

THE DERMAPTERA AND ORTHOPTERA OF THE
MARQUESAS ISLANDS *

By

MORGAN HEBARD

The collection recently placed in our hands for study includes 38 species. To these should be added 3 endemic species of the Acrididae which have been studied and reported on elsewhere. Excluding 9 cosmopolitan species, we find that, of the 29 others, 15 are endemic as far as yet known, 6 are known to occur elsewhere only in Oceania, while 11 are also known from Melanesia, Australia, or Malaysia. Five new genera and 13 new species are here described.

Considering the information available for the other islands of Oceania, it is evident that the progress eastward of species of Melanesian, Australian, and Malaysian origin shows a progressive, marked reduction. Thus we are satisfied that a large number of such species will be found to occur in the Society Islands, when that area has been more thoroughly examined. The Samoan islands, which we believe have been fully as thoroughly examined from an orthopterological point of view as the Marquesas, have approximately twice as many such species. The islands of Fiji have apparently been much less thoroughly examined, but many forms from there are reported scatteringly through past literature and indicate that that group is inhabited by a much more extensive representation of Melanesian, Malayan, and Australian forms. So poorly is the Melanesian fauna understood that it is impossible to determine whether many of the Fijian species are endemic or have a vastly greater range in Melanesia.

Comparing the endemic orthopteran fauna of the Marquesas with that of Hawaii, we would note that three endemic species of Dermaptera are known from Hawaii (two labidurids and a labiid) but none from the Marquesas Islands. In the Orthoptera no mantids or phasmids are endemic. Hawaii has no endemic forms of blattids, but six such are present in the Marquesas, four of a common ancestral stock with *Mareta*, an ectobiine genus abundantly represented by species throughout the tropics of the Old World and particularly well represented also in Australia. The four Marquesan forms have, however, much closer affinity to each other than to any others known, and none of the *Maretae* reported from the Oceanic islands to the west show any affinity to them. Another blattid, belonging to the *Pseudomopinae*, is present in both the Marquesas and Society islands and though not yet known elsewhere may well occur also in Melanesia and even Malaysia.

* Pacific Entomological Survey Publication 7, article 8. Issued August 25, 1933.

In the Tettigoniidae, Hawaii has a number of distinctive endemic species of the copiphorid genus *Banza*, but the Marquesas possess instead four remarkable endemic conocephalids, of which one represents the widespread genus *Conocephalus* and the other three belong to two endemic genera which are widely distinct from any previously known. Another endemic species belongs to the listroscelids, but it is closely related to a Samoan species which in turn has affinities in Papua and Malaysia.

In the Gryllidae Hawaii has 24 or more endemic species, the majority belonging to *Paratrigonidium*, but several representing two most remarkable endemic genera of eneopterids. The trigonidids of the Marquesas are represented instead by two extremely plastic species of *Metioche*, a Melanesian and Malayan genus. One of these is widespread in Oceania and Melanesia, but does not reach Hawaii; the other is known elsewhere only from Tahiti.

In the Dermaptera we find *Labia dubronyi* to be known only from Hawaii and the Marquesas, whereas in the Tettigoniidae the listroscelid *Xiphidiopsis lita* is found in Hawaii, the Marquesas, and Tahiti. Both of these species we believe will be found to have an extensive distribution in Oceania.

From this evidence we believe that the endemic Orthoptera of Hawaii and the Marquesas have been derived from very different sources. More than 34 endemic Hawaiian tettigoniids and gryllids are known, all of these representing only 5 different genera. Of the 14 most probably endemic Marquesan species, 4 represent 3 genera of the Blattidae, 3 represent 3 genera of the Acrididae, and 5 represent 4 genera of the Tettigoniidae. Not one endemic Hawaiian species belongs even to the same subfamily as an endemic Marquesan species.

In the Acrididae Hawaii has no endemic species, but three occur in the Marquesas. One of these is an acrydiine belonging to a genus known elsewhere only from Tahiti; the other two are cyrtacanthacrines, one belonging to an endemic genus, the other congeneric with and belonging to a group which includes Melanesian species.

Although the combination of characters shown by a number of endemic Marquesan species is unusual, relationship is often clearly traceable to certain Melanesian and Malayan forms; such is much less true of the endemic Hawaiian species.

DERMAPTERA

LABIDURIDAE

Euborellia annulipes (Lucas).

Hivaoa: Tapeata, Mount Ootua, altitude 2500 feet, in tree fern petiole, 1 juvenile female.

Tahuata: Kiinui, altitude 1210 feet, June 14, 1930, under horse manure, 1 female, 1 juvenile male, 2 juvenile females.

Fatuhiva: Otomahe, Omoa [Oomoa] Valley, altitude 290 feet, August 20, 1930, 1 large juvenile male.

Fatuuku, altitude 860 feet, November 19, 1930, beating *Morinda citrifolia*, 1 large juvenile female.

Nukuhiva: Tapuaooa, altitude 3100 feet, November 11 and 14, 1929, 1 male, 1 large juvenile female; Vaiotekea, altitude 2100 feet, August 6, 1931, 1 juvenile female.

Uahuka: Hanahoua, altitude 750 feet, March 10, 1931, in dead log of *Inocarpus edulis*, 1 large juvenile female; Hitikau Ridge, altitude 2300 feet, March 3, 1931, 1 large juvenile female.

Uapou: Hakahetau Valley, altitude 1000 feet, December 14, 1929, 1 juvenile female.

Eiao, altitude 1600 to 1855 feet, April 16 to September 29, 1929 and 1931, one under stone, 4 males, 6 females, 2 juvenile females.

This common circumtropical species was recorded from three of the islands of the Marquesas in 1928 by L. E. Cheesman.

LABIIDAE

Sphingolabis hawaiiensis Bormans.

Tahuata: Amatea, altitude 2500 feet, July 7, 1930, in rotting banana stalk, 1 adult; Hanamiai Valley, May 28, 1930, in rotting banana stalk, 3 males, 1 female, 1 juvenile.

Fatuhiva: Teavaione, Omoa [Oomoa] Valley, altitude 1700 feet, August 29, 1930, in rotting banana stalk, 1 male, 1 juvenile female; Vaikoo, Omoa [Oomoa] Valley, altitude 1500 feet, August 30, 1930, 1 male; Ahuava altitude 1840 feet, August 19, 1930, 1 female.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 25, 1929, in rotting banana stalk and under bark of *Hibiscus tiliaceus*, 1 juvenile female, 1 very small juvenile; Tapuaooa, altitude 3100 feet, November 14, 1929, 1 female.

Uahuka: Vaipae Valley, altitude 250 feet, March 18, 1931, 1 male, 2 females.

Uapou: Pepehitoua Valley, altitude 2700 feet, December 8, 1929, 1 large juvenile female; Vaiokokoo, Paaumea Valley, altitude 2500 feet, November 26, 1931, 1 male; Hakahetau Valley, January 29, 1930, in dried stem of "Fei," *Musa* species, 1 male, 3 females, 3 juveniles. This species was previously known from Hawaii, Tahiti, Samoa, the Philippines, and Lombok.

Labia pilicornis (Motschulsky).

Uapou: Hakahetau Valley, altitude 1000 to 2000 feet, January 29, 1930, in dead stem of "Fei," *Musa* species, 1 male, 6 females, 1 juvenile female.

The females are typical, though they show great size variation (length, including forceps, 6 to 8.1 mm.). The male agrees closely with others before us except in the form of the ultimate tergite and pygidium. The former is excised in the form of a symmetrical trapezoid above the latter, leaving sharp angles of very slightly greater than 90 degrees projecting above the base of the pygidium on each side. The pygidium is twice as wide as long, its margins convex-convergent to the small acute projecting apex. Had Borelli not described Philippine material of the species as having the male pygidium variable "acute-angulate, truncate or lightly notched" we would believe that a species related to, but distinct from *pilicornis* was represented. Such general agreement is shown, however, that with the available evidence it appears more probable that unusual individual variation is to be found in the male genitalia of *pilicornis*.

The present specimens are uniform dull yellowish brown in coloration and average large for the species. The species is known to range from Hawaii, Tahiti, and the Philippines to Ceylon. Color agreement is shown by the very different species *L. karnyi* (Borelli) (with synonym *abnormis* Hebard), *L. minor* (Linnaeus) and *L. lutea* Bormans.

***Labia curvicauda* (Motschulsky).**

Hivaoa: Matauuna, altitude 3700 feet, March 2, 1930, under decaying leaves on ground, 1 female.

Tahuata: Amatea, altitude 2700 feet, June 28, 1930, 1 female.

Nukuhiva: Tekao Hill, altitude 3250 feet, July 23, 1931, in dead stipes of tree fern, *Cyathea* species, 1 female.

Uahuka: Hitikau Summit, altitude 2910 feet, March 4, 1931, in dead stipes of tree fern, *Cyathea* species, 1 male.

Eiao: near center of island, altitude 1300 feet, October 1, 1929, under bark of *Pisonia* species, 1 male.

The Eiao male has the head blackish brown, the pronotum ochraceous buff, the tegmina and wings almost as dark as the head with a metallic purplish sheen and the abdomen deep tawny, becoming darker laterad. The other specimens are much more uniformly brown, the pronotum as dark as the lighter brown tegmina, the head often even paler. The Eiao male represents *flavicollis* Bormans in Burr, described from Samoa, of which material is before us from Hawaii (Waiki Parker Ranch, Waimea, Hawaii, August 2, 1921, feeding among woolly aphis, 2 females, 1 juvenile female), Fiji (Mauson, 1 male), and a large series from Tahiti. This name was synonymized by Burr in 1912, at which time *rechingeri* Holdhaus from Samoa was also placed as a synonym. Certainly a most unusual and striking color phase occurs in Oceania and is apparently peculiar to that region. The species is circumtropical in distribution.

Labia dubronyi Hebard (fig. 1, *a*).

Hivaoa: Mount Temetiu, 1 female.

Nukuhiva: Tapuaooa, altitude 3100 feet, November 11, 1929, 1 female.

Uapou: Hakahetau Valley, altitude 1000 feet, December 8 and 11, 1929, one from dead stipes of tree fern, *Cyathea* species, 1 male, 1 female.

These specimens agree closely with Hawaiian material, from which islands only the species was previously known.

CHELISOCHINAE

Chelisoches morio (Fabricius).

Hivaoa: Aimoa, March 7, 1929, altitude 1665 feet, 2 males, 1 female, 4 juveniles; Tapeata, Mount Ootua, altitude 2500 feet, May 25, 1929, in tree fern petiole, 1 juvenile; Kopaafaa, altitude 2770 feet, August 2, 1929, in dead stipes of tree fern, *Cyathea* species, 3 juveniles.

Tahuata: Vaitahu Valley, sea level, June 11, 1930, 1 male, 1 female; Amatea, altitude 2000 feet, June 28, 1930, 1 female.

Fatuhiva: Teavaione [Teavione], Omoa [Oomoa] Valley, altitude 1700 feet, August 29, 1930, in decaying banana stalks, 3 males; Hanavave Valley, altitude 1550 feet, August 23, 1930, 1 male; Vaikoao, Omoa [Oomoa] Valley, altitude 1600 feet, August 29, 1930, 1 juvenile.

Nukuhiva: Tapuaooa, altitude 3100 feet, November 11, 1929, 1 juvenile.

Uahuka: Hitikau Ridge, altitude 2950, March 3, 1931, one in dead stipes of *Angiopteris* species, others on fruit of *Freycinetia* species, 1 female, 4 juveniles; Penau Ridge, altitude 2000 feet, March 5, 1931, 1 male; North Ridge, altitude 2000 feet, 1 juvenile.

This is one of the commonest earwigs in Oceania and Papua, and material is before us from the Philippines, Java, and the coast of California (introduced).

ORTHOPTERA

BLATTIDAE

ECTOBIINAE

Genus MARETINA, new genus

This is an endemic Marquesan genus, including two species here described, of which we select *M. hivaoa* as genotype.

The insects have the appearance of broad, brachypterous species of *Marcta* and show close affinity to that genus.

Separation is best made by the specialized dorsal surface of the male abdomen, other generic features being the following. Occiput rounding evenly into face. Interocular space very broad, lateral margins of face moderately convergent ventrad. Palpi with third and fourth joints (normally equal in

length) elongate and slender, fifth shorter but moderately elongate. Pronotum rounded symmetrically trapezoidal, surface evenly and weakly convex. (Tegmina considerably reduced, rounded rectangular pads in the two species known). Dorsal surface of male abdomen with distal (two or three) tergites extensively but very weakly concave, those areas roughened and supplied with microscopic short but stout spinulae. Supra-anal plate of male well produced, delicate, rounded triangular. Cerci with slender acute apical portion. Subgenital plate of female with a median cleft at apex, the distal portion normally carried curled upward and inward and usually not visible from below. Ventro-cephalic margin of cephalic femora armed with a row of piliform spines, terminating in two very elongate spines. Caudal metatarsus very elongate, decidedly longer than combined length of succeeding joints. Small distal pulvilli present on tarsal joints. Moderately large arolia present between the simple, strongly asymmetrical tarsal claws.

