark 8
8. Wing blackened from apex of subcosta to tip along costa, and from anterior margin to, or almost to, fourth vein, with a small subtriangular hyaline mark near apex of submarginal cell (R_3), and a cloud over cross vein connecting with the larger one; mid femur of male with a series of black bristles on posteroventral surface from base to beyond middle which become longer apically, and a similar series on both the anteroventral and posteroventral surfaces of the hind femur, the tips of the longer bristles very fine and slightly curled (fig. 1, *h*); hind femur of female with two or three quite strong straight bristles on apical half of anteroventral surface (fig. 1, *j*) ..... **7. armatipes**
   Wings hyaline, with at most a faint cloud over apex of second vein 9
9. Palpi and antennae entirely yellow; mid and hind femora as in *armatipes*; wings entirely hyaline ..... **8. armatipes claripennis**
   Palpi, and usually the third antennal segment, blackened at least apically; mid and hind femora not armed as above 10
10. Central portion of the scutellum pale, the sides narrowly infuscated; arista almost bare; palpi fuscous at apices; mid femur with two or three straight and rather strong black bristles on central portion of posteroventral surface, the hind femur with some similar bristles on same portion of posteroventral surface and four or five on apical half of anteroventral surface ..... **9. setifemur**
    Central portion of the scutellum black-brown, the sides narrowly yellow 11

11. Female ovipositor of the ordinary type (fig. 1, *b*); entire dorsum of abdomen black; hind femur with four or five short fine bristles on apical half or less of anteroventral surface; inner cross vein of wing beyond the middle of the discal cell, the penultimate section of fourth vein about half as long as the ultimate section.....**10. sp. ? unipuncta**

    Female ovipositor prong-like (fig. 1, *c*); abdomen broadly black on sides and with a yellow central stripe on dorsum; hind femur without anteroventral bristles; inner cross vein at or before the middle of the discal cell, the penultimate section of fourth vein not nearly half as long as the ultimate section .....**11. armiventris**

1. **Prochaetops anthrax,** new species.

Female

Shining black, extreme apices of femora yellowish, frons quite densely whitish grey dusted, the face less evidently so, occiput with distinct whitish dust and not distinctly yellow on lower portion; third antennal segment and aristae missing in type; palpi fuscous. Thorax and abdomen black, the former with rather noticeable greyish white dusting, not vittate, abdomen hardly showing any trace of dusting. Wings greyish hyaline, with a very faint trace of brownish clouding on costa from before apex of second to apex of third vein, the veins black. Squamae brownish, margins fuscous. Knobs of halteres black.

Frons slightly longer than wide and almost parallel-sided, anterior orbitals much closer to anterior margin than to upper pair, both pairs and the four verticals long and strong, postverticals not as long as orbitals, but slightly longer than the ocellars; eye distinctly narrowed below; face almost perpendicular, slightly convex; cheek without strong bristles. Thorax with the usual bristles all strong except the anterior sternopleural, which is slightly weaker than the posterior one; intradorsocentral hairs decumbent, black, rather short, and in about eight series; scutellum subtriangular, slightly flattened on disc, with four strong bristles. Abdomen tapered apically, tergites subequal, the apical bristles on second to fifth tergites longer than on sixth. Legs rather stout, all tibiae with well developed apical dorsal bristle, fore femur with a complete series of strong, rather widely separated, posteroventral bristles, and no preapical anteroventral comb of short setulae, mid and hind femora without any ventral bristles, no submedian anterior bristles on mid pair but one near apex on posterior side, the hind pair with one or two near apex on both the anterodorsal and posterodorsal surfaces. Wing rather narrow, third vein ending almost exactly in wing tip, parallel with fourth, the apical section of latter about 1.5 as long as the preapical section, inner cross vein close to middle of discal cell, outer cross vein not twice as long as apical section of fifth vein, the latter evanescent at apex. Length, 4.5 mm.; wing, 5 mm.

Hivaoa: Northeast slope of Mount Temetiu, altitude 2800 feet, August 3, 1929, holotype female, Mumford and Adamson.

2. **Prochaetops bicolor,** new species.

Male

Differs from the preceding species in having the lower occiput distinctly testaceous yellow, the pleura almost all of the same pale color, with dark ill-defined marks on the mesopleura and sternopleura, the lower half of humeri yellow, and most of the postnotum fuscous, the grey dusting on mesonotum denser than in *anthrax*. Abdomen yellow at extreme base on sides and on entire venter. Legs including the coxae testaceous yellow,

apices of fore and hind femora, central portion of tibiae, and base of fore metatarsus, darkened. Wings greyish hyaline, with a quite conspicuous fuscous mark along the costal margin from before the apex of second vein to apex of fourth, veins black. Squamae greyish, margins darker. Halteres with dull brownish yellow knobs.

Third antennal segment about three times as long as second, rounded at apex, the aristae with hairs on entire extent which are slightly longer than its basal diameter; otherwise as *anthrax*. Length, 5 mm.

Hivaoa: Northeast slope of Mount Temetiu, altitude 2500 feet, July 24, 1929, holotype male, Mumford and Adamson.

It is possible that this is the male of the preceding species, but without data to support this belief it is better to recognize them as distinct tentatively.

3. **Prochaetops fusca,** new species.

Female

Type specimen greasy so that the coloration of thorax and abdomen can only be uncertainly decided. Head testaceous yellow, frons with a broad fuscous stripe in center which widens out over posterior margin and entirely covers it; occiput with a large fuscous mark on each side of upper half; jowls black, the dark portion with its anterior margin in line with inner margin of eye, fading out posteriorly and not reaching back of head, the epistome with a narrow fuscous line connecting the two dark marks and the labrum also fuscous; antennae brownish testaceous, third segment infuscated apically; aristae fuscous, palpi yellow at bases, beyond blackened. Thorax apparently fuscous, the mesonotum showing traces of a broad central grey dusted vitta, and on each side anteriorly a narrow yellow vitta on edge of same. Abdomen fuscous, shining, the apices of tergites yellowish. Legs dark brown or fuscous, knees and bases of mid and hind tarsi yellowish. Wings greyish hyaline, with a very narrow and inconspicuous brownish tinge along the costal margin from near apex of second vein to apex of fourth; veins black. Calyptrae yellowish. Halteres dull brownish yellow.

Structurally similar to the next preceding species, but the arista has very much shorter hairs, showing pubescence only under a high power (× 34). Length, 4.5 mm.

Hivaoa: Tepuna, altitude 3000 feet, August 1, 1929, holotype female, Mumford and Adamson.

The peculiarly marked head and the extension of the brownish costal cloud to the apex of fourth vein should distinguish this species from any other now before me and should be found in both sexes.

4. **Prochaetops bivittata,** new species.

Male

Head orange-yellow, frons unicolorous, jowls marked as in the preceding species, but the epistome without a distinct transverse line, ocellar spot fuscous, occiput with a large fuscous mark on each side above; palpi black at apices; antennae testaceous yellow, third segment browned apically; aristae fuscous. Thorax testaceous yellow, mesonotum with a broad blackish brown vitta on each side separated by a densely whitish grey dusted central vitta, all continued over the scutellum; pleura with whitish dusting. Abdomen largely brownish black above, the apices and lateral portions of the tergites testaceous yellow. Legs entirely testaceous yellow, fore coxae with white dust.

Wings greyish hyaline, with a large fuscous mark along the costal margin from before apex of second to apex of third vein, and faintly distinguishable almost to fourth. Halteres yellow.

Structurally similar to *fusca,* the aristae very indistinctly pubescent, but the frons is longer and more flattened, the posterior bristle is farther from the vertical than from the anterior orbital bristle, and the fore femur has one long bristle near apex and some much shorter bristles basad of it on the posteroventral surface instead of a series of long and strong bristles as in all three species already described herein. In other respects the species are very similar. Length, 5 mm.

Hivaoa: Northeast slope of Mount Temetiu, altitude 2500 feet, July 24, 1929, holotype male, Mumford and Adamson.

This again may be the male of *fusca,* but it seems hardly possible and I accept it as distinct.

5. Prochaetops adamsoni, new species (fig. 1, *a*).

Male

Head testaceous yellow, the frons with three greyish vittae which may be rather indistinct, a large ill-defined fuscous mark on each side of upper occiput, and a brownish mark on the jowls; antennae bright yellow, palpi concolorous, aristae fuscous. Thorax fuscous, mesonotum densely grey dusted, with a narrow dark brown vitta along each series of dorsocentrals, traceable on sides of scutellum, a broader vitta of same color along the inner margin of each humeral callus which is interrupted at suture and discontinued before attaining the posterior margin, and a third vitta behind suture between the other two; pleura showing some yellow and dark brown markings. Abdomen with a large black mark on each side of each tergite which leaves only the hind margin and a narrow central stripe yellow. Legs testaceous yellow, with traces of a dark stripe on dorsal surface of fore and hind femora, the fore, and to a less marked degree the hind, tibiae browned, and the third and fourth segments of mid and hind tarsi fuscous. Wings hyaline, with a very faint linear cloud along the apex of costal vein, the veins yellow except at apices. Halteres brownish yellow.

Ocellar bristles very fine; aristae with rather dense short hairs, the longest about as long as its basal diameter. Thorax differing from those already described in having but four series of intradorsocentral hairs, and like them in having no well developed prescutellar acrostichal bristles. Abdomen tapered apically, the apical bristles on the tergites as in *anthrax.* Legs with the femora rather strong, the fore pair with a moderately long bristle near base and about four on apical half of posteroventral surface, the apical one of the last series strongest, the others weak; fore metatarsi slender except at base, and longer than the remaining segments combined. Wing as figure 1, the costal vein on the truncate apical section black and thicker than on the remainder of its course. Length, 5 mm.

Uapou: Hakahetau Valley, altitude 2500 feet, December 8, 1929, holotype male, Adamson; Hakahetau Valley, altitude 1000-2000 feet, January 29, 1930, 2 paratype males, Whitten.

6. Prochaetops unipuncta, new species (fig. 1, *d, e*).

Male

Type specimen greasy, but the general color reddish yellow, frons with a broad dark central vitta, third antennal segment fuscous except at base, aristae fuscous, palpi

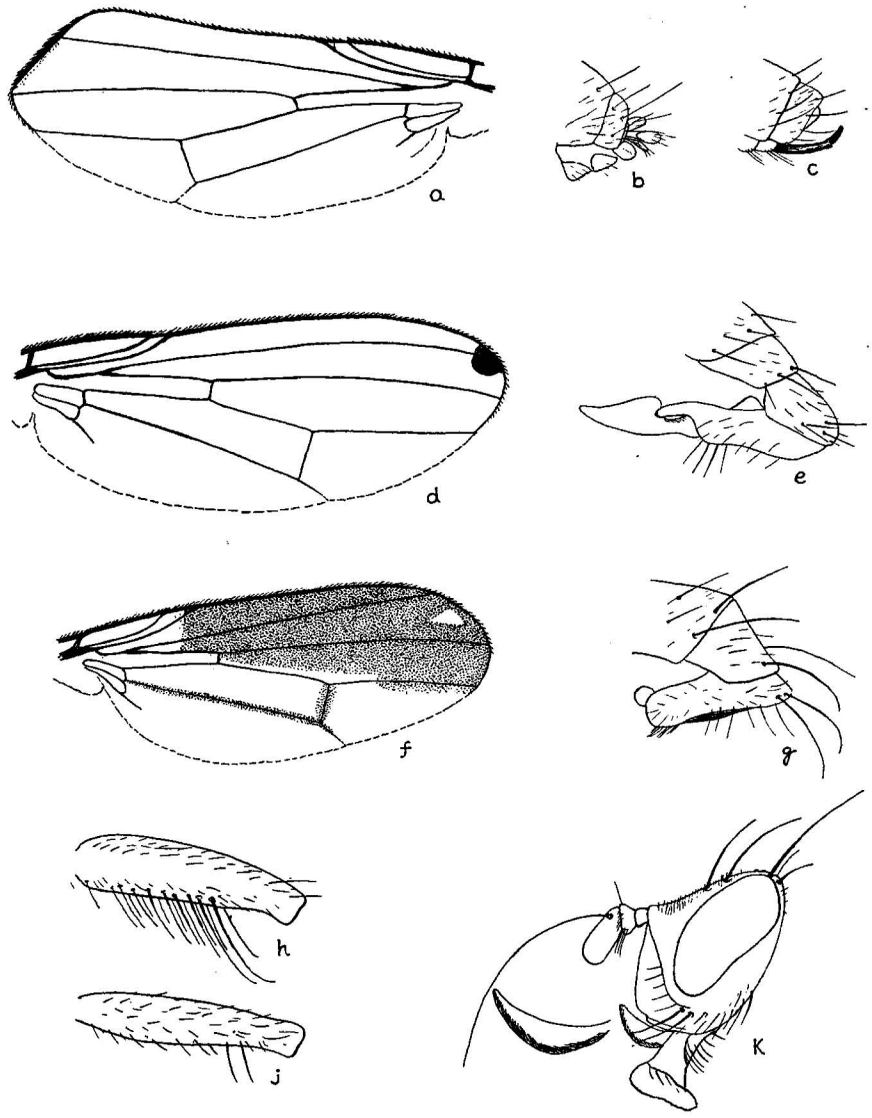


FIGURE 1. Features of Prochaetops: *a, Prochaetops* (*Prochaetops*) *adamsoni,* wing of male; *b, Prochaetops* (*Prochaetops*) species (*unipuncta*?), genital segments of female from the side; *c, Prochaetops* (*Prochaetops*) *armiventris,* genital segments of female from the side; *d, e, Prochaetops* (*Prochaetops*) *unipuncta, d,* wing of male, *e,* hypopygium of male from the side; *f-j, Prochaetops* (*Prochaetops*) *armatipes, f,* wing of male, *g,* hypopygium of male from the side, *h,* hind femur of male, *j,* hind femur of female; *k, Prochaetops* (*Prochaetopsis*) *tahuatae,* head from the side, below in front, left palpus.

yellow. Thorax with two broad fuscous dorsal vittae, disc of scutellum black, the sides yellow. Abdomen with a dark fascia on most of the tergites, hypopygium yellow. Legs yellow, tarsi paler than remainder. Wings glassy hyaline, with a round deep black spot at apex of second vein and a slight yellow tinge on the discal and adjoining cells, the veins fuscous. Squamae and halteres yellow.

Frons over 1.5 as long as its width at vertex, rather more narrowed in front than in the other species, the bristling similar; third antennal segment longer and more tapered apically than in the other species, its length fully three times as great as its basal width; aristae finely pubescent. Thorax as in preceding species, the intradorsocentral hairs in about six series, the prescutellar acrostichals well developed but not strong. Thorax short, tapered apically, hypopygium quite large, in type extending forward almost to base of venter (fig. 1, *e*), the bristling as in the other species. Legs not thickened, fore femur with a rather regular series of short bristles on the posteroventral surface which do not exceed in length the diameter of the femur and are rather widely spaced; fore metatarsus not attenuated nor as long as the remaining segments combined; mid and hind femora without well developed anteroventral bristles, some of the hairs setulose near apices. Wings as in figure 1, *d*. Length, 6 mm.

Hivaoa: Vaiepoepo, altitude 2500 feet, June 3, 1929, holotype male, Mumford and Adamson.

The male hypopygium in this species is much larger and therefore much more conspicuous than in any other now before me.

7. **Prochaetops armatipes,** new species (fig. 1, *f-j*).

Male

Head testaceous yellow, vertex, upper occiput, ocellar triangle, and a short stripe on upper part of each frontal orbit fuscous, with grey dusting; bristles and hairs on frons dark, hairs on lower occiput yellow; antennae and palpi clear yellow. Thorax testaceous yellow, mesonotum fuscous except on lateral margins, the dark discal part with grey dust and four darker vittae, scutellum fuscous on sides, yellow in center, and the disc with greyish dust; metanotum fuscous, grey dusted, with a dark vitta extending forward on each side below wing base. Abdomen fuscous, slightly shining, with some greyish dusting, the lateral margins of tergites, the venter, and most of the hypopygium testaceous. Legs testaceous yellow, the bristles fuscous. Wings clear at bases, on hind margin, and a small triangle in apex of submarginal cell, the remainder dark brown, and a paler brown cloud over outer cross vein and along fifth vein (fig. 1, *f*). Halteres brownish yellow.

Head of the same general form as in *anthrax,* the frons a little longer than its width at vertex, and slightly widened anteriorly, the ocellar bristles longer than the postvertical pair but not as long as the orbitals, the orbitals and verticals regularly spaced; third antennal segment about 1.5 as long as wide, regularly rounded at apex; aristae almost bare. Mesonotum with six series of intradorsocentral hairs, and a pair of quite well developed prescutellar acrostichals; propleural bristle well developed, yellow in color. Abdomen subcylindrical, the hypopygium bent forward below venter and rather large (fig. 1, *g*). All femora rather stout, fore pair with a complete posteroventral series of long bristles, mid pair with a similar series which is incomplete apically, hind pair with two series, one on the anteroventral and the other on the posteroventral surface as in figure 1, *h*; mid tibia with the preapical dorsal and apical ventral bristles both strong and long, the fore and hind tibiae with the preapical dorsal bristle long, but not as strong as on the mid tibia, the hind pair with a short rather stout and slightly curved apical anterior bristle which is brownish yellow in color; tarsi normal, the basal

segment of each pair subequal in length to the remaining segments combined; tarsal claws rather large. Wing venation as in figure 1, *f*.

Female

Differs from the male in having the frons with a broad central fuscous vitta, the third antennal segment darkened above, palpi dark at apices, and the femora less thickened and only the posteroventral bristles on the fore pair and two long anteroventral bristles on hind pair (fig. 1, *j*). Length, 4.5 mm.

Nukuhiva: Puokoke, Tunoa Ridge, altitude 3500 feet, October 22, 1929, holotype male; Ooumu, altitude 3500 feet, November 12, 1929, allotype female, Mumford and Adamson.

I assume that the difference in coloration of the head is a sexual one and that my association of male and female is correct, but a decision depends on further data on field collections.

8. Prochaetops armatipes claripennis, new variety.

Male

This variety differs from the typical form only in having the wings without dark markings.

Nukuhiva: Puokoke, Tunoa Ridge, altitude 3500 feet, October 22, 1929, type male, Mumford and Adamson.

The apex of abdomen is missing but I deduce from the characters agreeing with those of the male of *armatipes* that it is a male. It is slightly teneral but probably not sufficiently so as to cause the lack of wing markings.

It may be noted here that in all the other species already dealt with, there is a distinct apical anterior bristle on the hind tibia, but it is generally almost straight and always darker in color than in the present species.

9. Prochaetops setifemur, new species.

Male

A rather teneral specimen of a general testaceous yellow color, but with traces of two darker vittae on the mesonotum which extend over the sides of the scutellum as in some of the other species, the upper edge of the third antennal segment darkened, and the apices of palpi fuscous. Wings hyaline. Halteres yellow.

Structurally differing from the previously described species in having the third antennal segment about twice as long as wide, with the upper side slightly concave and the upper apical extremity slightly angulate, the lower apical extremity rounded; arista subnude; frons slightly narrowed in front. Intradorsocentral hairs in about six series, the prescutellar acrostichals quite long. Abdomen rather shrivelled so that the hypopygium is not visible. Fore femur with four or five short stout bristles on apical half or more of posteroventral surface, the other femora with fewer similar bristles on central section of same surface, and the hind pair with four or five on the apical half of anteroventral surface; tibiae and tarsi as in *armatipes*. Wing venation as in that species. Length, 5 mm.

Nukuhiva: Ooumu, altitude 4000 feet, November 13, 1929, holotype male, Mumford and Adamson.

10. Prochaetops species (fig. 1, *b*).

Female

This specimen may be a female of *unipuncta,* but it lacks the small black spot at the apex of the wing that characterizes that species, though this may be a sexual distinction. In other respects it agrees perfectly and I have a very strong suspicion that it belongs to *unipuncta.* The genital segments are as in figure 1, *b.* Length, 5.5 mm.

Hivaoa: Vaiepoepo, altitude 2500 feet, June 3, 1929, 1 female, Mumford and Adamson.

11. Prochaetops armiventris, new species (fig. 1, *c*).

Female

Head testaceous yellow, frons with a broad central fuscous or brown vitta, occiput with a large dark mark on each side above; third antennal segment dark at apex; palpi fuscous, yellow at bases. Thorax testaceous yellow, mesonotum with two broad fuscous sublateral vittae which are sometimes divided behind suture by a narrow yellow line into two narrower vittae, and occasionally fused on posterior margin, the disc of scutellum blackish brown, sides yellow; metanotum broadly blackened in center. Abdomen largely black on dorsum, with narrow apical fascia and more or less distinct central stripe on each tergite yellowish. Legs yellow. Wings hyaline, without distinct apical cloud. Halteres brownish yellow.

Head as in *anthrax,* the third antennal segment narrower and slightly tapered to apex where it is regularly rounded, its length about 2.25 as great as its basal width; arista pubescent. Intradorsocentral hairs in six series; prescutellar acrostichals moderately long. Abdomen subcylindrical, tapered apically, with bristles at apices of the tergites, the ovipositor prong-like as shown in figure 1, *c.* Legs normal, the fore femur with a series of posteroventral bristles of moderate length; neither the mid nor hind femora with ventral bristles. Wings rather broader than in the other species, of normal structure, the venation similar to that of *armatipes.* Length, 4.5-5 mm.

Hivaoa: Northeast slope of Mount Temetiu, altitude 2500 feet, July 24, 1929, holotype female; Teava Uhia i te Kohu, altitude 2100 feet, February 15, 1930, 5 paratype females on *Hibiscus tiliaceus*; Kopaafaa, altitude 2800 feet, July 2, 1929, Mumford and Adamson.

It would be of interest to find the male of this species, as it may depart more from the typical forms in structure than any of the others now before me.

PROCHAETOPSIS, new subgenus

This subgenus differs from *Prochaetops* in the structure of the head, the frons being much longer, more narrowed in front, and with the two orbital bristles closer together, the upper one being farther from the vertical bristle than from the anterior one, and the other being much farther from anterior margin of frons than from the upper bristle; the palpi are also peculiarly formed (fig. 1, *k*), and the jowl has one or two long and quite strong for-

wardly directed bristles below the eye. In other respects the two groups agree very well, minor distinctions being included in the description of the type species given below.

12. Prochaetops (Prochaetopsis) tahuatae, new species (fig. 1, *k*).

Male

Testaceous yellow, hardly shining. Frons pale brownish in center, parafacials fuscous; palpi with lower margin blackened. Mesonotum with the following black markings: two narrow submedian vittae which do not extend to posterior margin, a large subtriangular presutural mark on each side which does not extend over the humeri, and two slightly curved postsutural vittae which do not extend to posterior margin; pleura without dark markings; scutellum with a fuscous mark at apex; postnotum with two fuscous marks, one on each side, bristles and hairs black. Abdomen apparently slightly darkened on dorsum but all the specimens are teneral and it is not possible to distinguish the markings of the tergites if there are any. Legs pale testaceous. Wings hyaline, with a narrow dark brown stripe along the costa from a little beyond apex of second vein almost to apex of third, the veins fuscous. Halteres yellow.

Head in profile as in figure 1, *k*; frons over twice as long as its width at vertex, the surface with many very short fine hairs, sides convergent in front, ocelli very small and closely placed, the posterior pair not occupying over one-sixth of the width of vertex, the ocellar bristles undeveloped and the cruciate postverticals very short and fine, inner vertical much longer than the other bristles; arista very long and hair-like, nude. Thorax with the bristles as in the preceding genus, all long and strong, including the prescutellar acrostichals, intradorsocentral hairs in four to six series; scutellum not appreciably flattened on disc. Abdomen short and much tapered to apex, the apical bristles on the tergites quite strong; hypopygium small. Legs moderately strong, fore femur with a complete series of strong posteroventral bristles, and no preapical anteroventral comb; mid femur with a series of closely placed black setulae or short bristles on the entire extent of the anteroventral surface, and some very much weaker hairs on posteroventral surface; hind femur with four or five fine bristles on apical half of anteroventral surface; all tibiae with distinct preapical dorsal bristle, the apical ventral bristle of mid tibia long and strong; fore tarsus not as long as fore tibia, normal in form, the basal segment fully as long as the remaining segments combined, the tarsal claws not enlarged. Wing venation much as in *armatipes,* but the wing is narrower, the fourth vein bends down slightly at apex, and the costal division between apices of second and third veins is longer.

Female

Much darker than the male, the face and frons tinged with black, the thorax also fuscous with the same markings as in male black, and the scutellum tinged with dark color and deep black at apex. The legs are also infuscated, but the wings are without a trace of the black costal mark so prominent in the male.

Structurally similar to the male, but evidently the jowl has normally one instead of two bristles, the thoracic bristles are stronger and the mesonotal hairs more numerous, while the mid femur has not as evident a series of anteroventral setulae. Length, 5-6 mm.

Tahuata: Vaitupaahei, altitude 1800 feet, July 9, 1929, holotype, allotype and 5 paratypes, LeBronnec and H. Tauraa.

The sexual dimorphism here is very marked, but I am certain I have correctly associated the specimens.

NEW SPECIES OF CALLIPHORA FROM THE MARQUESAS, WITH NOTES ON SARCOPHAGA TAITENSIS SCHINER *

By

JOHN R. MALLOCH

BUREAU OF BIOLOGICAL SURVEY, U. S. DEPARTMENT OF AGRICULTURE

SUBFAMILY SARCOPHAGINAE

There is but one species of this subfamily before me from the Marquesas, and as there has been considerable uncertainty regarding the identity of it I append a few notes on the species.

Genus SARCOPHAGA Meigen

Sarcophaga taitensis Schiner.

This species has been recorded by Buxton[2] as *peltata* Aldrich, and I have revived for the Samoan species the name *taitensis* Schiner.[3] Townsend [4] in a recent paper has refused to accept this decision, stating that the characters cited by me and accepted as sufficient by Aldrich are "too slight to carry specific value." I have examined quite a large number of males from the Orient and South America and can not find any evidence that the peculiar fifth abdominal sternite of *peltata* with its almost straight sides and slightly bilobed apex approaches that of *taitensis,* which has two quite prominent rounded apical central lobes from the base of each of which the lateral outline is carried outward sometimes almost angularly; on both the lobes and on the subangular portions are a number of quite strong black bristles or spines. This was the basis for my separation of the two species and though there are in almost every part of the hypopygium more or less marked distinctions between them, I did not deal with the differences of the anal forceps as stated by Townsend. Aldrich [5] introduced this character, stating that "the forceps in *peltata* are wide in the middle when viewed from behind, while those of *taitensis* are narrow." Figure 2 shows the forceps from the outside and slightly in front.

It is not necessary to deal further with the specific distinctions, as it must be apparent to anyone who has both species before him that they are distinct though closely allied, but two other points raised by Townsend must be considered.

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[2] Buxton, P. A., Sarcophagidae, Insects of Samoa, pt. 6, fasc. 3, p. 147, 1929.

[3] Malloch, J. R., Exotic Muscaridae, Diptera, 27, Ann. Mag. Nat. Hist. ser. 10, vol. 4, p. 256, 1929.

[4] Townsend, C. H. T., Notes on American Oestromuscoid types, Rev. de Ent., Brazil, vol. 1, fasc. 1, p. 77, 1931.

[5] Aldrich, J. M., Notes on types of the American two-winged flies of the genus Sarcophaga . . ., Proc. U. S. Nat Mus., vol. 78, art. 12, p. 28, 1931.

* Pacific Entomological Survey Publication I, article 2.

The name used by Townsend is *obtusifrons* Thomson. This species was described from a female taken in the Galapagos Islands about 500 miles off the coast of south America. Aldrich[6] has reported upon this species represented by both sexes in the collection of the United States National Museum, and I have examined the material. Townsend uses the Thomson name, whereas Aldrich accepts the general custom as correct and gives Schiner's name priority. I agree with Aldrich. Schiner's species is the only one of the genus which I have seen from the Society Islands, removing any chance of error in the identification.

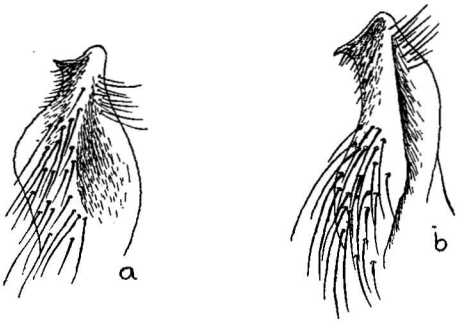

FIGURE 2. Superior hypopygial forceps from the side and slightly in front: *a, Sarcophaga peltata; b, Sarcophaga taitensis.*

Also, Townsend gives the prosternum of the Thomson type as bare. This is obviously an error of observation. In all examples seen by me there are fine but distinct hairs except on the anterior part of the prosternum as in most species of the genus.

Regarding the recognition of the genus *Oxysarcodexia* Townsend in which fall the two species under discussion, *peltata* being the genotype, it may be pertinent to say that the tibiae of the hind legs are distinctly villose, as pointed out by Aldrich, and that on this account they will not run out to the genus in Townsend's key to genera.[7] The concept appears to me to be merely a species group of much less value than generic rank.

Hivaoa: Mataovau, altitude 400 feet, May 31, 1929; Hanaheka [Tanaeka] Valley, altitude 1500 feet, June 4, 1929; Atuona Valley, altitude 300 feet, June 6, 1929; Teava Uhia i te Kohu, altitude 2100 feet, February 15, 1930; Mount Temetiu, northeast slope, altitude 3200 feet, September 13, 1929, Mumford and Adamson. Tahuata: Hanahevane Valley, seashore, July 16, 1930; Tehue Valley, altitude 650 feet, May 27, 1930; Kiinui Valley, altitude 1200 feet, June 14, 1930, LeBronnec and H. Tauraa. Fatuhiva: Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930; Hanavave Val-

[6] Op. cit.

[7] Townsend, C. H. T., Genera of the Dipterous Tribes Sarcophagini; Biol. Soc. Wash., Proc., vol. 30, p. 190, 1917.

ley, altitude 50 feet, September 8, 1930, LeBronnec. Nukuhiva: Ooumu, altitude 4000 feet, November 12, 1929, Mumford and Adamson. Uahuka: Putatauua, Vaipaee Valley, altitude 900 feet, September 20, 1929, Adamson; Hanahoua Valley, altitude 30 feet, March 9, 1931, LeBronnec and H. Tauraa. Eiao: uplands toward north end, east side, altitude 1,800 feet, September 29, 1929, Adamson.

SUBFAMILY CALLIPHORINAE

Genus **CALLIPHORA** Robineau-Desvoidy

There are two species of this genus before me, both of which are apparently undescribed.

Calliphora mumfordi, new species.

Male

Head black behind and with grey dusting, becoming orange-yellow in front, the frontal orbits densely greyish white dusted, the dust becoming silvery on the parafacials, interfrontalia blackish above, merging into orange-yellow near middle; jowls fuscous on the raised portion and with yellowish dust, the hairs all black, the parafacials and other parts of jowls and lower part of face orange-yellow, face infuscated above; antennae orange-yellow, third segment slightly browned above; palpi clear orange-yellow; beard yellow. Thorax shining black, with a blue tinge on the scutellum only, the surface with grey dusting, the mesonotum when seen from behind with a very narrow central black vitta, an interrupted linear black vitta along the lines of dorsocentrals, and a broader vitta of same color laterad of the latter which is distinct only in front; hairs and bristles black. Basal abdominal tergite black, the others metallic blue, with green and violet reflections, and the usual checkered white dust, the hairs and bristles black. Legs black, tibiae brownish yellow. Wings greyish hyaline, veins brown, yellow at bases. Calypteres brownish yellow, paler on margin of lower one; thoracic spiracles with orange-yellow flaps. Halteres yellow.

Eyes bare; frons at narrowest point as wide as third antennal segment, gradually widened to anterior margin, the inner verticals long, outer pair practically indistinguishable, ocellar and frontal bristles subequal in length; parafacials very finely and rather sparsely haired, as wide as third antennal segment, which is three times as long as second and normal in structure; arista long, plumose on basal half; palpi slender; jowls about one-third of the eye height. Thorax with the usual hairs and bristles, posterior sublateral bristle lacking, two pairs of presutural acrostichals present which are about as long and strong as the presutural dorsocentrals, postsutural dorsocentrals and acrostichals three pairs, anterior intra-alar strong; sternopleurals 2 + 1. Abdomen ovate, apical bristles present on central portion of all tergites but first visible one, fine on second and fourth, stronger on third; fifth sternite with the lobes rounded and without exceptional armature. Fore tibia with one submedian posterior bristle, mid tibia with one ventral, one anterodorsal, and two posterior bristles; hind tibiae lacking in the type specimen. Hairs on third vein confined to extreme base above and below. Length, 7 mm.

Nukuhiva: Ooumu, altitude 4000 feet, September 13, 1929, holotype male, Mumford and Adamson.

The pale face and antennae, reddish tibia, pale calypteres, and strong presutural acrostichal bristles will distinguish this species from any other in the genus.

Named in honor of the Director of the Pacific Entomological Survey.

Calliphora simulata, new species.

Male and Female

Head black, frontal orbits, parafacials, and occiput with grey to yellowish-grey dusting, the postocular orbits more distinctly white dusted, interfrontalia of female black or blackish brown, paler anteriorly; basal two segments of antennae and usually the extreme base of third reddish, remainder of third black; palpi testaceous yellow, in greasy specimens brownish yellow; hairs and bristles black, a few of the hairs in center of lower margin of back of head brownish. Thorax black, greasy in all specimens before me, but apparently with an aeneous tinge, slightly grey dusted, and without conspicuous vittae, the prothoracic and metathoracic spiracular coverings orange-yellow. Abdomen metallic blackish blue, fourth segment more distinctly blue, the dorsum without evident dusting. Legs black. Wings greyish hyaline, brown at bases to beyond humeral cross vein and to furcation of second and third, the cross veins not clouded. Squamae dark brown, the fringes of same color. Halteres fuscous.

Frons of male at narrowest point not nearly as wide as third antennal segment, the interfrontalia obliterated in part, the outer verticals lacking, inner pair long, ocellars undeveloped, orbits with fine hairs above, becoming longer and stronger anteriorly; frons of female about one-third of the head width, orbits narrow, with the usual bristles well developed, all four verticals and the ocellars present; parafacials not as wide as third antennal segment, finely haired; epistome projecting beyond outer margin of antennae when the latter are in normal position; vibrissae long, with several setulae above them extending to about middle of face; jowls black, slightly dusted, and with black hairs; palpi almost linear; third antennal segment about four times as long as second; arista plumose, bare on apical third. Mesonotum with the usual bristles, the posterior sublateral bristle present, the presutural acrostichals in two pairs, sometimes with a weaker anterior third pair present; otherwise as the preceding species. Abdomen as in the preceding species, but the apical bristles on the third visible tergite longer and stronger. Length, 7.5-8.5 mm.

Uapou: Hakahetau Valley, altitude 1000-2000 feet, January 31, 1930, holotype male, allotype female, and 1 paratype male, Whitten; same locality, December 6, 1929, 1 paratype male, Adamson.

Besides the above specimens there are four females that differ from the allotype in being larger, 9.5 mm. in length, and in having the abdomen bronzy instead of bluish. Three of them have the frons more conspicuously reddish yellow in front, and the dust on the orbits and parafacials more pronouncedly yellow. It is possible that these represent a distinct species, but in the absence of males for dissection it is not possible definitely to decide this.

The three specimens that diverge most from type are from Hivaoa: two from Matauuna, one 3760 feet, August 1, 1929, the other 3800 feet, March 2, 1930; and one, Mount Temetiu, 3620 feet, July 24, 1929, Mumford and Adamson. The other specimen which does not agree absolutely with either lot is from Uapou: Teava Uhia i te Kohu, 3000 feet, December 8, 1929, Mumford and Adamson.

This species in the typical form closely resembles *Lucilia nosocomiorum* Doleschall, of which I believe *inducta* Walker is a synonym.

ON TWO NEW SPECIES OF PROTERHINUS FROM THE MARQUESAS AND THE INCLUSION OF THIS GENUS IN THE FAMILY AGLYCYDERIDAE *

By

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Using the family name Aglycyderidae to include the Proterhindae, the species therein contained are chiefly found in the Hawaiian islands, where the genus *Proterhinus* is represented by a great variety of forms. The two earliest known species, however, belonged to the genus *Aglycyderes* and were described, one from the Canary Islands (*A. setifer* Wollaston) and the other (*A. wollastoni* Sharp) from New Zealand, where subsequently a second species was discovered. For many years the genus *Proterhinus* was known only from Hawaii, but nearly thirty years ago a species was discovered on Samoan coconuts. This species does not appear to present any very striking characters to distinguish it from Hawaiian species, though at present only the male sex is known. In 1924 a much more remarkable form was discovered by E. H. Bryan, Jr., in the Phoenix Islands.[8] The two new species described below extend the distribution of the genus still further, being recent discoveries by Mumford and Adamson in the Marquesas. Each of these species, in one way or another, exhibits remarkable characters. I have recently been able to make some comparison between the two first described species of *Aglycyderes* and the Marquesan and Phoenix Islands *Proterhinus*. The fore part of the head of the male in the insect from Phoenix Islands and in one of the Marquesan species bears a very considerable resemblance to that of *A. wollastoni* of New Zealand and differs greatly from any known Hawaiian *Proterhinus,* in which the sides of the head immediately in front of the eyes are so rounded as to form an expansion or feeble lobe over the insertion of the antennae. This feature is not present in *Aglycyderes,* where the outline is almost straight, nor can it be said to exist definitely in *Proterhinus phoenix,* the fore parts of the male head of which so greatly resemble *Aglycyderes.* On the other hand, both Marquesan species are obviously like Hawaiian species in this expansion, although in the face of the male one of them approaches the Phoenix

[8] Perkins, R. C. L., Descriptions of New Hawaiian Coleoptera, Hawaiian Ent. Soc. Proc., vol. 7, p. 511, 1931.

* Pacific Entomological Survey Publication I, article 3.

Islands species. It would appear therefore that the form from Phoenix Islands and also one of the Marquesan forms do make a connecting link between Hawaiian *Proterhinus* and the New Zealand *Aglycyderes* and it might be questioned whether the New Zealand form is not as distinct from its Canary Islands congener, as it is from *P. phoenix*. As it is, the essential difference between *Aglycyderes* and *Proterhinus* would appear to be in the development of wings in *Aglycyderes,* while *Proterhinus* is flightless. Neither the male nor the female of *Aglycyderes* has a definite rostral portion of the head, whereas in females at least of typical *Proterhinus* there is a true and distinct beak; but in the males of the *Proterhinus* there is not very much difference between the rostral portion of the head and that of females of *A. wollastoni.* In one species at least of Hawaiian *Proterhinus* the female resembles the male in the rostral portion of the head, and the sexes are hardly to be distinguished without dissection, and in a few the female rostrum is short and broad and not more developed than in males of some other species. Although *P. phoenix,* male, so greatly resembles that of *Aglycyderes wollastoni* in the form of the head anteriorly, yet its female has a very well developed rostrum, quite distinct from the rest of the head. In the Marquesan species, which has a somewhat similar form of head, the female has a much shorter rostrum, not exceeding in length the rostral portion of the male head of some Hawaiian *Proterhinus.* The sculpture in general of the Phoenix and Marquesan *Proterhinus* is unlike that of *Aglycyderes wollastoni,* whose sculpture is almost reproduced in some Hawaiian *Proterhinus.* In such Hawaiian species the pronotum in sculpture and form may also greatly resemble *Aglycyderes,* and it is notable that such species of *Proterhinus* are to be found among those which in my earliest studies of the genus I considered to be the most primitive members of the Hawaiian series. The clothing of *Aglycyderes* resembles that of *Proterhinus* in the appressed, curved, thickened setae, often hyaline, as well as in the erect clothing, which is present also on the eyes of most, if not all, species, unless abraded. *A. wollastoni* is remarkable for its antennae, the scape hardly extending beyond the sides of the head, being hidden, or only the extreme tip visible, in dorsal aspect. The sculpture of *A. setifer* is unlike that of any other of the family, the surface in profile being everywhere coarsely shagreened, due to minute elevations; the setae on the eyes are not prominent, but closely appressed. The denticulations along the sides of the pronotum are to be found, though less strong, in some of the more primitive Hawaiian forms. The excretion which, in the specimens I have examined, largely conceals the surface of *A. setifer* is a good deal similar to that on many Hawaiian *Proterhinus.*

Proterhinus mumfordi, new species (figs. 3, 4).

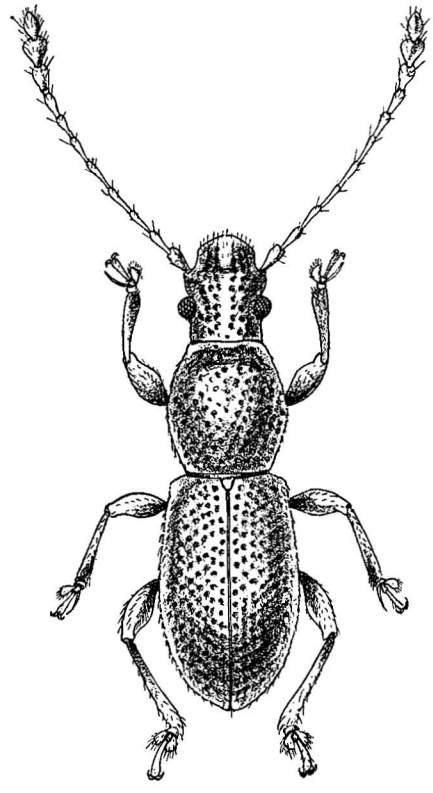

FIGURE 3. *Proterhinus mumfordi* new species male, × 32.

Black, becoming red or reddish in parts, the pronotum obscure reddish, as also the head in front of the antennae, which are clear rufotestaceous; the femora at base and apex, the tibiae and tarsi also rufescent. A narrow, elongate species, sparsely clothed with appressed pale setae, no doubt considerably abraded in the single specimen obtained. On the four anterior legs the second tarsal joint has the posterior lobe modified to form a narrow spine-like process, which extends back beyond the normal lobe as far as the apex of the claw-joint. Female unknown.

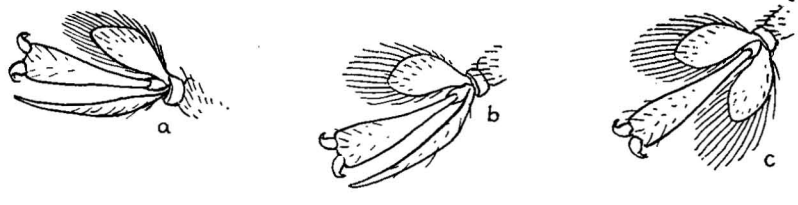

FIGURE 4. *Proterhinus mumfordi* new species, tarsi of left side: *a,* foreleg; *b,* middle-leg; *c,* hind-leg, × 100.

Rostral portion of head short and transverse as in most male *Proterhinus* and defined, as usual, by the clothing and sculpture, and also by its color; eyes rather large, the antennae long, longer than the head and pronotum together, the scape and all the funicle joints elongate, the first of these notably stouter than the second, but subequal in length, the following joints also subequal, but the apical ones become stouter apically and the last is stouter and rather shorter than the preceding and also shorter and considerably less stout than the first of the three club joints. The pronotum is rather narrow, with evenly rounded sides and appearing almost elongate, though really about as long as its greatest width, nearly devoid of clothing in the type, and with coarse punctures, but not definite impressions. The surface is partly covered with gum and the unique type, being apparently already abraded, has not been subjected to cleaning or manipulation by me. The elytra, which are simply convex, without ridges, elevations, or impressions, bear appressed white setae, sparsely distributed, and there are also very short, white, erect ones observable along the sides and posteriorly. The humeral angles are not at all produced or acute and the length of the elytra is equal to that of the head and pronotum together, or about twice their own basal width. The punctures are less close and coarse than in many species and appear considerably less so and less definite than those of the pronotum. The basal abdominal sternites appear to be smooth and shining in the middle and bear little or no definite sculpture there. Length, 2 mm.

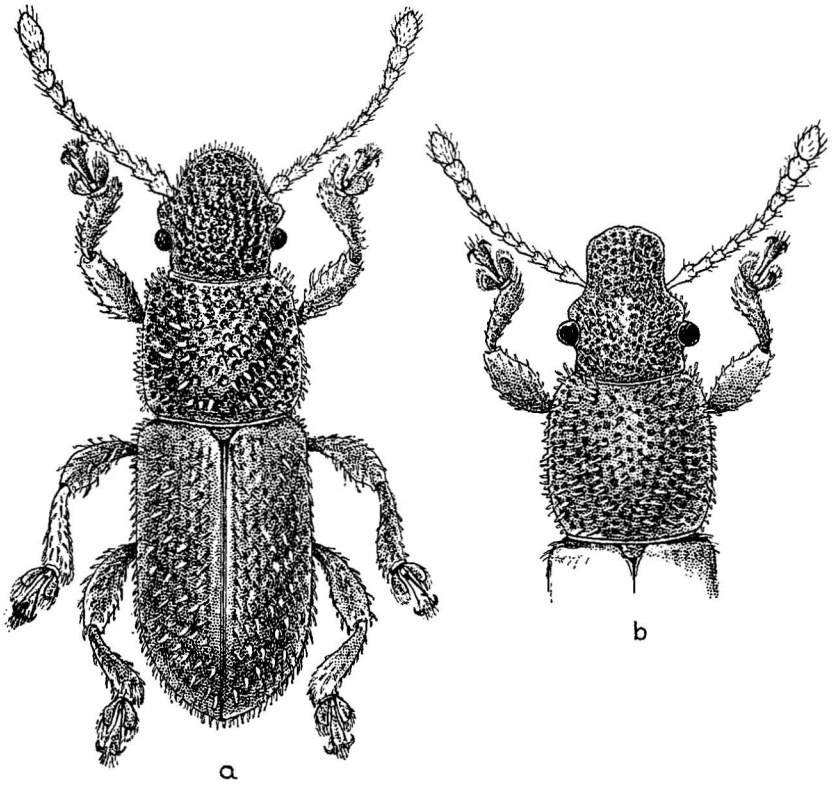

FIGURE 5. *Proterhinus adamsoni* new species: *a*, male, × 32; *b*, female, × 32.

Nukuhiva: Oumu, altitude 3600 feet, November 10, 1929, taken by miscellaneous sweeping, holotype male, Mumford and Adamson.

Proterhinus adamsoni, new species (fig. 5).

A small, narrow and elongate species of an obscure red color more or less infuscated in parts, the legs and antennae red. Head of male in front view very wide, the apical part being subsemicircular in outline and not at all rostrate, the female with a short but distinct rostrum, nearly parallel-sided and coarsely subrugosely punctate.

Head sparsely clothed with pale decumbent setae; antennae of moderate length, reaching back to the hind margin of the pronotum in the female, the scape elongate and clavate, much longer than the ovate second joint, the third more slender than this, the club distinctly three-jointed, its basal joint being notably longer and stouter than the preceding. Pronotum straight or hardly at all rounded at the sides, longer in the female than in the male, but probably variable in this character, vaguely flattened or impressed in the middle posteriorly, coarsely punctured, but more sparsely in the female than in the male of the pair examined. The clothing is not dense and consists of pale appressed setae, which, as usual, are wide and curved in form and glassy, as seen under a compound microscope; along the margins somewhat similar outstanding setae are notable. Elytra ordinarily convex or cylindrical, basally with subparallel sides, the humeral angles not produced nor acute, the clothing white and sparse, similar to that on the pronotum, the erect setae short, but conspicuous at the sides and apically, the punctures somewhat fine and indefinite, and in some aspects in the female they are seen to be arranged in somewhat oblique longitudinal series. Legs with the short, white, erect setae numerous, and no special modification of the tarsi. Basal sternite of abdomen with sparse, feeble, or obsolete punctures. Length, 2.2 mm.

In the shape of the head of the male, this species bears considerable resemblance to *P. phoenix* of the Phoenix Islands, and, to a certain extent, in the form of the pronotum, but the legs show no special modification. The spinose armature of the basal tarsal joint in the male of *P. phoenix* and the modification of one lobe of the second joint into a spine in *P. mumfordi* are very remarkable.

Hatutu [Hatutaa]: middle of east side of island, altitude 800 feet, September 30, 1929, on *Waltheria lophantus,* two males including the holotype, allotype female, Adamson.

The type specimens of both species have been deposited in Bernice P. Bishop Museum.

MICROGONUS, NEW GENUS, AND RHYNCOGONUS, FROM THE MARQUESAS *

By

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GENERAL RELATIONS

The genus *Rhyncogonus* and the related *Microgonus* are both members of that large group of broad nosed weevils belonging to the subfamily Brachyrhininae (Otiorhynchinae) of the family Curculionidae. In using the term Brachyrhininae, I am following Pierce.[9] The genus *Rhyncogonus* was established in 1885 by Sharp[10] for the reception of two Hawaiian species and redefined in 1919 by the same author.[11] Later other species from the Hawaiian islands were discovered, so that now thirty-three species from this archipelago are known. Most of these are from the islands of Kauai and Oahu, but others have been found on Molokai, Lanai, and Hawaii, and on the smaller islands, Necker, Laysan, and Nihoa and the distant Wake Island. The peculiarities of these have been noted by Perkins[12] and need not be repeated here except as they will serve as a basis for comparison with species with which this paper is to deal.

Besides the Hawaiian species and *R. fallax* Perkins from Wake Island, one species of *Rhyncogonus, R. gracilis* Perkins, has been described from Rapa, six species from the Marquesas, and one species, *R. planidorsis* Braun, from the Kermadec Islands. The members of the Pacific Entomological Survey have added considerably to this list, collecting not only all of the species previously described from the Marquesas, but seventeen additional species of *Rhyncogonus,* increasing the number now known from the Marquesas to twenty-three species. The Entomological Survey has also obtained one species of the same genus from Tahiti,[13] and a species of a related but

[9] Pierce, W. D., Miscellaneous contributions to the knowledge of the weevils of the families Attelabidae and Brachyrhinidae: U. S. Nat. Mus., Proc., 45, pp. 365-426, 1913.

[10] Blackburn, Thomas, and Sharp, David, Memoirs on the Coleoptera of the Hawaiian islands: Roy. Dublin Soc., Sci. Trans., 3, pp. 176-177, pl. 5, fig. 28, 1885.

[11] Sharp, David, Studies in Rhynchophora, 5, The genus Rhyncogonus: Hawaiian Ent. Soc. Proc., vol. 4, pp. 77-82, 1919.

[12] Perkins, R. C. L., Description of two new species of Rhyncogonus (Otiorhynchinae); Ent. Monthly Mag., 35, pp. 56-57, 1899. Coleoptera Rhyncophora: Fauna Hawaiiensis, vol. 2, pt. 3, pp. 122-130, pl. 7, 1900. Coleoptera (Various): Fauna Hawaiiensis, vol. 3, pt. 4, pp. 650-653, 1910. A new Hawaiian Rhyncogonus (Coleoptera-Rhyncophora): Hawaiian Ent. Soc. Proc., vol. 5, p. 379, 1924. Coleoptera, weevils: B. P. Bishop Mus., Bull. 31, pp. 53-66, 1926. Notes on Hawaiian Coleoptera (Curculionidae, Proterhinidae, and Cerambycidae) and descriptions of new species: Hawaiian Ent. Soc. Proc., vol. 6, pp. 465-468, 1927. Species of the Coleopterous genus Rhyncogonus Sharp (Curculionidae), from the Marquesas Islands: Ann. Mag. Nat. Hist., ser. 10, vol. 1, pp. 123-129, 1928.

[13] Van Dyke, E. C., Rhyncogonus submetallicus, new species, manuscript, Bernice P. Bishop Museum.

* Pacific Entomological Survey Publication I, article 4.

new genus from the Marquesas. All of their material in the genus *Rhyncogonus* and the related *Microgonus* has been kindly referred to me by E. P. Mumford and A. M. Adamson of the Pacific Entomological Survey and forms the basis of this paper. To assist me further, O. H. Swezey of the Hawaiian Sugar Planters' Association Experiment Station has sent me numbers of the Hawaiian species which, with what I have from those islands, will give me a good series to serve as a basis for comparison. E. H. Bryan, Jr., of Bernice P. Bishop Museum, has furnished much important information.

Rhyncogonus appears to be one of the most characteristic genera of Polynesian Rhynchophora. The species comprise some of the largest of Polynesian weevils, and in the different archipelagos they vary or diverge in such different ways that they make a most interesting and instructive group to study. All of the Hawaiian species which I have been able to study have the following features which are more or less characteristic: the first and second funicular segments subequal in length, or, if unequal, the first longer; the elytral punctures generally arranged in rows, especially in the striae; the abdominal sculpturing quite similar in both sexes; and the pilosity also much the same in both sexes. The Hawaiian species fall into three rather distinct groups: first, large, somewhat elongate, and in general more or less glabrous species such as *blackburni* Sharp and *nitidus* Sharp; second, smaller, shorter, much more flattened or depressed, and slightly pilose species like *vittatus* Perkins; and third, short, very convex or bulbous, and quite pilose species like *alternatus* Van Dyke and *extraneus* Perkins. The species from Tahiti is of a generalized type, a moderately elongate, very convex species, simulating in general proportions the members of group three of the Hawaiian species. It has, however, certain characters that are peculiarly its own, such as submetallic elytra and a sharply defined and narrow elytral margin. In its antennae, where there is a longer second than first funicular segment, it simulates most of the Marquesan species, and it also resembles one of the Marquesan species, *plumbeus,* from Eiao, in its general shape and sparse yet uniformly dispersed pubescence, and *duplex* Perkins and certain other members of group *B* (p. 25) of Marquesan species in having somewhat reduced and slightly convex eyes. The Marquesan species as a whole have the first and second funicular segments unequal, the second generally much the longer, contrasting very definitely with the Hawaiian species. The elytral punctures are generally irregularly dispersed, and the basal abdominal segments in the male are definitely sulcate, glabrous, and granular or rather conspicuously studded with small tubercles, whereas in the female the same segments are flat or even convex and, in many, moderately hairy. This sexual dimorphism is never very marked in any of the Hawaiian species. In group *B,* the dominant group in the Marquesas, there is in

addition often a marked sexual difference as regards the color of the pile. In groups *B* and *C* there is also a double type of pile, a more or less dense, closely appressed pile with long and erect hairs somewhat serially arranged along the intervals. This serial arrangement, though evident in many of the Hawaiian species, is never so marked as it is in some of the Marquesan species. The Marquesan species thus show both as a whole and as individual species that they stand well apart from those of Hawaii. They have a common ancestry to be sure, but it hardly seems possible that one could have been derived from the other, though certain species of each assemblage show close resemblances here and there. These will be discussed later on. As to the origin of the Marquesan species as a whole little can be said with confidence. We need more knowledge with regard to the insect faunas of the islands to the west before we can speak with assurance. The probabilities are, however, judging from certain resemblances between the genus *Rhyncogonus* and other genera found in the western part of Polynesia, as brought out by Sharp, that the center of dispersal was at some point in western Polynesia. It is also barely possible that the ancestral home of the genus was Antarctica.

The Marquesan species of *Rhyncogonus* may be assembled into four rather well characterized groups:

A. A group with what I would call generalized features, moderately elongate, moderately convex, and without any extremely divergent peculiarities, containing but one species.

B. A group containing species which have a tendency to become quite elongate, often with somewhat prolonged elytral apices, with a rostrum that is generally longer than broad, eyes large yet often only slightly convex, and a marked degree of sexual dimorphism, containing fourteen species.

C. A group containing species which are in general smaller than those of group *B*, with the upper surface generally more or less flattened and the margin of the elytra more decidedly carinate, the rostrum about as broad as long, the eyes of moderate size yet always very convex, in a few species obliquely flattened in front, and with the vestiture often scale-like rather than hairy, containing six species.

D. A group of small, convex, and quite glabrous species, containing two species.

In addition, *Microgonus* is a genus containing one species which bears a superficial resemblance to the members of group *D* but is otherwise divergent from any members of the genus. In group *A* the single species, *R. plumbeus* new species, bears a superficial resemblance to *R. submetallicus* new species from Tahiti, being of moderate length and robustness, quite convex, and having well rounded outlines. It also resembles *R. submetallicus* in being generally clothed with a sparse yet rather uniformly distributed pile. This insect might also be compared with some of the members of the third group

of Hawaiian species as regards the general form, shape of prothorax, and somewhat uniform type of pilosity. The single species of group *A* has, of course, many definite characters of its own, but these will be mentioned later. Group *B* is not only the dominant but likewise the most characteristic group of the Marquesan species. Some of the larger species are in general shape much like *blackburni* Sharp of the first group of Hawaiian species, but widely separated as to details. In group *B* are found the most marked sexual dimorphism and sexual dichromatism, also the greatest development of the double type of pilosity, the narrowing and prolongation of the elytra, especially in the males, seen in the extreme in the males of *navicularis* Marshall (fig. 7, *d*), and the great lengthening of the second funicular segment. There is also a great variation as regards the size and convexity of the eyes within the group; this is to be noted in the *blackburni* group of the Hawaiian islands, though to a lesser degree. In group *C* are six known species which show a relationship to the second group of Hawaiian species. *Rhyncogonus walkeri* Perkins of the Marquesas very closely simulates in form and general appearance the rather small, broad, and flattened Hawaiian species such as *R. vittatus* Perkins. However it possesses to a well marked degree the dominant peculiarities of the Marquesan species: a pronounced sexual difference as regards the ventral segments, the long second funicular segment of the antennae, and the irregularly dispersed punctures of the elytra. *R. planatus* (fig. 7, *e*) is the most divergent of the species of group *C*, many males having the elytra absolutely flat, a condition which is not closely approached by any Hawaiian species. Group *D* is the most specialized group of the entire genus. The species are small, moderately convex, and almost entirely smooth, contrasting so greatly with the other members of the genus that I was at first inclined to believe that they did not rightfully belong in it. However, they have not only all of the essential characters of the genus but also most of the specialized features of the Marquesan group. The single species of *Microgonus* also superficially resembles the two species of group *D*. It has certain specialized characters, however, which widely separate it from all members of the genus, thus warranting the erection of a new genus for its reception.

The geographical distribution of the Marquesan species of *Rhyncogonus* within the Marquesas is somewhat parallel to that of the Hawaiian species in the Hawaiian islands and in general to that of most endemic Rhyncophora on oceanic islands. For instance, all species are restricted to single islands, many to certain small areas on the islands, and where many species are found on an island certain of the individual species may be more widely separated from each other than they are from some of the species to be found on the other islands. Table 1 shows the distribution of the Marquesan species.

Table 1. Distribution of Marquesan Species of *Rhyncogonus* and *Microgonus*.

Island	Species	Group	Island	Species	Group
Eiao	Rhyncogonus plumbeus	A	Hivaoa	Rhyncogonus mimus	B
Eiao	Rhyncogonus brunneus	C	Hivaoa	Rhyncogonus mumfordi	B
Hatutu [Hatutaa]			Hivaoa	Rhyncogonus navicularis	B
	Rhyncogonus perkinsi	C	Hivaoa	Rhyncogonus corvus	B
Nukuhiva	Rhyncogonus walkeri	C	Hivaoa	Rhyncogonus lugens	C
Nukuhiva	Microgonus oodemaformis New genus		Hivaoa	Rhyncogonus pygmaeus	D
			Tahuata	Rhyncogonus oppositus	B
Uahuka	Rhyncogonus planatus	C	Tahuata	Rhyncogonus uniformis	B
Uahuka	Rhyncogonus aeneus	D	Fatuhiva	Rhyncogonus eximius	B
Uapou	Rhyncogonus griseus	B	Fatuhiva	Rhyncogonus duplex	B
Uapou	Rhyncogonus lateralis	B	Fatuhiva	Rhyncogonus cinereus	B
Hivaoa	Rhyncogonus ochraceus	B	Fatuhiva	Rhyncogonus cuneatus	B
Hivaoa	Rhyncogonus adamsoni	B	Fatuhiva	Rhyncogonus brevis	C

By consulting Table 1 and the map (fig. 6) at the same time, a better understanding may be had of the true distribution of the various species and its significance. In group *A* the one species, *plumbeus,* a generalized species, does not seem to be closely related to any of its fellows in the Marquesas but shows a somewhat close affinity with the Tahitian species, *submetallicus,* and a more distant relationship to the third group of Hawaiian species. Species of group *B,* in which are to be found the greatest number, as well as the most characteristic Marquesan species, are limited to the southwestern islands: Uapou, two species; Tahuata, two species; Hivaoa, six species; and Fatuhiva, four species. On Uapou and Tahuata the members of group *B* are the only species so far found, but on Hivaoa and Fatuhiva other groups are represented. The flatter species of group *C,* those resembling to a considerable degree many of the Hawaiian species, are to be found only on the northern and eastern islands: Hatutu, one species; Eiao, one species; Nukuhiva, one species; Uahuka, one species; the most divergent of the group, Hivaoa, one species; and Fatuhiva, one species. Species of group *D,* the only two representatives and the most unlike the remainder of any of the groups, are to be found on Uahuka and Hivaoa. The only species of *Microgonus,* a species which simulates the species of group *D,* is limited to Nukuhiva. The island of Mohotani has no species. Thus, the distribution within the archipelago is not a haphazard one, which indicates that the islands have been settled in an orderly manner. That certain groups are more or less confined to rather definite parts of the archipelago would lead one to believe either that for each group there was a definite center of origin in one large primitive island or that the ancestor of each somehow found a lodgment upon one island and the various derivatives were dispersed from this location. The original settlement,

judging from the degree of specialization, must have occurred at a very early period, early Pliocene if not Miocene.

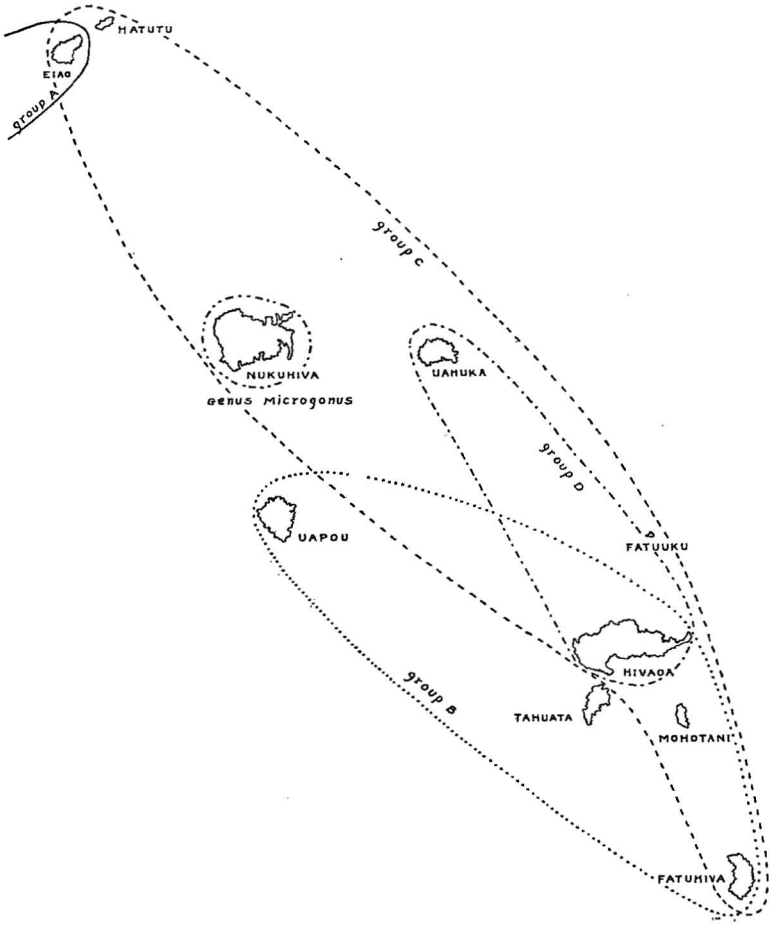

FIGURE 6. Map of Marquesas Islands showing distribution of *Microgonus* and of species of *Rhyncogonus* by groups.

RHYNCOGONUS Sharp

This genus, as indicated by Sharp,[14] belongs to the subfamily Brachyrhininae (Otiorhynchinae) of the family Curculionidae, and has the following peculiar or differentiating characters: a robust and short rostrum, as broad as long or but slightly longer, dilated apically, with the scrobes confined to pterygia; the antennae very long, the scape much elongated, and the club

[14] Blackburn, Thomas, and Sharp, David, Memoirs on the Coleoptera of the Hawaiian islands Roy. Dublin Soc. Sci. Trans., 3, pp. 176-177, 1885.

elongate fusiform; the submentum broad and quite flat, widely separated from sides of head by deep buccal cavities thus exposing the outer portion of the maxillae for their entire length, the buccal cavities also extending backwards beyond base of submentum enabling the latter to have a distinct gular peduncle; the anterior coxae approximate, the middle rather narrowly separated, and the posterior very widely separated; the hind tibiae with apical truncature broad, not interrupted or prolonged above and with corbels not cavernous.

According to Sharp this genus should be placed in a new tribe of weevils, that of the Rhyncogonini (Rhyncogonides of Sharp), and in this I concur. It differs from the tribe "Otiorhynchides vrais" of Lacordaire [15] and all other tribes associated with it by the deep buccal cavities and exposed maxillae, resembling in this regard the members of the tribe Celenthetides of Lacordaire. It, however, differs from this tribe as well as from those associated with it by not having the corbels of the posterior tibia cavernous. Its position is well summed up by Sharp [16]:

> Some of the Celeuthetides have the mouth not completely Adelognathous (e.g., *Elytrurus*), and it is probably to these that *Rhyncogonus* is nearest, but the Celeuthetides have also the corbels more or less modified whereas they are quite simple in the Hawaiian genus. The Celeuthetides are specially characteristic of the Polynesian area, and we shall not be far wrong I believe if we consider that *Rhyncogonus* is a Celeuthetid form, with more simple (or primitive) conditions of the mouth and tibiae.

The general and special characters useful in separating the species are: the general size, shape, and proportions; the shape of head; rostrum, and proportionate length of the various segments of the antennal funicle; the size of eyes, degree of convexity, and curvature; the shape, ornamentation, and sculpturing of prothorax; the shape, type of margin, degree of convexity, sculpturing, and pilosity of elytra; and the modifications of the abdomen and legs. The males are in general smaller and narrower than the females and as a rule flatter; they have the apices of the elytra more sharply pointed; a certain proportion of males have the base of prothorax but little wider than apex, whereas it is distinctly wider in the female; the pilosity of upper surface of males is generally sparser and in many males is of a grayish tint, in contrast to a rather dense, more or less fulvous pubescence in the female, and the male abdomen beneath is more glabrous, the anterior segment of many is quite sulcate, and the general surface is studded with granules, the females on the other hand having the surface flattened at the most, generally finely pubescent, finely punctured, and often somewhat scabrous.

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[15] Lacordaire, J. T., Hist. nat. d. Ins. Genera des Coléoptères, Paris, 6, Curculionides, p. 145, 1863.

[16] Sharp, David, Studies in Rhynchophora 5, The genus Rhyncogonus: Hawaiian Ent. Soc. Proc., vol. 4, pp. 77-82, 1919.

Synoptic Key to Species

1. Moderate or rather large, 10-19 mm. in length, and generally more or less pilose — 2
   Smaller, less than 9 mm. in length, very convex, smooth and shining — 24
2. The disk of elytra rather evenly convex, not markedly flattened toward sides — 3
   The disk of elytra more or less flattened, especially toward sides and in males; rostrum as broad as long; pile often scalelike — 20
3. Elytra quite convex from side to side; sides evenly arcuate from humeri to apices; apices but little produced; sparsely pubescent — 4
   Medium or large; the elytra but moderately convex at center, somewhat flattened toward sides in females, and apices distinctly narrowed; often quite densely pubescent — 5
4. Black; sides of elytra not margined, and disk densely, somewhat irregularly punctured with large and small punctures; eyes prominent; the surface sparsely and evenly pilose; Eiao — **1. plumbeus**
5. Larger, less convex, 13 mm. or more in length; pile more or less dense at least laterally in females — 6
   Smaller, more convex, 12 mm. or less in length; rather sparsely though somewhat uniformly pilose — 15
6. The pile of fresh specimens more or less uniformly dispersed over upper surface, in females generally denser and more fulvous in contrast to the gray pile of males — 7
   The pile even in fresh specimens more or less localized to the sides of upper surface; the sutural region of elytra quite glabrous; the pile of some females somewhat fulvous — 13
7. Base of prothorax distinctly narrower than middle in males; funicular segments robust, the outer not more than one and one-half times as long as broad; eyes but moderately prominent; black; more or less rugose; moderately clothed with depressed fulvous pile and sparser, longer, erect white hairs; Fatuhiva — **2. eximius**
   Base of prothorax hardly if at all narrower than middle even in males; funicular segments elongated, the outer about twice as long as broad — 8
8. Eyes prominent, standing well out from head — 9
   Eyes not prominent, less convex, projecting but little beyond lateral margins of head — 11
9. Anterior tibiae unarmed on inner face; eyes almost hemispherical; lateral margin of elytra very distinct; female upper surface rather densely clothed with ochraceous pile; Hivaoa — **3. ochraceus**
   Anterior tibiae armed on inner face with series of serrations or small sharp spines; the eyes prominent but not hemispherical; sides of elytra hardly more than carinate, the margin vague — 10
10. Anterior tibiae merely finely serrate on inner face near apex; males rather sparsely clothed with long, erect and short, depressed, cinereous pile; females more densely clothed with light, fulvous depressed pile and longer erect cinereous pile; Tahuata — **4. oppositus**
    Anterior tibia armed on inner face near apex with series of small, acute spines; both males and females clothed with cinereous pile, the depressed hairs arranged roughly in a vittate manner, the longer erect hair rather shorter than in the preceding species and irregularly dispersed; Hivaoa — **5. adamsoni**
11. Eyes evidently convex; head broader through eyes than posterior to eyes — 12
    Eyes very slightly convex; head narrower through eyes than posterior to eyes; prothorax with sides gradually convergent forward in both sexes; males clothed with double type of cinereous hairs, the long erect hairs almost as abundant as the depressed; the females more densely clothed with fulvous, depressed pile, the semi-erect hairs short and sparse; Fatuhiva — **6. duplex**

12. Prothorax gradually narrowed forward in both sexes; both sexes also clothed with fulvous pile, slightly more dense in females, the erect hairs short and sparse; Hivaoa ..... **7. mimus**

    Prothorax broadest at center in both sexes, though narrower at apex than base; both sexes clothed with cinereous pile, the depressed hairs moderately dense, the erect hairs long and abundant but slightly shorter and less evident in females; Fatuhiva ..... **8. cinereus**

13. Sides of elytra distinctly carinate and margin narrow but well marked from base to apex; pile sparse, slightly more evident at sides; Hivaoa..... **9. mumfordi**

    Side margin of elytra rather evenly rounded and subcarinate only at middle if at all; the pile more or less dense at sides and almost absent at center of body 14

14. Elytra much prolonged and narrowed behind in males, broader and less arched toward sides in females; the disk of elytra irregularly punctured and scabrous; the pile limited to sides in males, extending toward suture in females; Hivaoa ..... **10. navicularis**

    Elytra more broadly cordate in males as well as females, slightly less arched laterally; the disk serially striate, the intervals smooth in males, less so in females as result of minute punctures on fourth and fifth intervals; pile dense at sides more closely approaching suture in both sexes; Uapou ..... **11. lateralis**

15. Species all somewhat narrow and elongate, the rostrum always slightly longer than broad..... 16

    Broad, short, and quite convex, the rostrum short and fully as broad as long..... 19

16. Eyes large and prominent, standing well out from the head; second funicular segment almost a fourth longer than first; the elytral punctures numerous and irregularly distributed; general surface slightly rugose or scabrous; erect hairs short and inconspicuous..... 17

    Eyes smaller or less prominent; second funicular segment variable in length; elytral punctures more or less serially arranged, the intervals moderately smooth or slightly granular; erect hairs long and numerous..... 18

17. Upper surface uniformly though rather sparsely clothed with moderately long gray or, as on sides of prothorax, gray and fulvous pile; apex of prothorax but little narrower than base; Tahuata..... **12. uniformis**

    Upper surface almost naked, the hairs very fine and short, hardly projecting beyond the rim of the punctures; general surface shining black and rugose; apex of prothorax distinctly narrower than base; Hivaoa..... **13. corvus**

18. Diameter of each eye more than one half breadth of interocular space, the eyes themselves not prominent; second segment of funicle fully a fourth longer than first; elytra cordate; Fatuhiva..... **14. cuneatus**

    Diameter of each eye hardly one half breadth of interocular space, the eyes small but quite convex; second segment of funicle barely longer than first; elytra elliptical; Uapou..... **15. griseus**

19. The disk of elytra very convex, side margin alone compressed, elytral punctures serially arranged; pile sparse and uniformly dispersed, the erect setae almost as evident; Fatuhiva..... **16. brevis**

20. No species more than 14 mm. in length and even females only moderately broad; upper surface somewhat convex; eyes never nearly hemispherical; vestiture of upper surface more or less scalelike..... 21

    Large and broad, more than 13 mm. in length, generally 15 mm.; upper surface very flat, almost horizontal in males; eyes prominent, almost hemispherical; vestiture composed of very fine, short, and sparsely though evenly dispersed hair; Uahuka..... **21. planatus**

21. Small, 9 mm. in length; eyes obliquely flattened in front giving a triangular outline; depressed vestiture dense, rather uniformly dispersed; elytra with large, somewhat serially arranged punctures 22
    Somewhat larger, 12 mm. or over in length; eyes rather evenly convex; vestiture less dense and not uniformly distributed; elytra without large punctures; general surface irregularly granulate 23
22. Brown; densely clothed with short, golden brown scales and with numerous erect, stiff setae; the alternate elytral intervals more or less elevated apically; Eiao ..... **17. brunneus**
    Black; densely clothed above with elongate white scales and with a few short, semierect setae near the elytral apices; elytral intervals all flat; Hatutu [Hatutaa] ..... **18. perkinsi**
23. Vestiture, long hairlike scales moderately well disposed over the upper surface and with a slight tendency to form vittae; males as well as females moderately broad; Nukuhiva ..... **19. walkeri**
    Vestiture, short scales, very sparsely disposed, in males only at posterior angles of prothorax above, in females, somewhat scattered over the elytra; males very narrow, hardly more than half as broad as females; Hivaoa ..... **20. lugens**
24. Black, the upper surface aeneous; apex of prothorax distinctly narrower than base; punctures of elytra coarser, more numerous and more regularly distributed; pilosity sparse but evident; Uahuka ..... **22. aeneus**
    Rufopiceous with red legs and antennae; apex of prothorax but little narrower than base; punctures of elytra shallowly impressed and each with a very minute hair; Hivaoa ..... **23. pygmaeus**

1. **Rhyncogonus plumbeus,** new species (fig. 7, *a, b, c*).

Moderately elongate, robust, dull black, rather uniformly clothed with very short decumbent and longer, more numerous, erect hairs. Head slightly convex above and coarsely punctured and somewhat strigose, the apex of rostrum triangularly flattened and more finely, shallowly punctured; eyes moderately large and prominent; rostrum about as broad as long; antennae with scape reaching middle of prothorax, the second funicular segment slightly longer than first, third somewhat more than twice as long as broad, the following gradually shorter. Prothorax distinctly broader than long, the apex 1 mm. narrower than base, the sides arcuate and convergent forward, the disk evenly convex and coarsely, closely, somewhat cribrately punctured, more finely at sides. Scutellum clothed with white hairs. Elytra one-third longer than broad and three times as long as prothorax; sides evenly arcuate to posterior third, thence straight and convergent to rounded apex, no evident side margin; the disk evenly convex, rather coarsely punctured with well spaced punctures, between which are finer punctures, slightly rugose. Beneath rather finely punctured and scabrous; males with abdomen very sparsely pubescent, more or less shining, the first and second segments flattened and with numerous well spaced granules distributed over the surface; females with abdomen more evidently pubescent, less shining, the first and second segments somewhat concave and furnished with granules as in males but of smaller size. Legs moderately long, front tibiae very finely, middle and hind rather coarsely serrate on inner margin. Male (average): length, 14 mm.; breadth, 6 mm. Female: length, 16 mm.; breadth, 6.5 mm.

