INSECTS OF GUAM—II

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FOREWORD

"Insects of Guam—II" consists of papers completed after publication of the first volume in 1942. About 470 species and varieties are here discussed, of which 94 are described as new. The material is comprised mainly of collections made in Guam by D. T. Fullaway in 1911, and by O. H. Swezey and R. L. Usinger in 1936. Some groups have not yet been reported on, the most important being the Microlepidoptera, which includes about 75 to 80 species. It seems desirable, however, to print the manuscripts on hand now, rather than to delay until the remainder of the material has been submitted for publication.

Appreciation is hereby expressed to those who have participated in the production of this second bulletin on Guam insects.

—O. H. Swezey.

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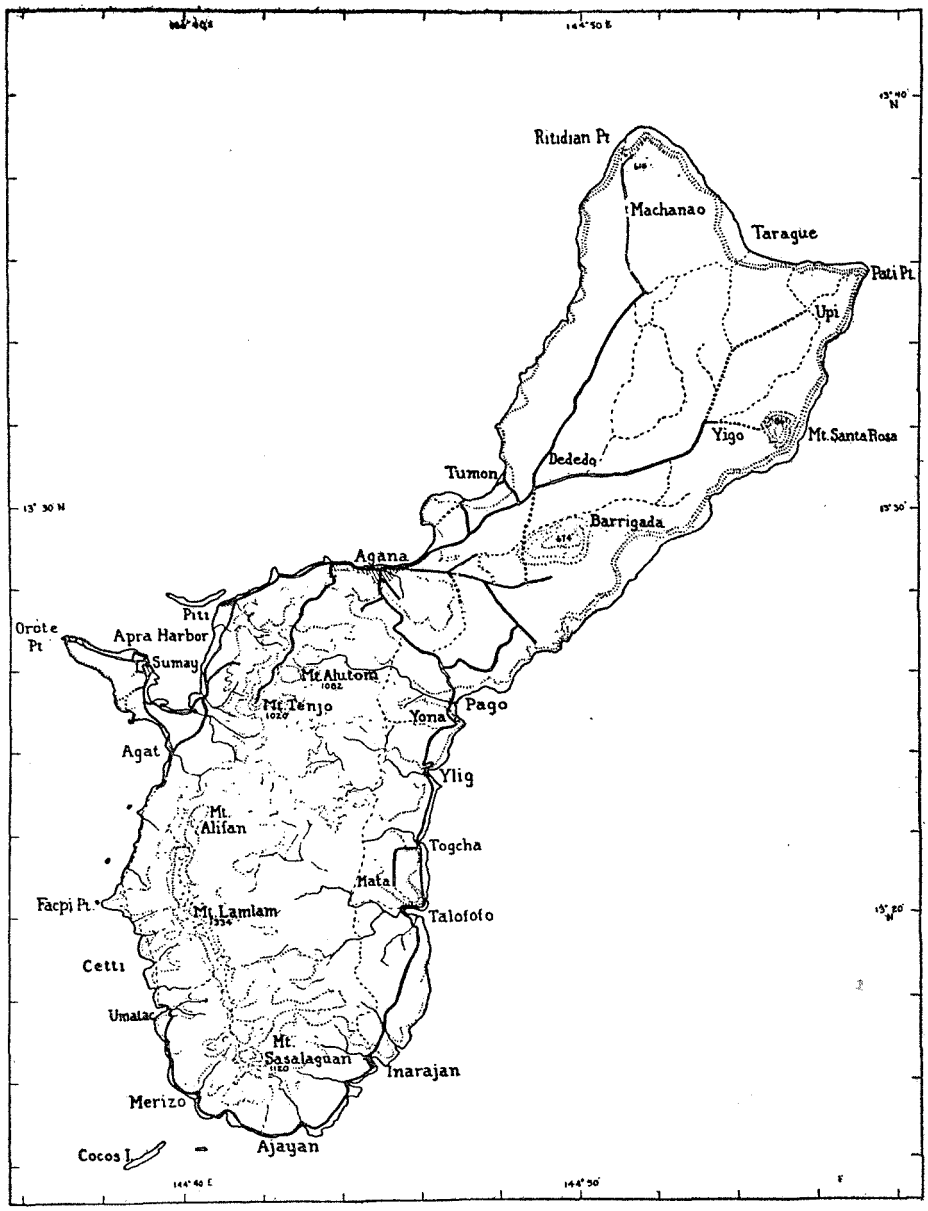