Maretina hivaoa, new species (fig. 1, *b*).

General coloration testaceous. Head with a broad interocular bar of cinnamon brown and a narrower band of the same between the antennal sockets which curves dorsad. Pronotum with disk buffy, not very conspicuously marked with cinnamon brown (as figured). Tegmina testaceous with intervals between veins and veinlets all dark cinnamon brown. Abdomen dorsad reddish brown faintly mottled with a paler shade. Palpi, limbs, and ventral surface buffy, the abdomen suffused laterad, mesad, and particularly distad with cinnamon brown in female.

Length of body, male 9.8 mm., female 10 mm.; length of pronotum, male 3.1 mm., female 3.1 mm.; width of pronotum, male 4.9 mm., female 4.9 mm.; exposed length of tegmen, male 3.8 mm., female 3.8 mm.; width of tegmen, male 3.4 mm., female 3.4 mm.

Male

Size medium, form broad for the group. Width between antennal sockets three-quarters that between eyes. Palpi with the very elongate third and fourth joints of equal length, fifth two-thirds as elongate as fourth. Pronotum with latero-caudal portions and tegmina with mediastine fields broad. Tegmina slightly overlapping, longer than wide, costal margin rounding more broadly into the transverse distal margin than does the sutural margin; venation distinct, with impressions between veins and veinlets definite. Wings minute, atrophied, concealed. Abdomen with fourth, fifth, and sixth tergites specialized as described above, a very blunt median carina indicated on each, roughening very fine and transverse, spinulae directed caudad; seventh tergite narrowly visible. Cerci terete proximad, then moderately moniliform, then with the two distal joints elongate and slender. Subgenital plate triangularly produced sinistrad and bearing a small node near base on its inner margin; dextral portion produced an equal distance in a finger directed to the sinistral projection and then parallel to it, its apex blunt and very minutely microscopically denticulate.

Female

Agrees very closely with male. Interocular space no wider. Palpi similar. Supra-anal plate triangularly produced with apex very broad, rounded, but showing a broad and very shallow median emargination.

Hivaoa: north crest of Mount Temetiu, altitude 3620 feet, July 24, 1929, type male, allotype female, Mumford and Adamson; altitude 3860 feet, December 27, 1930, 1 large, 1 small immature male, H. Tauraa.

Maretina uahuka, new species (fig. 1, c).

General coloration testaceous. Male intensive, female recessive. Head with marking similar to that of *hivaoo* in male, but the markings more conspicuous and the band between the antennal sockets rounded angulate instead of convex dorsad; these markings obliterated in female, apparently due to poor preservation. Pronotum of male with disk buffy, marked with chestnut brown as figured; these markings greatly reduced (even less extensive and less well indicated than in *hivaoo*) in female. Tegminal and abdominal markings as in *hivaoo*.

Length of body, male 8.8 mm., female 8.2 mm.; length of pronotum, male 2.8 mm., female 2.4 mm.; width of pronotum, male 4 mm., female 3.7 mm.; exposed length of tegmen, male 3.1 mm., female 2.7 mm.; width of tegmen, male 2.7 mm., female 2.4 mm.

Male

The generic characters given above are not repeated, nor are those which are given for *hivaoo*, in which full agreement is shown by the present closely related insect. Size below medium, form only moderately broad for the group. Palpi proportionately slightly shorter than in *M. hivaoo*. Pronotum with latero-caudal portions and tegmina with mediastine fields broad but distinctly narrower than in *hivaoo*. Tegmina with impressions between veins and veinlets very feeble. Abdomen with fifth and sixth tergites alone specialized as given in generic analysis and description of *hivaoo*.

Female

Similar to type but slightly smaller and slightly less broad. Palpi proportionately shorter (malformation is suggested as the left palpus is normal, but the right palpus has the fourth joint shortened and no longer than the elongate fifth joint). Supra-anal plate smaller than in *hivaoo*, with apex almost evenly broadly convex.

Uahuka: Hitikau Ridge, altitude 2900 feet, March 4, 1931, on *Cyperus* species, type male, LeBronnec and H. Tauraa; altitude 2850 feet, March 4, 1931, on *Weinmannia* species, allotype female, LeBronnec and H. Tauraa. Hebard Collection.

These species are compared under *M. hivaoo*. One immature male bearing the same data as the type and two male and one female immatures bearing the same data as the allotype show even heavier marking than the type, the dark brown latero-caudal bands of the pronotum being continued on mesonotum and metanotum with dots of the same in the area between them.

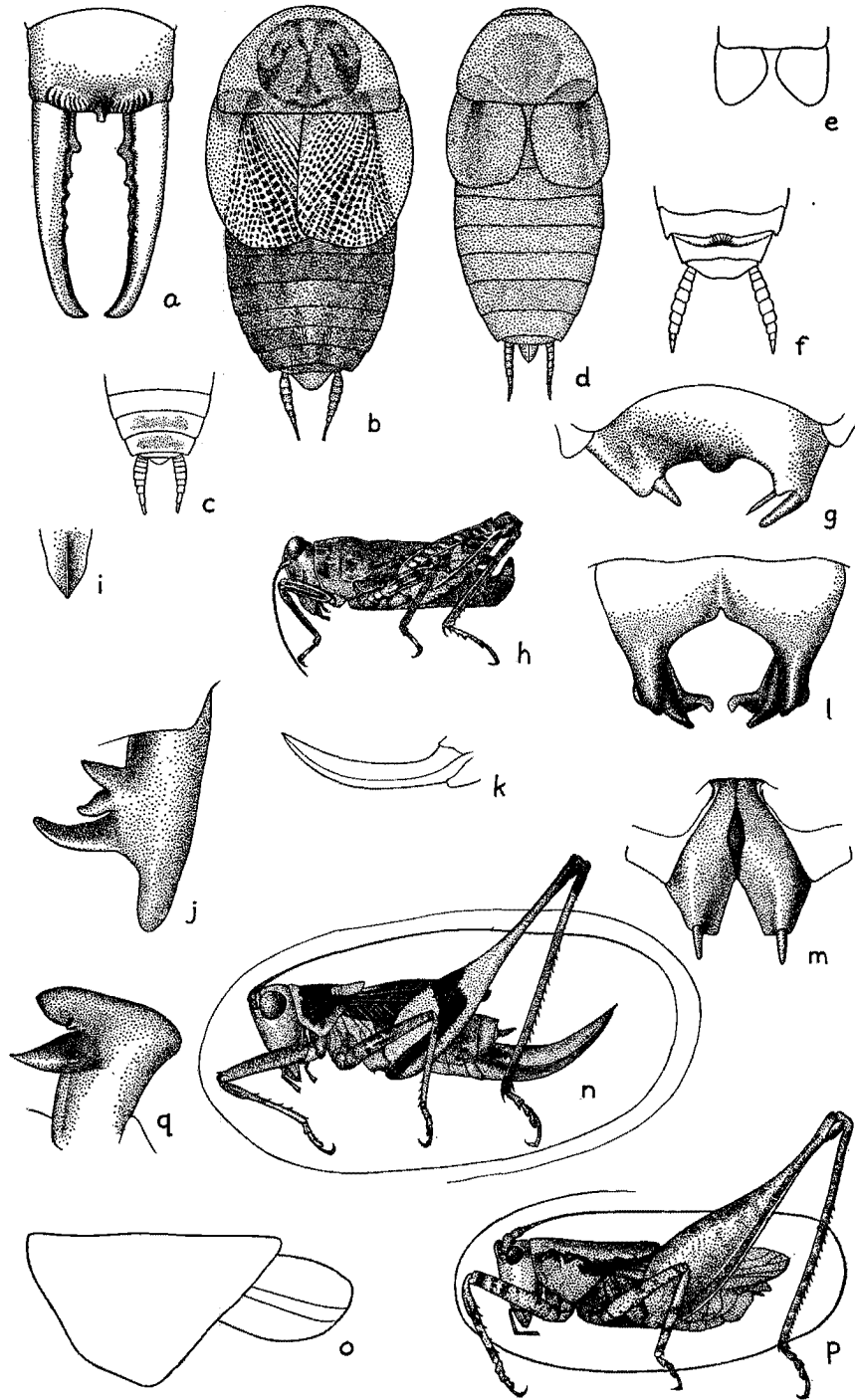
Possibly conspecific immatures are also from the island of Tahuata. These are best separated from certain richly marked immatures of *Aneurina* in that the caudal metatarsus is considerably longer, longer than the combined length of the succeeding tarsal joints.

Genus ANEURINA, new genus

This genus is erected to include a small group of Marquesan species, with *viridis* as genotype. It is clearly close to *Mareta*, but even closer to the Marquesan genus *Maretina* here described.

From *Maretina* it is best separated by the unspecialized dorsal surface of the male abdomen and smooth diaphanous tegmina in which the humeral

FIGURE 1. Marquesan Dermaptera and Orthoptera: *a*, *Labia dubronyi* Hebard, type female, dorsal view of ultimate tergite and forceps, $\times 14$; *b*, *Maretina hivaoa*, new species, type male, dorsal view showing specialization of 4th, 5th, and 6th tergites, $\times 5$; *c*, *Maretina uahuka*, new species, type male, dorsal view of distal portion of abdomen showing broader specialization of 5th and 6th tergites only, $\times 4$; *d*, *Aneurina viridis*, new species, type male, dorsal view, $\times 5$; *e*, *Aneurina tahuata*, new species, type male, dorsal outline of tegmina and caudal margin of pronotum, $\times 5$; *f*, *Kuchinga remota*, Hebard, Society Islands, type male, dorsal view of distal portion of abdomen showing specialization of 8th tergite, $\times 1\frac{1}{2}$; *g*, *Kuchinga remota*, Hebard, Society Islands, type male, ventral view of subgenital plate, greatly enlarged; *h*, *Hydrotetrix marquesana*, new species, allotype male, lateral view, $\times 5$; *i*, *Hydrotetrix marquesana*, new species, type female, dorsal view of apex of pronotum, $\times 6$; *j*, *Conocephalus tridens*, new species, paratype male, dorso-caudal view of cercus, greatly enlarged; *k*, *Conocephalus tridens*, new species, paratype female, lateral outline of ovipositor, $\times 3$; *l*, *Fatuhivella colorata*, new species, type male, dorsal view of ultimate tergite and apices of cerci, which alone are exposed from above, greatly enlarged; *m*, *Fatuhivella colorata*, new species, type male, ventral view of subgenital plate, same scale as *l*; *n*, *Fatuhivella colorata*, new species, allotype female, lateral view, $\times 3$; *o*, *Fatuhivella marmorata*, new species, type female, lateral outline of pronotum and tegmen, $\times 7$; *p*, *Nukuhivella agraeioides*, new species, type male, lateral view, $\times 3$; *q*, *Nukuhivella agraeioides*, new species, type male, ventro-caudal view of cercus to show apex and its projections, shaft necessarily fore-shortened, greatly enlarged.



trunk is weakly indicated, but other venation detectable only when the tegmina are held in certain lights and examined under a high-powered microscope. The insects appear more glabrous, with vertex broader, palpi and tarsal joints shorter and tegminal reduction slightly to distinctly greater. The same slender apical production of the cerci found in *Maretina* is shown, this aiding in distinguishing these genera from *Mareta*. The shell-like tegmina (due to the almost obliterated venation), smooth and without tessellation, further distinguish the species of *Aneurina* from those of *Mareta*.

Other noteworthy generic features of *Aneurina* agree throughout with those here given for *Maretina*. It shows the following differences probably of minor generic differential value from that genus. Head shorter with occipital width proportionately greater and lateral margins of face more decidedly convergent ventrad. Palpi short, with third and fifth joints about equal in length and fourth joint shorter. (Tegmina much reduced, broadly rounded quadrate or triangular pads.) Caudal metatarsus slightly shorter to slightly longer than combined length of succeeding joints.

***Aneurina viridis*, new species (fig. 1, d).**

Considerable modification has occurred in the species and decided variation in size and some variation in tegminal contour and palpal, cercal, and tarsal proportions is shown by the series.