Holotype male, allotype female, and numerous designated paratypes, collected by LeBronnec and H. Tauraa, on Eiao, Marquesas, at an altitude of 1700 feet, April 21-24, 1931. Taken on *Sida* species, *Ageratum conyzoides,* and *Abutilon* species. Other specimens were found, most of them under

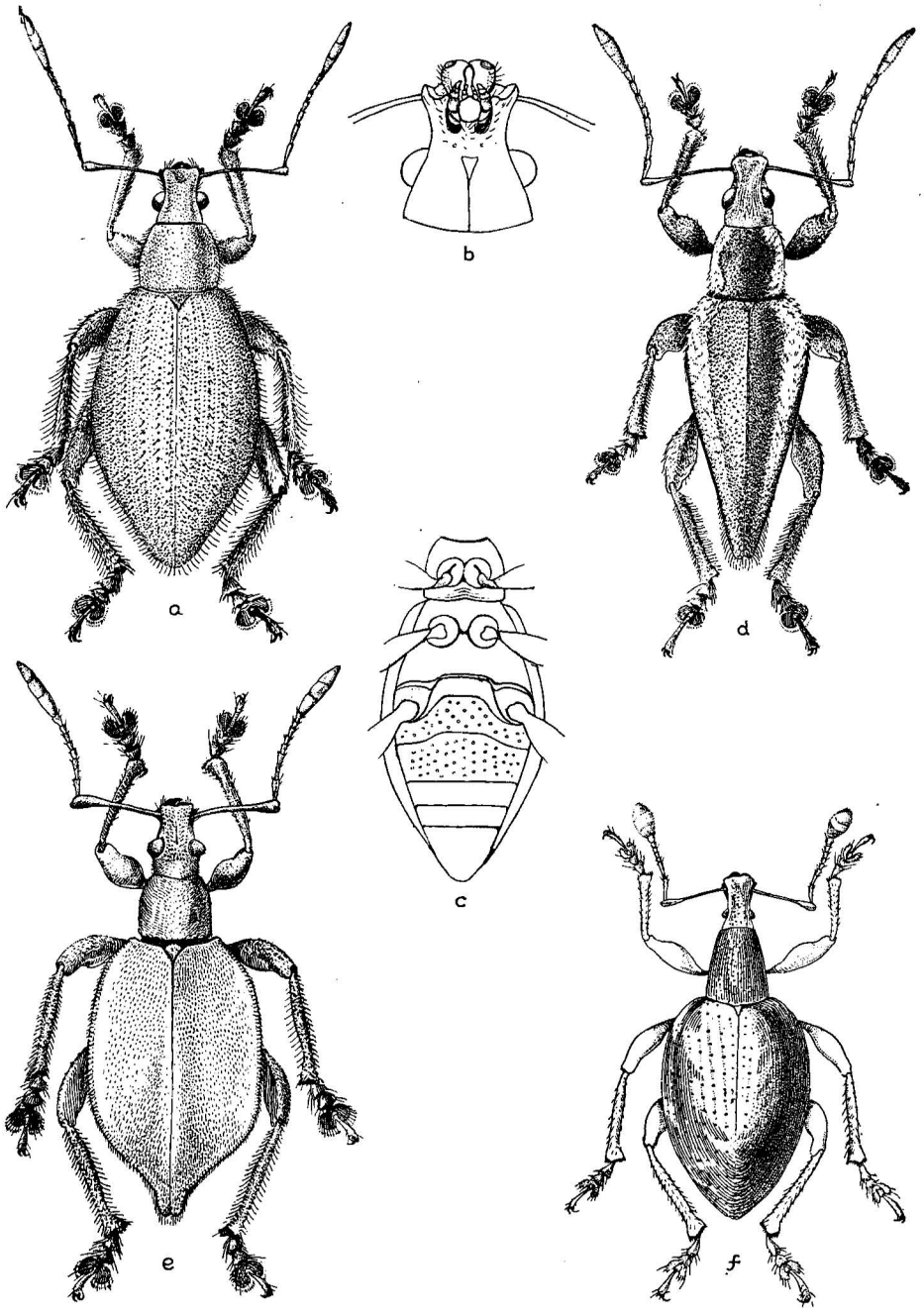

FIGURE 7. *Rhyncogonus* and *Microgonus*. *a-c, Rhyncogonus plumbeus* new species, from Eiao: *a,* male, × 4; *b,* underside of head showing mouthparts; *c,* underside of body of male. *d, Rhyncogonus navicularis* Marshall, male, from Hivaoa, × 4½. *e, Rhyncogonus planatus* new species, male, from Uahuka, × 3¾. *f, Microgonus oodemaformis* new species and new genus, from Nukuhiva, × 9.

stones, near the center of the island at an altitude of 1200 feet, September 28 to October 1, 1929, by A. M. Adamson. The entire lot examined consists of 222 mounted specimens. There is also a large series preserved in alcohol.

This species is very distinct from other species found in the Marquesas, differing chiefly in the even convexity of the upper surface and general degree of robustness, also in the fine and evenly distributed pile. In these regards it resembles the Tahitian species. It is, however, quite different from that species in other respects, and also quite different from the generally shorter and stockier members of the third group of Hawaiian species. I consider it the most generalized of the Marquesan species. The size is also quite variable, the length varying from 10 mm. to 17 mm. and the breadth from 4 mm. to 8 mm., the largest specimens averaging in bulk four times that of the smallest specimens. Most of the specimens are of a dull black, the erect pile, though quite conspicuous when seen from the side, only giving the insect a slight grayish or pruinose appearance when seen from above. There are, however, a number which are very densely pilose, and these appear quite gray.

2. **Rhyncogonus eximius** Perkins.

Rhyncogonus eximius Perkins, Ann. Mag. Nat. Hist., Ser. 10, vol. 1, pp. 126-127, 1928.

Elongate, moderately robust; black, shining where abraded, and rather densely clothed above with dark fulvous decumbent hairs and longer and finer, erect, very light fulvous hair, the sides more densely clothed and the hair of the underside sparser and more or less cinereous. Head flattened above, coarsely punctured and distinctly strigose, the rostrum above broadly and shallowly sulcate; eyes moderately large and prominent; rostrum longer than broad; antennae with scape reaching just beyond anterior third of prothorax, second funicular segment very long, one-fourth longer than first, the following robust, not quite twice as long as broad. Prothorax broader than long, broadest at middle, the apex slightly narrower than base, sides arcuate, the disk convex and coarsely rugose, slightly strigose and with the strigae somewhat radially arranged. Scutellum clothed with light fulvous, almost white pile, contrasting strongly with the darker pile of the elytra. Elytra more than one-third longer than broad and three times as long as prothorax, elongate cordate, the sides evenly arcuate to beyond the middle, then straight and divergent to rounded apices. Side margin vaguely defined toward base; the disk convex yet somewhat flattened, moderately coarsely, irregularly punctured and somewhat scabrous. Beneath rather shining, finely, irregularly punctured, the first and second abdominal segments slightly sulcate in the male and granulate-scabrous. Legs moderately long, the front and middle tibiae not noticeably serrate on inner margin, the hind distinctly so. Length, 15 mm.; breadth, 5.5 mm.

The original description of the species was based upon a single specimen, presumably a female, collected by C. L. Collenette, at an altitude of 1500-2000 feet, Fatuhiva, January, 1925, on pepper. The only specimen which the Pacific Entomological Survey secured was an undoubted male, collected by LeBronnec at Vaikoao, Omoa [Oomoa] Valley, Fatuhiva, at an altitude of

1500 feet, August 30, 1930, and taken on *Canthium barbatum*. This specimen was in good condition and not at all abraded and agreed exactly with the excellent description given by Perkins. The species because of its long pile and generally hairy condition stands removed from all of its fellows with the exception of *cinereus* (8), which it simulates in size, general shape, and degree and type of pilosity. The latter, however, differs primarily by having less prominent eyes and the pile of a uniform gray color in both sexes.

3. **Rhyncogonus ochraceus,** new species.

Elongate, robust, and more or less depressed; black, and densely clothed with orange red or ochre colored, moderately long depressed hair, which is lighter along the suture and on the disk of the pronotum and very sparse on the head and median portion of the body beneath, and a moderate amount of erect hair, which is longer and denser toward the elytral apex. Head somewhat flattened above, coarsely irregularly punctured, and evidently strigose on the front; the eyes large and prominent, almost hemispherical; the rostrum about as broad as long; antennae with scape reaching the middle of prothorax, the second funicular segment evidently longer than first, the third segment about twice as long as broad, the two following gradually shorter and the sixth and seventh still shorter. Prothorax broader than long, the apex much narrower than base, the sides arcuate and gradually convergent, the disk coarsely punctured and rugose. Scutellum densely clothed with ochraceous pile. Elytra one-third longer than broad and three times as long as prothorax, sides evenly arcuate at humeri, slightly arcuate, almost straight at middle, thence straight and convergent to rounded hind angles, and with a narrow yet well defined lateral margin from humeri almost to apex, the disk convex yet moderately depressed, finely, irregularly punctured apically and granulate basally. Beneath, abdominal segments finely scabrous, and the first abdominal segment slightly concave. Legs of moderate length, the front and middle tibiae without noticeable serrations on inner face and the hind tibiae finely serrate on inner face. Length, 14 mm.; breadth, 6 mm.

Holotype, a unique female, collected by Mumford and Adamson at Matauuna, Hivaoa, Marquesas, at an altitude of 3700 feet, August 1, 1929.

This species is well defined by its ochraceous color, prominent eyes, rugose pronotum, granulate basal area of elytra, well developed elytral side margin, and simple front tibiae. When it is compared with any of the other eight species to be found on Hivaoa this sum of characters will enable it to be readily separated, even from such as *adamsoni, mimus,* and *mumfordi,* its closest relatives.

4. **Rhyncogonus oppositus,** new species.

Elongate, the male narrow, the female rather broad and robust, and somewhat depressed; the males black, legs often reddish, sparsely clothed with short depressed and longer erect gray hairs; the females reddish brown and rather densely clothed with short depressed, fulvous pile and slightly longer erect hairs; the underside of entire abdomen in male and last ventral in female quite glabrous. Head flattened above, coarsely punctured behind, a fine longitudinal crista sometimes also evident; the eyes large and moderately prominent; the rostrum slightly longer than broad; antennae with scape reaching beyond middle of prothorax, the second funicular segment very long, about one-fourth

longer than first, the third over twice as long as broad, the following gradually shorter. Prothorax very slightly broader than long in males; distinctly broader in females, the apex much narrower than base, the sides arcuate and gradually narrowing forwards; the disk with mixed fine and coarse punctures in males; more finely, less closely punctured in females. Scutellum covered by a patch of white pile in male and a fulvous patch in female. Elytra over a third longer than broad in male, under a third in female, and in both sexes about three times as long as prothorax, sides evenly arcuate in front, straight and convergent posteriorly to rounded hind angles, the males without definite lateral margin but the females with narrow and well marked margins except near apex; the disk in males with series of large serially arranged punctures and with smooth intervals, in the females with smaller, more numerous and less regularly arranged punctures, also somewhat asperate and with patches of very fine punctures placed about where the alternate intervals should be. Beneath with abdomen irregularly granulate and first and second segments somewhat excavated in male, finely punctured and faintly scabrous in female. Legs rather long in male, of moderate length in female, all tibiae rather finely serrate on inner margin. Male: length, 13 mm.; breadth, 5 mm. Female: length, 14 mm.; breadth, 6.5 mm.

Holotype male collected by LeBronnec and H. Tauraa at Amatea, Tahuata, Marquesas, altitude 2000 feet, June 28, 1930, on *Piper latifolium*; allotype female collected by the same collectors at Vaitupaahei, Tahuata, altitude 1750 feet, July 9, 1930, also on *Piper latifolium*; and several designated paratypes from a series of 43 specimens all collected at the above mentioned locations and at Hanamiai Valley, altitude 1200 feet, June 3, 1930.

The species is one of several which are sexually both markedly dimorphic and dichromatic, the males being rather narrow, black, and sparsely clothed with very long erect and short depressed somewhat grayish pile as well as having the abdomen almost naked but studded with pronounced granules; the females on the other hand broad, depressed, generally brownish in color, rather densely clothed with short depressed fulvous pile and more sparsely with semierect, short hairs, the underside finely pilose and with granules obscurely indicated at most. From *duplex* Perkins and *mimus* Perkins which most closely simulate it and share with it the extreme sexual peculiarities it differs in the main by having large and rather prominent eyes, a shorter and broader rostrum, and the erect hairs longer and more abundant than the females of *duplex* and *mimus,* as well as the males of *mimus.*

5. **Rhyncogonus adamsoni,** new species.

Males elongate and narrow, females broader and more robust, black, legs sometimes rufous in fresh specimens, and sparsely clothed with cinereous pile, the decumbent hairs more dense along the sides of prothorax and arranged in a somewhat vittate manner on the elytra, particularly in the female, the erect hairs sparse and more or less irregularly dispersed. Head rather finely, closely punctured above and the rostrum broadly, shallowly sulcate and with a faint longitudinal carina at middle; eyes large and moderately prominent; rostrum longer than broad; antennae with scape reaching the middle of prothorax, second funicular segment slightly longer than first, the third more than twice as long as broad, the following gradually shorter. Prothorax broader than

long, apex much narrower than base, sides almost parallel near base and evenly arcuate and narrowed to apex, the disk moderately coarsely, somewhat irregularly punctured. Scutellum concealed by a patch of white pile. Elytra considerably over a third longer than broad in male and not quite three times as long as prothorax, three times as long as broad in females and three times as long as prothorax, sides evenly arcuate to beyond middle in males, almost to apex in females, thence straight and convergent to rounded apex, the side margin sharply carinate but not otherwise defined; the disk convex, rather coarsely, serially punctured near the suture, more irregularly at the sides, in the males, and more or less irregularly punctured over entire surface in the females as well as with the addition of very minute punctures on the intervals. Beneath, the males with abdominal segments smooth at middle and studded with pronounced, well spaced granules, the females with the abdominal segments finely pubescent and very finely closely granulate. Legs rather long in male, of moderate length in female, the anterior tibiae armed on inner face near apex with small, acute spines, serrate above, the middle and posterior tibiae merely armed with well marked serrations on inner face. Male: length, 13 mm.; breadth, 5 mm. Female: length, 13 mm.; breadth, 6 mm.

Holotype male, allotype female, and two paratype males from Vaiepoepo, Hivaoa, Marquesas, collected at an altitude of 2300 feet, June 2, 1929, by Mumford and Adamson on *Piper latifolium.*

This species is rather closely related to *oppositus* and to a lesser degree to *ochraceus,* differing in having the pile of a uniform cinereous color in both sexes and in having the serrations on the inner face of the anterior tibiae developed into well marked spines. The rostrum is also definitely sulcate in *adamsoni,* flat in the others, and in *ochraceus* also shorter and broader.

6. **Rhyncogonus duplex** Perkins.

Rhyncogonus duplex Perkins, Ann. Mag. Nat. Hist., Ser. 10, vol. 1, p. 124, 1928.

Large and elongate, the males narrow and females moderately broad; the males black, clothed with conspicuous yet not dense depressed pile, and longer, very fine, erect hair, the females brown, somewhat densely clothed with fulvous depressed pile and a few short, erect hairs. Head flattened above, rather coarsely punctured, somewhat strigose between the eyes, and the rostrum broadly, shallowly sulcate above, with an obsolete median longitudinal carina in some specimens, and slightly longer than broad; eyes of normal diameter but very flat, not projecting beyond the side margin of head, the head posterior to the eyes also of greater breadth than through the eyes; the scape not quite reaching middle of prothorax, second funicular segment long, longer than first, the third about three times as long as broad, the following gradually shorter. Prothorax barely broader than long, the males with apex slightly narrower than base, broadest at middle and sides rather evenly arcuate, the females with apex decidedly narrower than base, broadest at base, sides gradually arcuate and narrowed forwards; the disk closely, somewhat reticulately punctured with punctures of varying size. Scutellum clothed with white pile in the male and fulvous in the female. Elytra over a third longer than broad, the female slightly the broader, and over three times as long as prothorax, sides in male moderately rounded near base, thence arcuate and gradually narrowed to posterior third and straight to rounded apex, in female more broadly arcuate from base to posterior third and straight to rounded apex, the side margin narrow and well defined near base in male, almost to apex in female; the disk coarsely, somewhat serially punctured near suture, more irregularly and densely at sides, and with minute punctures between, the general

surface as a result rather finely granulate. Beneath in male very finely, sparsely pubescent, the abdomen with basal segments concave and with marked, well spaced granules, finer toward apex, the female more evidently pubescent, the basal abdominal segments merely flattened, finely punctured and scabrous. Legs long in male, shorter in female, and all tibiae distinctly serrate on inner surface, the anterior with serrations somewhat spinous near apex. Male: length, 17 mm.; breadth, 6 mm. Female: length, 16 mm.; breadth, 7 mm.

This is in general the largest species of the archipelago. From *mimus* it differs primarily in that the males are clothed with white pile and by being generally larger; from *cinereus,* in that the females are clothed with fulvous pile; and from *oppositus* and *adamsoni* in that the eyes are much less prominent. These species all agree in being of large or moderate size and in having the elytra in the males much elongated and cuneiform, the females with more definitely cordate and broader elytra. The expedition secured ten males and four females, from the following localities: Ihiota, Hanavave Valley, altitude 4500 feet, Fatuhiva; Vaikoao, Omoa [Oomoa] Valley, altitude 1500 feet, Fatuhiva; Teaotu, Hanavave Valley, altitude 700 feet, Fatuhiva and Ahuava, altitude 1800 feet, Fatuhiva, collected in August and September, 1930, LeBronnec, on *Piper latifolium* and *Canthium barbatum.*

7. Rhyncogonus mimus Perkins.

Rhyncogonus mimus Perkins, Ann. Mag. Nat. Hist., Ser. 10, vol. 1, p. 125, 1928.

Moderately elongate and robust; reddish brown to black and in both sexes irregularly clothed with depressed light fulvous hairs, denser at the sides of the elytra and with a tendency to be somewhat vittate, the males in addition with a few short, semierect hairs. Head flattened above, rather coarsely punctured and strigose on the front, with an elongate fovea between the eyes and the rostrum broadly, shallowly sulcate; eyes moderately large but not prominent, hardly projecting beyond the side margin of the head, the head, however, broader through the eyes than behind; rostrum longer than broad; antennae with scape extending slightly behind middle of prothorax, the second funicular segment elongate, slightly longer than first, the third over twice as long as broad, the following gradually shorter. Prothorax slightly broader than long in male, evidently so in female, the apex distinctly narrower than base, the male broadest in front of base and with sides slightly arcuate, the female broadest at base and with sides arcuate and convergent forward, the disk rather coarsely, irregularly punctured and rugose. The scutellum covered with a patch of fulvous pile. Elytra in male over a third longer than broad and less than three times as long as prothorax, in female one-third longer than broad and over three times as long as prothorax, the sides sharply carinate and with narrow margin only near base, the disk with coarse or but moderate punctures in female, somewhat serially arranged and with numerous very minute punctures between, giving a dull aspect. Beneath, the male with abdomen almost naked, somewhat flattened in front and studded with fine granules, the female with abdomen distinctly pubescent, finely punctured, and slightly convex. Legs of moderate length in both sexes, all tibiae rather coarsely serrate on inner face. Male: length, 12.5-13 mm.; breadth, 5-5.5 mm. Female: length, 14.5-17 mm.; breadth, 6-7.5 mm.

In this species, which is in general slightly smaller than *duplex,* both sexes are somewhat similar as to vestiture, the males therefore easily separated from all close relatives by the fulvous color. The females, which simulate the females of *oppositus* and *duplex,* have the eyes about intermediate in prominence between the two, *oppositus* having the eyes very prominent, almost hemispherical, and *duplex* with its eyes much flattened, not projecting beyond side margins of head. Twenty-three specimens were obtained by the Survey from Hivaoa, Marquesas, mainly by Mumford and Adamson: Kopaafaa, August 2, 1929; ridge northwest of Taaoa, altitude 2800 feet, June 3, 1929; Tepuna, August 1, 1929; and slope north of summit of Mount Temetiu, altitude 2000-2500 feet, December 27, 1930.

8. Rhyncogonus cinereus, new species.

Large, elongate, the males narrow, the females broad, black and both sexes about equally and rather densely clothed with shorter depressed and longer erect gray pile. Head moderately finely punctured behind, coarsely punctured and somewhat strigose between the eyes, the rostrum broadly and shallowly sulcate, eyes large but flattened, hardly projecting beyond side margins of head; the rostrum slightly longer than broad; the antennae with scape not quite reaching middle of prothorax, second funicular segment very long, about a fourth longer than first, the third about two and a half times as long as broad, the following gradually shorter. Prothorax broader than long, broadest slightly in front of base in female and about at middle in male, the apex narrower than base, sides evenly arcuate in male, arcuate and narrowed forward in female, the disk closely, irregularly punctured and with more or less evident median, longitudinal carina. The scutellum covered by a patch of very white pile. Elytra four-tenths longer than broad and over three times length of prothorax, cordate cuneate, broader in female, the sides evenly arcuate to posterior third in male and fourth in female, thence straight to rounded hind angles, the side margin only carinate near base in male but distinctly yet narrowly margined almost to apex in female, the disk with coarse or moderate (female) somewhat serially arranged punctures and very minute punctures between. Beneath with abdomen moderately smooth and shining in male, the first segment concave, and ornamented with pronounced, well spaced granules; the female with abdomen finely pubescent, anterior segments merely flattened, and finely punctured and scabrous, especially basally. Legs long in male, of moderate length in female, front tibiae finely serrate on inner face, the middle and hind more coarsely serrate. Male: length, 14 mm.; breadth, 5 mm. Female: length, 17 mm.; breadth, 6.5 mm.

Holotype male, allotype female, 6 paratypes, all except one collected at Vaikoao, Omoa [Oomoa] Valley, altitude 1600 feet, Fatuhiva, Marquesas, August 27, 1930, LeBronnec, on *Piper latifolium.* One female, collected at Ihiota, Hanavave Valley, altitude 450 feet, Fatuhiva, September 10, 1930, by LeBronnec.

This large species, only slightly smaller than *duplex,* can generally be readily separated by its size, rather dense gray pile in both sexes, the erect hairs as abundant as the depressed, and character of eyes. The only chance for confusion is between the males of *duplex* and *cinereus.* In *duplex* the eyes do not project beyond the side margin of head, and the prothorax is

hardly narrowed at base. In *cinereus* the eyes project definitely beyond side margin of head and the prothorax is narrowed almost as much basally as it is apically. It is rather interesting to find two such closely related species as *cinereus* and *duplex,* not only on the same island but often in the same regions. It is an exception to the general rule as regards Marquesan species of this genus. The eyes are so definitely different between the two species that one would not be justified in considering them varieties of the same species.

9. **Rhyncogonus mumfordi,** new species.

Of moderate size, elongate, the males narrow, females somewhat robust, moderately flattened above, black or pruinose with legs and antennae reddish (probably slightly immature) and sparsely clothed with depressed pile, most evident around eyes and at sides of prothorax and elytra, and a limited number of semierect hairs on elytral apices. Head rather finely punctured on vertex, coarsely irregularly punctured and somewhat strigose in front, a distinct fovea between eyes, the rostrum broadly, shallowly sulcate; eyes large, moderately prominent, projecting moderately beyond side margins of head; rostrum slightly longer than broad; antennae with scape reaching middle of prothorax, second funicular segment very long, at least a fourth longer than first, the third almost three times as long as broad, the following gradually shorter. Prothorax broader than long, broadest near middle, apex slightly narrower than base in male, markedly so in female, the sides moderately arcuate and somewhat narrowed in front, the disk rather coarsely, closely, and in places confluently punctured and with a more or less obsolete median longitudinal carina near apex. Scutellum covered by a patch of white pile. Elytra in male nearly twice as long as broad, in female one-third longer than broad and in both sexes over three times as long as prothorax. Sides arcuate or somewhat straight near middle and straight and convergent at posterior third to rounded apices, the sides also carinate and with moderately well defined but narrow margin, the disk with coarse punctures somewhat serially arranged and intervening areas minutely punctured and rugose. In one male the large punctures have been to a great extent obliterated; their anterior margins have been elevated in the form of well marked granules, which are rather generally distributed over the surface. The elytra in this specimen are also without definite lateral margins and the sides are non-carinate. Beneath, male with abdomen sparsely pubescent, the metasternum and first abdominal segment concave, all abdominal segments studded with granules, well spaced on second and following segments; female more evidently pubescent, metasternum and first abdominal segment merely flattened and rather finely scabrous. Legs long in male, of moderate length in female, all tibiae rather finely serrate on inner margin. Male: length, 15 mm.; breadth, 5 mm. Female: length, 15 mm.; breadth, 6 mm.

Holotype male, allotype female, and seven paratypes collected at Teava Uhia i te Kohu, Hivaoa, Marquesas, altitude 2000 feet, February 15, 1930, Mumford and Adamson.

This interesting species is quite distinct. Its pruinose appearance, sparse pubescence, in the main limited to the sides, well defined though narrow side margin in both sexes, and somewhat flattened upper surface will enable it to be readily recognized. The single divergent male with dorsal granules and simple side margins agrees so well in all other regards with its fellows

that I can consider it as nothing more than an individual variant. It is a most interesting specimen, though, for it shows how even within the limits of a species one type of sculpturing can replace another and opposite type. A careful examination brings out the fact that it has been accomplished merely by a slight suppression of one set of characters and the exaggeration of others.

10. Rhyncogonus navicularis Marshall (fig. 7, *d*).

Rhyncogonus navicularis Marshall, Ann. Mag. Nat. Hist., ser. 10, vol. 6, pp. 553-554, 1930.

Elongate, narrow, much attenuated behind especially in males, and sparsely clothed with fulvous or white pile, the fulvous pile most evident at sides and on legs, the white pile generally restricted to males and best seen on sides of disk and here and there on legs. Head punctate and markedly strigose, not sulcate in front; eyes large and quite prominent; rostrum about as broad at base as long; antennae with scape reaching middle of prothorax, second funicular segment about a fourth longer than first, third slightly more than twice as long as broad, the following gradually shorter. Prothorax broader than long, apex considerably narrower than base, sides almost parallel at basal half or slightly convergent forward in female and rounded to apex, disk coarsely, closely punctured and irregularly cribrate. Scutellum with a tuft of white pile in male, fulvous in female. Elytra considerably more than one-third longer than broad in male, slightly more than one third longer in female, over three times as long as prothorax, the sides neither carinate nor margined in male, slightly margined and carinate near base in female, disk somewhat coarsely and shallowly punctured, in male also quite closely punctured and distinctly rugose, especially near base. Beneath, the male with the abdomen shining, shallowly, broadly sulcate in front and sparsely studded with small well spaced granules; the female with abdomen subglabrous, flattened in front, and sparsely, finely punctured or somewhat subscabrous in front. Legs long, front and middle tibiae obscurely serrate on inner face, the hind tibiae distinctly serrate. Male: length, 14 mm.; breadth, 5 mm. Female: length, 15 mm.; breadth, 6 mm.

A series of more than 350 specimens was collected at an altitude of 2000 to 3000 feet, on the slope of Mount Temetiu, Hivaoa, Marquesas, December 29, 1930, and January 9, 1931, by H. Tauraa. Other series were taken in the same localities by Mumford and Adamson. Taken feeding mainly on *Piper latifolium*.

This species, as shown in figure 7, *d*, is a long and narrow species with the elytra much attentuated behind and the pubescence to a great extent limited to the sides of both prothorax and elytra. It is somewhat simulated by *lateralis* from the island of Uapou, but *lateralis* is in general larger and more robust, with the elytra far less narrowed behind, the elytral pilosity covering a greater area, and the elytral punctures never continguous and generally more or less serially arranged and the interspaces non-rugose.

11. **Rhyncogonus lateralis,** new species.

Elongate, moderately robust, black, the sides of prothorax and elytra densely clothed with depressed fulvous pile, each elytron having in addition a covering of white pile extending from the sides to beyond the middle (in a few specimens this is also fulvous), and a limited amount of fine, semierect pubescence scattered over the surface, the median portion of both prothorax and elytra glabrous and shining. Head flattened in front, coarsely punctured, and in most cases markedly strigose especially in males; the rostrum longer than broad and at times shallowly bisulcate; eyes large and moderately prominent; antennae with scape reaching middle of prothorax, second funicular segment very long, one-half longer than first, the third nearly three times as long as broad, the following gradually shorter. Prothorax slightly broader than long, apex somewhat narrower than base, broadest at middle, the sides subparallel behind or somewhat arcuate and narrowed to apex, the disk irregularly and rather closely pitted with coarse and fine punctures and with a vague median carina anteriorly. Scutellum with a small patch of white pile. Elytra over one-third longer than broad and three times as long as prothorax, elongate cordate, the sides arcuate in front, straight and convergent behind to rounded apices; the disk rather numerously punctured with moderately coarse, somewhat serially arranged punctures, the female in addition with the intervening areas densely and minutely punctured. Beneath, the male shining at middle, the anterior sternites sulcate, and all abdominal segments studded with well marked and well spaced granules finer and denser on last segment; the female with abdomen finely and sparsely pilose and punctured. Legs long, front and middle tibiae obscurely serrate on inner margin, hind tibiae rather coarsely serrate. Male: length, 15 mm.; breadth, 6 mm. Female: length, 16 mm.; breadth, 6 mm.

Holotype male, allotype female, and numerous designated paratypes from a series of 47 specimens collected at Papaika (holotype), and elsewhere in Hakahetau Valley (allotype), 1000-2000 feet, Uapou, Marquesas, December 6-11, 1929, A. M. Adamson and R. R. Whitten.

This species is somewhat related to the preceding. It differs by being considerably more robust, more convex above, the elytra less narrowed behind, the disk not granulate-rugose, and with the pilosity denser and covering nearly two-thirds of the outer portion of each elytron, as well as sharply limited within, the eyes also slightly less prominent. Fresh specimens are very distinct, the sharply defined, shining, black glabrous sutural area contrasting most decidedly with the densely clothed white or pale fulvous sides.

12. **Rhyncogonus uniformis,** new species.

Elongate, the males quite narrow, the females broader and generally more robust, black, and sparsely yet uniformly clothed with light fulvous depressed pile and here and there a short, semierect hair on the elytra. Head flattened, coarsely punctured, somewhat strigose, a well defined fovea between the eyes; the rostrum a bit longer than broad, non-sulcate but with a vague, median longitudinal carina; the eyes large and moderately prominent; antennae with scape reaching middle of pronotum, second funicular segment at least one-fourth longer than first, the third slightly more than twice as wide as long, the following gradually shorter. Prothorax slightly broader than long, apex a bit narrower than base in male and evidently so in female, broadest at middle or slightly behind in female, the sides arcuate and narrowed in front, the disk coarsely, irregularly punctured and somewhat strigose. Scutellum covered with a patch of light fulvous pile.

Elytra slightly over a third longer than broad in male, just a third longer in female, and over three times as long as prothorax, elongate cordate, the sides arcuate in front, straight and convergent from middle in male, posterior third in female, to rounded hind angles, the disk irregularly punctured and finely scabrous. Beneath, male with abdomen shining, anterior sternites sulcate, and abdomen in general studded with well spaced granules; female sparsely finely pubescent and punctured. Legs long, front tibiae simple, middle finely serrate, and hind rather coarsely serrate on inner margin. Male: length, 12 mm.; breadth, 4.5 mm. Female: length, 11 mm.; breadth, 5 mm.

Holotype male, allotype female, and several designated paratypes from a series of fourteen specimens collected at Amatea, altitude 2620-2700 feet, Tahuata, Marquesas, July 7-10, 1930, by LeBronnec and H. Tauraa, from *Metrosideros collina* and *Weinmannia* species.

This is one of the rather narrow and medium sized species and may be readily separated by the cordate elytra, rather large and moderately prominent eyes, sparse and uniformly distributed depressed pubescence. Certain related species are separated from it as follows: *corvus* by being somewhat proportionately shorter and almost entirely glabrous; *cuneatus* by having the eyes less prominent, the prothorax much larger posteriorly, the elytra more cuneate posteriorly, and the pile, though sparse, about equally divided between the depressed and long erect hairs; and *griseus* by having very small though prominent eyes, the elytra quite elliptical and with somewhat serially arranged punctures, and with sparse gray pubescence, partly depressed and partly short and semierect.

13. **Rhyncogonus corvus,** new species.

Rather narrow and moderately elongate, glabrous above except for patches of white hairs on scutellum and at humeri and very short hairs on elytral disk, hardly protruding above margins of punctures, the propleurae and anterior portion of epipleurae with a limited number of rather long ochraceous hairs. Head flattened, coarsely punctured, somewhat strigose, and with deep fovea between eyes; the rostrum as broad as long and non-sulcate; eyes large and moderately prominent; antennae with scape reaching middle of prothorax, the second funicular segment not a fourth longer than first segment, the third slightly more than twice as long as broad, the following gradually shorter. Prothorax about as long as broad, broadest at middle, apex one-fifth narrower than base, sides shallowly arcuate posteriorly, narrowed in front, the disk coarsely, irregularly and somewhat confluently punctured. Elytra somewhat more than a third longer than broad and over three times as long as prothorax, the sides arcuate and gradually narrowed from behind humeri to rounded apices, the side margin more or less carinate and distinctly margined near humeri, the disk coarsely, regularly but not serially punctured and more or less granulate especially near base. Beneath, with abdomen deeply sulcate in front and studded with rather closely placed granules, almost smooth behind. Length, 11 mm.; breadth, 4.25 mm.

Holotype, a unique male collected at Tepuna, altitude 3000 feet, Hivaoa, Marquesas, August 1, 1929, by Mumford and Adamson.

This medium sized, black, and almost completely glabrous species is quite readily distinguished. Comparative characters will be noted in the description of the previous species and those which follow.

14. Rhyncogonus cuneatus, new species.

Of moderate size, somewhat narrowed, black, clothed above with scattered longer erect and short depressed gray pile, the pile at sides beneath denser and quite fulvous. Head coarsely punctured, somewhat strigose and with a deep fovea between the eyes, the rostrum shallowly sulcate (bisulcate in female) and slightly longer than broad; eyes of moderate size and prominence, antennae with scape reaching middle of prothorax, the second funicular segment long, fully one-fourth longer than first, the third two-thirds length of second and about twice as long as broad, the following gradually shorter. Prothorax slightly broader than long, broadest at middle, the apex one-fifth narrower than base, the sides gradually divergent to middle then narrowed and somewhat constricted forwards, the disk convex and coarsely, irregularly punctured. Scutellum with a tuft of white pile in female (probably rubbed off in male). Elytra almost twice as long as wide, over three times as long as prothorax, amphora shaped, the sides broadly rounded to before the middle, thence straight and convergent to rounded hind angles, the sides slightly carinate anteriorly in female but not so in male, the disk moderately convex, with moderate sized punctures, somewhat serially arranged near suture but irregularly outwardly, and rather finely rugose especially near base. Beneath, the male with abdomen evidently sulcate in front and studded with granules, finer and more numerous in front, coarser and sparser behind; the female with abdomen merely flattened at middle in front and finely sparsely punctured, vaguely scabrous in front. Legs moderately long, the anterior tibiae obscurely serrate on inner margin, the middle and hind distinctly serrate. Length, 12 mm.; breadth, male, 4.75 mm., female, 5 mm.

Holotype male and allotype female collected at Ahuava, altitude 1800 feet, Fatuhiva, Marquesas, August 19, 1930, by LeBronnec, beaten from *Metrosideros collina.*

This medium-sized species shows its distinctness in regard to the shape of its prothorax and elytra, the distinct amphora-like shape of the elytra readily separating it from the other medium-sized species, all of which have the elytra much more elliptical.

15. Rhyncogonus griseus, new species.

Elongate, of moderate size, black, sparsely clothed above with depressed and a limited number of semierect gray hairs, the propleurae and epipleurae more densely pilose, the hairs of the epipleurae somewhat fulvous. Head coarsely punctured above, somewhat reticulate, with a large shallow fovea between the eyes, the rostrum longer than broad, shallowly sulcate above and with the sulcus more or less smooth; the eyes not large but prominent; the antennae with scape not quite reaching middle of prothorax, second funicular segment about four times as long as broad and hardly longer than first, the third about one-half its length and the following gradually shorter. Prothorax slightly broader than long, broadest at middle, the apex a bit narrower than base, sides feebly arcuate forward to middle then gradually narrowed and slightly constricted just before apex, the disk coarsely, irregularly punctured and with a few strigosities at middle. Scutellum with a patch of gray pile at apex. Elytra about a third longer than broad, slightly less than three times as long as prothorax, somewhat elliptical in shape

though pointed behind, the sides arcuate from base to posterior third then gradually narrowed to rounded apices, subcarinate; the disk slightly convex, rather coarsely, more or less serially punctured and rather finely, irregularly asperate, especially toward base and suture. Beneath rather finely, sparsely punctured and obscurely scabrous in front. The legs with all tibiae rather finely serrate on inner margin. Length, 11 mm.; breadth, 4.5 mm.

Holotype, a unique female, collected in Hakahetau Valley, altitude 1000-2000 feet, Uapou, Marquesas, December 11, 1929, by R. R. Whitten, beaten from shrubs.

This species is readily separated from its fellows by its size, dull appearance, shape of prothorax and elytra, and antennal characters. It is a species of intermediate type linking the members of the group just described with the flatter, duller species which are to follow, the members of Group *C*.

16. Rhyncogonus brevis, new species.

Small, short, robust, black, sparsely clothed with short depressed and a limited number of longer, semierect hairs, the pile of prothorax denser at sides, head coarsely punctured and distinctly strigose above, with a small fovea midway between the eyes, the rostrum as broad as long, flattened above and quite smooth though finely, sparsely punctured; eyes prominent but rather small; antennae with scape reaching the middle of prothorax, the second funicular segment elongate, at least four times as long as broad and slightly longer than first, the third segment almost two-thirds length of second, the following gradually shorter. Prothorax broader than long, broadest at middle, the apex somewhat narrower than base, the sides but slightly arcuate, the disk coarsely, closely, irregularly and somewhat cribrately punctured, in one specimen a narrow carina at middle. Scutellum with but a few hairs at apex. Elytra less than a third longer than broad and over three times as long as prothorax, the sides evenly rounded from base to first third, then somewhat straight and parallel and from behind the middle arcuate, narrowed and then slightly sinuate and straight to rounded hind angles, the margin well defined though narrow and carinate; the disk very convex, rather coarsely yet not deeply and serially punctured, somewhat aciculate and more or less rugose. Beneath, the abdomen finely, sparsely punctured, and obscurely scabrous. The legs with anterior tibiae not evidently serrate within and the middle and posterior pair but slightly serrate. Length, 10 mm.; breadth, 4.5 mm.

Holotype female and paratype female, collected on the ridge east of Omoa [Oomoa] Valley, altitude 3100 feet, Fatuhiva, Marquesas, August 28, 1930, by LeBronnec, swept from a species of Vaccinium.

This species is the shortest and proportionately most robust species of the Marquesas. It shows certain relationships to *cuneatus* on one hand and through *griseus* to the members of Group *C* on the other. The type of eyes and shape of prothorax are quite definitely those of Group *C* while its convex elytra and general facies more that of Group *B*.

17. **Rhyncogonus brunneus,** new species.

Small, rather short and narrow, brown, somewhat densely clothed with small, yellowish brown scales, in addition the head supplied with a few semierect hairs, the prothorax with very short, inclined setae and the elytra with rather long, coarse and erect setae. Head coarsely punctured and distinctly strigose even close to apex of rostrum, and with a small, deeply impressed fovea between the eyes, the rostrum about as broad as long; the eyes rather small, obliquely flattened in front and prominent; the antennae with scape reaching middle of prothorax, the second funicular segment slightly more than three times as long as broad and about a third longer than first, the third a bit more than twice as long as broad and as long as first, the following gradually shorter. Prothorax slightly broader than long, broadest near base, the apex narrower than base, the sides slightly arcuate, almost parallel forward to beyond the middle then gradually narrowed to apex; the disk moderately coarsely, sparsely punctured. Scutellum smooth and naked. Elytra somewhat elliptical, distinctly over a third longer than broad and not three times as long as prothorax, the sides arcuate from base to posterior third thence convergent and slightly sinuate to rounded hind angles, carinate and with margin narrow and poorly defined; the disk slightly convex, the punctures of moderate size, deeply impressed and in general irregularly placed though here and there serially arranged, the third, fifth, and seventh intervals feebly elevated behind. Abdomen beneath more or less smooth and finely, sparsely punctured. All tibiae without distinct serrations within. Length, 9 mm.; breadth, 2.25 mm.

Holotype, a unique, presumed female, collected on the east side of the middle of Eiao, Marquesas, at an altitude of 17 feet, September 28, 1929, by A. M. Adamson. It was taken on *Hibiscus tiliaceus.*

This small species is most distinct, not alone because of its size and brown color, but also because of its peculiar vestiture, the small yellowish-brown scales and rigid setae. It, of course, though slightly convex, belongs with the more or less flattened species of Group *C,* and shares with the more typical members of the group like *perkinsi, walkeri,* and *lugens* the tendency to have the shorter pile scale-like. This character, not developed elsewhere among the Marquesan species, is carried to the extreme degree in *brunneus,* though in *lugens* the vestiture is almost as typically scale-like but here it is very sparse.

18. **Rhyncogonus perkinsi,** new species.

Rather small, somewhat narrowed and considerably flattened, black; rather densely clothed above with small, elongate, white, decumbent scales, with a few, short, decumbent white hairs intermixed, and a small number of short, semierect setae, chiefly evident on the apical portion of the elytra. Head coarsely punctured, markedly strigose almost to apex of rostrum and with shallow fovea between the eyes; the rostrum fully as broad as long; the eyes rather small, prominent, and anteriorly obliquely flattened; the antennae with scape reaching beyond middle of prothorax, second funicular segment over one-fourth longer than first, the third over twice as long as broad and about three-fourths length of first, the following gradually shorter. Prothorax about as broad as long, broadest at middle, the apex narrower than base, the sides slightly arcuate, almost parallel at middle, the disk sparsely irregularly punctured. Scutellum glabrous. Elytra almost

twice as long as broad and three times length of prothorax, the sides obliquely divergent, hardly arcuate, from base, almost straight and parallel for median third, thence straight and convergent to rounded apices, subcarinate, and indistinctly margined near base; the disk slightly convex, rather coarsely, irregularly, and more or less serially punctured. Beneath, with abdomen rather smooth, finely sparsely punctured and minutely alutaceous. All tibiae without distinct serrations within. Length, 9 mm.; breadth, 3.75 mm.

Holotype, a unique female, collected on the small and most northern island of the Marquesas, Hatutu [Hatutaa], altitude 1000 feet, by LeBronnec and H. Tauraa, on a species of *Pisonia*. It is named in honor of R. C. L. Perkins, who has contributed so much to our knowledge of Polynesian insects.

This species is intermediate in size and general appearance between *brunneus* and *walkeri*. With *brunneus* it shares the short and robust beak, markedly strigose above, the somewhat angulately shaped eyes, and rather dense scaly vestiture. In *brunneus* the scales are almost as broad as long, and golden brown, whereas in *perkinsi* they are narrow, several times as long as broad and silvery white. Also, *perkinsi* is somewhat flatter than *brunneus*. In *walkeri* the scales are very elongate, almost hair-like, and of a very yellowish white color. In addition, the scutellum has a tuft of white hairs posteriorly, whereas it is absolutely naked in *perkinsi* and *brunneus*.

19. Rhyncogonus walkeri, Perkins.

Rhyncogonus walkeri Perkins, Ent. Monthly Mag., 25, p. 56, 1899.
Rhyncogonus walkeri Perkins, Ann. Mag. Nat. Hist., ser. 10, vol. 1, pp. 128, 129, 1928.

Of moderate size, somewhat dilated and considerably flattened, black, the upper surface partially clothed with white or yellowish white (especially in females) hair-like scales and a few, short, semierect setae, the sides of prothorax beneath, epipleurae and to a certain extent the legs more densely clothed with ochraceous pile. Head coarsely punctured, more or less strigose between the eyes; the rostrum about as broad as long; the eyes of moderate size and prominent; the antennae with scape reaching middle of prothorax, the second funicular segment almost a third longer than first, the second over twice as long as broad and but slightly shorter than first, the following gradually shorter. Prothorax barely broader than long, broadest at middle, apex slightly narrower than base, sides moderately arcuate, at times sinuate behind; the disk coarsely, irregularly punctured and more or less rugose. Scutellum with a tuft of white hair behind. Elytra one-third longer than wide and not three times as long as prothorax, the sides arcuate from base to posterior third, thence straight and convergent to rounded hind angles, strongly carinate, narrowly and somewhat distinctly margined in female; the disk but slightly convex, surface markedly granulate in male and with punctures not defined, the punctures well defined and serially arranged in female, the granules less evident. Beneath, the abdomen in male almost glabrous, shallowly sulcate in front and irregularly studded with small granules, the abdomen in female finely, sparsely pubescent, merely flattened in front, and finely punctured and scabrous. All tibiae very finely serrate on inner margin. Males: length, 8.5-12 mm.; breadth, 3-5 mm. Females: length, 13 mm.; breadth, 6 mm.

This species is definitely sexually dimorphic and dichromatic, the females not only more robust than the males and with the usual abdominal differences but with the pile evidently fulvous. This species of all the Marquesan species superficially more closely resembles certain Hawaiian species like *vittatus* Perkins and *kauaiensis* Perkins, than do any of the others. The Pacific Entomological Survey collected 92 specimens on Nukuhiva: Teuanui, Tovii [Toovii], altitude 1000 feet, October 27, 1929; Ooumu, altitude 4000 feet, November 12, 1929; Puokoke, altitude 3500 feet, October 22, 1929; all collected by Mumford and Adamson. An additional lot was taken at Tapuaooa Hill, altitude 3500 feet, July 20, 1931; Tovii [Toovii], altitude 3000 feet, June 20, 1931; Tekao Hill, altitude 3020 feet, July 23, 1931; Ooumu, altitude 3000 feet, May 29, 1931; on the north side, Muake, altitude 2500 feet, July 3, 1931; Keahaatiki, altitude 2000 feet, July 6, 1931, Le-Bronnec and H. Tauraa. All from Nukuhiva and collected from the following plants: *Vaccinium cereum, Hisbiscus tiliaceus, Metrosideros collina, Weinmannia* species, *Piper latifolium, Styphelia tameiameiae, Angiopteris* species, and *Cyperus* species.

20. Rhyncogonus lugens Perkins.

Rhyncogonus lugens Perkins, Ann. Mag. Nat. Hist., ser. 10, vol. 1, pp. 127-128, 1928.

Of moderate size, the males narrow, females rather broad, considerably flattened, black, the upper surface almost naked, the few white or yellowish-white scales being distributed along the sides of head and prothorax, more concentrated at hind angles of prothorax, and in females somewhat generally distributed over the elytra, especially posteriorly, the scales being more or less assembled to form vittae, and the discal scales always much smaller than the lateral, in addition a tuft of white hair covering the posterior part of the scutellum. Head flattened, coarsely punctured and strigose almost to apex of rostrum; the latter as broad as long; eyes moderate in size, prominent, slightly obliquely flattened in front; antennae with scape reaching middle of prothorax, the second funicular segment about one-fourth longer than first, the third three times as long as broad and three-fourths length of first, the following gradually shorter. Prothorax as broad as long in male, broader in female, broadest at middle, the apex slightly narrower than base in male, considerably narrower in female, sides sinuate in front of base in male and arcuate and narrowed towards apex, in female arcuate from base and definitely narrowed from middle to apex; the disk coarsely, closely punctured and rugose, and with a narrow crista at middle. Elytra about a third longer than broad and less than three times as long as prothorax in male, about three times in female; sides arcuate and gradually narrowed from anterior third to apex in male, from posterior third in female, and sinuate towards apex, sharply carinate and evidently margined; the disk but slightly convex, more so in female; and coarsely granulate, the punctures not evident. Beneath, the abdomen in male slightly sulcate in front, almost glabrous and finely punctured and alutaceous, obscurely scabrous; the abdomen in female merely flattened in front, finely, sparsely pubescent, and finely punctured and alutaceous as well as obscurely scabrous. The tibiae not distinctly serrate. Male: length, 10 mm.; breadth, 3-4 mm. Female: length, 11-12 mm.; breadth, 4.5-5 mm.

This species stands out among its fellows because of its dull black, sparsely pilose, and much flattened appearance. It is separated from *walkèri,* its closest relative, in being narrower, less pilose, more flattened, and in having the elytra uniformly granulate and without trace of the larger punctures evident in the female of *walkeri.* The Pacific Entomological Survey collected 86 specimens of this species and from the following localities on the island of Hivaoa: Mount Temetiu, at an altitude of 2000-3000 feet on the slope north of summit, December 27, 1930 to January 9, 1931; Vaiepoepo, altitude 2300 feet, June 2, 1929; and the ridge northwest of Taaoa, altitude 2800 feet, June 3, 1929, all taken by Mumford and Adamson. They were all taken on *Piper latifolium.*

21. Rhyncogonus planatus, new species (fig. 7, *e*).

Robust, broad, very much flattened, black, upper surface rather evenly clothed with very fine, short, well spaced, depressed yellowish white pile, the margins of elytra in females fringed with semierect setae. Head coarsely punctured, somewhat strigose, in general with a more or less evident median longitudinal crista, making the upper surface of the rostrum more or less bisulcate; the rostrum as broad as long; eyes of moderate size and prominent; antennae with scape reaching middle of prothorax, the second funicular segment one-fourth longer than first, the third about three times as long as broad and about three-fourths length of first, the following gradually shorter. Prothorax broader than long, broadest at middle, apex almost one-third narrower than base, sides straight or sinuate from base to middle thence arcuate to apex; the disk coarsely, closely punctured, also somewhat reticulate and rugose. Scutellum finely punctured and with a tuft of white pile at apex. Elytra one-third longer than broad and over three times as long as prothorax; sides broadly rounded at base, slightly arcuate or almost straight at middle, arcuate and narrowed from posterior third and sinuate just before very much narrowed yet rounded apices, markedly carinate and with margin narrow and poorly defined; the disk very flat and horizontal or but slightly elevated near suture in male, in female flat yet gradually elevated towards suture, rarely arcuate, the entire surface granulate, more evidently so in male and with a certain proportion of the granules more prominent so that they show through the pile. The abdomen beneath quite glabrous in male and with the anterior segment sulcate and the first two studded with granules, in the female with the anterior segments merely slightly flattened, very sparsely pilose, finely punctured and scabrous. The middle and hind tibiae only distinctly serrate within. Male: length, 15.5 mm.; breadth, 7 mm. Female: length, 15 mm.; breadth, 7 mm.

Holotype male, allotype female, and several designated paratypes from a series of 56 specimens collected on Penau Ridge, altitude 2000-2200 feet, and Hitikau Ridge, various altitudes from 2000-3000 feet, Uahuka, Marquesas, March 2-4, 1931, by LeBronnec and H. Tauraa, on *Weinmannia* species, *Freycinetia* species, and also on the crest of North Range, altitude 2400 feet, on *Piper latifolium,* A. M. Adamson.

This species is one of the most distinct in the entire genus, its proportionate breadth and very great flatness, especially in the males, readily

separating it. Its general flatness, markedly carinate elytra on outer margin, broad and rather short rostrum, medium sized yet prominent eyes, and prothorax, broadest at middle, place it without a doubt in group *C*. Its general facies would also put it here, some of the more convex females looking very little different from some of the females of *walkeri*. It might, therefore, be considered as the most divergent of its group and shows this well by not having the pile at all scale-like.

22. **Rhyncogonus aeneus,** new species.

Small, moderately robust, subglabrous, shining, black, upper surface bronzed, more or less alutaceous, the vestiture consisting of minute, scattered hair arising from the various punctures and only evident upon close examination. Head coarsely, shallowly punctured, obscurely strigose, and somewhat flattened and depressed in front; the rostrum very short, broader than long; the eyes small, just perceptibly obliquely flattened in front, and prominent; the antennae with scape reaching the middle of prothorax, the second funicular segment narrower and slightly longer than the first, the third about three-fourths length of first, the following gradually shorter. Prothorax about as broad as long, apex one-fourth narrower than base, the sides slightly arcuate and narrowed toward apex, the disk very convex, shallowly, more or less regularly and somewhat distantly punctured. Scutellum glabrous. Elytra cordate, about a fifth longer than broad and two and a half times as long as prothorax, sides broadly rounded to anterior third, then less arcuate and gradually narrowed to rounded hind angles, obscurely carinate near base but not margined, the disk evenly convex, somewhat regularly though not closely punctured, the punctures at times serially arranged. Abdomen beneath somewhat concave in front and moderately, sparsely punctured. The tibiae not evidently serrate. Length, 8 mm.; breadth, 3.75-4 mm.

Holotype and three paratypes collected on Hitikau Ridge, altitude 2900 feet, Uahuka, Marquesas, March 4, 1931, LeBronnec and H. Tauraa, from *Weinmannia* species and *Freycinetia*. The four specimens are apparently all females though one is somewhat smaller and narrower than the others.

This small, shining species is quite unlike any of the species which have been previously described. It is quite closely related to the species which follows and superficially very much resembles the single species of *Microgonus*.

23. **Rhyncogonus pygmaeus,** new species.

Small, rather narrow and somewhat elongate, subglabrous, shining, rufopiceous, the antennae and legs rufous, the vestiture consisting of very minute and sparsely placed hairs, each arising from the elytral punctures as well as from the underside. Head closely punctured behind, more sparsely in front; rostrum as broad as long, eyes of moderate size and prominent; the antennae with scape reaching midde of prothorax, second funicular segment one-fourth longer than first, the third slightly more than twice as long as wide and about three-fourths length of first, the following very gradually narrower. Prothorax barely longer than broad, broadest at middle, apex slightly narrower than base, sides rather broadly arcuate, somewhat sinuate toward base, the disk

rather coarsely punctured with a narrow median longitudinal smooth line. Scutellum glabrous. Elytra two-fifths longer than broad and two and a half times as long as prothorax, sides evenly arcuate from base to behind middle, then gradually narrowed to rounded hind angles, without either carination or defined margin; disk quite convex and with rather small, shallow punctures, well spaced over the surface. Elytra beneath quite glabrous, with anterior segment shallowly sulcate, and sparsely, finely punctured. Tibiae without evident serrations on inner face. Length, 8 mm.; breadth, 3 mm.

Holotype, an apparent male, collected at Teava Uhia i te Kohu, altitude 2100 feet, Hivaoa, Marquesas, February 15, 1930, Mumford and Adamson, from dead stipes of tree fern, *Cyathea* species.

This small species, though rather closely related to the preceding, is in every way distinct. The color, more robust antennae, elongate and apically dilated rostrum, and quite fusiform prothorax enable it to be readily separated.

MICROGONUS new genus

This genus is related to *Rhyncogonus,* agreeing with it as regards the mouthparts and most of the other general characters. It differs in having the head basally more conical, the eyes very small yet prominent, the rostrum distinctly longer than broad, the antennae with the funiculus and club both proportionately shorter, the latter hardly three times as long as broad; the prothorax quite cylindrical and much longer than broad; and the lobes of the third tarsal segments moderately narrow or somewhat elliptical in shape.

In general appearance the only known species superficially suggests *Rhyncogonus aencus* and *pygmaeus,* the two smallest and smoothest of their genus. Genotype: *Microgonus oodemaformis,* new species.

24. **Microgonus oodemaformis,** new species (fig. 7, *f*).

Small, slightly elongate, very convex, somewhat aeneous, with reddish legs and antennae and practically glabrous. Head slightly flattened above, coarsely, sparsely punctured and somewhat strigose, the rostrum distinctly longer than broad and narrowly sulcate at middle; eyes small, moderately prominent, somewhat obliquely flattened in front, the interocular space about six times the breadth of eyes; the scape of the antennae long, almost reaching the middle of prothorax, the funicle of about equal length, the first and second segments subequal, about three times as long as broad, the third about twice as long as broad and two-thirds length of second, the following of about the same length as second but gradually broader and all from the third to seventh somewhat moniliform, the club elliptical, not quite three times as long as wide and less than one-third length of funicle. Prothorax subcylindrical, at least one-seventh longer than broad, the apex about one-third narrower than base, the sides slightly arcuate and convergent forward, the disk distinctly punctured with numerous large and a few finer punctures, alutaceous. Scutellum small, triangular and glabrous. Elytra subcordate, very convex, and over one-fourth longer than broad, the sides rather evenly arcuate from base to posterior third then gradually convergent to acute apex, and neither carinate nor margined, the disk rather coarsely punctured with rounded punctures, serially arranged,

the striae not evident, and with a few very minute setae on apical declivity. Beneath, the first and second abdominal segments flattened, faintly alutaceous, finely, sparsely punctured and with minute hairs arising from the same. The tibiae simple, without serrations. Length, 5 mm.; breadth, 2.5 mm.

Holotype, a unique specimen, collected at Ooumu at an altitude of 4000 feet, Nukuhiva, Marquesas, November 12, 1929, by Mumford and Adamson.

This species superficially very much resembles many of the species of the well known Hawaiian Cossonid genus *Oodemas,* and for that reason is given its specific name.

NEW SPECIES AND OTHER RECORDS OF MALLOPHAGA FROM THE MARQUESAS *

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INTRODUCTION

In presenting this report upon the Mallophaga collected by members of the Pacific Entomological Survey, the writer wishes first of all to make clear his point of view. It is his belief that whatever value mere lists of identifications, accompanied by descriptions of new species, may have in connection with other groups of organisms, their value in connection with the Mallophaga approaches the vanishing point. In this particular group the problems of distribution have a special significance which has been pointed out by various writers, a significance that can only be explored by the most careful of systematic studies. The identification of species and the grouping of species into genera and other categories need here, above all, to be guided and controlled by ideals of accuracy and a clear conception of biological principles if conclusions as to the problems of distribution are to have any special value.

That a very large part of the systematic work upon the Mallophaga has not thus been guided and controlled is clear. A glance at the synonymy presented under the names of certain of the species discussed in this paper should make this statement understandable. The situation disclosed, involving as it does confusion of most easily recognizable species, is certainly characteristic of the conditions to be found in much of the systematic work on the Mallophaga. In the face of such conditions, the presentation of unadorned lists of identifications can contribute little to understanding. A researching of the data is needed. I have therefore chosen to figure all the species discussed, whether they be presumably "new" species or not. The number of new species is gratifyingly low; but two are included in the list. Certain material from domesticated hosts, representing well known species, has been omitted. Twelve species are here dealt with.

FAMILY MENOPONIDAE HARRISON

Recent authors have segregated certain genera in this family on the basis of the absence of gastric teeth. It is my belief that gastric teeth are present

* Pacific Entomological Survey Publication I, article 5.

in all the species. They occur, at least, in all the species that I have examined. They are not indicated in the accompanying figures.

Genus **COLPOCEPHALUM** Nitzsch

Like the other large and meaningless genera of the Mallophaga, this genus has been somewhat reduced of recent years by the removal of a number of groups. It still remains a heterogeneous assemblage.

Colpocephalum angulaticeps Piaget (fig. 8, *a-f*).

Colpocephalum angulaticeps Piaget, Les Pédiculines, p. 569, pl. 47, f. 8, 1880.

Colpocephalum spineum Kellogg, California Acad. Sci. Occ. Papers, 6, p. 38, pl. 4, f. 1, 1899; Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 484, 1902; Waterston, Natural History Report, British Antarctic Expedition, Zoology, 3, p. 270, 1921.

Marquesas: Atuona, Hivaoa, March 20, 1929, from *Fregata minor,* Mumford and Adamson. From frigate bird, Ceylon, Stanford collection. Originally described by Piaget from *Fregata minor,* without indication of origin. Previously collected in the Galapagos and Revillagigedo Islands from *Sula websteri, Anous stolidus, Puffinus subalaris,* and *Geospiza fuliginosa,* Kellogg and Kuwana; Panama, the Galapagos and Revillagigedo Islands, Ascension and south Trinidad islands, from frigate birds.

The availability of specimens from the type host of *Colpocephalum angulaticeps* reveals the synonymy of *Colpocephalum spineum* with this species. It is evidently a characteristic parasite of frigate birds and the other host records are to be regarded with doubt, although perhaps the occurrence of the species upon hosts of the genus *Sula* is normal.

Colpocephalum angulaticeps departs from the type of the genus only in the strong sexual dimorphism, but there seems no reason to suppose that this male and female do not belong together. The accompanying figures make an extended discussion of the species unnecessary.

Genus **DENNYUS** Neumann

This is a very small genus, including about a half dozen presumably valid species, which occur on swifts (Cypselidae). Certain species from other birds (*Nitzschia latifrons* Carriker, from *Riparia riparia,* of which *Nitzschia piageti* Kistiakowsky from the same host is probably a synonym), referred to this genus, probably do not belong here. I am entirely in accord with Ewing in placing the genus *Takamatsuia* of Uchida as a synonym of *Dennyus.* One species of the genus is at hand.

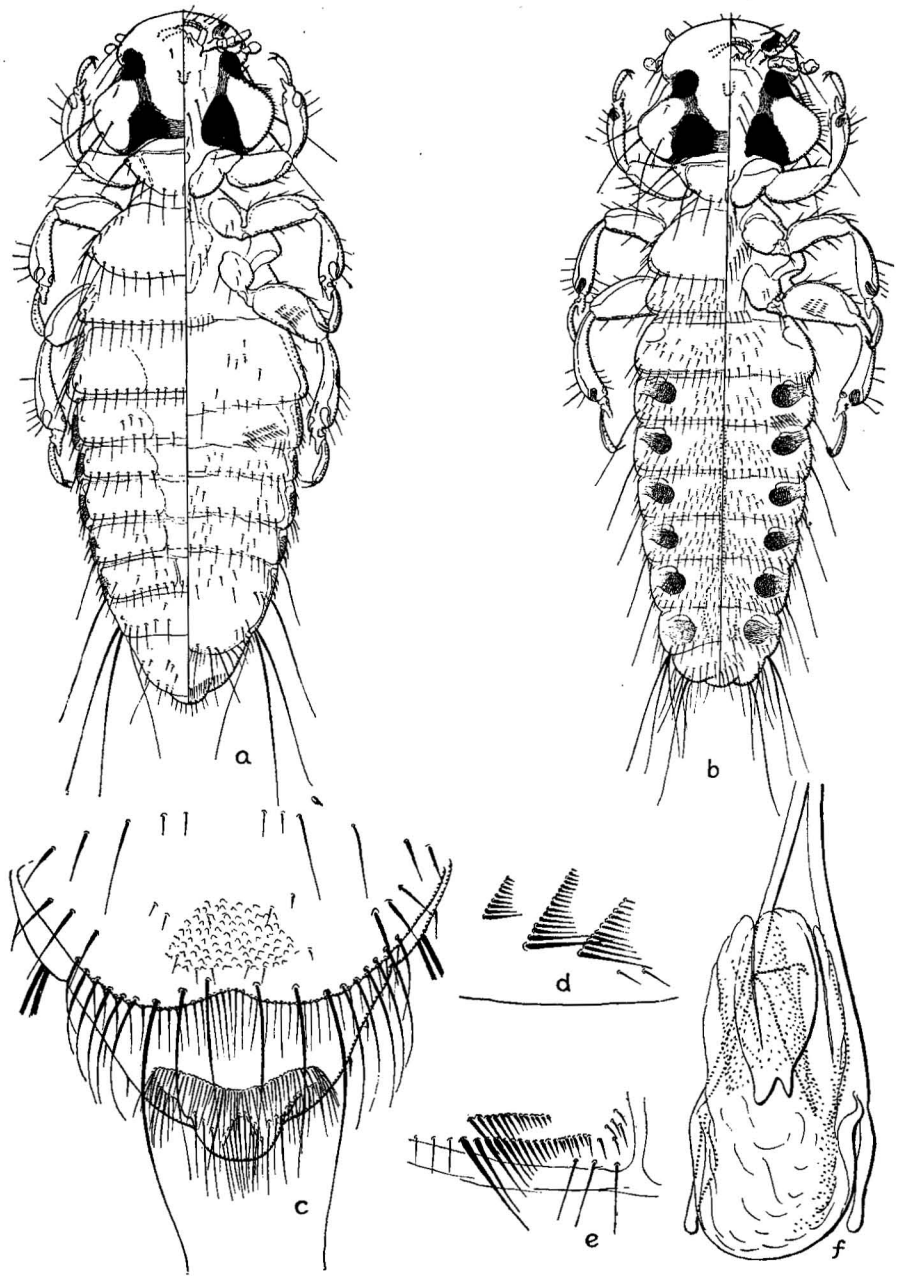

FIGURE 8. *Colpocephalum angulaticeps* Piaget, from specimens from *Fregata minor*, Marquesas: *a*, female; *b*, male; *c*, genital region of female; *d*, combs of posterior femur; *e*, combs of third abdominal sternite; *f*, genitalia of male.

Dennyus distinctus Ferris (figs. 9, *a, b;* 10, *a-h*).

Dennyus distinctus Ferris, Canadian Ent., 48, pp. 310-311, tf. 15, 1916.

Marquesas: Vaipaee Valley, Uahuka, September 22, 1929, 1 male and 2 females from *Collocalia ocista,* Adamson. Previously collected from *Collocalia* species, from Samarang, Java.

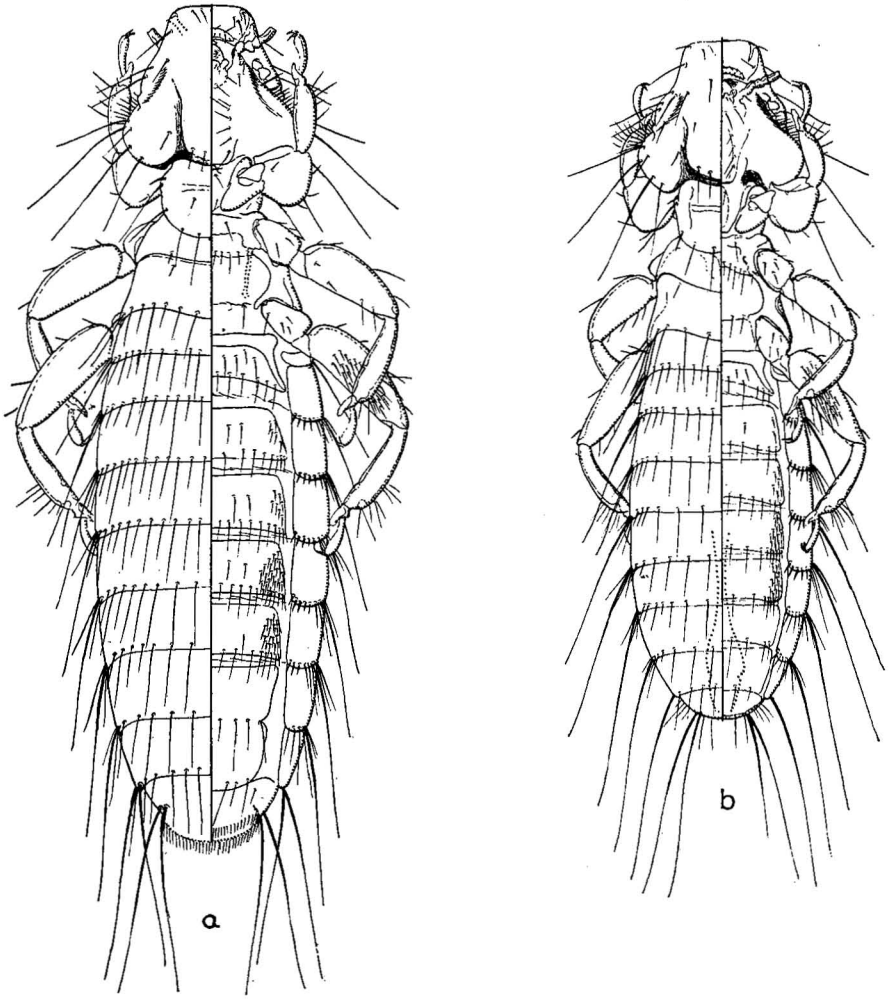

FIGURE 9. *Dennyus distinctus* Ferris, from specimens from *Collocalia ocista,* Marquesas: *a,* female; *b,* male.

In the original description of this species the male alone was figured, and opportunity is here taken to present fuller illustrations and additional

notes. As noted in the original description, the truncate head (fig. 10, *f*) is a marked feature of the species, separating it from any other named form. The antennae (fig. 10, *b*) are relatively very small, with the third segment closely united with the fourth. The femoral and abdominal brushes of setae (fig. 10, *g, h*) are strongly developed. The posterior margin of the paratergites (fig. 10, *c*) is beset with short, thorn-like setae. The genital region of the female (fig. 10, *a*) bears a single large plate formed by the fusion of the seventh and eighth sternites; the margin of the vulva is smoothly convex and beset only with small, slender setae.

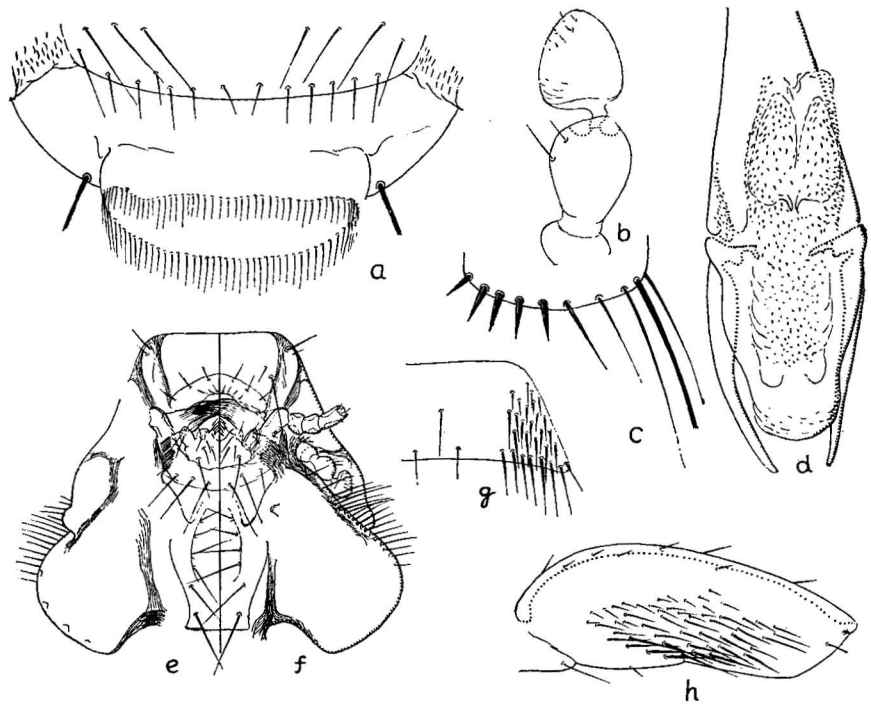

FIGURE 10. *Dennyus distinctus* Ferris: *a,* genital region of female; *b,* antenna; *c,* posterior margin of paratergite; *d,* genitalia of male; *e,* dorsal aspect of portion of head; *f,* ventral aspect of portion of head; *g,* brush of setae from fifth sternite of female; *h,* ventral aspect of posterior femur.

The male is very similar in general form to the female, apparently differing only in the genital structures. The genitalia (fig. 10, *d*) are of a simple type, the parameres slender and slightly curved, inclosing between them the sclerotic terminal portion of the preputial sac, the membranous basal portion of which is beset with small teeth and shows a pair of slightly sclerotic plates that terminate each in a mesal hook.

Genus **MENOPON** Nitzsch

Like others of the old and all inclusive genera of Mallophaga, the genus *Menopon* has been somewhat reduced by the removal of various groups. It still remains a heterogeneous assemblage of whose included species very few are strictly congeneric with the type. Certainly the two species herein dealt with are not Menopons, but no genus exists for them and I am not prepared to define such genera at present.

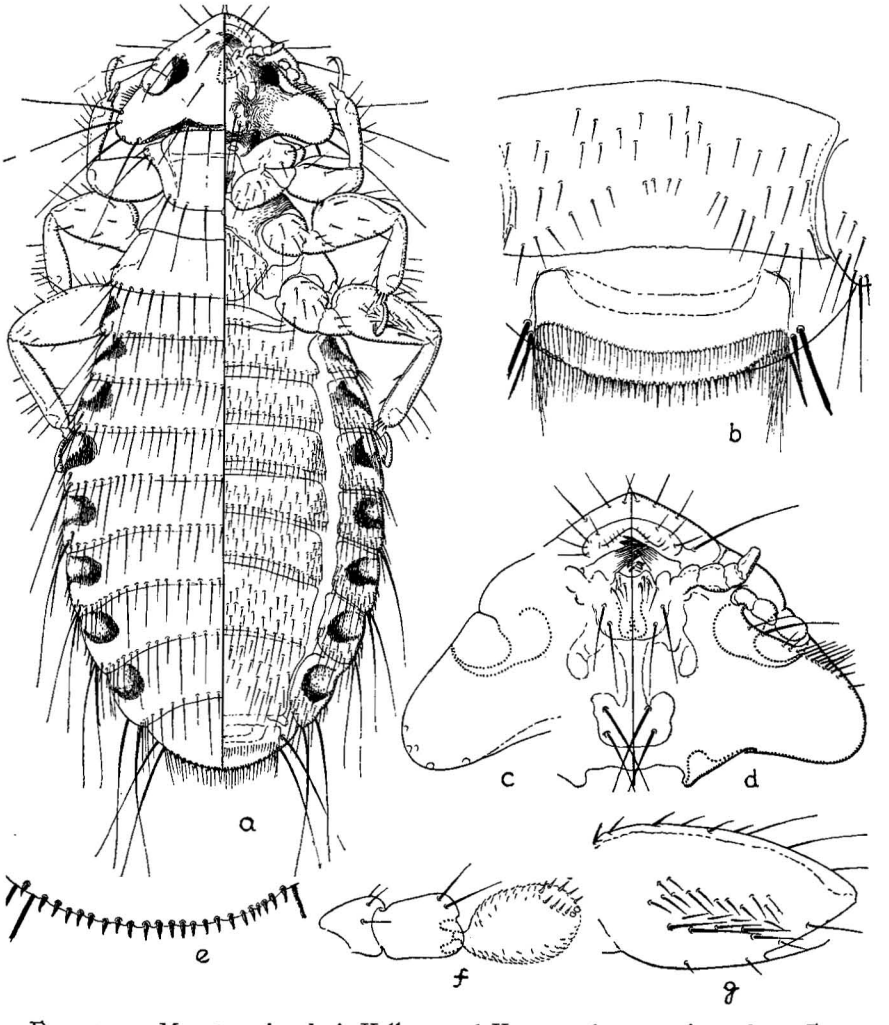

FIGURE 11. *Menopon singularis* Kellogg and Kuwana, from specimen from *Fregata minor*, Marquesas: *a*, female; *b*, genital region of female; *c*, dorsal aspect of portion of head; *d*, ventral aspect of portion of head; *e*, apical margin of ninth tergite; *f*, antenna; *g*, ventral aspect of posterior femur.

Menopon singularis Kellogg and Kuwana (fig. 11, *a-g*).

Menopon singularis Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 485, pl. 31, *f.* 1, 1902; Kellogg, Am. Ent. Soc. Trans., 32, p. 321, 1906.

Marquesas: Hatutu [Hatutaa], November 28, 1931, 1 female from *Fregata minor,* LeBronnec and Tauraa. Previously recorded from the Galapagos and Revillagigedo Islands and adjacent waters from *Anous stolidus, Sterna fuliginosa, Sula variegatus, Sula nebouxii,* and *Phaethon aetherus.*

The original description omits many characters of significance. The accompanying figures should make its features clear.

Menopon sternophilum new species (fig. 12, *a-f*).

Female

Length, 2 mm. A moderately pigmented species. Head (fig. 12, *c*) considerably broader than long, the lateral margins of the forehead noticeably convex, without any indication of a slit or notch, the antennal fossa entirely roofed over. Ventral side with a pair of sclerotic, longitudinal gular bands, each with several long setae. Antennae (fig. 12, *d*) clearly four-segmented. Pronotum broad and large, mesonotum distinct, metathorax very broad. Abdomen with the tergites strongly sclerotic and pigmented, separated by a very narrow suture from the large paratergites (pleurites), bearing setae along the posterior margins. Sternites quite strongly developed, beset with many small setae, the seventh and eighth fused into the genital plate. Ventral brushes of setae, on both femora and sternites, scarcely recognizable. Vulva (fig. 12, *e*) very close to the apex of the body, presenting no specially distinctive features.