MAP OF GUAM

Guam is about 30 miles long and 4 to 8 miles wide. The portion of the island northeast of Agana, the capital, is a limestone plateau 200 to 300 feet in elevation. The docks are at Piti, and a channel 2 miles long extends to the ship anchorage in the outer part of Apra Harbor. Heavy lines on the map are automobile roads, broken lines are trails, and heavy broken lines are poor roads.

Insects of Guam—II

ORTHOPTERA AND RELATED ORDERS

ORTHOPTERA AND RELATED ORDERS OF GUAM

By O. H. Swezey
Experiment Station, Hawaiian Sugar Planters' Association, Honolulu

These orders were not strongly represented in our Guam collection of 1936, although some of the species were very abundant. Some records of collections by D. T. Fullaway in 1911 are included. Besides the few species enumerated here, about 20 species were referred to James A. G. Rehn for determination, and have not yet been reported on.

ORTHOPTERA

Family TETRIGIDAE

1. Paratettix species.

Piti, April 30, Swezey; Agana, May 3, 4, Bryan; Upi Trail, May 5, Swezey; Umatac, May 28, Usinger; Piti, May 31, Usinger; hills back of Piti, June 3, July 13, Swezey; Sumay, June 21, Swezey; Orote Peninsula, Sept. 27, Swezey; Fullaway (1284).[1]

Common in low, grassy places, often near pools.

Family ACRIDIDAE

2. Aiolopus tamulus (Fabricius).

Gryllus tamulus Fabricius, Ent. Syst., Suppl., 195, 1798.

Aiolopus tamulus, Chopard, Ins. Samoa 1(2) : 56, 1929.

Agfayan, March 28, Bryan; Ritidian Point, April 15, Bryan; Merizo, April 24, Bryan; Piti, March 28, Bryan, June 1, Usinger, May 28, July 5, Aug. 10, Oct. 14, Swezey; Umatac, May 28, Usinger; Upi Trail, May 5, Swezey; Inarajan, May 14, on rice, Swezey; Machanao, June 30, on tobacco, Swezey; Orote, July 19, Swezey; Atantano, Sept. 3, on rice seedling plot, Swezey; Merizo, Oct. 2, Swezey.

A small grasshopper which is widely distributed from India and Japan to Australia and Samoa, and now recorded in Guam for the first time. It was common to abundant everywhere in grasslands.

This species was determined by F. X. Williams.

[1] Numbers in parentheses refer to collection numbers.

3. Locusta danica (Linnaeus).

Gryllus locusta danicus Linnaeus, Syst. Nat., 12th ed., 1(2): 702, 1767.

Locusta danica, Kirby, Fauna Brit. India, Orth., 146, 1914.

Umatac, March 28, Bryan; Mt. Tenjo, April 1, Bryan; Upi Trail, May 5, Swezey; Mt. Chachao, May 16, Swezey, Usinger; Mt. Alifan, May 26, Usinger, June 27, Swezey; Inarajan, May 14, July 25, on rice, Swezey; Piti, May 28, June 13, on sugar cane, Aug. 13, Swezey; Sumay, June 15, Swezey; Dandan, July 17, Swezey; Fullaway (1287).

A medium to large grasshopper, widely distributed in the Old World. Abundant in Guam in all grasslands.

4. Valanga excavata (Stål).

Acridium excavatum Stål, Freg. Eugenies Resa, Orthoptera, 326, 1861.

Valanga excavata, Uvarov, Ann. Mag. Nat. Hist. IX, 12: 356, 1923.