The type is of about average size. Below are the extremes of the series as well:

	Length, body	Length, pronotum	Width, pronotum	Exposed length, tegmen	Greatest width, tegmen
Male					
Ooumu, Nukuhiva, type.....	8	2.9	3.8	2.6	2.7
Ooumu, Nukuhiva, paratype	7.6	2.1	3	1.8	1.8
Tekao Hill, Nukuhiva, paratype	9	2.8	3.8	2.7	2.5
Female					
Ooumu, Nukuhiva, allotype.....	7.4	2.3	3.1	1.8	2
Tapuaooa Hill, Nukuhiva, paratype	7.2	2.4	3.2	2	2.1
Tauamaka, Nukuhiva, paratype	8.9	2.8	3.9	2.7	2.7

The immatures are unicolorous, deplanate, and very delicate in structure.

The ootheca is carried vertically. It is short, thick and smooth, with suture showing a series of very feeble thickenings.

Male

The following features are given in addition to those considered of generic value. Size small for the group *Maretae*, form medium. Width between antennal sockets less than two-thirds that between the very widely spaced eyes. Palpi with third joint longest, large fifth joint slightly longer than fourth. Tegmina slightly overlapping, exposed portions as long as broad (varying to slightly longer than broad), costal margin rounding hardly less broadly into the distal margin than does the sutural margin and slightly (to scarcely) less produced so that the distal margin is weakly oblique; venation almost obliterated, the attingent (if in normal position) tegmina appearing like transparent and smoothly and weakly convex shells except that there is weak depression at the humeral trunk and the moderately broad mediastine field is flattened. Wings minute and atrophied, but visible through the tegmina. Abdomen smooth, convex, tapering, with disto-lateral angles of tergites very slightly produced at slightly less than a

right angle; seventh small with latero-caudal angles convex. Supra-anal plate delicate, triangularly produced, about two-thirds as long as basal width, with apex broadly rounded. Cerci as described for *Maretina hivaoa*. Subgenital plate with distal section deeply cleft, the flaps thus formed adjacent with ventral surfaces concave, each terminating dorsad in a small chitinous finger curving dorsad then caudad; inner margin of sinistral flap armed half way to its base with a curved spine as large as the apical finger, inner margin of dextral flap armed one-third way to its base with a minute rounded socketed style, no longer than broad.

Female

Differs from male as follows. Occiput more convex, the eyes less projecting laterad and width between antennal sockets three-quarters that between the less remote eyes. Palpi slightly but definitely shorter. Supra-anal plate triangularly produced with apex moderately bilobate (rarely truncate), slightly less than (varying to slightly more than) half proximal length.

Thirty-seven specimens examined—11 males, 9 females, and 17 immature individuals.

Nukuhiva: Tekao Hill, altitude 3020 feet, July 23, 1931, on *Metrosideros collina*, *Weinmannia* species, and *Rapanea?* species, 4 males, 1 female, paratypes, 4 juveniles, LeBronnec and Tauraa; Ooumu, altitude 3000-3890 feet, May 27 to 28, 1931, on *Weinmannia* species and *Cyrtandra* species, adults, 3 males, 1 female, type male (altitude 3000 feet, May 27, 1931, on *Weinmannia* species, LeBronnec and Tauraa), allotype female (altitude 3200 feet, May 28, 1931, on *Weinmannia* species, LeBronnec and Tauraa), paratype, 7 juveniles, Tauraa, Mumford, and Adamson; Tauamaka, altitude 2900 feet, November 10, 1929, on *M. collina*, 2 females, paratypes, Mumford and Adamson; Tapuaooa Hill, altitude 2500 to 3600 feet, May 30, 1929, to November 10, 1931, 3 males, 3 females, paratypes, 1 juvenile, Tauraa, Mumford, and Adamson.

Fatuhiva: Tahuna, altitude 2050 feet, September 3, 1930, on *M. collina*, 2 females and 2 juveniles, LeBronnec; Teavaipuhiau, altitude 2150 feet, August 25, 1930, on *M. collina* and *Weinmannia* species, 2 juveniles, LeBronnec.

Uahuka: Penau Ridge, altitude 2000 feet, February 27, 1931, 1 small juvenile, LeBronnec and Tauraa.

Tahuata: Haaioipu (summit), altitude 2700 feet, July 9, 1930, on *M. collina*, 1 male, 1 juvenile, LeBronnec and Tauraa.

This species is distinguished by its light green coloration, the occiput to between the antennae opaque buffy, the pronotal disk on each side sometimes with a suffusion of buff or orange yellow. The subgenital plate is brown in males, brown meso-distad in females.

In so delicately colored an insect, specimens sometimes turn greenish buff or brownish buff in drying, and this, naturally, is particularly true in immatures.

Aneurina hivaoa, new species.

Generally light clay color. Three specimens show traces of green, particularly on limbs and abdomen, indicating that in life some individuals may be more strongly tinged with that color. Pronotal disk immaculate (recessive) or with inconspicuous suffusions laterad with a few flecks of darker brown between. Head and tegmina immaculate. Dorsal surface of abdomen with lateral bands of chestnut brown, the bands breaking into a series of large spots in a few individuals and subobsolete in one specimen showing maximum recession. In the specimen of maximum intensive coloration there is also a medio-longitudinal series of dark brown flecks and the other portions of the abdomen appear slightly mottled. Ventral surface uniform light clay color, the abdomen proximad often suffused with brown, rarely with lateral margins narrowly and apex brown.

Size variation in the adults is moderate, those of the smallest female paratype being given before those of the allotype. Length of body, male 8 mm., female 6.8 mm. and 8.2 mm.; length of pronotum, male 2.3 mm., female 2.2 mm. and 2.3 mm.; width of pronotum, male 3.4 mm., female 3.5 mm. and 3.6 mm.; exposed length of tegmen, male 2 mm., female 1.9 mm. and 1.9 mm.; greatest width of tegmen, male 2 mm., female 2 mm. and 1.9 mm.

Male

Very similar to *viridis* in the structural features here given, differing only as follows: Palpi slightly shorter. Tegmina showing slightly greater reduction, separated by a narrow interval, with distal convexity broader on both costal and sutural margins. Subgenital plate similar except that inner margin of sinistral flap is armed at one-third the distance to its base with a socketed style which is slightly longer than broad, and very similar to the apical production, a smaller socketed style present on inner margin of dextral flap one-quarter distance to base.

Female

Very similar to male. Form slightly broader. Supra-anal plate as in *viridis*.

Fifteen specimens examined—3 males, 5 females, and 7 immature individuals.

Hivaoa: Mount Temetiu, altitude 3660 to 3860 feet, May 27, 1928, and December 27, 1930, 1 in fern petiole, 2 males, 4 females (altitude 3860 feet, December 27, 1930, type male, H. Tauraa, altitude 3660 feet, May 27, 1929, in fern petiole, allotype female, Mumford and Adamson) type, allotypes, paratypes, 7 juveniles, Mumford, Adamson, and Tauraa; Matauuna, altitude 3700 feet, March 4, 1930, 1 male, 1 female, paratypes, Mumford, Adamson, and Tauraa.

Aneurina tahuata, new species (fig. 1, *e*).

Generally light cinnamon buff above and below. Head, pronotum, and tegmina immaculate. Dorsal surface of abdomen in allotype (maximum recessive) almost immaculate, three female paratypes with brown lateral bands and with a much finer medio-longitudinal brown band, these bands in two broken into series of spots, minute flecks of brown also along the slightly paler buffy caudal margins of the tergites; type with lateral bands formed by larger spots of Prout's brown, but median band and flecks obsolete. Lateral margins of abdominal sternites suffused with brown in male type and two female paratypes.

Little size variation is shown by the series including 3 female paratypes and 14 immatures, of which the majority are very small. Length of body, male 7 mm., female 6.8 mm.; length of pronotum, male 2 mm., female 2 mm.; width of pronotum, male

3.05 mm., female 3.1 mm.; exposed length of tegmen, male 1.7 mm., female 1.7 mm.; greatest width of tegmen, male 1.7 mm., female 1.75 mm.

Male

Differs from *hivaoa* only as noted above. Tegmina decidedly reduced; separated at bases a distance over half basal tegminal width, sutural margin oblique produced to caudal margin of mesonotum, so that at that point the tegmina are less widely separated than proximad, sutural margin thence rounding into the almost straight oblique distal margin, the broadly rounded apex consequently nearer the costal margin. Styles slightly shorter. Subgenital plate similar. Generic features given in generic description.

Female

Very similar to male, slightly broader. Supra-anal plate slightly less than half as long as basal width (found to be variable in length in allied species).

Tahuata: Amatea, altitude 2700 feet, July 7, 1930, on *Metrosideros collina*, type male, allotype female, LeBronnec and Tauraa.

Closely related to *A. hivaoa*, this insect is distinguished by its smaller size and more reduced tegmina which are separated by wider intervals and have their distal margins distinctly oblique, retreating to the sutural margins.

Graptoblatta notulata (Stål).

Eiao, altitude 1500 feet, April 22, and 24, 1931, 3 males, 1 female.

Hivaoa: Tapeata, altitude 2500 feet, May 25, 1929, in tree fern petioles, 2 small juveniles.

Tahuata: Vaitahu Valley, altitude 90 to 120 feet, June 2 to 16, 1930, on cotton, *Gossypium* species, 2 males, 7 juveniles.

Fatuhiva: Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, 1 juvenile female.

Nukuhiva: Teuanui, altitude 1400 and 1800 feet, October 25 and 26, 1929, at light, 2 females; Tapuaooa Ridge, altitude 3000 feet, June 18, 1931, on *Metrosideros collina*, 1 female, 1 juvenile.

Uahuka: Penau Ridge, altitude 2000 to 2170 feet, March 4 and 5, 1931, 2 at light, 2 males, 1 female, 1 large juvenile male; Vaitiake, altitude 1000 feet, March 24, 1931, on *Canthium barbatum*, 1 female; Putiovae [Putiovai], altitude 1530 feet, March 23, 1931, on *Xylosma suaveolens*, 1 male; Vaipae Valley, altitude 880 feet, in banana leaves, 1 small juvenile.

This species is known from Hawaii, the Marquesas, and Tahiti to New Caledonia, New Guinea, Celebes, Borneo, Java, Sumatra, and the Malay Peninsula.

PSEUDOMOPINAE

Genus MICROBLATTA, new genus

This genus is erected to include the single species, *M. uapou*, here described. It may be recognized by the following characters. Size very small,

structure quite strongly chitinous. Head much deeper than wide, interocular space extremely broad, margins of cheeks weakly convergent ventrad below eyes. Palpi moderately elongate. Pronotum with convex surface showing no impressions, cephalic and caudal margins truncate. Tegmina represented by rounded quadrate pads, with venation subobsolete and anal sulcus obsolete. Wings vestigial. Male with surfaces of distal tergites very finely rugulose. Male subgenital plate broadly cleft with two projections on each side, maretoid. Femora stout, median and caudal with ventral margins well spined, cephalic with ventro-cephalic margin armed with an elongate row of short piliform spines, terminating in two elongate spines. Caudal metatarsus slightly longer than combined length of succeeding joints, its ventral surface with two rows of very minutely microscopic spines. Pulvilli obsolete. Arolia present between the delicate, simple symmetrical tarsal claws.

The male subgenital plate is of a maretoid type, but heavy spination of the ventral margins of the median and caudal femora indicate that the species belongs to the Pseudomopinae. The armament of the ventro-cephalic margins of the cephalic femora and simple symmetrical tarsal claws show that it is nearest *Ceratinoptera*, differing in the longer and differently proportioned palpi, decidedly heavier armament of the median and caudal femora, larger arolia, and entirely different type of male genitalic specialization.

Microblatta uapou, new species (fig. 2, a, b).

General coloration shining blackish brown, lateral portions of pronotum and costal field of tegmina obscurely paler, obscure ochraceous tawny. Limbs and spines very dull hazel.

Length of body, male 6.2 mm. (abdomen extruded), female 6 mm.; length of pronotum, male 1.9 mm., female 2.06 mm.; greatest (caudal) width of pronotum, male 2 mm. (estimated), female 2.1 mm.; exposed length of tegmen, female 1.9 mm.; greatest (median) width of tegmen, female 1.77 mm.; length of caudal tibia, male 2.27 mm., female 2.27 mm. (by micrometer).