Male

Length, 1.25 mm. In general form closely resembling the female. Genitalia (fig. 12, *f*) with the basal plate strongly expanded at the apex and slightly asymmetrical, parameres widely separated, slender and curved, much exceeding the apex of the preputial sac, preputial sac small, beset mesally with small teeth and bearing a pair of flat plates of somewhat irregular form, one terminating in a strong hook.

Marquesas: Teuaua, off Uahuka, September 21, 1929, Adamson. Holotype female, allotype and 4 paratypes from *Sterna fuscata.*

I am unable to associate this species definitely with any named form. It is evidently very similar to *Menopon fuscofasciatum* Piaget, which was described from terns, and may possibly be that species. However, Piaget's figure indicates the margin of the forehead as concave. It is not the same, at least, as specimens in the Stanford collection identified by Kellogg as that species, although it is of a similar type.

FAMILY PHILOPTERIDAE BURMEISTER

Genus **ESTHIOPTERUM** Harrison

This genus has resulted from the division and restriction of the old genus *Lipeurus,* the latter now including only certain forms from gallinaceous birds. Further division and restriction will undoubtedly be necessary, for

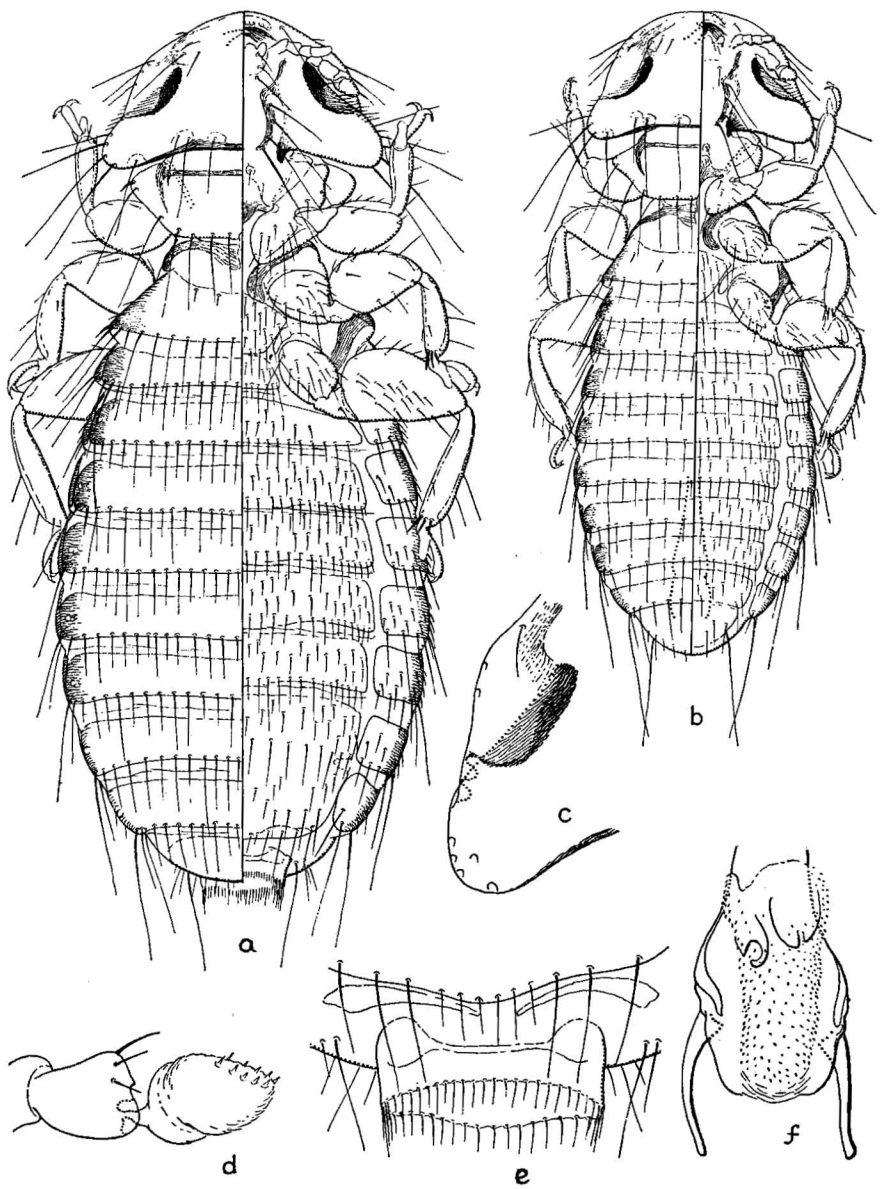

FIGURE 12. *Menopon sternophilum* new species: *a*, female; *b*, male; *c*, dorsal aspect of portion of head; *d*, antenna; *e*, genital region of female; *f*, genitalia of male.

comparatively few of the species now referred to *Esthiopterum* have any close similarity to its type, *Esthiopterum gruis* (Linnaeus) (= *Lipeurus hebraeus* Nitzsch). Certainly the two species here referred to this genus do not belong in it, but more extensive studies than I have been able to make in connection with this paper are necessary before the naming of new genera can be undertaken with confidence.

Esthiopterum gracilicornis (Piaget) (fig. 13, *a-e*).

Lipeurus gracilicornis Piaget, Les Pédiculines, p. 309, pl. 25, f. 6, (as to male), 1880.

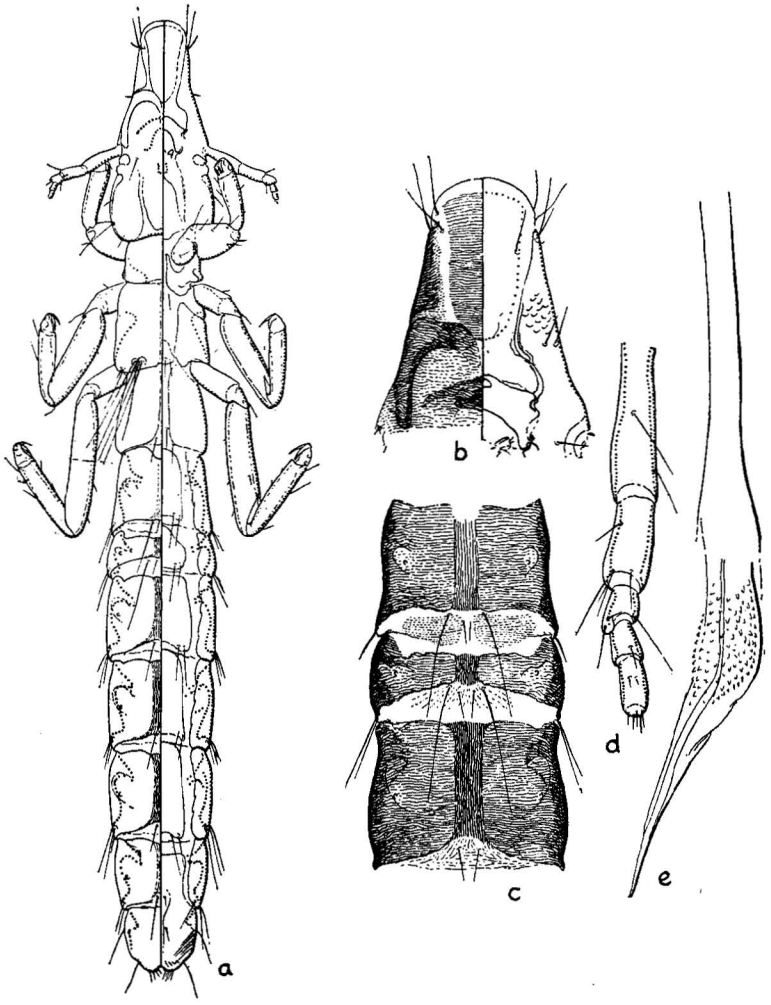

FIGURE 13. *Esthiopterum gracilicornis* (Piaget), from specimen from *Fregata minor*, Marquesas: *a*, male; *b*, anterior portion of head; *c*, flexing segment of abdomen; *d*, antenna of male; *e*, genitalia of male.

Lipeurus gracilicornis variety *major* Kellogg, California Acad. Sci. Occ. Papers, 6, p. 30, pl. 3, f. 3 (as to male), 1899; Kellogg and Kuwana, Washington Acad. Sci., Proc., 4, p. 477 (as to male), 1902; Kellogg, Am. Ent. Soc., Trans., 33, p. 321, 1906.

Marquesas: Hatutu [Hatutaa], April 28, 1931, from *Fregata minor,* LeBronnec and Tauraa; from frigate bird, Ceylon, Stanford collection. Males only are included in this material.

The original description of this species appears to have been based upon the male of one species and the female of another, and this error has been perpetuated by later authors. The male, having been described first by Piaget and having been quite clearly figured, may be accepted as the type. The female will be discussed in connection with *Pectinopygus sulae* (Rudow).

It is a curious coincidence that this male and female should have been taken together several times and each without its proper opposite sex, which lead to the error noted. It may, of course, be suggested that the error is mine, but the evidence seems clear. No female which can be definitely assigned to accompany this male is at hand. The female should be a slender-bodied form.

The accompanying figures should make the characteristics of the species clear, and attention is only called to certain special points. The modified abdominal segment of the male, which permits the flexing of the body for purposes of copulation, is in this species the apparent third (fig. 13, *c*). The genitalia (fig. 13, *e*) are exceedingly small and delicate, and the parts are so modified that the homologies are greatly obscured.

Esthiopterum marquesanum new species (figs. 14, *a, b*; 15, *a-f*).

Female

Length, 4 mm. A very slender, strongly sclerotic and deeply pigmented form with very slender head. Signature (fig. 15, *c*) broader than long, the forehead marked dorsally by two submedian, longitudinal dark bands and with a ventral, internal pair of rather faint longitudinal bars. Abdomen with extremely heavy, longitudinal, marginal buttresses, the segments all closely fused and quite uniformly sclerotic. Pygidium without an apparent tenth segment, genital region very simple, the vulva appearing merely as a crescentic slit beset only with minute setae (fig. 15, *e*).

Male

Length, 3.5 mm. Head similar to that of female, but with the hind head somewhat narrower. Antennae (fig. 15, *a*) with the first segment much elongate and stout, the second about a third as long, the third modified with the anterior margin longer than the posterior, the fourth and fifth small. Abdomen with the apparent first to third segments closely fused, the posterior margin of the fourth (morphological fifth) tergite emarginate, the fifth and succeeding segments (fig. 15, *d*) with the tergites emarginate both anteriorly and posteriorly, thus allowing of flexion. The fifth segment is slightly shorter than either the fourth or sixth. Genitalia (fig. 15, *f*) very small and obscure, the terminal portion elongate and slender.

Marquesas: Hivaoa, Mount Temetiu, holotype female, allotype, and numerous paratypes from *Pterodroma rostrata,* December 30, 1930, Tauraa.

I am unable to connect this species with any described form. It is apparently not *Naubates pterodromi* Bedford. Its relationships are undoubtedly with such forms as *Esthiopterum diversum* (Kellogg), these species constituting a group that will eventually be placed as a distinct genus.

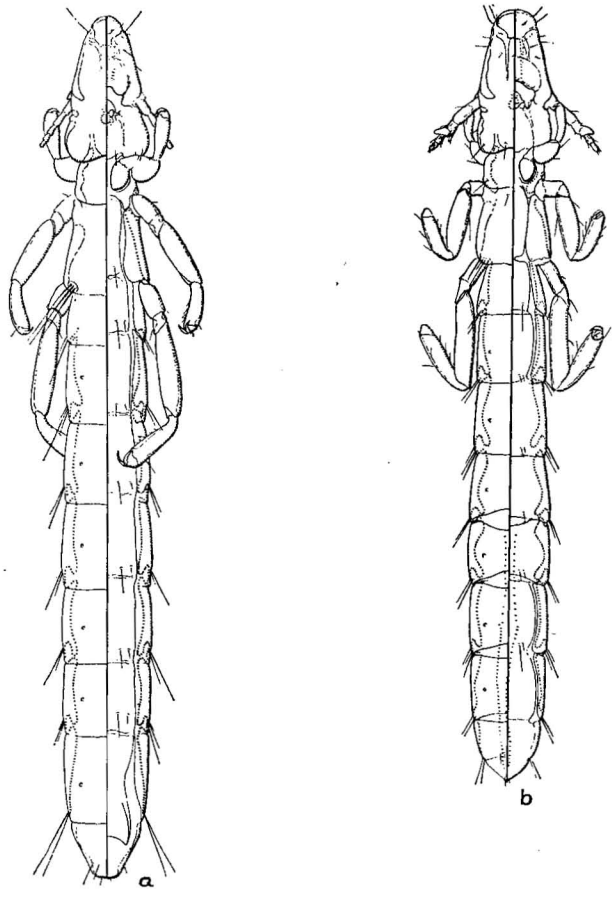

FIGURE 14. *Esthiopterum marquesanum* new species: *a,* female; *b,* male.

Genus PECTINOPYGUS Mjöberg

This genus was established originally for the single species, *Lipeurus bassanae* (Fabricius) (= *Lipeurus pullatus* Nitzsch). I am in entire accord with Waterston, who has expressed the view that the characters upon which the genus was founded are largely specific and that its definition must be

expanded to include certain other species that are characteristically parasites of gannets. The exact limiting of the genus awaits more extensive studies. For the present, *Lipeurus potens* Kellogg and Kuwana and *Lipeurus sulae* Rudow (= *Lipeurus helleri* Kellogg and Kuwana) may be referred to it.

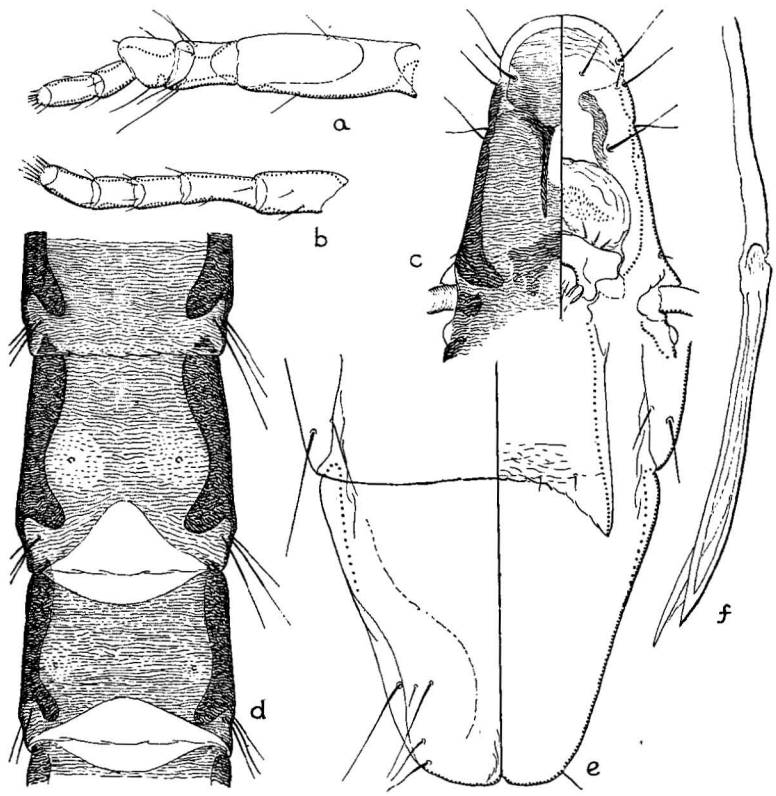

FIGURE 15. *Esthiopterum marquesanum* new species: *a*, antenna of male; *b*, antenna of female; *c*, anterior portion of head of female; *d*, flexing segments of abdomen of male; *e*, genital region of female; *f*, genitalia of male.

Pectinopygus sulae (Rudow) (figs. 16, *a, b*; 17, *a-d*).

Lipeurus sulae Rudow, Zeit. für ges. Naturw. 36, p. 134, 1870.

Lipeurus gracilicornis Piaget, Les Pédiculines, p. 309, (as to female?), 1880.

Lipeurus gracilicornis variety *major* Kellogg, California Acad. Sci. Occ. Papers, 6, p. 30, (as to female), 1899; Kellogg and Kuwana, Washington Acad. Sci., Proc., 4, p. 477, (as to female), 1902; Kellogg, Am. Ent. Soc., Trans., 32, p. 319, (as to female), 1906.

Lipeurus helleri Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 479, pl. 30, f. 3, 1902; Kellogg, Am. Ent. Soc. Trans., 32, p. 319, (part), 1906.

Lipeurus potens Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 477, (part), 1902; Kellogg, Am. Ent. Soc. Trans., 32, p. 319, (part), 1906.

Pectinopygus sulae (Rudow), Waterston, Ent. Soc. London, Trans., p. 289, 1923.

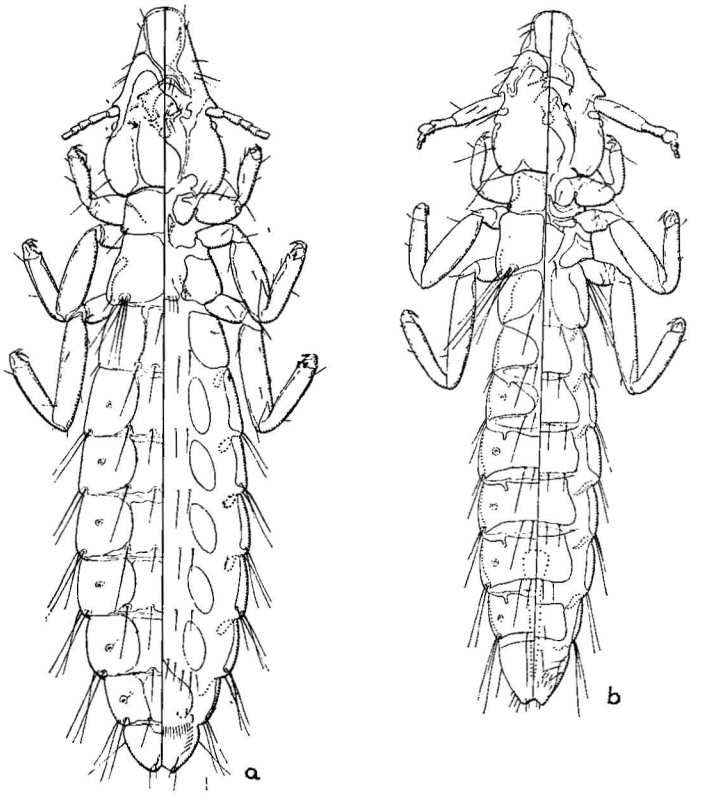

FIGURE 16. *Pectinopygus sulae* (Rudow): *a*, female from type slide of *Lipeurus gracilicornis* variety *major* Kellogg; *b*, male from type of *Lipeurus helleri* Kellogg and Kuwana.

Head (fig. 17, *b*) elongate, with markings as figured. Abdomen moderately stout, the tergites in the female all with a well-defined median area that is usually beset with minute points. In some specimens this area is more heavily pigmented than in others. Sternites of the abdomen membranous except for a pair of oval plates on each of the third (morphological) to seventh segments, the median area tending to be somewhat squamose. Genital area (fig. 17, *a*) as shown; terminal segment with a pair of small, slender lobes on each side.

Male more slender than the female and slightly shorter. Antennae (fig. 17, *c*) with the third segment much elongate and enlarged, the third somewhat globose. Tergites of first to third (apparent) abdominal segments divided medially, the remainder complete. Sternites undivided. Genitalia (fig. 17, *d*) small and slender, the terminal parts of the characteristic form shown, the preputial sac large and beset with small teeth.

Marquesas: Atuona, Hivaoa, from *Fregata minor,* June 20, 1929, Mumford and Adamson; Hatutu [Hatutaa], April 28, 1931, LeBronnec and Tauraa. From frigate bird, Ceylon, in the Stanford collection. Originally described by Rudow from *Sula fiber.*

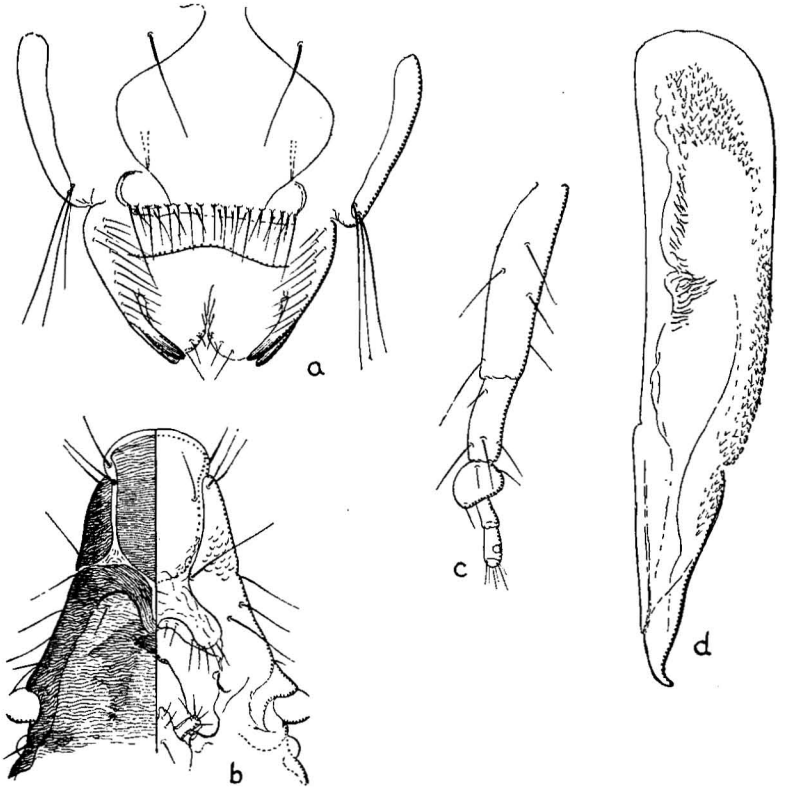

FIGURE 17. *Pectinopygus sulae* (Rudow): *a,* genital region of female; *b,* anterior portion of head of female; *c,* antenna of male; *d,* genitalia of male.

This species is very similar to *Pectinopygus potens* (Kellogg and Kuwana), but the two are readily separable. It is probable that the female recorded by Piaget under the name *Lipeurus gracilicornis,* from *Fregata minor,* is this species. Owing to the misidentifications indicated in the

synonymy, no published records can be accepted at their face value. On the basis of an examination of the material in the Kellogg collection, the following records may be accepted. From *Fregata aquila, Sula websteri, Sula cyanops* and *Sula variegata, Anous stolidus, Sterna fuliginosa, Puffinus subalaris,* and *Geospiza fuliginosa,* Galapagos and Revillagigedo Islands and adjacent waters. Some of these records are undoubtedly abnormal.

The extrordinary tangle of misidentifications involving this species could be cleared up only by reference to the actual specimens upon which the literature has been based. The conclusions of Waterston as to the identity of *Lipeurus sulae* Rudow are here accepted without question. The identity of the species described by Piaget as *Lipeurus gracilicornis* is discussed in connection with *gracilicornis* under the genus *Esthiopterum.* It is probable that the female recorded by Piaget is the same as females at hand from *Fregata minor,* this being the form upon which Kellogg based his *Lipeurus gracilicornis* variety *major.* The fortunate presence of a male associated with this female and undoubtedly of the same species clears up the doubt that might have remained. That *Lipeurus helleri* Kellogg and Kuwana is the same species—within any definition of the word that may be based upon preserved specimens alone—is evident, as is the fact that specimens of this species were misidentified as *Lipeurus potens* Kellogg and Kuwana and specimens of the latter as *Lipeurus helleri.* The statement made by Kellogg that he was figuring the female of *Lipeurus gracilicornis* variety *major* was in error. The specimen he figures is a male.

Thus it appears that whereas *Pectinopygus sulae* Rudow is normally a parasite of the gannets (*Sula*) it is also normally to be found upon frigate birds. In the large amount of material at hand there is a certain amount of variation in the form of the head, some specimens having the head more elongate than others. Possibly a detailed study of masses of material would reveal the presence of races associated with particular hosts. Males are rare in the material from frigate birds, but common in the material from *Sula.*

The figures and notes presented here should make possible the definite recognition of the species.

Genus **DEGEERIELLA** Neumann

Not even a beginning has been made in the breaking up of this enormous and obviously heterogeneous group. Any attempt to do so must take into consideration, in all probability, species now referred to *Philopterus* as well. While recognizing that the two species here referred to *Degeeriella* are not congeneric with its type, one must leave them here for the present.

Degeeriella gloriosa (Kellogg and Kuwana) (fig. 18, *a-e*).

Nirmus gloriosus Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 467, pl. 29, f. 1 (part), 1902; Kellogg, Am. Ent. Soc. Trans., 32, p. 313, 1906; Kellogg and Paine, Ent. News 21, p. 125, 1910; Kellogg and Mann, Ent. News, 23, p. 58, 1912.

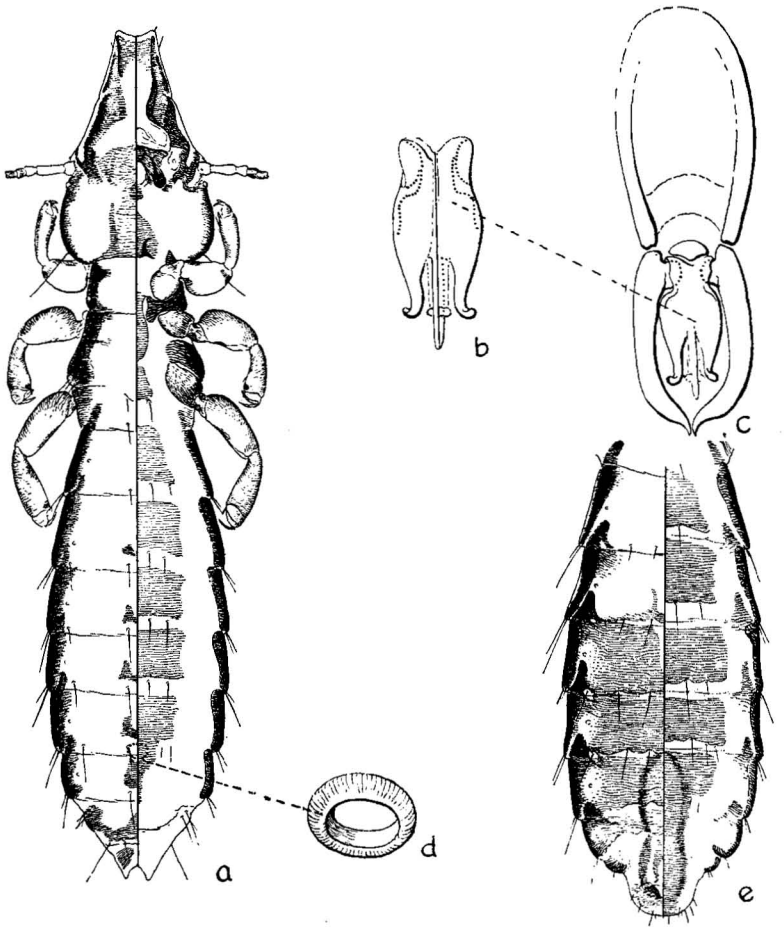

FIGURE 18. *Degeeriella gloriosa* (Kellogg and Kuwana), from *Sterna fuscata*, Marquesas: *a*, female; *b*, endomeral complex of genitalia of male; *c*, genitalia of male; *d*, spermatheca of female; *e*, abdomen of male, to larger scale than female.

Marquesas: Hatutu [Hatutaa], from *Sterna fuscata*, April 28, 1931, LeBronnec and Tauraa. Previously reported from the Galapagos and Revillagigedo Islands and adjacent waters from *Sterna fuliginosa, Sterna anathaeta, Anous stolidus, Camarhynchus affinis, Geospiza fuliginosa,*

Progne modesta, and *Nesomimus barringtoni,* and Laysan I., from *Sterna lunata.*

Apparently species of *Sterna* are the normal hosts, and the records from other birds, especially the land species, are to be regarded as abnormal. No type was originally designated, and although the specimen figured was from *Progne modesta,* I herewith designate as the type a specimen from *Sterna fuliginosa,* Clipperton Island. In the original description specimens of *Degeeriella separata* (Kellogg and Kuwana) were mingled with this species. The species later described by Kellogg and Chapman as *Nirmus gloriosus* variety *emarginatus* is a synonym of *Degeeriella separata.*

The very striking markings of the species, as shown in the accompanying illustrations, make its identification simple. Attention should be called to the very conspicuous spermatheca (fig. 18, *d*). The gentalia of the male present the characters shown in figure 18, *b. c.* The species is evidently related to such forms as *Degeeriella phaeonota* (Nitzsch), of which specimens from *Sterna hybrida* are at hand.

Degeeriella separata (Kellogg and Kuwana) (fig. 19, *a-e*).

Nirmus gloriosus Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 467, (part), 1902.

Nirmus separatus Kellogg and Kuwana, Washington Acad. Sci. Proc., 4, p. 472, pl. 29, f. 6, 1902; Kellogg, Am. Ent. Soc. Trans., 32, p. 317 (part), 1906; Uchida, Annotationes Zoologicae Japonensis, 9, p. 484, 1918.

Nirmus gloriosus var. *emarginatus* Kellogg and Chapman, New York Ent. Soc. Jour., 10, p. 159, 1902.

Marquesas: Mohotani, from *Anous stolidus,* February 3, 1931, LeBronnec and Tauraa. Society Islands: Tahiti, Hitiaa, on the same host, November 22, 1928, Adamson (fig. 19).

Previously collected in the Galapagos and Revillagigedo Islands and adjacent waters from *Anous stolidus, Sterna fuliginosa, Geospiza conirostris,* and *Geospiza fortis, Progne modesta, Certhidea albemarlei* and *Nesopelia galapagensis.* Hawaii: Maui, from *Anous stolidus.* Specimens recorded by Kellogg from *Oceanodroma cryptoleucura* are another species.

As indicated by the synonymy, this species was recorded by Kellogg under three different names. The records involving land birds are to be regarded as abnormal. The normal host is evidently *Anous.*

The female possesses a spermatheca of essentially the same form as in *Degeeriella gloriosa,* but very weakly sclerotic and consequently obscure and easily overlooked. The anterior margin of the vulva (fig. 19, *d*) is a simple lobe beset with very small setae which are somewhat variable in size and

form. In the male the entire dorsum of the abdomen is sclerotic, the sclerites of at least the first three segments with a deep, narrow median notch. The genitalia of the male (fig. 19, *b, c*) are of the same form as in *Degeeriella gloriosa,* only differing in small details.

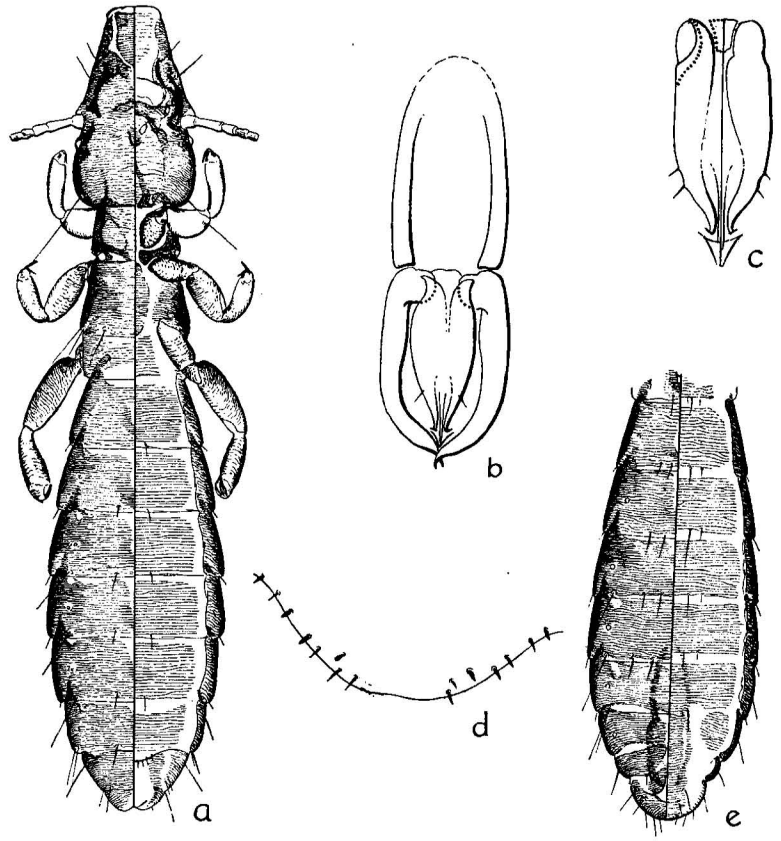

FIGURE 19. *Degeeriella separata* (Kellogg and Kuwana), from specimens of *Anous stolidus,* Tahiti; *a,* female; *b,* genitalia of male; *c,* endomeral complex of genitalia of male; *d,* margin of vulva of female; *e,* abdomen of male, to larger scale than female.

Genus **PHILOPTERUS** Nitzsch

Although rather extensive inroads upon this genus have been made by the breaking off of a number of groups, there still remains much to be done. One species in the material at hand may be treated as belonging to this genus.

Philopterus snyderi (Kellogg and Paine) (fig. 20, *a-d*).

Docophorus snyderi Kellogg and Paine, Ent. News, 21, p. 124, figs. 1, 2, 1910.

Marquesas: Hatutu [Hatutaa], from *Sterna fuscata,* 2 males, 1 female, April 28, 1931, LeBronnec and Tauraa. Previously collected from Laysan Island, from *Sterna lunata.*

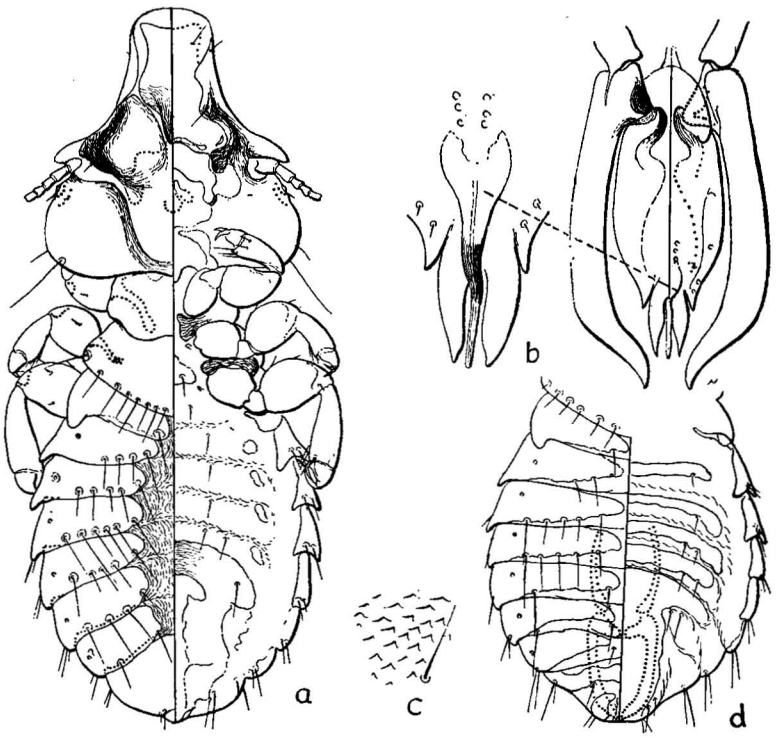

FIGURE 20. *Philopterus snyderi* (Kellogg and Paine), from specimens from *Sterna fuscata,* Marquesas: *a,* female; *b,* genitalia of male, with details of endomeral complex; *c,* ornamentation of venter of female; *d,* abdomen of male, to larger scale than female.

It is not practicable in this paper to enter into the problem of the identity of the species of *Philopterus* found on gulls and terns. It may merely be noted that the specimens here recorded seem referable to *Philopterus snyderi,* in spite of very slight differences in the endomeral pieces of the genitalia of the male which will probably fall within the range of normal variation. *Philopterus snyderi* in turn is certainly identical with specimens identified by Kellogg as *Philopterus melanocephalus* (Nitzsch). The distinguishing character given by Kellogg and Paine for *Philopterus snyderi,* "the rounded but

distinct median angle of the posterior margin of the prothorax," is entirely illusory.

Figures 20, *a-d,* show clearly the characteristics of the species. Attention is called to the wrinkled condition of the conjunctivum of the dorsum of the abdomen in the female and to the fact that the conjunctivum of the venter is thickly beset with minute, sclerotic squamations (fig. 20, *c*). The abdomen of the male is much more strongly sclerotic than that of the female. The genitalia of the male (fig. 20, *b*), are of a type common to a large group of species. In comparing them with the genitalia of similar species attention will need to be concentrated especially upon the form of the endomeral complex. How much allowance must be made for normal variation needs to be determined by the examination of many specimens.

TERMITES OF THE MARQUESAS ISLANDS *

By

S. F. LIGHT

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INTRODUCTION

Edward P. Mumford, Director of the Pacific Entomological Survey, has kindly asked me to study and report on the termites collected by the Survey. Mr. Mumford and his colleague, A. M. Adamson, are to be congratulated on a most interesting and valuable collection. It is well preserved, furnished with careful locality and habitat notes, and above all is remarkable for the number of collections containing all castes, alates, soldiers, and nymphs or workers.

No termites have previously been reported from the Marquesas. Seven species are represented in the present collection, of which three are considered to be new. One striking species represents a new subgenus, *Metaneotermes,* of *Kalotermes* sensu latiore (see page 77). I take pleasure in naming one of the new species for Mr. F. C. Atherton, President of the Hawaiian Sugar Planters' Association, and one for Mr. James Dole of the Association of Hawaiian Pineapple Canners, because of the interest and support which these men and their associations have given to the Survey.

Even more important than the additions to the known species is the insight into distribution and faunal affinities which arises from the presence in the collection of species previously known from other regions. A close relationship between the Hawaiian and Marquesan faunas seems strongly indicated by the finding in the Marquesas of all three of the endemic Hawaiian species, *Kalotermes* (*K.*) *immigrans* Snyder, *K.* (*Neotermes*) *connexus* Snyder, and *K.* (*Cryptotermes*) *piceatus* Snyder. Extremely interesting also, and perhaps of economic significance, is the finding of a species of *Coptotermes* far to the east in the Pacific islands, the nearest reported indigenous species being found in distant New Hebrides. The general affinities of the fauna are with that of the Papuan region, with no indications of any relationship to the Neotropical region. The *Coptotermes,* for example, is of a type quite different from the species known from the Americas and of the type common to the Papuan and Indo-Malayan region, very close indeed to the common species of the Philippines, *Coptotermes vastator* Light.[17] There remains, of course, the possibility that it actually is this spe-

[17] Light, S. F., Notes on Philippine termites, 3: Philippine Jour. Sci., 40, pp. 421-453, 1929.

* Pacific Entomological Survey Publication I, article 6.

cies, for it has been intercepted several times in the plant quarantine station at Honolulu. Indeed, the ease with which termites may be transported calls for caution in the interpretation of distributional data until much more complete information is available.

I wish to express my appreciation of the coöperation of Gerald F. Hill, Senior Entomologist of the Division of Economic Entomology, Canberra, New South Wales, Australia, who has made numerous contributions to our knowledge of the termites of the Pacific islands.[18] Mr. Hill has sent me valuable material for comparisons and has himself kindly examined examples of the species in the Pacific Entomological Survey collection and confirmed my diagnoses.

Following is a list of the species in the collection, with the distribution of each. Previously known distribution is given in parentheses.

1. *Kalotermes* (*Kalotermes*) *immigrans* Snyder (Hawaii, Fanning Island, Washington Island). Marquesas: Hivaoa; and Jarvis Island.
2. *Kalotermes* (*Neotermes*) *connexus* Snyder (Hawaii; collected by the Pacific Entomological Survey on Moorea, Society Islands). Marquesas: Hivaoa, Tahuata, Fatuhiva, Nukuhiva, Uahuka, Uapou, and Eiao.
3. *Kalotermes* (*Metaneotermes*) *athertoni,* new subgenus and species, Marquesas: Hivaoa, Tahuata, Fatuhiva, Nukuhiva, Uahuka and Uapou.
4. *Kalotermes* (*Cryptotermes*) *dolei,* new species, Marquesas: Hivaoa, Fatuhiva, Mohotani, Nukuhiva, Uahuka, Uapou, and Eiao.
5. *Kalotermes* (*Cryptotermes*) *hermsi* Kirby[19] (Fanning Island). Marquesas: Hivaoa and Tahuata.
6. *Kalotermes* (*Cryptotermes*) *piceatus* Snyder (Hawaii, Hongkong?). Marquesas: Hivaoa.
7. *Coptotermes pacificus,* new species. Marquesas: Hivaoa.

Genus **KALOTERMES** Hagen sensu latiore

Subgenus **KALOTERMES** sensu stricto

Kalotermes (K.) immigrans Snyder (fig. 21, *a-e*).

Kalotermes immigrans Snyder, U. S. Nat. Mus. Proc. 61, pp. 2, 3, pl. 4, fig. 15, 1922.

Five collections from Atuona, Hivaoa, must be considered to belong to this species, although the alates from the Marquesas are larger than those in my collection from Hawaii and differ in other minor details. The soldiers agree very closely.

Four of the collections were of swarming alates and one was a nest series. The swarming alates were taken from February 15 to June 6 and are evidently night fliers, for they were taken about lights.

[18] Hill, G. F., Isoptera: Insects of Samoa, pt. 7, fasc. 1, pp. 1-18, 1927. Termites from the Australian region: Nat. Mus. Melbourne Mem., pt. 1, no. 7, pp. 5-119, 1927.

[19] Kirby, Harold, Jr., *Cryptotermes hermsi* sp. nov., a termite from Fanning Island: Univ. of California Pub. Zool. 26, pp. 437-441, 1925.

Kalotermes immigrans was thought to have been introduced into Hawaii, as the specific name indicates, but its distribution as now known, from the Hawaiian islands to the Marquesas through Fanning and Jarvis islands,[20] seems to render introduction into Hawaii less probable. *Kalotermes immigrans* is not known to be a house termite or to do damage to poles, but it has been reported as damaging living coffee plants in Hawaii.

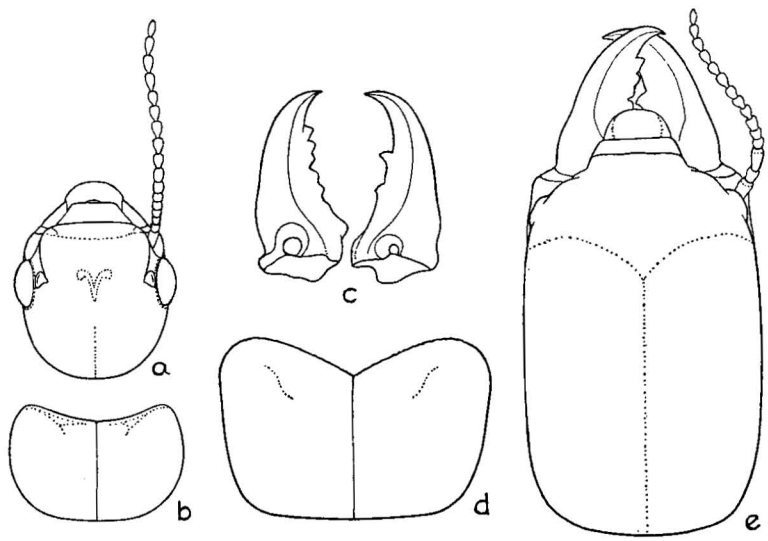


FIGURE 21. *Kalotermes* (*K.*) *immigrans* Snyder: *a*, head of alate; *b*, pronotum of same in natural position; *c*, mandibles of soldier; *d*, pronotum of soldier; *e*, head of soldier. Drawings from camera lucida outlines with parts in dorsal view, all at the same magnification.

Measurements in millimeters of alates of *Kalotermes immigrans* Snyder from Atuona Valley, Hivaoa:

	With Wings	Without Wings
Length over all	13.50	.....
Length of body	.....	9.00
Length of head	.....	1.81
Width of head	.....	1.52
Pronotum length, maximum	1.01	0.93
Pronotum length, minimum	0.93	0.88
Pronotum width	1.62	1.60
Long diameter of compound eye	0.44	0.40
Short diameter of compound eye	0.42	0.38
Length of hind tibia	.....	1.22
Length of forewing	10.50	.....
Width of forewing	3.00	.....

[20] A collection of this species given to me for study some time ago by Bernice P. Bishop Museum was made by L. A. Whitney in timbers of the wrecked schooner *Amaranth* at Jarvis Island in 1924 [Whippoorwill Expedition].

Measurements in millimeters of a soldier of *Kalotermes immigrans* Snyder from Atuona Valley, Hivaoa:

Length of head capsule	3.61
Length of head (with mandibles)	5.09
Pronotum width	2.50
Pronotum length, maximum	1.67
Pronotum length, minimum	1.30
Gula length	2.73
Gula, maximum breadth	0.74
Gula, minimum breadth	0.46
Head width	2.27

Subgenus **NEOTERMES** Holmgren

Kalotermes (Neotermes) connexus Snyder (pl. 1, *D;* fig. 22, *a-e*).

Kalotermes connexus Snyder, U. S. Nat. Mus. Proc., 61, pp. 9-11, figs. 3 and 4, pl. 4, fig. 16, 1922.

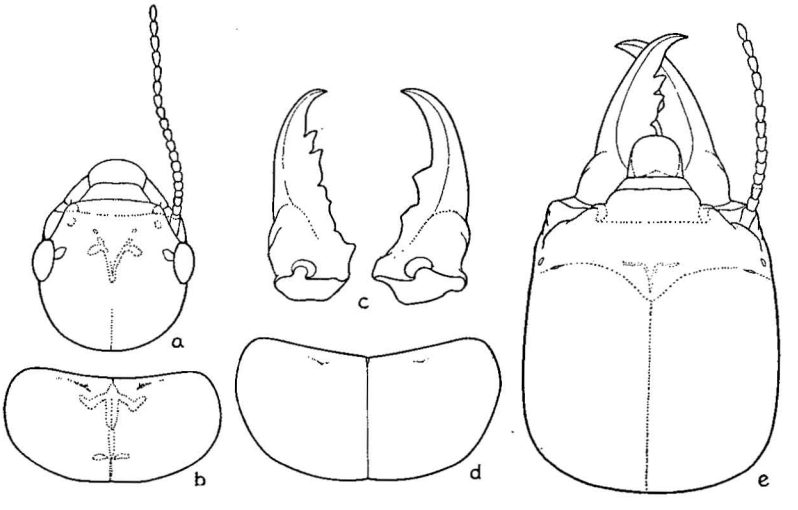


FIGURE 22. *Kalotermes (Neotermes) connexus* Snyder: *a,* head of alate; *b,* pronotum of alate spread flat; *c,* mandibles of soldier; *d,* pronotum of soldier; *e,* head of soldier. Drawings from camera lucida outlines with parts in dorsal view, all at the same magnification.

The most conspicuous element in the collections is a large species showing much variation in both alate and soldier castes which I have identified with the Hawaiian *Neotermes, Kalotermes (N.) connexus* Snyder, although certain minor differences appear.

This species was taken by the Survey three times on Moorea, Society Islands, and although the collections include none from Tahiti, it seems certain that future collections will demonstrate its presence there. It was taken

76 times in the Marquesas, as follows: Hivaoa, 24 collections; Tahuata, 10 collections; Fatuhiva, 9 collections; Nukuhiva, 1 collection; Uahuka, 17 collections; Uapou, 10 collections; and Eiao, 5 collections.

Kalotermes (N.) connexus is the terminal representative of a group of large, closely related species of *Neotermes,* distributed from Papua and northern Australia across the Pacific and north to the Hawaiian islands, including *K. (N.) papua* Desneux, *K. (N.) rainbowi* Hill, *K. (N.) samoanus* Holmgren, and the present species. *K. connexus* is very closely related to *K. (N.) samoanus* Holmgren.[21] More complete collections may prove them to be a single species, in which circumstance Holmgren's name would have priority.

Measurements in millimeters of a typical soldier of *Kalotermes (Neotermes) connexus* Snyder from Uapou:

Length	13.00
Head length, (with mandibles)	6.38
Head width	3.52
Pronotum length, maximum	2.22
Pronotum length, minimum	1.76
Pronotum width	4.07
Gula length	2.59
Gula width, maximum	1.16
Gula width, minimum	0.56
Length of head capsule	4.02
Length of hind tibia	2.13

Subgenus **METANEOTERMES** new subgenus

ALATE

Medium sized; about 12 mm. long with wings; antennae elongated; pronotum wider than long; hind tibia with but two apical spines; wing ornamentation coarse; median vein coalescent with radius sector throughout all or nearly all of wing membrane.

SOLDIER

Head long, rectangular; frons but little declivitous; third segment of antennae elongated, thickened and chitinized; pronotum as in *Neotermes,* broad, short, and weak, broader than head, weakly chitinized, not deeply excavate, not overhanging head. Hind tibia with but two apical spines.

Type species *Kalotermes (Metaneotermes) athertoni,* new species.

[21] Holmgren, Nils, Neue Termiten aus dem deutschen entomologischen Museum: Ent. Mitt., 1, pp. 279-282, 1912.

Kalotermes (Metaneotermes) athertoni, new species (pl. 1, *A-C*; pl. 2, *A-C*; fig. 23, *a-e*).

Alate

Generally a shining black-brown to black; head, pronotum and abdominal tergites darkest; labrum and tibiae of legs lightest.

Head (pl. 2, *C*) rather square; sides parallel, rounding into flatly convex posterior margin; head capsule about as broad as long, broader through eyes; dorsal profile nearly straight; highest at level of ocellus, dorsal surface flat; centrally broadly and irregularly excavate with a median raised area; hairing very sparse, with long stiff hairs posteriorly and very short hairs in front.

Eye moderately large; strongly projecting; somewhat truncated, truncation oblique, in front and above; eye somewhat prolonged anteroventrally; separated from dorsal and ventral margins by slightly less than short diameter and from posterior margin by about twice long diameter.

Ocellus (pl. 2, *C*) small, somewhat elongated vertically; pointed below, located just back of middle of eye and separated from it by somewhat less than half its short diameter.

Labrum not strongly vaulted; somewhat wider than long; antero-lateral corners rounded; anterior margin with broad straight or weakly convex middle zone and shorter, straight or faintly convex, receding, lateral areas; sides straight or faintly convex, converging somewhat posteriorly.

Gulamentum about two-thirds as long as wide; sides parallel in middle, nearly straight and converging at both ends, posterior margin nearly straight; posterior three-fifths and a short, median rectangular projection therefrom dark smoky-brown, remainder white, as also small irregular crescent-shaped spot near center of sclerite.

Antennae (pl. 2, *A*) smoky-black-brown; long; of 16 to 18, typically of 17, segments; when 16, third longer than second; when 17 or 18, third subequal to second or shorter; fourth usually smallest; distal segments increasing in length and breadth, club-shaped; terminal segment oval, much narrower, somewhat shorter.

Pronotum (pl. 2, *B*) more than twice as wide as long; anterior margin weakly but broadly and evenly concave; lateral portions of anterior margin somewhat convex; antero-lateral corners broadly rounded; sides convex; sides receding strongly behind into weakly emarginate posterior border.

Three long closely approximated spines on tibiae of first and second legs, two on tibia of third leg. Pulvillus well developed. Cercus of two segments; basal segment asymmetrically swollen, apical segment longer, roughened. Styles of male prominent, slender.

Wings (pl. 1, *A-C*) brown, costal veins bright shining brown; membrane light smoky-brown; a proximal patch along posterior margin darker smoky-brown; papillae large and coarse on all save costal veins, scattered on membrane, in close series on veins, close-set and minute on costal veins. Wings relatively short and broad with bluntly pointed tips. Subcosta of forewing (pl. 1, *C*) joins margin at about inner sixth, in hind wing at extreme base of wing; radius joins margin near basal one-third in both wings (pl. 1, *A-C*), median joins radius sector within basal one-fifth of forewing (pl. 1, *C*) and is never free in hind wing (pl. 1, *B*); free portion on fore wing chitinized; joint vein broad, heavy; radius sector gives rise to five to seven branches in each wing, first two long and very oblique; first oblique branch in fore wing arises within basal one-half of wing, in hind wing at about center of wing; cubitus unchitinized save briefly at base, but strongly outlined; cubitus considerably above middle of wing; with numerous faint, vertical, sometimes anastomosing superior branches to median and radius sector; cubitus runs to margin just below tip of wing; with about eight branches in each wing.

Measurements in millimeters of an alate of *Kalotermes* (*Metaneotermes*) *athertoni* new subgenus and species from Pouau, Hivaoa:

Length of wings	8.50	Compound eye, short diameter	0.25
Length of head with mouthparts	1.43	Compound eye, long diameter	0.27
Length of head capsule	1.22	Ocellus, short diameter	0.06
Head width	1.26	Ocellus, long diameter	0.11
Pronotum length, maximum	0.76	Length of hind tibia	1.05
Pronotum length, minimum	0.67	Length of forewing	7.00
Pronotum width	1.39	Width of forewing	1.50

Soldier

Head yellow-brown at posterior margin, shading through smoky-red-brown to reddish-black at anterior end; pronotum rusty-yellow with brown anterior margin; dorsal surface of thorax lighter rusty-yellow; abdominal sternites very light brownish-yellow; ventral surface dirty white, legs yellowish; tarsi light brown; claws reddish.

Head (fig. 23, *e*) long (head index about 0.68), rectangular; sides straight, parallel; postero-lateral corners shortly rounded, posterior margin straight; head low, dorsal profile straight; dorsal surface flattened in middle; sides rounding up broadly to median flattened area; frons only slightly declivitous, smooth.

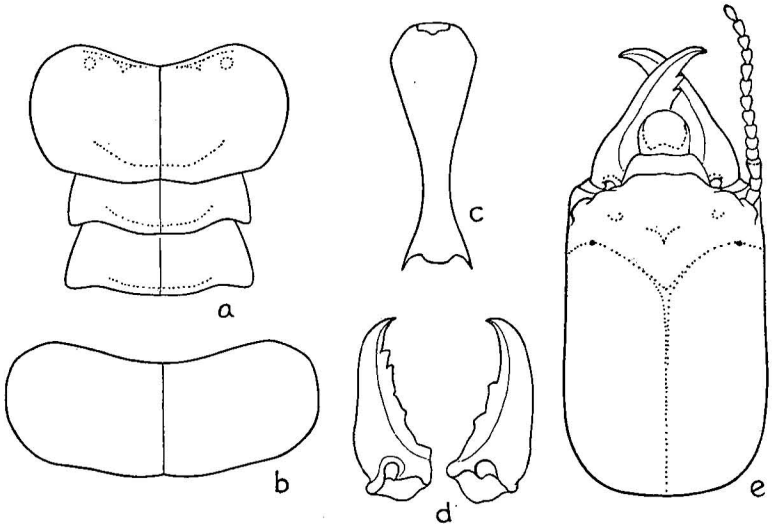


FIGURE 23. Soldier of *Kalotermes* (*Metaneotermes*) *athertoni* new subgenus new species: *a*, nota in natural position; *b*, pronotum spread flat; *c*, gula; *d*, mandibles; *e*, head. All drawings from camera lucida outlines, at same magnification.

Eyespot dorso-ventrally elongated, somewhat crescent-shaped, concave anteriorly; separated from rim of antennal foveola by more than its short diameter. Ocellus spot tiny (fig. 23, *e*), often linear, somewhat behind level of eye and separated from it by nearly once and a half the distance between eye and rim of antennal foveola.

Labrum about as long as broad; sides straight, antero-lateral corners broadly rounded; anterior margin straight; three shorter spine-like hairs on either side, two long and several shorter hairs in middle.

Mandibles (fig. 23, *d*) relatively short; tips shortly but strongly incurved; left mandible with first two teeth directed distally; right mandible with first tooth well in front of middle; second tooth directed mediad, with relatively long, convex anterior face.

Antennae (fig. 23, *e*) of 13 or 14 segments; short, not much longer than mandibles, slender; third segment somewhat enlarged, as long as first, wider than first, about once and one-half as wide as second or fourth.

Gulamentum (fig. 23, *c*) strongly narrowed from near anterior end; narrowest behind the middle; maximum width considerably more than twice minimum width.

Pronotum (fig. 23, *a, b*) weakly chitinized, broad and short, much broader than the head; more than twice as broad as long; anterior margin broadly and more or less angularly or irregularly concave, anterolateral corners rounding into convex sides; sides receding from in front of middle (in natural position); postero-lateral corners not rounded, obtuse; posterior margin convex in general; sinuous with three weak emarginations, two lateral and one median. Mesonota and metanota (fig. 23, *a*) with median emargination and laterally with well-marked wing rudiments.

Femora at least three times as wide as tibiae; spines of tibiae heavy, red; three spines on tibia of first and second leg, two on inner face and one on posterior; two inner spines on tibia of third leg, posterior spine lacking. Cerci and styles as in alates; all soldiers with styles.

Measurements in millimeters of two soldiers of *Kalotermes* (*Metaneotermes*) *athertoni,* new subgenus, new species, from Pouau, Hivaoa:

Length over all	6.66	8.00
Head length, to tip of mandible (mandibles crossed)	3.66	3.28
Length of head capsule	2.50	2.11
Head width, maximum	1.73	1.47
Pronotum length, maximum	1.12	1.01
Pronotum length, minimum	0.97	0.88
Pronotum width	2.06	1.77
Gula length	1.81	1.68
Gula breadth, maximum	0.72	0.63
Gula breadth, minimum	0.25	0.25

Nymph

Head broad; head capsule broader than long, sides of head faintly convex, rounding from near middle into weakly convex posterior margin. Pronotum very broad and short, much broader than head; about three times as broad as long; sides strongly convex; anterior and posterior margins as in the soldier.

This species was taken 33 times and from six different islands in the Marquesas; 14 times from Nukuhiva, 12 times from Hivaoa, 4 times from Uahuka, and once each from Tahuata, Fatuhiva, and Uapou.

Alates were present in colonies on dates ranging from March to as late as September. By far the most common host plant was *Hibiscus tiliaceus,* although colonies were also taken in mango and *Sapindus saponaria.* Their very dark color would suggest that they are day fliers.

Little is known of the biology and economic significance of this striking termite species.

I take pleasure in naming it for Mr. F. C. Atherton, President of the Hawaiian Sugar Planters' Association.

Subgenus CRYPTOTERMES Banks

Kalotermes (Cryptotermes) dolei, new species (pl. 3, *A, B*; fig. 24, *a, d*).

Alate

Generally brown; head somewhat lighter; prothorax and wing scales rusty; legs, antennae, and palpi yellow.

Head (fig. 24, *a*) elongated, somewhat rectangular, head capsule longer than broad; sides nearly straight, parallel; postero-lateral corners rounded; posterior margin nearly straight; head relatively high; dorsal profile nearly straight.

Eyes subtriangular; considerably elongated; pointed in middle behind and somewhat ventrally in front; separated from ventral margin and dorsal surface of head (in side view) by about their short diameter and from posterior margin by about twice their short diameter. Ocellus (fig. 24, *a*) touching eye at about its middle; asymmetrically broadened below, drawn out into point in continuation with transverse head suture. Third segment of antennae chitinized, club-shaped, longer than second.

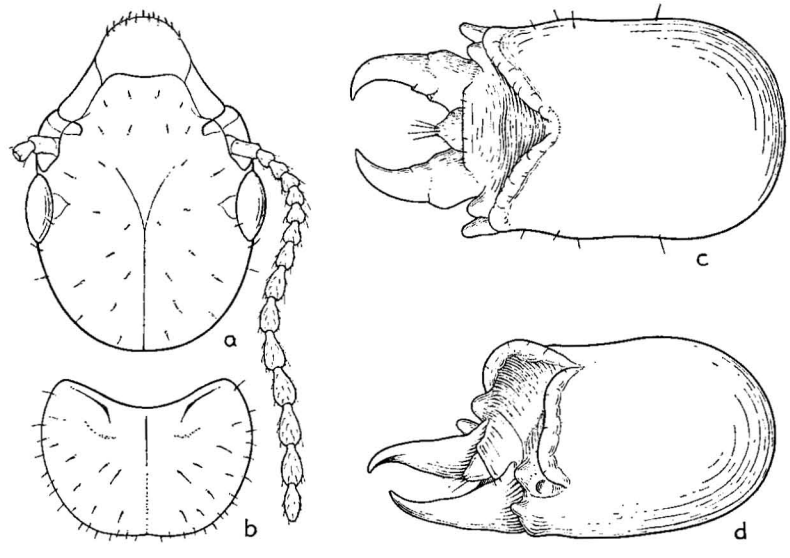


FIGURE 24. *Kalotermes (Cryptotermes) dolei,* new species: *a,* head of alate; *b,* pronotum of same; *c,* head of soldier in dorsal view; *d,* head of soldier in oblique lateral view to show configuration of frontal area. From camera lucida outlines.

Pronotum (fig. 24, *b*) about twice as broad as long; anterior margin concave; antero-lateral corners shortly rounded; sides convex, receding from near middle and rounding into faintly emarginate, nearly straight, posterior margin.

Forewing scales reaching beyond middle of metanotum; overlapping in center. Wings (pl. 3, *A, B*) a warm translucent light brown; costal veins a rich dark golden-brown; papillae large, scattered; subcosta of forewing united with margin throughout membrane; radius joining margin at inner one-third; radius sector with 4 or 5 longer and 2 very short distal branches, first branch at inner one-third of wing; median and cubitus and branches broad; all save basal four cubital branches marked with a series of large, widely spaced papillae; on these they are close-set, smaller, and sometimes double; median lies nearer cubitus than radius sector to beyond middle of wing where

it curves upward to join radius sector between its second and third branches, at about distal third of wing; cubitus lying at about center of wing membrane, with about 10 branches.

Measurements in millimeters of three alates of *Kalotermes* (*Cryptotermes*) *dolei*, new species, from Hivaoa:

Length over all	8.50	8.50	8.00
Length of head (to tip of labrum)	1.33	1.26	1.26
Length of head capsule	0.95	0.91	0.93
Width of head (across eyes)	1.01	0.97	0.96
Pronotum length, maximum	0.55	0.55	0.59
Pronotum length, minimum	0.51	0.51	0.52
Pronotum width	0.93	0.88	0.90
Compound eye, short diameter	0.23	0.25	0.22
Compound eye, long diameter	0.29	0.25	0.26
Ocellus, short diameter	0.08	0.09	0.09
Ocellus, long diameter	0.14	0.14	0.10
Length of forewing	6.75	7.00	6.50
Width of forewing	1.75	1.50	1.75
Length of hind tibia	0.84	0.80	.....

Soldier

Head shading from pale dirty yellow-brown behind through red-brown to black in front; cervical sclerites and anterior margin of pronotum brown; remainder dirty whitish-yellow to pale diffuse dirty brown.

Head (fig. 24, *c, d*) short, broad and high; subquadrangular in dorsal view; sides straight or slightly convex; nearly parallel or converging slightly anteriorly; widest near posterior end; postero-lateral corners rounded into weakly convex posterior margin; dorsal profile (fig. 24, *d*) elevated in front at anterior flaring rim, sunken just behind rim, rising to maximum at posterior one-third and rounding sharply to posterior margin; frons black, high, concave, with black flaring rims in two lobes set off by broad, deep, angular excavation in middle; head constricted on sides and above just posterior to rim; concavity of frons, rim of frons, and constricted zone inconspicuously roughened; dorsal surface of head with inconspicuous transverse wrinkles; a prominent, transversely elongated mound (frontal spine) located on either side just below rim and mediad to antennal foveola with rim of which it is continuous laterally; frontal spine projecting beyond level of frontal rim; antero-lateral corners of head capsule below drawn out into a flat, laterally and anteriorly directed "antennal spine"[22] projecting about to level of frontal spine in front; rim of frons above, frontal spine medially, and antennal spine below limit a deep fossa within which lies the antennal foveola.

Eyespots dull dirty white, vertically elongated, separated from rim of antennal foveolae by at least twice their short diameter.

Labrum flat, much broader than long; sides nearly straight, parallel; antero-lateral corners very shortly rounded; anterior margin triangular; with sharp median point or papilla-like projection bearing five long, slightly radiating hairs.

Mandibles as in figure 24, *c*; right practically toothless save for short shelf-like projection at level of basal thickening; left with long, low vestiges of second and third teeth and a sharp projection at level of basal thickening.

Antennae short and light, shorter than head; of 12 segments; third shortest and narrowest, obconic; fourth and fifth subcylindrical; sixth to eleventh shortly and broadly obconic; twelfth short, oval. Gulamentum broadest behind, tapering to narrow anterior end; posterior margin rounded; dark red-brown posteriorly, whitish anteriorly.

Pronotum deeply, broadly, and angularly concave; antero-lateral corners bluntly pointed; sides strongly concave; receding strongly from middle into straight posterior margin.

[22] Light, S. F., Notes on Philippine termites, 3; Philippine Jour. Sci. 40, pp. 421-453, 1929.

Measurements in millimeters of two soldiers of *Kalotermes* (*Cryptotermes*) *dolei*, new species, from Hivaoa:

Length over all (with mandibles)	5.75	5.00
Length of head (to tip of mandibles)	2.11	2.06
Length of head capsule	1.64	1.58
Head width	1.23	1.31
Pronotum, maximum length	0.72	0.72
Pronotum, minimum length	0.59	0.55
Pronotum width	1.10	1.03
Gula length	.....	1.22
Gula width, maximum	.....	0.72
Gula width, minimum	.....	0.23
Length of hind tibia	0.59	0.80

The soldier of this species differs widely from those of previously described species in the long, narrow head, the less than vertical frons, the widely flaring frontal rim, broadly and deeply notched, and in the relatively smooth, level dorsal surface of the head. These characters separate it sharply from the two chief species groups of the subgenus, the *Cryptotermes domesticus* group (*Cr. domesticus* Haviland, *Cr. campbelli* Light, *Cr. kotoensis* Oshima, *Cr. buxtoni* Hill, *Cr. gulosus* Hill, *Cr. hermsi* Kirby, etc.), in which the head of the soldier, although medianly notched, has in general a bulging outline in front, and the *Cryptotermes brevis* group (*Cr. brevis* Walker, *Cr. piceatus* Snyder etc.), in which the soldier has a greatly roughened, sunken dorsal and frontal surface. In most of these characters it approaches *Planocryptotermes nocens* Light of the Philippines, but the head of *Cr. dolei* new species is much narrower and higher in position.

The alate is very different from that of *P. nocens* in its much smaller size, much less elongated antennal segments, and in the coarse decorations of the wings. It is nearest, perhaps, to *Cryptotermes albipes* Holmgren, but it differs in being much lighter, save for the tibiae, which are yellower, in that the median joins the radius sector typically at the point of origin of its third branch, and, most strikingly, perhaps, in a paucity of inferior branches of the cubitus, which are about 10 in number.

The twenty collections of *Cryptotermes dolei* new species are all from the Marquesas, representing seven islands. Eight are from Hivaoa, five from Mohotani, two each from Uapou and Eiao, and one each from Fatuhiva, Nukuhiva, and Uahuka. For it, as for the other species of *Kalotermes* sensu latiore, *Hibiscus tiliaceus* was the common host plant. Others were *Sapindus saponaria, Cordia subcordata,* mango, *Morinda citrifolia,* and *Xylosma suavolens.* The only swarming alates were taken in October, but alates are present in nest collections taken in February, March, and June.

Kalotermes (Cryptotermes) hermsi Kirby (pl. 3, *C*).

Cryptotermes hermsi Kirby, Univ. Calif. Pub. Zool. 26, pp. 437-441, figs. 1-12, 1925.

This species, previously taken by Kirby at Fanning Island, is represented by four collections from Atuona, Hivaoa, and two from Hanahevane Valley, Tahuata. Swarming alates were taken twice (Hivaoa), once in February and once in May. The two nest series from Hivaoa were from mango and the two from Tahuata from a *Sapindus* log.

Kalotermes (Cryptotermes) piceatus Snyder (pl. 3, *D*).

Cryptotermes piceatus Snyder, U. S. Nat. Mus. Proc. 61, pp. 14-16, pl. 5, figs. 19 and 20, 1922.

Kalotermes piceatus is the common "house termite" of Hawaii. Dr. Snyder reports that it has been taken in materials imported from Hongkong. This raises the question as to whether the species is indigenous to Oceanica and introduced thence to Hongkong or has been carried from Hongkong to Hawaii and thence or independently to the Marquesas. I was unable to find any indication of a house termite in Hongkong and the only Chinese species collected by me, *Cryptotermes campbelli* Light, is from Hainan and differs widely from *Cr. piceatus,* being of the *Cr. domesticus* type. A single collection was made by the Survey of alates of this species swarming about lights at Atuona, Hivaoa, in February, 1929.

Genus COPTOTERMES Wasmann

Coptotermes pacificus, new species (pl. 3, *E, F*; fig. 25, *a, b*).

Alate

Moderately dark brown above, abdominal sternites light brown, yellow in center; ventral surface of thorax and bases of legs whitish yellow or yellow-brown; tibiae light brown; tarsi light yellow, antennae, labrum, and palpi light brown.

Head (fig. 25, *a*) broad; head capsule broader than long; sides straight in front (masked by projecting eyes); rounding broadly from posterior margin of eyes into somewhat convex posterior margin; head low, highest at level of ocelli; profile descending anteriorly and posteriorly from ocelli; dorsal surface of head somewhat flattened; with a transverse sunken area just behind level of ocellus, containing fontanel; fontanel very small, its position marked by a small white, often elongated, spot; antennal spots (fig. 25, *a*) conspicuous, broadly half-moon shaped with convexity behind, separated from ocellus by about half of short diameter of spot and less than half of short diameter of ocellus; head with scattered long, erect, spinelike hairs and numerous shorter forwardly directed, somewhat curved hairs of various lengths.

Eye large, subcircular, slightly longer than high, weakly truncated anterodorsally; separated from ventral margin by slightly less than its diameter, from dorsal surface by about one-third its diameter and from posterior margin by a little more than its long diameter.

Ocellus (fig. 25, *a*) oval, about two-thirds as wide as long, almost in contact with eye; directed obliquely upward and anteriorly, making an angle of about 45° with long axis of head; narrow in dorsal view due to slope of side of head.

Labrum about as broad as long; sides convex, rounding broadly into rounded anterior margin with somewhat reduced, flat-margined median area; sides basally converging, nearly straight. Postclypeus light yellow; short, four times as broad as

long; anterior broadly, evenly, and shallowly concave; posterior margin broadly, evenly, and shallowly convex. Antennae (fig. 25, *a*) of 18 or 19 segments; third shortest, often disc-shaped. Gulamentum broadest behind, sides straight, converging anteriorly, antero-lateral and postero-lateral corners shortly rounded, anterior margin straight; posterior margin faintly convex, anterior one-fourth white, remainder yellow.

Pronotum (fig. 25, *b*) about twice as broad as long; anterior margin broadly, very shallowly, and somewhat angularly concave; sides convex, receding from near anterior end; posterior margin biconvex.

Wings (pl. 3, *E, F*) very light, membrane white, costal veins and first two or three branches of cubitus yellow; costal veins basally darkened; no costal stripe; no visible micrasters; hairs short, not close-set, transparent; marginal hairs short; median runs above middle of wing, branching distally, cubitus with about nine branches in each wing.

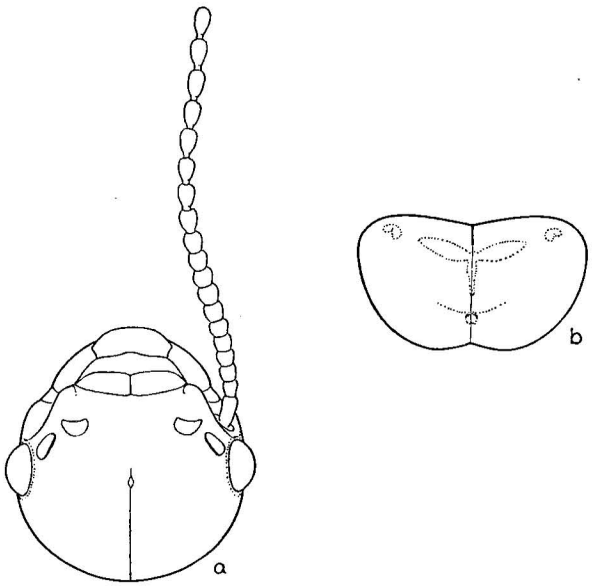


FIGURE 25. *Coptotermes pacificus,* new species: *a,* head of alate; *b,* pronotum. From camera lucida outlines.

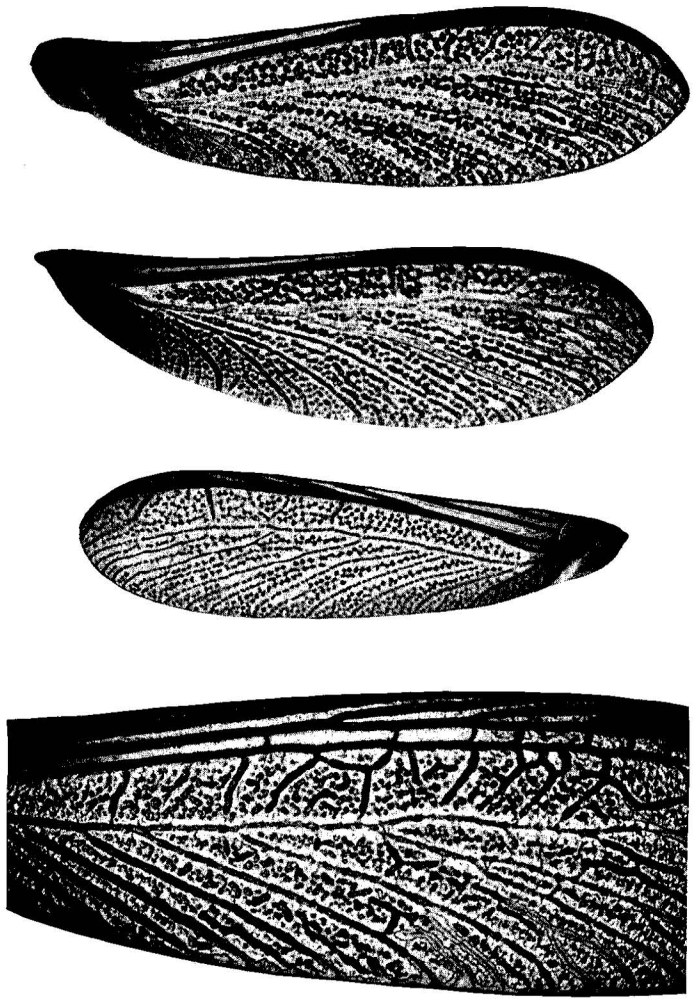
Measurements in millimeters of two alates of *Coptotermes pacificus,* new species:

Length over all	12.50	11.75
Length of forewing	10.50	9.25
Width of forewing	3.00	2.25
Head length	1.52	1.43
Length of head casule	1.12	1.09
Head width	1.45	1.37
Pronotum length, maximum	0.80	0.76
Pronotum length, minimum	0.72	0.67
Pronotum width	1.33	1.22
Compound eye, short diameter	0.32	0.29
Compound eye, long diameter	0.38	0.34
Ocellus, short diameter	0.13	0.13
Ocellus, long diameter	0.17	0.17
Length of hind tibia	1.18	1.22

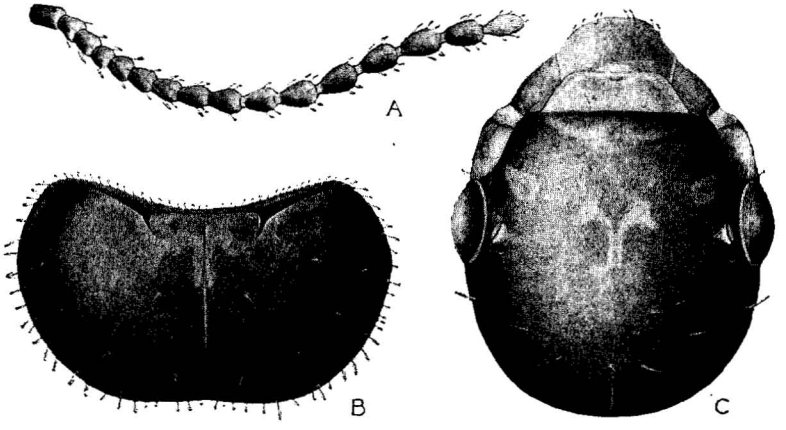
Coptotermes pacificus is most closely related to the Oriental species of the genus. Indeed, it is very similar to the common Philippine species, *C. vastator* Light.[23] Certain small differences and the great geographical gap make it necessary to consider it a separate species as yet. The head, for example, seems to be smaller, broader in proportion, and less rounded behind, the ocellus larger, longer, and the antennae shorter. More extensive material including soldiers may prove it to belong to this species, in which circumstance introduction would seem to be the explanation of its presence thus far afield. As I have already pointed out, this species has been intercepted at Honolulu on several occasions. It differs most strikingly from *Coptotermes formosanus* Shiraki, the introduced species of Hawaii, in its smaller size and, for example, in having crescent-shaped antennal spots. Hill reports it as distinct from any known Australian termite but nearest to *C. acinaciformis.*

The species of this genus are responsible for a very large part of the damage to wooden structures by termites throughout the tropics and subtropical regions. Their economic status and potentiality in the Marquesas should be ascertained and proper preventive measures adopted.