Agana, May 4, Swezey; Paasan, June 15, on banyan, Swezey; Talofofo, June 17, Swezey; Merizo, June 25, on cotton, Swezey; near Atao beach, June 25, Usinger; Inarajan, July 25, on *Thespesia populnea,* Swezey; Barrigada, Aug. 28, on corn, Swezey; Orote Peninsula, Sept. 29, on *Pipturus,* Swezey; Piti, Oct. 12, on *Ipomoea* and *Glochidion,* Swezey; Fullaway (1288). The species was determined by F. X. Williams.

This large grasshopper, described from a single male from Guam, has not been recorded elsewhere. It was rather common in 1936, often occurring on trees or bushes, rather than on grass.

Family TETTIGONIIDAE

5. Euconocephalus insulanus (Redtenbacher).

Conocephalus insulanus Redtenbacher, Zool.-Bot. Ges. Wien, Verh. 41: 416, 1891.

Euconocephalus insulanus, Karny, Gen. Ins. 139: 35, 1912.

Inarajan, May 6, Usinger; Tarague, May 17, Swezey; Piti, May 19, Usinger; May 23, Swezey, Sept. 7, at light, Swezey; Mt. Alifan, May 26, Usinger; Barrigada, June 24, Usinger; Palae, Oct. 3, on sugar cane, Swezey; Fullaway (1295).

The species was described from Borneo and Singapore, and has also been recorded from the Philippines. The description gives the color as "testaceus", but that might be due to the normal green color having faded. (I cannot be sure that this is not *gracilis.*) It was not very common in Guam, occurring mostly in regions of sword grass.

6. Xiphidion longipenne (de Haan).

Locusta (*Xiphidium*) *longipennis* de Haan, Temminck, Verh. Orth., 188, 1842.

Xiphidion longipenne, Karny, Philippine Jour. Sci. **18**: 608, 1921.

Piti, April 30, ex grass, Usinger; Inarajan, May 14, on rice, Usinger; Agana, May 25, Usinger; Yigo, Nov. 8, on corn, Swezey.

This species is distributed from India and Ceylon to China and the Philippines. It was common in Guam, being somewhat of a rice pest, feeding on the rice kernels in the heads before they were ripe.

7. Salomona guamensis Hebard, Acad. Nat. Sci. Philadelphia, Proc. **74**: 232, pl. 22, fig. 1, 1922.

This large insect was described from Guam, and I know of no other records. Collected by Fullaway in 1911, one female is in the U. S. National Museum and one in Bishop Museum.

8. Phaneroptera brevis Serville, Ins. Orth., 418, 1839.

Ritidian Point, April 22, Bryan; near Agfayan, April 28, Bryan; Piti, April 30, ex grass, Swezey, May 10, Usinger, May 28, Sept. 17, Nov. 3, Swezey; Inarajan, May 14, on rice, June 8, on rice, Swezey; Orote Peninsula, Sept. 1, Swezey; Fullaway (1294).

This species is distributed from Java and Singapore to the Philippines and northern Australia. It was not previously recorded in Guam. We found it quite common and generally distributed.

Family GRYLLIDAE

9. Gryllotalpa africana Beauvois, Ins. Rec. Africa and America, 229, 1805.

This widely distributed mole cricket was not previously recorded in Guam. We saw very little of it or its work. One came to light at Piti, May 9, Usinger; Fullaway (1304). It occurs in Hawaii.

10. Gryllus conspersus Schaum, Berlin Akad., 776, 1853.

One specimen in house at Piti, May 28, Swezey. It also occurs in Hawaii.

11. Gryllus oceanicus Le Guillou, Rev. Zool., Année, 293, 1841.

Widely distributed in the Pacific and Malaya, and is found in Hawaii. Collected in Guam by Fullaway in 1911 (1303).

12. Gryllodes sigillatus (Walker).

Gryllus sigillatus Walker, Cat. Dermapt., Saltat., Blatt., Suppl., Brit. Mus., 46, 1869.