Male

Important characters given in generic description. Size very small, form comparatively moderately graceful. Interocular space equal to width across antennal sockets to their outer margins. Ocelli obsolete. Pronotum with cephalic margin transverse and very faintly convex, caudal margin much broader, transverse, but showing faint convexity mesad; cephalic and very broadly convex lateral margins cingulate. Tegmina probably much as in female (type damaged, tegmina missing). Wings atrophied pads, but extending distad beyond caudal margin of metanotum. Distal tergites very finely and irregularly rugulose, very minute short hairs present. Supra-anal plate triangular, less than half as long as wide, with apex broadly convex. Cerci with margins entire and apices blunt. Subgenital plate produced on each side in a bidentate lamella, the dextral much narrower than the sinistral lamella.

Female

Very similar to male, differing as follows: Interocular space slightly wider. Tegmina quadrate, slightly shorter than pronotum, large scutellar area exposed, production slightly greatest at sutural margin, distal costal angle very broadly rounded, slightly

oblique distal margin showing very weak convexity; surface smooth and shining, venation only apparent where light can shine through the tegmina. Surface of abdomen smooth. Supra-anal plate with margins very weakly convex convergent to the more sharply rounded apex, where there is a brief medio-longitudinal subchitinous line. Cerci more acute at apices. Subgenital plate destroyed.

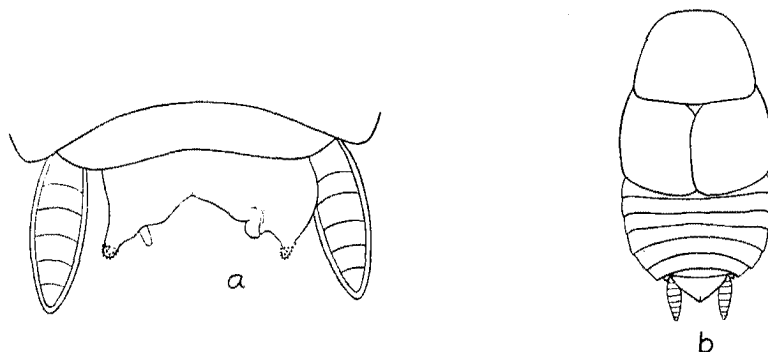


FIGURE 2. *Microblatta uapou*, new species: a, type male, ventral view of distal portion of abdomen (greatly enlarged); b, allotype female, dorsal outline, $\times 6$.

Uapou: Teavaituhai, Hakahetau Valley, altitude 3000 feet, October 19, 1931, type male, allotype female, LeBronnec.

This very small blackish brown insect is best compared with the Mexican *Ceratinoptera tropaia* Hebard. It is even smaller, less robust, and darker, with the pronotum definitely truncate cephalad, tegmina shortest at costal instead of at sutural margin, and entirely lacking an anal sulcus, strikingly longer caudal tibiae and very distinct genitalia.

The armament of the ventro-cephalic margins of the cephalic femora is of a distinct type from that developed in *Temnopteryx*, *Anisopygia*, and their allies.

Kuchinga remota, new species (fig. 1, f, g):

General coloration testaceous. Head with a suffused brown band between ocelli and below with two narrower bands of irregular intensity, strongly convex ventrad on face. These markings often reduced to weak flecks and obsolete in recessive specimens. Pronotal disk with two inconspicuous brown flecks mesad, in intensive individuals with two to four very minute brown dots meso-caudad. Tegmina and nodes on veins immaculate. Limbs immaculate, rarely with a fleck of brown dorso-distad on cephalic femora and brown at bases of dorsal tibial spines. Cerci with base, before apex and immediate apex brown. Ventral surface of abdomen laterad maculate with dark brown. Immatures heavily and strikingly tessellate with dark brown.

Little size variation is shown by the series. Length of body, male 6.8 mm., female 6.8 mm.; length of pronotum, male 1.7 mm., female 1.7 mm.; width of pronotum, male 2.3 mm., female 2.4 mm.; length of tegmen, male 6.8 mm., female 6.6 mm.; width of tegmen, male 2.2 mm., female 2.2 mm.

Male

Size very small, form medium. Head little flattened, moderately short, margins of cheeks very gradually convergent ventrad. Interocular space four-fifths that between

antennal sockets. Palpi only moderately elongate, fourth joint distinctly shorter than third, fifth elongate but distinctly shorter than fourth. Pronotum weakly convex, greatest width slightly caudad of the median line, caudal margin very faintly convex. Tegmina and wings fully developed. Tegmina normal, apices well rounded, discoidal sectors longitudinal and nodose (the bases of microscopic hairs). Wings normal, costal veins briefly and heavily clubbed, distad, ulnar vein with one (rarely two) continuous branch, intercalated triangle small but as broad as long. Eighth abdominal tergite with a raised transverse ridge, mesad, rounded obtuse angulate and pointing cephalad, its cephalic surface particularly mesad supplied with minute hairs. Supra-anal plate transverse, faintly sub-bilobate. Subgenital plate triangularly produced on each side with apices rounded, between concave particularly sinistrad, with a small rounded projection mesad. From the inner surface of this projection, a curved spine lies along the upper surface of the plate, its point extending nearly to the apex of the sinistral style. Styles similar, simple, slender, tapering to sharply rounded apices, the sinistral slightly smaller than the dextral; sinistral at apex of sinistral projection, dextral on inner side of apex of dextral projection. Ventro-cephalic margin of cephalic femora with two proximal and two elongate distal spines, separated by a closely placed row of microscopic spinules.

Female

Very similar to male; very slightly broader with tegmina very slightly shorter. Supranal plate more strongly transverse. Subgenital plate very weakly bilobate distad.

Eleven specimens examined—5 males, 3 females, and 3 immature individuals.

Hivaoa: Teava Uhia i te Kohu, altitude 2000 feet, February 15, 1930, 1 female, Mumford and Adamson.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1500 feet, August 30, 1930, 1 male, 2 large juvenile males; Ihiota, Hanavave Valley, altitude 450 feet, 1 teneral female, LeBronnec.

Uahuka, Vaipae Valley, altitude 880 feet, September 20, 1929, in banana leaves, 1 juvenile, Adamson.

Described from the Society Islands.

Society Islands. Moorea: Faaroa Valley, altitude 1000 feet, 3 miles from sea, December 4, 1928, in dead banana leaves, 1 female allotype, Adamson. Tahiti: Hitiaa, 3 miles from sea, altitude 1500 feet, December 20, 1928, 3 males, type and paratypes; Papeari, altitude 900 feet, November 9, 1928, in *Freycinetia* species, 1 male paratype, Adamson.

This very small buffy species is very dissimilar in appearance from the genotype, *longealata* (Brunner) and its general testaceous coloration is much nearer *K. nimbata* (Shelford). In superficial appearance, however, *remota* agrees even more closely with certain New World species of *Cariblatta*.

The specialized dorsal surface of the male abdomen and shorter palpi may indicate generic differentiation, but until we better understand *Kuchinga*, we believe that step would be unwise. It certainly would, if that genus is found to include many and as diverse species as are now known to be referable to *Mareta*.

From the insufficient description, based only on the female sex, we note that *Margattea vermiculata* Hanitsch, described in 1928 from Siberut Island, Mentawi Islands, may be congeneric. From *remota* it is apparently distinguished by the dark vertex, vermiculate pronotal disk and ulnar vein of wings with four branches. Rehn has recently pointed out that *Margattea* has oblique tegminal discoidal sectors.¹ Hence the original generic assignment of *vermiculata* is incorrect.

Loboptera dimidiatipes (Bolivar).

This species was described from the Philippines in 1890. A synonym is *Temnopteryx sakalava* Saussure, described from Madagascar in 1891. In 1909, Holdhaus recorded the species from Samoa as *Loboptera extranea* Perkins, a name based on Hawaiian material which we placed under *sakalava* in 1922. Holdhaus also added to the present synonymy by describing *Loboptera maculicornis* from Samoa in 1909, based on immature material of the present species, in which stages, but not in the adult, white antennal annuli are present. Brunner erected another synonym in 1916, *Temnopteryx ferruginea*, based on a recessive female from Fiji such as we have recorded from Penau Ridge, Uahuka. Still another synonym is *Temnopteryx bimaculata* described by Chopard from New Caledonia in 1924 (his figure shows the distinctive markings, but the insect is actually smoother and more compact in appearance). In 1927 the insect was reported as *Temnopteryx sakalava* by Caudell from Fiji and Tahiti, and in 1930 as *Temnopteryx bimaculata* by Chopard from Tahiti.

The species was evidently not recognized as extremely widespread, probably by commerce, through the South Seas.

Nukuhiva: Ooumu, altitude 3890 feet, July 30, 1931, 1 juvenile; Tapu-aooa, altitude 2600 feet, May 30, 1931, 5 males, 9 females, 2 juveniles.

Uahuka: Penau Ridge, altitude 1860 and 2000 feet, February 27, and March 5, 1931, 2 females (unusually pale, reddish brown in general coloration).

Hatutu [Hatutaa]: altitude 800 feet, April 28, 1931, under grass, 1 female.

The species is known from as far west as Tanganyika, Africa.

BLATTINAE

Periplaneta brunnea (Burmeister).

Hivaoa: Atuona, April 25, 1929, 1 female.

¹ Rehn, J. A. G., On the Blattid Genera *Abrodiæta* Brunner (=Allacta Saussure and Zehntner) and *Margattea* Shelford (Orthoptera): Ent. Soc. America, Trans., vol. 57, p. 301, 1931.

Periplaneta australasiae (Fabricius).

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1500 feet, August 30, 1930, 2 juveniles; Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, 3 juveniles.

Nukuhiva: Teuanui, altitude 1800 feet, at light, 1 female.

Uahuka: Vaipae Valley, altitude 270 feet, March 18, 1931, under coconut fronds, 2 males, 1 juvenile.

Fatuuku: November 19, 1930, 2 females, 2 juveniles.

Mohotani: altitude 1200 feet, August 20, 1930, to February 2, 1931, 2 males, 2 females, 15 juveniles.

Hatutu [Hatutaa]: altitude 800 feet, April 28, 1931, under grass, 1 male, 2 females, 1 juvenile.

Eiao: altitude 1000 feet, April 21, 1931, at light, 1 male.

Periplaneta americana (Linnaeus).

Hivaoa: Atuona, February 6, 1929, 1 male.

Nukuhiva: Taiohae, sea level, June 4, 1931, at light, 1 male.

These three species of *Periplaneta* are circumtropical and often a serious pest on the smaller ships sailing the South Seas.

Cutilia soror (Brunner).

Hivaoa: Matauuna, altitude 3760 feet, August 1, 1929, 2 males, 2 females, 1 large juvenile male; Tenatinaei, altitude 3760 feet, August 1, 1929, 1 large juvenile male.

Nukuhiva: Teuanui, Toovii, altitude 2000 feet, October 15, 1929, 1 large juvenile male; Tapuaooa, altitude 2600 feet, May 30, 1931, 2 males, 2 females.

Uahuka: Hanatea, altitude 100 feet, March 11, 1931, under stone, 1 male; Hane Ridge, altitude 1800 feet, February 26, 1931, 1 female; Vaitiake, altitude 1000 feet, March 9, 1931, under dead log, 2 males.

Hatutu [Hatutaa]: altitude 800 feet, April 28, 1931, under stone, 1 male.

This insect, representing a genus represented by numerous species in Australia and a number of species in Melanesia, has been recorded from Hawaii and Tahiti to Formosa, Ceram, and Amboina.

Cutilia nitida (Brunner).

We are satisfied that *C. feejeeana* Bruner, described in 1916, is a synonym, probably based on a teneral specimen. The width is given as 16 mm. In the series here recorded this dimension ranges from 14.6 to 15 mm. in females, but one from Ceram and one from the Philippines in the author's collection are as wide as Bruner's specimen.

Nukuhiva: Toovii, altitude 2500 feet, August 4, 1931, 4 males, 1 female.

Mohotani: altitude 1200 feet, February 1 and 2, 1931, 5 males, 6 females.

This species was previously known from Fakarava in the Tuamotus and Samoa to Formosa, the Philippines, Ceram, Amboina, and Australia.

PANCHLORINAE

Pycnoscelus surinamensis (Linnaeus).

Tahuata: Vaitahu Valley, altitude 120 feet, June 16, 1930, 1 female, 5 juvenile females; Kiinui, altitude 1210 feet, June 14, 1930, 1 juvenile female.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1600 feet, August 29, 1930, 1 juvenile female; Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, 1 small juvenile female.

Nukuhiva: Teuanui, Tovii [Toovii], altitude 2000 feet, October 25, 1929, in banana leaves, 1 juvenile female.

Uahuka: Hane Valley, altitude 150 feet, March 15, 1931, 1 female; Vaitiake Valley, altitude 1000 feet, March, 1931, 1 juvenile female.

Fatuuku: altitude 860 feet, November 19, 1930, 2 females, 6 juvenile females.