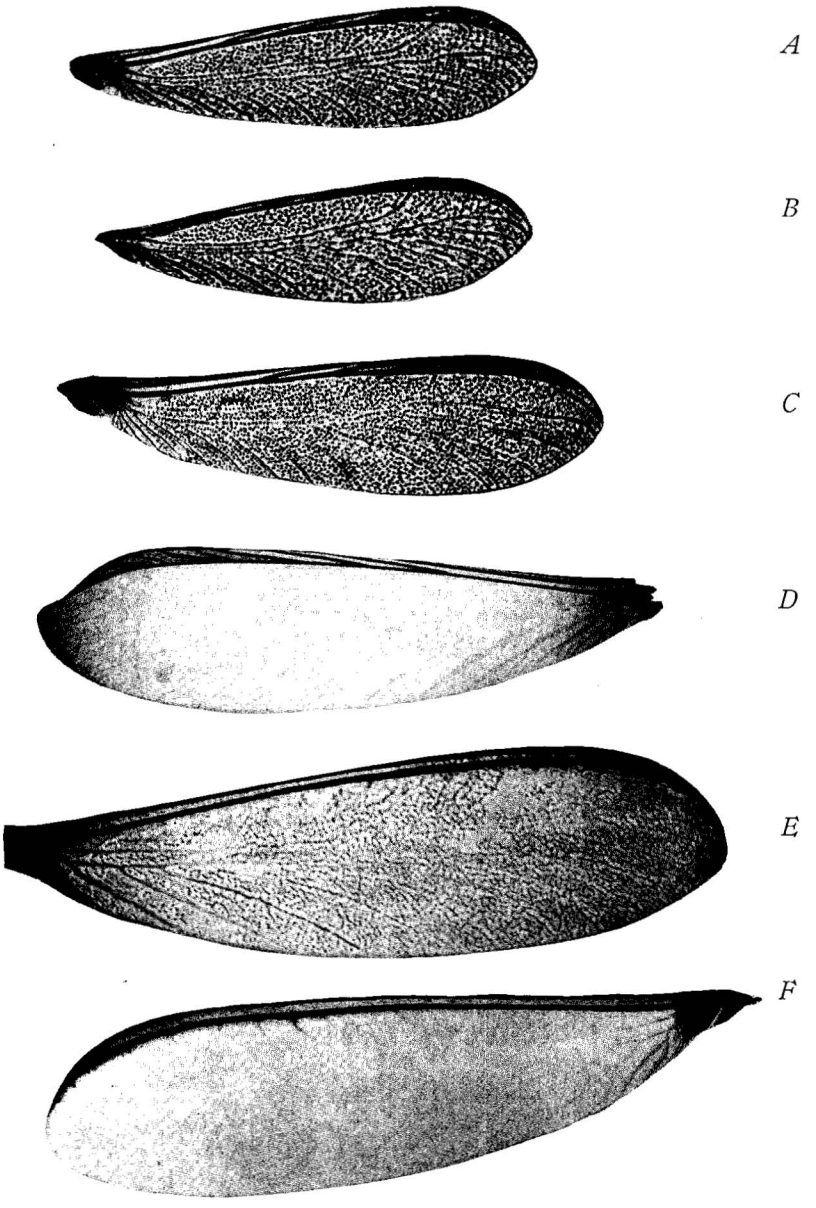
[23] Light, S. F., Notes on Philippine termites, 3: Philippine Jour. Sci. 40, pp. 421-453, 1929.



WINGS OF *KALOTERMES*: *A*, FORE WING OF LARGE INDIVIDUAL OF *KALOTERMES* (*METANEOTERMES*) *ATHERTONI* NEW SUBGENUS, NEW SPECIES; *B*, HIND WING OF *K. ATHERTONI; C*, FORE WING OF SMALL INDIVIDUAL OF *K. ATHERTONI; D*, PORTION OF FORE WING OF *KALOTERMES* (*NEOTERMES*) *CONNEXUS* SNYDER. (ALL TAKEN DRY ON THE SLIDE TO BRING OUT CHARACTERISTIC WING ORNAMENTATION; ALL × 10 ±).



ALATE OF *KALOTERMES* (*METANEOTERMES*) *ATHERTONI* NEW SUBGENUS, NEW SPECIES: *A*, ANTENNA OF ALATE; *B*, PRONOTUM OF ALATE; *C*. HEAD OF ALATE. DRAWINGS FROM CAMERA LUCIDA OUTLINES.



PHOTOMICROGRAPHS OF WINGS OF MARQUESAN TERMITES: *A*, FORE WING OF *KALOTERMES* (*CRYPTOTERMES*) *DOLEI* NEW SPECIES; *B*, HINDWING OF *K.* (*C.*) *DOLEI*; *C*, FORE WING OF *K.* (*C.*) *HERMSI* KIRBY; *D*, FORE WING OF *K.* (*C.*) *PICEATUS* SNYDER SHOWING MUCH LARGER SIZE, WEAK ORNAMENTATION, AND TENDENCY OF MEDIA TO REMAIN SEPARATE, THUS APPROACHING WING CHARACTERS OF KALOTERMES SENSU STRICTO; *E*, WING OF *COPTOTERMES PACIFICUS*, NEW SPECIES, SHOWING SURFACE ORNAMENTATION; *F*, WING OF *COPTOTERMES PACIFICUS*, NEW SPECIES, FROM STAINED MOUNT IN BALSAM. (ALL SAVE *F* TAKEN DRY ON SLIDE TO BRING OUT CHARACTERISTIC WING ORNAMENTATION; ALL × 9 ±).

NEW AND LITTLE KNOWN TIPULIDAE FROM THE MARQUESAS *

By

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INTRODUCTION

The species discussed in this paper were submitted to me for determination by the collectors of most of the specimens, E. P. Mumford and A. M. Adamson, of the Pacific Entomological Survey.

TRIBE ERIOPTERINI

The vast majority of the Eriopterine Tipulidae in the more remote Pacific islands pertain to the subgenus *Lipophleps* of the genus *Gonomyia* Meigen. In this series from the Marquesas are included no fewer than four species of this subgenus, all, as known, being restricted to the Marquesas.

Key to Marquesan Species of Lipophleps

1. General coloration metallic blue-black; wings yellowish, conspicuously patterned with brown; size large (wing, male, more than 6 mm.) ..... **metallescens** Edwards

   General coloration reddish brown to brown, variegated with yellow; wings unmarked, except for the stigmal area when present; size small (wing, male, not exceeding 5 mm.) 2

2. Tips of all femora broadly and conspicuously blackened ..... **adamsoni** new species

   Femora uniformly blackened, or pale with a brown subterminal ring 3

3. Antennae, legs, and knobs of halteres brown; wings strongly suffused with blackish ..... **mumfordi** new species

   Antennae with the scapal segments conspicuously light-yellow; knobs of halteres yellow, femora brownish-yellow, with a slightly darker subterminal brown ring; wings brownish gray ..... **marquesana** new species

* Pacific Entomological Survey Publication I, article 7.

Edwards [24] has recorded still another species of *Lipophleps* from Hivaoa. His specimen was in too fragmentary a condition to determine, but is certainly different from the other species known from the Marquesas.

Gonomyia (Lipophleps) metallescens Edwards (fig. 26, *a, e*).

Gonomyia (Lipophleps) metallescens Edwards: Ann. Mag. Nat. Hist. (9), 20, p. 240, 1927.

Male

Length about 5.5-6 mm.; wing, 6.5-7.5 mm. Palpi dark-brown. Dorsal sternopleurite shimmering blue-gray, its ventral portion polished black. All legs with femora chiefly blackened, with a paler annulus beyond midlength; tibiae and tarsi chiefly blackened. Wings (fig. 26, *a*) with the prearcular region broadly and abruptly light yellow; cubital and anal cells beyond base almost uniformly infuscated; remainder of wing-pattern about as in the type. Venation: Sc_1 ending opposite or slightly beyond the origin of *Rs*. Abdomen black, the hypopygium a trifle paler. Male hypopygium (fig. 26, *e*) with the lateral arms of the tergal plate produced, each bearing two branches, one being a flattened black paddle, the other, an acute spine; on one side the spine exceeds the obtuse arm, and on the opposite side the obtuse arm exceeds the spine. Two dististyles, the outer heavily sclerotized; inner dististyle much expanded at base.

The ochreous abdominal rings described for the type female are little apparent in the material at hand, being most evident on the subterminal tergites.

Marquesas: Eiao, uplands toward north end, east side, elevation 1900 feet, September 29, 1929, on *Hibiscus tiliaceus*, 2 males (1 allotype), 1 female; Vaituha, near sea level, September 29, 1929, at light, 1 female, and October 2, 1929, 1 male; Adamson.

The male sex has never been described, and one of the present specimens is defined as allotype. This striking crane-fly was described from two females taken on Nukuhiva, Marquesas.

The hypopygium is very different in structure from that of the two other species of the *flavidapex* group whose males are known (*dicranura* Edwards and *labidura* Edwards). In these latter species, the basistyles are strongly produced at apices, the lobes thus formed heavily blackened and terminating in a small terminal spine; a single dististyle. In the present species the basistyle is unmodified and there are two dististyles, as described.

Gonomyia (Lipophleps) adamsoni new species (fig. 26, *b, f*).

General coloration of mesonotum light reddish-brown, without distinct markings; pleura pale, blackened dorsally, the ventral portion with a silvery longitudinal stripe; femora with tips broadly and conspicuously blackened; wings pale brownish-yellow, the stigma and axillary region faintly darkened; a small brown cloud on anterior cord; *Sc* short, Sc_1 ending just before origin of *Rs*; male hypopygium with the phallosome symmetrical, each arm bearing a lateral branch beyond midlength, the branches and arms clothed with an abundant delicate pubescence.

[24] Edwards, F. W., Diptera Nematocera from the South Pacific: Ann. Mag. Nat. Hist., (9), 20, p. 240, 1927.

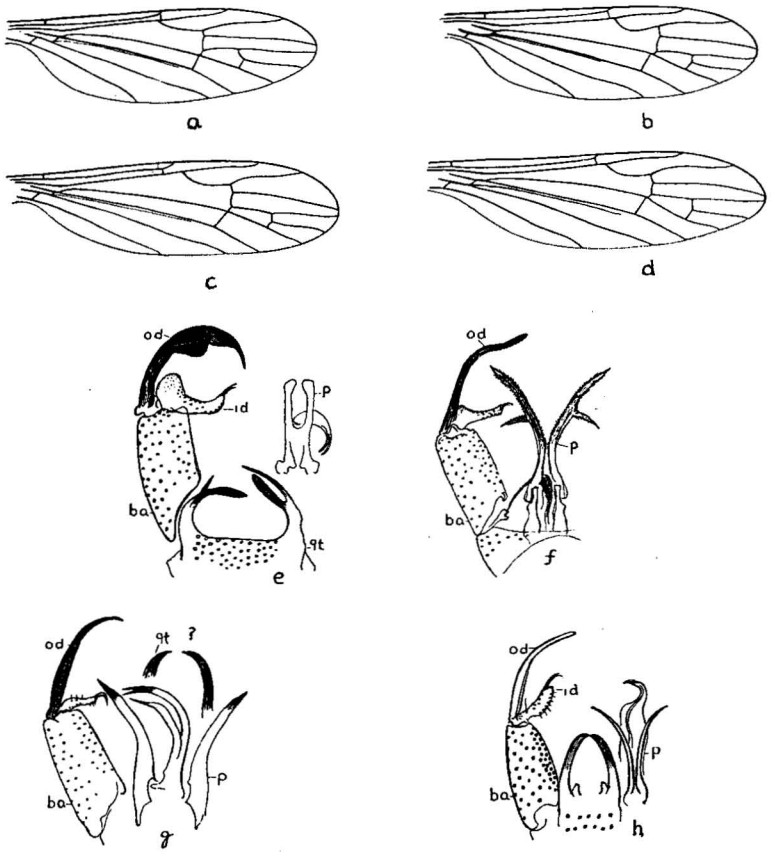

FIGURE 26. Marquesan species of *Lipophleps*: *a, Gonomyia* (*Lipophleps*) *metallescens* Edwards, wing; *b, Gonomyia* (*L.*) *adamsoni* new species, wing; *c, Gonomyia* (*L.*) *mumfordi* new species, wing; *d, Gonomyia* (*L.*) *marquesana* new species, wing; *e, Gonomyia* (*L.*) *metallescens* Edwards, male hypopygium; *f, Gonomyia* (*L.*) *adamsoni* new species, male hypopygium; *g, Gonomyia* (*L.*) *mumfordi* new species, male hypopygium; *h, Gonomyia* (L.) *marquesana* new species, male hypopygium. *ba* = basistyle; *id* = inner dististyle; *od* = outer dististyle; *p* = phallosome; *9t* = 9th tergite.

Male: length about 4.3-4-4 mm.; wing, 4-4.2 mm. Female: length about 5 mm.; wing, 4.2 mm.

Rostrum and palpi brownish-black. Antennae with the scapal segments light-yellow, the flagellar segments a little more testaceous, in the male with elongate verticils. Head light yellow, the center of the vertex restrictedly darkened.

Pronotum yellow. Mesonotal praescutum and scutum reddish brown, without distinct markings, the lateral margin of the praescutum paler, centers of scutal lobes slightly darkened; scutellum testaceous; postnotal mediotergite pale testaceous, the cephalic portion a little darker. Pleura blackened dorsally, the ventral portion with a conspicuous silvery longitudinal stripe extending from behind the fore coxae to the base of the abdomen, passing beneath the root of the halteres; ventral sternopleurite reddish-brown; the dorsal darkening includes the dorso-pleural membrane, propleura, anepisternum and pteropleurite, the pleurotergite pale. Halteres light sulphur-yellow. Legs with the fore and middle coxae yellowish testaceous, the posterior coxae slightly more darkened; trochanters yellow; femora yellow, the tips broadly blackened, the amount subequal on all legs; tibiae and tarsi yellow, the outer tarsal segments slightly infuscated. Wings (fig. 26, *b*) pale brownish-yellow; stigma and axillary region faintly darkened; a more conspicuous darker broken cloud on anterior cord; veins pale-brown, the anterior cord dark-brown. Venation: Sc_1 ending just before the strongly arcuated *Rs*, Sc_2 close to its tip; anterior branch of *Rs* nearly straight; cell *1st* M_2 closed; *m-cu* close to the fork of *M*.

Abdominal tergites and sternites obscure yellow, narrowly blackened laterally. Male hypopygium (fig. 26, *f*) with two dististyles, the outer a curved, simple, glabrous, blackened rod; inner style much smaller, fleshy, with abundant erect setae, including two stouter, more fasciculate setae at apex. Phallosome symmetrical, each arm slender, densely clothed with a delicate pale pubescence, the tips acute; on outer margin beyond midlength with an acute lateral spine arising from membrane, the basal half of the spine with numerous setulae. Aedeagus terminating in an acute recurved spine.

Marquesas: Eiao, Vaituha, near sea level, October 2, 1929, at light, holotype male, allotopotype female; September 29, 1929, paratopotype male, Adamson.

This very distinct species of *Gonomyia* is named in honor of the collector of the material, A. M. Adamson.

Gonomyia (Lipophleps) mumfordi new species (fig. 26, *c, g*).

General coloration dark-brown, the thoracic pleura with a more or less distinct ventral yellow stripe; rostrum and antennae black; legs blackened; knobs of halteres darkened; wings with a uniform strong blackish tinge; vein *1st A* with macrotrichia distributed throughout the entire length.

Male: length about 3.2 mm.; wing, 4 mm.

Rostrum, palpi, and antennae black, the outer segments of the antennae slender, with long conspicuous verticils. Head dark-brown, restrictedly variegated with yellow.

Mesonotum chiefly dark-brown, the median region of the scutum, together with the adjoining portions of the praescutum, obscure yellow; scutellum dark brown; postnotal mediotergite dark-brown. Pleura dark-brown, especially the dorsal half, the ventral half traversed by a more or less distinct yellow longitudinal stripe; ventral sternopleurite paler brown than the dorsal region. Halteres brown. Legs with the coxae and trochanters pale-brown; remainder of legs dark brown to black. Wings (fig. 26, *c*) with a uniform blackish tinge, the oval stigma very slightly darker; veins brown. Costal fringe relatively long and conspicuous; macrotrichia on vein *1st A* for the entire length. Venation: Sc_1 ending just before the origin of *Rs*, Sc_2 a short distance from

its tip; *Rs* very strongly arcuated; basal deflection of R_5 long; *m-cu* close to the fork of *M*.

Abdomen, including the hypopygium, dark-brown. Male hypopygium (fig. 26, *g*) with the outer dististyle simple, glabrous. Inner dististyle very small, terminating in two fasciculate setae, with additional normal setae scattered over surface. Phallosome consisting of two divergent apophyses, pale, with the acute tips narrowly blackened, before the tips on mesal face with an extensive pale membrane. Aedeagus elongate, curved, at apex split into two acute, slightly divergent spines; immediately beneath the aedeagus and closely connected with it for about one-half of its length is a second rod that is drawn out into a long pale point.

Marquesas: Hivaoa, Matauuna, elevation 3700 feet, March 4, 1930, miscellaneous beating, holotype male; March 3, 1930, paratopotype male, Mumford and Adamson.

I take great pleasure in naming this interesting *Gonomyia* in honor of the Director of the Pacific Entomological Survey, Mr. Edward P. Mumford. The species is readily distinguished from all other small regional species of *Lipophleps* by the almost uniform dark color of the body, legs, halteres, and wings. The paratype is more extensively darkened than the type, the yellow pleural stripe being obliterated or nearly so.

Gonomyia (Lipophleps) marquesana new species (fig. 26, *d, h*).

Rostrum black; antennal scape light-yellow, flagellum black; scutellum dark-brown basally, the apex broadly yellow; thoracic pleura yellow, conspicuously striped longitudinally with dark-brown; knobs of halteres light-yellow; femora brownish-yellow, with a subterminal pale brown ring; wings brownish-gray, the prearcular and costal regions pale yellow; stigma pale-brown, oval; macrotrichia on vein *1st A* for entire length.

Male: length about 3.5-3.7 mm.; wing, 4.2-4.5 mm. Female: length about 4.5 mm.; wing, 5 mm.

Rostrum and palpi black. Antennae with the scapal segments clear light-yellow, the flagellum black; flagellar segments of male with elongate verticils, as in the subgenus. Head light-yellow.

Pronotum yellow dorsally, darker laterally. Mesonotal praescutum brown medially, paling to yellowish brown on sides, the humeral region and lateral pretergites clear light yellow; pseudosutural foveae reddish-brown, but little conspicuous against this ground-color; scutal lobes dark-brown, obscure yellow on median portion; scutellum dark brown medially at base, the apex broadly yellow; postnotal mediotergite yellow, the cephalic margin darkened, the caudal margin with two paler brown spots. Pleura pale whitish-yellow, conspicuously variegated with darker, including a dorsal longitudinal stripe extending from the cervical sclerites to the abdomen, passing beneath the halteres; a much paler brown area on the ventral sternopleurite. Halteres with the stem testaceous, the knobs clear light yellow. Legs with the coxae pale yellow, the basal portions of the mid-coxae a trifle darkened; trochanters yellow, femora brownish yellow, with a slightly darker subterminal brown ring; tibiae brownish black; tarsi black. Wings (fig. 26, *d*) with a brownish-gray tinge, the prearcular and costal regions pale-yellow; stigma pale-brown, oval, very faintly indicated and ill-defined; veins brown. Macrotrichia on vein *1st A* for the entire length; costal fringe and macrotrichia of veins long and conspicuous. Venation: *Sc* short, Sc_1 ending opposite origin of *Rs*.

Abdominal tergites obscure yellowish-brown, the sternites a little paler; hypopygium yellow. Male hypopygium (fig. 26, *h*) with two dististyles, the outer one a simple

gently curved rod, the inner small and fleshy, terminating in two fasciculate setae, with other smaller setae, chiefly marginal in distribution. Elements of phallosome symmetrical, consisting of two flattened sword-shaped dusky blades, with two more slender divergent rods. Apex of aedeagus a short curved hook.

Marquesas: Hivaoa, Mount Temetiu, elevation 3,900 feet, December 30, 1930, at light, holotype male and numerous paratopotypes, males and females; December 29, 1930, at light, numerous paratopotypes, males and females, H. Tauraa; Matauuna, elevation 3,700 feet, March 4, 1930, by miscellaneous beating, allotype female, Mumford and Adamson.

One paratype male has one wing with cell *1st* M_2 open by the atrophy of *m*.

ANOMOTERGA TAHUATA, NEW GENUS AND NEW SPECIES, AND OTHER CHERMIDAE FROM THE MARQUESAS*

By

F. D. KLYVER

SAN MATEO, CALIFORNIA

INTRODUCTION

The material upon which this paper is based was collected by E. P. Mumford, Director of the Pacific Entomological Survey, A. M. Adamson, of the Survey, and their field assistants. The collection was placed at my disposal for study at the suggestion of E. O. Essig, Professor of Entomology, University of California, with the concurrence of D. L. Crawford, President of the University of Hawaii.

The holotypes and allotypes of the three new species here described are in the collection of Bernice P. Bishop Museum.

PAUROPSYLLINAE CRAWFORD

ANOMOTERGA, new genus

Body small, robust. Head strongly deflexed, as wide as or wider than thorax; vertex uniformly rounded forward and downward, with two foveae on each side of the median suture; very little swollen beneath antennal insertions, genae wanting; frons conspicuous, bearing the prominent anterior ocellus; antennal segments one and two small, slender (remaining antennal segments wanting and unknown); eyes large, hemispherical. Thorax strongly arched, broad. Fore wings somewhat translucent and fumate, oval, broadly rounded apically, the venation suggesting that of *Paurocephala* but with the radial sector very nearly perfectly straight throughout its length; pterostigma present. Hind wings well developed; venation obscure. Legs short and stout; the posterior tibia without a claw or claws at the base, with eight to ten large teeth and a group of two to four smaller teeth at the apex. Metacoxal spurs large. Abdomen with the tergites, particularly tergites five and six in the male and tergites five, six, and seven in the female, with the posterior half greatly raised above the level of the anterior half to form several broadly rounded ridges across the abdominal dorsum. Genitalia of both male and female simple in structure.

* Pacific Entomological Survey Publication I, article 8.

Type of the genus: *Anomoterga tahuata,* new species. (FK333.1. ♀ 1).

The most important and striking characters of the genus are the greatly modified tergites and the secondary groups of small teeth at the apex of the posterior tibiae.

Anomoterga tahuata, new species (fig. 27, *a-p*).

Length to tip of folded wing, 1.6 mm. to 2.3 mm.; length of body mounted on slide, 2.3 mm. to 2.5 mm.; length of fore wing, 1.4 mm. to 1.6 mm.; width of fore wing, 0.6 mm. to 0.8 mm.; width of head, 0.6 mm. to 0.7 mm. General color dark brown to black with lighter brown markings and stripes on the thorax and abdomen, legs lighter brown, the head with the vertex pale brownish grey with the eyes and foveae dark brown, the first and second antennal segments light brown. Wings brownish around the apical margin and along the caudal margin.

Head as wide as or slightly wider than the thorax, nearly perpendicularly deflexed, shape and proportions as illustrated (fig. 27, *d*), the vertex uniformly rounded forward and downward, with two foveae (fig. 27, *e*) on each side of the median suture and situated toward the upper part of the vertex, represented by four dark brown spots in dry mounts, the surface only slightly rugose and with but few setae (fig. 27, *d, e*). First and second antennal segments small and slender; remaining segments unknown.

Thorax strongly arched, with the prothorax bulging over the back of the head; dorsum with only very minute setae; metacoxal spurs (fig. 27, *h*) well developed. Posterior femur with a row of three sensoria on the anterior mesal aspect (fig. 27, *g*). Posterior tibia without a claw at the base (fig. 27, *f*); with 8 to 10 large black teeth and a group of 2 to 4 smaller teeth at the apex (fig. 27, *o, p*). Fore wing with the shape and venation as illustrated (fig. 27, *k*), the membrane semi-translucent and fumate along the apical and caudal margins, the membrane beset, except immediately along the veins, with conspicuous punctations, the membrane thicker, slightly more translucent, and more densely beset with points in the relatively large pterostigma, the wing veins bearing obscure hair-like setae; alar radulae wanting. Hind wings (fig. 27, *m, n*) three-fourths as long as fore wings, the membrane beset with numerous punctations, the obscure venation developed in the form of fine ridges along which the punctations are arranged in more or less definite single, double, and irregular rows.

Abdomen with the tergites greatly modified as described for the genus and as illustrated (fig. 27, *a*); the sternites, especially in the female, of abdominal segments 5, 6, and 7 each with two lateral sclerites representing the lateral portions of ordinary sternites but without continuous chitinized plates on the ventral side of the abdomen; the last character resulting in the complete collapsing of the ventral side of the female abdomen in dry mounts, causing the abdomen to be so distorted that the genital segment assumes a vertical position; the abdominal membrane dorsad and immediately anterior to the anal valve of the female bearing a group of relatively large setae. Genitalia of the male (fig. 27, *i*) simple in structure, the claspers of uniform width, with a forward directed claw-like process on the mesal side of the apex (fig. 27, *j*). Genitalia of the female about one-third the length of the entire abdomen (fig. 27, *a*), the ventral valve short, subacute at the tip, the dorsal valve nearly twice as long as the ventral, tapering from a broad base to a subacute tip bearing scattered large setae and many anteriorly directed smaller setae (fig. 27, *c*), the circumanal ring developed as a single row of simple, elongate pores; the spermatheca persisting even in specimens cleared with potassium hydroxide, with a membraneous wall bearing curious hooked rings (fig. 27, *l*) which apparently have not been previously noticed.

Marquesas: Tahuata, Hanatuuna Valley, elevation 300 feet, July 19, 1930, host unrecorded, holotype female (FK331.1. ♀ 1) and allotype male

FIGURE 27. *Anomoterga tahuata,* new species: *a,* lateral aspect of female abdomen and genitalia; *b,* chitinized areas on membrane; *c,* setae on apex of dorsal valve; *d,* head; *e,* fovea with surrounding area and setae; *f,* base of posterior tibia; *g,* sensoria on posterior femur; *h,* metacoxal spur; *i.* male genitalia; *j,* inner aspect of clasper; *k,* fore wing, without pigmentation; *l,* structures in wall of spermatheca; *m,* hind wing; *n,* detail of hind wing; *o,* apex of posterior tibia; *p,* detail of posterior tibia, enlarged.

(FK333.1. ♂ 1), 7 paratype males and 4 paratype females (FK333.1.-333.13), LeBronnec and H. Tauraa.

TRIOZINAE PUTON

TRIOZA Forster

Trioza alifumosa, new species (fig. 28, *a, c-f, h-l, o, p*).

Length to tip of folded wing, 3.5 mm. to 3.8 mm.; length of body mounted on slide, 2.8 mm. to 3.0 mm.; length of fore wing, 2.9 mm. to 3.2 mm.; width of fore wing, 1.2 mm. to 1.3 mm.; width of head, 0.6 mm. General color very dark brown to black, excepting antennal segments 3, 4, 5, 6, and tibiae and tarsi of all the legs, which are lighter brown. Wings black or very darkly fumate in areas illustrated (fig. 28, *c*) and faintly and uniformly fumate over the remainder of the membrane, veins and alar radulae dark brown. (One teneral specimen is general reddish brown.) Characters of the genus well developed with the one exception that the posterior tibia bears a conspicuous claw at the base (fig. 28, *i*), a character which is unusual in the Triozinae and is unknown in Trioza according to Crawford.

Head as wide as mesothorax, strongly deflexed; shape and proportions as illustrated (fig. 28, *a*), the eyes large, the genae bluntly rounded and but little divergent, the foveae of the vertex joined by two sulca meeting at the median line, the vertex and genae moderately pubescent. Antennae 10-segmented, somewhat more than twice as long as width of head, segment 3 longer than segments 4 and 5 combined, segments 4, 6, and 8 bearing sensoria at their distal ends.

Thorax moderately arched, bearing scattered large hair-like setae. Posterior trochanter having a row of sensoria around the outer aspect (fig. 28, *l*), posterior femur with a row of four or more stout setae (fig. 28, *j*) on the outer anterior side of the apex, posterior tibia with a claw or several small claws at the base (fig. 28, *i*) and with three black teeth on one side and a single tooth and a row or comb of setae on the other side of the apex (fig. 28, *k*). Fore wing with shape and venation as illustrated (fig. 28, *c*), the proximal end darkly fumate to black and the remainder of the membrane brownish tinged or fumate; the membrane beset with punctations over the caudal two-thirds of the outstretched wing, the punctations being absent on the anterior third and, over the remainder of the wing, never on or near the veins; the proximal end of the wing membrane tending to be somewhat rugose particularly in the darkest areas, the veins beset with small, inconspicuous slender setae; three alar radulae present, one in each of the marginal cells and one between Cu_1 and M_3+_4. Posterior wing two-thirds as long as fore wing, the membrane beset with many conspicuous punctations, the venation for the most part distinct and developed as a single or double row of punctations along which are brownish fumate streaks.

Abdomen with the tergites and sternites heavily chitinized, and with a series of lateral sclerites on either side ventrad of tergites 5, 6, and 7. Male genitalia (fig. 28, *o, p*) relatively simple, the proctiger about twice as long as the claspers, the latter short, stout, with the upper fourth turned backward in lateral aspect. Female genitalia (fig. 28, *e, f, h*) one-third as long as the remainder of the abdomen, robust, the dorsal valve irregularly chitinized at the base and with an intricate system of small sclerites on the membrane anteriorly (fig. 28, *f*), the ventral valve uniformly and heavily chitinized, the circumanal ring developed as a series of simple pores (fig. 28, *h*).

Marquesas: Fatuhiva, ridge east of Omoa [Oomoa] Valley, elevation 2800 feet, August 28, 1930, by beating *Metrosideros collina,* holotype male (FK313.1. ♂ 1) and allotype female (FK313.1. ♀ 1), 7 paratype males and

1 paratype female (FK313.1-313.10); elevation 3000 feet, sweeping over *Vaccinium* species, 9 males and 5 females (FK314.1-314.14); host unrecorded, 5 males (FK315.1-315.5), LeBronnec.

This and the following species are remarkably similar in nearly all important details.

Trioza alipellucida, new species (fig. 28, *b, g, m. n*).

Length to tip of folded wing, 3.4 mm. to 3.7 mm.; length of body mounted on slide, 2.8 mm. to 3.0 mm.; length of fore wing, 2.9 mm. to 3.2 mm.; width of fore wing, 1.0 mm. to 1.2 mm.; width of head, 0.55 mm. to 0.7 mm. General color dark chocolate brown to jet black, usually with a yellow brown stripe one-third as wide as the thorax extending from the median posterior margin of the scutellum to the tips of the genae, with the stripe lacking or imperfectly developed in the darker specimens, with a patch of similar color on the thorax at the base of the wings, on antennal segments 3 and 4, and from the base of the tibiae to the ends of the legs. Wings mostly hyaline except for a dark brown area along about one-half of the proximal end of the anal vein, wings of some specimens slightly fumate, veins and alar radulae distinctly brown. Characters of the genus developed as in the preceding species.

Head slightly wider (fig. 28, *b*) than in *Trioza alifumosa,* with the genae relatively shorter, more conical, and more divergent. Thorax differing, possibly, in being less pubescent. Fore wings slightly longer and narrower, without punctations except in a limited area in the proximal angle of the anal cell, without coloration except for a dark brown to black area along the proximal half of the anal vein and, in some cases, for a faintly brownish tinge over the remainder of the wing. Hind wings similar.

Abdomen similar except for significant differences in the male, and less importantly the female, genitalia. Genitalia of the male (fig. 28, *m, n*) with the proctiger less elongate and proportionately more robust, with the claspers relatively longer but differing as illustrated (fig. 28, *n, p*), tapering uniformly from a wide base to a narrow angular apex. Genitalia of the female with the dorsal and ventral valves more nearly and regularly chitinized, with the intricate system of small sclerites less developed than in *T. alifumosa* (fig. 28, *f*).

Fatuhiva: Tahuna, elevation 2,100 feet, September 3, 1930, beating *Metrosideros collina,* holotype male (FK308.2. male 1) and allotype female (FK308.2. female 1), 29 paratype males and 45 paratype females (FK308.1-308.76); Teavapuhiau, elevation 2,100 feet, August 25, 1930, beating *Weinmannia* species, 11 males, 9 females, (FK309.1-309.20), LeBronnec.

Hivaoa: Matauuna, elevation 3,800 feet, July 24, 1929, on *Weinmannia* species, 9 males, 8 females, (FK316.1-316.17); Mount Temetiu, elevation 3,600 feet, July 24, 1929, host unrecorded, 1 male, 1 female (FK319.1-319.2); Tepuna, elevation 3,000 feet, August 1, 1929, miscellaneous sweeping, 1 male (FK326.1); Kopaafaa, elevation 2,800 feet, February 25, 1930, beating *Metrosideros collina,* 1 male, 1 female (FK322.1-322.2), August 2, 1929, by miscellaneous sweeping, 2 females (FK324.1-324.2), August 3, 1929, miscellaneous sweeping, 3 males, 1 female (FK325.1-325.4); Mounaofefe, elevation 2,000 feet, September 13, 1929, on *Weinmannia* species, 1 male (FK317.1), Mumford and Adamson.

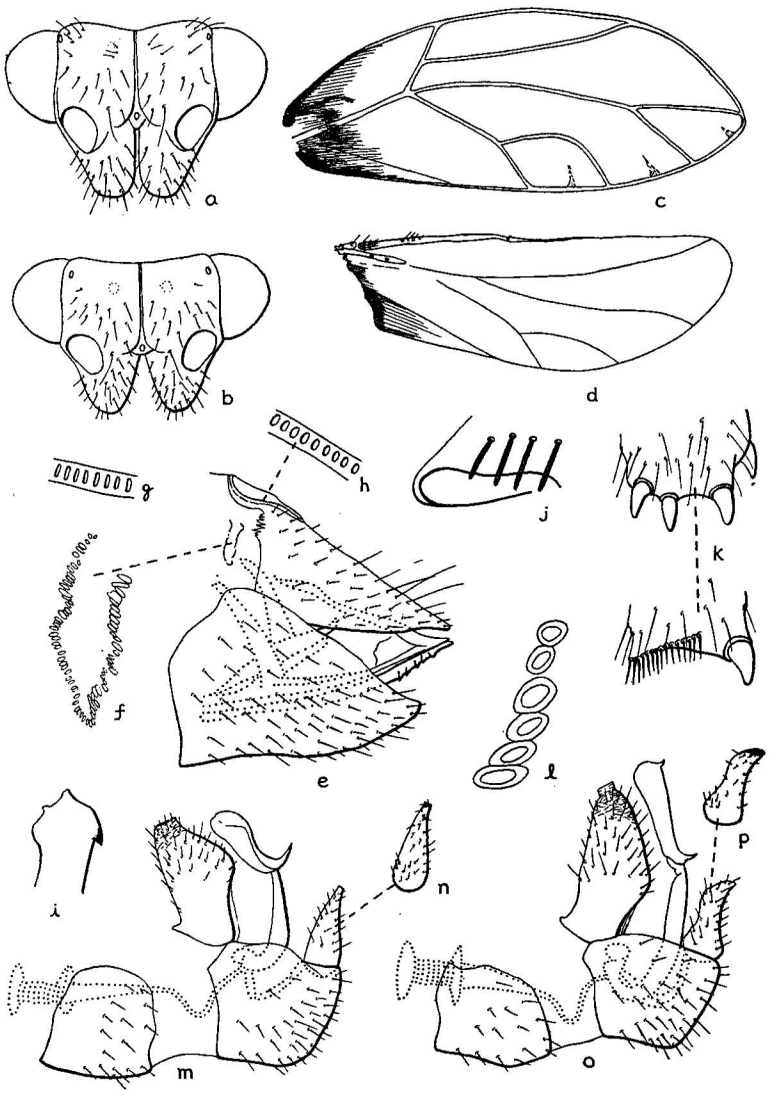

FIGURE 28. *Trioza alifumosa,* new species: *a,* head; *c,* fore wing; *d,* hind wing; *e,* female genitalia; *f,* detail of small chitinized areas; *h,* detail of circumanal ring; *i,* base of posterior tibia; *j,* setae, apex of posterior femur; *k,* apex of posterior tibia; *l,* sensoria on posterior trochanter; *o,* male genitalia; *p,* inner aspect of clasper. *Trioza alipellucida,* new species: *b,* head; *g,* detail of circumanal ring; *m,* male genitalia; *n,* inner aspect of clasper.

Tahuata: Amatea, elevation 2,700 feet, July 7, 1930, host unrecorded, 1 female (FK332.1), LeBronnec and H. Tauraa.

Nukuhiva: Ooumu, elevation 4,000 feet, November 12, 1929, beating *Metrosideros collina,* 4 males, 3 females (FK328.1-328.7), host unrecorded, 1 male, 1 female (FK329.1-329.2), elevation 3,700 feet, November 12, 1929, on *Ilex marquesensis,* 1 male (FK327.1); Teuanui, elevation 2,500 feet, October 25, 1929, beating *Metrosideros collina,* 1 male (FK323.1); ridge north of Teuanui, elevation 2,800 feet, October 26, 1929, on *Metrosideros collina,* 1 male, 1 female (FK321-321.2), Mumford and Adamson.

Uapou: Hakahetau Valley, elevation 2,500 feet, December 6, 1929, on *Metrosideros collina,* 2 males (FK320.1-320.2), Adamson.

This species is here described only in the particulars in which it differs significantly from *Trioza alifumosa,* above, to which it is apparently closely related. However, the similarity does not here amount to intergradation, except in the matter of coloration, which is regarded as being merely of secondary importance. Structurally the two forms are distinctly separated as two species.

PHYLLOPECTA Zacher

Phyllopecta vitiensis (Kirkaldy) (fig. 29, *a-r*).

Length to tip of folded wing, 5.2 mm. to 6.3 mm.; length of body mounted on slide, 3.4 mm. to 4.0 mm.; length of fore wing, 5.0 mm. to 6.1 mm.; width of fore wing, 1.8 mm. to 2.1 mm.; width of head, 0.8 mm. to 1.0 mm. General color of the specimens in two distinct series; the general color of one series (FK312.1-312.38) pale brownish yellow or straw-colored over the entire body, with the eyes, the tips of the antennae, and the teeth of the posterior tibiae darker to black, the general color being strikingly constant in this series (a number of specimens in this series appear to have been taken while still teneral); the general color of the second series (FK307.1; 310.1-310.25; 311.1-311.5; 318.1-318.2) variable from a light to a dark brown, with the eyes only slightly darker and varying with the general color. Wings hyaline and somewhat glistening, the veins brown in marked contrast, two small dark brown to black spots at the characteristic bend of the basal vein and on the proximal half of the anal vein. Characters of the genus well developed except that the secondary metacoxal spurs are hardly developed as more than broadly rounded knobs of conspicuous size.

Head considerably wider than prothorax and not as wide as mesothorax, strongly deflexed, having the shape and proportions as illustrated (fig. 29, *a, b*), the pubescence of the head being noticeable chiefly on the genae in pin specimens. Antennae 10-segmented; the third segment nearly as long as segments 4, 5, 6, and 7 combined; antennal segments 4 (fig. 29, *f*), 6 (fig. 29, *e*), and 8 bearing sensoria, that of segment 6 being unusually large.

Thorax strongly arched, the prothorax relatively narrow and the mesothorax proportionately broad, the dorsum bearing scattered long hair-like setae. Posterior tibia armoured with two large and several smaller spurs at the base, and with three black teeth on one side and a single tooth and a comb of stout setae on the other side of the apex. Fore wing hyaline and somewhat glistening; wing venation and shape as illustrated (fig. 29, *g*), the basal vein with a noticeable bend; three alar radulae (fig. 29, *h*), one in each of the marginal cells and one between Cu_1 and $M_3 + _4$. Posterior wings

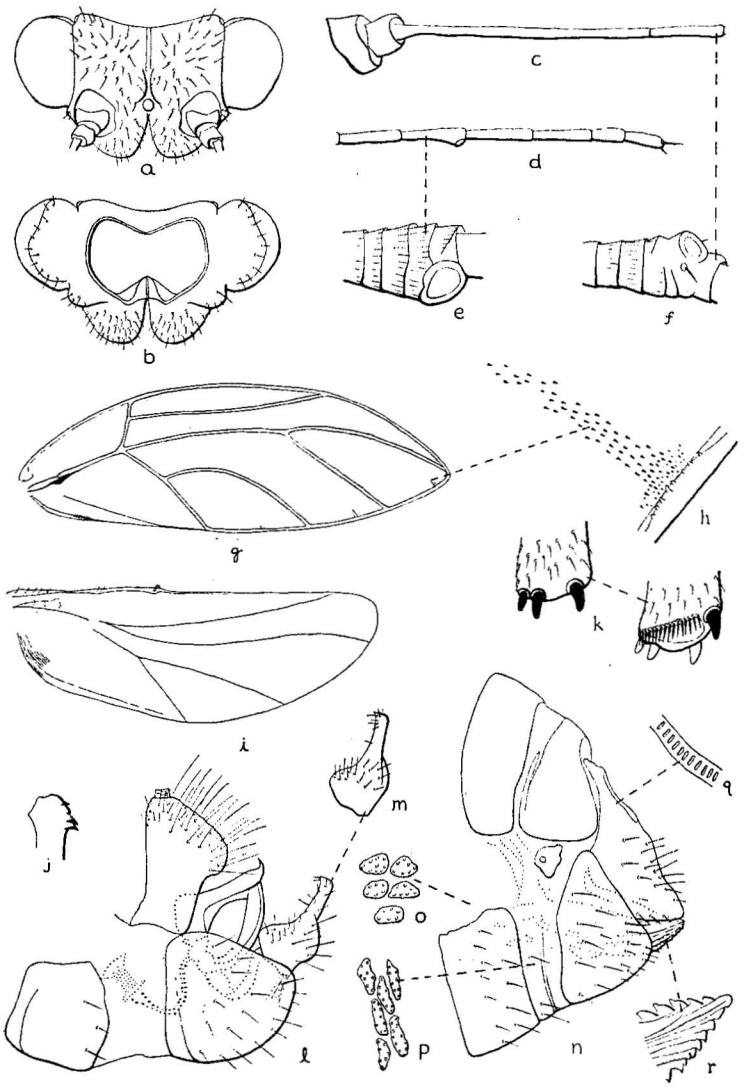

FIGURE 29. *Phyllopecta vitiensis* (Kirkaldy): *a*, dorsal aspect of head; *b*, ventral aspect of head; *c*, antenna; *d*, antenna; *e*, detail of segment six; *f*, detail of segment four; *g*, fore wing; *h*, detail of alar radula; *i*, hind wing; *j*, base of posterior tibia; *k*, apex of posterior tibia; *l*, male genitalia; *m*, inner aspect of clasper; *n*, female genitalia; *o*, chitinized areas on membrane; *p*, chitinized areas on membrane; *q*, detail of circumanal ring; *r*, apex of ovipositor.

(fig. 29, *i*) slightly more than one-half as long as fore wings, the membrane beset with numerous points, and the venation for the most part developed as an irregular single or double row of punctations.

Abdomen robust, with the tergites and sternites mostly heavily chitinized and the membrane for the greater part covered with small, closely set chitinized plates (fig. 29, *n, o, p*); the abdomen bearing a secondary series of lateral sclerites on either side slightly ventrad of the lateral extremities of tergites 5, 6 and 7, the corresponding spiracle in each instance in another sclerite ventrad of the lateral series. Genitalia of the male as illustrated (fig. 29, *l, m*) with the proctiger large and with a slight posterior lobe, the clasper relatively small and complex, the lower half large, the upper slender, with the apex directed forward hook-like. Genitalia of the female short and blunt (fig. 29, *n*), the circumanal ring developed as a single row of simple pores (fig. 29, *q*), the tip of the genital apparatus saw-like, suggesting a possible gall-forming habit (fig. 29, *r*).

Marquesas: Fatuhiva, Teaotu, Hanavave Valley, elevation 750 feet, September 9, 1930, beating *Eugenia* species, 12 males, 13 females (FK310.1-310.25), LeBronnec.

A specimen from Moorea, Society Islands, was also examined, the record being as follows:

Society Islands: Moorea, Opunohu Valley, 2 miles from sea, elevation 100 feet, November 30, 1928, host unrecorded, 1 male (FK307.1), Adamson.

Crawford has commented upon the habit of this species of forming leaf galls on *Eugenia malaccensis* (*Jambosa domestica*) in the south Pacific and in tropical Asia.

MARQUESAN SIMULIIDAE *

By

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INTRODUCTION

The following notes are based mainly upon the study of collections made during 1928 and 1929 by the Pacific Entomological Survey under the direction of E. P. Mumford, to whom I am indebted for the privilege of examining the material collected by Mr. Mumford and A. M. Adamson and their field assistants.

Three species of *Simulium* have so far been found in Polynesia: *S. buissoni* Roubaud in the Marquesas, and *S. tahitiense* Edwards and *S. cheesmanae* Edwards in Society Islands. *S. buissoni* has also been recorded from Society Islands, but wrongly, as now appears. In addition to these strictly Polynesian species, one (*S. jolyi* Roubaud) is found in Fiji and in New Hebrides, but the family is apparently absent from the Hawaiian, Samoan, and Tongan islands. A synonym of *S. jolyi* is *S. laciniatum* Edwards. When describing *S. laciniatum* I had overlooked Roubaud's description of the species, which is well characterized by the structure of the hind tarsi. L. E. Cheesman has found *S. jolyi* to be widely distributed in New Hebrides.

Simuliidae are a scourge in the Marquesas. Miss Cheesman, who visited this part of the Pacific on the St. George Expedition in 1925, wrote: "*S. buissoni*, the 'no-no' of the Marquesans, occurs in incredible numbers in the Taipi Valley, Nukuhiva. In the month of January it was biting most viciously, and would cover all exposed flesh in black masses, setting up unbearable irritation and producing much swelling of the parts attacked . . . It haunted the shores at the mouth of the valley, and even came out to sea, attacking the passengers of incoming ships." A. M. Adamson wrote on December 12, 1930: "They are a serious pest on Nukuhiva and Eiao—and are said to have been, up till about forty years ago, on Uapou as well. Their 'disappearance'—or at least their ceasing to attack human beings—is said to have been quite sudden. The whole question seems to be of great interest in both the Marquesas and Society Islands."

As *Simulium* was found to be much more troublesome on some islands of the Marquesas than on others—on some islands they were not found biting man at all—it was naturally suspected that more than one species might be present. At first sight the material submitted by Mumford and Adamson

* Pacific Entomological Survey Publication I, article 9.

appeared to belong to a single species, but a more careful study led to the conclusion that one form was represented among the specimens from Nukuhiva and Eiao, but that this form was replaced by a closely allied but distinct race on most of the other islands, including Uapou and Hivaoa. Moreover, on Hivaoa two other distinct species were found to be represented, and all three species were found together. The Nukuhivan species (*S. buissoni*) has a slightly but appreciably longer proboscis than the others, and this probably accounts for the marked difference in biting habits; the mouthparts of the variety of *S. buissoni* on Hivaoa are perhaps too short to pierce the human skin, although sufficiently long to pierce the skin of birds.

In describing the Simuliidae collected in the south Pacific by the St. George Expedition,[25] I noted that a small species found by Cheesman in Tahiti appeared indistinguishable from *S. buissoni*. Further material of this same species was subsequently obtained by A. L. Tonnoir and submitted to me in 1930, but again I did not detect any distinction between it and *S. buissoni*. The present collections, however, make it clear that the Tahitian species is certainly distinct from any of those now shown to exist in the Marquesas; not only are the larvae and pupae markedly different, but the female is readily distinguishable from *S. buissoni*, at least, in the much larger abdominal tergites. Reduction of the abdominal tergites is a character found in several of the most bloodthirsty species of the genus, and would probably be a useful adaptation to such species, allowing of greater distension of the abdomen.

Genus SIMULIUM

Subgenus EUSIMULIUM

All three recorded Polynesian species, as well as the two new ones described below, and one new species from Tahiti,[26] belong to the subgenus *Eusimulium*, the adult females having the following characters:

Frons only moderately wide, dull. Antennae 11-segmented. Thorax dark, without special ornamentation. Front tarsi only very indistinctly flattened. Hind tarsi with well-developed projection (calcipala) at tip of first segment on inner side, and with distinct excision (pedisulcus) dorsally near base of second segment. Claws with strong basal tooth. Wings without basal cell; radius hairy throughout; sector simple, lying close to R_1; costa with minute spinules in addition to fine hairs; Cu_2 with strong double bend.

[25] Edwards, F. W., Diptera Nematocera from the South Pacific collected by the 'St. George' Expedition, 1925: Ann. Mag. Nat. Hist., (9), 20, pp. 241-243, 1927.

[26] Edwards, F. W., Simulium oviceps, new species, manuscript, Bernice P. Bishop Museum.

They are all, however, different from the typical species of the subgenus, such as *S. aureum* Fries and *S. latipes* Meigen, in the complete absence of hairs on the upper surface of the radial sector, and also (in three species at least) in the greater number of filaments in the pupal respiratory organs, which are typically only four. In these respects they resemble Enderlein's group Gomphostilbia.

Regarding the possible origin of *S. buissoni* and other Polynesian Simuliidae, little can be said. There are no obvious allies among the described South American species; on the other hand, some Oriental species such as *S. atratum* de Meijere seem somewhat allied. Closer allies may be found in New Guinea when that fauna is better known. On the whole, evidence does not conflict with that afforded by other groups of animals in suggesting that the whole Polynesian fauna has been derived from the west.

Simulium buissoni Roubaud (figs. 30, 31, 32).

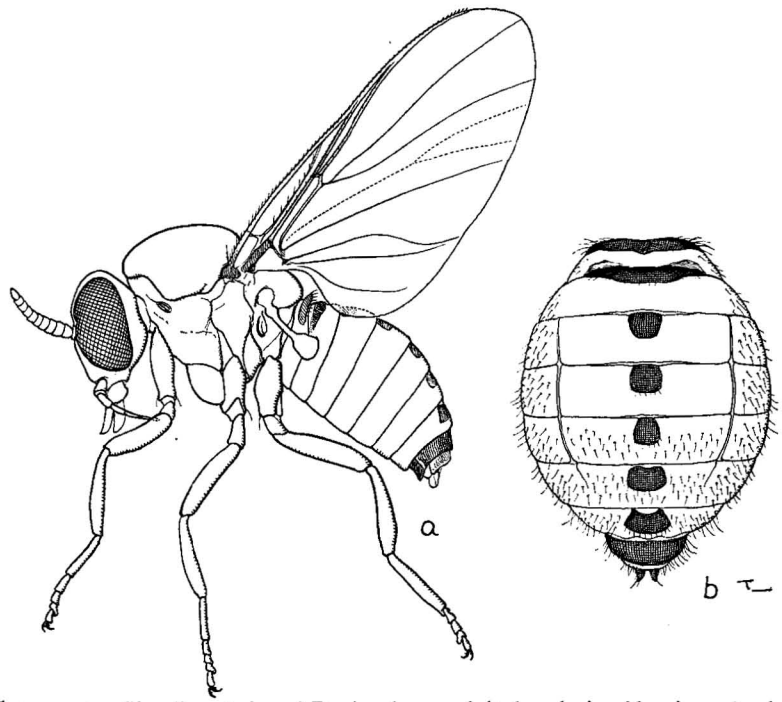

FIGURE 30. *Simulium buissoni* Roubaud: *a*, adult female in side view; *b*, abdomen of female in dorsal view (distended with blood) showing small tergal plates.

Female

Black, averaging about 1.7 mm. in length of body. Frons rather narrow above antennae, but considerably widened upwardly; face large and broad; in perfect specimens both the frons and the face bear coarse yellowish pubescence, but this is not very

dense. Antennae black, the two basal segments sometimes indistinctly paler. Labrum (as seen from in front) fully three-fifths as long as antennae. Last palpal segment distinctly longer than the others combined. Thorax dull, without trace of stripes, clothed above with coarse golden-yellowish pubescence, rather dense in perfect specimens. Pleural membrane and mesosternum bare. Abdomen with scanty yellowish pubescence which is evenly distributed; basal fringe yellowish. Tergites 3 to 6 all small, somewhat narrower or at least scarcely broader than long, tergite 7 also smaller than in many species, usually less than twice as broad as long, but rather variable in size; tergites 3 to 6 dull, 7 to 9 slightly shining. No sternite to segment 6. Legs mainly dark brownish, but tibiae more or less pale at extreme base and sometimes indistinctly paler in middle; first hind tarsal segment mainly pale, only about the apical fourth or fifth darkened; pubescence of tibiae coarse and yellowish throughout, or at least on the basal three-fourths. First hind tarsal segment almost as long as the tibia, deepest in middle, rather less deep on apical third; its apical projection (calcipala) occupying about two-thirds of the depth at tip, long, reaching beyond the middle of the short second segment; third segment not or scarcely longer than broad. Basal tooth not quite reaching middle of claws. Hair at base of wing dark. Radial sector entirely bare above, with one row of hairs beneath. Halteres dark brownish, knob sometimes indistinctly paler at tip.

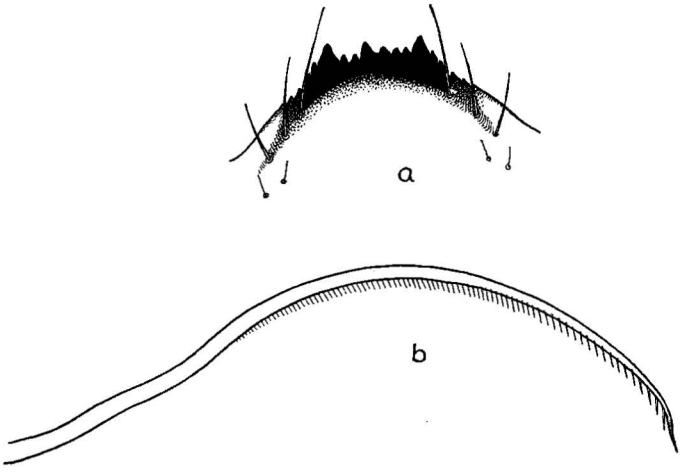

FIGURE 31. Mouth parts of larva of *Simulium buissoni* Roubaud: *a*, mentum; *b*, single fan-ray.

Larva

Head largely pale above, but with very characteristic fronto-clypeal markings in the form of a figure 8, conspicuous in dark specimens, somewhat faint in pale specimens; sides of head largely dark, but with the usual clear area over the eyes and another clear area behind them. Labral fans normal, large, with about 30 rays; pectinations moderately close. Antennae 4-segmented, the two basal segments thin-walled as usual, second longer than first; third segment as usual more slender and strongly chitinized, about half as long as first two together; fourth minute. Mandibles of the usual form. Mentum with the median and lateral teeth strongly projecting, separated by three small teeth. A pair of small ventral tubercles present on last segment. Terminal circlet of hooks of about 60 rows, with about 12 hooks in the row. Chitinous anal armature normal, not passing more than half way around the body. Anal gills simple.

Pupa

Respiratory organ almost as long as the pupa itself, formed of six branches; the main stem forks close to the base into a dorsal and ventral branch, the ventral branch forks again at a considerable distance from the first branch, the dorsal branch gives one long branch externally near its base, and two more branches further out internally, the distance between the bases of these three branches being subject to some individual variation. Tergites 3 and 4 (but not 2) each with an apical row of eight (4 + 4) recurved hooks; tergites 6 to 8 each with a basal row of about eight small backwardly directed spines; tergite 9 with a pair of very small sharp tubercles. Sternites 4 to 7 each with four (2 + 2) apical reflexed hooks. Cocoon rather closely woven, not quite covering thorax of pupa, without anterior projection above, without floor beneath thorax, and without connecting band in front.

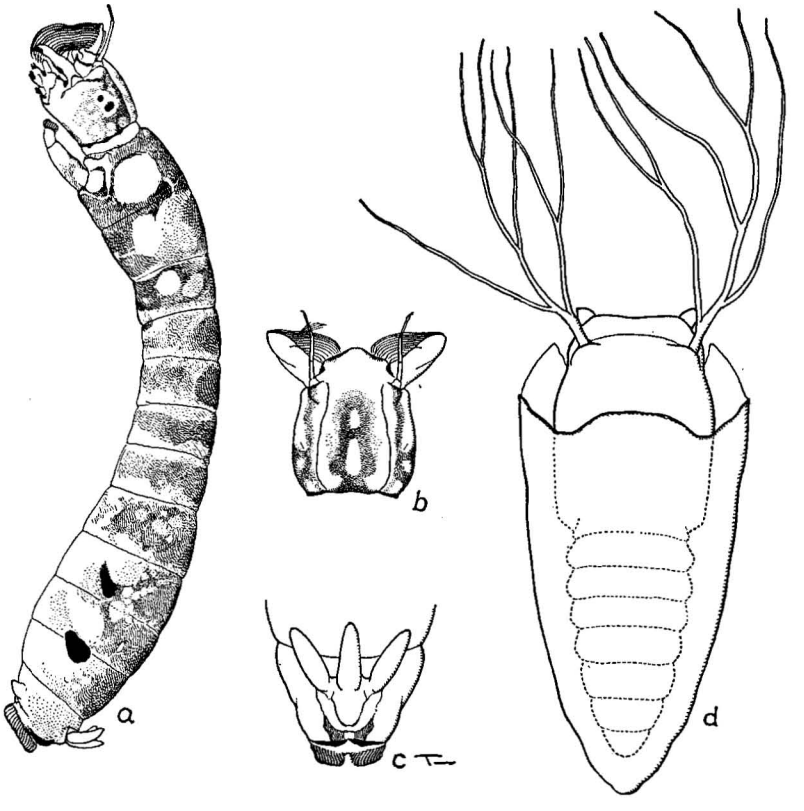

FIGURE 32. *Simulium buissoni* Roubaud, larva and pupa: *a*, larva in side view; *b*, head of larva in dorsal view; *c*, tip of abdomen of larva in dorsal view; *d*, pupa in cocoon.

Nukuhiva: Vaioa, Hakaui Valley, near sea level, November 16, 1929; Teuanui, Toovii, elevation 2,000 feet, October 25, 1929; Tapuaooa, elevation 3,100 feet, November 14, 1929; Taiohae, elevation 100 feet; Taiohae,

near shore, January 24, 1929; Tauamaka, elevation 2,900 feet, November 10, 1929; Ooumu, elevation 4,050 feet, November 12, 1929, Mumford and Adamson.

Eiao: Vaituha, near sea level, October 1-2, 1929; near center of island, elevation 1,665 feet, September 28, 1929, Adamson.

Uahuka: Putatauua, Vaipaee Valley, elevation 880 feet, September 20, 1929, Adamson.

In addition to this material I have examined a number of specimens in the British Museum (Natural History) determined by Roubaud, probably from Nukuhiva, and also those collected by Cheesman on the same island. I am unable to distinguish between the specimens from Nukuhiva and those from Eiao, but those from Uahuka perhaps have the proboscis slightly shorter.

Larvae and pupae, presumably of *S. buissoni,* were collected by the Pacific Entomological Survey on Nukuhiva, Eiao, Uapou, and Hivaoa. These are all alike, including those from Hivaoa.

Simulium buissoni gallinum, new variety.

Average size perhaps slightly smaller (1.4 mm.) than typical *S. buissoni.* Mouth parts distinctly shorter; labrum less than half as long as antenna. Basal antennal segments distinctly yellowish. Tibiae (especially the hind pair) with the narrow yellowish area at the base more clearly defined, contrasting with the dark tibia; pubescence of hind tibia mainly dark brown, and apparently somewhat finer than in *S. buissoni,* the coarse yellowish pubescence being usually confined to the base. Halteres paler, yellowish brown.

Hivaoa: Atuona Valley, elevation 300-350 feet, March and July, 1929, 8 females (including type); Mataovau, elevation 390 feet, June 6, 1929, 13 females; Hanaheka [Tanaeka] Valley, elevation 1,100 feet, June 4, 1929, 16 females; Tahauku, seashore, July 10, 1929; Mumford and Adamson. Tahauku, numerous females taken on domestic fowl, August 22, 1929, LeBronnec.

Tahuata: Tehue Valley, elevation 800 feet, 1 female, LeBronnec and H. Tauraa.

Fatuhiva: Hanavave Valley, elevation 50 feet, 1 female, LeBronnec.

Uapou: Hakahetau Valley, elevation 100-3,000 feet, December, 1929, and January, 1930, numerous females, Adamson and Whitten.

It is possible that the specimens collected on Uapou may represent a distinct race intermediate between typical *S. buissoni* and variety *gallinum*; they agree with the above definition except that in most insects the hind tibiae have a band of yellowish pubescence in the middle as well as at the base, and the halteres are darker.

Simulium mumfordi, new species.

Mouth parts rather shorter than in *S. buissoni,* labrum barely half as long as antennae. Front rather narrower, less widened above; face also narrower. Front and face (even in perfect specimens) greyish, with black suberect hair only, no yellowish pubescence. Thoracic pubescence entirely dark brown and rather more close-lying. Abdominal pubescence still scantier and dark; basal fringe dark. Tergite 6 less reduced, nearly twice as broad as long; tergites 6 to 9 more distinctly shining. Bases of tibiae more distinctly (but narrowly) pale; tibial pubescence all dark and rather finer.

Hivaoa: Atuona Village, September 5, 1929, on window, 2 females (including type); Atuona Valley, elevation 100-325 feet, 5 females; Tahauku, July 10, 1929, 2 females; Mumford and Adamson.

Simulium adamsoni, new species.

Size larger (length of body, fully 2 mm.; wing, 2.5 mm.) than *S. buissoni.* Mouth parts shorter, labrum barely half as long as antennae. Yellowish pubescence on frons and face perhaps somewhat denser, that on frons directed outward from the middle line instead of downward as in *S. buissoni* (this may not be a constant feature, but the three specimens examined are alike). Yellowish coarse pubescence on sides of abdomen and on first tergite rather denser, but pubescence on tergites 6 to 9 dark brownish and finer. Tergites 5 to 7 much better developed, tergite 6 more than twice as broad as long. Legs with the femora and tibiae extensively pale brown; front and middle pairs almost entirely so, hind pairs somewhat darker, the tibia with an ill-defined dark ring near base. Tibial pubescence yellowish.

Hivaoa: Atuona Valley, elevation 330 feet, March 28, 1929, type female, and elevation 300 feet, July 6, 1929, 1 female, Mumford and Adamson.

Fatuhiva: Punahitahi, Omoa [Oomoa] Valley, altitude 650 feet, August 18, 1930, one female, LeBronnec.

COENAGRION INTERRUPTUM, NEW SPECIES, FROM THE MARQUESAS, AND NYMPH OF HEMICORDULIA ASSIMILIS HAGEN *

By

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The following descriptions are based on material in the collection of the Pacific Entomological Survey which was sent me for determination.

Coenagrion interruptum, new species (fig. 33, *a, b*).

Length, 32 mm.; abdomen, 29 mm.; hind wing, 18 mm.

This is a slender blackish damselfly prettily marked with blue, green, and yellow. The top of the head in the mature male is black with roundish bright blue post-ocular spots. The face is dull yellowish around the mouth and greenish at the sides up to above the level of the antennae along the eye margin, and black on frons and clypeus, with the green almost meeting and almost dividing the black along the fronto-clypeal suture. Front side of basal antennal segments yellow.

Prothorax black above, yellowish beneath, with a blue cross-band in front on dorsum and a broad blue stripe on each side. Synthorax black in front with a broadly interrupted antehumeral stripe that forms an inverted exclamation mark, the outer edging of which is light blue, on each side. Sides green, with only a hair line of black on the third lateral suture, dilated into a spot near its upper end; a similar spot at the top of the middle suture is confluent with the black line on the subalar crest. There are also hair lines on the sutures about the leg bases. Venter yellowish. Wings hyaline with tawny stigma; 11 to 12 post-nodals in the fore wing, 10 in the hind. Vein M_2 arises near the sixth antenodal in the fore wing, the fifth in the hind wing. Legs yellowish becoming greenish with age, femora and tibiae heavily capped with black externally toward the knees. Spines of the external row of hind tibiae very variable in number, usually 6, but varying from 5 to 8, the last 2 close together. Hind tarsi very much shorter than the others.

Abdomen very slender on the elongated middle segments. Segments 1 and 2 blue above, each with a quadrangular basal black spot covering three-fourths of the dorsum and with a narrow apical black ring; side greenish; segments 3 to 7 black above, yellowish at the sides, the black widens apically, and at the base is invaded by the yellow; 8 and 9 wholly blue, becoming violet. The intersegmental membrane at the apex of segments 7, 8, and 9 forms a narrow pale blue transverse crescent; 10 above and superior appendages black; sides of 10 and of inferior appendanges yellowish. The second joint of the penis ends in two pairs of subequal clawlike hooks, one above the other, and the membranous third joint is deeply bifid at the tip.

The female differs in having the pale color more extensive, especially on the face, and in having the bluish green of the sides of the thorax and of the basal abdominal segments replaced by yellowish brown or tan. The large postocular pale areas are (in this one mature specimen) overlaid next the eye by a postocular spot of blue like that of the male. The dorsal stripes of the synthorax are wide and continuous from collar to crest; almost as wide as the mid-dorsal black stripe. The stigma is tawny, as in the young male.

* Pacific Entomological Survey Publication I, article 10.

The superior appendages of the male are about as long as the tenth segment. Viewed from above they are a pair of stout semicircularly incurved and acutely pointed hooks. The basal third is thick, hairy, and elevated and terminates in a transverse ridge whose superior margin bears internally a small rounded lobe and externally two teeth. Beyond this thickened basal portion the hooks are flattened and declined and bare. The inferior appendages are slightly shorter, strongly declined, and with a rounded tubercle in the middle of the superior margin and on the upturned tooth at the tip.

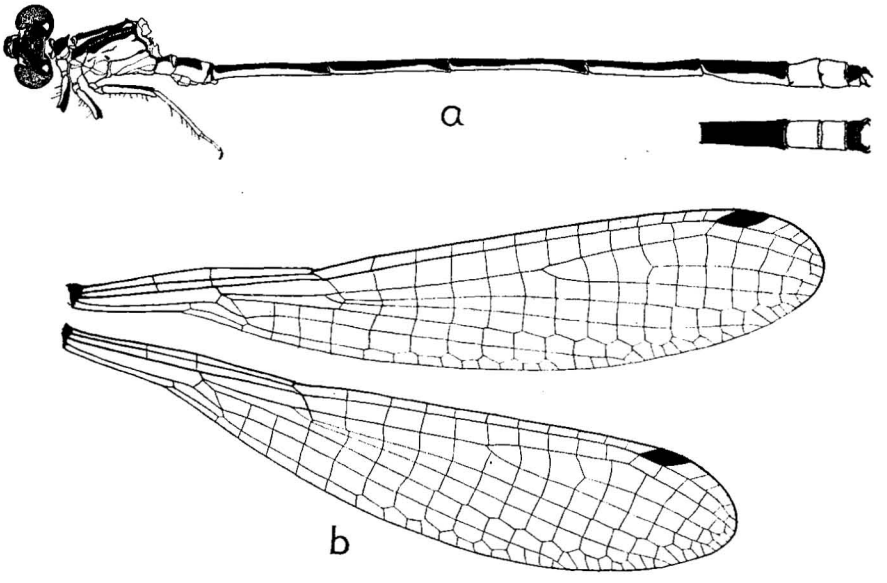

FIGURE 33. *a, Coenagrion interruptum,* new species; *b,* wings of *Coenagrion interruptum.*

There is a single female with half of the abdomen missing. There are seven males among which are two whole specimens. The others lack more or less of the abdomen.

Uapou: Hakahetau Valley, elevation 900 feet, December 14, 1929, elevation 1,500 feet, December 26, 1929, elevation 800 feet, January 25, 1930, R. R. Whitten.

Tahuata: Tehue Valley, elevation 650 feet, May 27, 1930, elevation 1,000 to 2,000 feet, January 29, 1930; Amatea, elevation 2,500 feet, July 11, 1930, LeBronnec and H. Tauraa.

This species does not quite fit *Coenagrion,* and another new genus might with abundant precedents be erected for it, were it not that there are already too many undefinable genera in this part of the series. Stigmas are alike in fore and hind wing, and there is no elevation and scarcely an emargination of the tip end of the abdomen in the male.

Hemicordulia assimilis Hagen (fig. 34, *a, b*).

Nymph

Total length, 25 mm.; abdomen, 15 mm.; width of head, 7.5 mm.; width of abdomen, 8 mm. This is a stocky smooth-bodied nymph with blunt, short-spined abdomen. Head rather large with small laterally prominent eyes. Labium short, its hinge only reaching the middle legs, with 8 lateral and 8 or 9 mental setae, the 5 outer ones larger. End hook rather slender. Legs faintly banded with lighter and darker areas. The pair of ventral tubercles before the middle coxae, beside the hinge of the labium, is clad with tufted bristles.

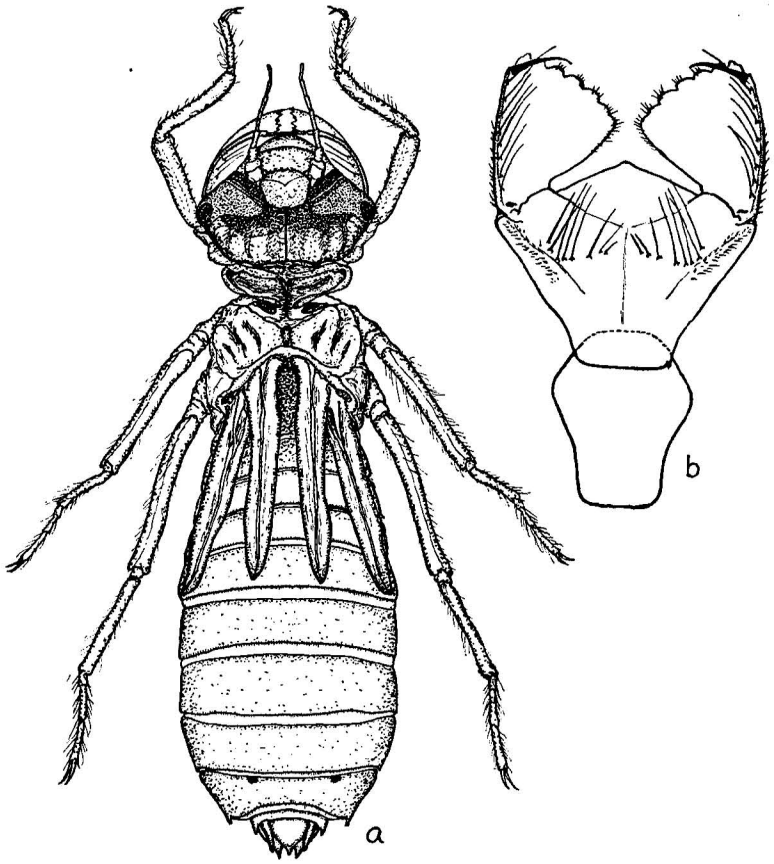

FIGURE 34. *Hemicordulia assimilis* Hagen: *a,* nymph; *b,* labium of nymph, from within.

Abdomen with no dorsal hooks and with very short lateral spines on segments 8 and 9, those of 8 almost vestigial. Segment 10 annular, included in the apex of 9, which is a little prolonged and hair-fringed beneath. Appendages very short, the superior, viewed from above, almost an equilateral triangle; laterals almost as long; inferiors a little longer.

Two adult males of this fine metallic species were collected on Tahuata, Vaitupaahei, elevation 1,750 feet, July 9, 1930, and elevation 1,800 feet, LeBronnec and H. Tauraa, and two in addition on the slope north of the summit of Mount Temetiu, Hivaoa, elevation 3,680 feet, March 27, 1930, Mumford and Adamson. Five nymphs that I refer by supposition to the same species were collected on Mount Temetiu, Hivaoa, elevation 3,000 feet, December 29, 1930, H. Tauraa. The species has been reported from the Celebes, New Guinea, and Alu and Rubiana of the Solomon Islands.

TWO NEW SPECIES OF ASTEIIDAE (DIPTERA) FROM THE MARQUESAS *

By

JOHN R. MALLOCH

BUREAU OF BIOLOGICAL SURVEY, U. S. DEPARTMENT OF AGRICULTURE

Genus ASTEIA Meigen

This genus as accepted by Duda [27] contains at least two segregates which some other author very probably will separate as distinct genera. One of these has the arista almost bare, and the other has it distinctly haired. The first group contains but one species, *A. decepta* Becker from the Canary Islands, the other group being left to receive the remaining ten species with which Duda deals.

In a recent paper Aldrich [28] has erected a new genus, *Bryania,* for the reception of a Hawaiian species that would fall in the first segregate referred to on the basis of the lack of hairs on the arista, but the species before me, *bipunctata* Aldrich, differs from *decepta* in the structure of the head and the chaetotaxy of the thorax to such an extent that it can not be accepted as belonging to the same genus. I do not intend to erect a new genus for *decepta,* even though there is now before me a second species which appears to belong to the same group, as there are so few species in the family that the eight genera already accepted as valid appear to me quite sufficient, to say the least, for all practical purposes.

Asteia atriceps, new species.

Female

Head whitish yellow, the epistome with a rather broad deep black transverse band, ocellar spot fuscous; antennae entirely yellow; hairs and bristles on the head yellow. Thorax testaceous yellow, paler yellow on a broad central stripe extending from a little behind the suture to apex of the scutellum and over surface of the latter except a small spot at each anterior lateral angle; extreme lateral edge of the notopleural region slightly darkened. Pleura whitish yellow above, with a dark vitta on central portion at suture between mesopleura and sternopleura; hairs and bristles yellow. Abdomen and legs testaceous, abdomen discolored on part of dorsum. Wings hyaline. Knobs of halteres dark brown.

Frons as long as its width at vertex, narrowed at anterior extremity, the surface with numerous pale hairs, the upper orbital distinct and a few setulae in front of it, all four vertical bristles present, the inner pair distinctly longer than the outer one, the

[27] Duda, Oswald, Revision der altweltlichen Astiidae (Diptera): Deutsch. Ent. Zeit., p. 128, 1927.

[28] Aldrich, J. M., New acalyptrate Diptera from the Pacific and Oriental regions: Hawaiian Ent. Soc. Proc., vol. 7, p. 396, 1929.

* Pacific Entomological Survey Publication I, article 11.

latter, upper orbital, and ocellar bristles about equal in length, the postverticals indistinguishable; face sunken so that the antennae are almost invisible from the side, the third segment rounded, arista very fine, nude, hardly longer than the vibrissa; eye oblique, the cheek higher behind than in front, at latter point not higher than width of third antennal segment. Thorax with four pairs of quite conspicuous dorsocentral bristles, the anterior pair in front of the suture, the posterior pair most widely separated, no prescutellar acrostichals, and two very fine sternopleurals; the scutellum with two long apical and two much shorter preapical bristles. Abdomen ovate, much swollen in type, without remarkable armature. Legs normal in form and without distinct bristling. Wing as in *decepta,* the second vein very short and entering costa at or very close to apex of first vein. Length, 1.5 mm., wing as long as body.

Hivaoa: Atuona, March 7, 1930, holotype female, Mumford and Adamson.

Asteia tarsalis, new species.

General color deep black, almost glossy. Frons brownish black with the anterior margin narrowly yellowish and a slender yellow line on each side of the ocellar triangle midway between the posterior ocelli and eye margin which extends forward from vertex to level of anterior ocellus; face yellowish above, becoming black just above the broad milk-white transverse fascia on epistome, the jowls yellow, with a fuscous shade along lower margin; occiput fuscous; antennae brownish yellow, third segment darkened above; aristae fuscous. Thorax glossy black on dorsum, becoming brownish on sides and with slight yellowish grey dusting, the sutures of the pleura yellowish. Abdomen black, the membrane brownish and dull. All hairs and bristles dark. Legs black, coxae, knees, and tarsi dull testaceous yellow. Wings slightly browned, the veins dark brown. Knobs of halteres black.