Gryllodes sigillatus, Kirby, Syn. Cat. Orth., 42, 1906.

Piti, July 7, 11, Aug. 10, Sept. 9, Oct. 14, Swezey. Occurs in Hawaii.

This widely distributed cricket was abundant under rubbish and was also taken in the house at Piti.

BLATTARIA

FAMILY BLATTIDAE

Nine species of roaches are listed here, eight of which occur also in Hawaii.

1. **Supella supellectilium** (Serville).

Blatta supellectilium Serville, Ins. Orth., 114, 1839.
Supella supellectilium, Shelford, Ent. Mo. Mag. 2(22) : 155, 1911.

One male specimen of this cosmopolitan house roach was taken in the house at Piti, Nov. 9, Swezey. Occurs in Hawaii.

2. **Graptoblatta notulata** (Stål).

Blatta notulata Stål, Freg. Eugenies Resa, Ins., 308, 1860.
Graptoblatta notulata, Hebard, B. P. Bishop Mus., Bull. **114**: 117, 1935.

Piti, April 30, on *Hibiscus tiliaceus,* Swezey; Piti, July 9, in house, Swezey; Dededo, Aug. 11, in corn field, Swezey.

Widely distributed in the Pacific and Malaya. Occurs in Hawaii.

3. **Lupparia adimonialis** Walker, Cat. Blattidae, Brit. Mus., 66, 1868.

Talofofo plateau, June 18, Usinger; Piti, July 18, on pumpkin vine, Swezey; Piti, Aug. 13, 21, 31, in house, Swezey; Piti, Sept. 6, in house, Oct. 19, Swezey.

This little roach was described from the Philippines, and I have found no other record.

4. **Blattella germanica** (Linnaeus).

Blatta germanica Linnaeus, Syst. Nat., 12th ed., **1**: 668, 1767.
Blattella germanica, Hebard, B. P. Bishop Mus., Occ. Papers 7(14) : 330, 1922.

Merizo, June 11, in cornfield, Swezey; Mt. Alifan, June 27, on corn, Swezey; Piti, July 18, on pumpkin vine, Swezey; Yona, Nov. 18, in cornfield, Swezey; Fullaway (8001).

This cosmopolitan roach is also found in Hawaii.

5. **Symploce hospes** (Perkins).

Phyllodromia hospes Perkins, Fauna Hawaiiensis 2(1) : 5, 1899.
Symploce hospes, Hebard, B. P. Bishop Mus., Occ. Papers 7(14) : 330, 1922.

Collected in Guam by Fullaway in 1911 (1280). Occurs in Hawaii.

6. **Cutilia soror** (Brunner).

Polyzosteria soror Brunner, Nouv. Syst. Blatt., 219, 1865.
Cutilia soror, Hebard, B. P. Bishop Mus., Occ. Papers 7(14) : 333, 1922.

Collected in Guam by Fullaway in 1911. Occurs in Hawaii.

7. Neostylopyga rhombifolia (Stoll).

Blatta rhombifolia Stoll, Spectres Blatt., 5, pl. 3, fig. 13, 1813.

Neostylopyga rhombifolia, Hebard, B. P. Bishop Mus., Occ. Papers 7(14): 333, 1922.

A single specimen of this large wingless roach was taken in the kitchen at Piti, Nov. 22, Swezey; Fullaway (1219). Occurs in Hawaii.

8. Periplaneta americana (Linnaeus).

Blatta americana Linnaeus, Syst. Nat., 10th ed., 424, 1758.

Periplaneta americana, Burmeister, Handb. Ent. 2: 503, 1838.

The American roach was a pest in our house at Piti. We saved only four specimens: May 7, July 5 and 11; Fullaway (1218). Occurs in Hawaii.

9. Pycnoscelus surinamensis (Linnaeus).

Blatta surinamensis Linnaeus, Syst. Nat., 12th ed., 1: 687, 1767.

Pycnoscelus surinamensis, Chopard, Ins. Samoa 1(2): 20, 1929.