Hatutu [Hatutaa]: altitude 1018 feet, October 30, 1929, 1 female.

Mohotani: altitude 700 feet, February 2, 1931, 1 female, 8 juvenile females.

This circumtropical species is evidently parthenogenetic in the Marquesas, as is the case over the great part of its distribution. In the Indo-Malayan regions, however, males are frequent.

CORYDIINAE

Holocompsa nitidula (Fabricius).

From Shelford's description and figures of his *H. capsoides* from Lower Ogowe, Africa, in 1911, and Chopard's record of a male from Samoa in 1929 which agreed fully with the type, we are satisfied that that name is a synonym.

Uapou: Hakahetau, December 31, 1929, at light, 1 female.

Common in tropical America and known to be widely distributed by commerce, we believe that *nitidula* has probably reached Oceania through importation from that continent.

The female is very different from the male, being of broader form, with pronotum cinnamon-rufous instead of black, and suffusion of the distal portion of the organs of flight slightly stronger.

OXYHALOINAE

Diploptera dytiscoides (Serville).

Uahuka: Haave [Haavei] Valley, sea level, March 19, 1931, under bark, 1 male, 1 large juvenile female.

This insect, known to be sometimes injurious to trees, is apparently widely distributed in Oceania and has been reported from Hawaii to Australia, Singapore, Ceylon, and southern India.

A female from Ascension Island in the South Atlantic is in the author's collection, where the species was almost certainly introduced.

PHASMIDAE

PHIBALOSOMINAE

Graeffea crouanii (Le Guillou).

Described from Samoa, this name has priority over *coccophagus* as indicated by Kirby in 1904, but missed by Brunner in his monograph in 1908, where the synonymy of *Anophelepsis fulvescens* Saussure, described from Hivaoa, was, however, correctly established.

Hivaoa: Atuona, low level, July 12, and 19, 1929, 17 females (two brown phase, others green) 9 large juvenile females, 6 small juveniles.

The adults range from 106 to 116 mm. in length.

The species is widespread in Oceania as far north as the Marquesas and Samoa, west to the Solomon Islands and south to Australia. It is decidedly injurious to the coconut, and particularly so to young trees.

ACRIDIDAE

ACRYDIINAE

Hydrotetrix marquesana, new species (fig. 1, *h, i*).

General coloration dark brown, usually uniform, rarely with slightly darker patches laterad on disk back of shoulders and on dorsal surfaces of caudal femora beyond the median point. Cephalic and median tibiae slightly paler with very weaker defined dark annuli, which are strongest on the cephalic pair. Caudal tibiae dark brown, usually paler at base.

Little size variation is shown. Length of body, male 6.2 mm., female 7.8 mm.; length of antenna, male 3.7 mm., female 4.8 mm.; length of pronotum, male 4.8 mm., female 5.8 mm.; width of pronotum at shoulders, male 1.9 mm., female 2.1 mm.; length of caudal femur, male 4 mm., female 4.9 mm.

Female

Size small, form moderately graceful. Lateral ocelli in line with median portion of eye. Antennae elongate. Fork of frontal costa very narrow. Vertex without a transverse ridge back of the deeply bi-impressed portion. Pronotum not surpassing base of ovipositor; with a pair of short sharp carinae between shoulders and a pair of carinae meso-caudad which converge to join the median carina caudad. Pronotal lateral lobes with caudal angles rounded, not reflexed; scapular area prominent. Organs of flight absent. Ovipositor elongate and rather slender. Cephalic and median limbs moderately elongate, with margins scarcely undulate. Caudal femora elongate, with oblique rugae rather conspicuous. Caudal metatarsus considerably longer than combined length of succeeding joints.

Male

Very similar to female. Size smaller. Vertex narrower, slightly narrower than the dorsal ocular width. Pronotum extending to opposite base of subgenital plate.

Specimens examined: 49; 15 males, 24 females, and 10 immature individuals.

Fatuhiva: Ihiota [Iniota], Hanavave Valley, altitude 500 feet, September 10, 1930, on wet rocks beside stream, 5 males, 5 females, 3 juveniles; Tea-vaione, Omoa [Oomoa] Valley, altitude 1700 feet, August 29, 1930, on wet rocks beside stream, 8 males, 16 females, type female, allotype male, LeBronnec (B. P. Bishop Museum), paratypes, 7 juveniles.

This insect is closely related to *H. aspera* Uvarov of the Society Islands, differing in the pronotum having its median carina less distinctly elevated between the shoulders, but decidedly more pronounced caudad and its lateral margins more convergent caudad so that that caudal extremity is rather strongly acute-angulate. The vertex is slightly broader so that in the females it is as broad as the dorsal ocular width instead of being slightly narrower than that dimension. The rugosities of the pronotum are not conspicuous.

From the genotype *H. cheesmanae*, of the Society Islands, these species are quickly separable by the much shorter caudal tarsi.

The genus *Hydrotetrix* is apparently near *Mazarredia* Bolivar, though not as conspicuously a metrodorid as our recently described genus *Cingalena* from Ceylon.

CYRTACANTHACRINAE

Three endemic species of this subfamily occur in the Marquesas: *Ootua antennata* Uvarov on Hivaoa, *Valanga marquesana* Uvarov on Nukuhiva, and *Patanga pinchoti* Caudell on Eiao. The Survey's collection of these species has already been dealt with by Uvarov in a paper in this series.²

TETTIGONIIDAE

COPIOPHORINAE

Euconocephalus roberti (Le Guillou).

Walker's *Conocephalus insularis* was synonymized by Kirby in 1906. We recorded specimens apparently representing this species from the Philippines and Java as *sobrinus* in 1922, and now believe that name to be probably a synonym.

This species has been recorded as *E. australis* from many islands in Oceania, including Hivaoa in 1927. We are not convinced that that name is a synonym, though it was so placed by Chopard in 1929. It was described from New Caledonia and with *longiceps* (also described from that island) as a synonym, is apparently a species having a longer vertex (and sometimes more attenuate if correctly figured by Redtenbacher). Caudell's record of *Euconocephalus lineatipes* from Fatuhiva in 1932 certainly is based on a specimen of the present species.

² Uvarov, B. P., Acrididae from the Marquesas: B. P. Bishop Mus., Bull. 98, pp. 239-240, 1932.

Hivaoa: Mount Ootua, altitude 2500 feet, May 6, 1929, 1 female (green); Atuona, sea level, March 9 to July 12, 1929, 39 males, 4 females (14 males, 1 female, green, others brown); Mount Temetiu, altitude 3200 feet, September 13, 1929, 1 small juvenile (green); Tapcata, altitude 2250 feet, May 25, 1930, 2 juveniles (brown).

Tahuata: Kiinui Valley, altitude 1200 feet, June 14, 1930, 1 juvenile male (green); Vaitahu Valley, sea shore, June 5 to 16, 1930, 9 males (2 green, others brown).

Fatuhiva: Tapuhiva, Hanavave Valley, altitude 500 feet, September 9, 1930, 1 juvenile male (green); Omoa [Oomoa] Valley, sea level to 100 feet, August 21 to September 26, 1930, 1 female, 3 juveniles (all green); Hanavave Valley, altitude 30 feet, in *Paspalum conjugatum*, 1 small juvenile.

Nukuhiva: Taipivai, November 21, 1929, 8 males, 6 females, 4 juveniles (4 females and 1 juvenile brown, others green); Taiohae, November 26, 1929, 4 males, 2 females, 4 juveniles (2 males green, other brown); Tapuaooa, altitude 2600 feet, May 20 to June 19, 1931, 30 males, 1 female, 2 juveniles (10 males, 2 juveniles green, others brown); Vaihakameama, altitude 2600 feet to 3100 feet, June 19, 1931, 1 male, 1 female, 3 juveniles (2 juveniles green, others brown).

Uahuka: Vaitiake, altitude 1000 feet, March 24, 1931, 1 small juvenile (brown); Vaipae Valley, altitude 50 feet, March 19, 1931, 1 female (green); Tauheeputa, altitude 1770 feet, March 23, 1931, on *Abutilon* species, 1 juvenile male (green).

Uapou: Hakahetau Valley, December 18, 1929, 1 juvenile (brown), 2 females.

This insect is apparently distinguished from its allies by the longer vertex (except in the case of *longiceps*), which to the naked eye appears acute, and the short ovipositor. In none of the present series is the immediate costal margin of the tegmina darkened. It is apparently the only species of the genus which has extended its distribution into Oceania.

CONOCEPHALINAE

Conocephalus affinis (Redtenbacher).

Fatuhiva: Atipo [Atipu], altitude 2100 feet, September 3, 1930, in *Paspalum conjugatum*, 1 female; Omoa [Oomoa] Valley, near sea level, August 21, 1930, 1 male; Tapuhiva, Hanavave Valley, altitude 500 feet, September 9, 1930, in *P. conjugatum*, 4 juveniles; Hanavave Valley, altitude 1560 feet, August 23, 1930, 1 male, 2 juvenile females; Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, in *P. conjugatum*, 10 males, 4 females, 25 juveniles.

Nukuhiva: Tapuaooa, altitude 2600 feet, May 30, 1931, and November 11, 1929, 2 males, 4 females, 10 juveniles.

Mohotani: altitude 1400 feet, February 1, 1931, 2 juveniles.

The species is known also from Samoa, Fiji, the Society Islands, the Philippines, Banks Island, and the Aru and Kei islands.

Conocephalus tridens, new species (fig. 1, *j*, *k*).

General coloration light yellow brown, the dorsum of the head and pronotum margined laterally with yellow buff, this continued on the humeral vein of the tegmina for some distance. Area between on head and pronotum often darker than elsewhere. Antennae yellow brown, intersection of joints brown and occasionally one of these dark brown. Limbs and body discolored but apparently almost immaculate.

Considerable size variation is indicated, the measurements of the largest paratypes following those of the type and allotype. Length of body, male 14.5 mm. to 17.3 mm., female 14 mm. to 15.8 mm.; length of pronotum, male 3.7 mm. to 4.3 mm., female 3.8 mm. to 4.7 mm.; length of tegmen, male 14.7 mm. to 19.7 mm., female 15 mm. to 20.2 mm.; length of caudal femur, male 11.8 mm. to 14 mm., female 12 mm. to 14.7 mm.; length of ovipositor, 7.3 mm. to 8 mm.

Male

Size and form medium for the genus; macropterous. Head with dorsal outline very feebly concave, the vertex scarcely ascending. Fastigium narrow, distinctly less than half the width of the large proximal antennal joint, sides broadly concave to facial suture, depth over twice width. Eye small and not unusually prominent. Lateral lobes of pronotum longer than deep, cephalic margin broadly convex with angulation suggested, ventro-caudal angle situated slightly caudad of mesad and rounded rectangulate, caudal margin weakly convex to the broad but distinct humeral sinus, convex callosity broad but poorly defined. Tegminal stridulating field of normal size, about as broad as long. Ultimate tergite broadly produced, extending above cerci half the distance to inner teeth, its very broad apex very broadly concave. Supra-anal plate deflexed, divided into two rounded portions with their surfaces concave. Cerci stout, cylindrical; distal portion more slenderly cylindrical to the rounded apex; shaft armed just beyond median point ventrad on its inner surface with a flattened finger directed at a right angle to the shaft and curved slightly inward, this finger as long as the distal portion of the shaft; above this finger are two slightly curved spines, each about half as large as the finger, so arranged that in caudal aspect the cercus appears heavily tridentate. Subgenital plate with distal margin weakly angulate-concave between the very small, socketed disto-lateral styles. Prosternum unarmed. All femora with ventral margins and genicular lobes unarmed. Cephalic tibiae with rimate foramina, these and median tibiae with six pairs (including distal pair) of short spines. Caudal tibiae armed with numerous small dorsal spines and ventrad with much more widely spaced spines in distal portion only, apex with three pairs of spurs.

Female

Closely resembles male. Ovipositor short, broadly but distinctly curved dorsad; slightly but distinctly broader mesad than at proximal point of greatest constriction. Subgenital plate embracing ovipositor, triangular with apex showing broad concavity.

Twenty-one specimens examined—8 males, 7 females, 6 immature individuals.

Eiao: Vaituha, altitude 1200 feet, October 3, 1929, on *Cassia occidentalis*, type male; altitude 800 feet, September 29, 1929, allotype female, Adamson; altitude 800 to 1200 feet, September 29 to October 3, 1929, on *Cassia occidentalis* and *Dodonaea viscosa*, 4 males, 2 females, paratypes; near center of

island, altitude 1300 feet, October 1, 1929, 1 male, 1 female, paratypes; altitude 1700 to 1800 feet, April 16 and 22, 1931, on *Sida* species, 1 male, 1 female, paratypes, 2 juveniles.