Frons a little longer than wide, with but one strong orbital which is situated close to middle, the outer vertical lacking, and the ocellars very short and fine; antennae normal, the arista with two long rays above and below, the setula on second segment of antenna rather long and fine; eye higher than long, the jowls almost linear in front, the vibrissa well developed. Thorax almost bare except for the three pairs of strong dorsocentrals, the anterior one of which is distinctly in front of the suture, the prescutellar acrostichals lacking, scutellum with two long apical bristles and basad of each a short fine hair; sternopleura with but one long bristle. Abdomen subcylindrical. Legs moderately stout, the fore and mid tarsi each with quite dense hairs on dorsal surface which are at least as long as the segments except on the basal one, the hind pair without such long hairs. Wings much as in the preceding species, but the second vein ends in the costa distinctly beyond the apex of first instead of in or close to the apex of first. Length, 1.5 mm.

Hivaoa: Mount Temetiu, northeast slope, elevation 2,500 feet, July 24, 1929, holotype, Mumford and Adamson.

This species is most closely allied to *A. sexsetosa* Duda, but differs in lacking the outer vertical bristle, in having the scutellum black, and the fore and mid tarsi with longer hairs than usual. The hairs on the costa are distinctly longer than usual, especially from base to the apex of first vein, a character which separates the species from one that occurs in Society Islands.

ECTOPARASITES OF MARQUESAN RATS*

By

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INTRODUCTION

Several collections of ectoparasites from rats were made in the Marquesas by members of the Pacific Entomological Survey. At the time of this writing the identity of the rats has not been established, and the host must here be recorded merely as a species of *Rattus*. Of the parasites, which include five species, one sucking louse is found commonly on the domestic rats (*R. rattus* and *R. norvegicus*), and another sucking louse has been known from various rats of the Malayan and East African regions; one species of mite occurs on domestic rats throughout the world, another has been known only from the native rat of Hawaii, and a third is here described as new.

ORDER ACARINA

FAMILY PARASITIDAE

Genus LAELAPS Koch

The genus *Laelaps,* as generally understood, has recently been divided by Ewing [29] into four genera on grounds that do not impress the writer as at all convincing. Neither of the two species here included in *Laelaps* would be so placed if this subdivision were accepted, but the genus is here retained in its usual significance.

Laelaps echidninus Berlese.

Echinolaelaps echidninus (Berlese): Ewing, Manual of External Parasites, p. 11, 1929.

Laelaps echidninus Berlese: Trägårdh, Natural History of Juan Fernandez and Easter Island, 3, p. 616, 1931.

Hivaoa: Atuona, from *Rattus* (field no. R 10), Mumford and Adamson. Hatutu [Hatutaa], from *Rattus* (field no. R 13), LeBronnec and Tauraa. "Marquesas," from *Rattus* (field no. R 15), LeBronnec and Tauraa. A widely distributed species on *Rattus rattus* and *R. norvegicus*.

This species has been so frequently recorded and described that it calls

[29] Ewing, H. E., Manual of external parasites, pp. 11, 184-187, Springfield and Baltimore, 1929.

* Pacific Entomological Survey Publication I, article 12.

for no special treatment here. Apparently it has been the custom to refer all specimens of *Laelaps* having the posterior border of the genito-ventral shield excavated to fit the anterior border of the anal plate to *L. echidninus.* Trägårdh, however, has departed from this practice and described as a new species, *L. pallidus,* such a form found on *Rattus rattus* on Juan Fernandez. The differences indicated as a basis for the species are very slight, and nothing can be done with the Marquesan specimens except to refer them to *L. echidninus.* Ewing has made this species the type of the genus *Echinolaelaps.*

Laelaps hawaiiensis Ewing (fig. 35, *a-d*).

Laelaps hawaiiensis Ewing: B. P. Bishop Mus., Bull. 14, p. 8, fig. 1, *a,* 1924.

Hivaoa: Atuona, from *Rattus* (field no. R 10), Mumford and Adamson. Hatutu [Hatutaa]), from *Rattus* (field no. R 13), LeBronnec and Tauraa. "Marquesas," from *Rattus* (field Nos. R 14, and R 15), LeBronnec and Tauraa. Previously recorded from *Rattus hawaiiensis,* Oahu, Hawaii.

The description given by Ewing is somewhat inadequate, but the identification of the Marquesan specimens with *L. hawaiiensis* seems reasonably secure. In order to bring the knowledge of the species more nearly into harmony with the excellent work of Hirst on other species of the genus the accompanying notes and figures are presented.

The specimens at hand agree quite closely with the size given by Ewing, about 0.6 mm. for the female. The males are scarcely 0.5 mm. in length. The cheliceral fingers of the female (fig. 35, *c*) are small and weakly toothed and the seta of the fixed finger is stout and bluntly tipped. At the base of the movable finger is a group of small spines, the presence of which has been utilized by Ewing as a part of the basis for his genera *Geneiadolaelaps* and *Macrolaelaps.* But as these spines are present in *L. echidninus,* in which species Ewing has specifically recorded them as absent, and as they are frequently very difficult to see, they should perhaps not be taken too seriously as generic characters. The dorsal plate is marked by the faintest of transverse lines and reticulations, but apparently lacks such areolations as are present in some species and have been regarded by Vitzthum and Trägårdh as important specific characters. About the posterior margin of the plate is a narrow zone of weaker sclerotization of a different texture. The distribution of the dorsal setae is indicated in the accompanying illustration (fig. 35). The ventral plates are marked only by faint transverse lines. The lateral coxal platelet is very small and somewhat elongate. Spiracular peritreme slender, extending forward to above the middle of the first coxa.

Males (fig. 35) associated with these females and presumably belonging to this species have the cheliceral fingers (fig. 35, *d*) long, slender, and blade-like, and apparently lack the cluster of minute spines at the base of the movable finger. The third coxa alone bears a stout seta, the setae of the other coxae being slender. The dorsal plate is faintly reticulate, and the ventral plate is somewhat more strongly marked with transverse lines.

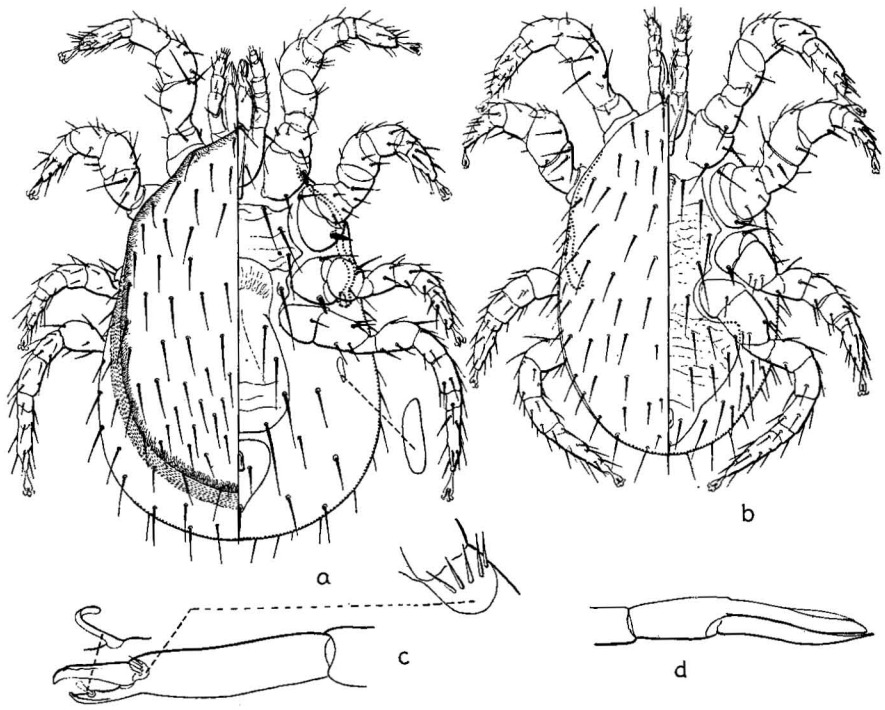


FIGURE 35. *Laelaps hawaiiensis* Ewing: *a, b,* male and female; *c,* chelicera of female with details; *d,* chelicera of male.

FAMILY LISTROPHORIDAE

Genus **LISTROPHOROIDES** Hirst

LISTROPHOROIDES Hirst: Zool. Soc. Lond., Proc., p. 999, 1923.

Apparently but a single species, *L. aethiopicus* Hirst, has been referred to this genus. The species here to be dealt with differs from the type rather noticeably in certain respects, but if not referred to *Listrophoroides* it would seem to require a new genus for its reception.

Listrophoroides expansus, new species (fig. 36, *a-j*).

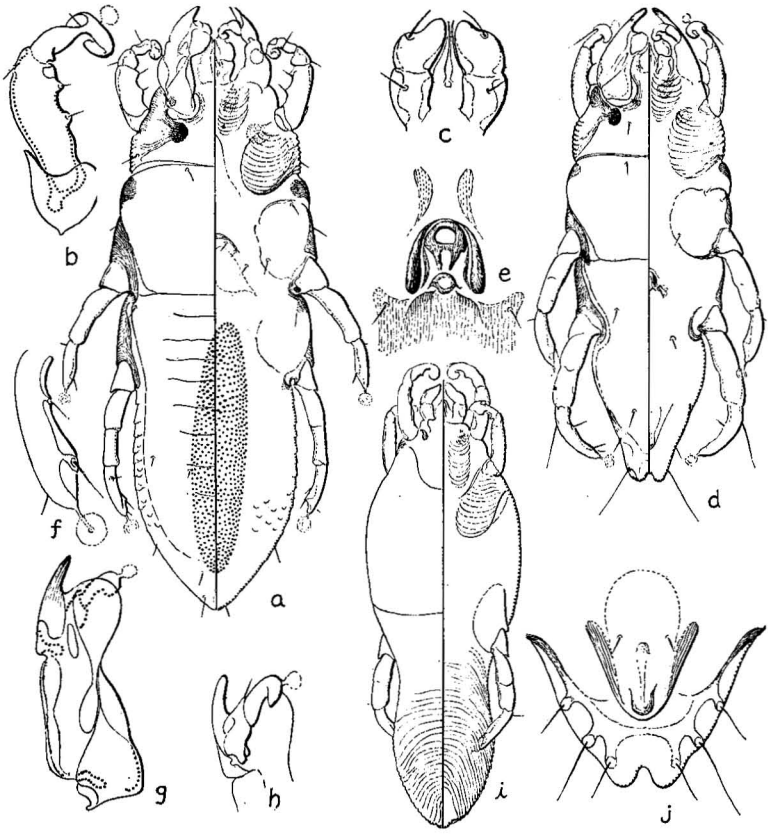


FIGURE 36. *Listrophoroides expansus,* new species: *a,* female; *b,* second leg; *c,* capitulum; *d,* male; *e,* genitalic structures of male; *f,* detail of posterior leg; *g,* dorsal aspect of first leg; *h,* ventral aspect of terminal segments of first leg; *i,* first stage of nymph; *j,* ventral aspect of abdomen of male.

Female (fig. 36, *a*)

Length, 0.4 mm. Body flattened and elongate, slightly sclerotic. Palpi (fig. 36, *c*) two-segmented, short and stout. First legs (fig. 36, *g, h*) modified as hair-clasping organs, what is apparently the femur being flattened and expanded and terminating in a conspicuous, acute process on the outer side and a flattened lobe on the inner side, these more or less concealing the very minute terminal segments, the last segment terminating in a hook and bearing a very inconspicuous caruncle. Second legs (fig. 36, *b*) also somewhat modified, but less strongly so, the apparent femur being long and stout, the succeeding segments small and cylindrical, the apical segment terminating in two lateral anchor-like hooks and bearing a small caruncle. Third and fourth legs but little modified, without claws and with a distinct disc-like caruncle.

Dorsum divided by two transverse furrows, one being just behind the first and one behind the second legs, into three plates. Abdominal tergal plate marked by several transverse furrows; margins of the abdomen slightly serrate. Derm of the ventral side for the most part membranous. The coxae are much flattened and expanded and form a considerable portion of the ventral body wall. Those of the first two legs are marked by very evident transverse ridges and furrows, which in the second legs extend about to the lateral margin of the body. Genital opening a transverse slit bordered anteriorly by a minute crescentic plate and several small setae.

Male (fig. 36, *d*).

Length, 0.34 mm. Closely resembling the female except for the slightly stouter posterior legs and the short conical abdomen. Apex of the abdomen (fig. 36, *j*) slightly bi-lobed and bearing three pairs of small setae, the ventral side with a median, pre-apical papilla. Genital opening between third and fourth coxae, its strongly sclerotic parts having the form shown in fig. 36, *e*.

Immature Stages

Apparently four instars, including the adult, are present in the material at hand. The largest immature specimens, which are from 0.37 mm. to 0.4 mm. long and seem certainly to represent the last nymphal stage, differ from the adult female only in lacking the genital structures and in having the abdomen membranous and marked by numerous transverse lines, the legs and thoracic structures being as in the adult. What is apparently the second stage differs from this only in length, being about 0.26 mm. long. What may be assumed to be the first stage, as it is of the same length as eggs contained within the female, is but 0.18 mm. long (fig. 36, *i*). It possesses but three pairs of legs, the first two pairs being alike and resembling the second pair of the other stages. The abdomen is strongly marked with arcuate, transverse lines.

Hivaoa: Atuona, many specimens, male, female, and immature, from *Rattus* (field no. R 10), Mumford and Adamson. Holotype a female.

Listrophoroides aethiopicus Hirst was described from the male only. It differs from *L. expansus* conspicuously in the form of the first legs, which are not flattened as in the new species, the two first pairs apparently resembling more nearly the second legs of *L. expansus*. Also in the genotype the coxae of the third legs appear to be provided with strong spurs.

Order ANOPLURA

Genus **HOPLOPLEURA** Enderlein

Hoplopleura oenomydis Ferris (figs. 37, *a-i*; 38, *a-k*; 39, *a-e*).

Hoplopleura oenomydis Ferris, Contributions toward a monograph of the sucking lice: Stanford Univ. Pub., Biol. Sci., 2, pp. 82-84, figs. 47-48, 1921.

Hoplopleura pacifica Ewing, B. P. Bishop Mus., Bull. 14, pp. 9-11, fig. 1, *b, c,* 1924.

Hivaoa: Atuona, from *Rattus* (field no. R 10), Mumford and Adamson. Eiao, from *Rattus* (field no. R 12), Adamson. "Marquesas," from *Rattus*

(field nos. R 14, R 15), LeBronnec and Tauraa. In addition, specimens from *Rattus rattus diardi,* Federated Malay States, and from *Rattus norvegicus,* Townsville, Australia, are at hand, and specimens from "Mus sp.," Sumatra, received from the British Museum (Natural History) for identification some years ago and since returned to that institution are to be referred to the same species. Previously recorded by Ferris from *Oenomys hypoxanthus bacchante* (type host), *Dasymys incomptus helukus,* and *Thamnomys surdaster polionopus,* British East Africa; *Limnomys mearnsi* and *Rattus calcis,* Philippine Islands.

The problem of the identity of the species of *Hoplopleura* from Marquesan rats is one of considerable interest, but from the writer's point of view it is by no means as complex as Ewing has indicated. Ewing has described a new species, *Hoplopleura pacifica,* from specimens taken from the Hawaiian rat, *Rattus hawaiiensis,* and has indicated his intention of describing another species which has apparently not actually been named, based upon specimens from *Rattus calcis* in the Philippine Islands. It may be noted that the specimens at hand from *Rattus calcis* are from the same individual animal as those recorded by Ewing, being a part of material taken by the writer from a skin in the United States National Museum and returned to that institution.

It is possible that the question of the name to be applied to a louse from an obscure mammal in an insignificant archipelago is not one that is worthy of extended discussion, for the matter might well be dismissed by the unadorned statement that all the specimens recorded represent the same species. However, the question of distribution is of some interest, and of even more interest is the problem of the methods which should be applied in the systematic work by which alone the question of distribution can be approached. It is largely as a contribution toward the development of such methods in the study of the ectoparasites that the following discussion is presented.

It is the writer's contention that—as far as can be determined by the contemplation of preserved material only—only a single species is involved, and that the conclusions derived by Ewing were neither based upon the examination of adequate material, nor did they include allowance for normal variation or involve comparison of his specimens with the species to which they should properly have been compared.

Hoplopleura oenomydis Ferris is one of a group of species that may be regarded as centering about *H. affinis* (Burmeister) and that includes such species as *H. apomydis* Ferris, *H. chrotomydis* Ferris, and *H. malaysiana* Ferris. It is distinguishable from these other species chiefly by the form of the paratergites (pleurites) of the abdomen, the broad dorsal and ventral lobes of the third plate, as well as of the fourth and fifth, the narrow

and acute ventral lobe of the sixth, the absence of an acute and prolonged dorsal lobe in the seventh, the pair of moderately long median setae on the second and third plates, and the minute ventral median seta on the fourth to sixth. The species is thus well enough defined as an entity and is clearly recognizable.

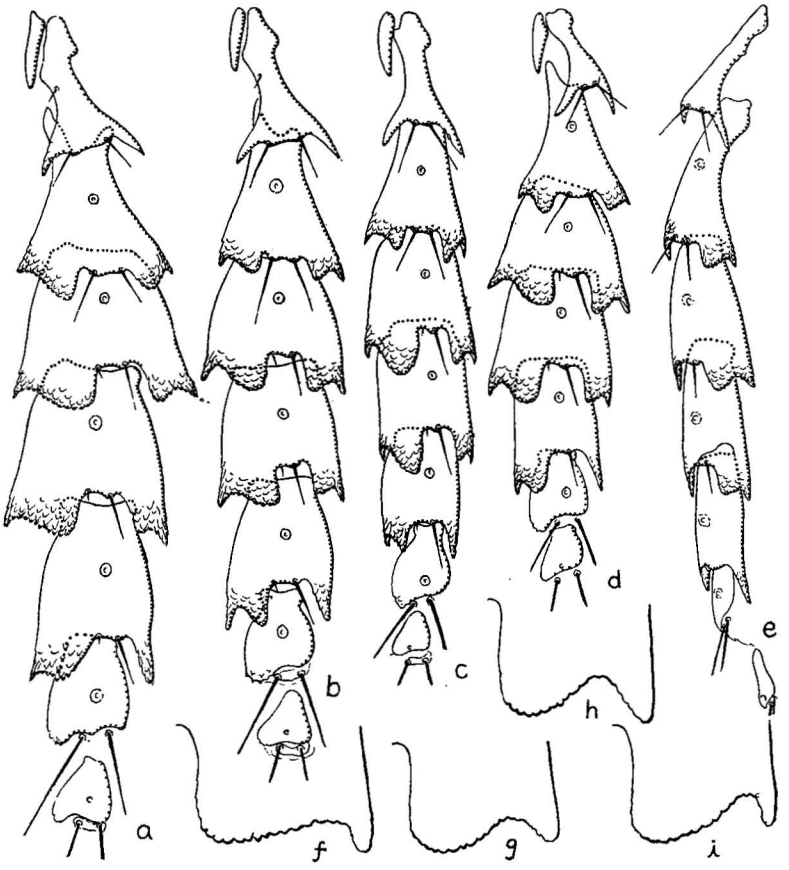


FIGURE 37. *Hoplopleura oenomydis* Ferris. Paratergal plates of females: *a,* from paratype, from *Oenomys hypoxanthus*; *b,* from *Rattus* species, Marquesas; *c,* from *Rattus diardi,* Malay Peninsula; *d,* from *Rattus calcis,* Philippine Islands; *e,* from *Rattus norvegicus,* Townsville, Australia. Posterior margin of dorsal lobe of fifth plate; *f,* of paratype; *g, h, i,* from Marquesan specimens, showing variation.

The specimens at hand, which are here assigned to *H. oenomydis,* may be compared critically and most easily on the basis of three sets of structures, the paratergal plates, the sternal plate of the thorax, and the genitalia of the male. It is in these structures that bases for specific separation are most commonly to be found in this group.

In attempting a critical comparison of the paratergal plates of a series of closely related forms, difficulty is at once encountered in securing specimens that are directly comparable. The plates should be dissected from the body and flattened out, but the same degree of flattening cannot always be secured, and allowance must be made for this factor. Differences due to it may be detected in figure 37, *a-e*. There exist, however, in the specimens at hand, certain real differences. There is evidently a considerable difference in size, specimens from *Rattus calcis* having these plates noticeably smaller than do specimens from the type host. But as indicated in the figures, the intergradation in size of a series of the plates makes a specific separation on this basis entirely impracticable, even though such differences may be genetically fixed. In actual structure the only apparent differences are to be found in the depth of the secondary lobing of the posterior margin of the plates, but here again (fig. 37, *f-i*) variation and intergradation make the use of such a character impracticable.

Differences are to be found in the form and size of the thoracic sternal plate, but again it is evident that these differences are variable and intergrading, plates from Marquesan specimens (fig. 38, *e, f*) practically duplicating the type form (fig. 38, *a, b*), even though the normal form in the Marquesan specimens (fig. 38, *d*) is more rounded.

The genitalia of the males (fig. 38, *i-k*), while varying in size and minute details, show no differences that are at all significant and that are outside of the range of variation normally to be expected, that are, in fact, even as great as may be found between opposite halves of the same specimen.

In the distribution of the body setae nothing significant can be detected. In the form of the head there are slight variations, but these are not greater than might readily be caused by differences in preparation. The head of the type female, as noted in the original description, is rather noticeably slender, but this apparent difference is not maintained in the male and in specimens from other African hosts, and is closely approached by individual specimens from other sources.

It may very well be that in a species distributed over such a wide geographical area and on different hosts analysis by genetical methods would reveal fixed differences, but until such an analysis has been made there is nothing to be gained by recognizing more than one species in the material at hand. Specimens from the Hawaiian rat are not available, but Ewing's description and figure, together with circumstantial evidence, are sufficient to indicate that it comes within this series.

It may be concluded, then, that in all probability *Hoplopleura oenomydis* is one of those species which are capable of rather ready, even though

erratic, transfer from one host species to another. Its occurrence upon *Rattus norvegicus,* of which it is certainly not a normal parasite, would indicate as much. It may be suspected that it was originally a parasite of some species of *Rattus* in the Malayan region and that it has spread from that center.

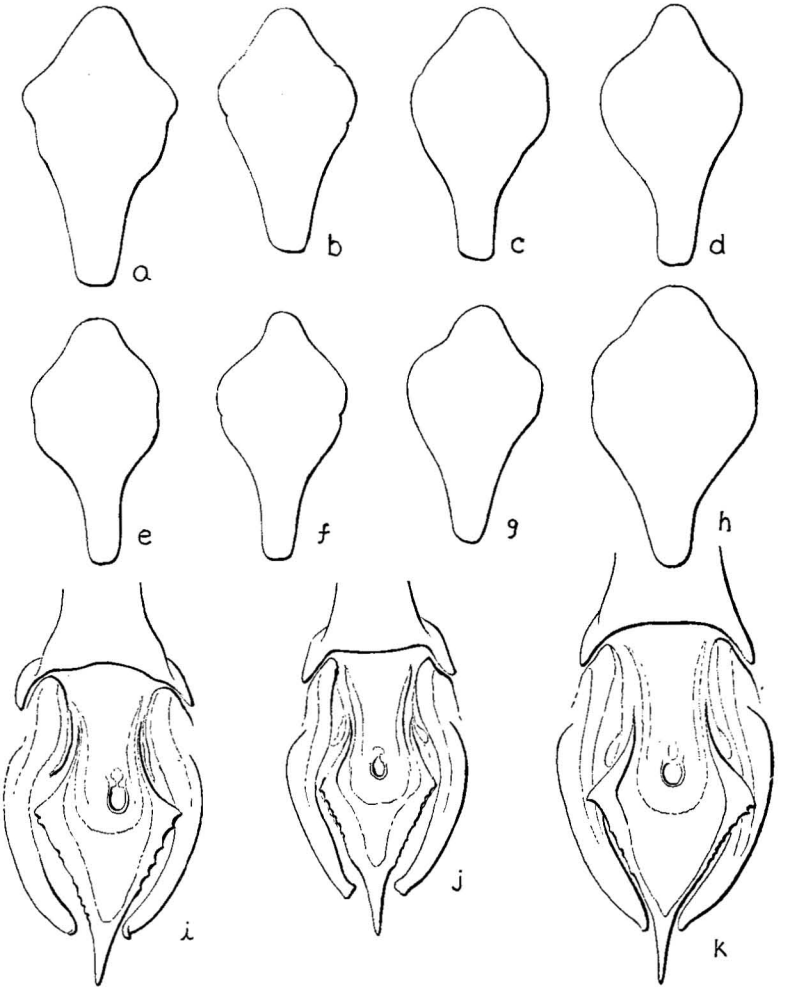


FIGURE 38. *Hoplopleura oenomydis* Ferris. Sternal plates of thorax: *a,* from the type female; *b,* from the allotype male; *c,* from specimen from *Rattus diardi*; *d, e,* from female from the Marquesas; *f,* from male from the Marquesas; *g,* from female from *Rattus calcis*; *h,* from female from *Rattus norvegicus,* Australia. Genitalia of male: *i,* from allotype; *j,* from specimen from the Marquesas; *k,* from specimen from *Rattus norvegicus,* Australia.

Immature stages are at hand in the Marquesan material and among the specimens from *Rattus diardi,* and eggs are present in the Marquesan material. The immature specimens from different sources agree exactly, a further support for the contention that this is all one species, since the immature forms—as far as known—in this genus appear to differ as sharply as do the adults. The first instar is represented only by an embryo in an egg, and of it nothing can be said except that the abdomen bears a single very long seta at each side near the apex. This seta is not present in more mature nymphs. On the basis of size, two other stages appear to be present; these are similar in structure, the larger being definitely the last nymphal stage

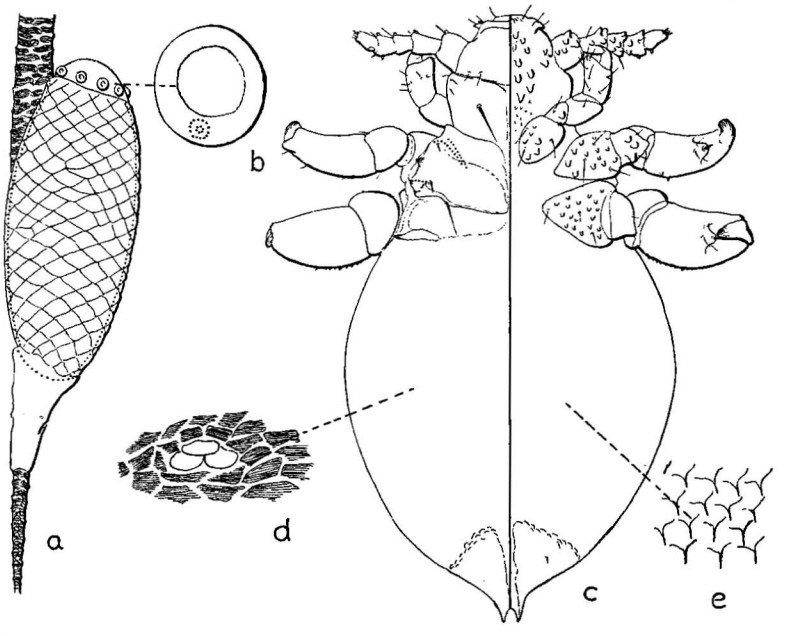


FIGURE 39. *Hoplopleura oenomydis* Ferris: *a,* egg; *b,* detail of egg; *c,* last stage of nymph; *d,* ornamentation of derm of dorsum; *e,* ornamentation of derm of venter.

(fig. 39, *c*). The coxae and the ventral side of the head are beset with numerous small tubercles; the derm of the abdomen is somewhat sclerotic, the sclerotization of the dorsum and the lateral regions of the venter being laid down in a mosaic of minute plates (fig. 39, *d*). The median region of the venter is thickly beset with minute points (fig. 39, *e*). The apex of the abdomen is more heavily sclerotic, the mosaic merging into a single plate. Abdominal spiracles can not be detected and none but perhaps the most minute of setae are present.

Little information exists as to the eggs of the sucking lice. Eggs, which

may be assumed to belong to *H. oenomydis,* are at hand. The length of the egg capsule itself is approximately 0.52 mm. The egg (fig. 39, *a*) is marked by scale-like reticulations. The operculum bears seven or eight tubercles (fig. 39, *b*), which appear to open into the egg by a minute pore and to the outside by a larger pore.

Genus POLYPLAX Enderlein

Polyplax spinulosa (Burmeister).

Polyplax spinulosa (Burmeister): Ferris, Stanford Univ. Pub., Biol. Sci., 2, pp. 187-191, fig. 119, 1923.

Hivaoa: Atuona, from *Rattus* (field no. R 10), 1 male, 1 female, Mumford and Adamson. Recorded previously as a normal parasite of the domestic rats, *Rattus rattus* and *R. norvegicus,* wherever they occur; also recorded from *Rattus calcis,* Philippine Islands, *Rattus stridens,* Malay Peninsula, and from other genera and species of Murine and Microtine rodents.

This species is well enough known to need no further treatment. The Marquesan specimens are entirely typical.

ELATERIDAE OF THE MARQUESAS, WITH A NEW SPECIES FROM FIJI*

By

R. H. VAN ZWALUWENBURG

HAWAIIAN SUGAR PLANTERS' ASSOCIATION

The collection of beetles of the family Elateridae taken by the Pacific Entomological Survey in the Marquesas and in Society Islands is a small but very interesting one. It throws some light on the possible position of Fairmaire's *Oophorus instabilis* from Tahiti,[30] variously assigned to *Heteroderes* and *Drasterius,* which in the writer's opinion is probably a member of a new Pacific genus related to *Melanoxanthus*.

So far as the writer knows, specific references to elaterid species from the Marquesas are limited to the four papers listed in the footnotes. Le Guillou [31] described *Monocrepidius chazali,* which has since been synonymized with *Simodactylus cinnamomeus* (Boisduval). Fairmaire [30] and Candèze [32] again recorded this species. In 1927 Blair [33] listed the following elaterids from the Marquesas: *Adelocera modesta* (Boisduval); *Simodactylus cinnamomeus* (Boisduval); *Drasterius instabilis* (Fairmaire), recorded with some doubt; and *Psephus aenescens* Blair. Thus three species and a doubtful fourth have until now been recorded from the Marquesas. The first two are in the collection under consideration; *Propsephus aenescens* (Blair) was not found by the Survey collectors. The third species in Blair's list may prove to belong to the new genus *Pacificola,* of which fourteen species are here described.

ADELOCERINAE

1. Lacon modestus (Boisduval).

Agrypnus modestus Boisduval: Voy. Astrolabe, Col., p. 108, 1835.

Eight specimens. Eiao: near middle of island, altitude 1200 feet, September 28, 1929, under stone, Adamson; near middle of island, east side, altitude 1650 feet, September 28, 1929, under bark, Adamson; above Vaituha, altitude 1200 feet, October 3, 1929, at light, Adamson; altitude 1600 feet, April 24, 1931, from dead *Cordia subcordata,* LeBronnec and H. Tauraa.

[30] Fairmaire, Léon, Essai sur les coléoptères de la Polynésie: Rev. et Mag. Zool., ser. 2, vol. 1, pp. 21, 22, 1849.

[31] Le Guillou, E. J. F., Description de vingt Insectes Coléoptères recuellis pendant le voyage autour du monde de l'Astrolabe et la Zelée: Rev. Zool., vol. 7, p. 220, 1844. (Not seen.)

[32] Candèze, E. C. A., Monographie des Élatérides, vol. 2, p. 171, 1859.

[33] Blair, K. G., The Heteromera and some other families of Coleoptera from Polynesia collected on the St. George Expedition, 1925: Ann. Mag. Nat. Hist., ser. 9, vol. 20, pp. 171-173, 1927.

* Pacific Entomological Survey Publication I, article 13.

Uahuka: Haane [Hane] Valley, altitude 15 feet, March 13, 1931, LeBronnec and H. Tauraa.

Mohotani: north part, altitude 500 feet, February 4, 1931, from dead wood of *Pisonia* species, 3 specimens, LeBronnec and H. Tauraa.

This species is widely distributed in the tropics of the Old World.

PACHYDERINAE

2. Simodactylus cinnamomeus (Boisduval).

Aeolus cinnamomeus Boisduval: Faun. Océanie, Col., p. 106, 1835.

Fairly common in the Marquesas. Eiao: middle of island, east side, altitude 1665 feet, September 28, 1929, on *Hibiscus tiliaceus,* 5 specimens, Adamson; altitude 50 feet, April 17, 1931, at light, LeBronnec and H. Tauraa.

Hivaoa: Aimoa, altitude 1665 feet, March 7, 1929, Mumford and Adamson; Atuona, May 7, 1929, at light, Mumford and Adamson; Atuona, May 27, 1929, Mumford and Adamson; Mount Ootua, summit, altitude 3032 feet, February 13, 1930, on *Hibiscus tiliaceus,* Mumford and Adamson; Mount Temetiu, slope north of summit, altitude 2750 feet, December 29, 1930, H. Tauraa.

Nukuhiva: Taiohae village, November 26, 1929, Mumford and Adamson; Teuanui, Tovii [Toovii], altitude 2000 feet, October 27, 1929, at light, Mumford and Adamson.

Uahuka: altitude 30 feet, February 23, 1931, 3 specimens, LeBronnec and H. Tauraa; Hitikau, altitude 2900 feet, March 3, 1931, LeBronnec and H. Tauraa.

Uapou: Teoatea, Hakahetau Valley, altitude 2000 feet, at light, LeBronnec; Teavanui, Paaumea [Paumea] Valley, altitude 2700 feet, beating on *Freycinetia,* November 27, 1931, LeBronnec; Kohepu Summit, altitude 3200 feet, November 28, 1931, on *Metrosideros collina,* LeBronnec.

Larvae which agree perfectly with larvae of *Simodactylus cinnamomeus* from the Hawaiian islands were collected by the Survey on the following islands of the Marquesas:

Eiao: near middle of island, altitude 1450 feet, October 1, 1929, under bark of *Pisonia* species, 3 specimens, Adamson; near middle east side of island, altitude 1665 feet, September 28, 1929, in surface soil, 7 specimens, Adamson.

Tahuata: Amatea, altitude 2500 feet, July 7, 1930, from dead trunk of *fei* (*Musa* species), LeBronnec and H. Tauraa.

Mohotani: altitude 500 feet, February 2, 1931, 2 specimens, LeBronnec and H. Tauraa.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 25, 1929, from rotting stems of banana, 3 specimens, Mumford and Adamson.

Adults of this species were taken by the Survey in the Society Islands: Moorea, Faaroa Valley, altitude 1000 feet, 3 miles from sea, December 4, 1928, banana leaves, 2 specimens, Adamson; Tahiti, Hitiaa, November 10, 1928, at light, Adamson. A specimen from Tahiti, altitude 200 feet, September, 1925, is in the F. L. Washburn collection.

Widely distributed in the Pacific as far north as the Hawaiian islands.

CONODERINAE

3. Conoderus pallipes (Eschscholtz).

Monocrepidius pallipes Eschscholtz: Thon's Ent. Archiv., vol. 2, pt. 1, p. 31, 1829.

This species apparently is absent from the Marquesas. The Pacific Entomological Survey specimens are all from Society Islands. Tahiti: Paea, seashore, August 29, 1928, *Hibiscus tiliaceus,* 7 specimens, Adamson; Mataiea, sea level, December 20, 1929, 2 specimens, Adamson.

The specimens in the F. L. Washburn collection are also from Society Islands: Tahiti, 3 specimens; Moorea, 4 specimens; Raiatea, 1 specimen.

Blair [34] records the species from Austral Islands (Rurutu), New Hebrides, Ellice Islands, and Gilbert Islands. I have seen specimens from Solomon Islands and Samoa. In the Bernice P. Bishop Museum collections are specimens from Palmyra, Washington, and Fanning islands. In Fiji, according to Veitch,[35] *pallipes* " . . . feeds voraciously on the white grubs of *Rhopea vestita* and it is undoubtedly one of the most important factors holding that pest in check." *C. pallipes* is not found in the Hawaiian islands.

ELATERINAE

PACIFICOLA new genus

Small to medium-sized insects of obscure coloration, covered with fine, usually tawny, pubescence; often with variable testaceous patterns on the elytra; apparently confined to island groups in the south Pacific.

Mouth parts inclined downward. Front margined; regularly convex or slightly flattened anteriorly. Fronto-clypeal region wider than high. Mandibles bifid. Maxillary palpi with elongate, subovoid terminal joint.

Antennae short, usually not attaining the tips of the posterior angles of the prothorax; feebly serrate; longitudinally carinate on outer face of all but the basal and last one or two joints. Joint 1 thicker than the others (fig.

[34] Blair, K. G., The Heteromera and some other families of Coleoptera from Polynesia collected on the St. George Expedition, 1925: Ann. Mag. Nat. Hist., ser. 9, vol. 20, p. 171, 1927.

[35] Veitch, Robert, Notes on the more important insects in sugar cane plantations in Fiji: Bull. Ent. Research, vol. 10, p. 34, 1919.

40, *e*); joint 2 short; joint 3 intermediate in length between 2 and 4; joint 4 about as long as, or longer than, 2 and 3 together; joints 5 to 10 subequal in length; joint 11 slightly longer than joint 10.

Prothorax usually slightly longer than broad, occasionally broader than long; anteriorly narrowed from rear third or from tips of the posterior angles. Posterior margin widely emarginate, so that the posterior angles are wide at the base. Posterior angles acute but not elongate; dorsally unicarinate, or incompletely so, or without carina. Punctation of pronotum (fig. 41) simple or nearly umbilicate, never double. No basal sulci. Lateral carina bent downward anteriorly to meet the lower third of the eye.

Prosternal sutures vaguely double, slightly concave, more or less excavate anteriorly. Prosternal epipleura more or less opaque; upon this background a widely-spaced, shallow, irregular punctation. Prosternal lobe moderately developed. Mucro nearly straight; channeled behind the coxae.

Mesosternal cavity with sides subparallel, declivous, not prominent.

Scutellum moderately declivous, sometimes slightly convex.

Elytra about twice as long as head and thorax; narrowed to apex, which is rounded or faintly truncate. Striae punctate; intervals conspicuously so, being almost pustulate toward the base of the elytra.

Posterior coxae gradually widened inwardly; the hind margin rounded more or less sharply at its widest point.

Tarsi simple. Hind tarsi about as long as tibiae, sometimes slightly shorter. Joints 1 to 4 decreasing in length (fig. 40, *d*). The 1st joint of the hind tarsi is about as long as the three following together, and is always distinctly longer than 2 and 3 together. The 5th tarsal joint is relatively robust and short, being in all but one species (*grandis*) about as long as joint 3. Joints 3 to 5 with dense, erect pubescence on the under side. Claws simple.

The type of the genus is *Pacificola obscura,* new species. Thirteen species from the Marquesas and one from Fiji are described. The type material is in Bernice P. Bishop Museum, with the exception of the type of *P. vitiensis,* new species, which is in the type collection of the Hawaiian Entomological Society.

Despite considerable variation in color, all the specimens have the anterior part of the front, and the anterior margin and posterior angles of the prothorax, in some degree lighter than the rest of the head and prothorax. The species have much the *facies* of *Melanoxanthus,* but may be separated by the shorter 5th tarsal joint, and by the erect pubescence on the last three tarsal joints. These characters, and the absence of double punctation on the pronotum, the non-acute terminal palpal joint, and the simple tarsi, make it distinct from *Heteroderes, Drasterius,* or *Aeolus.*

In Samoa the genus is represented by *P. compta* (Van Zwaluwenburg). This species, described as a *Melanoxanthus*,[36] appears, upon examination of the paratype from the island of Tutuila in Bernice P. Bishop Museum, to belong in the new genus. The holotype in the British Museum (Natural History), from the island of Upolu, has not been reëxamined. Fairmaire's description [37] of *Oophorus instabilis* from Tahiti (400 meters, on *Metrosideros* blossoms), recognized with doubt by Blair,[38] presents a group of characters applicable in their entirety to *Pacificola*. Thus there seems strong likelihood that the new genus exists in Society Islands, as well as in the Marquesas, Samoa, and Fiji.

Although the Pacific Entomological Survey collection is small and several species are represented by single specimens, there appears to be a very pronounced island endemicity; no species is known to occur on more than a single island.

Key to the Species

1. Posterior angles of pronotum strongly unicarinate for their entire length 2
   Posterior angles of pronotum with carina feeble, incomplete or entirely absent 10
2. Prothorax attaining its greatest width before the posterior margin; (posterior angles parallel or nearly so) 3
   Prothorax attaining its greatest width across the tips of the posterior angles; (posterior angles plainly divergent) 8
3. Hind margin of posterior coxal plate straight mediad of widest point; the tooth obtuse and straight sided ..... **insularis**
   Hind margin of coxal plate sometimes finely but always distinctly emarginate mediad of its widest point; the tooth rounded 4
4. Lateral carina of prothorax in side view upturned posteriorly; posterior angle upturned at tip ..... **obscura**
   Lateral carina in side view posteriorly horizontal or even depressed; posterior angle nearly horizontal 5
5. Punctation of pronotal disc very fine 6
   Punctation of pronotal disc coarse under high magnification 7
6. Prothorax (median measurements) distinctly wider than long ..... **contracta**
   Prothorax about as long as wide ..... **silvestris**
7. Emargination mediad of widest point on hind margin of posterior coxal plate fairly deep, making the tooth prominent ..... **vitiensis**
   Emargination mediad of widest point of hind coxal plate distinct but slight; tooth less prominent than in *vitiensis* ..... paratype of **compta**
8. Punctation of pronotal disc simple and close-set ..... **mumfordi**
   Punctation of disc shallow, flat, proportionally more widely spaced 9
9. Scutellum decidedly convex posteriorly; antennal joints 2 and 3 subequal ..... **convexa**
   Scutellum flat; antennal joint 3 obviously longer than 2 ..... **bella**

[36] Van Zwaluwenburg, R. H., Elateridae: Insects of Samoa, pt. 4, Coleoptera, fasc. 2, p. 123, London, 1928.

[37] Fairmaire, Léon, Essai sur les coléoptères de la Polynésie: Rev. et Mag. Zool. ser. 2, vol. 1, p. 22, 1849.

[38] Blair, K. G., The Heteromera and some other families of Coleoptera from Polynesia collected on the St. George Expedition: Ann. Mag. Nat. Hist., ser. 9, vol. 20, p. 172, 1927.

10. Prothorax widest across tips of posterior angles; the angles distinctly divergent 11
    Prothorax almost, if not quite, as wide before posterior margin, as across tips of posterior angles; the angles subparallel 13
11. Punctation of pronotal disc simple; insect 3.5 mm. long ..... **nana**
    Punctation of disc rather wide, shallow, subumbilicate; larger insects 12
12. 4th antennal joint longer than 2 and 3 together; insect 7 mm. long ..... **grandis**
    4th antennal joint not longer than 2 and 3 together; insect not over 5 mm. long ..... **montana**
13. Pronotal epipleura strongly concave longitudinally on anterior portion ..... **adamsoni**
    Pronotal epipleura nearly flat, only slightly concave anteriorly 14
14. Posterior angles of prothorax feebly but distinctly unicarinate ..... **fasciata**
    Posterior angles without trace of carina ..... **remota**

4. **Pacificola insularis,** new species.

Length, 5.0 mm. Blackish, with front of head reddish and the anterior margin and posterior angles of pronotum, basal third of elytra, and area on posterior third attaining lateral margins posteriorly, testaceous; suture more or less black. Antennae brown with four basal joints somewhat lighter. Legs yellowish; under side of body irregularly fuscous to rufous. Pubescence yellowish, recumbent, and fine.

Front regularly convex; anterior margin broadly rounded. Antennae not attaining the tips of posterior angles. Joint 4 as long as 2 and 3 together.

Pronotum slightly longer than wide; its widest point about three-quarters back from the anterior margin, the posterior angles converging slightly backward. Posterior angles distinctly unicarinate. Punctation of disc simple, fine, and close-set. Median basal canaliculation well marked but short.

Elytra slightly narrower than prothorax, sides subparallel to about middle, thence conjointly narrowed to apex; each very finely mucronate at sutural angle.

Joint 5 of hind tarsi about twice as long as broad, its length about equal to that of joint 3. Hind margin of posterior coxal plate (fig. 40, *a*) almost straight mediad of widest point, making the projection nearly rectangular.

Uahuka: Haane [Hane] Valley, altitude 150 feet, March 9, 1931, holotype female, LeBronnec and H. Tauraa.

5. **Pacificola obscura,** new species (pl. 4, *B*).

Length, 4.25 mm. to 4.75 mm. Blackish with elytra sometimes slightly lighter. Front of head, anterior margin and posterior angles of pronotum rufous to yellowish. Under side of body dark reddish; legs reddish with tarsi lighter. Antennae dark brown with 4 basal joints lighter.

Front regularly convex; margin broadly rounded. Antennae (fig. 42, *e*) not attaining tips of hind angles of prothorax; joint 4 about as long as 2 and 3 together.

Prothorax slightly longer than wide; greatest width before posterior margin. Posterior angles converging slightly to apex, strongly unicarinate. The tips of the posterior angles in lateral aspect (fig. 40, *g*) are distinctly, though sometimes only slightly, upturned. Punctation on disc simple, close-set, moderately coarse. Median basal canaliculation varies in depth and strength; usually well marked.

Elytra slightly narrower than prothorax. Tips finely mucronate at sutural angle. Striae rather feebly impressed; punctures linear; intervals flat, somewhat rugose toward base.

Joint 5 of hind tarsi (fig. 40, *d*) only slightly longer than joint 3. The hind margin of the posterior coxal plate (fig. 40, *b*) has, just mediad of its widest point, a slight but unmistakable undulation, making the posterior projection of the plate well defined.

Uahuka: Penau Ridge, altitude 2000 feet, March 4, 1931, at light, holotype female, LeBronnec and H. Tauraa. Paratypes, all from Uahuka, as follows: Penau Ridge, altitude 2000 feet, March 4, 1931, at light, LeBronnec and H. Tauraa; Haane [Hane] Valley, altitude 150 feet, March 9, 1931, 5 females, LeBronnec and H. Tauraa; Teivipuhipuhi, Vaikivi Valley, altitude 1250 feet, March 6, 1931, on *Metrosideros collina,* 1 probable female, LeBronnec and H. Tauraa.

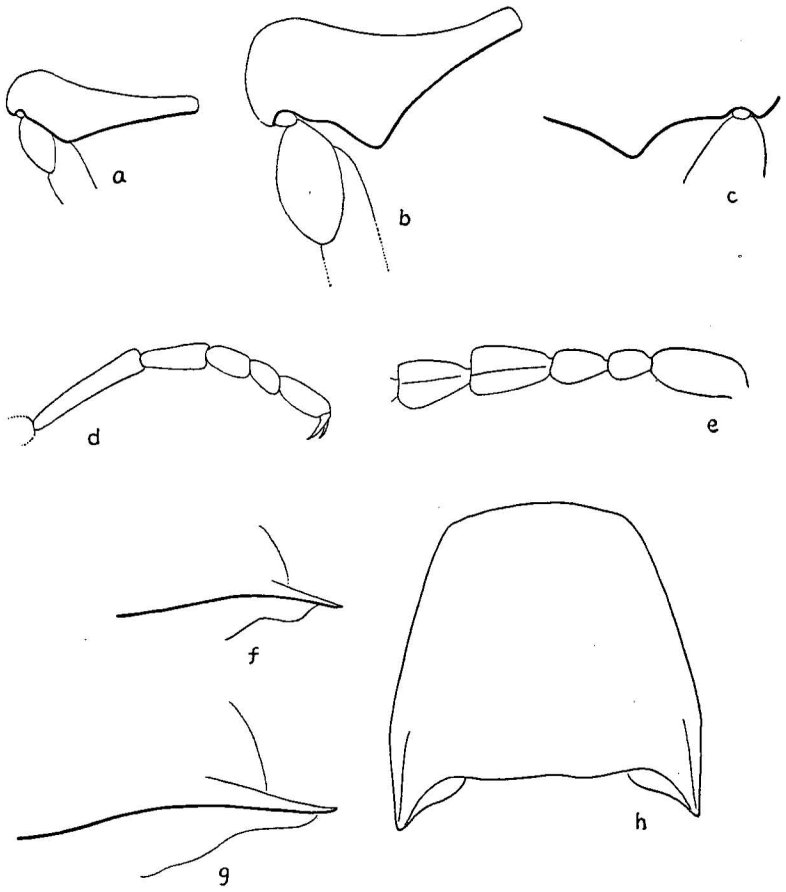


FIGURE 40. Species of *Pacificola. a-c,* hind coxal plate: *a, P. insularis*; *b, P. obscura; c,* outline of portion of hind margin, *P. vitiensis. d, e, P. obscura: d,* hind tarsus (pubescence omitted); *e,* lateral view of five basal joints of antenna. *f-h,* prothorax: *f,* lateral view of posterior portion, *P. contracta*; *g,* lateral view of portion of prothorax, *P. obscura*; *h,* outline of dorsal aspect (setation omitted), × about 23, *P. contracta.*

6. Pacificola contracta, new species.

Length, 5.9 mm. Blackish with anterior part of front, anterior margin, and posterior angles of prothorax, reddish. Pubescence tawny. Scutellum black. Elytra black with a reddish area on intervals 2, 3, and 4 extending back from the base for about one-third the length of the elytra, where it is interrupted by a blackish suffusion. Back of this on the posterior half is another reddish area which quickly widens to include the lateral margins and extends to the apex of the elytra. Antennae reddish brown with basal joints slightly lighter. Body beneath blackish with reddish suffusions on prosternum and on margins of the abdominal segments. Legs brown.

Front convex above, slightly excavate behind frontal margin; margin broadly rounded. Antennae not attaining tips of posterior angles of the prothorax. Joint 4 as long as 2 and 3 together; joint 3 plainly longer than joint 2.

Prothorax distinctly broader than long (fig. 40, *h*); greatest width before the posterior margin; pubescence recumbent. Posterior angles converging backward with no undulation of the lateral margins. Posterior angles strongly unicarinate; in side view (fig. 40, *f*) the lateral margin posteriorly depressed. Punctation of disc simple, fine, and close-set. Basal median canaliculation feeble.

Elytra slightly narrower than prothorax; sides subparallel to about middle, thence conjointly narrowed to apex. Apex rounded, not mucronate. Striae rather weakly impressed, punctures linear; intervals flat, rugose toward base.

Joint 5 of hind tarsi about as long as joint 3.

Projection on hind margin of posterior coxal plate robust and prominent, the plate three times wider at its widest point than at its outer margin.

Fatuhiva: Tepapaohivapu, altitude 2150 feet, August 25, 1930, holotype female (?), LeBronnec.

Close to *P. silvestris* but more robust, and with the hind coxal projection more prominent; the comparatively wider prothorax will further distinguish it.

7. Pacificola silvestris, new species.

Length, 5.0 mm. Blackish with anterior part of front, and anterior margin and posterior angles of prothorax, testaceous; scutellum blackish. Elytra blackish, with vague yellowish area along median basal third, and another on posterior third, these areas not attaining either the suture or the lateral margins. Antennae blackish with four basal joints reddish. Body beneath blackish with under side of hind angles of prothorax yellowish, and the tibiae and tarsi reddish brown.

Front convex, anteriorly flattened; margin broadly rounded. Antennae not attaining tips of posterior angles of prothorax. Joint 4 as long as 2 and 3 together.

Prothorax about as long as wide (median measurements); greatest width at about its posterior third; posterior angles undulate and slightly incurved, their tips excurved. Posterior angles strongly unicarinate. Side margin in lateral aspect horizontal posteriorly. Punctation of disc (fig. 41, *c*) very fine, fairly widely spaced. Pubescence semi-erect on prothorax. Basal median canaliculation shallow and vague.

Elytra slightly narrower than prothorax. Sides subparallel to about middle, thence conjointly narrowed to apex. Apex subtruncate and finely mucronate at sutural angle. Striae moderately well impressed, punctures linear; intervals flat, rugose on basal half.

Hind margin of rear coxal plate emarginate mediad of its widest point; the projection well defined and rounded. Joint 5 of hind tarsi about as long as 3.

Fatuhiva: Ahuava, altitude 1800 feet, August 19, 1930, beating on *Glochidion ramiflorum,* holotype female, LeBronnec.

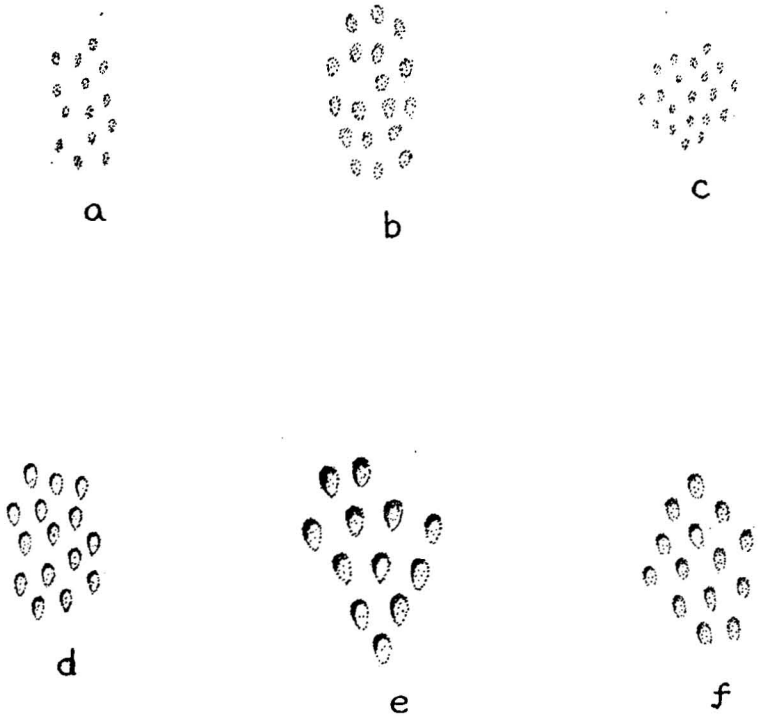


FIGURE 41. Species of *Pacificola,* punctation of disc of pronotum (setation omitted), × about 80: *a, P. nana, b, P. convexa, c, P. silvestris, d, P. mumfordi, e, P. vitiensis, f, P. grandis.*

8. **Pacificola vitiensis,** new species.

Length, 4.5 mm. Head and thorax dark brown, with front of head vaguely, anterior margin and posterior angles of prothorax definitely, yellowish brown; elytra yellowish brown, with scutellum, sutural margin, and vague area along sides, dark brown. Antennae dark brown with four basal joints somewhat lighter. Body beneath dark reddish brown; tibiae and tarsi lighter brown.

Front almost flat, rather coarsely punctured; front broadly rounded. Antennae not attaining posterior angles of prothorax; joint 4 as long as 2 and 3 together.

Pronotum slightly longer than wide; its greatest width before the posterior margin, the posterior angles being parallel. The posterior angles are strongly unicarinate. In side view the lateral margin of the pronotum is horizontal, not upturned posteriorly. Punctation on disc (fig. 41, *e*) coarse, wide, and fairly deep. Posterior median canalicu-lation brief, but well impressed.

Elytra as wide as pronotum; subparallel to about middle, thence conjointly nar-rowed to apex. Apex subtruncate with suggestion of mucro at sutural angle. Striae fairly well impressed; punctures linear; intervals almost flat, rugose toward base.

Indentation of hind margin of rear coxal plate (fig. 40, *c*) mediad of widest point well marked, with the result that the posterior angle of the plate is fairly prominent. Joint 5 of hind tarsi slightly longer than 3, shorter than 3 and 4 together.

Fiji: Viti Levu, Lami district, altitude 300 and 800 feet, 1920, in native forest, holotype (probably a female), C. E. Pemberton. The holotype is in the collection of the Hawaiian Entomological Society.

P. vitiensis and *P. compta* are closely allied, and have much the same *facies*. The surface of the pronotal epipleura in both is less opaque than among the Marquesan species. In *vitiensis* the pronotal punctation is somewhat coarser, the basal median furrow on the pronotum much more apparent, the fifth joint of the hind tarsus relatively longer, and, above all, the projection of the hind margin of the rear coxal plate much more prominent, than in *compta* (paratype).

9. Pacificola mumfordi, new species (pl. 4, *C*).

Length, 6.0 mm. to 6.25 mm. Light brown to castaneous with darker suffused areas on vertex of head and on pronotum. Body beneath somewhat, and irregularly, darker; legs yellowish.

Front convex; anterior margin broadly rounded. Antennae not attaining tips of posterior angles of thorax. Joint 4 of antennae as long as 2 and 3 together.

Prothorax longer than wide; widest across tips of posterior angles. Hind angles strongly unicarinate. Punctation of pronotum (fig. 41, *d*) simple, close-set, fairly deep and regular, even on disc. Median basal canaliculation well defined.

Elytra at base as wide as prothorax, slightly narrowed to about middle, thence more sharply to apex, which is subtruncate and finely mucronate at sutural angles. Strial punctures will impressed; intervals flat, rugose toward base.

Joint 5 of hind tarsi slightly longer than joint 3.

Nukuhiva: Tauamaka, altitude 2900 feet, November 10, 1929, on *Metrosideros collina,* holotype female, Mumford and Adamson; Tapuaooa, altitude about 2600 feet, May 30, 1931, paratype female, LeBronnec and H. Tauraa. Another specimen, a female, which lacks head and thorax, may belong to this species; it was taken at Ooumu, Nukuhiva, altitude 3700 feet, October 13, 1929, Mumford and Adamson.

10. Pacificola convexa, new species.

Length, 3.75 mm. Head and prothorax black, with anterior margin of front, and anterior margin and posterior angles of prothorax, reddish brown. Scutellum dark brown. Elytra yellowish brown with lateral blackish suffusion arising near the humeri extending to posterior two-thirds, and widening at about the middle to interval 5. Vague blackish markings on posterior third of elytra from about interval 8 to interval 3, not attaining the apex. Antennae blackish with 3 basal joints lighter. Under side more or less concolorous with that portion of the dorsum immediately above it. Legs yellowish brown.

Front convex, rather acutely rounded on the margin. Antennae not attaining tips of posterior angles of the prothorax; joints 2 and 3 subequal, together about as long as joint 4.

Pronotum with posterior angles strongly unicarinate, the carinae extending forward only slightly beyond the base of the angles. Pronotum about as long as wide (median measurements); uniformly narrowed from tips of diverging posterior angles to the

anterior third, thence more strongly. Punctation of pronotum (fig. 41, *b*) fairly coarse; subumbilicate even on disc. Median basal canaliculation finely, deeply marked.

Scutellum convex on basal half. Elytra as wide as prothorax. Tips separately rounded and finely mucronate at sutural angles. Striae punctate-striate; intervals flat, somewhat rugose toward base.

Posterior coxal plate obtusely rounded at widest point.

Nukuhiva: Ooumu summit, altitude 3890 feet, July 20, 1931, on *Cyrtandra* species, holotype female, LeBronnec and H. Tauraa.

11. **Pacificola bella,** new species.

Length, 4.75 mm. Generally blackish with anterior part of front, the anterior margin of the pronotum, rufous, and the following areas flavous: (1) posterior angles of pronotum, (2) an irregular area on the basal third of each elytron, attaining neither the suture nor the lateral margins, and (3) a vaguer area on the distal third attaining neither the suture, lateral margins, nor tips of the elytra. Scutellum black. Antennae blackish with 3 basal joints paler. Under side of body blackish except for prosternal lobe and posterior angles of prosternum, which are brownish; abdomen blackish to rufous. Legs testaceous.

Front convex, rather more acutely rounded on margin than in the other members of the genus. Antennae not attaining tips of posterior angles of prothorax; joint 3 plainly longer than 2; together equal to joint 4.

Pronotum with posterior angles distinctly carinate, with a faint suggestion of a second carina mediad of the principal one. Slightly longer than wide; greatest width across tips of posterior angles which diverge toward the rear. Punctation coarse; subumbilicate even on disc. Median basal canaliculation well marked.

Scutellum flat or nearly so. Elytra as wide as prothorax. Their tips slightly divergent and finely mucronate at sutural angle. Striae strongly punctate-striate; intervals flat, rugose toward base.

Posterior coxal plates obtusely rounded at widest point. Joint 5 of hind tarsi about as long as joint 3.

Tahuata: Haoipa, summit, altitude 2700 feet, July 9, 1930, beaten from *Metrosideros collina,* holotype female, LeBronnec and H. Tauraa.

12. **Pacificola nana,** new species (pl. 4, *A*).

Female, 3.5 mm. long; probable male, 3.3 mm. long.

Blackish with yellowish areas as follows: front of head, anterior margin and hind angles of prothorax, and base of elytra. The coloration of the elytra varies. In one specimen (female) a vaguely defined stripe runs from the base along the 4th elytral interval for about half the length of the wind-covers. Antennae blackish with the 3 basal joints yellowish. Under side of body generally blackish with front and rear of prosternum, posterior angles of the pronotal epipleura, and tip of abdomen, testaceous to rufous. Legs testaceous with femora fuscous.

Front convex, flattened anteriorly; anterior margin broadly rounded. Antennae of female not attaining tips of posterior angles of prothorax; of male, barely exceeding tips. Joint 4 as long as 2 and 3 together .

Prothorax slightly longer than wide; widest across tips of posterior angles. Punctation of pronotum (fig. 41, *a*) circular, simple, extremely fine and light. Posterior angles not carinate. Basal median canaliculation shallow.

Elytra (behind the humeri) slightly wider than prothorax, subparallel to about middle (female), thence conjointly narrowed to apex; in the male the elytra about as wide as prothorax, narrowed from shoulders to apex. Apex rounded; finely mucronate at tips of sutural angles. Striae fine, punctures linear; intervals flat, granulate for almost their entire length.

Joint 5 of hind tarsi stout, about as long as joint 3.

Hivaoa: Matauuna, altitude 3700 feet, March 4, 1930, miscellaneous beating, holotype female, Mumford and Adamson; Matauuna, altitude 3700 feet, March 3, 1930, allotype (probable male), Mumford and Adamson.

13. Pacificola grandis, new species.

Length, 7.2 mm. Blackish with front of head, anterior margin and posterior angles of prothorax, yellowish brown. Elytra castaneous with base yellowish brown. Scutellum and sutural margins dark brown. Antennae blackish with 3 basal joints reddish. Body beneath dark reddish brown; tibiae and tarsi somewhat lighter.

Front regularly convex; rather acutely rounded. Antennae nearly reaching to tips of posterior angles of prothorax. Joint 4 longer than 2 and 3 together.

Prothorax longer than wide; widest across tips of diverging posterior angles. The angles are strongly unicarinate anteriorly only, the carina absent on the posterior half. Punctation of pronotum (fig. 41, *f*) close, subumbilicate, fairly shallow, and regular. Median basal canaliculation faint.

Elytra about as wide as posterior angles of prothorax; subparallel to beyond middle, thence conjointly narrowed to apex. Sutural angles slightly divergent, finely mucronate. Striae moderately impressed, punctures linear; intervals flat, pustulate toward base.

Projection on hind margin of posterior coxal plate prominent. Joint 5 of hind tarsi about as long as 3 and 4 together.

Hivaoa: Matauuna, altitude 3700 feet, March 4, 1930, on *Vaccinium,* holotype female (?), Mumford and Adamson.

The relative length of joint 5 of the hind tarsi is in this species greater than usual in *Pacificola;* however, joint 1 is as long as joints 2, 3, and 4 together, and joints 3 to 5 are characteristically pubescent beneath.

14. Pacificola montana, new species (pl. 4, *D*).

Length, 4.2 mm. to 5.0 mm. Blackish with anterior part of front, and anterior margin and posterior angles of prothorax, brownish. Scutellum black. The elytra have the following pattern: lateral margins and the interval on either side of the suture, black to blackish; basal half yellowish brown on intervals 2 to 5, interrupted by an irregular black fascia; behind this another brown area on basal half on intervals 2 to 7, widening posteriorly to include interval 8; apex of elytra cloudy. The typical pattern varies in area and intensity among the specimens at hand. Antennae blackish with 3 basal joints brownish. Body beneath blackish with prosternal sutures and margins of abdominal segments in part, reddish. Legs brownish, especially tibiae and tarsi.

Front regularly convex; margin broadly to subacutely rounded. Antennae not attaining (female), or slightly exceeding (male), tips of posterior angles of prothorax. Joint 4 as long as 2 and 3 together.

Prothorax slightly longer than wide; greatest width across tips of posterior angles. Posterior angles faintly carinate anteriorly only, or not at all. Punctation of disc shallow, more or less umbilicate. Basal median canaliculation short but well defined.

Elytra slightly wider than prothorax (posterior angles excepted), subparallel to about middle (female), or narrowed from base to apex (male). Apex subtruncate; finely mucronate at sutural angles. Striae moderately well impressed, punctures linear; intervals flat, pustulate toward base.

Joint 5 of hind tarsi about equal to joint 3.

Hivaoa: Mt. Temetiu, slope north of summit, altitude 3900 feet, December 30, 1930, beating on *Weinmannia* species, holotype female, H. Tauraa; Matauuna, altitude 3700 feet, March 4, 1930, on *Vaccinium,* 2 paratype females, Mumford and Adamson; Matauuna, altitude 3700 feet, March 3, 1930, 1 paratype female, Mumford and Adamson; Mt. Temetiu, slope north of summit, altitude 3800 feet, December 27, 1930, beating on *Weinmannia* species, 1 probable female, H. Tauraa; Matauuna, altitude 3700 feet, February 24, 1930, miscellaneous beating, allotype male, Mumford and Adamson; Mt. Temetiu, slope north of summit, altitude 3,860 feet, December 27, 1930, on *Weinmannia* species, 1 probable male, H. Tauraa.

15. Pacificola adamsoni, new species.

Length, 5.0 mm. Yellowish brown, with head blackish on vertex; a dusky suffusion on middle of pronotum; scutellum blackish; a dark brown line on intervals 5 and 6 of elytra, extending nearly halfway back from the base, then crossing obliquely to outer-posterior fifth of the elytra. Under side of prothorax yellowish brown, the rest of the most interval and continuing back to tip; just before the middle a transverse dusky band connects the marking on intervals 5 and 6, with a vague, irregular sutural marking which extends forward from that point to the scutellum; another dusky area on the posterior fifth of the elytra. Under side of prothorax yellowish brown, the rest of the prosternum and the abdomen darker; legs yellowish brown. Antennae dark with 4 basal joints lighter.

Front convex, flattened anteriorly; margin broadly rounded. Antennae not attaining tips of posterior angles of prothorax. Joint 4 as long as 2 and 3 together. In the type both antennae are broken, each having but 9 joints.

Prothorax considerably longer than wide; greatest width before the posterior margin. Posterior angles directed straight back; strongly unicarinate anteriorly, but the carina extremely vague on posterior third. Punctation simple, fine, and close-set on disc. Median basal canaliculation vague. The shallow impressions on the posterior margin, within the posterior angles, wider than in the rest of the genus. Pronotal epipleura very concave longitudinally, giving the effect of a wider channel on the outer half or third, roughly parallel with the outer margin.

Elytra at base as wide as prothorax; strongly narrowed posteriorly to apex; tips finely mucronate at sutural angle. Striae well impressed; intervals flat, pustulate, especially toward base. Pubescence on elytra rather coarse. Elytra very convex in cross section with the sides almost perpendicular. The abdomen is likewise strongly convex transversely.

Joint 5 of hind tarsi about as long as joint 3.

Hivaoa: Kopaafaa, altitude 2800 feet, February 25, 1930, on *Weinmannia* species, holotype female, Mumford and Adamson.

P. adamsoni is more slender than *P. remota,* and has the punctation on the pronotum finer and closer than in that species.

16. Pacificola fasciata, new species.

Length, 4.0 mm. Brownish black with anterior part of front, and anterior margin and posterior angles of prothorax, yellowish brown. Antennae dark brown. Scutellum black. Elytra yellowish brown with blackish sutural stripe and lateral marking which widens inward at about the middle to the 4th interval, and rearward vaguely approaches the suture. A vague blackish stripe from widest part of lateral band runs backward parallel with the suture. Under side of body dark reddish brown.

Front regularly convex; anterior margin broadly rounded. Antennae almost attaining tips of posterior angles. Joint 3 longer than 2, together as long as joint 4.

Prothorax about as long as wide; only very slightly wider across tips of posterior angles than before posterior margin. The posterior angles almost parallel; finely but distinctly unicarinate. Punctation on disc more or less umbilicate. Basal median canaliculation faint. Pronotal epipleura nearly flat, not conspicuously channeled.

Elytra as wide as prothorax; slightly widened from base to beyond middle, thence narrowed to apex. Apex subtruncate, faintly mucronate at sutural angle. Striae well marked; punctures linear; intervals rather coarsely punctured, flat, more or less granulate toward base.

Uapou: Kohepu summit, altitude 3300 feet, November 27, 1931, beating on *Weinmannia* species, holotype female, LeBronnec.

This is not satisfactorily separated by key from *P. remota* but is so conspicuously more robust there seems little doubt as to its validity.

17. Pacificola remota, new species.

Length, 4.0 mm. Blackish with anterior part of front, anterior margin and hind angles of prothorax, and a vague basal and a post-median area on each elytron, yellowish brown. Sutural line nearly black, and this, together with the brownish areas which separate the lighter spots, produces a fairly well defined cruciform pattern on the elytra. Under side of body irregularly reddish brown, with legs somewhat lighter.

Front regularly convex; anterior margin broadly rounded. Antennae about attaining tips of posterior angles of prothorax. Joint 4 as long as 2 and 3 together; joint 3 longer than joint 2.

Prothorax slightly longer than wide; almost as wide before its posterior margin as across the tips of the hind angles. Posterior angles almost parallel; no trace of carina. Punctation of disc, subumbilicate. Basal median canaliculation faint. Pronotal epipleura nearly flat, not conspicuously channeled.

Elytra as wide as prothorax; subparallel to about middle, thence conjointly narrowed to apex. Finely mucronate at tips of sutural angle. Striae well marked; punctures linear; intervals flat, more or less rugose toward base.

Joint 5 of hind tarsi as long as joint 3.

Fatuhiva: Tahuna, altitude 2050 feet, September 3, 1930, on *Metrosideros collina,* holotype female, LeBronnec.

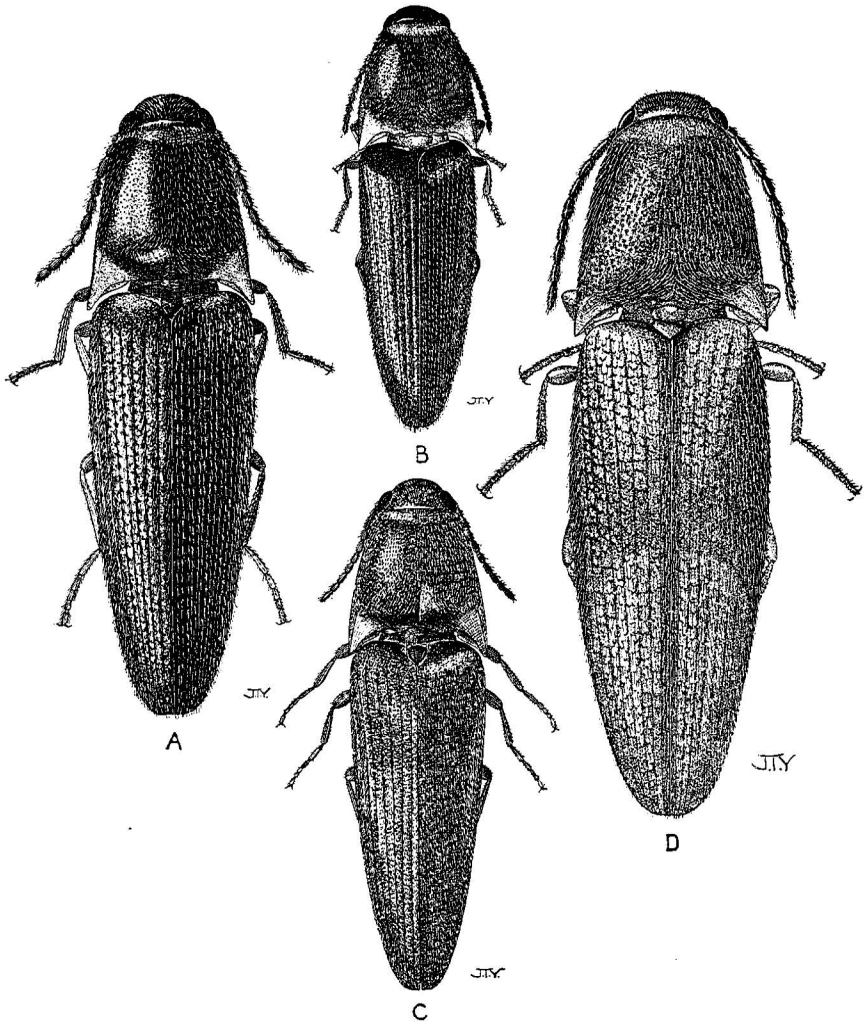
This species is conspicuously more slender than *P. fasciata,* although the type of each is a female.

Insect collections have been made with reasonable thoroughness in the Marquesan, Samoan, and Hawaiian archipelagoes; the Fiji Islands, although

not yet so well known entomologically as the foregoing, have received much more attention than most other island groups in Polynesia and Melanesia. The following table, based upon our present knowledge of the Pacific Elateridae, reveals an extremely high percentage of endemic species in the Marquesas, Fiji, and Hawaii.

Islands		Genera		Species		
	Approximate area in square miles	Common to other regions	Total	Endemic	Not Endemic	Total
Marquesas Islands	500	4	4	14	2	16
Society Islands	700	6	6	3	3	6
Samoa	2,600	7	9	6	9	15
Hawaii	6,600	6	9	44	6	50
Fiji	7,500	9	10	14	3	17

Although *Pacificola* with 13 species in the Marquesas is doubtless indigenous there, no elaterid genus is known to be endemic in that group. On the other hand, Samoa has 2 genera, Fiji 1, and Hawaii 3, which are not known to exist elsewhere.



DORSAL VIEWS OF FEMALES, SPECIES OF *PACIFICOLA*: *A, P. NANA,* × ABOUT 22; *B, P. OBSCURA,* × ABOUT 12; *C, P. MUMFORDI,* × ABOUT 11; *D, P. MONTANA,* × ABOUT 19.

TWO TRYPETIDAE FROM THE MARQUESAS ISLANDS, WITH ONE NEW SPECIES (DIPTERA)*

By

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INTRODUCTION

The genus *Dacus* Fabricius is one of the most important economically in the Pacific islands, and there are many species that feed in their larval stages in cultivated fruits, causing considerable loss to growers. The genus, in the strict sense as I accept it, is found in Africa, but the subgenus *Chaetodacus* Bezzi is met with throughout the Orient and southward into Australia. Unfortunately many of the species are quite imperfectly understood and considerable doubt exists on the score of distinguishing characters. However, there can be no doubt of the specific distinctness of the species recorded and redescribed below, as it is abundantly differentiated from any allied form in both color and in structure.

I have published a specific synopsis of the genus as far as the species are now known to me [39] but did not include the present one. It will be easy, however, to run it out by means of the characters employed in that paper and it is the only species of the genus which I have seen from the Marquesas. The description below is offered to supplement the original one in which there are unfortunately several omissions of important characters, and I feel that a new subgenus is necessary for its reception.

Genus DACUS Fabricius

Subgenus MARQUESADACUS, new subgenus

This subgenus is distinguished from the others already known by the presence of but one pair of incurved orbitals and their distance from the recurved pair.

Dacus (Marquesadacus) perfuscus Aubertin.

Chaetodacus perfuscus Aubertin: Entomologist, vol. 62, p. 173, 1929.

Male and Female

Length, 6.5 mm. to 7 mm. Head reddish yellow, frons darker, with the very narrow frontal orbits greyish white dusted, occiput with a large black triangle on each side above, antennae fuscous, apex of second segment and base of third, especially on inner

[39] Malloch, J. R., Trypetidae: Insects of Samoa, pt. 6, fasc. 7, pp. 253-266, London, 1931.