Ritidian Point, April 22, Bryan; Umatac, May 14, Swezey; Agat, May 31, under bark, Usinger; Fadian, Aug. 19, Swezey; Piti, July 19 and Oct. 18, at light, Swezey. Occurs in Hawaii.

The Surinam roach was common, but we saved only a few specimens.

PHASMIDA

Family PHASMIDAE

1. Acanthograeffea denticulata (Redtenbacher).

Graeffea denticulata Redtenbacher, Die Insektenfamilie der Phasmidae, 371, 1908.

Acanthograeffea denticulata, Günther, Zool. Mus. Berlin, Mitt. 17: 776, fig. 1, 1931.

Talofofo, April 1, Bryan; Piti, May 3, Usinger; Inarajan, May 7, on coconut, Bryan; Inarajan, June 8, on *Pandanus,* Swezey; Machanao, June 30, on *Pandanus,* Swezey.

This large walking-stick was described from Saipan, Marianas Islands, and I know of no other records. Fullaway reported it on coconut leaves in 1911 (1293) without name (merely "phasmid"). We saw coconut trees with ragged leaves, said to have been caused by the feeding of this insect when abundant. However, we found only an occasional specimen, and no significant injury being done. Some of the specimens that we collected were on *Pandanus* leaves.

DERMAPTERA

Family LABIDURIDAE

1. Euborellia annulipes (Lucas).

Forficesila annulipes Lucas, Soc. ent. France, Ann. 2(5) : 84, 1847.

Euborellia annulipes, Hebard, B. P. Bishop Mus., Occ. Papers 7(14) : 312, 1922.

Collected in Guam by Fullaway in 1911 (4001). Occurs in Hawaii.

Family LABIIDAE

2. Labia curvicauda (Motschulsky).

Forficesila curvicauda Motschulsky, Soc. Nat. Moscou, Bull. 36(3) : 2, pl. 2, fig. 1, 1863.

Labia curvicauda, Dohrn, Stett. Ent. Zeitung 25 : 428, 1864.

Upi Trail, May 5, Usinger; Mt. Alifan, May 26, ex papaya log, Usinger; Asan, Aug. 22, in rotten breadfruit on the ground, Swezey; Piti, Sept. 9, under bark, Sept. 21, in cow dung, Swezey; Yigo, Nov. 13, in rotten banana stem, Swezey.

Described from Ceylon, and widely distributed in the tropics. Occurs in Hawaii.

3. Chelisoches morio (Fabricius).

Forficula morio Fabricius, Syst. Ent., 270, 1775.

Chelisoches morio, Borm., Tierreich, Forf., 85, 1900.

Agana, May 4, ex *Pandanus* log, Usinger; Yona, May 12, Usinger; Machanao, June 4, 30, under bark, Swezey; Piti, July 20, in house, Swezey; Agana, Oct. 3, on royal palm, Swezey; Piti, Oct. 12, at light, Swezey; Yigo, Oct. 21, in dead coconut petiole, Swezey; Yigo, Nov. 8, on corn, Swezey; Fullaway (1290).

This large black earwig is widely distributed in the Pacific and to India. It occurs in Hawaii.

ISOPTERA

ISOPTERA OF GUAM

By S. F. Light
University of California

Not much termite material was collected in the 1936 insect survey of Guam. Three species were represented, and one other species is here listed which was reported from "Marianen", no island specified, so it is not known whether it was from Guam.

1. **Cryptotermes hermsi** Kirby, Univ. Calif. Pub. Zool. **26**: 437, fig., 1925.
   Piti, Oct. 27, in dead bamboo stub, Swezey.

   Described from Fanning Island. Recorded by Light from Washington Island, Marquesas, Tahiti, Austral Islands, Oeno Island, and Flint Island. Not previously recorded from Guam.

2. **Neotermes connexus** Snyder, U. S. Nat. Mus., Proc. **61**(20): 9, figs. 3, 4, 1922.