Nukuhiva: Ooumu, altitude 3000 feet, May 28, 1931, 2 juvenile females; Tapuaooa, 3100 feet, November 11, 1929, 1 juvenile female.

Tahuata: Vaitupaabei, altitude 2300 feet, July 10, 1930, 1 female, paratype, 1 juvenile female; Amatea, altitude 2600 feet, June 27, 1930, 1 male, 1 female, paratypes.

Of the three other members of the genus found in Oceania, one is tropical American and has surely been introduced in Hawaii, one is Melanesian and Australian, and the other is Melanesian and Malayan. The present species is so distinctive in type of male genitalia, however, that we believe it to be not only endemic but peculiar to the Marquesas.

The unarmed prosternum may indicate that this species is referable to the subgenus *Conocephalus*.³ We have noted the variation found in this feature in species we have referred to the subgenus *Xiphidion*. The narrow vertex, finely annulate antennae, tridentate male cerci, distinctly recurved ovipositor, and unarmed margins and genicular lobes of the caudal femora quickly separate this not strikingly marked species from all others.

Genus FATUHIVELLA, new genus

This genus is proposed to include two species, with *colorata* as genotype. It appears to be a more advanced development showing nearest affinity to the group of *Conocephalus* to which *melas*, *cognatus*, and *vestitus* belong, differing from all other species of that genus in having the stridulating vein of the male tegmina wholly concealed by the pronotum, the male ultimate tergite very greatly produced on each side above the unusually specialized cerci. The genotype agrees more nearly with *Conocephalus cognatus* but is very different from the normal forms of *Conocephalus* in being robust and stocky with caudal femora strikingly marked.

Though subgeneric rather than generic rank may eventually be proven, we think that to be unlikely.

The second species, *marmorata*, is known only from a female which differs decidedly from that sex of *colorata* in having the pronotum longer and more produced caudad but with caudal margin of disk almost as truncate, broadly convex. It lacks entirely the very strikingly contrasted markings found in the genotype and except for the evenly convex dorsal surfaces of the cephalic tibiae would seem to be nearer *Nukuhivella* here described.

Other features of generic significance are as follows. Size small. Fas-

³ Hebard, Morgan, Studies in Malayan, Melanesian and Australian Tettigoniidae (Orthoptera): Acad. Nat. Sci. Phila., Proc., vol. 74, p. 248, 1922.

tigium not extending beyond antennal sockets, narrow. Pronotum with convex callosity of lateral lobes and humeral sinus very feebly indicated or obsolete. Mesosternal lobes rounded sharply acute angulate, metasternal lobes broadly rounded rectangulate. Femora with ventral margins and genicular lobes unarmed. Cephalic tibiae with rimate foramina, dorsal surface unarmed and evenly convex, ventral margins with six pairs of short spines. Caudal tibiae with three pairs of distal spurs. Prosternum bispinose. Male cerci specialized, subgenital plate deeply emarginate between the small socketed simple styles. Ovipositor short, moderately curved dorsad, rather broad, tapering to the acute apex, unarmed—(more agraeicoid than in *Conocephalus cognatus* or *tridens*).

Fatuhivella colorata, new species (fig. 1, *l-n*).

General coloration ochraceous buff strongly tinged with tawny. Antennae with proximal joints marked with black, other portions black. Pronotum with a shining black saddle including all but the cephalic margin of the prozona and lateral lobes to narrow caudal marginal border. Tegmina shining black with male stridulating field hyaline faintly tinged with buffy, anal field of female buffy. Wings smoky. Caudal femora with a broad longitudinal ventro-external band of black which becomes broader near apex of enlarged portion and there crosses to the dorsal surface; apices of caudal femora and bases and apices of caudal tibiae black. Other limbs with black flecks. Apices of male ultimate tergite and cerci black. Ovipositor darkened proximad, brown along margins and at apex.

The series shows little size variation. Length of body, male 11.1 mm., female 11.2 mm.; length of pronotum, male 3.2 mm., female 3.7 mm.; length of tegmen, male 5.5 mm., female 5.2 mm.; length of caudal femur, male 10.8 mm., female 11.8 mm.; length of ovipositor, 6.4 mm.

Male

Size small, form robust. Head large in proportion to size of body. Occiput convex, scarcely descending to the horizontal fastigium, the dorsal surface of which shows a very fine trace of medio-longitudinal sulcation. Fastigium about one-third as wide as the large proximal antennal joint, its sides faintly convex to the facial suture, slightly over three times as deep as wide. Eyes small, prominent. Pronotum with metanotal portion ascending caudad, its caudal margin truncate; lateral lobes longer than deep, cephalic margin straight to the rounded obtuse-angulate ventro-cephalic angle, thence straight to the rounded-rectangulate ventro-caudal angle which is situated mesad; caudal margin very feebly convex, then very feebly concave; convex callosity indicated by a moderately broad very feebly raised area. Tegmina coriaceous except in the hyaline stridulating field, scarcely tapering to the broadly rounded apices and reaching to the cercal bases; veins prominent, on the convex surface of the discoidal field with distinct cross-veinlets transverse proximad and moderately oblique distad, there forming a network; stridulating field small, all but distal portion concealed by the pronotum; marginal field moderately broad with mediastine vein paralleling discoidal vein to distal portion, numerous (twenty-one to twenty-two) regular costal veins present. Wings reaching almost as far as tegmina but probably incapable of flight. Ultimate tergite large, acute-angulate emargination with margins decidedly convex mesad; lateral portions produced as far as cerci in elongate convex fingers which embrace the cerci, these distad expanding slightly, there solid, tapering and slightly decurved to the apices. Supra-anal plate vertical, triangular, sulcate medio-longitudinally and with convergent sulci laterad. Cercus stout and straight, slightly slenderest mesad; apex external, a quadrate plate with angles

rounded directed inward and dorsad, a round chitinous projection on inner side at its base, apparently with a soft apex above which projects as far as the outer projection a very delicate plate with dorsal margin convex and ventral margin concave to its rounded apex. Subgenital plate deeply and roundly V-emarginate, surface deeply medio-longitudinally concave; lateral apices truncate, a moderately large socketed simple style at each lateral external margin. Caudal femora very stout proximad.

Female

Very similar to male except as follows: pronotum with metanotal portion very faintly ascending caudad. Tegmina moderately tapering and not covering apex of abdomen, mediastine vein much shorter, irregular; decidedly fewer, irregular, costal veins. Ovipositor falcate, broadest proximad, moderately recurved to the acute apex, margins unarmed. Subgenital plate with convergent sides rounding into the broadly truncate apex.

Thirty-six specimens examined—11 males, 11 females, and 14 immature individuals.

Fatuhiva: Teavaipuhiau, altitude 2150 feet, August 25, 1931, in *Paspalum conjugatum*, 7 males, 4 females, type male, allotype female, paratypes, 10 juveniles; Atipo, altitude 2100 feet, September 3, 1930, in *P. conjugatum*, 4 males, 7 females, paratypes, 1 juvenile and 3 very small juveniles.

This insect in some ways suggests *Lipotactes* Brunner, but may quickly be distinguished by many characters.⁴ The present genus is clearly a member of the Conocephalinae, while *Lipotactes* is as readily referable to the Listroscelinae. Convergence is, however, shown by a number of characters. *Fatuhivella colorata* much more definitely resembles a heavy, strikingly marked species of *Conocephalus*. The black markings on this otherwise tan-colored insect are very striking and distinctive.

Fatuhivella marmorata, new species (fig. 1, o).

Size small, form very slightly less robust than in *F. colorata*. Agrees with that species in form of fastigium, meso- and metasternal lobes, ovipositor, subgenital plate, and limb armament; differing as follows: head proportionately distinctly smaller, normal. Pronotum more elongate, more produced caudad, with metanotal portion not ascending caudad and its caudal margin very broadly convex but not truncate; lateral lobes much longer than deep, cephalic margin straight to the very broadly rounded, very obtuse-angulate ventro-cephalic angle, thence straight to the rounded ventro-caudal angle which is slightly greater than a right angle and is situated slightly cephalad of mesad; caudal margin straight with humeral sinus and convex callosity obsolete. Tegmina represented by rounded pads, projecting a distance equal to the width of one of them, rather delicate in structure with distinct venation, separated by an interval equal to about one-quarter the width of one of them. Wings vestigial, distinctly shorter than tegmina. Prosternal spines elongate, distinctly better developed than in *colorata*. Caudal femora moderately enlarged proximad.

Head dull russet with occiput (but not fastigium) darker. Antennae mummy brown with irregular small annuli of ochraceous buff. Pronotum with disk russet, with traces of buffy separating it from the deep Mars brown lateral lobes. Abdomen laterad Mars brown, dorsad paling to tawny olive flecked with Mars brown. Tegmina tawny olive

⁴Hebard, Morgan, Studies in Malayan, Melanesian and Australian Tettigoniidae (Orthoptera): Acad. Nat. Sci. Phila., Proc., vol. 74, p. 267, 1922.

with humeral trunk proximad, and a rounded suffusion proximad on sutural margin Mars brown. Ovipositor chestnut proximad, hazel distad. Limbs tawny olive very heavily overlaid, flecked and mottled with Mars brown. All of these markings are so fine and so vague in outline that the general appearance of the insect is dull, with marmoration conspicuous only under the microscope.

Length of body, 11.2 mm.; length of pronotum, 4.8 mm.; exposed length of tegmen, 1.8 mm.; length of caudal femur, 11 mm.; length of ovipositor, 6 mm.

Fatuhiva: ridge east of Omoa [Oomoa] Valley, altitude 3000 feet, August 28, 1930, type female, LeBronnec.

The unique female type is readily separated from that sex of *F. colorata* by its obscure marmorate coloration and annulate antennae as well as by the important structural features here given, particularly in the generic discussion.

Genus NUKUHIVELLA, new genus

The monotypic species, *N. agraeioides*, is clearly a highly aberrant member of the Conocephalinae, showing in some features an even higher specialization of the characters which distinguish *Fatuhivella marmorata* from *F. colorata*. The vertex and features of limb armament prove that it is a conocephalid, though the great production of the pronotum caudad was hitherto not known for this subfamily, but found in the related Agraeciinae, Listrosclinae, and Decticinae.

Agreement with *Fatuhivella* is shown in size, fastigium, unarmed genicular lobes of all femora and unarmed ventral margins of cephalic and median femora, foramina and armament of cephalic tibiae, bispinose prosternum, ovipositor and subgenital plate. Parallelism is also shown in some of the most striking features of the highly specialized male genitalia.

Distinctive generic features are the male pronotum strongly produced caudad to cover the entire stridulating field of the tegmina, tectate position of the tegmina when at rest, metasternum only slightly less strongly rounded acute-angulate produced than mesosternum, male ultimate tergite greatly produced on each side above the unusually specialized cerci (which rather suggest those of certain species of the Copiphorinae than of any previously known form of the Conocephalinae), male subgenital plate little emarginate between the simple socketed styles, dorsal surface of cephalic tibiae flattened between the very weakly and roundly elevated lateral margins, very finely serrulate ventral margins of the caudal femora, very finely and closely serrulate ventro-external margin of the caudal tibiae (an exceedingly remarkable feature).

Nukuhivella agraeioides, new species (fig. 1, *p*, *q*).

General coloration clay color, generally flecked with slightly darker (tawny olive) on body and more heavily flecked and annulate with much darker (mummy brown) on limbs. Antennae clay color with frequent irregular minute annuli of tawny olive.

Lateral lobes of pronotum with dorsal portions narrowly (but solidly in metazonal portion) marked with mummy brown, defining them from disk. Tegmina clay color, with proximal portions and venation tinged with brown.

Length of body, 11.7 mm.; length of pronotum, 6 mm.; exposed lateral length of tegmen, 6.8 mm.; length of caudal femur, 11.2 mm.; width of caudal femur, 3 mm.