* Pacific Entomological Survey Publication I, article 14.

side, reddish yellow; face without black spots, palpi yellow; frontal and vertical bristles black. Thorax glossy black, the only yellow markings consisting of a round spot on metapleura and a large triangle on posterior margin of mesopleura, the prosternum fulvous yellow; abdomen entirely glossy black, even the membrane fuscous. Legs glossy black, fore coxae and femora entirely honey yellow. Wings hyaline, with a well developed black stripe on the costa from apex of subcosta to apex of fourth vein, which does not extend much beyond level of second vein anywhere, and is but slightly widened apically, the dark color traceable along the second vein almost to its base; anal streak rather faint, cross veins not clouded. Calypteres grey. Halteres yellow.

Frons about 2.5 times as long as wide, with but one bristle on each orbit anterior to the pair of recurved bristles on the upper glossy vittae; all four verticals present; face without a marked central elevation in profile. Mesonotum with the usual 4 anterior marginal bristles, 2 notopleurals, 2 prescutellars, 2 postalars and 1 supra-alar; scutellum with 2 bristles, its apex almost transverse, sometimes with a slight elevation in center between the bristles; mesopleura with one hind marginal bristle, pteropleura without a distinct bristle, merely haired. Abdomen with the tergites well differentiated, extensile, and with many setiferous punctures, the fourth visible tergite with the usual more finely haired depressed patch on each side. Legs normal. Cross veins of wing separated by about the length of outer one.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2,000 feet, October 27, 1929, taken at rest on under side of leaves, 31 specimens, Mumford and Adamson.

Tahuata: Vaitupaahei, altitude 1,750 feet, July 9, 1930, 1 specimen, LeBronnec and H. Tauraa.

Uapou: Hakahetau Valley, altitude 1,000 to 2,000 feet, January 31, 1930, 10 specimens; altitude 1,000 feet, January 22, 1930, 9 specimens; Papaika, December 14, 1929, 11 specimens, R. R. Whitten.

Recorded from Hivaoa, Tahuata, and Nukuhiva, January, 1925.[40]

This species is distinguished from all others of which the descriptions or specimens are known to me by the entirely glossy black color of the dorsum of the thorax and abdomen, including the scutellum and humeri, the color markings of the legs, and the presence of but one pair of fronto-orbital incurved bristles, which are situated very far forward, indicating that it is the upper pair that is lacking.

Unfortunately there are no records of the food habits of the species on any of the specimens, which were collected in general field work.

Genus **TRYPANEA** Schrank

This genus is very widely distributed, being found in all faunal zones and regions.

Trypanea simplex, new species (fig. 42).

Male and Female

Length, 4 mm. to 5 mm. A testaceous yellow species, with thorax and abdomen black and covered with dense grey dust which obscures the entire surface, the mesonotum without dark markings, and the wings as in figure 42.

[40] Aubertin, D., and Cheesman, L. E., Diptera of French Oceania: Entomologist, vol. 62, p. 174, 1929.

Frons about 1.5 times as long in center as its width at vertex, much narrowed to anterior margin where it is one-third narrower than at vertex, the orbits each with 5 or 6 bristles; epistome rather sharply produced in center, parafacials linear in profile, height of face not over two-thirds that of back of head; third antennal segment angular at upper apical corner; arista bare; proboscis short and stout; palpi normal; eye obliquely placed; gena not over one-fourth of the eye height. Thorax with the usual 2 pairs of long postsutural dorsocentral bristles; scutellum with 2 strong marginal bristles, decumbent hairs on thorax and abdomen all white or yellowish white. Legs normal, fore femora with some rather long bristles on the apical half of the postero-ventral surface; fore tarsi of male slightly thickened and with a few rather long hairs along the posterior side, those of the female slender and without outstanding posterior hairs. Wings as in figure 44, first vein setulose from proximad of humeral cross vein to its apex above, and on apical fourth below, third bare above and with a few widely spaced fine hairs on basal portion below.

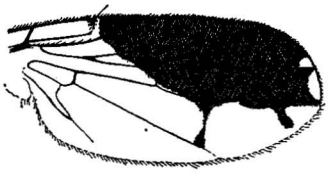

FIGURE 42. Wing of *Trypanea simplex,* new species.

Hivaoa: Atuona Valley, altitude 330 feet, February 25, 1929, holotype female, Mumford and Adamson.

Eiao: coconut plantation, near center, sweeping, October 1, 1929, allotype, A. M. Adamson.

Uahuka: Putiovai, March 23, 1931, paratype female, LeBronnec and H. Tauraa.

THE SPHEGOID WASPS OF THE MARQUESAS ISLANDS*

By

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INTRODUCTION

Six named species of sphegoid wasps have been recorded from the Marquesas Islands, *Sceliphron caementarium* (Drury), *Pison hospes* Smith, *Pison tahitense* Saussure, Pison *iridipenne* Smith, *Pison argentatum* Shuckard subspecies *ignavum* Turner, and *Pison impunctatum* Turner. To this list the expedition of the Pacific Entomological Survey now adds a seventh species, namely, *Tachysphex fanuiensis* Cheesman. All of these species are found elsewhere, although *Tachysphex fanuiensis* seems to have a rather limited distribution in the South Pacific.

This meager and commonplace sphegoid fauna differs from that of the Society Islands only in lacking the eighth species, *Oxybelus utoroae* Cheesman[40] from Raiatea. It is comparable also to the sphegoid fauna of Samoa with its nine species, of which four appear to be endemic.[41] The Sphegoidea of the more extensive though equally oceanic Hawaiian islands comprise 42 known species—with a few additional varieties—of which 29 or 30 are found nowhere else in the world, whereas the remaining 12 or 13 species are recent to very recent immigrants, 3 of them, *Dolichurus stantoni* (Ashmead), *Larra luzonensis* Rohwer, and *Notogonidea subtessellata* (Smith) have been purposely introduced from the Philippine Islands. The sphegoid fauna of Fiji, which is continental, is apparently very limited, and I can find but seven species listed therefrom.[42]

Among the immigrant sphegoid wasps the genus *Pison,* a group that is best represented in the Australian and Oriental regions, is dominant in each of these several archipelagoes. Wasps of this genus and some others, as *Sceliphron* and *Trypoxylon,* employ mud for building their cells, which they occasionally affix to such transportable objects as boards and furniture. Indeed, *Sceliphron* has been known to build its nests on ships in port. These several wasps store their cell-nests, without too much discrimination as

[40] Cheesman, L. E., A contribution towards the insect fauna of French Oceania, pt. 2: Ann. Mag. Nat. Hist., 10th ser., vol. 1, pp. 171-179, 4 figs., 1928.

[41] Perkins, R. C. L., and Cheesman, L. E., Trypoxylonidae: Insects of Samoa, pt. 5, Hymenoptera. fasc. 1, pp. 26-28, 1928.
Williams, F. X., Larridae: Insects of Samoa, pt. 5, Hymenoptera, fasc. 1, pp. 33-39, 1928.

[42] Turner, R. E., The Hymenoptera of Fiji: Ent. Soc. London, Trans., Sphegidae, pp. 337-338, 1918-1919.
Williams, F. X., Tachysphex vitiensis, new species: Studies in tropical wasps—their hosts and associates, Bull. Experiment Sta., Hawaiian Sugar Planters' Assoc., Ent. ser., no. 19, pp. 166-168, 1928.

* Pacific Entomological Survey Publication I, article 15, issued November 25, 1932.

to species, with spiders, arthropods that are always available even within the artificial environment of seaports. It is easy to see, then, how wasps such as these may be carried about through commerce.

FAMILY SPHEGIDAE

Sceliphron caementarium (Drury).

Sphex caementaria Drury: Illus. Nat. Hist. I, p. 105, 1770.

Hivaoa: Atuona, July 16, 1929, 1 female; same locality, near sea level, July 22, 1929, 1 male; Tahauku, July 10, 1929, 1 male; Mumford and Adamson.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 22 and September 26, 1930, 4 females, LeBronnec.

Uahuka: Haave [Haavei] Valley, sea level, March 19, 1931, 1 female; Hanaehi Valley, seashore, March 10, 1931; LeBronnec and H. Tauraa.

Immature stages and spider prey, from Atuona, Hivaoa, July 16, 1929; Teavamatahi, Uahuka, 730 feet, March 19, 1931, LeBronnec and H. Tauraa; Omoa [Oomoa] Valley, Fatuhiva, 650 feet, September 16, 1930, LeBronnec; Hanaehi Valley, Uahuka, seashore, March 10, 1931, LeBronnec and H. Tauraa (wasp grubs); Atuona, Hivaoa, February 12, 1928, Mumford and Adamson (spiders).

This large and common American mud-dauber is widely distributed in North America and Central America and occurs also in the Society Islands, Hawaii, Madeira, Cuba, and Barbados. It has not been reported from Samoa or Fiji.

FAMILY LARRIDAE

Tachyspex fanuiensis Cheesman (fig. 43).

Tachyspex fanuiensis Cheesman: Ann. Mag. Nat. Hist., 10th ser., vol. 1, pp. 172-175, 1928.

Hivaoa: Hanaheka [Tanaeka] Valley, altitude 1,450 feet, June 4, 1929, 6 males, Mumford and Adamson.

Recorded by Cheesman from the Tuamotus, Fakarava; Society Islands, Tahiti, Raiatea, and Borabora.

A finely sculptured black wasp about 6 to 10 mm. long.

Miss Cheesman observed this *Tachysphex* in the Society Islands, where it was preying upon *Blatella notulata* (Stål), a small cockroach, described from Tahiti in 1861, that is active in the daytime. From a burrow of the wasp Miss Cheesman secured two dead cockroaches, upon one of which was fastened the wasp's egg.

Wasps of the genus *Tachysphex* usually prey upon saltatorial Orthoptera, but a European species, *Tachysphex lativalvis* Thomson, and its variety *gib-*

bosa Kohl, are also known to store their nests with cockroaches of the genus *Ectobius*. Recently Mr. H. Hacker of the Queensland Museum, Brisbane, very kindly sent the writer a large, rather coarsely sculptured *Tachysphex* labeled "Brisbane, 5/1/1914, H. Hacker" and "caught on the wing with a cockroach in mandibles." Hence this interesting departure from the usual type of prey in the genus is rather widespread, though rare.

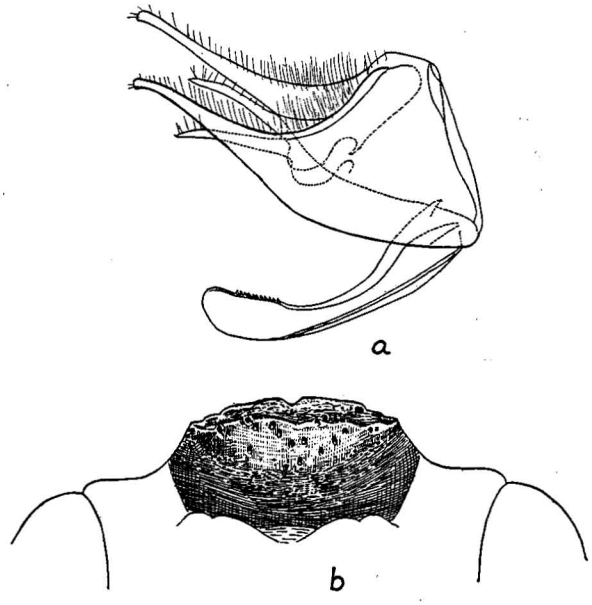

FIGURE 43. *Tachysphex fanuiensis* Cheesman: *a*, male armature, slightly inclined from lateral view, from Tahiti, Society Islands: *b*, clypeus of female from Moorea, Society Islands.

FAMILY TRYPOXYLONIDAE

Pison hospes Smith.

Pison hospes Smith: Linn. Soc. Zool., Jour., vol. 14, p. 676, 1879.

Hivaoa: Tahauku, near shore, July 10, 1929, 2 males, Mumford and Adamson.

Tahuata: Hanamiai Valley, altitude 500 to 1,000 feet, May 28, 1930, 1 female; Pahukea Ridge, altitude 1,100 feet, July 25, 1930, 1 female; Hanateio Valley, altitude 1,000 feet, July 23, 1930, 1 female; LeBronnec and H. Tauraa.

Fatuhiva: Teatapu, altitude 1,400 feet, August 19, 1930, 1 female, LeBronnec.

Previously recorded from Cocos-Keeling, Singapore, Australia, Fiji, Samoa, Society Islands, Hawaii.

Pison tahitense Saussure.

Pison tahitense Saussure: Reise Novara, Zool., 2, pt. 1, pp. 65-66, 1867. (*Pison rechingeri* Kohl, 1908.)

Hivaoa: Aimoa, altitude 1,660 feet, March 7, 1929, 1 male, Mumford and Adamson.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, September 22, 1930, 1 female, LeBronnec.

Previously recorded from Fiji, Samoa, Society Islands, Ellice Islands, Australia(?).

Pison iridipenne Smith.

Pison iridipenne Smith: Linn. Soc. Zool., Jour., vol. 14, p. 676, 1879.

Hivaoa: Atuona Valley, altitude 100 feet, February 25, 1929, 1 female, Mumford and Adamson.

Tahuata: Kiinui Valley, altitude 1,100 feet, June 16, 1930, 1 female, LeBronnec and H. Tauraa.

Nukuhiva: Teivipakeka, altitude 2,400 feet, October 16, 1929, 1 female, Mumford and Adamson.

Uahuka: Hane Valley, seashore, March 10, 1931, 1 female, LeBronnec and H. Tauraa.

Uapou: Hakahetau, December 31, 1929, 1 female, R. R. Whitten.

Previously recorded from Australia, Fiji, Samoa, Society Islands, Tuamotus, Hawaii.

I have not seen males of this species from the Marquesas, but all those that I have examined from Hawaii (four males in the collection of the Experiment Station, Hawaiian Sugar Planters' Association, and one male from Bernice P. Bishop Museum), as well as two males from Tahiti, Society Islands, in the collection of the Pacific Entomological Survey, show the usual large transverse tubercle on the third abdominal sternite, as well as a quite small tubercle on the fourth abdominal sternite.

Pison ignavum Turner.

Pison ignavum Turner: Zool. Soc. London, Proc., pp. 511-512, 1908.

Hivaoa: Atuona, March 9, 1930, 1 male; Atuona Valley, March 9, 1930, 7 females; Mumford and Adamson.

Tahuata: Hanamiai Valley, altitude 500 to 1,000 feet, May 28, 1930, 1 female; Vaitahu Village, May 29, 1930, 1 female; Hanatetena Valley, altitude 400 feet, July 28, 1930, 1 female; LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, September 26, 1930, 1 female, LeBronnec.

Nukuhiva: Tovii [Toovii], altitude 2,500 feet, August 4, 1931, 2 females, LeBronnec and H. Tauraa.

A female with spider prey (Attidae) taken at Atuona Village, Hivaoa, August 4, 1929, and another on April 6, 1930, Mumford and Adamson.

Previously recorded from Australia, Fiji, Samoa, Society Islands.

Although originally described as an independent species, it has more lately been regarded as a subspecies of *P. argentatum.* It is quite specifically distinct from *P. argentatum* from Hawaii in having the clypeus in the female slightly bilobed—by reason of its median marginal depression—, in the coarser puncturation and propodial striae, and in being less sericeous than *P. argentatum.*

Its nesting habits are about as in *P. argentatum.*

Pison impunctatum Turner.

Pison impunctatum Turner: Ann. Mag. Nat. Hist., 8th ser., vol. 9, pp. 200-201, 1912 (female, New Guinea).

This species was not taken by the Pacific Entomological Survey. It was secured in 1925 on Hivaoa and Fatuhiva on the St. George Expedition.[43]

Recorded also from New Guinea and the Society Islands.

Allied to *P. iridipenne.*

[43] Cheesman, L. E., A contribution towards the insect fauna of French Oceania, pt. 2: Ann. Mag. Nat. Hist., 10th ser., vol. 1, p. 176, 1928.

ANTS OF THE MARQUESAS ISLANDS *

By

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MUSEUM OF COMPARATIVE ZOOLOGY, HARVARD UNIVERSITY

INTRODUCTION

For many years our knowledge of the ants of the Marquesas and Society Islands has consisted of a few records from the latter [44] and some scattered references in myrmecological literature. Recently L. E. Cheesman and W. C. Crawley have published a much more extensive account [45] of the ant fauna of both the Marquesas and Society Islands, based on material collected by Cheesman in 1925. Their list comprises 25 different forms. A considerable collection of ants, amassed by E. P. Mumford and A. M. Adamson and their assistants while engaged in making a general entomological survey of the two island groups, and sent me for study, adds materially to the list of forms previously known and to our knowledge of their distribution. In this collection I am able to recognize 28 different forms, 13 of which have not before been recorded from the Marquesas and Society Islands. Nine others, which are cited in the Cheesman-Crawley list, are not represented in the series taken by Mumford and Adamson. The 16 forms common to both collections are nearly all tropicopolitan vagabond species well known from other small islands in the Pacific. Comparing the fauna of the two archipelagos, we find that of the total number (38) of distinct forms, 15 which are found in the Society Islands have not been taken in the Marquesas. From the Marquesas 4 are known which have not been taken in Society Islands, and 19 are common to both archipelagoes. This last group consists very largely of the vagrants, which are known to have a wide distribution throughout the tropics of the Old World or even of both hemispheres. A single species, *Lasius* (*Acanthomyops*) *claviger* Roger, seems to be clearly a recent and probably evanescent importation by commerce from the United States. All the forms cited in the following list are small or very small ants, the fecundated females of which might have been transported to the islands by violent winds or as stowaways in native canoes, on logs, or on other flotsam and jetsam.

An account of the collection made by the Pacific Entomological Survey

[44] Wheeler, W. M., The ants of Moorea, Society Islands: Am. Mus. Nat. Hist., Bull. 24, pp. 165-167, 1908.

[45] Cheesman, L. E., and Crawley, W. C., A contribution towards the insect fauna of French Oceania, part 3, Formicidae: Ann. Mag. Nat. Hist. (10), 2 p. 514, 1928.

* Pacific Entomological Survey Publication I, article 16, issued November 20, 1932.

in Society Islands will form the subject of a separate paper which will be published by Bernice P. Bishop Museum.

FAMILY FORMICIDAE

SUBFAMILY PONERINAE

Ponera perkinsi Forel.

Recorded by Cheesman and Crawley from Fatuhiva.

Ponera species.

Tahuata: Vaitahu, seashore, ♂, LeBronnec and Tauraa.

A single specimen which I am unable to identify without the worker or female.

SUBFAMILY MYRMICINAE

Pheidole megacephala (Fabricius).

Hivaoa: Vaiepoepo, altitude 2,430 feet, 2 ☿, Mumford and Adamson; Aimoa, altitude 1,660 feet, ♂ ☿, Mumford and Adamson; Mount Ootua, altitude 2,800 feet, 2 ☿ ♀ ♂, Mumford and Adamson; Tapeata, east slope of Mount Ootua, altitude 2,500 feet, ☿, Mumford and Adamson; Anatikaue, altitude, 1,750 feet, ☿, Mumford and Adamson; Tepuna, altitude 3,010 feet, in sweepings, ☿, Mumford and Adamson; Hanahaka [Tanaeka] Valley, altitude 1,100 and 1,450 feet, dry slope, ☿ ♀, Mumford and Adamson; Kopaafaa, altitude 2,770 feet, in sweepings, 2 ☿, Mumford and Adamson; Mount Temetiu, altitude 2,600 and 3,500 feet, in sweepings, 2 ☿, Mumford and Adamson; Atuona, low level, ♀ ♀, Mumford and Adamson; Atuona Valley, altitude 330 feet, ☿, Mumford and Adamson; Tahauku, ☿, Mumford and Adamson.

Tahuata: Tehue Valley, altitude 650 feet, in dead trunk of *Inocarpus edulis,* 2 ☿, LeBronnec and H. Tauraa; Hanamiai Valley, altitude 500 feet, 2 ☿, LeBronnec and H. Tauraa; Hanahevane Valley, sea level, ☿, LeBronnec and H. Tauraa; Vaitupaahei, altitude 200 and 2,400 feet, in dead fern stipes, 2 ☿, LeBronnec and H. Tauraa; Amatea, altitude 2,500 feet, in dead log, 2 ☿, LeBronnec and H. Tauraa; Tehue, Vaitahu Valley, altitude 150 feet, 2 ☿, LeBronnec and H. Tauraa.

Fatuhiva: Ihiota, Hanavave Valley, altitude 600 feet, in rotten fruit of *Inocarpus edulis* and in sweepings, ☿ ♀, LeBronnec; Teaotu, Hanavave Valley, altitude 700 feet, on *Eugenia* species, ☿, LeBronnec; Omoa [Oomoa] Valley, ☿, LeBronnec.

Mohotani: above Anaoa, altitude 160 to 650 feet, in sweepings, ☿, Adamson; west side of island, altitude 975 feet, ☿, Adamson.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 1,800 feet, under bark of *Hibiscus tiliaceus*; at 2,500 feet, nesting in *Metrosideros collina,* ♀ ♂ ☿, Mumford and Adamson; Tapuaooa, altitude 3,100 feet, ☿, Mumford and Adamson; Tauamaka, altitude 2,900 feet, nesting in *Metrosideros collina,* ♀ ☿, Mumford and Adamson; Taiohae, ♀ ☿, Mumford and Adamson.

Uahuka: Hanatea Valley, altitude 100 feet, ♀ ☿ ♀, LeBronnec and H. Tauraa; Vaipaee Valley, altitude 150 and 270 feet, ♀ ☿, LeBronnec and H. Tauraa; Vaitiake, altitude 1,000 feet, ♀ ☿ ♀ ♂, LeBronnec and H. Tauraa; Hanatekeo, Hane Valley, altitude 600 feet, in dead log of *Hibiscus tiliaceus,* ☿, LeBronnec and H. Tauraa; Penau, altitude 2,000 feet, ♂, LeBronnec and H. Tauraa; Haahue Valley, elevation 90 feet, in dead log of *Pisonia* species, ♀ ☿ ♀, LeBronnec and H. Tauraa; Teanatuhiva, altitude 300 feet, ♀ ☿ ♀, LeBronnec and H. Tauraa; Tahoatikikau, altitude 780 feet, ♀ ☿, LeBronnec and H. Tauraa; Teuaei, altitude 350 feet, ♀ ☿ ♀ ♂, native collector; Teavamataiki, altitude 730 feet, ☿, LeBronnec and H. Tauraa.

Uapou: Hakahetau Valley, altitude 1,200, 1,500, and 2,000 feet, in dead log, ☿, Adamson.

Eiao: on *Pandanus,* ☿, Adamson.

This tropicopolitan ant seems to be rare in Society Islands, but is abundant and widely distributed in the Marquesas. Cheesman and Crawley also record it as abundant in the Marquesas (Hivaoa, Fatuhiva, and Nukuhiva), but not from Society Islands. Mr. Adamson writes me that it "appears to be as destructive in the Marquesas as it is in the Hawaiian islands, and unfortunately it extends its range up to the highest elevations in the Marquesas, though at 3,000 feet its numbers begin to diminish."

Pheidole umbonata Mayr.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1,600 feet, ♀ ☿, LeBronnec.

Pheidole oceanica Mayr.

Mohotani: altitude 700 feet, ♀ ☿, LeBronnec and H. Tauraa.

Uahuka: Hanatekeo, altitude 950 feet, in dead guava stem, ♀ ☿, LeBronnec and H. Tauraa.

Recorded also by Cheesman and Crawley from Fatuhiva.

Pheidole (Pheidolacanthinus) sexspinosa Mayr, subspecies **adamsoni,** new subspecies.

Soldier

Differing from the typical *P. sexspinosa* in the decidedly deeper transverse occipital impression of the head, in having the dorsal surface of the thorax smoother and more shining, and in coloration, the body being black, with castaneous mandibles, scapes and

gaster, the funiculi and femora paler and somewhat more reddish brown, the tibiae, tarsi, and tip of terminal antennal joint brownish ivory yellow. The head is opaque above, with the coarsely reticulate-rugose occipital lobes shining, the gaster smooth and shining, except the base of the first segment which is subopaque, shagreened and sparsely foveolate.

Worker

Differing from the worker of the typical *P. sexspinosa* in having the head behind distinctly narrower and more rounded. The surface of the head and thorax is smoother and more shining above, the rugae on the front obsolescent, and the sides of the front are finely and densely punctulate. Color as in the soldier, except that the base of the first gastric segment is ivory yellow or whitish.

Female

Length 4.5 mm. Head resembling that of the soldier but shorter, nearly square, slightly broader than long, without transverse occipital impression. Ocelli rather widely separated. Thorax short and broad, pronotum with sharply, rectangularly dentate humeri representing the spines of the soldier. Mesonotum broadly, transversely elliptical, only slightly depressed; epinotum short, concave, and sloping in the middle, with strong acute spines feebly deflected at their tips. Petiole with a median angular ventral projection, the node shaped much as in the soldier, with entire superior border; postpetiole considerably broader, laterally produced as stout, blunt conules, ventrally with a pronounced projection. Gaster suboblong. Legs stout, with incrassated femora. Sculpture like that of the soldier but mesonotum anteriorly with transverse, posteriorly with longitudinal rugules, the latter converging to the mid-dorsal line. Color like that of the soldier. Wings greyish hyaline, veins pale yellow, pterostigma brown.

Male

Length 3.6 mm. Very similar in form to the males of other species of *Pheidole*. Antennal scapes very slender, only twice as long as broad, funiculus thicker, its first joint large and globular, remaining joints longer than broad. Pronotum and epinotum unarmed, mesonotum broader than long, very convex anteriorly, base of epinotum sloping, as long as the declivity. Petiolar node low and rounded, postpetiole as long as broad, rounded in front. Legs slender, the hind tibiae distinctly bowed. Head finely punctate-rugulose, subopaque, remainder of body smooth and shining. Hairs yellowish, delicate, short, more abundant than in the soldier and female, oblique and subappressed on the legs. Brown; head, mesonotum, scutellum, coxae and middle portion of femora darker; mandibles, clypeus, antennae, tibiae and tarsi sordid yellow; wings as in the female but with paler veins and pterostigma.

Described from numerous soldiers and workers, three males, and one female belonging to a single colony taken by LeBronnec in a dead log of *Pandanus* at Vaikoao, Omoa [Oomoa] Valley, Fatuhiva, at an altitude of 1,600 feet. Several workers of the same subspecies were taken by Adamson at Papeari, Tahiti, Society Islands.

This subspecies is much darker than the Papuan subspecies *biroi* Emery and the variety *fuscescens* Emery. Of the undescribed female of the typical *P. sexspinosa* I possess two specimens from Apia, Samoa (H. Swale) and one from the Solomon Islands (W. M. Mann). They are brownish ferruginous with the gaster dark brown and have the mesonotum longitudinally rugulose throughout. The superior border of the petiolar node is rather deeply excised in the middle.

Cardiocondyla nuda (Mayr).

Fatuhiva: Omoa [Oomoa] Valley, ☿, clearly belonging to the typical form of the species, LeBronnec.

Cardiocondyla nuda, subspecies **nereis** Wheeler.

Hivaoa: plateau above Atuona, altitude 1,200 feet, ☿, Mumford and Adamson; Matauuna, altitude 3,700 feet, ☿, Mumford and Adamson; Hanaheka [Tanaeka] Valley, altitude 1,450 feet, dry slopes, ☿ ♀, Mumford and Adamson; Teava Uhia i te Kohu, altitude 2,100 feet, ☿ ♀, Mumford and Adamson; Tapeata, east slope of Mount Ootua, altitude 2,500 feet, ☿, Mumford and Adamson; Anatikaue, altitude, 1,750 feet, ☿, Mumford and Adamson; Kopaafaa, altitude 2,770 feet, ☿ ♀, Mumford and Adamson; Atuona, altitude 330 feet, ☿, Mumford and Adamson; Tahauku, near shore, ♀, Mumford and Adamson.

Tahuata: Hanahevane Valley, altitude 150 feet, ☿, LeBronnec and H. Tauraa.

Fatuhiva: Ihiota, Hanavave Valley, altitude 600 feet, in sweepings, ♀, LeBronnec; Ahuava, altitude 1,800 feet, sweeping over *Paspalum conjugatum,* ☿, LeBronnec; Uia [Ouia] Valley, near sea level, ☿, LeBronnec; Omoa [Oomoa] Valley, ☿, LeBronnec.

Mohotani: altitude 975 feet, ☿ ♂, Adamson.

Nukuhiva: Ooumu, altitude 3,700 feet, on shrub, ☿, Mumford and Adamson.

Uahuka: Teanatuhiva, altitude 300 feet, ☿ ♀, LeBronnec and H. Tauraa; Vaipiha, altitude 1,770 feet, ☿ ♀, LeBronnec and H. Tauraa.

Eiao: in sweepings, altitude 1,450 feet, ☿, A. M. Adamson.

Originally described from Norfolk Island. Like the variety *minutior* Forel of Hawaii, it is decidedly smaller than the typical *C. nuda,* but the surface of the body of the worker and female is smoother and more shining.

Monomorium pharaonis (Linnaeus).

Uahuka: Haavei Valley, altitude 10 feet, ☿, LeBronnec and H. Tauraa.

Monomorium minutum Mayr, variety **liliuokalani** Forel.

Uahuka: crest of north ridge, in sweepings, ☿, A. M. Adamson.

Tetramorium guineense (Fabricius).

Hivaoa: Atuona Valley, altitude 325 feet, in dead banana leaves, ☿, Mumford and Adamson.

Tahuata: Hanamiai Valley, altitude 500 feet, ☿ ♀ ♂, LeBronnec and H. Tauraa.

Fatuhiva: Teaotu, Hanavave Valley, altitude 1,000 feet, ☿, LeBronnec.

Mohotani: northern part, altitude 200 feet, ☿, LeBronnec and H. Tauraa.

Uahuka: Teanatuhiva, altitude 300 feet, ☿, LeBronnec and H. Tauraa; Teaua Islet, off Uahuka, ☿, A. M. Adamson.

Eiao: near middle of island, altitude 1,450 feet, ☿, A. M. Adamson.

Recorded also by Cheesman and Crawley from Nukuhiva and Fatuhiva.

Tetramorium pacificum Mayr.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1,600 feet, ☿, LeBronnec; Punahitahi, Omoa [Oomoa] Valley, altitude 650 feet, ☿, LeBronnec; Ahuava, altitude 1,840 feet, ☿, LeBronnec; ridge east of Omoa [Oomoa] Valley, altitude 3,000 feet, ☿, LeBronnec.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2,500 feet, under bark of *Hibiscus tiliaceus,* ☿, LeBronnec.

Tetramorium simillimum (F. Smith).

Fatuuku: altitude 860 feet, ☿, H. Tauraa.

Tetramorium tonganum Mayr.

Hivaoa: Aimoa, altitude 1,515 and 1,600 feet, under dead bark of *Pandanus,* ☿, Mumford and Adamson; Atuona, altitude about 300 feet, nesting in dead trunk of *Inocarpus edulis,* ☿, Mumford and Adamson.

Fatuhiva: Ihiota, Hanavave Valley, altitude 600 feet, ☿ ♀, LeBronnec.

Also recorded by Cheesman and Crawley from Nukuhiva.

The female of this species was described by Santschi from a deälated Samoan specimen with only a single ocellus, the median, which was greatly enlarged. That this was an anomaly, as Santschi suspected, is shown by the two females from Fatuhiva and Moorea, which have three normal ocelli, each with a dark spot at its mesial border. The wings of the female are greyish hyaline, with colorless veins and pterostigma.

Strumigenys (Cephaloxys) inezi Forel, subspecies **mumfordi,** new subspecies.

Worker

Length about 1 mm. Even smaller than the variety *taipingensis* Forel from Malacca, but very similar in form and proportions. Erect club-shaped hairs on the abdomen longer; head covered with evenly-spaced, white, squamiform hairs, which are decidedly coarser than those on the clypeus. Gaster shagreened, only slightly shining, the basal half of the first segment dark brown.

Uapou: Hakahetau Valley, 1 specimen, altitude 2,500 feet, A. M. Adamson.

Nukuhiva: Ooumu, altitude 4,050 feet, 1 specimen, Mumford and Adamson.

SUBFAMILY DOLICHODERINAE

Tapinoma (**Micromyrma**) **melanocephalum** (Fabricius), variety **australe** Santschi.

Uahuka: Teanatuhiva, altitude 300 feet, ☿, LeBronnec and H. Tauraa.

Eiao: ☿, A. M. Adamson.

Hatutu [Hatutaa]: altitude 1,010 feet, on *Pisonia* species, ☿ A. M. Adamson.

Technomyrmex albipes (F. Smith).

Hivaoa: Aimoa, altitude 1,515 feet, nesting under dead bark, ☿ ♂, Mumford and Adamson; Atuona Valley, altitude 100 feet, ☿, Mumford and Adamson; Mount Temetiu, altitude 2,440 feet, on *Freycinetia,* ☿, Mumford and Adamson; Mount Temetiu, altitude 1,990 feet, in dried stipes of *Angiopteris* species, ☿ ♀, Mumford and Adamson; Mounaofefe, altitude 2,000 feet, on *Premna tahitensis,* ☿, Mumford and Adamson; Matauuna, altitude 3,760 feet, in sweepings, ☿, Mumford and Adamson.

Tahuata: Hanamiai Valley, altitude 1,200 feet, ♀ ♂, LeBronnec and H. Tauraa; Faanui Valley, altitude 1,500 feet, ☿, LeBronnec and H. Tauraa.

Fatuhiva: Ahuava, altitude 1,840 feet, in dry *Angiopteris* stalk, ☿, LeBronnec; Uia [Ouia] Valley, altitude 100 feet, ☿ ♀, LeBronnec; Vaikoao, Omoa [Oomoa] Valley, altitude 1,600 feet, 1,000 to 1,600 feet in dried fern stalks, ☿, LeBronnec; Teavaipuhiau, altitude 2,150 feet, ☿, LeBronnec: Punahitahi, Omoa [Oomoa] Valley, altitude 650 feet, ☿, LeBronnec; Teavaione Valley, altitude 1,700 feet, ☿, LeBronnec.

Mohotani: altitude 975 feet, on *Miscanthus floridulus,* ☿, A. M. Adamson; above Anaoa, altitude 160 to 650 feet, in sweepings, ☿, A. M. Adamson; altitude 700 feet, in dead log of *Cordia subcordata,* ☿ ♂, LeBronnec and H. Tauraa; altitude 1,000 feet, in dead log of *Pisonia* species, ☿, LeBronnec and H. Tauraa.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2,000 feet, ♂, Mumford and Adamson.

Uahuka: crest of north range, altitude 2,350 feet, nesting in fern stipes, ☿, A. M. Adamson; Penau, altitude 2,000 feet, in dead leaf of *Pandanus,* ♀, LeBronnec and H. Tauraa; Hanatekeo, Hane Valley, altitude 1,100 feet, in dead stipes of *Angiopteris,* ☿, LeBronnec and H. Tauraa.

Eiao: uplands to north east end of east side, altitude 1,850 feet, on *Hibiscus tiliaceus,* ☿, Adamson; uplands toward north end of east side, altitude 1,660 feet, on *Pandanus,* ☿, A. M. Adamson.

Technomyrmex albipes, variety **vitiensis** Mann.

Cheesman and Crawley identify some of their specimens from Tahiti and

from Nukuhiva, Hivaoa, and Fatuhiva in the Marquesas as belonging to this Fijian and Samoan variety. All the specimens taken by Mumford and Adamson are very constant and seem to me to be referable to the typical form of the species.

SUBFAMILY FORMICINAE

Anoplolepis longipes (Jerdon).

Hivaoa: Atuona Valley, altitude 100 feet, ☿, Mumford and Adamson.

Tahuata: Vaitahu Valley, altitude 100 to 150 feet, ☿, LeBronnec and H. Tauraa; Hanamiai Valley, altitude 500 feet, ☿, LeBronnec and H. Tauraa.

Fatuhiva: Hanavave Valley, altitude 50 feet, ☿, LeBronnec: Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, ☿, LeBronnec; Uia [Ouia] Valley, sea level, ☿, LeBronnec.

Uahuka: Putatauua, Vaipaee [Vaipae] Valley, on banana leaves, ☿, A. M. Adamson; Hanatekeo, altitude 950 feet, ☿ ♀, LeBronnec and H. Tauraa; Vaipiha, altitude 1,770 feet, ☿, LeBronnec and H. Tauraa; Vaikivi Valley, altitude 1,150 feet, ☿, LeBronnec and H. Tauraa; Tauheeputo, altitude 1,770 feet, on *Sida* species, ☿, LeBronnec and H. Tauraa.

Eiao: above Vaituha, altitude 1,150 and 1,200 feet, under stones, ☿, A. M. Adamson.

Cheesman and Crawley mentioned this ant as abundant on all the islands visited in the Marquesas.

Plagiolepis mactavishi Wheeler.

Hivaoa: Hanaheka [Tanaeka] Valley, altitude 1,100 feet, ☿, Mumford and Adamson; Atuona, altitude 1,200 feet, ☿, Mumford and Adamson; plateau above Atuona, altitude 1,000 feet, ☿, Mumford and Adamson; Vaioa, altitude 1,800 feet, under bark of *Hibiscus tiliaceus,* ☿, Mumford and Adamson; Vaioa, altitude 1,200 feet, nesting in hollow stem of *Piper latifolium,* ☿ ♀, Mumford and Adamson.

This ant, originally described from Moorea, is found also in Hawaii. It was taken also by Miss Cheesman on Tahuata.

Paratrechina longicornis (Latreille).

Mohotani: north part, altitude 200 and 300 feet, ☿, LeBronnec and H. Tauraa; altitude 300 feet, under stone, ☿ ♀, LeBronnec and H. Tauraa; north region, altitude 400 feet, on *Melochia velutina,* ☿.

Uahuka: altitude 250 feet, ☿, LeBronnec and H. Tauraa.

Uapou: altitude about 500 feet, in dead trunk of "noni," ☿, Whitten.

Eiao: in coconut plantation, altitude 1,450 feet, ☿, Adamson.

Recorded also by Cheesman and Crawley from Tahuata.

Paratrechina (Nylanderia) vaga (Forel), variety **crassipilis** Santschi.

Hivaoa: Tapeata, east slope of Mount Ootua, altitude 2,500 feet, ♂, Mumford and Adamson; Anatikaue, altitude 1,750 feet, ☿, Mumford and Adamson; Atuona Valley, altitude 325 feet, in dead banana leaves, ☿, Mumford and Adamson; Pouau, ☿, Mumford and Adamson; Teava Uhia i te Kohu, altitude 2,100 feet, swept from *Paspalum conjugatum*, ♂, Mumford and Adamson.

Tahuata: Faanui Valley, altitude 1,500 feet, ☿, LeBronnec and H. Tauraa; Hanamiai Valley, altitude 1,500 feet, ♂, LeBronnec and H. Tauraa.

Fatuhiva: Ihiota, Hanavave Valley, altitude 460 feet, ☿, LeBronnec; Omoa [Oomoa] Valley, ☿, LeBronnec; Teavai, Omoa [Oomoa] Valley, altitude 1,700 feet, ♀, LeBronnec; Vaikoao, Omoa [Oomoa] Valley, altitude 1,600 feet, ♀ ♂, LeBronnec.

Nukuhiva: Tapuaooa, ♀, Mumford and Adamson; Teuanui, Toovii, ☿ ♀, Mumford and Adamson.

Uahuka: Putatauua, Vaipaee Valley, altitude 880 feet, ☿, Adamson.

Paratrechina (Nylanderia) bourbonica (Forel), subspecies **bengalensis** (Forel).

Tahuata: Vaitahu Valley, seashore, at light, ♂, LeBronnec and H. Tauraa; Amatea, altitude 2,700 feet, ♂, LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, ☿, LeBronnec; Hanavave Valley, altitude 50 feet, ☿, LeBronnec; Uia [Ouia] Valley, sea level, ☿, LeBronnec.

Cheesman and Crawley also record this ant from Nukuhiva, Tahuata, and Fatuhiva.

NEW MARQUESAN THYSANOPTERA *

By

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TEREBRANTIA HALIDAY

SUPERFAMILY THRIPOIDEA HOOD, 1915

FAMILY THRIPIDAE UZEL, 1895

SUBFAMILY THRIPINAE KARNY, 1921

Genus **ISONEUROTHRIPS** Bagnall: Ann. Mag. Nat. Hist., vol. 15, p. 592, 1915.

Isoneurothrips brevicornis, new species (fig. 44, *a-c*).

Female holotype

Body uniformly dark brown. Antennae dark brown except the extreme base and apex of the third and fourth segments, which are lighter. Legs dark brown except all tarsi and fore tibiae, which are light yellowish brown. Wings uniformly dark brown. Eyes black. Body spines dark.

Total body length, 1.245 mm.; head length, 0.120 mm., width, 0.195 mm.; prothorax length, 0.150 mm. and width, 0.232 mm.; pterothorax length, 0.300 mm., width, 0.330 mm.; abdomen, greatest width, 0.335 mm. Segments of antennae, length (width) in microns: first, 20 (32); second, 40 (32); third, 48 (28); fourth, 52 (29); fifth, 32 (29); sixth, 48 (30); seventh, 16 (10); total length, 260. Length of spines in microns: interocellar, 24; on posterior angles of prothorax, outer, 88, inner, 88; inner pair on posterior margin, 32; on metanotum, outer pair, 28, inner pair, 60; on ninth abdominal segment, inner, 104 to 112, outer, 122 to 140; on tenth abdominal segment, 102 to 114.

Head much broader than long, not rounded in front, cheeks arched and roughened along edges, surface behind eyes with only two rows of cross striations at posterior part of head. Interocellar spines small, placed outside of ocellar triangle along sides of anterior ocellus, a row of five spines behind each eye, the outer one of which is prominent, the second very small, the third large, the fourth small like the second, and the inner one large. Eyes large, strongly protruding, occupying over half of head's length. Ocelli large, twice as large as facets of eye, posterior pair placed far apart, contiguous to eyes and slightly anterior to a line connecting the posterior margins of the eyes. Mouth cone short and blunt, reaching only to posterior margin of prosternum. Antennae short and stout, with short, stocky segments, only slightly more than twice as long as head.

* Pacific Entomological Survey Publication I, article 17, issued November 20, 1932.

Prothorax broadly quadrangular with sides only slightly rounded. Pronotum without cross-striations, with only two long setae in the median area and with a row of four or five small setae along each lateral margin. Spines on posterior angles of the prothorax long and equal in length, two spines on each side along the posterior margin. Median spines on metanotum placed approximately 12 μ behind anterior margin. Pterothorax with sides rounded, metanotum reticulated. Legs strong, well developed, with many spines, posterior tibiae with a series of 8 stout spines on the inner side. Wings fully developed. Spines on veins of fore wings evenly spaced as follows: costa, 25 to 26; fore vein, 15; hind vein, 14 to 15.

Abdomen broad, narrowed at apex, eighth segment without comb. Spines on ninth and tenth abdominal segments strong.

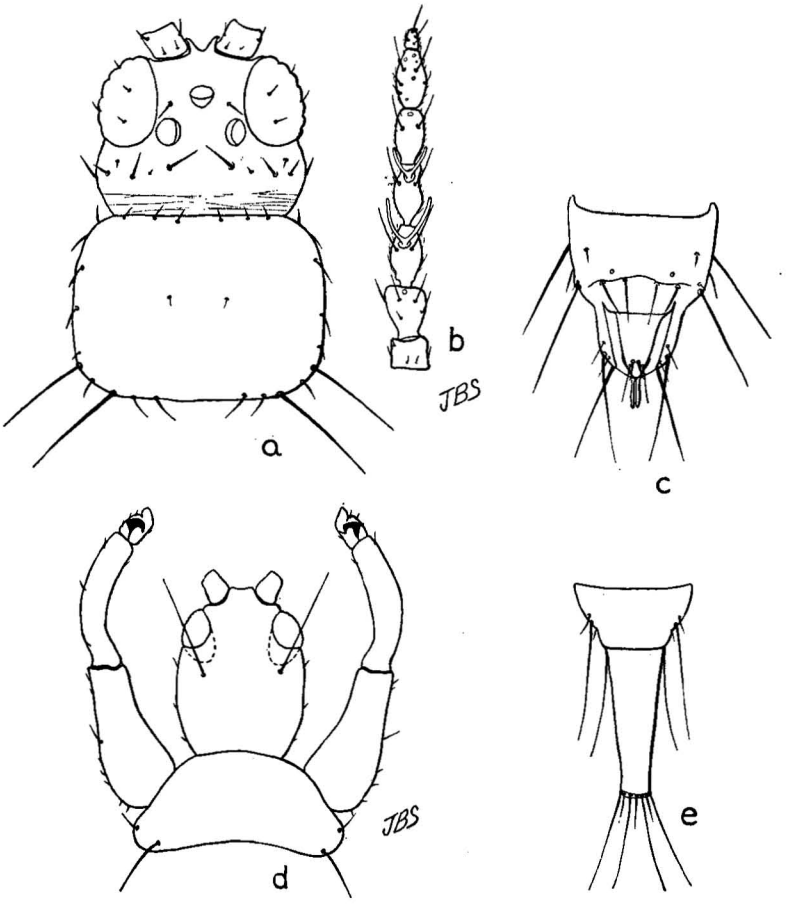

FIGURE 44. *Isoneurothrips brevicornis,* new species, and *Bolothrips nigra,* new species: *a,* head and prothorax of female, *I. brevicornis; b,* right antenna of female, *I. brevicornis; c,* end of abdomen of male, *I. brevicornis; d,* head and prothorax, *B. nigra; 3,* end of abdomen, *B. nigra.*

Male allotype

Colored as in female. Total body length, 1.020 mm.; head length, 0.112 mm., width, 0.180 mm.; prothorax length, 0.120 mm., width, 0.210 mm.; pterothorax length, 0.270 mm., width, 0.285 mm.; greatest width of abdomen, 0.225 mm.; total length of antenna, 0.247 mm. Length of spines: interocellar, 30 μ; spines on posterior angles of prothorax, 68 μ to 76 μ; outer spines on ninth abdominal segment, 76 μ, on tenth segment, 88 μ.

Similar to female in appearance and form except for smaller size. Abdominal segments 2 to 6 with oval-shaped clear areas on the sternites which increase in size from the second to the sixth, segment 9 with a transverse row of four median dorsal spines, each about 32 μ long.

Hivaoa: Matauuna, elevation 3,900 feet, April 14, 1930, female holotype, male allotype, 5 female paratypes, 1 male paratype, all on *Reynoldsia* species, Mumford and Adamson. Type, B. P. Bishop Museum, Moulton no. 4196.

The dark color of the body and antennae with uniformly dark wings and the short, stocky antennae distinguish this species from all other described species except *I. antennatus* Moulton, *I. fullawayi* Moulton and *I. jenseni* Karny, but *I. brevicornis* can be distinguished from these as follows: *I. antennatus* has strong interocellar spines which are placed between the posterior ocelli, long slender antennae about three times as long as the head, fore vein of fore wing with 21 spines and a complete comb on the posterior margin of abdominal segment 8; *I. fullawayi* has strong interocellar spines which are placed between the posterior ocelli, the fore vein of the fore wing with 18 to 21 spines, and a complete comb on the posterior margin of the eighth abdominal segment; *I. jenseni* is a smaller species, only 0.8 mm. to 0.9 mm. long, the fore wings clear in the basal fourth or fifth, and the pronotum set with short setae.

TUBULIFERA Haliday

Superfamily PHLOEOTHRIPOIDEA Hood, 1915

Family PHLOEOTHRIPIDAE Uzel, 1895

Subfamily MEGATHRIPINAE Priesner, 1927.

Tribe COMPSOTHRIPINI Priesner, 1927.

Genus **BOLOTHRIPS** Priesner, Die Jugendstadien der malayischen Thysanopteren: Treubia, vol. 8, Supplement, p. 90, 1926. Thysanoptera of Europe, p. 684, 1927.

Bolothrips nigra, new species (fig. 44, *d, e*).

Holotype (sex undetermined)

Body color dark blackish brown. Antennae concolorous with body, except extreme base of segment 3, and tips of 3 and 4 which are yellowish brown. Legs concolorous

with body except all tarsi, which are slightly lighter. Eyes dark purplish black with outer margins yellowish white. Body spines brown.

Total body length, 2.025 mm.; head length, 0.285 mm., width, 0.240 mm.; prothorax length, 0.165 mm., width, 0.360 mm.; mesothorax length, 0.210 mm., width, 0.355 mm.; abdomen, greatest width, 0.525 mm.; tube length, 0.232 mm., width, 0.097 mm. Antennal segments: length (width) in microns: first, 40 (52); second, 49 (36); third, 84 (36); fourth, 92 (38); fifth, 80 (36); sixth, 72 (32); seventh, 48 (20); eighth, 38 (18); total length, 0.510 mm. Eye length dorsally, 0.075 mm., ventrally, 0.098 mm. Length of spines in microns: interocellar, 28; postocular, 133; anterior angles of prothorax, 32; posterior angles of prothorax, 100; ninth abdominal segment, 124; tenth segment, outer, 192, inner, 160; end of tube, longer, 160, shorter, 60.

Head rounded in front with cheeks arched, somewhat narrowed posteriorly. Interocellar spines small and indistinct, postoculars long and pointed. Cheeks with three or four short, pointed spines. Eyes small, slightly protruding, occupying about 0.26 of head dorsally, and extending ventrally as characteristic of the genus, so that about 0.34 of the head length is occupied ventrally. Ocelli not discernible. Mouth cone short, reaching to posterior margin of prosternum and rounded at tip.

Antenna 8-segmented with segment 8 separated from 7. Two slender sense cones on segment 3, four sense cones on segment 4, and two sense cones on segment 5.

Prothorax narrowed anteriorly with posterior angles broadly rounded, spines on anterior angles small, those on posterior angles longer, all pointed. Legs moderately stout, fore femora enlarged, fore tarsi bearing a large claw. Wings absent.

Abdomen elongate ovate, tube 0.8 length of head, segments 5 to 10 bearing long pointed spines.

Hivaoa: Mount Temetiu, elevation 3,620 feet, July 24, 1929, Mumford and Adamson. Types, B. P. Bishop Museum, Moulton no. 4204.

This species is distinguished by its uniformly dark body color, dark antennae, and prominent brown spines on the abdomen. It is close to *B. brachyurus* (Bagnall) in color, but the tube of *B. brachyurus* is short and stout, 190 μ long and 100 μ wide at base, compared with the elongate tube of *B. nigra* which is 232 μ long and 97 μ wide at the base. Also the postocular bristles of *B. brachyurus* are fine and short, only about as long as the eye, 67 μ, whereas those of *B. nigra* are much longer than the eye, 133 μ.

KALOTERMES (GLYPTOTERMES) JUDDI: A NEW SPECIES OF TERMITE FROM THE MARQUESAS ISLANDS*

By

S. F. LIGHT

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I have already identified seven species of termites in the Pacific Entomological Survey collections from the Marquesas; of these, three were described as new. In examining subsequent collections from the Survey I have discovered a fourth new species, *Kalotermes (Glyptotermes) juddi,* which I take pleasure in naming after Albert F. Judd, President of the Board of Trustees of Bernice P. Bishop Museum.

Kalotermes (Glyptotermes) juddi, new species.

Imago unknown.

Soldier

Head light brown, body and legs pale dirty yellow-brown; small, head about 1.05 mm. wide; head narrow, somewhat elongated, sides only faintly convex, not convergent, head index about 0.80 mm.; frons sloping at an angle of about 45 degrees, faintly but broadly excavate, not set off laterally and behind by sharp ridges as in *K. (G.) xantholabrum* Hill. Pronotum much as in *K. (G.) xantholabrum* save perhaps more distinctly emarginate behind. A sparse set of long reddish hairs, longer than in *K. (G.) xantholabrum.* Otherwise much as in that species.

Head width	1.05 mm.
Head capsule, length	1.20 mm.
Head with mandibles, length	1.86 mm.
Pronotum, length	0.55 mm.
Pronotum, width	1.05 mm.
Head index	0.80 mm.
Pronotal index	0.52 mm.

Nymph

Not noticeably different from *K. (G.) xantholabrum* Hill.

Uahuka: Tehaevea, Hane Valley, altitude 500 feet, February 27, 1931, soldier and numerous nymphs, from dead wood of *Calophyllum inophyllum,* LeBronnec and H. Tauraa.

This species is close to *K. (G.) xantholabrum* Hill[46] and later collections may show them to intergrade. At present, however, it is differentiated by smaller size, by proportionately longer and narrower head, as brought out in

[46] Hill, G. F., Isoptera (Family Termitidae): Insects of Samoa, pt. 7, fasc. 1, p. 13, 1927. Termites from the Australian Region: Nat. Mus. Melbourne, Mem., no. 7, p. 14, 1927.

* Pacific Entomological Survey Publication I, article 18, issued November 22, 1932.

the following measurements of *K.* (*G.*) *xantholabrum,* by the shallower excavation of the frons and its less sharply ridged borders, and by the more pronounced emargination of the posterior border of the pronotum.

Measurements of largest and smallest soldiers, *Kalotermes* (*Glyptotermes*) *xantholabrum* Hill from Tahiti:

Head width	1.14 mm.	1.38 mm.
Head length	1.38 mm.	1.71 mm.
Head length (mandibles crossed)	1.98 mm.	2.34 mm.
Pronotum length	0.54 mm.	0.66 mm.
Pronotum width	1.06 mm.	1.29 mm.
Head index	0.83 mm.	0.85 mm.
Pronotal index	0.51 mm.	0.51 mm.

KEY TO THE MARQUESAN SPECIES OF TERMITES, WITH RECORDS OF HOST PLANTS AND DISTRIBUTION *

By

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In a previous paper[47] the termites collected by the Pacific Entomological Survey in the Marquesas were reported as belonging to seven species, of which three were described as new. Since then several additional collections have been received, all but one of which belong to previously listed species. One, considered to be new, was described as *Kalotermes (Glyptotermes) juddi*[48] in honor of Albert F. Judd, President of the Board of Trustees of Bernice P. Bishop Museum.

It seems worth while at this time to give a working key to the species known from the Marquesas and to give the complete collection records, including localities, the altitude at which taken, the food plants, the dates of collection, and the reproductives collected. The last two items are given since they throw light on the life cycle, particularly as to the time of emergence and swarming of alates.

Key to the Termites of the Marquesas

Alates

1. No fontanel; wing scales large, forewing scale overlapping hindwing scale.....2
   Fontanel present (tiny); wing scales smaller; forewing scale not overlapping hindwing scale.....**Coptotermes pacificus** Light
2. Small species; head about 1 mm. wide; median vein unchitinized, curving up to join radius sector near middle of wing.....3
   Larger species, head more than 1.25 mm. wide; median vein chitinized, close to or coalescent with radius sector.....5
3. Small, head about 0.80 mm. wide without eyes; brown, wings light brown with conspicuous coarse papillations.....**Kalotermes (Cryptotermes) dolei** Light
   Larger, head more than 0.90 mm. wide; yellow to light brown, wings hyaline, papillations inconspicuous.....4
4. Larger, head about 1 mm. wide without the eyes; pronotum less than half as wide as long; wing papillations very fine and inconspicuous.....**Kalotermes (Cryptotermes) piceatus** Snyder
   Smaller, head less than 0.95 mm. wide without eyes; pronotum more than half as long as wide; wing papillations coarse but inconspicuous because hyaline.....**Kalotermes (Cryptotermes) hermsi** Kirby

[47] Light, S. F., Termites from the Marqueses: B. P. Bishop Museum, Bull. 98, Pacific Ent. Survey Pub. I, art. 6, 1932.

[48] Light, S. F., Kalotermes (Glyptotermes) juddi, a new species of termite from the Marquesas Islands: B. P. Bishop Mus., Bull. 98, Pacific Ent. Survey Pub. I, art. 18, 1932.

* Pacific Entomological Survey Publication I, article 19, issued November 22, 1932.

5. Very dark to black; median coalescent with radius sector..... **Kalotermes (Metaneotermes) athertoni** Light
   Lighter, brown to yellow; median separate.....6
6. Very large, head more than 2 mm. wide; median chitinized, running close to radius sector and sending many branches to it..... **Kalotermes (Neotermes) connexus** Snyder
   Smaller, head less than 1.3 mm. wide; median unchitinized, midway between cubitus and radius sector..... **Kalotermes (K.) immigrans** Snyder

(The alate of *K.* (*Glyptotermes*) *juddi* Light is unknown, but may be distinguished by having the median chitinized and lying near the radius sector but without branches to it.)

Soldiers

1. Head yellow, ovate; with large anterior fontanel emitting sticky milky fluid; mandibles smooth..... **Coptotermes pacificus** Light
   Head blackish, brown, red-brown or reddish yellow, subrectangular; without fontanel; mandibles heavily toothed 2
2. Head short, high, approximately cubical, truncated in front with nearly vertical or excavated frons; mandibles weak 3
   Head and mandibles normal 5
3. Larger, anterior half of head marked with conspicuous wrinkles, a conspicuous depression in mid-dorsal region..... **Kalotermes (Cryptotermes) piceatus** Snyder
   Smaller, head not especially rugose and lacking mid-dorsal depression.....4
4. Head about as broad as long with slight median notch; frons overhanging, frontal rim not strongly flaring at sides..... **Kalotermes (Cryptotermes) hermsi** Kirby
   Head clearly longer than broad, frontal rim flaring broadly at sides; deeply notched in center; frons less than vertical..... **Kalotermes (Cryptotermes) dolei** Light
5. Small; head dull brown, usually not more than 1.10 mm. wide; head rather high and box-like with precipitous frons..... **Kalotermes (Glyptotermes) juddi** Light
   Larger; head bright reddish-brown or reddish-yellow, usually more than 1.5 mm. wide; head relatively low, frons with gentle slope.....6
6. Third antennal segment very slightly if at all enlarged; a large species, head usually 2.5 mm. or more in width..... **Kalotermes (Neotermes) connexus** Snyder
   Third antennal segment enlarged and elongated; smaller.....7
7. Pronotum nearly half as long as wide, anteriorly deeply notched; posterior margin nearly straight..... **Kalotermes (K.) immigrans** Snyder
   Pronotum much less than half as wide as long, anterior margin weakly emarginate, posterior margin sinuous..... **Kalotermes (Metaneotermes) athertoni** Light

Collection Records for Termites Taken in the Marquesas Islands

(Place names as on collection labels.)

Island	Locality	Altitude in feet	Date	Food Plant	Remarks
1. *Kalotermes (Neotermes) connexus* Snyder					
Uahuka	Hanatekeo, Hane Valley	1,300	2-25-31	*Aleurites moluccana*	Alates in colony
	Hanatekeo, Hane Valley	1,200	2-25-31	*Hibiscus tiliaceus*	
	Hanatekeo, Hane Valley	1,300	2-25-31	*A. moluccana*	Alates in colony
	Hanatekeo, Hane Valley	920	2-24-31	*H. tiliaceus*	
	Hanatekeo, Hane Valley	800	2-24-31	*H. tiliaceus*	
	Putatauua, Vaipaee Valley	880	9-21-29	*H. tiliaceus*	Pair; incipient colony
	Putatauua, Vaipaee Valley	880	9-21-29	*H. tiliaceus*	Alates in colony
	Putatauua, Vaipaee Valley	880	9-21-29	*H. tiliaceus*	1 dealate
	Vaipaee Valley	270	3- 3-31	*H. tiliaceus*	1 dealate
	Hitikau Ridge	2,300	3- 3-31	*H. tiliaceus*	Alates in colony
	Crest of North Range	2,350	9-23-29	*H. tiliaceus*	
	Haapaoaiki	700	2-27-31	*Pandanus* species	
	Haapaoaiki	700	2-27-31	*H. tiliaceus*	
	Tehaevea, Hane Valley	500	2-27-31	*Callophyllum inophyllum*	
	Hane Ridge	1,570	2-26-31	*Glochidion rhamiflorum*	
	Penau Ridge	2,000	3- 5-31	*H. tiliaceus*	Alates in colony
	Penau Ridge	2,000	3- 5-31	*H. tiliaceus*	2 dealates
Eiao	Towards northeast side	1,850	9-29-29	*H. tiliaceus*	Pair
	Towards northeast side	1,850	9-29-29	*H. tiliaceus*	Pair
	Towards northeast side	1,850	9-29-29	*H. tiliaceus*	Alates in colony
	(None given)	2,000	4-21-31	*H. tiliaceus*	
	Near middle, east side	1,650	9-29-29	*Pandanus* species	
Uapou	Hakahetau Valley	800	12-10-29	Guava (dead trunk)	Alates in colony
	Hakahetau Valley	2,000	12- 6-29	*H. tiliaceus*	1 dealate
	Hakahetau Valley	1,000	12-23-29	Dead *Aleurites moluccana*	
	Hakahetau Valley	1,250	9-16-31	Dead *Aleurites moluccana*	
	Vaikokoo, Paaumea Valley	1,850	11-31-31	*H. tiliaceus*	Alates in colony
	Paaumea Valley	2,500	11-26-31	*H. tiliaceus*	Alates in colony
	Vaihakaatiki, Hakahetau Valley	2,500	11-18-31	Dead *tiliaceus*	
	Teavanui	2,900	11-30-31	Dead *tiliaceus*	Alates in colony
	Koputukea, Hakahetau Valley	1,250	11-16-31	Dead *tiliaceus*	Dealate in colony
Tahuata	Hanateio Valley	635	7-24-30	*Aleurites moluccana*	Alates in colony
	Tutaipuna, Vaitahu Valley	1,400	6-12-30	Dead logs	
	Kiinui	1,210	6-14-30	*H. tiliaceus*	
	Tehue Valley	650	5-27-30	*H. tiliaceus*	
	Amatea	2,100	6-30-30	*H. tiliaceus*	
	Amatea	2,630	6-27-30	*H. tiliaceus*	
	Amatea	2,630	6-27-30	*H. tiliaceus*	
	Hanamiai Valley	500	5-30-30		1 dealate
	Hanamiai Valley	1,500	6- 4-30		1 dealate
	Vaitupaahei	2,400	7- 8-30	*Weinmannia* species	2 dealates

Collection Records for Termites Taken in the Marquesas Islands—*Continued*

(Place names as on collection labels.)

Island	Locality	Altitude in feet	Date	Food Plant	Remarks
Hivaoa	Vaioa	1,200	7-26-29	*H. tiliaceus*	Alates
	Vaioa	1,200	7-26-29	*H. tiliaceus*	1 dealate
	Vaioa	1,200	7-26-29	*H. tiliaceus*	Alates in colony
	Vaioa	1,200	7-26-29	*H. tiliaceus*	Pair; incipient colony
	Vaioa	1,200	7-26-29	*H. tiliaceus*	Alates
	Vaioa	1,200	7-26-29	*H. tiliaceus*	Pair
	Vaioa	1,200	7-26-29	*H. tiliaceus*	Alates in colony
	Vaioa	1,200	7-26-29	*Piper latifolium*	Pair
	Anatuakina	1,525	6- 1-29	*Sapindus saponaria*	Pair
	Tehueto Valley	600	3- 8-29		Alates in colony
	Tehueto Valley	200	3- 8-29		1 dealate
	Tehueto Valley	500	3- 9-29		Alates in colony
	Tehueto Valley	.....	3- 8-29		Alates in colony
	Tenatiaei	3,760	8- 3-29	*Reynoldsia* species	
	Vaiepoepo	2,330	6- 2-29	*H. tiliaceus*	1 dealate
	Vaiepoepo	2,170	6- 2-29	*Pandanus* species	1 dealate
	Matauuna	3,900	3- 3-30	*Sclerotheca* species	
	Matauuna	3,900	3- 3-30	*Cheirophyllum* species	2 dealates
	Teava uhia i te kohu (above Puamau)	2,100	2-15-30	*H. tiliaceus*	Alates and dealates
	Aimoa	500	2-22-29	*H. tiliaceus*	Alates in colony
	Aimoa	500	2-22-29	*H. tiliaceus*	
	Mt. Temetiu	3,620	7-24-28	*Reynoldsia* species	1 dealate
	Pouau	500	3- 5-29		Alates in colony
	Tapeata	750	5-25-29		
Fatuhiva	Ihiota, Hanavave Valley	600	9-10-30	*H. tiliaceus*	2 dealates
	Ihiota, Hanavave Valley	460	9-10-30	*H. tiliaceus*	
	Punahitahi, Oomoa Valley	650	8-18-30	*H. tiliaceus*	
	Otomahe, Oomoa Valley	280	8-20-30	*Carissa grandis*	
	Vaikoao, Oomoa Valley	1,600	8-30-30	*Pandanus* species	
	Vaikoao, Oomoa Valley	1,500	8-30-30	*H. tiliaceus*	
	Tepeia, Oomoa Valley	300	8-16-30	*H. tiliaceus*	
	Teaotu, Hanavave Valley	1,000	9- 2-30	*H. tiliaceus*	
	Teavaione, Oomoa Valley	1,700	8-29-30	*H. tiliaceus*	
Nukuhiva	Taipivai	15	11-20-29	(at light)	1 alate
2. *Kalotermes* (*K.*) *immigrans* Snyder					
Hivaoa	Atuona Valley	100	3- 6-29	Orange tree (*fide* a native)	Dealates and alates
	Atuona Valley	.....	May, 1929	(at light)	Wing
	Atuona Valley	.....	2-15-29	(at light)	Alates
	Atuona Valley	.....	May, 1929	(at light)	Alate and dealates
	Atuona Valley	.....	6- 6-29	(at light)	Alates
	Atuona Valley	.....	2-16-29	(at light)	Alates

Collection Records for Termites Taken in the Marquesas Islands—*Continued*

(Place names as on collection labels.)

Island	Locality	Altitude in feet	Date	Food Plant	Remarks
3. *Kalotermes* (*Metaneotermes*) *athertoni* Light					
Uahuka	Tauheeputa	1,770	3-23-31	*H. tiliaceus*	
	Haahue Valley	90	3-20-31	*Pandanus* species	
	Crest of North Range	2,350	9-23-29	*H. tiliaceus*	Pair, incipient colony
	Matukuâha	1,570	2-27-31	*Glochidion rhamiflorum*	Dealate only
Nukuhiva	Tapuaooa	3,100	11-14-29	*H. tiliaceus*	1 dealate and 1 alate in colony
	Tapuaooa	2,600	5-30-31	*Metrosideros collina*	
	Tapuaooa	3,100	11-14-29	*H. tiliaceus*	
	Tapuaooa	3,100	11-14-29	*H. tiliaceus*	2 dealates
	Tapuaooa	3,100	11-14-29	*H. tiliaceus*	1 dealate
	Tekao Hill	3,150	.....		3 dealates
	Ooumu	3,000	5-28-31	*Weinmannia* species	1 dealate
	Ooumu	3,500	11-10-29		2 dealates
	Teuanui, Toovii	2,000	10-27-29	*H. tiliaceus*	Pair
	Tuanui, Toovii	2,000	10-27-29	*H. tiliaceus*	4 dealates
	Tuanui, Toovii	2,000	10-27-29	*H. tiliaceus*	
	Tuanui, Toovii	2,000	10-27-29	*H. tiliaceus*	Pair
	Tuanui, Toovii	2,000	10-25-29	*H. tiliaceus*	
	Tuanui, Toovii	2,000	10-25-29	*H. tiliaceus*	2 dealates in colony
Fatuhiva	Vaikoao, Oomoa Valley	1,600	8-29-30	*H. tiliaceus*	
Tahuata	Hanamiai Valley	1,500	6- 4-30		1 dealate
Uapou	Papaika	1,000	12-14-29	*H. tiliaceus*	
	Koputukea, Hakahetau Valley	1,150	11-16-31	*H. tiliaceus*	Alates in colony
Hivaoa	Tenaeka Valley	1,100	6- 4-29	*H. tiliaceus*	1 dealate
	Tenaeka Valley	1,100	6- 4-29	*H. tiliaceus*	4 dealates
	Tenaeka Valley	1,100	6- 4-29	*H. tiliaceus*	2 dealates
	Atuona Valley	50	3-28-29	Mango	1 dealate
	Aimoa	500	2-22-29	*H. tiliaceus*	
	Aimoa	500	3- 7-28	*H. tiliaceus*	Alates and dealates
	Tapeata	750	5-25-29	*H. tiliaceus*	
	Pouau	500	3- 5-29		Alates in colony
	Vaioa	1,200	7- 6-29	*H. tiliaceus*	Pair
	Vaioa	1,200	7- 6-29	*H. tiliaceus*	Pair
	Anatuakina	1,525	6- 1-29	*Sapindus saponaria*	Pair
	Kopaafaa	2,900	2-26-30	*Crossostyles biflora*	1 dealate
4. *Kalotermes* (*Cryptotermes*) *dolei* Light					
Uahuka	Haahue Valley	260	3-20-31	*Sapindus saponaria*	
Nukuhiva	Taiohae	.....	Oct., 1929		1 alate
Uapou	Manueva	500	12-17-29	*Morinda citrifolia*	
Eiao		1,700	4-22-31	*S. saponaria*	Alates in colony
	Middle of island, east side	1,665	9-28-29	*H. tiliaceus*	2 dealates

Collection Records for Termites Taken in the Marquesas Islands—*Continued*

(Place names as on collection labels.)

Island	Locality	Altitude in feet	Date	Food Plant	Remarks
Fatuhiva	Ouia Valley	100	9- 2-30	*H. tiliaceus*	
Hivaoa	Tehueto Valley	200	3- 8-29		2 dealates
	Anatuakina	1,525	6- 1-29	*S. saponaria*	Alates in colony
	Anatuakina	1,525	6- 1-29	*S. saponaria*	
	Anatuakina	1,525	6- 1-29	*Xylosma suaveolens*	
	Anatuakina	1,525	6- 1-29		
	Atuona Valley	150	3-28-29	Mango	2 dealates
	Atuona Valley	.....	2-25-29		
	Atuona Valley	150	3-28-29	Mango	1 dealate
Mohotani		700	1-31-31	*Cordia subcordata*	1 dealate
		1,300	1- 2-31	*Sapindus saponaria*	Alates in colony
		400	1-31-31	*Sapindus saponaria*	
	Above Anaoa	350	8-13-29	*Sapindus saponaria*	
5. *Kalotermes* (*Cryptotermes*) *hermsi* Kirby					
Hivaoa	Atuona	.....	Feb., 1929		4 dealates—1 alate
	Atuona	.....	May, 1929		1 alate
	Atuona	30	3-28-29	Mango	
	Atuona	50	3-28-29	Mango	Pair
Tahuata	Hanahevane Valley	300	7-16-30	*S. saponaria*	Alates in colony
	Hanahevane Valley	300	7-16-30	*S. saponaria*	Alates in colony
6. *Kalotermes* (*Cryptotermes*) *piceatus* Snyder					
Hivaoa	Atuona	Near Sea Level	Feb., 1929	(at light)	Alates
7. *Kalotermes* (*Glyptotermes*) *juddi* Light					
Uahuka	Tehaevea, Hane Valley	500	2-27-31	*Calophyllum inophyllum*	
8. *Coptotermes pacificus* Light					
Hivaoa	Atuona	.....	Feb., 1929	(at light)	Dealates and alates

NEW HEMIPTERA-HETEROPTERA FROM THE MARQUESAS*

By

E. P. VAN DUZEE

CALIFORNIA ACADEMY OF SCIENCES

INTRODUCTION

I am indebted to the Pacific Entomological Survey for the opportunity to study certain Heteroptera taken by them in the Marquesas. With the exception of the specimens from Uapou, taken by R. R. Whitten, the collections were made by E. P. Mumford and A. M. Adamson of the Survey and by local assistants trained by them. Types have been deposited in Bernice P. Bishop Museum, and for most species I have retained one or more paratypes in the Museum of the California Academy of Sciences, San Francisco.

FAMILY SCUTELLERIDAE

Coleotichus adamsoni, new species.

This species belongs to Schouteden's subgenus *Paracoleotichus* and in his table runs to *breddeni* but is proportionately longer; yellowish testaceous, quite uniformly punctured with black, the punctures tending to form transverse broken sinuate lines, with a percurrent pale line; pronotum with four black points in a transverse row; sides of scutellum parallel on basal half; connexival segments acute, the 4th, 5th, and 6th spined. Length, 12 mm. to 15 mm.

Head of male, 2.7 mm. long, 3.5 mm. wide across the eyes; shaped about as illustrated by Schouteden,[49] moderately convex at base; sides narrowly smooth and calloused, feebly sinuate near base, then slightly arcuate to apex of tylus; tylus almost impunctate, sides about parallel before and behind the stricture; surface irregularly punctate, but with four regular rows between the ocelli. Antennal segments 1 and 2 subequal; 3 not twice as long as 2; 4 and 5 subequal, longer than 3. Rostrum attaining hind margin of metasternum.

Pronotum of male, 5 mm. long, 8 mm. wide; sides rectilinear, narrowly calloused; median line smooth, percurrent; surface quite uniformly punctured, the punctures finer and closer within the lateral margins; callosities smooth with a median and an encircling row of punctures. Scutellum, 5 mm. wide, 7 mm. long; sides briefly divergent, then subparallel to the middle, beyond arcuately converging to the truncate and slightly emarginate apex; median line smooth, percurrent; base usually with a small callus near the basal angle.

Corium with a subcostal series of irregular, more or less confluent punctures, forming a blackish vitta; membrane exceeding the scutellum.

Prosternal flap broadly rounded, briefly truncate next the eye, areolate-punctate. Exterior pleural margin broadly smooth; surface very irregularly and in places sparsely punctate; the punctures forming a vitta anteriorly. Apical hook of osteolar canal not

[49] Schouteden, Henri, Monograph of Genus Coleotichus: Mus. Nat. Hung., Ann., vol. 8, pp. 317-361, pl. 8, figs. 9, 10, 1905.

* Pacific Entomological Survey Publication I, article 20. Issued December 21, 1932.

attaining anterior margin of mesosternum. Bifurcated tubercle on ventral segment 2 broader than in *sordidus* Walker. Apex of connexival segment 3 acute, 4 and 5 short-toothed, 6 with a longer tooth which passes the middle of the male genital segment. Genital segment strongly, transversely impressed, apical margin deeply roundedly excavated, clothed with long hairs, this excavation deeper than shown by Schouteden.[50] Female genital plates formed about as in *artensis*.[51]

Color yellowish testaceous, more strongly tinged with yellow on the head and on the pronotum anteriorly. Pronotum with four black dots placed one at each end of each callosity; scutellum sometimes showing indications of 2 or 4 black spots at base and an arcuate, darker vitta on either side from base to middle of lateral margin; this vitta may be followed by a paler area and in some females there are faint indications of transverse darker lines toward the apex. Beneath with a black line above the antennal base and on some of the pleural sutures; stomata and marginal segmental spots black; ventral sutures often slenderly brown. Antennae and legs concolorous; rostrum mostly black.

Fatuhiva: Tetana, Omoa [Oomoa] Valley, altitude 500 feet, August 22, 1930, on *Dodonaea viscosa,* 2 males, including holotype, and allotype female, LeBronnec.

Hivaoa: Mount Temetiu, altitude 1,670 feet, February 23, 1929, 1 female; Atuona, near sea level, May 11, 1929, 1 female; Mumford and Adamson.

Tahuata: Hanahevane Valley, altitude 45 feet, July 16, 1930, 1 female; Hanatetena Valley, altitude 50 feet, July 23, 1930, 1 female, LeBronnec and H. Tauraa.

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

Society Islands, Tahiti: Faa, November 7, 1928, near sea level, 1 female, A. M. Adamson.

FAMILY ARADIDAE

Ctenoneurus parallelus, new species (pl. 5).

Small, parallel-sided; castaneous brown, a little paler beneath and on the tergum; vertex and pronotum minutely granulate, as are the veins of the corium and carinae of scutellum; tergum still more minutely granulate; scutellum transversely wrinkled. Length, 3 mm. to 3.5 mm.

Head as long as pronotum, with a small blunt tubercle superiorly behind each eye; tooth on antenniferous tubercles short, obtuse; tylus narrow, short, reaching to basal third of segment 1 of antennae, apex truncate, with the cheeks produced as minute points. Antennae as long as head and pronotum together; segment 1 fusiform, its thickness one-half its length; 2 scarcely longer than thickness of 1; 3 linear, hardly longer than 1; 4 clavate with conical tip, equal to 3 in length.

Pronotum twice wider than long; sides oblique, almost rectilinear, carinate, narrowly recurved; anterior angles prominent, obtuse; hind margin straight before the scutellum; hind angles slightly produced. Margin and median line of scutellum distinctly carinate; its surface transversely wrinkled.

Corium short, passing the scutellum by one-third its length; hind margin oblique, rectilinear, apex subacute; reflexed basal costal lobes narrow, as long as median carina of scutellum; membrane attaining apex of penultimate tergite, inner field faintly transversely veined.