   Agana Swamp, May 4 and 25, ex *Pandanus* log, Swezey; Upi Trail, May 5, ex *Hibiscus tiliaceus* log, Swezey; Yigo, Oct. 18, ex log of fertile breadfruit, Swezey.

   Described from the Hawaiian Islands. It belongs in a series which is badly in need of revision, and probably includes *N. papua* Desneux, *N. rainbowi* Hill, *N. sanctae-crucis* Snyder, and *N. kanehirae* Oshima. Not previously recorded from Guam.

3. **Prorhinotermes inopinatus** Silvestri (?), Die Fauna Sudwest-Australiens, Isoptera **2**(17): 287, 1909.

   Yigo, Oct. 18, ex log of fertile breadfruit, Swezey.

   Specimens agree well with *P. inopinatus* Silvestri from Samoa, but whether this is the same as *P. panopiensis* Oshima from the Carolines, *P. luzonicus* Light, and other species remains to be seen. It is a small species occurring in logs, only occasionally met with.

4. **Calotermes marianus** Holmgren, Ent. Mitt. **1**: 281, 1912.
   Described from "Marianen." Not collected on Guam by Swezey in 1936.

HEMIPTERA

HETEROPTERA OF GUAM

By Robert L. Usinger
University of California

INTRODUCTION

This paper deals with the heteropterous Hemiptera collected mainly by O. H. Swezey and me during an insect survey of Guam in 1936. We were preceded by E. H. Bryan, Jr., who turned over to us his insect collections of two months. Mrs. Swezey accompanied us and assisted in many ways. Thanks are due, also, to various residents of Guam, especially A. I. Cruz, and to the naval authorities at that time, all of whom made our stay enjoyable and profitable.

I collected from April 27 to July 6, and Mr. Swezey continued until November 30. Daily trips were made from our house on the Root Agricultural School grounds at Piti. Adequate roads enabled us to drive to all sections of the island, and fairly good trails made it possible to reach even the most remote areas. Field work occupied most of the daylight hours and the light of our porch attracted many insects during the evenings. Mounting of specimens was done at the end of each day or early the following morning.

HISTORY

Previous to our visit, 12 species of Heteroptera had been recorded from Guam and the neighboring Marianas Islands. The first of these, *Parealda chrysoptera,* was described by Herrich-Schaeffer in his "Die Wanzenartigen Insekten" in 1844. The three lygaeids, *Graptostethus nigriceps, Nysius pulchellus,* and *Ninus insignis,* were described next by Stål (1859) from the Eugenies Resa expedition in 1852. At the close of the century (1899) Marché evidently collected in the Marianas, for *Coleotichus breddini* Schouteden (1905), *Parealda bouvieri* Schouteden (1907) (= *chrysoptera* Herrich-Schaeffer), *Creontiades stramineus* Walker (see Poppius, Hist.-Nat. Mus. Nat. Hung., Ann. 13 : 18, 1915), and *Anisops hyperion* Kirkaldy (Wien. Ent. Zeitung 23 : 114, 1904) (= *Anisops cleopatra* Distant ?), were reported from his collection, which is apparently a part of the collection of the Paris Museum. *Creontiades* was definitely recorded from Agrigan, a small island north of Rota, but the others were simply recorded from the Marianas as a group.

Twenty-one additional species were collected by D. T. Fullaway in 1911, but only one species, *Cimex lectularius,* was actually listed by him [Guam Agric. Expt. Sta., Ann. Rept. (1911), 33, 1912] and present records suggest

that this was a misidentification of the tropical bed bug, *Cimex hemipterus*. The material collected by Fullaway was deposited in Bishop Museum and in the United States National Museum. It constitutes a valuable addition to the material available for study and contains representatives of species not seen by us in the field. Only one species of Hemiptera, *Tingis guamensis* Drake, was described from this material, and that not until 1941.

Brachyplatys pacificus was recorded from the "Marianne Is." by Distant (Nova Caled., Zool. 1: 370, 1914), presumably on the basis of material in the collection of the British Museum (Natural History).