Male

In addition to the generic characters given, the following are shown. Head normal, much as in *Fatuhivella marmorata*. Fastigium very slender, evenly convex dorsad, about one-fourth as wide as the large proximal antennal joint, its sides very faintly convex to the facial suture, slightly over three times as deep as wide. Pronotum with metanotal portion not ascending caudad, greatly produced caudad with apex convex and entirely concealing tegminal stridulating field; lateral lobes over twice as long as deep, cephalic very faintly convex, almost straight to the broadly rounded obtuse-angulate ventro-cephalic angle, thence broadly concave to the rectangulate rather sharply rounded ventro-caudal angle which is situated mesad, caudal margin faintly convex then very broadly concave, convex callosity obsolete. Tegmina rather delicate, tapering moderately distad to the rounded apices and briefly surpassing the cerci, almost vertical with dorsal margins narrowly curled inward and adjacent; venation prominent, position of veins much as in *F. colorata* but with oblique cross-veinlets more regular from ulnar vein to sutural margin and much fewer (12) similar costal veins. Wings reaching almost as far as tegmina. Ultimate tergite of same general type as in *F. colorata*, distal margin broadly obtuse-angulate and narrowly deflexed, mesad briefly cleft with lateral angles thus formed rounded; laterad produced to just before specialized apices of cerci in fingers which are broader proximad than in *F. colorata* but are narrower distad, strongly concave ventrad to embrace shaft of cerci to their rather narrowly rounded apices. Supra-anal plate vertical, triangular, with rounded apex and sulcation of surface weak. Cercus short, straight, distad suddenly directed slightly inward and dorso-cephalad and terminating in two processes, the dorsal of these lamellate with its ventral margin more convex than its dorsal margin, and the whole like a large curved spine, the ventral of these processes a stout spine of equal length, each of these furnished ventrad near its base with a minute but decided tubercle; angulation formed by ventral and distal margins of cercal shaft rounded at distinctly less than 90 degrees. Subgenital plate produced, ample, very delicate, convex; distal margin very broadly concave between the rather elongate simple-socketed styles. Prosternal spines elongate, even longer than in *F. marmorata*. Caudal femora even heavier than in *F. colorata*, but with proximal enlarged portion subsiding less suddenly.

Nukuhiva: Tapuaooa, altitude 3100 feet, November 11, 1929, type male, Mumford and Adamson.

Three immature females taken at Ooumu, Nukuhiva, altitude 3200 feet, May 28, 1931, and 4050 feet, November 12, 1929, show that the cephalic tibiae are similar dorsad and the pronotum is greatly produced caudad. The ovipositor is much as in *F. marmorata*, the coloration as dark in two and only slightly paler in one and very similar to that species. The caudal femora ventrad and caudal tibiae dorsad are unarmed, indicating that the minute teeth there found in the male type either appear only in adults or are developed only in the male sex of this extraordinary species, unless these immatures represent a distinct species, which we believe is improbable.

This light brown, not strikingly marked insect, represents one of the most distinctive new species we have ever encountered. Though a conocephalid,

the form of the pronotum, contour of dorsal surfaces of the cephalic tibiae, and thickly serrulate ventro-external margins of the caudal tibiae constitute features of very unusual specialization.

LISTROCELINAE

Xiphidiopsis lita Hebard.

Nukuhiva: Tovii [Toovii], altitude 2500 feet, August 4, 1931, 1 female, 9 juvenile females.

Tahuata: Hanamenino Valley, altitude sea level to 30 feet, July 17, 1930, 1 female, 1 juvenile female and 1 juvenile, possibly a male; Vaitahu Valley, altitude 90 feet, June 2, 1930, on cotton, *Gossypium* species, 1 juvenile female.

Of the thirty-six specimens of this species we have seen from Hawaii, the Marquesas and Tahiti, all, except possibly one, are females. The species is evidently parthenogenetic throughout Oceania as Swezey⁵ has shown it to be in Hawaii.

It is probable that, though the genus is very large, this is the only species of *Xiphidiopsis* which occurs in Oceania.

Phisis marquesana, new species.

General coloration very light green. Males with node in anal field of tegmina usually purplish pink, other veins in stridulating area and narrow margin for a brief distance caudad very pale brown. Ovipositor buffy with margins, suture and apex, Prout's brown.

The series shows little size variation. Length of body, male 16.5 mm., female 15.4 mm.; length of pronotum, male 3.8 mm., female 3.8 mm.; greatest width of pronotum, male 2.7 mm., female 2.7 mm.; length of tegmen, male 24.7 mm., female 25.3 mm.; greatest (meso-distal) width of tegmen, male 2.8 mm., female 2.9 mm.; length of longest cephalic tibial spine, male 2 mm., female 2 mm.; length of cephalic femur, male 6.8 mm., female 7 mm.; length of caudal femur, male 12.2 mm., female 12.8 mm.; length of ovipositor, 10.7 (paratype 10.4) mm.

Male

Size medium, form slender, normal for the genus. Vertex very slender, feebly ascendant to the sharply rounded apex, medio-longitudinally finely sulcate. Palpi very elongate, last joint decidedly longer than fourth, very weakly sigmoid, moderately enlarged in distal two-fifths with dorsal surface concave in distal third. Pronotum with disk showing distinct sulci, briefly produced metanotum ascending caudad with cingulate caudal margin very broadly rounded obtuse-angulate emarginate, lateral lobes elongate, ventro-cephalic angle more sharply rounded than ventro-caudal angle, humeral sinus weak but distinct. Tegmina and wings fully developed, the former with a moderate convexity in anal field, stridulating veins well developed. Prosternum bispinose, mesosternum binodose, metasternum with rounded angles moderately projecting latero-cephalad. Cerci elongate, slender, curving broadly with apices overlapping, proximal section moderately thickened without an internal spine, other portions cylindrical. Ultimate

⁵ Swezey, O. H., Parthenogenesis in a Phasgonurid, *Xiphidiopsis lita*, in Hawaii: Haw. Ent. Soc., Proc., vol. 7, p. 279, 1929.

tergite bilobate, fusing with supra-anal plate which is large, lamellate and horizontally produced, its sides distinctly divergent to the small rounded disto-lateral projections, the broad distal margin between weakly and broadly bilobate. Vertical plates on each side of supra-anal plate terminating ventro-mesad in a flattened finger directed ventrad and a similar finger of half its size just before it which is also directed ventrad. Subgenital plate large, the lateral margins convex, then briefly concave before short latero-caudal projections, the latter each surmounted by a small socketed style; distal margin broadly angulato-concave between these. Cephalic coxae with a minute dorsal spine. Median trochanters unarmed. Femoral genicular lobes with a single acute production. Cephalic femora with four internal and five external elongate and moderately curved ventral spines. Median femora with three smaller ventro-external and one or two much smaller ventro-internal spines, the latter followed, as in *P. pallida*, by very minute denticles. Caudal femora with very small ventral spines (two to five internal, seven to eleven external). Cephalic tibiae with auditory foramina inflated conchate, the large oval openings situated ventro-cephalad; armed ventrad with seven pairs of very elongate slender moderately curved spines which decrease in length distad and a pair of minute apical spines. Median tibiae unarmed dorsad, ventrad armed with the same number of much smaller spines. Caudal tibiae armed with numerous very small dorsal and less numerous larger ventral spines, and three pairs of small distal spurs.

Female

Agrees closely with type, differing as follows: pronotal metazona less ascendant caudad with caudal margin showing even less emargination, humeral sinus very weak. Ovipositor moderately elongate, curved moderately dorsad, slightly widest meso-distad, margins very finely serrulate distad to the acute apex. Subgenital plate moderately elongate, lateral margins concave convergent to the truncate apex in allotype, but paratypes show shallow emargination, much as in the larger Moluccan species recorded by us as *pectinata* in 1922,⁶ described as *P. hebardi* by Karny in 1931.

Fourteen specimens examined—5 males, 2 females, and 7 immature individuals.

Eiao: altitude 20 to 50 feet, April 24, 1931 (one male at light), 2 males, paratypes.

Nukuhiva: Muake, altitude 2500 feet, August 3, 1931, on *Metrosideros collina*, 1 large juvenile male.

Uahuka: Hane Valley, altitude 30 feet, at light, February 23, 1931, type male, altitude 150 feet, March 15, 1931, at light, allotype female, LeBronnec and Tauraa; Vaipae Valley, sea level, March 18, 1931, female at light, 1 female, paratype, 1 juvenile female.

Tahuata: Amatea, altitude 2000 feet, July 7, 1930, 1 male, paratype; Vaitahu Valley, sea shore, July 5, 1930, 1 male, paratype, 1 juvenile male; Hanateio Valley, altitude 1650 feet, July 25, 1930, 1 large juvenile male, 2 small juveniles; Hanamenino Valley, sea level, July 17, 1930, 1 juvenile female.

This species is extremely close to *P. pallida* (Walker), differing in that the male cerci lacks a proximo-internal tooth, the male supra-anal plate expands more decidedly distad with latero-caudal angles roundly projecting and distal margin broadly bilobate, in that the vertical adjacent plates ter-

⁶ Hebard, Morgan, Studies in Malayan, Melanesian and Australian Tettigoniidae (Orthoptera): Acad. Nat. Sci. Phila., Proc., vol. 74, p. 266, 1922.

minate ventro-cephalad in two large tooth-like projections, and the female subgenital plate has the apex not broad but definitely concave-truncate.

Chopard in 1929 figured and distinguished *P. pallida* from *P. pectinata*. The former species is known from Samoa and Vavau Island just north of Tonga. It appears very probable that *pallida* also occurs in Fiji. Redtenbacher's *rapax* may be a synonym, though if that is the case, an error in counting the spines of the cephalic femora apparently occurred, as in all but that specimen (including Caudell's Fijian specimens recorded as *rapax*) the count is five external and four internal spines.

GRYLLIDAE

GRYLLINAE

Gryllus oceanicus LeGuillou.

Eiao: altitude 1200 feet, October 1, 1929, 6 juveniles, 1800 feet, April 22, 1931, 3 males, 2 females; above Vaituha, altitude 1200 feet, at light, October 3, 1929, 1 juvenile.

Nukuhiva: Taiohae, November 26, 1929, 2 males, 6 females.

Uahuka; Hanatea Valley, altitude 100 feet, March 3 and 11, 1931, 9 males, 8 females, 14 juveniles; Penau Ridge, altitude 1600 feet, February 26, 1931, 3 males, 8 juveniles; Teivipuhipuhi, Vaikivi Valley, altitude 1250 feet, March 6, 1931, 2 juveniles; Hanahoua Valley, altitude 150 feet, March 10, 1931, 1 female; Matukuoha, Hane Valley, February 26, 1931, 1 juvenile; Vaitiake, altitude 1000 feet, March 24, 1931, 1 male, 2 females; Teuaei, altitude 350 feet, March 19, 1931, 1 male, 1 female; Hanatea Valley, altitude 100 feet, March 2, 1931, under stone, 1 teneral female; Hane Valley, altitude 150 feet, March 15, 1931, 1 male.

Uapou: Ouhaupakea, altitude 500 feet, December 17, 1929, 1 male, 2 females; Hapava, altitude 500 feet, December 13, 1929, 1 male, 2 females.

Hivaoa: Atuona, sea level, July 12, 1929, 9 males, 6 females, 1 juvenile; Vaitumata, sea level, July 12, 1929, 4 males, 5 females, 1 juvenile; Mount Tapeata, altitude 2500 feet, May 25, 1929, 1 juvenile.

Tahuata: Vaitahu Valley, sea shore, June 10 to 12, 1930, 9 males, 11 females, 19 juveniles; Hanatetena Valley, altitude 350 feet, July 28, 1930, 1 male, 1 female, 1 juvenile.

Mohotani: altitude 1400 feet, February 1 and 2, 1931, 2 males, 2 females.

Fatuhiva: Teatapu, altitude 1400 feet, August 19, 1930, 3 males, 1 female, 4 juveniles.

This common species, for which the type locality is the island of Nukuhiva, is very widespread in Oceania and is also known from Japan and Malaysia.

Grylloides sigillatus (Walker).

Fatuhiva: altitude 860 feet, November 19, 1930, on *Morinda citrifolia*, 4 juveniles.

Uahuka: Teuaei, altitude 350 feet, March 19, 1931, 3 males.

Uapou: Ouhaupakea, altitude 500 feet, December 17, 1929, under horse manure, 1 male; Hapava, altitude 500 feet, December 13, 1929, 3 males, 7 juveniles.

Hatutu [Hatutaa]: altitude 700 feet, June 28, 1931, under stones, 3 males, 7 females, 2 juveniles.

Tahuata: Vaitahu Valley, July 12, 1930, sea shore, 1 female.

Mohotani: altitude 200 feet, February 4, 1931, 2 males, 3 females, 1 juvenile.

This series is very strikingly intensive in coloration when compared with material before us from the West Indies, Mexico, Costa Rica, Panama, and India. In fact only a few specimens are as weakly marked as these in the darkest individuals of that large series.

In most Marquesan material the general coloration is very dark, the pronotum with pale markings obliterated except for a narrow meso-caudal transverse band which, in a few of the darkest specimens, is almost obliterated. We noted color intensification in a Hawaiian adult and this condition appears to be much more decided in Oceania than elsewhere in the very wide distribution of the species. The present series also averages small for the species.