[50] Schouteden, pl. 9, fig. 14.
[51] Schouteden, pl. 9, fig. 2.

Prosternum with a shallow median groove; mesosternum feebly depressed behind the carinate anterior edge. Femora unarmed. Margin of abdomen feebly sinuate posteriorly.

Color castaneous brown, a little darker on the disk posteriorly of the pronotum and on the scutellum and corium; membrane piceous, paler at base; legs pale. Connexivum paler, becoming yellowish at apex of each segment.

Nukuhiva: Tapuaooa, altitude 3,100 feet, November 10, 1929, on *Weinmannia* species, holotype male; Teivipakeka, altitude 2,300 feet, October 16, 1929, in dead stipes of *Histiopteris incisa,* 1 pair; Teuanui, Tovii [Toovii], altitude 2,000 feet, October 25, 1929, under bark of *Hibiscus tiliaceus,* 1 male, and in dead stipes of *Angiopteris* species, 1 male; Mumford and Adamson.

Uapou: Aneou [Aneo] Valley, altitude 1,000 feet, December 30, 1929, in dead fern stipes, allotype female; Hakahetau Valley, altitude 2,000 feet, January 29, 1930, in dead stem of *Musa fehi,* 1 female; R. R. Whitten.

Society Islands, Tahiti: Vallée de la Reine, altitude 460 feet, December 17, 1928, 1 female, Mumford and Adamson; Tipaerui Valley, altitude 750 feet, September 12, 1928, in rotting banana stem, 1 female, A. M. Adamson.

This insect belongs to the little group of species loosely placed by Bergroth and China under the generic name *Ctenoneurus* Bergroth. It is very close to *samoanus* China, but certainly distinct; the hind angles of the pronotum are more produced, the sides scarcely notched, scutellum narrower, costal lobe of elytra very differently shaped, the membrane shorter.

FAMILY LYGAEIDAE

Genus **GERMALUS** Stål

OPHTHALMOCORIS Montandon 1907.

This genus, of which 21 species have been described, has a wide distribution in the Australian region and the islands of the South Pacific, with 1 species from Ceylon, 1 from Mauritius, and 1 from Madagascar. In this paper 6 species are recorded from the Marquesas Islands, a group from which none had before been reported. Of these 6 species, 5 are here described as new. The determination of the sixth, *unicolor* Montandon, a Bornean species, is uncertain. This makes a total of 26 known species in this genus.

In *Germalus* the sides of the clavus are almost parallel and the eyes are distinctly stylate, and directed more or less upward and backward. In one species, *membranaceus* Montrouzier, the ocular peduncles are extended posteriorly to the apex of the eyes which somewhat overlap the anterior angles of the pronotum. This has been made the type of a new genus, *Neogermalus,* by Montandon, but Bergroth considers it as scarcely of subgeneric value.

Key to Marquesan Species

1. Ocelli nearer than the distance between the ocelli and nearest margin of the eyes; peduncles semitransparent; eyes distinctly elevated; venter pale, without a vitta ..... **costalis**

   Ocelli more distant than to the nearest margin of the eyes 2

2. Elytra of a uniform, smoky brown, polished, the costal area paler; general color of body darkened; legs pale, without dots ..... **fuliginosus**

   Elytra semipellucid, at least in part 3

3. Color uniformly pale yellowish, the costal margin slenderly, and some punctures along the elytral veins, black; legs nearly immaculate ..... ? **unicolor**

   Color pale yellowish, black-punctate on the pronotum and scutellum; a line on the vertex and lateral vitta beneath more or less developed blackish; osteolar canal long, curved to a contact with the hind margin of the metapleura ..... **infans**

   Color more a fulvous yellow, tinted with luteous on the pronotum posteriorly, marked with piceous-brown, with lateral blackish vittae beneath; vertex with a median and two short lateral vittae; pronotum with a median geminate and a double lateral vitta brown, best distinguished before and behind 4

4. Vittae of the vertex best distinguished anteriorly; corium maculate at base and apex; membrane marmorate; connexivum maculate ..... **maculatus**

   Vittae of vertex best distinguished posteriorly, elytra slightly fuliginous, marked with brown only on the veins and apical margin; membrane scarcely fuliginous, immaculate; lateral vitta beneath strongly marked; oviduct of female nearly attaining base of abdomen ..... **lateralis**

Two or three specimens of *Germalus* in this collection are somewhat aberrant and cannot well be placed with present material. Distant [52] figures an insect evidently belonging to this genus but wrongly identifies it as *Ocypus variegatus* Montrouzier. A careful study of the description by Montrouzier convinces me that he was describing a true capsid as he stated, and not a lygaeid. Distant's figure very closely represents our *costalis* described below.

Germalus costalis, new species (fig. 45, *a*).

Pale yellowish testaceous with a few coarse, black punctures on the pronotum, scutellum, and along the elytral nervures. Length, 5 mm.

Eyes castaneous, their peduncles subhyaline; the red ocelli narrowly ringed with black; apex of head slightly infuscated.

Pronotum with large, scattering, black punctures which omit a broad band across the callosities, a narrow median line and the humeri and hind margin; humeri more or less infuscated. Scutellum tinged with fulvous, with a smooth, arcuate vitta between the basal angles, sending a slightly calloused line to the apex, thus leaving a punctured basal area and one at either side.

Elytra subhyaline, the clavus more opaque; clavus and the two discal areas of corium outlined with rows of black punctures; costal margin slenderly black; apical brown; membrane hyaline with a faint discal cloud.

Legs, rostrum, and all beneath, pale. Propleura with an area of black punctures, the mesoplura and metapleura with a slender black line. Femora and tibiae faintly tinged with fuscous. Apex of osteolar canal slender and feebly curved anteriorly at apex. Supra-anal plate of male with a large fuscous cloud.

[52] Distant, W. L., Rhynchota from New Caledonia and the surrounding islands: Sarasin and Roux, Nova Caledonia, Zoologie, vol. I-L.IV, no. 10, pl. 11, fig. 10, 1914.

Hivaoa: Kopaafaa, altitude 2,700 feet, August 2, 1929, by sweeping, 6 males, including holotype, 5 females, including allotype; Mount Temetiu, northeast slope, altitude 2,500 to 3,200 feet, July 24, 1929, August 1 to 3, 1929, and September 13, 1929, 4 males, 3 females; Tepuna, altitude 3,010 feet, August 1, 1929, 1 male, 1 female; Mumford and Adamson.

Germalus lateralis, new species (fig. 45, *b*).

Narrower than *costalis,* with a shorter osteolar canal, longer female genital groove, and with a more strongly marked venter. Length, 5 mm.

Head slightly more produced than in *costalis*; antennae a little more slender, segment 4 somewhat shorter than 3, in *costalis* as much longer; ocular peduncles shorter. Anterior angles of pronotum less broadly rounded. Rostrum longer, attaining base of genital groove in the female. Osteolar canal broader than in *costalis,* the anteriorly curved tip less attenuated. In this species the pygofers of the female are much extended, their base reaching nearly to the hind coxae, the 4th ventral segment being entirely cut away, as are the 5th and 6th.

Color soiled yellowish testaceous tinged with ochraceous on the head, callosities of scutellum, and sometimes on the discal area of the corium and beneath, occasionally with a decided reddish tint on the disk of the tergum and sides of the venter. Pronotum and scutellum with large black punctures as in *costalis.* Vertex with a median fuscous vitta which may become black on the tylus; usually there is another on either side which passes through the ocelli; front of the head with a slender black line from the antennae to the tylus, and a similar line encircles the ocular peduncles superiorly, these peduncles with a fuscous cloud posteriorly. Pronotum with a humeral cloud and three longitudinal vittae blackish fuscous, the median geminate, these vittae more pronounced on the callosities and hind margin; pale Y-shaped mark on the scutellum more on less obscured by black punctures. Elytra opaque, the costal area subhyaline, parallel behind the middle; margins of clavus, apical margin of corium, and median vein behind the middle, infuscated; costal margin slenderly black; all veins with black punctures as in *costalis*; membrane slightly infuscated. Beneath with a broad submarginal fuscous or black vitta, covering the genital segment in the male and black-punctate on the pleural pieces; base of venter and dorsal genital plate of male mostly blackish. Segment 1 of antennae with a dorsal fuscous spot, the incisures more or less darkened. Femora dotted with fuscous. Prosternum with concolorous punctures more or less distinct; ventral line and tip of rostrum and the oviduct of the female black; tibiae sometimes embrowned.

Hivaoa: Teava Uhia i te Kohu, altitude 2,100 feet, February 15, 1930, on *Weinmannia* species, 17 males, including holotype, 8 females, including allotype; Kopaafaa, altitude 2,770 feet, August 2, 1929, on *Metrosideros collina,* 2 males, 5 females; Mumford and Adamson.

Fatuhiva: Ahuava, altitude 1,800 feet, August 19, 1930, on *Metrosideros collina,* 6 males, 4 females, LeBronnec.

Nukuhiva: Ooumu, altitude 3,400 feet, November 11, 1929, on *Weinmannia* species, 6 males, 4 females; Ooumu, altitude 3,800 feet, November 10, 1929, 1 male; Tauamaka, altitude 2,900 feet; November 10, 1929, on *Metrosideros collina,* 1 male, 1 female; Puokoke, altitude 3,485 feet, October 22, 1929, 3 males, 3 females; Mumford and Adamson.

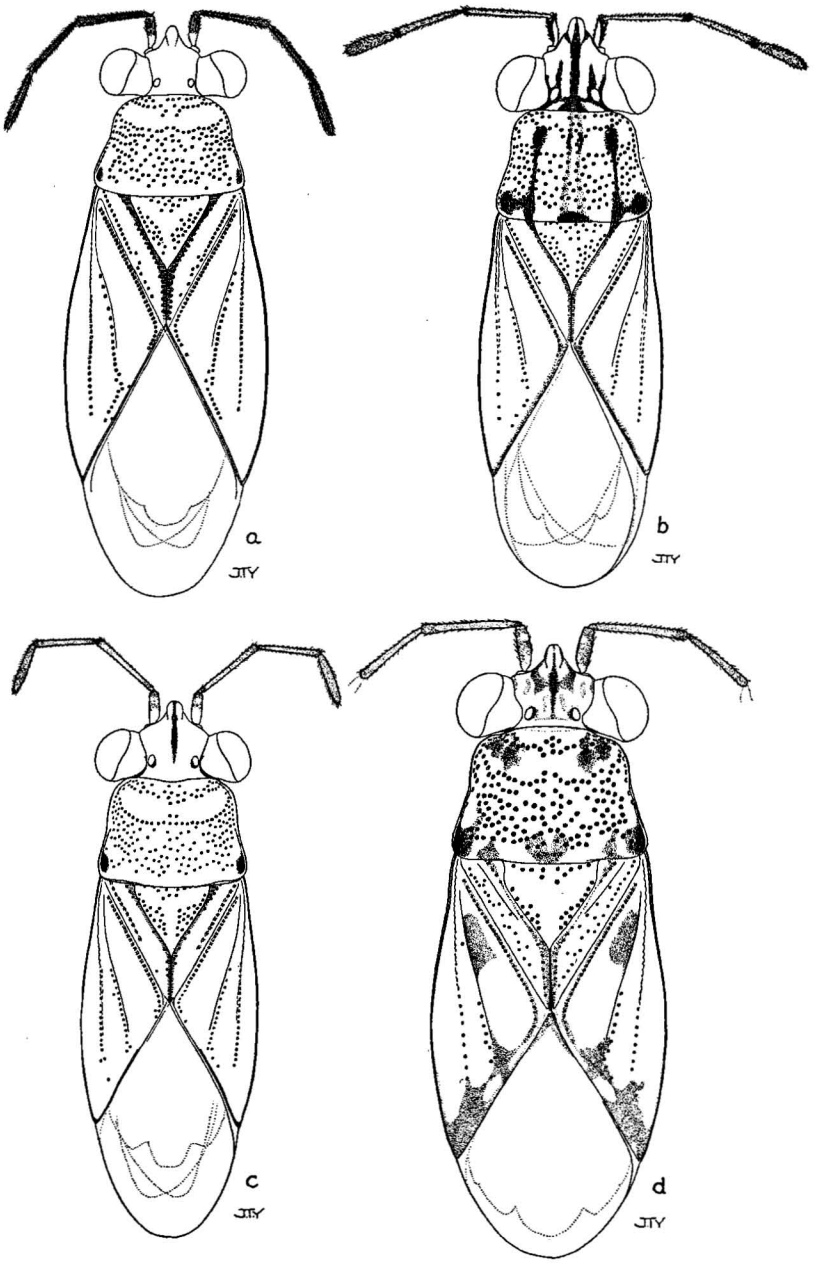

FIGURE 45. New species of *Germalus*: *a, G. costalis,* female, from Hivaoa, × 13 1/3; *b, G. lateralis,* male, from Hivaoa, × 15 1/3; *c, G. infans,* male from Hatutu, × 15; *d, G. maculatus,* male, holotype, from Tahuata, × 17 1/3.

Some of the specimens from Ooumu, Nukuhiva, are paler, with the dark markings reduced, but they have the narrow form and broad osteolar canal with a short abrupt tip and the long female pygofers and undoubtedly belong here.

Germalus infans, new species (fig. 45, *c*).

A small, pale species with the square thorax and the lateral ventral vittae of *lateralis;* head with a black median line; osteolar canal long. Length, 4.5 mm.

Head as in *costalis.* Pronotum as in *lateralis,* but little narrowed to the briefly rounded anterior angles. Elytra mostly subhyaline, becoming somewhat opaque basally; costal area arcuately expanded, but somewhat less so than in *costalis.* Antennae shorter and more slender; segment 4 stout, fusiform, subequal to 3 in length. Osteolar canal abruptly contracted to a thick linear carina, which is curved and attains the anterior margin of the metapleura just within the outer margin of the lateral vitta.

Color pale or whitish testaceous, slightly tinged with yellow on the head, callosities, and scutellum; median line of head, an anterior line from antennae to tylus, another behind the base of the ocular peduncle and a ring about the ocelli, black. Pronotum with coarse scattering black punctures which omit the sloping hind margin and the callosities; humeri smooth with a brown cloud; pale Y on scutellum well developed. Lines of punctures along the elytral veins less distinct than in the other species; costal and commissural nervures pale, very slenderly lineate with black; membrane hyaline. Beneath with a lateral fuscous or black vitta, more or less developed. Femora with nearly obsolete brown points.

Hatutu [Hatutaa]: middle of east side of island, altitude 1,010 feet, September 30, 1929, on *Pisonia* species, 6 males, including holotype, 3 females, including allotype; on *Waltheria lophanthus,* 1 male; by miscellaneous sweeping, 1 male; Adamson.

Eiao: near center of island, altitude 1,665 feet, September 28, 1929, on *Hibiscus tiliaceus,* 4 males, 2 females, altitude 1,450 feet, October 1, 1929, on *Waltheria lophanthus,* 1 male; uplands toward north end, east side, altitude 1,855 feet, September 29, 1929, on *Hibiscus tiliaceus,* 2 females; above Vaituha, altitude 1,200 feet, October 2, 1929, on *Waltheria lophanthus,* 1 male, 1 female; autitude 800 feet, September 29, 1929, 1 female; altitude 1,100 feet, September 29, 1929, on *Waltheria lophanthus,* 2 females; Adamson.

A male from Hanavave Valley, Fatuhiva, at 1,550 feet, taken August 23, 1930, by LeBronnec on *Metrosideros collina* seems to be nearly typical of this species. Another male from Amatea, Tahuata, taken at 2,600 feet, June 27, 1930, on *Reynoldsia* species, by LeBronnec and H. Tauraa, has the brown markings on the pronotum and elytra strongly developed, the membrane with a distinct median vitta and the lateral vittae of the venter nearly obsolete. A female from Matauuna, Hivaoa, taken March 2, 1930, at 3,700 feet, on *Cyrtandra* species by Mumford and Adamson, is more strongly tinged with yellow, becoming orange on the disk of the scutellum. In this individual the lateral vittae on the venter are represented by a fulvous shade and the osteolar canal is shorter. Its identity is somewhat doubtful.

Germalus maculatus, new species (fig. 45, *d*).

Aspect of *infans* but with the head characters, nearly, of *lateralis;* more strongly tinged with fulvous than our other species and more maculate with brown, with maculate connexivum. Length, 5 mm.

Head formed about as in *lateralis* but with the eyes a little more elevated and more produced backward, the peduncles being more produced posteriorly. Pronotum but little narrowed anteriorly, as in *lateralis,* the disk distinctly transversely depressed behind the callosity and the sides sinuate with edge of anterior lobe more strongly carinate; calloused Y of the scutellum strongly developed, leaving but a few punctures at base and a row either side. Costal membrane broad as in *costalis.* Osteolar canal long, nearly attaining mesopleural margin as in *infans.* Posterior angles of metapleura obviously produced. Antennal segment 2 longer than 3 (3-2).

Color pale yellow tinged with gray on the disk of pronotum. Median line of vertex widened at base and continued on clypeus; an angulate vitta either side including the ocelli, and a line before the antennae brown; base of head margined with black behind the eyes; eyes castaneous; antennae infuscated, segment 1 pale beneath (4 wanting). Pronotum coarsely black-punctate, leaving the hind margin, a sublateral vitta, and an obscure median line smooth; anterior margin smooth, the latter especially, calloused. Elytra subhyaline, tinged with golden brown, the veins punctate; most of the clavus, a large spot on base of inner corial area, one at middle of apical margin, and a larger apical spot, fuscous-brown; membrane brownish hyaline. A blackish vitta on the genital plate and the apical connexival spot showing through. Pleura with a broad vitta of black punctures; venter brown at base and apex, the connexivum with a small brown spot at base of each segment. Middle of femora and tibiae embrowned, on the former black-punctate, tips of tibiae and tarsi black. In this individual the humeri, three small spots on the posterior margin of the pronotum, and a cloud on the distal one-half of the callosities are brown. Described from a unique specimen.

Tahuata: Haaoipu, summit, altitude 2,700 feet, July 9, 1930, on *Metrosideros collina,* holotype male, LeBronnec and H. Tauraa.

Germalus fuliginosus, new species (fig. 46, *a*).

Form of *maculatus,* having the head and pronotum of *lateralis* and the expanded elytra of *costalis* and *infans*; dull fulvous broadly marked with fuscous on the head and pronotum; elytra a uniform smoky-hyaline with paler costa; legs immaculate. Length, 6.5 mm.

Head essentially as in *lateralis,* the clypeus a little broader at apex. Smooth Y of scutellum but poorly distinguished. Elytra very minutely shagreened, the costa expanded about as in *infans.* Antennal 2 one-half longer than 3 (3-2), 4 longer than 3 (8-5). Pleurae opaque; prosternum polished and punctate for a space as wide as the gula between the eyes; osteolar canal produced, curved, about as in *costalis,* not attaining the mesopleural. margin. Oviduct reaching to the third ventral segment. Color dull fulvous. Antennae infuscated; segment 4 brown and 1 pale at base. Vertex with three broad vittae, coalescing before, leaving two lines between the ocelli and a spot next the eye, pale. Pronotum much infuscated, especially on the humeral region and behind the eyes, the inner field of the callosities and median line paler. Scutellum obscured, with a pale oblique vitta from each basal angle and a short apical pale line. Elytra polished smoky brown, opaque, the costal area paler and subhyaline; membrane paler smoky hyaline. Legs honey-yellow, a little darker apically. Body below clouded with brown, becoming smoky on the metapleura; a spot on the posterior acetabulae and one on either side of the second ventral segment pallid. Described from a unique specimen.

Hivaoa: Matauuna, March 4, 1930, holotype female, Mumford and Adamson.

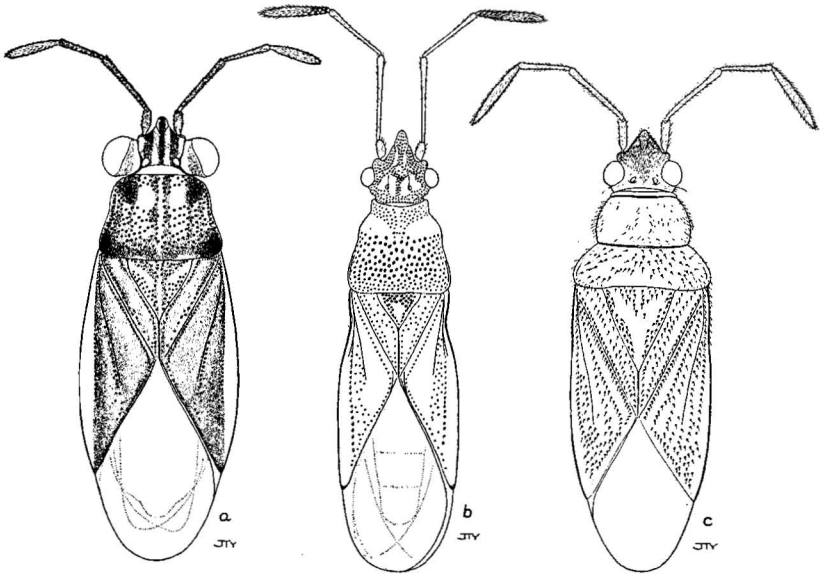

FIGURE 46. New species and a new genus of Lygaeidae from Hivaoa: *a, Germalus fuliginosus,* female, holotype, × 10 3/4; *b, Neocymus insularis,* new genus and new species, male, × 14; *c, Ptochiomera castanea,* male, holotype, × 14.

Genus **NEOCYMUS,** new genus

Intermediate between *Cymus* and *Cymoninus*; elongate, with the horizontally produced head of *Cymus* and the long antennae and hyaline elytra of *Cymoninus*.

Head nearly horizontal, constricted behind the eyes; length behind the eye equal to that between the eye and antenna. Eyes rather small, sessile; ocelli slightly farther from one another than from the eyes. Tylus produced; distance from its apex to base of antennae equal to that from base of antennae to hind margin of the eyes. Antennae scarcely shorter than the elytra; segment 1 very short, ovate, attaining middle of tylus; 2, longest; 3, one-fifth shorter than 2; 4, a little shorter than 3, fusiform. Rostrum almost attaining hind coxae; segment 1 nearly reaching base of head. Pronotum almost twice as wide across base as across the wide collum. Elytra constricted at base, mostly hyaline; claval commissure twice the length of the small scutellum; mesosternum sulcate, venter carinate. Type of genus is *Neocymus insularis* Van Duzee.

Neocymus insularis, new species (fig. 46, *b*).

Ferrugineous-yellow to castaneous, antennae and legs paler; apical segment of antennae and usually a vitta on apical margin of corium blackish; surface somewhat polished. Length, 4 mm. to 5 mm.

Head minutely punctate with a smooth spot about the ocelli, continued as a vitta toward the antennal base; punctured areas and tylus clothed with short, appressed, golden pubescence. Eyes castaneous, ocelli red.

Pronotum coarsely punctate, sides swollen opposite the transverse smooth callosities; humeri rounded, a little tumid. Scutellum transversely tumid across the middle.

Clavus opaque and punctured as is the corium between the two discal nervures, the claval and apical margins with a single row of punctures; membrane hyaline, with a linear, median, fuscous vitta beyond the middle, the basal margin typically with a black vitta from tip of clavus to middle of corial margin, sometimes reduced or wanting; extreme tip of corium embrowned.

Antennae pale, basal and apical segments castaneous, or the apical segment may be black. Legs and rostrum ochraceous, the tarsal claws and apex and the median line of rostrum black. Mesosternum piceous, its median area opaque. The general color above varies from ochraceous to castaneous, the head usually being castaneous. Described from 28 examples.

Fatuhiva: Omoa [Oomoa] Valley, near sea level, August 21 and 22, 1930, on *Cyperus* species, 11 males and 8 females, including holotype and allotype; Teavaipuhiau, altitude 2,150 feet, August 25, 1930, on *Paspalum conjugatum,* 2 females; LeBronnec.

Hivaoa: Tapeata, on east slope of Mount Ootua, altitude 2,500 feet, May 25, 1929, on *Paspalum conjugatum,* 2 males, 2 females; Teava Uhia i te Kohu, altitude 2,100 feet, February 15, 1930, on *Paspalum conjugatum,* 2 males, 1 female; Mumford and Adamson.

This interesting insect agrees with genus *Cymoninus* in having the eyes distant from the pronotum, in the mostly hyaline and basally constricted elytra, and in the longer second antennal segment, but differs in the horizontally produced head and carinate venter. As a rule the females are larger and paler than the males.

Ptochiomera castanea, new species (fig. 46, *c*).

Form and size nearly of a small *Orthaea basalis* Dallas; pertains to Stål's section "aa" in which the elytra are quite uniformly brown; color dull castaneous-brown; base of antennae, rostrum, and legs, paler. Length, 4 mm.

Head as long as wide before the eyes; minutely golden pubescent; surface shagreened, impunctate. Antennal 1 as long as posterior lobe of pronotum; 2 equal to width of head across the eyes; 3 as long as 1; 4 scarcely longer than 2, fusiform, thicker than 1. Rostrum attaining intermediate coxae; segment 1 not reaching base of head, subequal to 2; 3 a little shorter; 4, shortest.

Pronotum dull, with a few short appressed golden hairs; anterior lobe narrower before, impunctate, one-third longer than the posterior, slightly convex; collum slender; both transverse impressed lines deep, linear, subpunctate, black; posterior lobe with a few irregular coarse punctures, one-third wider than anterior lobe. Scutellum equilateral, the apical carina short; a triangular area on the base and the lateral margins punctate.

Elytra coarsely punctured in regular rows which become irregular on the costal area. Pleurae coarsely punctured; venter impunctate; hind angle of metapleura acutely produced. Anterior femora incrassate, armed inferiorly on apical one-third with three teeth, the basal the longest. Antennae and tibiae with a few short pale hairs.

Color dull castaneous-brown, more reddish on the head, pronotum, and scutellum; legs, antennae, and rostrum paler or honey-yellow; tip of rostrum black; apical two antennal segments dusky; elytra obscurely varied with darker brown; membranal veins paler.

Hivaoa: Vaiepoepo, altitude 2,450 feet, June 3, 1929, on *Metrosideros collina,* 2 males, including holotype, Mumford and Adamson.

Ptochiomera caeca, new species.

Like *castanea* in color and in most structural details but with ovate, rugosely punctured, semi-brachypterous elytra and modified pronotum.

Female

Length, 4 mm. Head as in *castanea* but with the eyes only about one-half the size and nearly circular, and with the ocelli wanting. Antennae stouter; segment 1 slightly but distinctly clavate; 2 twice longer than 1; 3 one-half longer than 1; 4 wanting.

Pronotum almost flat; anterior lobe nearly square, a little narrower before; anterior impressed line arcuate, leaving the collum much wider at the center with an irregular line of punctures; disk of anterior lobe feebly depressed either side of the middle, with a few obsolete punctures; sides arcuate with about two rows of coarse punctures; posterior lobe flat, less than one-half as long as anterior, coarsely punctate, slightly impressed along median line, separated from the anterior by a shallow impressed line. Scutellum longer than wide at base, the median line tumid; sides with one row of coarse punctures, the center of basal area with 4 or 5 coarse punctures.

Elytra ovate, convex, reaching nearly to apex of fifth tergite; membrane wanting; surface coarsely, rugosely punctate, the claval suture obsolete. Legs and below as in *castanea.*

Color dull castaneous-brown; antennae redder and elytra more mottled with pale than in *castanea.*

Nukuhiva: Oomu, altitude 3,400 feet, December 11, 1929, on *Weinmannia* species, holotype female, Mumford and Adamson.

At first I was inclined to consider this a brachypterous form of *castanea,* but the small eyes, heavier antennae, and the want of ocelli are characters that would hardly be changed in the brachypterous form, whereas those of the pronotum, scutellum, and elytra might possibly be subject to such change. On the whole, it seems best to consider it distinct, at least until more material is secured.

FAMILY NABIDAE

Nabis mumfordi, new species.

Aspect of *spinicrus* Reuter from the West Indies, but larger with annulate antennae and tibiae and pertaining to a different section of the genus; somewhat allied to *subrufus* White from the Hawaiian islands but with antennae and tibiae annulate; dull rufous-brown obscurely marked with lighter and darker colors. Length, 8 mm. to 9 mm.

Eyes large. Head produced behind the eyes for a space equal to one-half the

longitudinal diameter of the eye. Antennae long and slender; segment 1 linear, a little thicker than 2, a little longer than the pronotum; 2, one and a half times the length of 1; 3, equal to 1; 4, slightly longer than 3. Rostrum nearly attaining intermediate coxae.

Pronotal base two and one-half times as wide as the collum on the median line; sides obtusely carinate, nearly rectilinear, but slightly sinuate on posterior lobe; transverse impression strong; posterior lobe minutely punctate or shagreened; hind margin straight, slenderly pale-carinate; anterior lobe with a pale callus on either side against the transverse impressed line. Suture between venter and connexivum distinct.

Anterior femora moderately thickened, about twice the diameter of the intermediate and hind femora, unarmed but with a villous stripe beneath; anterior tibiae minutely serrate beneath. Genital hooks of male narrow, oblique, gradually produced to a very acute point. Whole surface irregularly pale pubescent with a few longer pale hairs, especially on the posterior tibiae. Hind tarsi slender, especially segment 3, which is nearly as long as 1 and 2 together.

Color rufous-brown or somewhat ferrugineous, marked with a red line on apical margin of corium near its tip. Antennal segment 2 with a black, subapical annulus and about five narrow brown annulations; head paler with the gula, an area behind the eyes, and a similar one before the amber-colored ocelli, brown, the latter area produced forward in a curved line; the elevated tylus more or less rufous. Pronotum varied with lighter and darker brown, the median line darker, the calloused areas paler; scutellum with the sides on the posterior lobe pale and calloused. Elytra parallel, veins more or less dark-margined, thickened and paler on the disk; membrane dusky, the veins heavily brown-margined. Beneath more or less dusky along the sides and on the mesosternum. Legs paler, middle and hind femora and all tibiae annulate with darker, anterior with the usual oblique brown lineations before and behind.

Tahuata: Amatea, altitude 2,700 feet, July 7, 1930, on *Weinmannia* species, 2 males, including holotype, 1 female; Amatea, altitude 2,600 feet, June 27, 1930, on *Weinmannia* species, 1 male; Haaoipu, summit, altitude 2,700 feet, July 9, 1930, on *Metrosideros collina,* female allotype; LeBronnec and H. Tauraa.

Hivaoa: Matauuna, altitude 3,700 feet, March 3, 1930, on ground under dead leaves, 1 brachypterous male; Kopaafaa, altitude 2,770 feet, August 2, 1929, 1 male, 2 females; Mount Temetiu, northeast slope, altitude 2,600 feet, November 13, 1929, on *Hibiscus tiliaceus,* 1 pair; Mumford and Adamson.

Nukuhiva: Oumu, altitude 3,600 feet, September 10, 1929, 1 female, Mumford and Adamson.

This species might easily be confounded with *Nabis spinicrus* Reuter from Brazil and Trinidad, but may be distinguished by the annulate antennae and legs, the more inflated anterior femora, the want of the longer spine-like hairs on the legs, and the different form of the male genital hook. From *capsiformis* it may be distinguished by the shorter postocular space and closely punctured posterior lobe of the pronotum.

Nabis longipes, new species.

Brachypterous, elongate, with a broadly ovate abdomen and tumid anterior lobe to the pronotum; ocelli wanting; antennae and legs unusually long and slender; color

rufous-brown, abdomen dull sanguineous, femora and base of the tibiae and antennal segments annulate with fuscous; connexivum maculate. Length, male, 8.5 mm.: female, 10 mm.

Head well produced; distance behind the eyes equal to the length of the eye; vertex twice as wide as an eye, evenly, transversely arcuate; surface impunctate, minutely shagreened, obliquely striate behind the eyes, minutely pale pubescent. Ocelli apparently completely absent, hardly indicated by an oblique ruga, more distinct in the female. Rostrum long; segment 1 scarcely longer than wide, 2 and 3 subequal, each as long as the head; 4 longer than 1. Antennae as long as the entire body; segment 1 a third longer than the head; 2 and 3 subequal, longer than 1; 4 subequal to 1.

Pronotum as long as head; hind margin one-third wider than anterior, sides nearly rectilinear, a little bulging above the tumid anterior acetabulae; collum and posterior lobe flat, of equal length, transversely wrinkled; anterior lobe tumid, impunctate but minutely granulate in lines about and behind the area of the callosities. Scutellum nearly equilateral, flat, transversely wrinkled.

Elytra about twice the length of the scutellum, ovate at apex, flat, wrinkled, with three heavy longitudinal veins; membrane wanting. Abdomen ovate, not quite twice longer to apex of segment 6 than wide, margins somewhat recurved; suture, between ventrals 2 and 3, subobsolete; surface impunctate, shagreened. Legs long and slender, hind femora as long as the body behind the pronotum; anterior femora as thick as the head; anterior tibiae nearly attaining the trochanters, intermediate quite so, posterior nearly as long as their femora and coxae. Male genital hooks broad, rounded externally, truncate apically, oblique on inner margin, with a minute but acute point.

Color dull yellowish brown varied with fuscous, with a divergent blackish line on either side of vertex, hooked at base over ocellar region; a median blackish vitta on pronotum expanded on hind margin of anterior lobe; a rounded polished black spot at base of anterior acetabulae and some irregular fuscous lines on the sides and pleurae. Male genital segment mostly black; abdomen dull rufous, especially above; connexivum darker with a light area on base of each segment; femora testaceous, anterior, clouded above, with the usual oblique lines along each side, intermediate and posterior irregularly annulate; tibiae rufo-testaceous, their apex and a sub-basal annulus dusky or black; antennae rufo-testaceous, dusky at apex, base of segment 1 and a basal and subapical annulus on 2 blackish; tibiae with pale hairs and an exterior row of minute black teeth.

Hivaoa: Kopaafaa, altitude 2,800 feet, February 25, 1930, holotype male; Matauuna, altitude 3,700 feet, March 3, 1930, allotype female; Mumford and Adamson.

This species undoubtedly is related to *annulipes* China from Samoa, but the markings on the pronotum, scutellum and legs are different, the ocelli are wanting, and the male genital hook is broader and more rounded posteriorly.

The long slender antennae and legs and the want of ocelli might be considered as characters of generic value, but I cannot see that anything could be gained by the erection of a new genus.

Nabis plicatulus, new species.

Elongate ovate; fuscous-brown varied with lighter; apical half of scutellum black; connexivum beneath with a percurrent prominent fold carrying the stomata; elytra attaining apex of abdomen. Length, 7 mm.

Head shorter than in *longipes,* less produced behind the eyes where the length is one-half the length of the eye. Rostrum attaining middle of mesosternum; segment 1

about as long as wide; 2 as long as the head; 3 subequal to 2; 4 equal to 1. Antennae a little shorter than the body; segment 1 as long as the head; 2 and 3 subequal; 4 equal to 1.

Pronotum about as in *longipes,* the posterior lobe a little longer than the collum. Scutellum distinctly longer than wide at base, with a lanceolate, depressed smooth area at each basal angle.

Elytra thick and opaque, infuscated, the clavus but feebly distinguished by a row of almost obsolete punctures; clavus with one, corium with two, longitudinal nervures, the outer forked near apex and both connected to the costa by a transverse vein before the apex of the clavus; membrane small, extending but little beyond apex of corium, coriaceous, with prominent veins.

Venter moderately convex; connexivum deeply distinguished and with a submarginal furrow, leaving a prominent fold carrying the stomata. Anterior femora stout, as thick as the head, with a pubescent area beneath for their whole length.

Mesosternum slenderly carinate as in *longipes.* Male genital hooks narrow, bent at a right angle and produced in a slender, acute point, much as in *mumfordi,* but shorter with a more rounded outer angle.

Color brownish fuscous varied with lighter, especially on the sides of the head and pronotum; tylus tinged with rufous; impressed black lines on the vertex more curved than in *longipes.* Median line of pronotum geminate, posteriorly forming a loop about a round, pale tubercle on either side against the transverse impressed line; humeri prominent, smooth, pale; sides pale, obtusely carinate; scutellum dull black with a pale spot either side at apex of an impressed polished, broadly lanceolate spot on each basal angle. Elytra with some pale marks along the veins. Beneath mostly black, marked with pale about the acetabulae and in the male along the disk and margins of the venter and on the connexival plica, the hind edge of ventrals 4 and 5 pale. Legs annulate with pale, most conspicuous being an annulus on apical third of femora and near base of tibiae; antennae brownish with pale incisures; sides of anterior femora with the usual oblique dark lines.

Hivaoa: Matauuna, altitude 3,700 feet, among dead leaves, March 5, 1930, holotype male, one female; same locality, March 2, 1930, allotype female; Mumford and Adamson.

This species with *longipes* and possibly *annulipes* China forms a group in this genus quite distinct from any other known to me. They are well distinguished from one another by the form of the male genital hooks as well as by the other characters mentioned.

CTENONEURUS PARALLELUS, NEW SPECIES, MALE
FROM NUKUHIVA, × 19 1/3.

MUSCIDAE OF THE MARQUESAS ISLANDS*

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INTRODUCTION

The family Muscidae inhabits all faunal regions. Some of the species are practically cosmopolitan because of the ease with which they are conveyed from point to point by commercial agencies and the facility with which they adapt themselves to their various habitats. Most of these widely distributed species are found in their larval stages in decaying vegetable matter or in what is very similar, manure, and occasionally in carrion. Hence no particular interest attends their presence even in well isolated regions or in distant islands. It is, however, of much interest to discover unique forms of even widely distributed genera. Although the material from the Marquesas is not exceptional in this respect, it does contain several new species. These are dealt with below, as are also all representatives of the family at this time available to me.

A striking feature of the Pacific Entomological Survey collection from the Marquesas Islands is the absence of any member of the subfamily Anthomyiinae. This subfamily is essentially a northern one. It is most profuse in the Palearctic and Nearctic regions and is represented but meagerly elsewhere. A large percentage of the more widely distributed species belongs to that group which is most readily transportable by commercial agencies and which is found in the larval stages in decaying vegetable matter.

SUBFAMILY LISPINAE

As far as they are known, the members of this group are aquatic in the larval stages, and the adults are found along the sides of streams or on the banks of ponds or other bodies of water. Three genera are already recognized, but the species in the collection from the Marquesas does not fit well into any one of these. It differs noticeably in the much narrower parafacials, which are almost invariably devoid of hairs. This character is unique in the subfamily, as far as I have seen. I consider that the divergence from typical forms of *Lispa* justifies the erection of a new genus for the reception of the species and refer to the following description for full discussion of the generic characters.

* Pacific Entomological Survey Publication I, article 21. Issued December 15, 1932.

Genus **COENOLISPA,** new genus

Subfamily characters: pteropleura with some hairs on center; frons of both sexes more than one-fifth of head width, without cruciate interfrontal bristles; palpi with a leaf-like apical expansion; lower calypter much larger than upper; scutellum bare below; sixth wing vein not attaining margin of wing; basal segment of hind tarsus without a basal ventral bristle.

Distinguished from all three known genera by the lack of hairs on the parafacials, which are much narrower than usual, the possession of 1 + 3 pairs of long dorsocentral bristles on the mesonotum; and the triangularly arranged three sternopleural bristles. The genal bristle is lacking, and there are two bristles on the presutural sublateral area of the mesonotum.

Genotype, *Coenolispa erratica,* new species.

Coenolispa erratica, new species (fig. 47).

Male

Head black, occiput grey dusted, frons grey dusted on the orbits, which become white anteriorly, ocellar triangle brownish grey dusted, face, parafacials, and genae white dusted; antennae black, extreme apex of second and base of third segment reddish yellow; palpi yellow, darker at bases and whitish at apices. Head in profile as in fig. 47, *a*; frons at vertex a little more than one-fifth of the head width, slightly wider just anterior to the ocelli and narrowed somewhat to anterior margin, the orbits poorly differentiated, especially on upper half, and almost linear, the triangle narrow, carried to anterior margin, distinguished by the yellowish dust; inner verticals much longer than the outer pair and distinctly proximad of them; postverticals undeveloped; ocellars long; two upper pairs of orbitals reclinate, the others incurved, the anterior pair very long and strong. Parafacials bare; face flat in center.

Thorax black, quite densely yellowish grey dusted, mesonotum with four black vittae, the submedian pair along the lines of dorsocentrals and more or less fused with the broader sublateral pair; a fifth vitta sometimes evident at least on the posterior part between the submedian pair which is carried on to the disc of the scutellum but not to its apex; grey dusting much more dense on lateral margins than on disc of mesonotum. Dorsocentrals long, 1 + 3, with occasionally a short setula anterior to the presutural one; one intra-alar; prealar and prescutellar acrostichals undeveloped.

Abdomen colored as thorax, the base and apex of each tergite densely grey dusted, and second and third with an additional grey central line that separates the shining black part into two large transverse spots, the fourth tergite without the central line, apical bristles on all tergites, becoming longer from basal to apical tergite, quite conspicuous and strong on fourth, and one or more median lateral bristles on each tergite. Hypopygium rather small, forceps as in fig. 47, *b*; fifth sternite with a shallow central apical emargination.

Legs black, femora grey dusted, fore tibiae largely yellowish, most distinctly so basally, mid and hind pairs yellowish at bases only. Fore coxae whitish grey dusted, with two series of widely spaced bristles on anterior side from base to apex; fore femur with a series of rather closely placed short regular bristles on the entire anteroventral surface and a more widely spaced series of much longer and stronger bristles on posteroventral surface; posteroventral surface with a few intermixed shorter and finer bristles basally; mid femur with a few long widely spaced bristles on the anteroventral and posteroventral surfaces centrally; hind femur much as the mid one; fore tibia with a long curved bristle at middle on posterior surface which is about half as

long as the tibia, apical posterior and dorsal bristles much shorter and straight, the ventral setulose hairs not exceptionally developed; mid tibia with the same type of median posterior bristle but the apex with a moderately long ventral bristle, and the ventral setulose hairs longer than on the fore tibia; hind tibia with a long anterodorsal bristle just beyond middle, a shorter anteroventral one a little nearer apex, the preapical dorsal bristle about as long as the anteroventral, and a slightly curved and stronger apical ventral bristle; tarsi normal, basal segment of fore pair longer than the next two segments combined.

Wings rather narrow, rounded at apex, brownish hyaline, more darkened from beyond first vein to apex of costa. Outer cross vein straight, inner cross vein at middle of discal cell, ultimate section of fourth vein a little longer than penultimate section, and not converging towards third at apex.

Calypteres white, margins yellowish. Halteres pale yellow.

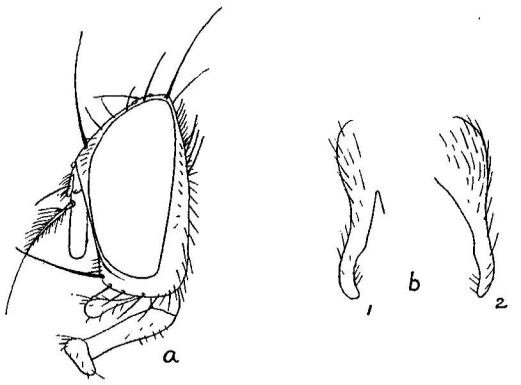

FIGURE 47. *Coenolispa erratica,* new genus, new species. *a,* head in profile, male. *b,* hypopygial forceps of male: 1, right, from below; 2, left, in profile.

Female

Length, 7 to 8.5 mm. Differs from the male in having the central vitta on the mesonotum better developed, the ventral setulose hairs on the mid tibia especially longer and stronger, and the abdomen stouter, more ovate, with the genitalia furnished with short dense curled fuscous hairs.

Hivaoa: Tapeata, east slope of Mount Ootua, altitude 2,500 feet, May 25, 1929, type male; Matauuna, altitude 3,800 feet, March 5, 1930, allotype; Matauuna, altitude 3,760 feet, August 1, 1929, in miscellaneous sweeping, paratypes; Mumford and Adamson.

Uapou: Hakahetau Valley, altitude 1,000 to 2,000 feet, January 1, 1930, paratypes, R. R. Whitten.

There is some variation in the extent of pale color on the tibiae but no structural distinction that I can find to justify a belief that there are two species in the material. The facial dust also varies from pure white to yellowish white, but most of the specimens have been wet and thus are not in very good condition for determination of the degree of variation from the type.

SUBFAMILY PHAONIINAE

A widely distributed subfamily, containing most of the genera of tropical occurrence, and a wealth of species, especially in the Orient. All the genera represented in the collection are already described.

Genus **OPHYRA** Robineau-Desvoidy

The members of this genus as far as I know are scavengers, the larvae living in manure and other decaying matter. The flies frequently occur on flowers, and when on the wing have a peculiar habit of standing stationary for considerable periods much as do many species of the genus *Fannia* Robineau-Desvoidy, and many genera of the family Syrphidae.

Ophyra chalcogaster Wiedemann.

A species widely distributed from China southward, originally described from Java. The character by means of which both sexes may be distinguished from all others in the genus is to be found in the very distinct white apices of the ventral surface of the segments of the fore tarsi, all other species having the fore tarsi black.

There are no specimens in the collection from the Marquesas Islands, but it undoubtedly ought to occur there, as there are two males from the Society Islands in the material before me, and the new species described below occurs in both groups.

Ophyra trochanterata, new species.

Male

Of the same general aeneous glossy black color as the other members of the genus, but with the palpi brownish yellow, a character met with in the genus only in *O. aenescens* Wiedemann, apart from the present species.

Head black; frontal orbits and upper fourth of parafacials glossy black, remainder of parafacials, face, and cheeks except the vibrissal angles, densely grey dusted or tomentose; frontal lunule with the usual dense silvery grey tomentum; back of head shining black, slightly grey dusted along eyes on lower half or more. Antennae black, second segment brownish; palpi brownish yellow. Frons at narrowest point linear, anterior half or more with setulose hairs; vertical bristles lacking, the ocellars well developed. Third antennal segment about 2.5 times as long as second, its extremity falling short of reaching level of vibrissae; arista swollen at extreme base where there is some very short pubescence; palpi moderately wide.

Thorax glossy aeneous black. Dorsocentrals $2+4$, the two presutural pairs much stronger than the three anterior presutural pairs; anterior acrostichal hairs in four well-defined series, the prescutellar acrostichals undeveloped.

Abdomen more distinctly aeneous or bronzy than the thorax, the basal two visible tergites when seen from the apex and viewed along the disc from low down with slight greyish dust and a dark dorsocentral vitta, the two apical tergites glossy. Discal hairs on the basal two tergites much denser than on the apical two, especially the fourth, the third and fourth with some fine hair-like apical bristles that are longer than the discal

hairs. Second sternite basally and fourth apically with numerous long erect hair-like bristles which are directed downward, fifth with the apex broadly and shallowly emarginate and a transverse strip of bristly hairs similar to those on fourth near apex, the tips of the hairs more distinctly curled than those of fourth or second sternites.

Legs black, glossy. Fore legs normal, but the posteroventral surface of the femur with the bristles rather strong and very closely placed; mid femur with four or five very short stubbly thorns or bristles near base on the posteroventral and one or two on the anteroventral surface; mid tibia with two well-developed posterior submedian bristles, the ventral hairs on apical third or more dense, but not longer than the diameter of the tibia; hind trochanters with quite dense soft curled hairs on ventral surface which are about as long as basal diameter of the femur, the femur with the usual complete anterodorsal series of bristles, five or more stronger bristles on the apical half or less of the anteroventral surface, two or three very short stubbly bristles near base on anteroventral surface, and one rather fine and not very long bristle close to base on ventral surface; tarsi normal, claws and pulvilli of moderate size.

Wings brownish hyaline, veins dull yellow basally, third and fourth veins converging slightly at apices.

Calypteres brownish yellow, lower one merging into dark brown apically. Halteres with black knobs.

Female

Length, 6 to 7 mm. Similar to male in general coloration and characters, differing in having the frons almost one-third of the head width, with the frontal triangle glossy, almost parallel-sided to middle, where there is an incurved bristle inserted in each lateral edge, and from that point to anterior margin slightly narrowed, all four verticals present but short, and the upper third of each orbit with two or three outer bristles, the anterior one of which is proclinate. Mid and hind femora lacking the short basal ventral bristles; hind trochanters without exceptional hairing.

Hivaoa: Mataovau, altitude 390 feet, June 5, 1929, type male, allotype and 2 paratypes, Mumford and Adamson.

Mohotani: seashore, January 31, 1931, 23 paratypes, mostly females, LeBronnec and H. Tauraa.

I have also a male specimen from Tahiti, Society Islands, collected in the Papenoo Valley, at 500 feet altitude, on October 25, 1928, by A. M. Adamson.

This species is very similar to *Ophyra nigra* Wiedemann, which is, I believe, a prior name for *O. spiniger* Stein. This species and *O. simplex* Stein are similar to the new species in general characters and in having the mid and hind femora with short stubbly bristles on ventral surfaces basally, but in addition to having the palpi black these two older species have the hind tibia with different ventral armature, *O. nigra* having about four long bristly hairs on the anteroventral and posteroventral surfaces of the apical third or more, and *O. simplex* having similar armature on the anteroventral surface only. In *O. trochanterata* the anteroventral surface has the usual two short anteroventral bristles similar to those present in most females, and there are no well-developed hairs on any surface, though those on the anterodorsal surface are a little longer than usual; the calcar is longer than

usual in both sexes. There are no dense curled hairs on the ventral surface of the hind trochanters of the two older species referred to here.

It appears pertinent to note here that a character recently suggested by Hendel [53] for the separation of this family from the acalyptrate series, the parallel position of the outer and inner vertical bristles, falls down in even this genus, and particularly in the one previously described herein as well as many others in the family.

Genus **LIMNOPHORA** Robineau-Desvoidy

The genus as accepted here contains species in which the prosternum is haired on the sides, the third wing vein is haired at its base, the basal abdominal sternite is bare, and the fourth wing vein is usually bent slightly forward apically.

There are a number of specimens belonging to the genus in the material before me, but all are in rather poor condition and are with one exception females, which sex is not as readily identifiable specifically as the male. I present the following data on the basis of this rather unsatisfactory material.

All the members of the genus, as far as they are known, in the adult stage frequent streams and other bodies of water. The larvae are aquatic.

I have published a review of the species occurring in the Society Islands [54] to which students are referred for further information on the genus.

Limnophora nigropolita, new species.

Female

Glossy black, the thorax with very slight brownish dust on the mesonotum, only the humeri distinctly grey dusted, and the abdomen glossy black, with hardly a trace of brownish dust and no markings on the dorsum.

Frons black, dull, the triangle slightly shining, orbits dark brown dusted except at the anterior extremities, where they are whitish grey dusted like the parafacials, face, and genae; antennae, aristae, palpi, and proboscis, black, the latter glossy below. Frons at vertex more than one-fourth of the head width, the orbits narrow, all four vertical bristles well-developed, postverticals small, ocellars moderately long; each orbit with two recurved upper and four or five unequal incurved anterior bristles, the anterior one of the latter longest; triangle extending to beyond middle of frons; antennae extending almost to the vibrissae, third segment about 2.5 times as long as second; arista with the longest hairs not more than half as long as width of the third antennal segment; palpi a little longer than antennae, not dilated; gena not exceeding one-fifth of the eye height.

Thorax glossy black, mesonotum with slight brownish dusting, not vittate, the humeri very distinctly grey dusted above; pleura slightly grey dusted, mesopleura brownish dusted posteriorly. Mesonotum with 2 + 3 strong dorsocentrals, the anterior intra-alar small but usually distinct, presutural acrostichal series of hairs four,

[53] Hendel, Friedrich, Kritische und synonymische Bemerkungen über Dipteren: Verhandl. Zool.-Bot. Gesells. Wien, 81, p. 6, 1931.

[54] Malloch, J. R., Exotic Muscaridae (Diptera): Ann. Mag. Nat. Hist., 10th ser., vol. 4, p. 328, 1929.

prescutellar acrostichals small but distinct; sternopleurals 1 + 2, the lower posterior one small.

Abdomen glossy black, less dusted than the thorax. Discal and apical bristles on third and fourth visible tergites well-developed. Genitalia with dense stiff black hairs, but without definite spur-like thorns.

Legs black. Fore tibia without a median bristle; mid tibia with two posterior submedian bristles; hind femur with four or five anteroventral bristles on apical half; hind tibia with one anterodorsal and one anteroventral bristle, the latter a little farther beyond middle than the other; fore tarsal claws of moderate length, not as long as those of the female on *L. nigridorsata* Malloch.

Wings grayish hyaline, veins fuscous. Third vein with or without a setula at base; fourth vein bent slightly forward near apex.

Calypteres brown, margin and fringe of lower one fuscous. Halteres yellow.

Uapou: Hakahetau Valley, altitude 2,000 feet, December 6, 1929, on wet rock by stream, type and 1 paratype, A. M. Adamson. Same locality, altitude 1,000 to 2,000 feet, January 29, 1930, paratype, R. R. Whitten.

It is highly probable that the larvae of this species will be found in the stream near the place of capture of the adults. The male is in all probability more distinctly dusted on the thorax and abdomen than is the female.

Limnophora tepunae, new species.

Female

Length, 7 mm.

Black, distinctly shining, the thorax lightly and almost evenly pearly grey dusted on the entire surface, the mesonotum without distinct vittae and with the humeri and lateral margins not more conspicuously dusted than the disc.

Head black, with grey dust even on the frontal orbits, although the latter and the triangle are darker grey than the face; in other respects colored as in the preceding species. Frons a little narrower at vertex than in *L. nigropolita,* the bristles as in that species; antennae a little longer; arista with shorter hairs, which are hardly longer than its basal diameter, and, whereas in the preceding species they are present on practically the entire length, in the present species they are not visible beyond the middle; gena not more than one-sixth of the eye height.

Thorax shining black, quite evenly covered with pearly grey dust which does not obscure the surface, disc of mesonotum slightly more shiny than sides, and with the faintest trace of dark vittae when seen from behind and low down; pleura with grey dust even on posterior portion of the mesopleura. Chaetotaxy as in *L. nigripolita,* but the anterior intra-alar and lower posterior sternopleura both long and strong.

Abdomen more distinctly shining than the mesonotum, with very slight even grey dust, and no dorsal markings. Discal bristles on third visible tergite weaker than those on fourth; genitalia with longer and less dense, slightly curled, hairs.

Legs as in the preceding species, tarsal claws a little shorter.

Wings hyaline, veins fuscous to bases. Third vein with a basal setula; fourth vein curved forward near apex.

Calypteres brownish yellow, margin of lower one not darker than disc. Halteres yellow.

Hivaoa: Tepuna, altitude 3,010 feet, August 1, 1929, in miscellaneous sweeping, type female, Mumford and Adamson.

Limnophora, species.

Length, 6 mm.

Two females in too poor condition to determine, but distinct from the two above described. The wings broader, with two or three basal setulae on the third vein, and the calypteres yellow.

Hivaoa: Tapeata, east slope of Mount Ootua, altitude 2,500 feet, May 25, 1929; Mataovau, altitude 390 feet, June 5, 1929, Mumford and Adamson.

Limnophora, species.

Length, 3 mm.

A male specimen which is very closely related to *L. plumiseta* Stein, a species that occurs in Northern Africa and the Malay region. The fore femur has the same fine bristly hairs on the posteroventral surface which are longest at base and slightly curled at apices; the frons is one-third of the head width in the male, and the arista has the longest hairs about half as long as the width of the third antennal segment. Unfortunately the specimen is very badly preserved and though it has the abdomen present it is so greasy that it is impossible to determine if the fifth sternite has the dense short discal hairs that are present in *L. plumiseta.*

Hivaoa: Teava Uhia i te Kohu, altitude 2,100 feet, February 15, 1930, sweeping over *Paspalum conjugatum,* Mumford and Adamson.

Genus ATHERIGONA Rondani

This genus contains a large number of species but is, with the exception of one widely distributed form, strictly Old World in its occurrence. All the species of which the larval stages are known feed in fruits, vegetables, or the stems of grasses or grains, and possibly some of them may be considered of economic importance, especially in India and the Malay region. Without accurate data at hand on the habits of the species from the Marquesas, I suspect that all will be found feeding in fruits and vegetables; none of them, apparently, belong to the more slenderly built forms that feed in stems of grains and grasses.

It may be pertinent to note here that a key to the Sumatran species of this genus which I published in 1928[55] contains an obvious error at caption 17. Here the first section refers the user to 18, and the second refers to 19. The key was compiled from a more extensive one and there were two captions omitted in the abridged form so that because of omission to change the numbers after 17 one must accept the figure 20 as equivalent to 18 and 22 as equivalent to 19. In other respects this key is correct.

[55] Malloch, J. R., Fauna Sumatrensis, family Muscidae (Diptera): Ent. Mitt., 17, no. 5, p. 311, 1928.

Atherigona excisa (Thomson).

This species belongs to a group in which the males have a very well-developed depression or concavity on the upper side of the fore femur near its apex. This is the only species of that group in which there are no exceptional developments of the leg armature, and the wings have no markings. It has been described under many names from various parts of the Old World and is the only species as yet recorded from the New World, where it has been taken in some localities within the tropical zone. There is no question that it has been introduced into many localities in shipments of fruits, but it is hardly probable that it will prove destructive, as I believe that the larvae attack only injured or decaying fruits and vegetables.

The typical form of the species has the mesonotum densely grey dusted and with no definite brown vittae. The palpi are dark brown to black in both sexes.

Hivaoa: Atuona Valley, altitude 325 feet, July 6, 1929, 1 female, Mumford and Adamson.

Atherigona excisa, variety **flavipalpis** Malloch.

The palpi in this variety are testaceous yellow, and the mesonotum has traces of three brown vittae.

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

Atherigona excisa, variety **trilineata** Stein.

There are no males of this variety in the collection, but several females agree in every respect with Stein's type.

Hatutu [Hatutaa]: altitude 800 feet, September 30, 1929, near nest of *Fregata minor,* A. M. Adamson.

Mohotani: altitude 700 feet, January 31, 1931, LeBronnec and H. Tauraa.

A large number of females from the same locality and on the same date as the preceding variety may belong to either, but they have the palpi fuscous and are in greasy condition, so that it is not possible to allocate them definitely.

Atherigona ustipennis, new species.

Male

Head black, densely grey dusted except on the interfrontalia, the latter dark brown; antennae black; aristae pale brown; palpi brown, paler below apically owing to the presence of dense soft pale down on the under surface. All four verticals strong, postverticals shorter but well-developed. Antennae extending to vibrissal angles, third segment wide, equal to nearly one-half the width of the eye and more than four times as long as second segment; arista with very short pubescence basally, the second segment longer than wide and a little longer than first; palpi at least as long as lower margin of head, slightly clubbed at apices, with short bristles on outer side which are strong

and stubbly basally and become weaker apically, the apical third or more of the under or inner surfaces with dense soft hairs.

Thorax testaceous yellow, disc of mesonotum black and with dense grey dust, in type badly discolored with grease or water so that it is impossible to determine if there are distinct vittae, but in the females that are in better condition there are three dark brown vittae present, the central one of which extends on to the disc of the scutellum, only the margin of which remains of the ground color. The chaetotaxy almost as in the preceding species; humerals two, prealar small but distinct.

Abdomen testaceous yellow, with the dark spots present only on the apical two or three tergites, fourth visible one with two small round spots. General structure as in *A. excisa,* no hypopygial protuberance on dorsum at base.

Legs tawny yellow. Fore femur with the usual dorsal preapical depression deeper than in *A. excisa,* the armature similar to that of the other species. Hind femur with a short knife-like elevation on the ventral surface near apex, opposed to which there is a similar elevation on the ventral surface of the hind tibia near its base. None of the other legs abnormal in structure, the tarsi not exceptionally haired.

Wings hyaline, with a narrow but distinct brown cloud along the tip of the costa from apex of second to apex of fourth veins; first posterior cell narrowed at apex, its width on costa hardly half of the apex of the preceding cell; inner cross vein slightly beyond middle of discal cell.

Calypteres and halteres yellow.

Female

Length, 4 to 5 mm.

Similar to the male in general coloration and structure, but the palpi are not as noticeably widened at apices, the third antennal segment is narrower, the pleura darker, and the abdomen has a pair of large subtriangular dark brown spots on tergites 2 to 4, a pair of smaller round spots on 5, and a dark interrupted central vitta on the dorsum. The wings are stained with brown at apices. The fore femora are almost entirely black, the fore and hind tibiae are slightly darkened at apices as are also the fore and hind tarsi. The hind femora and tibiae lack the knife-like elevation on ventral surface as described for the male.

Hivaoa: Atuona Valley, altitude 325 feet, July 6, 1929, type male, allotype and 3 paratypes, Mumford and Adamson.

Tahuata: Kiinui Valley, altitude 1,210 feet, June 14, 1930, paratype females, LeBronnec and H. Tauraa.

Uahuka: Putatauua, Vaipaee Valley, altitude 880 feet, September 20, 1929, paratype females, A. M. Adamson.

Eiao: coconut plantation near center of island, altitude 1,450 feet, October 1, 1929, in miscellaneous sweeping, A. M. Adamson.

Specimens were collected in the Tipaerui and Fautaua Valleys, Tahiti, Society Islands, in September, 1928, by A. M. Adamson.

There are several described species of the genus in which the wing has an apical brown mark, but in no other except *L. crassiseta* Stein, which has the wings hyaline at apices, are the tarsi of the male without distinctive hairs and the hind femora and tibiae modified as in this species.

SUBFAMILY MUSCINAE

Genus **MUSCA** Linné

Musca domestica Linné.

A number of specimens in the collection are referable to this species, which is the most widely distributed of all those generally referred to the genus in the widest sense. I have recently restricted the genus to the species in which there are hairs on the center of the propleura, and thus to two forms, the present one and *M. vicina* Macquart. The latter is a very doubtful species; in fact, except for the narrower frons of the male, there is practically nothing to distinguish it from *M. domestica*, and as there is much variation in the character in *M. domestica* I have refused to accept two species, preferring to consider *M. vicina* as at most a variety of the genotype that is apparently confined to the tropical sections of the Old World. In fact, it is a remarkable circumstance that the farther from the tropics the specimens are found, the wider is the frons in the males. I make no attempt to explain this but merely place the matter on record.

Hivaoa, altitude to 1,520 feet; Uahuka, altitude 2,900 feet; Eiao, sea level. Also collected by the Pacific Entomoligical Survey in the Society Islands.

Genus **BYOMYA** Robineau-Desvoidy

Byomya sorbens Wiedemann.

This species is generally smaller than the preceding one and has the center of the propleura bare. It is the only other species recorded from Samoa and is apparently widely distributed throughout the Pacific islands.

Uahuka, altitude to 1,450 feet; Eiao, sea level. Also collected in the Society Islands.

NEW SPECIES AND OTHER RECORDS OF OTITIDAE (ORTALIDAE), PIOPHILIDAE, CLUSIIDAE, CHLOROPIDAE, AND DROSOPHILIDAE FROM THE MARQUESAS *

By

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INTRODUCTION

I have in my possession a rather large collection of certain families of Diptera taken in the Marquesas Islands by the staff of the Pacific Entomological Survey. Unfortunately, lack of time available to make an exhaustive study of them has prevented me from doing much more than to make a cursory survey, though I have already reported upon certain small groups in the survey series of publications.[56] Herein I merely make a partial report on some species that appear to be of importance in connection with problems of geographic distribution or that are of interest from other points of view.

FAMILY OTITIDAE (ORTALIDAE OF AUTHORS)

Genus SCHOLASTES Loew

Of the six species listed by Hendel,[57] only one is among this material.

Scholastes lonchifera Hendel.

Scholastes lonchifera Hendel: Abh. K. K. Zool.-Bot. Gesell. Wien, vol. 8, no. 1, p. 253, 1914.

This species is much darker than the more common and widely distributed *cinctus* Guérin, being shining black, with the abdomen distinctly metallic blue, the pale thoracic markings yellowish white, and the wing markings black. The frons is longer than wide, with the usual three transverse yellow stripes, the face is yellowish white, with a transverse median black band, and both sexes have a preapical elongate lozenge-shaped widened part on the arista.

Hivaoa: Atuona Valley, altitude 100 feet, February 25, 1929, Mumford and Adamson.

Fatuhiva: Tevaitapu Valley, altitude 650 feet, August 23, 1930; Omoa [Oomoa] Valley, Punahitahi, altitude 650 feet, August 18, 1930, LeBronnec.

Uahuka: Vaipaee Valley, September 20, 1929, Adamson.

Uapou: Hakahetau Valley, altitude 1,000 to 2,000 feet, January 31, 1930, and Papaika, altitude 1,000 feet, 1929, R. R. Whitten.

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[56] Marquesan Insects I, B. P. Bishop Mus., Bull. 98, Pacific Ent. Survey Pub. I, arts. 1, 2, 11, 14, 1932.

[57] Hendel, Friedrich, Platystominae: Abh. K. K. Zool-Bot. Gesell. Wien, vol. 8, no. 1, 1914.

* Pacific Entomological Survey Publication I, article 22. Issued December 9, 1932.

Adamson has also collected a number of specimens from Tahiti, Society Islands.

The species was originally described from a male, type locality, Cook Islands, and I have already recorded it from the Society Islands.[58]

Genus PSEUDORICHARDIA Hendel

This genus is readily distinguished by its blue-black color and the very much thickened hind femora, which have two series of short stout bristles on most of the extent of their ventral surface between which series lie the hind tibiae when at rest.

Pseudorichardia flavitarsis (Macquart).

Richardia flavitarsis Macquart: Dipt. Exot., suppl. 5, p. 121, 1850.
Richardia angulata Thomson: Freg. Eugen. Res., Dipt., p. 576, 1868.

This is the genotype. Only one other species is known, *aristalis* Bezzi, which was recently described from Fiji. *P. aristalis* may be known from *flavitarsis* by the lack of the large discal black spot on the wing, and the wholly yellow legs. Bezzi described a variety *interrupta* from Fiji in which the large black mark on the center of the wings in typical *flavitarsis* is reduced to a stripe over the base of the discal cell extending to the stigma, and a small isolated dark cloud over the inner cross vein. A teneral example from Society Islands which I have before me and another which I have recorded from Samoa closely approach this form, but I believe that immaturity with consequent lack of pigmentation is the cause of the variation and that the varietal name is unnecessary.

Hivaoa: ridge northwest of Taaoa, altitude 2,800 feet, June 3, 1929, Mumford and Adamson.

A series of specimens in collection from Tahiti, Society Islands.

Genus ACROSTICTA Loew

This genus as I accept it is distinguished from *Euxesta* Loew mainly by the pitted or rugose frons.

Acrosticta apicalis (Williston).

Euxesta apicalis Williston: Ent. Soc. London, Trans., pt. 3, p. 375, 1896.

Hivaoa: Hanaheka [Tanaeka] Valley, altitude 1,450 feet, June 4, 1929, Mumford and Adamson.

Fatuhiva: Uia [Ouia] Valley, near sea level, September 1, 1930, Le-Bronnec.

[58] Malloch, J. R., Exotic Muscaridae (Diptera), 26; Ann. Mag. Nat. Hist., 10th ser., vol. 4, p. 99, 1929.

Uahuka: Tahoatikikau, altitude 710 feet, March 18, 1931, LeBronnec and H. Tauraa.

Two specimens from Tahiti, Society Islands, Adamson.

A widely distributed species, having its origin apparently in the West Indies, whence it has evidently been carried in commerce to Samoa, Hawaii, Fiji, Society Islands, and the Marquesas.

Genus **PERISSONEURA,** new genus

This genus belongs to the group of closely allied genera containing *Acrosticta* Loew, *Euxesta* Loew, *Neoeuxesta* Malloch, *Paraeuxesta* Coquillett, *Pseudeuxesta* Hendel, *Chaetopsis* Loew, and *Stenomyia* Loew. The last two have been considered as synonymous and this opinion is concurred in by the writer. The status of *Pseudeuxesta* is dealt with subsequently in this paper. The remaining genera may be separated as follows:

Key to the Genera

1. First wing vein with small but constant and distinct setulae in a regular series on apical half above 2
   First wing vein bare, rarely with one or two scattered adventitious setulae on the upper side apically 3
2. Fifth wing vein continued beyond outer cross vein to, or almost to, the wing margin (Samoa) ..... **Neoeuxesta** Malloch
   Fifth wing vein terminating abruptly at, or just beyond, the outer cross vein..... **Paraeuxesta** Coquillett
3. Third antennal segment with a sharp point or well developed acute angle at upper apical corner ..... **Chaetopsis** Loew
   Third antennal segment rounded at apex..... 4
4. Frons distinctly pitted or rugose..... **Acrosticta** Loew
   Frons not pitted or rugose..... 5
5. Male, and rarely the female, with a spur vein projecting downward from near middle of the apical section of fourth vein; propleura with two quite stout and moderately long closely placed bristles; face with a central vertical carina which is rather sharply rounded on lower half and flattened on upper half between the antennal bases ..... **Perissoneura,** new genus
   Neither sex with a spur vein on fourth vein as described above; propleural bristle very fine and short, only exceptionally duplicated; face without a central vertical carina, with a submedian transverse depression..... **Euxesta** Loew
   Pseudeuxesta Hendel

I am erecting the new genus *Perissoneura* for the reception of the following new species which is apparently very common in the Marquesas.

Perissoneura diversipennis, new species (fig. 48).

Male

Length, 3 to 3.5 mm. Head black, with a slight greenish tinge on vertex and upper frontal orbits; upper portion of genae, upper part of face, anterior half of frons, the

antennae except upper margin of third segment and the aristae, and the entire palpi, orange yellow. Frons at vertex distinctly narrower than its length in center and over one-third of the head width, the orbits differentiated above from the interfrontalia by a slight gloss, all four verticals, the postverticals, and ocellars, long, the inner verticals very slightly proximad of the line of the outer pair; each orbit with two quite long upper reclinate bristles and anterior to these, three or more inner marginal bristles which are slightly shorter, the anterior one on each side usually incurved, the interfrontalia with numerous setulose hairs, sometimes with two in front much longer than the others and incurved, the hairing, however, rather irregular. Face in profile slightly produced at epistome, shallowly concave just above it but with a distinct fovea on each side so that the central line is raised in a narrowly rounded carina that becomes flattened above between the antennae; genae about as high as the width of the third antennal segment, with a series of marginal setae; third antennal segment longer than wide, rounded at apex; aristae subnude.

Thorax black, with a slight bluish to bronzy luster. Mesonotum with two pairs of postsutural dorsocentrals, the posterior pair longest, and some setulae in front of the anterior pair, the intradorsocentral hairs in about six irregular series, prescutellar acrostichals well developed, sternopleura with one distinct bristle and some long bristly hairs, mesopleura with at least one hind marginal bristle, propleura with the central armature and the pair of lower bristles about the same length and strength, straight. Scutellum with four subequal bristles.

Legs bluish or greenish black, the tibiae brown, paler basally, and the tarsi testaceous yellow, darkened at apices. Fore femur with a series of posteroventral bristles which are very short basally and become long before apex.

Wings greyish hyaline, with dark brown markings and venation as shown in figure 48, the spur vein usually curved.

Halteres yellow.

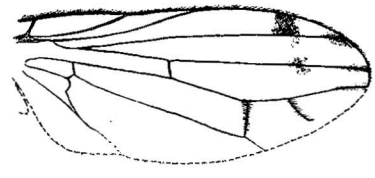

FIGURE 48. *Perissoneura diversipennis,* wing of male.

Female

Length, 3.5 to 4 mm. Differs from the male in having the wings entirely without dark markings and in very exceptional cases only with a trace of the spur vein, the tibiae and tarsi preponderantly testaceous, and the size greater.

Fatuuku: altitude 860 feet, September 19, 1930, type, male, allotype and many paratypes, H. Tauraa.

Hatutu [Hatutaa]: altitude 800 feet, April 28, 1931, a number of specimens of both sexes in a vial of alcohol, LeBronnec and H. Tauraa.

Genus EUXESTA Loew

In my report on the Ortalidae in the "Insects of Samoa" in 1930 I did not distinguish from the present genus the species upon which Hendel based the genus *Pseudeuxesta* and consequently redescribed the genotype of

the latter as *Euxesta semifasciata,* new species. To the extent that I failed to identify Osten Sacken's species I failed admittedly, but in failing to distinguish the two concepts I did not err, and in the collection now before me I find a species that connects the Oriental and New World species so completely that I am compelled to propose the synonymizing of *Pseudeuxesta* with *Euxesta.* Mere geographic distribution can not be made the criterion for the generic separation of Oriental from New World forms, and here we have little else upon which to base the separation.

I had, with only the typical American species of *Euxesta* and the genotype of *Pseudeuxesta* in hand, some doubt as to the propriety of absolutely refusing to recognize *Pseudeuxesta,* but the new species described below caused me to decide definitely to take this course. In the comparison of the genotypes I was struck by the much higher genae of the Oriental form than of the American, in the Oriental form as high as or higher than the length of the entire antenna, whereas in true *Euxesta* species the genae are very much narrower, never greater than the length of the third antennal segment alone. In addition to this distinction, the frons in *Euxesta* in the strict sense has the hairs and bristles much stronger; those along the inner margins of the orbits are about as long as the longer of the upper reclinate orbitals in some species, though they vary somewhat in the genus. In *Pseudeuxesta* the frons is much shorter and somewhat more densely haired, with usually but one distinct upper reclinate orbital and no well-developed inner marginal bristles anteriorly. Apart from these characters and the more regularly forwardly inclined apical section of the fourth vein, I can find no distinctions of moment. It is therefore interesting to discover in the Marquesan material a form, represented by many specimens, that agrees in wing venation with the Oriental form, and in the frontal characters, and almost equally in those of the genae, with the American forms. This I deal with below.

Euxesta hyalipennis, new species.

Male

Head red to brownish yellow, the face quite densely grey dusted, occiput shining bluish black, the vertex, ocellar triangle and upper third of the orbits colored as occiput but usually with a more distinct blue or violet tinge. Antennae brownish testaceous; genae black below, red above; palpi brownish to yellow testaceous. Frons at vertex a little more than one-fourth of the head width, slightly grey dusted on the dark parts, widened gradually to anterior margin, only the upper orbits differentiated in ground color, the extreme lateral edges proximad of these faintly yellowish grey dusted. All vertical bristles strong, the inner pair situated well behind the postocellar line and slightly proximad of the posterior verticals, the postverticals farther from posterior ocelli than the latter are from anterior ocellus; each orbit with two short but distinct reclinate bristles on the upper third, a few very much shorter setulae in front that are not reclinate, and the interfrontalia with scattered black setulose hairs which become longer and incurved anteriorly; length of frons about twice as great as its width at center. Genae about as high as width of third antennal segment. Face black below

the grey dust. Aristae subnude; third antennal segment about 1.25 times as long as its greatest width, broadly rounded at apex.

Thorax shining black, with a greenish or bluish tinge, usually more violet or purple near sides, the mesonotum with regular greyish pruinescence which does not very perceptibly obscure the ground color. The presutural bristle lacking as usual in this genus and its closest allies; dorsocentrals two pairs, the intradorsocentral hairs in six irregular series, rarely as many as eight, close to suture; prescutellar pair of acrostichals strong; scutellars consisting of four subequal bristles; propleural merely a fine hair, the central propleural hairs also very fine.

Abdomen colored as thorax, slightly brownish basally and sometimes on the sides; fourth visible tergite tapered to apex, not noticeably longer than third.

Legs bluish black, yellow at apices of fore coxae and all femora, bases of all tibiae, the basal segment of fore and basal two or three segments of mid and hind tarsi. Fore femur with a series of moderately strong posteroventral bristles.

Wings yellowish hyaline, veins pale brown; venation almost as in *prima* Osten Sacken, except that the first vein enters the costa farther from the apex of the subcosta; first posterior cell gradually narrowed to apex.

Halteres reddish or yellowish.

Female

Length, 2.5 to 4 mm. Similar to the male in all respects, but the mid and hind tarsi more extensively yellow. Fourth visible abdominal tergite distinctly shorter than third.

Hatutu [Hatutaa]: type, male, allotype, and paratypes, more than 70; the type, allotype, and several paratypes taken near nests of *Fregata minor,* altitude 800 feet, others at altitude 1,080 feet, near center of island, September 30, 1929, Adamson.

Euxesta pruinosa, new species.

Male

Very similar to the preceding species, differing in color in having the frons brighter, orange-red, the entire lateral margins of this and the vertex, ocellar triangle, upper edge of occiput, and the postocular orbits, densely grey dusted, the mesonotum also densely grey dusted so that the green ground color does not show as clearly as in *hyalipennis,* the abdomen aeneous, with much less distinct dust than the mesonotum, and the mid and hind tibiae testaceous yellow, only the fore pair extensively black, and the hind pair rather faintly browned.