This insect has probably been distributed by commerce. It is also known from French Guiana, Nossi Bé, Mauritius, and Australia.

TRIGONIDIINAE

Genus METIOCHE Stål

A large series of the genotype, *M. vittaticollis* (Stål) from the Philippines, in the author's collection, shows that individuals with caudate tegmina and wings or with caudate tegmina alone have the tegmina delicate and not coriaceous and the cephalic tibiae with auditory foramina present on both faces, but individuals with abbreviate tegmina and no wings have the tegmina more convex, moderately coriaceous, and the cephalic tibiae without auditory foramina.

As a result, our *Litogryllus*,⁷ described in 1926, with genotype *flavipes* (Saussure) falls as a synonym, as has been indicated by Chopard.⁸ We do

⁷ Hebard, Morgan, Dermaptera and Orthoptera: B. P. Bishop Mus., Bull. 31, p. 86, 1926.

⁸ Chopard, L., Results of Dr. E. Mjöberg's Swedish Scientific Expeditions to Australia, 1910-1913: Arkiv. zool. 18A, no. 6, p. 32, 1925.

Chopard, L., Orthoptera: Ins. of Samoa, pt. 1, fasc. 2, p. 39, 1929.

not agree, however, with Chopard that names can here be used with propriety for either macropterous or micropterous conditions or for color phases. Moreover we do not believe that *flavipes* can be considered conspecific with *vittaticollis*, though it is undoubtedly closely related and both species show very great individual variation.

From Philippine material of *Rhincogryllus fascipes* Chopard, described in 1925, we are further able to state that we believe that monotypic genus to be distinct from *Metioche*, though *Trigonidium tahitense* Saussure is referable to *Metioche* and not to *Rhincogryllus* as was indicated by Chopard in 1930. Though the tegminal veins in *tahitensis* are normally much heavier than in *flavipes*, these species are uncomfortably close in agreement in all but size and length of ovipositor, and possibly do not share certain of the many color phases developed.

Metioche tahitensis (Saussure).

Were the species of this genus not known to be so exceedingly variable, the six specimens here recorded might easily have been thought to represent three distinct species, differing as follows:

A. Head, proximal antennal joints, pronotum, tegmina, and abdomen black. Ocellar region of the head and in one specimen sides of pronotal disk dull deep purplish. Lateral lobes of pronotum with very narrow buffy ventral margins. Dorsal veins of tegmina heavy and bright yellow. Antennae and limbs testaceous.

B. Similar but proximal antennal joints testaceous. Sides of pronotal disk broadly testaceous with a purplish tinge. Lateral lobes of pronotum with broadly buff ventral margins. Tegmina buffy but infumate, with dorsal veins delicate and buffy.

C. Testaceous with head and pronotum fawn color. Dorsal veins of tegmina heavy.

Hivaoa: Kopaafaa, altitude 2770 feet, August 2, 1929, 1 female (A); Matauuna, altitude 3760 feet, August 1, 1929, 1 male, 3 females (male A, 2 females B, 1 female C); Mounaofefe, altitude 2000 feet, August 3, 1929, on *Premna tahitensis*, 1 female (A).

This species is known only from Tahiti and the Marquesas.

We distinguish this insect from *flavipes* by its larger size, longer and less decidedly curved ovipositor, and usually heavier and more evenly longitudinal dorsal tegminal veins.

Metioche flavipes (Saussure).

Eiao: altitude 1600 and 1800 feet, April 22 and 24, 1931, on *Sida* species, 11 males, 5 females, 3 juveniles (generally buffy, head with a blackish band from interantennal protuberance to clypeal suture and one on each side from eye to clypeal suture, pronotum sometimes with two broad adjacent bands of brown on disk and a brown band on lateral lobes, tegmina often darkened with veins pale); Vaituha, 1200 feet, October 3, 1929, at light, 1 male, 1 female, very similar.

Hatutu [Hatutaa]: altitude 700 to 1500 feet, September 30, 1929, and

April 28, 1931, one on *Ageratum conyzoides*, 4 males, 4 females, very similar, two on *Canthium barbatum*.

Uahuka: Putataua, Vaipae Valley, altitude 880 feet, September 20, 1929, 1 male, 1 female (head without markings, female buff, head and pronotum purplish, male head and pronotum darker, tegmina blackish with buff veins); Hitikau Ridge, altitude 2700 feet, March 3, 1931, 1 male, 2 females (much like last male, one female with limbs purplish).

Hivaoa: Tahauku, July 10, 1929, 2 males, 1 female (pair buff, one male darker, all with occiput and pronotum marked with brown, face immaculate).

Tahuata: Amatea, altitude 2700 feet, July 7, 1930, on *Weinmannia* species, 1 female (black, antennae beyond second joint, palpi and limbs alone buff).

Fatuhiva: Teaveipuhiau, altitude 2150 feet, August 25, 1930, on *Paspalum conjugatum*, 2 males, 1 female (one male with face, proximal antennal joints, pronotal lateral lobes and tegminal lateral fields black, occiput purplish brown, disk of pronotum same with pale lateral margins, dorsal fields of tegmina brown with slightly paler veins, antennae palpi and limbs buffy, the caudal femora with a medio-longitudinal suffusion of brown in proximal portion; pair similar but less recessive, face marked as in Eiao series, pale lateral margins of pronotal disk very broad, dorsal fields of tegmina buffy, female with longitudinal suffusion of caudal femora broad and percurrent); Vairoko, Omoa [Oomoa] Valley, altitude 1500 to 1600 feet, August 29 and 30, 1930, 1 male, 1 female (male teneral, uniform pale buff, female much like recessive Teavaipuhiau male, but disk of pronotum without pale lateral margins and tegminal veins all dark).

MOGOPLISTINAE

Genus CYCLOPTILUM Scudder

Material representing a fully sufficient series of species referable to *Cycloptilum* proves that degree of curvature of the caudal margin of the male pronotum can not be used as a generic character. Chopard distinguished *Liphoplus* Saussure, described in 1877, from *Cycloptilum* Scudder, described in 1869, by that character alone.⁹ We can find no other characters by which these genera can be separated, and therefore place *Liphoplus* in the present synonymy.

Cycloptilum novarae (Saussure).

Nukuhiva: Vaiotekea, altitude 2200 feet, August 6, 1931, from *Metrosideros collina*, 1 very small juvenile.

Uahuka: Putataua, Vaipae Valley, altitude 880 feet, September 20,

⁹ Chopard, L., Orthoptera: Ins. of Samoa, pt. 1, fasc. 2, p. 35, 1929.

1929, 1 very small juvenile; Vaikivi Valley, altitude 1300 feet, March 6, 1931, 1 juvenile male; Teivipuhipuhi, Vaikivi Valley, altitude 1250 feet, March 6, 1931, 1 very small juvenile; Tauheeputa, altitude 1770 feet, March 23, 1931, on *Glochidion ramiflorum*, 2 very small juveniles; Vaitiake, altitude 1000 feet, March 24, 1931, 1 juvenile male, 1 very small juvenile.

Uapou: Hakahetau Valley, altitude 500 feet, December 27, 1928, 5 very small juveniles.

Hivaoa: Teava Uhia i te Kohu, altitude 2100 feet, February 15, 1930, on *Paspalum conjugatum*, 1 male.

Tahuata: Tehue Valley, altitude 800 feet, May 27, 1930, 1 juvenile male, 1 very small juvenile; Hanatuuna Valley, altitude 325 feet, July 19, 1930, 1 small juvenile; Faanui, altitude 1500 feet, June 12, 1930, 1 juvenile female; Vaitahu, altitude 90 feet, June 2, 1930, on cotton, *Gossypium* species, 1 male.

Fatuhiva: Vaikoao, Omoa [Oomoa] Valley, altitude 1600 feet, August 27, 1930, 1 female, 1 juvenile female; Teaotu, Hanavave Valley, altitude 700 feet, September 9, 1930, on *Eugenia* species, 2 very small juveniles; Tevaitapu Valley, altitude 300 feet, August 23, 1930, 1 very small juvenile; Uia [Ouia] Valley, altitude 100 feet, September 1 and 2, 1930, 2 females, 5 small juveniles; Otomahe, Omoa [Oomoa] Valley, altitude 280 feet, August 20, 1930, from *P. conjugatum*, 1 juvenile female; Punahitahi, Omoa [Oomoa] Valley, altitude 650 feet, August 18, 1930, 1 juvenile female, 2 very small juveniles; Tetana, Omoa [Oomoa] Valley, altitude 500 feet, August 22, 1930, 1 juvenile male, 1 juvenile female, 6 very small juveniles.

Mohotani: above Anaoo, August 13, 1929, 1 male, 2 very small juveniles.

This species is also known from Tahiti, Samoa, Tonga, and Fiji and is apparently peculiar to Oceania.

BIBLIOGRAPHY

1. BORELLI, ALFREDO, Dermaptera: Insects of Samoa, pt. 1, fasc. 1, pp. 1-8, 1928.
2. BORMANS, AUGUSTE DE, Faune Orthoptérologique des îles Hawai ou Sandwich: Mus. Genova, Ann., 18, pp. 438-448, 1882.
3. BRUNER, LAURENCE, Notes on the Orthopteroid Insects of the Fiji Islands: Haw. Ent. Soc. Proc., 3, pp. 148-168, 1916.
4. BRUNNER VON WATTENWYL, CARL, On the Orthoptera of the Sandwich Islands: Zool. Soc. London, Proc., pp. 891-897, 1895.
5. BRYAN, E. H., JR., Orthoptera, Blattidae; Hebard, Morgan, Dermaptera and Orthoptera: B. P. Bishop Museum, Bull. 31, pp. 82-89, 1926.
6. CAUDELL, A. N., Report on Orthopteroid Insects of Fiji and New Zealand: Univ. Iowa, Studies in Nat. Hist., 12, Fiji portion, pp. 3-16, 1927.
7. CAUDELL, A. N., Insects of the Order Orthoptera of the Pinchot Expedition of 1929, Marquesas Islands: U. S. Nat. Mus., Proc., 80, art. 21, pp. 5-7, 1932.
8. CHEESMAN, L. E., A Contribution toward the Insect Fauna of French Oceania. Dermaptera: Ann. Mag. Nat. Hist., 10th ser., vol. 1, pp. 169-170, 1928. (Perkins in part).
9. CHOPARD, L., Orthoptera: Insects of Samoa, pt. 1, fasc. 2, pp. 9-58, 1929.
10. CHOPARD, L., On a small collection of Blattidae and Gryllidae from Tahiti: Ann. Mag. Nat. Hist., 10th ser., vol. 6, pp. 381-382, 1930.
11. HEBARD, MORGAN, Dermaptera and Orthoptera of Hawaii: B. P. Bishop Mus., Occ. Papers, 7, pp. 305-378, 1922.
12. HEBARD, MORGAN, Records of Hawaiian Dermaptera and Orthoptera of the Family Gryllidae: Haw. Ent. Soc., Proc., 6, pp. 299-303, 1926.
13. HOLDHAUS, KARL, Kritisches Verzeichnis der bisher von den Samoainseln Bekannten Orthopteren: Denkschr. K. Akad. Wiss., Wien, 84, pp. 537-562, 1909.
14. LE GUILLLOU, E. J. F., Description des Orthoptères nouveaux, recueillis pendant son Voyage de Circumnavigation sur la Corvette la Zélée: Rev. Zool., pp. 292-295, 1841.
15. PERKINS, R. C. L., Orthoptera: Fauna Hawaiiensis, II, pp. 1-30, 1899.
16. PERKINS, R. C. L., Orthoptera, supplement: Fauna Hawaiiensis, II, pp. 687-690, 1910.
17. UVAROV, B. P., A new genus of Tetriginæ from Tahiti (Orthoptera, Acrididae): Ann. Mag. Nat. Hist., 9th ser., vol. 17, pp. 654-656, 1926.
18. UVAROV, B. P., Three new Acrididae from the Marquesas and Rapa Islands: Ann. Mag. Nat. Hist., 9th ser., vol. 19, pp. 557-563, 1927.
19. UVAROV, B. P., in Cheesman, Contributions toward the Insect Fauna of French Oceania, Orthoptera: Ent. Soc. London, Trans., vol. 75, pp. 150-153, 1927.
20. UVAROV, B. P., Acrididae from the Marquesas: B. P. Bishop Mus., Bull. 98, pp. 239-240, 1932.

References to the numerous revisions and monographs in which appeared the original descriptions of a large proportion of the species of Dermaptera and Orthoptera occurring in Oceania are not given.