Frons at vertex about one-fourth of the head width, not widened in front as in the preceding species but parallel-sided, the bristling and hairing much the same, but the two pairs of upper orbitals are stronger and longer, the posterior one is a little in front of a line drawn across the anterior ocellus, and the anterior one is much farther in front of the posterior one than in *hyalipennis,* the distance being greater than that from the posterior bristle to the anterior ocellus while in the other it is distinctly less; genae a little higher than in *hyalipennis.*

Thorax differing, apart from the color, in having the intradorsocentral setulae in four rather irregular series close to suture.

Fore femur with the posteroventral surface with several series of quite long dense bristly hairs, most conspicuous basally, and apically with a few distinct bristles; mid tibia with a series of very short fine erect hairs on the entire extent to the anterodorsal surface which are not distinguishable in *hyalipennis.*

Wings as in the preceding species, but the veins more yellow at base.

Female

Length, 4 to 5 mm. Similar to the male, the fore femora not as densely haired below and the fine erect mid-tibial hairs less evident.

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

Mohotani: seashore, January 31, 1931, paratypes in poor condition, 1 male and 4 females, LeBronnec and H. Tauraa.

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

The numerous fine and bristly hairs on the ventral surface of the fore femora in both sexes readily distinguish the species from *hyalipennis,* which has in both sexes a single series of well-developed bristles on the entire extent of the posteroventral surface of the fore femora.

Genus **HETERODOXA,** new genus

This genus as I propose to accept it is, according to tenets laid down in many related families, quite heterogeneous, but I am inclined to consider that despite the varied characters of the constituent species they have all been derived from one common form and that by distinguishing them as other than merely species I should be doing violence to my principle of attempting to coördinate related forms on the basis of the facts disclosed in the particular region under examination rather than upon facts pertaining to the fauna of other regions. The degree of hairing of the first and third wing veins is a character that has been applied to the purpose of generic separations in most families of Diptera with a large degree of success, but not infrequently the too rigid application of a rule, such for example as the existence or nonexistence of setulae on the base of the third vein, will be found to result in the separation in some examples of the sexes of one species or, in others, in the separation of different specimens of the same species into two different genera. Having this in mind, I have handled the present material conservatively, and, I believe, in accordance with the best interests of our study, retaining the varied forms in one genus.

I would here point out that I consider the name proposed to be sufficiently distinct from *Heterodoxus* Le Souef and Bullen to entitle me to use it here despite the opinion of some of my contemporaries.

The position of the genus in the classification would evidently be in the subfamily Pterocallinae because of the setulose first vein of the wing, the rounded apex of the third antennal segment, the general dull color, and nonconvergent apices of the ultimate sections of the third and fourth wing veins. The genus runs down fairly well to *Callopistromyia* in Hendel's key to the genera of this group,[59] but the head is very different in structure,

[59] Hendel, Friedrich, Pterocallinae: Genera Insectorum, fasc. 96, p. 6, 1909.

with the height equal to, or exceeding, the width instead of much greater than the width, and the frons either parallel-sided or slightly widened in front instead of distinctly wider behind. In the wing venation there are also some distinctions, but I consider these of less importance than the cephalic characters. For other characters see the description below. The species before me may be distinguished as in the appended key. Genotype, *Heterodoxa uapouae,* new species.

Key to the Species

1. First wing vein setulose on its upper surface from close to the humeral cross vein to the apex, the markings as in figure 49, *a*.....**1. uapouae**
   First wing vein setulose on its upper surface only on the section from below, or very slightly proximad of, apex of the subcosta to its tip..... 2
2. Inner cross vein distinctly proximad of the middle of the discal cell, markings as in figure 49, *b;* scutellum testaceous yellow, with a central blue mark.....**2. hivaoae**
   Inner cross vein at or very close to the middle of the discal cell; scutellum without a central blue mark..... 3
3. Second visible tergite of abdomen velvety black; markings of wings as in figure 49, *c*.....**2. uahukae**
   Second visible tergite of abdomen testaceous yellow, with three dark brown vittae, one in center and one at each lateral dorsal curve; markings in wings as in figure 49, *d*.....**4. fatuhivae**

1. **Heterodoxa uapouae,** new species (fig. 49, *a*).

General color brownish yellow, nowhere distinctly shining. Head with the ocellar spot fuscous, upper half of occiput with a dark brown line on each side of the central part from which the brown color is carried outward less intensively to almost the lateral edges; frontal orbits, lunule, face, and postocular orbits grey dusted; third antennal segment browned below. Frons at vertex about one-third of the head width and less than one-half as wide as its length in center, parallel-sided, all vertical, the ocellar, postvertical, and orbital bristles long, the anterior pair of orbitals distinctly shorter than the posterior pair and situated about midway from posterior ocelli to anterior extremity, the orbitals distinct on the entire extent, as far as the grey dust is concerned, but the true orbits apparently ceasing at the upper bristle, the anterior one not situated on the grey dusted stripe but mesad of it; interfrontalia with numerous rather long setulose hairs, longer in front, curved over the central line. Face slightly concave in center in profile, without any definite antennal foveae; genae well defined, the entire jowl about as high as width of third antennal segment, the lower edge of genae with a series of quite long bristly hairs. Antennae not elongated, third segment broadly rounded at apex, and about 1.5 times as long as wide; aristae bare; palpi normal.

Thorax with greyish dust, the mesonotum with three broad and two linear brown vittae, all poorly defined, the linear pair along the bases of the dorsocentral series and somewhat punctiform, the larger bristles each with a distinct brown dot at base; pleura varied with dark brown. Two pairs of well developed postsutural dorsocentrals and one pair of presutellar acrostichals present. Scutellum without distinct dark marks, the four bristles long. Sternopleura and mesopleura each with one strong bristle and numerous hairs; propleural hair-like; prosterum bare.

Abdomen with some small dark brown spots, a partial central vitta, and the apices of the tergites with a fascia of the same color.

Legs unicolorous tawny yellow. Fore femur with a series of posteroventral bristles;

mid femur with two apical posterior bristles; hind femur with two preapical dorsal bristles.

Wing marked with dark brown as in figure 49, *a*; first vein setulose on upper side from near humeral cross vein to apex, bare below; third vein bare.

Female

Length, 5 mm. Similar to the male in all respects except the genitalia.

Uapou: Hakahetau Valley, altitude 1,000 to 2,000 feet, January 1, 1930, type, male, and allotype, R. R. Whitten.

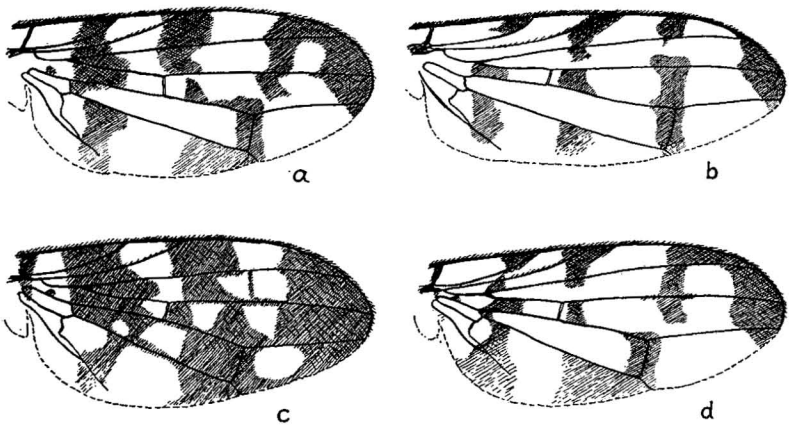

FIGURE 49. Wings of *Heterodoxa* species: *a, H. uapouae*; *b, H. hivaoae*; *c, H. uahukae*; *d, H. fatuhivae.*

2. Heterodoxa hivaoae, new species (fig. 49, *b*).

Male

Length, 5 mm. General color brownish yellow, as in the preceding species, but the thorax, and more especially the abdomen, more distinctly shining.

Head in addition to the black ocellar spot with a shining brownish black spot connected with it and behind the posterior ocelli. Structurally similar to the preceding species, but the anterior orbital not as far forward. Antennae both lacking except the basal two segments; these are yellow.

Mesonotum with grey dust and three broad though poorly defined fuscous vittae, the central one continued over the disc of the scutellum where it becomes distinctly blue in tone; pleura with two fuscous vittae, one near upper margin, the other on the upper part of sternopleura. Bristling as in the preceding species, the presutural not present.

Abdomen almost glossy, somewhat greasy so that the markings are obscured, but in the main similar to the preceding species though the first two visible tergites are more preponderantly blackened and the remainder less so.

Legs entirely tawny yellow, armed as in the preceding species.

Wings narrower than in the other species, when seen from the tip against the light distinctly yellow except in the anterior basal cell between the inner cross vein and the dark mark basad of it, in the first posterior cell, the apical section of the submarginal cell, and in the second posterior cell, which are whitish hyaline; the markings shown in figure 49, *b,* dark brown. The inner cross vein is distinctly before the

middle of the discal cell; to which character I do not attach the same importance as does Hendel in his classification of the subfamily, referred to above.

Hivaoa: Mount Temetiu, altitude 2,500 feet, July 24, 1929, type, miscellaneous sweeping, Mumford and Adamson.

3. **Heterodoxa uahukae,** new species (fig. 49, *c*).

Female

This species is of the same general color as the preceding two, but has the second abdominal tergite velvety black or brownish black, the brown mesonotal vittae all interrupted, the scutellum irregularly brown at base, and the wings marked as in figure 49, *c*.

Head with the ocellar spot fuscous, and the genae brown above, otherwise orange yellow, the third antennal segments missing in type; back of head slightly dark in center as the other species. All frontal bristles rubbed off, but from the size of the insertion scars they appear to be rather large, the anterior pair of orbitals about midway from the posterior ocelli to anterior margin.

Mesonotum with the central vitta extending from anterior margin to the suture at which latter point it is dilated, and at the bases of the presutural acrostichals it is again present in the form of two spots at bases of the bristles, the sublateral vittae broken into three parts, one on anterior margin, a second at the suture, and a third on the postalar convexity; pleura largely blackish brown; scutellum with a rather variable dark brown basal mark. Chaetotaxy as in the two preceding species.

Abdomen entirely dull, the basal two tergites dark, the others tawny yellow and with rather irregular velvety brown markings. Sheath of ovipositor black, yellowish at base.

Legs tawny yellow, femora darkest, the armature as in the genotype.

Wings more extensively blackened than in any of the others, the inner cross vein close to middle of the discal cell (fig. 49, *c*).

Halteres yellow.

Uahuka: Hitikau Ridge, altitude 2,900 feet, March 4, 1931, type, Le-Bronnec and H. Tauraa.

4. **Heterodoxa fatuhivae,** new species (fig. 49, *d*).

Female

Like the other species, this one is tawny yellow, though the type specimen is teneral, whence it is difficult to describe the exact color and markings. The mesonotum has much more distinct and complete dark brown vittae than the next preceding species, the abdomen has less extensive dark markings than in the latter, and the wings are marked as in figure 49, *d*.

Head with the same dark marks as in the next preceding species, but the occiput more extensively dark brown. The two pairs of orbital bristles are much closer than in the last species, the anterior pair about half as far from the posterior ocelli as they are from the anterior margin. Third antennal segments missing.

Thorax dull tawny yellow, with yellowish grey dust. Mesonotum damaged by the pin so that it is impossible to be sure whether the central vitta is present anteriorly, but there is a pale brown trace of it on the presutural area, as there is also on the disc of the scutellum; the sublateral vittae are quite conspicuous, dark brown, narrowly interrupted and angulate at the suture; pleura with a rather faint brown upper vitta and a similar central one over the upper part of the sternopleura. Chaetotaxy normal, the prescutellar acrostichals strong.

Abdomen tawny yellow, with a dark brown central vitta and apices of the same color to most of the tergites, the sheath of the ovipositer tawny yellow.

Legs tawny yellow, apices of the tarsi browned.

Wings with the markings as in figure 49, *d*, the inner cross vein white, as in the other species, and close to the middle of the discal cell.

Halteres yellow.

Fatuhiva: Teavaipuhiau, altitude 2,150 feet, August 25, 1930, sweeping over *Paspalum conjugatum,* type, LeBronnec.

Because of the teneral condition of the type specimen, the markings of the wings shown in figure 49, *d,* may not prove to be accurate for mature specimens. In mature examples the wing markings are generally more extensive.

FAMILY PIOPHILIDAE

Genus **PIOPHILA** Fallen

The members of this genus are, as far as is known, scavengers, feeding in decaying animal matter. Several of them are of almost world-wide distribution.

Piophila casei (Linné).

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

This is the most generally distributed and common species of the family. Its frequent occurrence in preserved meats and cheese is largely responsible for its distribution from New Zealand northward to Siberia in the Old World, and from Patagonia to arctic Canada in the New World.

FAMILY CLUSIIDAE

Genus **TONNOIRIA** Malloch

This genus was erected for the reception of a Society Islands species. I have before me a series of specimens dealt with below, and have also representatives from Guam.

Tonnoiria palliseta Malloch.

Hivaoa: Teava Uhia i te Kohu, above Puamau, on *Hibiscus tiliaceus,* Mumford and Adamson.

One female without head belongs here and agrees with a number taken on Tahiti, Society Islands, altitude 1,500 feet, by A. M. Adamson.

The larvae undoubtedly live in dead wood, but nothing is as yet known of the life history of this genus.

The Guam species is distinct from the present one, and apparently undescribed.

FAMILY CHLOROPIDAE

Genus **PROHIPPELATES** Malloch

Prohippelates pallidus (Loew).

Hatutu [Hatutaa], 1,010 feet; Uahuka 880 feet; Fatuhiva, 50 feet; Hivaoa, 2,500 feet; Mohotani, on seashore, 975 feet and 1,000 feet.

A number of specimens from Tahiti, Society Islands, 1,500 feet, were taken by A. M. Adamson.

This species is very widely distributed in tropical regions from the West Indies to the Hawaiian islands, the Seychelles, and Samoa.

Of the many specimens in the collection, the greatest number belongs to the typical form with entirely yellow thorax and antennae, but others show the two dark mesonotal vittae that distinguish form *bilineatus* de Meijere, and in a number of specimens the antennae are black, which latter may be accepted as *nigricornis* Thomson, considered as merely another variation.

The species has been reared from larvae feeding in dead shellfish.

Genus **CADREMA** Walker

This genus, generally accepted as *Hippelates* Loew, is represented by one species in the Marquesas Islands, but at present I have not determined it specifically.

In North America certain species are known as eye-flies and are very annoying in summer by flying around people and getting into the eyes and nostrils, especially during hot humid weather. They are suspected of being carriers of certain eye diseases, and an intensive investigation of their life-histories is being made in North America by the United States Bureau of Entomology.

I have seen one species from New Zealand and several from Australia.

Genus **MICRONEURUM** Becker

This genus is readily known by the very short second wing vein, the tip of this ending in the costa at less distance from first than the latter is from the humeral cross vein. I have seen one Australian species. The others come mainly from the tropical sections of the Old World.

Microneurum signatum Wollaston.

Teuaua Islet, off Uahuka, September 21, 1929, 25 specimens, Adamson.

This species is distributed from the Madeira Islands to Formosa.

Genus **OSCINOSOMA** Lioy

This is the most widely distributed genus of the subfamily Oscinosominae. At this time I present the description of one new species which might

with some plausibility be placed in *Gaurax* Loew, but the latter is a very poorly defined group, about the only character for its distinction from *Oscinosoma* being the more distinctly haired aristae.

Oscinosoma uahukae, new species.

Female

Length, 3 mm. Head yellow, triangle and upper two-thirds of back of head glossy black; antennae and aristae black; palpi orange-yellow; hairs and bristles on frons dark, the hairs on lower margin of gena yellow. Frontal triangle extending to or a little beyond middle of frons, the extreme edges and the ocellar spot slightly dusted; length of frons slightly over its width, the vertical bristles well developed, the inner marginal hairs on orbits quite long, and the surface hairs on interfrontalia quite strong; third antennal segment moderately large, somewhat reniform; arista with the longest hairs longer than its basal diameter; gena almost linear.

Thorax glossy black, including the scutellum, the mesonotum with a fairly large triangular yellow mark above the notopleural suture; lower edge of propleura yellowish brown. The usual 1 + 2 notopleurals present; scutellum with two moderately large apical and two much smaller preapical bristles, the disc haired; mesonotum not punctured.

Abdomen black.

Legs yellow, all femora blackened from near, or before, middle to near apices; all tibiae blackened from near base to beyond middle, the fore pair least distinctly so; apical three segments of fore and mid tarsi and apical two segments of hind pair black. Sensory area on hind tibia short but distinct.

Wings hyaline, much damaged in type so that the venation can not be described definitely.

Uahuka: Hitikau Ridge, altitude 2,900 feet, March 4, 1931, on *Weinmannia* species, type, female, LeBronnec and H. Tauraa.

FAMILY DROSOPHILIDAE

There is a very large number of specimens of this family amongst the material in my hands, though the number of species is not particularly large. Most of the species belong to *Drosophila* in the wide sense, but some others belong to genera in which there are comparatively few species. It is impossible to deal with the entire collection at this time, but a few of the most interesting species are covered in this paper.

Genus **DICLADOCHAETA,** new genus

This genus is very similar to *Cladochaeta* Coquillett, differing in having the head more elongate, with the posterior ocelli well in front of the vertex, the postvertical bristles closer together, the proclinate orbital distinctly in front of the very small reclinate one, the main branch of the arista with a very small hair near its apex above, and the mesonotum with but two series of intradorsocentral hairs.

Genotype, *Dicladochaeta biseriata,* new species.

Dicladochaeta biseriata, new species.

Male and Female

Length, 2.5 to 3 mm. Head varying from tawny yellow to orange-yellow, with the frons rather densely whitish grey dusted on each side, the dust extending over the vertex on each side of the ocelli; antennae entirely yellow, ocellar spot, a spot on each side of vertex below the upper level, and sometimes the upper orbits, fuscous below the pale dust; the hairs and bristles and also the aristae dark. Frons at vertex about half the head width, becoming slightly narrower to anterior margin, the orbits well differentiated because of the grey dust, narrow above, widened to the proclinate bristle which is situated about two-thirds from the vertex and well away from the eye, and narrowed from that point to anterior margin, at widest point fully half as wide as the interfrontalia at same point. All verticals well developed, postverticals convergent, about as long as the upper reclinate orbitals; ocellars slightly behind level of anterior ocellus and in line with the posterior ocelli and bases of postverticals; anterior reclinate pair mere short hairs; surface hairs very sparse. Face concave in profile, with no well developed vertical central carina, the parafacials hardly visible in side view; gena linear; vibrissa single; antennae normal, third segment about 1.5 times as long as second, rounded at apex, second with two or three short black bristles; arista consisting of a lower ray from which one about equally as long emanates near base, and usually a very short hair near apex on upper side of arista.

Thorax variable in color, sometimes tawny yellow, distinctly shining, and paler ventrally, and sometimes with two rather distinct dorsal brown vittae; the mesonotum usually with evident grey dust. Two pairs of strong dorsocentrals present, the anterior pair a little nearer to the suture than to the posterior pair, presutural bristle well developed, humeral one, intradorsocentral hairs in two regular series, prescutellar acrostichals undeveloped, sternopleurals two, the upper one weak; scutellars four.

Abdomen colored as thorax, rather variable also, but in the material before me generally unmarked.

Legs tawny yellow. Fore femur with a series of widely spaced posteroventral bristles, all tibiae with a fine, moderately long preapical dorsal bristle; claws of all legs quite large and conspicuously curved.

Wings hyaline, veins brownish. Costa with quite noticeable, fine, rather widely spaced erect hairs from apex of first to apex of third vein, and one bristle at the subcostal break. Sixth vein short but distinct, ending about midway to margin of wing. Outer cross vein at fully its own length from apex of fifth vein. Third vein ending in wing tip.

Halteres yellow.

Hivaoa: Matauuna, altitude 3,760 feet, July 24, 1929, type, male, allotype, and 5 paratypes, Mumford and Adamson.

The genus *Cladochaeta* occurs in tropical America only, and though the above genus is compared with it, this course is adopted because it is to the American genus it will run in existing keys to the genera. It is, however, my opinion that the new genus is more closely allied to *Scaptomyza* than to *Cladochaeta.*

Genus **BUNOSTOMA,** new genus

This genus, like the one just described, has but two series of intradorsocentral hairs on the entire extent of the mesonotum, and the prescutellar acrostichals undeveloped, but the aristae are numerously rayed above and

furnished with two or more rays below (fig. 50, *a*). In general the genus resembles *Drosophila* Fallen, but the face is very different in form, having a mound-like elevation over its entire width which tapers downward to the epistome, and gradually narrows into a slender interantennal carina above (fig. 50, *b*). The frons is similar to that of typical Drosophilidae, and, whereas in *Scaptomyza* Hardy there are but two series of intradorsocentral hairs, the face is not as in the present genus, and the species are much more slender.

Genotype, *Bunostoma flavifacies,* new species.

Bunostoma flavifacies, new species (fig. 50, *a, b*).

Male and Female

Length, 2.5 to 3 mm. Shining brownish black, the abdomen deeper black and more glossy than the thorax, the frons and mesonotum with very slight greyish dust, the abdomen without dust.

Head black, face except upper third varying from dull yellow to yellowish brown, second antennal segment sometimes reddish, palpi fuscous. Frons at vertex one-half of the head width, narrowed to anterior margin, its length in center distinctly less than equal to its width at vertex; inner verticals distinctly longer than outer pair, the latter equal to ocellars and upper reclinate orbitals in length; postverticals a little shorter than outer verticals, converging at tips; anterior reclinate orbital very minute, very slightly before the proclinate pair and nearer to eye than these, the proclinate bristles not more than half as long as the upper reclinate pair; orbits distinct to base of proclinate bristle, extending almost to anterior margin, the triangle shining and extending almost to anterior margin also; face yellow to pale brown below, evenly convex between vibrissae (fig. 50, *b*); profile of head as in figure 50, *a*; palpi with a rather long apical, and some much shorter preapical, setulae.

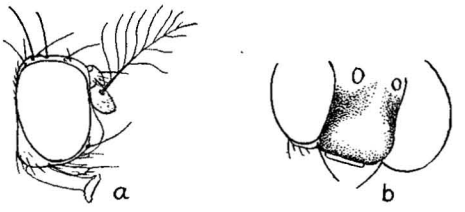

FIGURE 50. *Bunostoma flavifacies*: *a,* head in profile; *b,* face, oblique view.

Thorax shining brownish black, with slight grey or brownish dusting on mesonotum. Bristling as follows: two pairs of long equally widely spaced dorsocentrals, the anterior pair nearer to suture than to posterior pair, one humeral, two notopleurals, one supra-alar, one short prealar, two postalars, and one long presutural; intradorsocentral hairs in two series which do not extend entirely to hind margin; scutellum slightly flattened on disc, the apical bristles closer together than they are to the basal pair; sternopleurals two, the upper one short.

Abdomen glossy black. Seventh tergite in male reduced to a mere ring because of the truncate slightly concave apex of the abdomen, the sixth tergite with a series of quite long preapical bristles on each side below the curve. Genital lamellae of female very similar to those of *Scaptomyza incana* Meigen, the general color testaceous yellow, their inferior edges with short stubby bristles.

Legs shining black, extreme apices of femora, both extremities of tibiae, and all of the tarsi testaceous yellow. No exceptional armature present, all tibiae with a fine preapical dorsal bristle.

Wings greyish hyaline, veins brown. Costa with a series of minute rather widely spaced setulae on upper side which do not project forward but upward and are thus seen only when the wing is viewed from hind margin against the light; section of the costa between apices of second and third veins fully twice as long as the one beyond it and a little less than one-third as long as the preceding section; outer cross vein at about 1.5 times its own length from apex of fifth vein; ultimate section of fourth vein fully 1.5 times as long as penultimate section.

Halteres yellow.

Hivaoa: Kopaafaa, altitude 2,770 feet, August 2, 1929, in miscellaneous sweeping, type, male, allotype, and 3 male paratypes; Mount Temetiu, northeast slope, altitude 2,800 feet, September 13, August 3, 24, and 29, 1929, in miscellaneous sweeping, 4 paratypes; Mumford and Adamson.

Genus **SCAPTOMYZA** Hardy

This genus is distinguished from *Drosophila* merely by the less numerous series of intradorsocentral hairs. Recent writers have treated the genus variously. Duda at one time expressed the opinion that it was at most a subgenus of *Drosophila,* and then proposed dividing it into two subgenera. Hendel [60] has still more recently given it full generic status, realigned the type species of Duda's concepts pointing out the errors in Duda's papers, and elevated the two segregates to generic rank. The action taken by Hendel was predicated upon the characters of the bristling and hairing of the thorax, and apparently upon the food habits of the species involved. *Scaptomyza* as restricted by him contains *graminum* Fallen, with two doubtful forms, in which the mesonotum has but two series of intradorsocentral hairs, one strong humeral bristle, the face with a very distinct nose-like elevation, and larvae that occur as a rule in decaying vegetable matter or in fruits, only occasionally mining in leaves. *Scaptomyzella* (*Scaptomyzetta, erratum*) includes two species which have the intradorsocentral hairs in four series, two humerals, the face less distinctly elevated centrally, and the larvae true leaf-miners.

Unfortunately the habits of the larvae are not always known to one when specimens are submitted for identification, so this last character can hardly be maintained as of systematic value, particularly as it is not one that can be applied invariably even in the two groups under discussion. We are thus compelled to use only the structures listed above, and to some extent the minor characters of the terminal segments of the abdomen in both sexes mentioned by Hendel. In attempting to apply these to the North American

[60] Hendel, Friedrich, Über die minierenden europaeischen Scaptomyza-Arten und ihre Biologie (Diptera): Zool. Anz., vol. 76, p. 289, 1928.

species we find that *adusta* Loew, which has been found in the larval stage mining the leaves of cabbages, does not fit in either, having one strong humeral bristle and four series of intradorsocentral hairs so that it would appear to require either another genus for its reception or the dropping of the new one proposed by Hendel, *Scaptomyzella.* Of the other three North American species known to me, one would fit into *Scaptomyza,* the other into *Scaptomyzella,* Hendel's genus, but the other, *vittata* Coquillett, though falling into *Scaptomyza* on the characters cited above as to thoracic armature, has an additional pair of dorsocentral bristles and assumably might be considered as the basis for a fourth generic concept. My personal opinion is that one genus might well contain all four types and I suggest that *Scaptomyzella* be considered as a synonym of *Scaptomyza.*

In the Marquesas material before me there are a number of specimens referable to the genus, apparently representing three species, all of them with biseriate intradorsocentral hairs and one humeral bristle, and consequently they belong to *Scaptomyza* in the strict sense as defined by Hendel. I describe two of these as new.

Scaptomyza latifrons, new species.

Female

Length, 3 to 3.5 mm. A testaceous yellow species, with the thorax slightly, and the abdomen more distinctly, shining, ocellar spot hardly darkened, abdomen with a dark lateral mark on apex of each tergite from third to fifth inclusive, a less evident central apical dark mark on the same tergites, usually more noticeable on fifth, and a large fuscous mark on almost the entire dorsal exposure of the sixth. Wings hyaline.

Head entirely yellow. Frons at vertex half of the head width, much narrowed to anterior margin, its length in center about equal to its anterior width, the orbits slightly differentiated and with very faint grey dust, practically uniform in width on their entire length, the triangle poorly defined. Vertical bristles well developed; upper reclinate orbital a little below middle of frons and fully three times as far from vertical as from the proclinate bristle, the anterior reclinate bristle very short and fine, situated slightly laterad and in front of the proclinate one; postverticals situated below vertex and separated by a distance about 1.5 times as great as that across the posterior ocelli. Face much as shown in the figure of that of the next preceding genus, but the carina not as gradually rounded off below, though the nose-like form found in *graminum* Fabricius is quite different. Arista with 7 rays above and 2 long rays below, as compared with the normal 5 above and 1 below in *graminum.* Palpus with a moderately long terminal bristle. Gena not over one-fourteenth of the eye height; marginal hairs moderately long; vibrissa single.

Thorax with the same bristles and hairs as in the genotype, the two pairs of dorsocentrals equally strong, widely separated, and the prealar short but distinct; scutellum with four subequal marginal bristles; sternopleura with one long and one much shorter and finer upper bristle.

Abdomen normal, the apical dorsal process broadly rounded at apex, with numerous fine hairs, two at apex longer than the others; genital lamellae typical of the genus, with numerous small black points on the margin apically.

Legs normal, fore femur with the posteroventral bristles less numerous than in *graminum,* only three on apical half well developed.

Wings rather slender, third vein terminating in tip, the section of the costa beyond it about half as long as the one immediately before it.

Halteres yellow.

Hivaoa: Kopaafaa, altitude 2,770 feet, August 2, 1929, in miscellaneous sweepings, type and 3 paratypes, Mumford and Adamson.

It appears worth noting that the eyes are quite distinctly haired and have a much more marked emargination of the lower posterior border than in the North American species.

Scaptomyza biseta, new species.

Male

Length, 2 mm. A paler species than the one described above, without dark abdominal markings, but the type is rather greasy and it is difficult to determine the true condition.

Differs from *latifrons* in having the head longer, in profile about 1.25 times as long as high, instead of about as high as long, the gena about one-sixth of the eye height, the eyes more distinctly emarginate on lower posterior border, the frons a little less than half the head width and distinctly longer than its anterior width, with the two long orbitals more widely spaced, and the postverticals closer. The outstanding distinction is found in the antennal arista which has only two long upper and no lower rays.

Thorax and abdomen much as in the preceding species.

Fore femur with much weaker posteroventral bristles than in *latifrons.*

Hivaoa: Matauuna, altitude 3,700 feet, March 4, 1930, miscellaneous beating, type, Mumford and Adamson.

Scaptomyza species.

One specimen which is very close to, if not identical with *australis* Malloch. The back of the head is yellow in the center behind the ocelli and black on each side. The eyes are less noticeably emarginate than in the two preceding species. I hope to obtain more material to determine whether this Australian species occurs in the Marquesas.

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

Genus MARQUESIA, new genus

This genus is very similar to *Drosophila* Fallen, but differs in having the mesonotum with four pairs of well developed dorsocentral bristles, the anterior pair in front of, the second pair at, the suture. The head is similar to that of *Drosophila,* but the lower margin of the gena is quite densely haired, the mesonotum has about six irregular series of intradorsocentral hairs, and the sixth wing vein is very thick and incomplete, attaining a length of more than half that to the wing margin. For other characters see description of the genotype.

Genotype, *Marquesia major,* new species.

Marquesia major, new species.

Male

Length, 6.5 mm. A large stout testaceous yellow species with conspicuous dark brown markings, the abdomen mainly of the latter color, with a conspicuous yellow, grey dusted spot on each side of the apex of each tergite. Wings pale brownish, darker at base and narrowly so on outer cross vein.

Head testaceous, dull, with greyish dust on the pale parts, the frons dark brown except on angles of the triangle and narrowly along the outer edge of each orbit, face with an irregular dark brown transverse stripe below middle; back of head with a large irregular dark brown mark on each side behind lower half of eye but not attaining the margins of eyes. Antennae brown, third segment almost black, the aristae black; palpi fuscous. Frons at vertex about half of head width, with a very noticeable depression on each side of the posterior ocelli, all the vertical bristles long, the postvertical pair about as long as the ocellars, length of frons at center equal to its width at posterior ocelli, the sides convergent slightly in front; orbitals rubbed off but almost in longitudinal line, the smallest one well developed. Eyes narrowed below, the posterior margin appearing transverse from above middle to lower margin, the hairs dense, short, and erect; gena almost linear, with dense biseriate setulose lower marginal hairs which run up to the strong vibrissa, and adjacent to the vibrissa two or three slightly shorter bristles; face with very well developed central vertical carina that is readily seen in profile, and a transverse deeply impressed line about midway from apex of third antennal segment to epistome. Arista with about nine upper rays and two lower. Palpi slightly club-shaped, downy, with one fine apical bristle.

Thorax testaceous yellow, with greyish dust on the pale parts, mesonotum with five broad dark brown vittae, pleura with the surface so broadly dark brown that only a vitta from propleura over middle of mesopleura and a narrow line below that on level of upper margin of the sternopleura remain yellow; scutellum slightly yellow at tip; postnotum brown on sides. Dorsocentrals 1 + 3, prescutellar acrostichals undeveloped; sternopleura with one long lower and two short upper bristles; scutellum with disc flattened, the margin slightly angulate at base of each bristle.

Abdomen dark brown, dull, with a conspicuous yellow, grey dusted spot on each side of apex of all tergites on dorsal exposure, some of the pairs connected, and no pale ventral markings. Hypopygium small, the forceps consisting of opposed rounded lobes that are rather densely haired, and the penis (?) of a slender chitinous downwardly directed blunt tipped process.

Legs dark brown, bases of tibiae and of tarsi testaceous yellow. Fore femora with a rather irregular series of posteroventral bristles; all tibiae with a preapical dorsal bristle.

Wings brownish hyaline, darker at bases, the outer cross vein with a narrow dark cloud. Third vein ending in apex, the section of costa beyond the vein about two-thirds as long as the preceding section; outer cross vein at about its own length from apex of fifth vein; penultimate section of fourth vein hardly shorter than ultimate section; sixth vein short and thick.

Halteres yellow.

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

This species reminds one of some of the very large Hawaiian species of the genus *Drosophila,* but I have found none of the latter in which there are four pairs of well developed dorsocentral bristles, all known to me agreeing with typical species of that genus in having two postsutural pairs.

MYRIOPODA OF THE MARQUESAS ISLANDS*

By

A. M. ADAMSON

PACIFIC ENTOMOLOGICAL SURVEY

INTRODUCTION

This report is based on the field work of the members of the Pacific Entomological Survey, including the writer, from 1929 to 1931. Dr. Filippo Silvestri has very kindly identified the Survey collection of myriopods, in which eight species are represented. As far as the writer is aware, there are no previous specific records from the Marquesas, except for that of *Scolopendra morsitans* by Rollin.[61]

In the recording of native names and other information given by Marquesans, the Survey was fortunate in having the assistance of Monsieur LeBronnec, who has been a resident for many years in the islands. Dr. E. S. Craighill Handy, Ethnologist at Bernice P. Bishop Museum, has been kind enough to look over the Marquesan names here recorded and to give information regarding them. For helpful advice in the preparation of this paper the writer is grateful to Dr. F. X. Williams and Mr. R. H. Van Zwaluwenburg of the Hawaiian Sugar Planters' Association Experiment Station.

CHILOPODA

FAMILY SCOLOPENDRIDAE

Scolopendra morsitans Linnaeus.

Hivaoa: north side of Mt. Temetiu, altitude about 2,000 feet, July 27, 1929, numerous specimens, collected by natives.

Mohotani: altitude 1,200 feet, February 2, 1931, 3 immature specimens, LeBronnec and H. Tauraa.

Fatuuku: altitude 990 feet, November 19, 1930, 2 immature specimens, in dead wood of *Pisonia* species, H. Tauraa.

Uahuka: Vaipaee Valley, near sea level, March 19, 1931, 1 immature specimen; Haahue Valley, altitude 800 feet, March 20, 1931, 1 immature specimen, under bark; LeBronnec and H. Tauraa.

Scolopendra subspinipes Leach.

Hivaoa: Aimoa, altitude about 1,700 feet, March 7, 1929, 2 specimens, Mumford and Adamson.

[61] Rollin, Louis, Les iles Marquises, p. 53, Paris, 1929.

* Pacific Entomological Survey Publication I, article 23. Issued December 21, 1932.

Tahuata: Tehue Valley, altitude 750 feet, May 27, 1930, 1 specimen; Vaitahu, May 30, 1930, 1 immature specimen; Vaitahu, seashore, June 4, 1930, 1 immature specimen; Vaitahu, altitude 500 feet, June 16, 1930, 1 immature specimen; Amatea, altitude 2,100 feet, June 30, 1930, 1 specimen; LeBronnec and H. Tauraa.

Fatuhiva: Omoa [Oomoa] Valley, altitude 450 feet, September 18, 1930, numerous immature specimens, LeBronnec.

Mohotani: above Anaoa, altitude about 350 feet, August 13, 1929, 1 immature specimen, Adamson.

Uahuka: Vaipaee Valley, altitude 270 feet, March 18, 1931, 1 specimen with eggs; Hanatea Valley, altitude 100 feet, March 11, 1931, 1 immature specimen; LeBronnec and H. Tauraa.

Uapou: Hakahetau, altitude 500 feet, December 17, 1929, 1 immature specimen; Hakahetau Valley, altitude about 1,000 feet, January 22, 1930, 1 specimen; Ouhaupakoa, altitude 500 feet, December 17, 1929, 1 immature specimen; Whitten.

Eiao: near middle of island, east side, altitude 1,665 feet, September 28, 1929, 4 immature specimens, Adamson; 3 immature specimens, at altitudes of 1,600 feet, April 16, 1931, 1,650 feet, April 24, and 1,700 feet, April 24, LeBronnec and H. Tauraa.

As these records show, *S. subspinipes* is by far the commoner of these species in the Marquesas. Specimens identified by the writer and not included in the above records were collected also on Nukuhiva; none were taken on Hatutu [Hatutaa] or Fatuuku, and it is possible that this species has not yet reached these uninhabited and very rarely visited islands. On the six larger islands it is abundant everywhere from sea level to between 1,000 and 2,000 feet, except in very dry regions; it was not taken by the Survey in the cloud zone. LeBronnec, of the Survey, found it exceptionally abundant on Eiao in 1931. Although widely distributed in the Marquesas, *S. morsitans* is comparatively uncommon. It is never found in the villages.

The Marquesan name for centipede is *ve'i* (Maori, *weri,* "the smaller centipede"; Samoan, *veli,* "a fish which stings on being touched"; Tahitian, *veri,* "the centipede," "a marine insect"; Hawaiian, *weli,* "a long black worm found in the sea"; Tongan, *veli,* "an insect in the water, like a centipede"; Mangarevan, *veri,* "a poisonous sea-insect"; Mangaian, *veri,* "a centipede"; Tuamotuan, *veri,* "a centipede").[62] Because the Marquesans regard *S. morsitans* as a native species they have given it the name *ve'i enata* (native centipede); on Uapou the alternative name *ve'i mao'i,* with the same meaning, was recorded for it. On the other hand, *S. subspinipes,* which is recognized as distinct, is known as *ve'i papaa. Papaa* is Tahitian, meaning "foreign." The name *ve'i*

[62] Tregear, Edward, Maori-Polynesian comparative dictionary, Wellington, 1891.

taa, recorded from Uapou, as distinct from the *ve'i papaa,* is also probably applicable to *S. subspinipes.* The Marquesans believe that the *ve'i papaa* has been introduced into the islands within the last fifty years or thereabouts; residents of Fatuhiva stated that they could recall times when no *ve'i papaa* were present. The Marquesans further assert that the *ve'i enata* was formerly as abundant and widely distributed as the *ve'i papaa,* which is supposed to have replaced it, now is. Mohonui, a keen observer of natural history, expressed the belief that the *ve'i enata* is now extinct on the island of Uapou. Jardin, writing in 1858, states [63] that very large Scolopendras appear to be absent from the Marquesas, which seems to lend support to the statements of the Marquesans regarding the recent introduction of *S. subspinipes,* since this species is considerably larger than *S. morsitans.*

Among the writings of early voyagers to the Marquesas, references to centipedes, presumably *Scolopendra,* are made by Porter [64] and Torrey [65]. In a Marquesan legend recorded by Handy [66] the name *"Vei-oho-mana"* (Potent-hairy-centipede) is used figuratively for the tongue of an ogress. The reference must be to *Scolopendra,* rather than to the smaller and less venomous *Orphnaeus* or *Mecistocephalus.*

The above evidence would lead one to suppose that *S. morsitans* had reached the Marquesas either as a natural immigrant or with the Polynesians themselves, and that *S. subspinipes* had been introduced through modern commerce.

In the Hawaiian islands *S. subspinipes* is abundant, but the writer has not yet come across any information regarding the time of its arrival. *S. morsitans* has never been reported from Hawaii. Both species have been recorded [67] from the Society, Tuamotuan and Cook islands, and from Samoa. Buxton [68] writes:

> Residents in Samoa profess to know several species of venomous centipede, distinguished in size and colour, but all those which we brought home were determined by Mr. H. W. Brolemann as *S. subspinipes,* Leach. . . . It seems most probable that this creature was carried about the Pacific by the Polynesians during their migrations.

It would be interesting to learn more of what the Samoans know of these centipedes, and to compare their beliefs with those of the Marquesans.

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[63] Jardin, Edélstan, Essai sur l'histoire naturelle de l'archipel de Mendana ou des Marquises, 3me partie: Mém. Soc. Imp. Cherbourg, tome 6, p. 184, 1858.

[64] Porter, David, Journal of a cruise made to the Pacific Ocean, vol. 2, p. 128, New York, 1822.

[65] Torrey, William, Torrey's narratives: or the life and adventures of William Torrey, p. 118, Boston, 1848.

[66] Handy, E. S. C., Marquesan legends: B. P. Bishop Mus., Bull. 69, pp. 22, 25, 1930.

[67] See Chamberlin, R. V., The Myriopoda of the Australian region: Harvard Mus. Comp. Zool., Bull. 64, no. 1, 1920.

[68] Buxton, P. A., Researches in Melanesia and Polynesia, pts. 1-4, p. 52, London, 1927.

FAMILY ORYIDAE

Orphnaeus brevilabiatus (Newport).

Hivaoa: Atuona, low level, July 20, 1929, 1 specimen, Mumford and Adamson.

Tahuata: Hanateio Valley, altitude 500 feet, July 25, 1930, 5 specimens, LeBronnec and H. Tauraa.

Mohotani: altitude about 350 feet, August 13, 1929, 1 specimen, Adamson; northern part, altitude 500 feet, February 4, 1931, 1 specimen, under stone, altitude 1,200 feet, February 2, 1932, 2 specimens, LeBronnec and H. Tauraa.

Uahuka: Hanahoua Valley, altitude 250 feet, March 10, 1931, 1 specimen, under stone; Vaipaee, near sea level, March 24, 1931, 2 specimens, in grass; LeBronnec and H. Tauraa.

Hatutu [Hatutaa]. Near middle, east side, altitude 1,080 feet, September 30, 1929, 2 specimens, under bark of *Pisonia* species, Adamson. Altitude 100 feet, April 28, 1931, 1 specimen; altitude 600 feet, April 28, 1931, 1 specimen; altitude 700 feet, April 28, 1931, 1 specimen, under dead bark of *Pisonia* species; LeBronnec and H. Tauraa.

This species is not uncommon at low to medium elevations; it probably occurs on all of the islands.

FAMILY MECISTOCEPHALIDAE

Mecistocephalus tahitiensis H. F. Wood.

Hivaoa: Mt. Temetiu, altitude 1,500 feet, May 27, 1929, 1 specimen; Mt. Temetiu, northeast slope, altitude 3,620 feet, July 24, 1929, 2 specimens; Anatuakina, altitude 1,500 feet, June 1, 1929, 1 specimen, under bark of *Xylosma suaveolens*; Mumford and Adamson.

Nukuhiva: Oomu, altitude 4,050 feet, November 12, 1929, 2 specimens, altitude 3,200 feet, November 13, 1929, 1 specimen, Mumford and Adamson; altitude 3,890 feet, July 20, 1931, 1 specimen, on the ground under moss, LeBronnec and H. Tauraa.

Uahuka: Hanatekeo, Hane Valley, altitude 1,250 feet, February 25, 1932, 1 specimen, in dead log of *Hibiscus tiliaceus*; Penau Ridge, altitude 1,650 feet, February 27, 1931, 1 specimen; Hitikau Ridge, at altitudes of 2,950 feet, March 3, 1931, 3 specimens, from dead stipes of *Angiopteris* species, 2,910 feet, March 4, 1931, 3 specimens, in dead stipes of *Cyathea* species, 2,800 feet, March 3, 1931, 2 specimens, 2,900 feet, March 4, 1931, 1 specimen, under stone; LeBronnec and H. Tauraa.

Uapou: Pepehitou Valley, altitude 2,700 feet, December 8, 1929, 1 specimen, under bark of *Pisonia* species, Adamson.

Eiao: Vaituha Valley, altitude 200 feet, October 3, 1929, 1 specimen under bark of *Pisonia* species, Adamson.

Hatutu [Hatutaa]: altitude 700 feet, April 28, 1931, 1 specimen, under dead bark of *Pisonia* species, LeBronnec and H. Tauraa.

Though taken by the Survey at altitudes of 200 and 700 feet on the small islands of Eiao and Hatutu respectively, this species seems, on the six large islands, to be most common in the mountain forests.

Mecistocephalus maxillaris Gervais.

Hivaoa: Tapeata (east slope of Mount Ootua), May 25, 1929, 1 specimen; Atuona Valley, altitude about 75 feet, July 11, 1929, 1 specimen; Kopaafaa, altitude 2,900 feet, February 25, 1930, 2 specimens, under dead bark of *Crossostyles biflora*; Kopaafaa, altitude 2,900 feet, February 26, 1930, 1 specimen, in dead stipes of *Marattia* species; Mumford and Adamson.

Fatuhiva: Teaotu, Hanavave Valley, altitude 1,000 feet, September 9, 1930, 1 specimen, under dead bark, LeBronnec.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2,000 feet, October 27, 1929, 1 specimen in dead stipes of *Angiopteris* species and 1 specimen under bark of *Hibiscus tiliaceus,* Mumford and Adamson.

Uahuka: Tehaevea, altitude 500 feet, February 27, 1931, 1 specimen, in dead log of *Calophyllum inophyllum*; Haahue Valley, altitude 90 feet, March 20, 1931, 1 specimen, in dead log of *Pisonia* species; LeBronnec and H. Tauraa.

Uapou: Hakahetau Valley, altitude 500 feet, December 10, 1929, 1 specimen, Whitten.

Eiao: near middle of island, altitude 1,450 feet, October 1, 1929, 1 specimen, under bark of *Thespesia populnea,* Adamson; altitude 1,600 feet, April 16, 1931, 1 specimen, under bark of *Thespesia populnea,* 1,600 feet, April 23, 1931, 3 specimens, in dead log of *Pisonia* species, 1,700 feet, April 24, 1931, 1 specimen, LeBronnec and H. Tauraa.

The distribution of this species in the Marquesas is somewhat similar to that of *M. tahitiensis,* though it was found rather more frequently at low and medium altitudes.

The following Marquesan names were recorded for the smaller species of centipedes: *ve'i puaina* (Fatuhiva), *ve'i u'upuaina* (Fatuhiva and Tahuata), *ve'i iaufenua* (Fatuhiva), *ve'i ka'opuaina* (Uapou). The following translations for these terms are among those given by Dordillon[69]: *puaina,* ear; *u'u,* to enter; *ka'o,* to disappear or hide. (Compare the term "earwig" sometimes applied in America to small centipedes, as, for example, geophilids.) It is probable that these names are applied, without discrimination

[69] Dordillon, I. R., Grammaire et dictionnaire de la langue des iles Marquises, Paris, 1904.

as to species, to *Orphnaeus brevilabiatus, Mecistocephalus tahitiensis,* and *M. maxillaris.*

DIPLOPODA

Family POLYDESMIDAE

Orthomorpha coarctata (Saussure).

Except where otherwise stated, numerous specimens were collected at each of the following localities:

Tahuata: Hanamiai Valley, 560 feet, May 30, 1930, 2 specimens, LeBronnec and H. Tauraa.

Mohotani: altitude 400 feet, January 31, 1931, 500 feet, February 2, 1931, 700 feet, February 2, 1931, LeBronnec and H. Tauraa.

Uahuka: Pouau, Hokatu Valley, altitude 500 feet, March 9, 1931, including 2 specimens *in coitu* under bark of *Hibiscus tiliaceus,* Le Bronnec and H. Tauraa.

Uapou: Hakahetau Valley, altitude 1,500 feet, January 29, 1930, Whitten.

Orthomorpha gracilis E. L. Koch.

Numerous specimens were collected at each of the following localities:

Hivaoa: Atuona Village, July 7, 1929; Mount Ootua summit, altitude 3,032 feet, February 13, 1930, in leaves of *Asplenium nidus;* Mumford and Adamson.

Tahuata: Hanamiai Valley, altitude 560 feet, May 30, 1930; Amatea, altitude 2,700 feet, June 27, 1930; LeBronnec and H. Tauraa.

Fatuhiva: Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930; Teaotu, Hanavave Valley, altitude 800 feet, September 9, 1930; Vaikoao, Omoa [Oomoa] Valley, August 29, 1930; LeBronnec.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2,000 feet, October 25, 1929; Taiohae Village, November 25, 1929; Mumford and Adamson.

Family TRIGONIULIDAE

Trigoniulus naresii Pocock.

Except where otherwise stated, numerous specimens were collected at each of the following localities:

Hivaoa: Atuona, February 14, 1929, and July 7, 1929, Mumford and Adamson.

Tahuata: Hanamiai Valley, altitude 560 feet, May 30, 1930; Amatea, altitude 2,700 feet, June 27, 1930; LeBronnec and H. Tauraa.

Fatuhiva: Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930; Teaotu, Hanavave Valley, altitude 1,000 feet, September 9, 1930; LeBronnec.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2,000 feet, October 25, 1929; Taiohae Village, November 24, 1929, and November 25, 1929; Mumford and Adamson.

Uahuka: Hanatekeo, Hane Valley, altitude 750 feet, February 24, 1931, under bark of *Hibiscus tiliaceus*; Vaikivi Valley, altitude 900 feet, March 6, 1931, in dead log of *Hibiscus tiliaceus;* Pouau, Hokatu Valley, altitude 400 feet, March 9, 1931; Haahue Valley, altitude 90 feet, March 20, 1931, in dead wood of *Pisonia* species; LeBronnec and H. Tauraa.

Uapou: Hakahetau Valley, altitude 1,500 feet, January 29, 1930, Whitten.

The three species of millipedes listed above are abundant on all of the six larger islands, especially at low and medium elevations. None of them were observed on the smaller and drier islands of Mohotani, Fatuuku, Eiao, and Hatutu.

Millipedes are commonly called by the Marquesans, without discrimination as to species, *vei kina* (Chinese centipede). On Fatuhiva the name *tuna enata* (native "caterpillar") was once recorded for *Orthomorpha gracilis.* Neoefitu, chief of Tahuata and a reliable informant, stated that he was familiar with three species of millipede, two of which were of comparatively recent appearance in the islands, and the third no longer to be found.

GEOGRAPHICAL RELATIONS

Of the above eight species, six—*Scolopendra morsitans, S. subspinipes, Orphnaeus brevilabiatus, Mecistocephalus maxillaris, Orthomorpha coarctata,* and *O. gracilis*—are so widely distributed in the tropics that their occurrence in the Marquesas calls for no comment here. *Mecistocephalus tahitiensis* is known[70] from Tahiti, Samoa, Fiji, Bismarck Archipelago, New Guinea and Australia, and *Trigoniulus naresii*[71] from Samoa, the Marshall and Caroline islands, New Britain, the Seychelles, Madagascar, and (?) Guadeloupe, so that if the Myriopoda of the Marquesas, as now known, afford any evidence on the affinities of the fauna, it is merely as pointing to the west, and not to the Neotropical region in the east.

The arthropod fauna of the Marquesas is characterized by a high degree of endemism; the absence of endemic myriopods in the collection is therefore surprising. How many species not taken by the Survey are likely to occur, and whether others have become extinct owing to changes in the environment, are questions difficult to decide. It should be remembered, first, that a considerable amount of time was devoted by the Survey to collecting, on all the islands and at all altitudes, in habitats favored by myriopods; second, that

[70] See Attems, C., Myriopoden (Myriopoda): Insects of Samoa and other Samoan terrestrial Arthropoda, pt. 8, fasc. 2, p. 31, 1929.

[71] Attems, C., op. cit. p. 31, as *Spirostrophus naresii* Pocock. This species was collected by the Survey on Tahiti and Moorea, Society Islands.

each of the eight species collected was found not once or twice, but many times; and third, that in other classes of arthropods certain entire orders abundantly represented in all continental regions appear to be without endemic representatives in the Marquesas.

A comparison with the faunas of other high islands in the Pacific does not bring one nearer to a decision on these questions. The myriopod fauna of Samoa resembles that of the Marquesas in that only one — *Orthomorpha granosa* Attems—of the 16 species recorded by Attems is endemic. On the other hand, in the Society Islands, where little collecting has yet been done, Chamberlin[72] records 11 species, of which 4—*Cryptops mirus, C. tahitianus, Mecistocephalus angustior,* and *Trigoniulus tahitianus*—described by him as new, are presumably endemic. About 30 species are known in the Hawaiian islands; more than half of them have not been recorded elsewhere. No genus of myriopod is represented in Hawaii by more than one known endemic species, with the single exception of *Dimerogonus,* in which no less than 12 species were described by Silvestri.[73]

Regarding the absence of Symphyla and Pauropoda from the Marquesan collection, it may be mentioned that in Samoa no pauropods are recorded by Attems and of the symphylids only *Hanseniella orientalis* Hansen, known also from Siam, Java, and Sumatra. Neither class is listed by Chamberlin from the Society islands. In Hawaii, Van Zwaluwenburg[74] records two symphylids, *Scolopendrella neotropica* Hansen or *S. simplex* Hansen and *Scutigerella* species, and one pauropod, *Pauropus* species, probably *P. huxleyi* Lubbock. Mr. Van Zwaluwenburg informs the writer that these species occur elsewhere and that he regards them as introduced into Hawaii, probably in soil.

[72] Chamberlin, R. V., The Myriopoda of the Australian region: Harvard Mus. Comp. Zool., Bull. 64, no. 1, 1920.

[73] Silvestri, Filippo, Myriopoda: Fauna Hawaiiensis, vol. 3, pt. 4, Cambridge, 1904.

[74] Van Zwaluwenburg, R. H., The soil fauna of sugar cane fields: The insects and other invertebrates of Hawaiian sugar cane fields, compiled by F. X. Williams, pp. 339-352, Honolulu, 1931.

A NEW SPECIES OF DOLICHOPODID FROM THE MARQUESAS *

By

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Among the Dolichopodidae collected by the Pacific Entomological Survey in the Marquesas Islands are several new species, one of which is described here. The description of the others awaits the finding of additional material.

The author wishes to express his thanks to the Rev. O. Parent, who was good enough to look over doubtful species and give him much good advice, and also to J. F. Marshall, M.A., F.E.S., Director of the British Mosquito Control Institute, Hayling Island, for photographs.

Genus CHRYSOTUS Meigen

Chrysotus denticornis, new species (fig. 51; pl. 6).

Length, about 2.25 mm. Head: frons and vertex brilliant metallic dark green; the face similar below the antennae, but the pointed lower face densely dusted with dark brown pollen. Eyes touching for a long space, the frontal facets a little larger than the others; palpi black; antennae (fig. 51) entirely black, the third joint rounded and very hairy, with apical tooth, arista black, but pale on basal joint, inserted at base of tooth, densely pubescent. Ocular bristles very stout and long, verticals also long, all black, as is the post-ocular row of which the upper members are unusually stout; back of head black, post-oral bristles brownish. Thorax: dorsum dark shining green, five very stout dorsocentrals, including the more widely separated prescutellars; acrostichals well developed, about one-third as long and stout as the dorsocentrals. Scutellum exactly concolorous with the dorsum, the side bristles unusually long and stout; all the bristles black. Pleura black, slightly shagreened. Halteres yellow. Wings as in plate 6.

FIGURE 51. Antenna of *Chrysotus denticornis,* new species.

Alulae brown with four or five stout black fringing bristles. Legs with no special characters. Front coxa black with black bristles, trochanter dark orange; femur shining black, a little paler at tip; tibia dark orange with an anterior bristle basally; tarsus also dark orange, more suffused distally. Mid legs colored like front; tibia with a row of anterior bristles, the second and fourth being stouter, two superior bristles on middle third, the usual crowning bristles. Hind legs colored like front; femur stout and slightly grooved in front, a double row of superior bristles, the basal pair side by side, the last pair (about the middle) and the intermediate pair somewhat staggered; the usual crown

* Pacific Entomological Survey Publication I, article 24. Issued December 21, 1932.

of bristles. Abdomen, shining black, bristly, the marginal bristles being unusually stout on the sides of the segments. Hypopygium small and retracted.

Female like the male, stouter, the third antennal joint smaller, and the tooth inconspicuous.

Fatuhiva: Omoa [Oomoa] Valley, Punahitahi, altitude 650 feet, August 18, 1930, type male, 1 female; Tevaitapu Valley, altitude 650 feet, August 23, 1930, 3 females, including type; Omoa [Oomoa] Valley, Otomahe, altitude 280 feet, August 20, 1930, sweeping over *Paspalum conjugatum,* 2 males; Omoa [Oomoa] Valley, near sea level, August 21, 1930, 1 male, 1 female; Hanavave Valley, altitude 50 feet, September 8, 1930, sweeping over *Paspalum conjugatum,* 53 males, 14 females; Ahuava, altitude 1,800 feet, August 19, 1930, sweeping over *Paspalum conjugatum,* 1 male, 2 females; Teavaipuhiau, altitude 2,150 feet, August 25, 1930, sweeping over *Paspalum conjugatum,* 2 females; Omoa [Oomoa] Valley, Teavaione, altitude 1,700 feet, August 29, 1930, 2 females; Hanavave Valley, Teaotu, altitude 1,000 feet, September 9, 1930, on wet rock by stream, 1 female; Hanavave Valley, Ihiota, altitude 600 feet, September 10, 1930, 11 females, sweeping herbage, 2 females; LeBronnec.

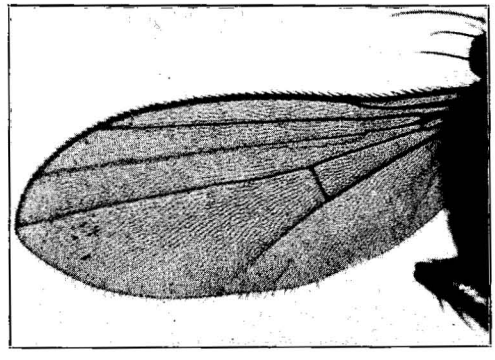
Hivaoa: Atuona Valley, altitude 325 feet, July 6, 1929, 1 male, 1 female; Teava Uhia i te Kohu, altitude 2,100 feet, February 15, 1930, sweeping over *Paspalum conjugatum,* 2 males, 7 females; Mount Temetiu, northeast slope, altitude 3,200 feet, September 13, 1929, by miscellaneous sweeping, 1 male, 2 females; Mount Temetiu, northeast slope, altitude 2,800 feet, August 3, 1929, 1 male, 1 female; Mount Temetiu, northeast slope, altitude 2,500 feet, July 24, 1929, by miscellaneous sweeping, 1 female; Mumford and Adamson.

Tahuata: Hanamiai Valley, altitude 1,000 feet, May 28, 1930, 2 females; Tehue Valley, altitude 800 feet, May 27, 1928, sweeping over grasses, 3 females; Hanahevane Valley, sea level, July 16, 1930, sweeping herbage, 1 female; LeBronnec.

Uapou: Hakahetau Valley, altitude 1,000 to 2,000 feet, January 29, 1930, 5 males, 5 females; Hakahetau Valley, altitude 1,000 to 2,000 feet, January 22, 1930, 1 male, R. R. Whitten. Hakahetau Valley, altitude 1,200 feet, December 6, 1929, 1 male, A. M. Adamson.

This species was also taken by the Pacific Entomological Survey in Tahiti.[75]

[75] Lamb, C. G., Dolichopodids from the Society Islands, manuscript, Pacific Entomological Survey, Bernice P. Bishop Museum.



WING OF CHRYSOTUS DENTICORNIS, NEW SPECIES.

TWO NEW LATHRIDIIDAE FROM THE MARQUESAS*

By

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Genus **MUMFORDIA** new genus

This genus is established for the reception of two species from the Marquesas which are characterized by having the anterior coxal cavities widely closed behind, all coxae distinctly separated, the trochanters long, slender and arcuate, the eyes small with individual facets very convex and well removed from the antennae, the antennae long with 2 basal segments large and spherical, the 1st twice the size of 2nd, the segments 3 to 7 filiform, segments 8 and 9 somewhat moniliform, and segment 10 and 11 enlarged forming the loose club, the genae prominent and the prothorax and elytra convex and both ornamented with series of conspicuous spines.

Genotype, *Mumfordia spinata,* new species.

This genus according to both Belon's[76] and Fall's[77] tables would have to be placed in the tribe Lathridiini and close to the genus *Belonia* Fall. From this genus *Mumfordia* differs by lacking the small prothorax and large afterbody, and in having the upper surface convex, not flattened, and studded with tubercles or spines.

Mumfordia spinata, new species (fig. 52, *a.*)

Small and delicate, dull black, the clypeus, antennae, and legs rufous. Head with two tubercles on either side of front and a third just to the inner side of the eyes. Prothorax broader than long, the posterior third somewhat constricted, the margin with stout spine at middle and at anterior angle, the posterior angles obtusely tubercular, the disk with series of three stout spines on either side of middle and another to the outer side and just forward of the middle ones. Elytra elliptical, hardly a third wider than prothorax and each elytron studded with five rows of stout spines, those of the fourth and fifth or marginal row the largest, these latter also separated by a wide gap. Beneath dull and granular. Length, 1.5 mm.; breadth, 0.5 mm.

Hivaoa: Mount Temetiu, altitude 3,660 feet, in fern petiole, May 27, 1929, holotype, a unique specimen, Mumford and Adamson.

Mumfordia tuberculata, new species (fig. 52, *b.*)

This species is somewhat similar to the preceding but is larger, more generally robust, the head with the tubercles very much reduced, hardly more prominent than the enlarged granules, the prothorax less narrowed behind and with the elevations more

[76] Belon, R. P., Family Lathridiidae: Wytsman's Gen. Insect., fasc. 3 pp. 1-4, pl. 1, 1902.

[77] Fall, H. C., Revision of the Lathridiidae of Boreal America: Am. Ent. Soc., Trans., vol. 26, pp. 101-190, pl. 3, 1899.

* Pacific Entomological Survey Publication I, article 25. Issued December 21, 1932.

robust and tubercular than spinous, the elytra more robust and oval, with the lateral spines very coarse and the discal ones smaller and sharper. Length, 1.90 mm.; breadth, 0.75 mm.

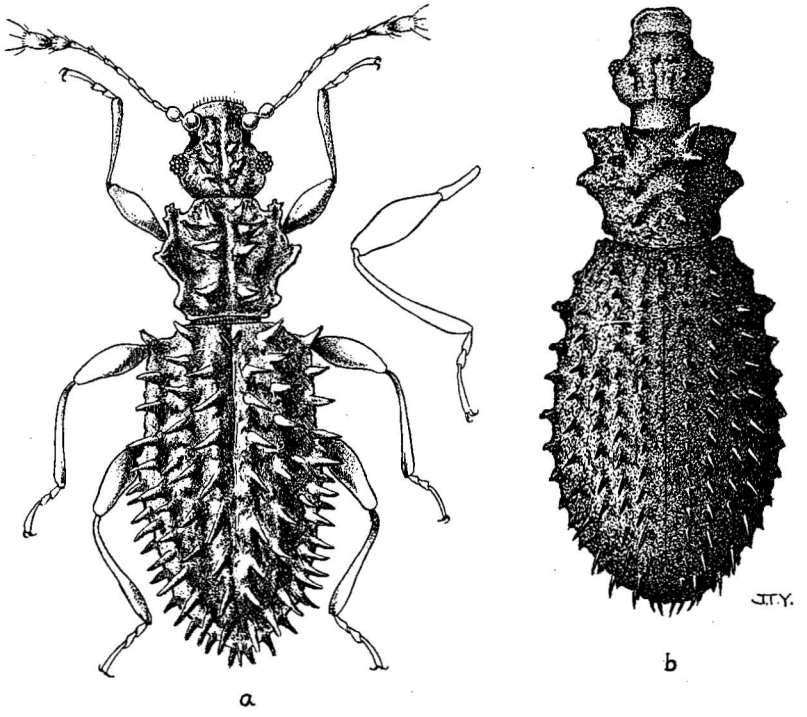

FIGURE 52. Two new Lathridiidae: *a, Mumfordia spinata,* new genus and new species, holotype from Hivaoa, × about 45, with left hind leg × about 62; *b, Mumfordia tuberculata,* new species, holotype from Uahuka, × about 40.

Uahuka: Hitikau Ridge, altitude 2,900 feet, from *Cyperus* species, March 4, 1931, holotype, a unique specimen, LeBronnec and H. Tauraa.

ACRIDIDAE FROM THE MARQUESAS*

By B. P. Uvarov

Imperial Institute of Entomology

The collection of Orthoptera made in the Marquesas by L. E. Cheesman of the St. George Expedition in 1925 contained two species of true Acrididae (exclusive of the Tetrigidae), both of which proved to be new and have been described by me[78] as *Ootua antennata* and *Valanga marquesana,* and also mentioned in Cheesman's paper.[79] In the collection of the Pacific Entomological Survey there is a third species, from the small uninhabited and rarely visited island of Eiao. This was recently described by Caudell from the same locality under the name *Patanga pinchoti.*[80]

Ootua antennata Uvarov.

Hivaoa: at the base of Mt. Ootua, altitude 2,200 feet, January, 1925, St. George Expedition, recorded by Uvarov and Cheesman. Mt. Ootua, north slope, altitude 2,650 feet, May 6, 1929, one male; Mt. Ootua, north slope, December 10, 1929, one female on *Bidens lantanoides;* Vaiepoepo, altitude 2,300 feet, June 2, 1929, one larva; Mumford and Adamson.

Valanga marquesana Uvarov.

Nukuhiva: Taipi Valley, January, 1925, St. George Expedition, recorded by Uvarov and Cheesman. [Specimens which appear to belong to this species have subsequently been taken by the Pacific Entomological Survey on Nukuhiva; others collected on Nukuhiva by the late F. L. Washburn have recently been received at Bernice P. Bishop Museum.—E. P. Mumford.]

Patanga pinchoti Caudell.

Eiao: slope above Vaituha, altitude 1,000 feet, September 28, 1929, 2 males, 1 female larva; altitude 800 feet, September 29, 1929, 2 males, 1 female larva; altitude 800 feet, October 2, 1929, 9 males, 2 females; altitude 1,200 feet, October 3, 1929, 2 males, 1 female larva, A. M. Adamson.

The generic determination of this insect presented some difficulty, since at first glance it appeared to refer to the genus *Austracris,* represented by numerous species and races in Australia and Pacific islands. However, the structure of the prosternal tubercle makes it impossible to include the species

[78] Uvarov, B. P., Three new Acrididae from the Marquesas and Rapa Islands: Ann. Mag. Nat. Hist., ser. 9, vol. 19, p. 558, 1927.

[79] Cheesman, L. E., A contribution towards the insect fauna of French Oceania, part 1: Ent. Soc. London, Trans., vol. 75, pt. 1, p. 150, 1927.

[80] Caudell, A. N., Insects of the order Orthoptera of the Pinchot Expedition of 1929: U. S. Nat. Mus., Proc., vol. 80, art. 21, pp. 6-7, 1932.

* Pacific Entomological Survey Publication I, article 26. Issued December 26, 1932.

in *Austracris,* while the insect does not really differ from *Patanga* in anything but the small size. Indeed, apart from the color of hind wings and the generally more uniform coloration with indefinite markings, *P. pinchoti* represents only a diminutive copy of the common *P. succincta* (Linnaeus).

There is no resemblance, as suggested by Caudell, between *P. pinchoti* and *Valanga rapana* Uvarov, which is a true member of its genus. I take the opportunity to add that my redescription of *V. stercoraria* Holdhaus was based on the examination of the type, and the species is also a true *Valanga.*

NEW SPECIES AND VARIETIES OF COLEOPTERA FROM THE MARQUESAS ISLANDS*

By

K. G. Blair

British Museum (Natural History)

The new forms here described were contained in a collection of beetles from the Marquesas Islands sent to me for determination by the Pacific Entomological Survey. This collection comprises only the families previously dealt with by me.[81]

FAMILY BUPRESTIDAE

Cyphogastra bedoci Théry (1926).

A species peculiar to the Marquesas and apparently showing a strong tendency to the formation of insular races.

The collection includes a very fine series from Uapou and Fatuhiva, and E. P. Mumford in sending the material remarks that it appears to be confined to these two islands, "being absent from the intervening islands of Mohotani, Tahuata, and Hivaoa." The series from Uapou agrees with the description in having the elytra green passing to coppery along the suture and (much more broadly) laterally; the spines at the apex of the elytra are long and slender, agreeing well with the figure. I have to thank M. Théry for an example of this form from Uapou which is therefore taken as typical.

Cyphogastra bedoci obscura, new variety (fig. 53).

Much less nitid than the type, the elytra being greenish-bronzy with a much narrower fiery coppery lateral band but no change of color along the suture; the puncturation is also much finer, almost obsolete on the sutural third, and the apical spines are much less developed.

Collected on Fatuhiva. This form was that found by the members of the *St. George* Expedition on the same island.

Cyphogastra bedoci cyanescens, new variety.

In puncturation, in the long apical spines, and in the change of color this form agrees with the type, though the colors themselves are different, the suture being green for about two-thirds of its length; outside this is a broad blue band reaching from the base nearly to the apex, followed successively by green and brassy to coppery along the margin.

A short series in the British Museum collected by E. Ahnne, unfortunately without record of the particular island.

[81] Blair, K. G., The Heteromera and some other families of Coleoptera from Polynesia collected on the St. George Expedition, 1925: Ann. Mag. Nat. Hist., 9th ser., vol. 20, pp. 161-174, 1927.

* Pacific Entomological Survey Publication I, article 27. Issued December 30, 1932.

These forms, represented by a dozen or more examples of each, remain quite distinct except for two specimens from Uapou which are rather dark with no sutural band of color but in other respects are typical, and one example of the *cyanescens* series in which the blue is but feebly developed, and the suture has a tendency to brassy. It is unfortunate that the island of origin of the *cyanescens* form is not at present known. All three forms show considerable variation in size, from 24 to 37 mm.

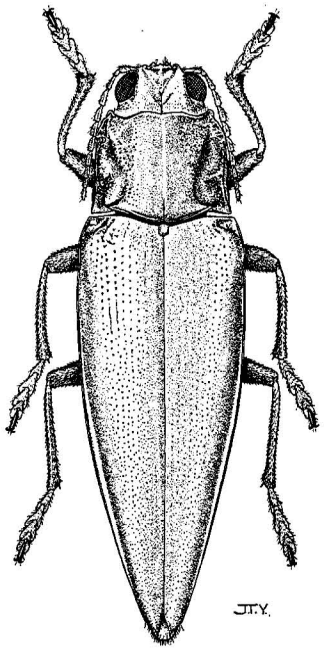

FIGURE 53. *Cyphogastra bedoci* Théry variety *obscura,* new variety from Omoa [Oomoa] Valley, Fatuhiva, × 5.1.

FAMILY CISIDAE

Cis adamsoni, new species (fig. 54).

Female

Length, 1.15 mm.; minute, piceous, subparallel, with scanty minute subdecumbent hairs so small as to be almost invisible. Head strongly deflexed, almost concealed from above beneath the pronotum; clypeus truncate in front, rather broadly elevated; eyes small; antennal club consisting of 3 joints which increase successively and considerably in size. Prothorax about as long as wide, the sides from above very feebly arcuate; in lateral view the margin is nearly straight for the greater part of its length though bent upwards near the anterior margin and is mainly concealed from above by the convexity of the side of the thorax; anterior angles obtuse but distinct, posterior rounded; anterior margin broadly rounded, feebly sinuate near the angles, and here finely bordered; base

feebly rounded and finely though somewhat indistinctly bordered; the surface is dull, moderately strongly and densely punctate, the intervening spaces alutaceous. Elytra as wide as thorax and about half as long again, the puncturation rather finer than that of thorax and much less dense, the interspaces less definitely alutaceous so that they appear more shining. Legs paler.

Eiao, near the center of the island, elevation 1,400 feet, 2 specimens including type, A. M. Adamson. These appear to be both the same sex and one has the ovipositor protruded. Type in Bernice P. Bishop Museum; paratype in British Museum.

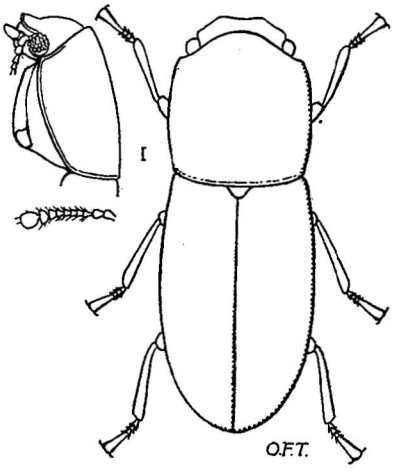

FIGURE 54. *Cis adamsoni,* new species.

Differs from *C. marquesanus* Blair in being smaller, narrower, and more parallel-sided, as well as in its darker color and more opaque surface. The form *C. evanescens* Sharp from Hawaii resembles it in size but has a transverse thorax with rounded sides and very feeble sculpture, the joints of the antennal club subequal in width, and a more depressed form; *C. retithorax* Scott, from Seychelles, also differs in its transverse thorax, less opaque sculpture, and in its shorter and more prominent head. The long and vertically held frons appears to be quite characteristic of *C. adamsoni,* though on only two examples and in the absence of a recognizable male too much importance should not be attached to this character.

FAMILY CANTHARIDAE

Maltypus marquesanus, new species (fig. 55).

Length, 2.5 mm.; dark pitchy, the head reddish, paler in front, mouth parts and legs pale testaceous. Head wider across the eyes than the prothorax, rounded behind, finely and moderately densely punctate, clypeus rounded in front concealing the mandibles when closed, the latter curved and finely pointed; eyes large, entire, hemispherical, completely

lateral, antennae inserted between the eyes, near their anterior margin, distance between them about equal to their first joint, third joint a little shorter than the rest which are subequal, about three times as long as wide. Thorax quadrangular, nearly twice as wide as long, strongly bordered throughout, disc moderately nitid, finely but not very closely granulate. Elytra slightly wider than the thorax, abbreviated, narrowed behind, parallel-sided, but divergent almost from the scutellum, not half the length of the abdomen; wings exposed, covering and extending a little beyond the abdomen. Legs slender, tarsi slender, over half as long as the tibiae, first joint as long as the three following united, fourth joint expanded, last joint very small. Sexual differences slight; sixth ventral segment in male excavate almost to base, forming a large oval cavity containing the genital armature; in female normally triangular and coincident with dorsal.

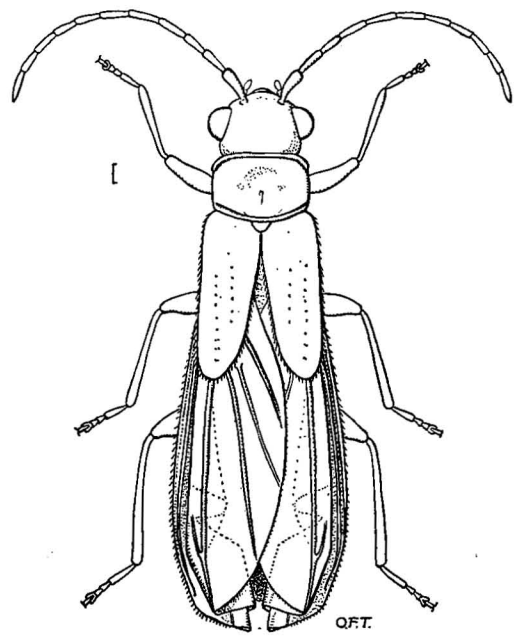

FIGURE 55. *Maltypus marquesanus,* new species.

Hivaoa: Kopaafaa, August 2, 1929, Mumford and Adamson.

Mohotani: August 13, 1929, Adamson.

Uahuka: Putatauua, September 20, 1929, Adamson.

Uapou: January 29, 1930, Whitten.

Eiao: September 29 and October 1, 1929, by beating on *Melochia velutina* and *Thespesia populnea,* Adamson.

Type and paratypes in Bernice P. Bishop Museum, other paratypes in British Museum. Resembles a small species of *Malthodes,* but differs in the shorter and subtriangular elytra, and in that the genital armature of the male is withdrawn into a cavity of the abdomen.