Five species were collected by Hans G. Hornbostel on Guam and Rota in 1923 and were deposited in the Bishop Museum collection.

In 1925, S. R. Vandenberg became entomologist for the Guam Agricultural Experiment Station and continued until the station was closed in 1932. His first report [Guam Agric. Expt. Sta., Rept. (1925), 19, 1926] mentioned *Leptocorisa varicornis* as having ruined the rice crop at various times. As mentioned later, the Guam *Leptocorisa* now proves to be *acuta*. In his report for 1926 [Guam Agric. Expt. Sta., Rept. (1926), 15, 1928], Vandenberg states that an insect collection was started but was ruined by mold and by book lice. The last species of Hemiptera mentioned by Vandenberg was *Leptoglossus* species which was injurious to watermelons, squash, and muskmelons in the southern part of the island [Guam Agric. Expt. Sta. Rept. (1927), 16, 1929].

Esaki [Ins. Samoa 2(2): 75, 1928] lists the gelastocorid, *Peltopterus macrothorax* (Montrouzier) from the "Marianne or Ladrone Is." but does not state on which island the specimens in the British Museum were collected. We looked in vain for this species on Guam.

At the time of our visit to Guam, Teiso Esaki was collecting on the neighboring islands of Saipan and Rota and elsewhere in the then Japanese mandated islands of Micronesia. He has made several additional trips since that time. The only report of the Marianas Hemiptera of these expeditions other than a cursory review in the Proceedings of the Sixth Pacific Science Congress was published by Esaki in Tenthredo in 1937. Included were *Microvelia diluta* from Saipan, *Halovelia bergrothi* from Rota, *Halobates mariannarum* from Rota, and *Limnogonus fossarum* from Saipan.

Following our collecting, R. G. Oakley was stationed on Guam by the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture. Mr. Oakley collected some insects not seen by us including one species of Heteroptera, *Plinachtus acicularis* (Fabricius).

Preliminary reports of our collections have been published by Swezey in The Hawaiian Planters' Record for 1936 and 1940, and in the Guam Recorder for January and February 1937.

The present work lists 69 genera, 99 species and one variety from Guam. Of these, one genus, 47 species, and one variety are described as new. By way of comparison, 73 genera, 104 species, and four varieties have been reported from Savaii, Upolu, Tutuila, and Manua in the Samoan Islands.

GEOGRAPHIC DISTRIBUTION

A detailed comparison of the hemipterous faunas of the various island groups in Oceania must await complete study of the exhaustive collections already on hand or stored in Bishop Museum and in the collection of the Hawaiian Sugar Planters' Association Experiment Station. Meanwhile, relatively well-known Samoan, Hawaiian, and Philippine faunas will serve as useful guides to determine the place of Guam in the general zoogeographic picture. These island groups lie to the south, east, and west of Guam, and represent distinct but adjacent zoogeographic subregions, Guam being in the so-called Micronesian subregion. A summary of the Guam Heteroptera is given below, an × in the appropriate square indicating the occurrence of a species on one or more of the Samoan, Philippine, or Hawaiian Islands. In the last column, other localities are listed or the general distribution of the species is summarized according to zoogeographic regions and subregions as defined by China [Ins. Samoa 2(3) : 85-89, 1930].

Table 1. Distribution of Guam Hemiptera-Heteroptera

	Samoa	Philippines	Hawaii	Other Localities
Family Plataspidae				
1. Brachyplatys pacificus Dallas	×			Tonga, Wallis, New Caledonia, and Austro-Oriental subregion
Family Cydnidae				
2. Geotomus pygmaeus (Dallas)	×	×	×	Society Islands, Oriental region
3. ? Adrisa flavo-marginata Vollenhoven				New Caledonia
Family Scutelleridae				
4. Coleotichus breddini Schouteden				
5. Coleotichus marianensis, new species				
6. Calliphara munda Stål				China, Rota Island
Family Pentatomidae				
7. Glaucias inornata (Stål)		×		
8. Alciphron glaucus (Fabricius)	×			New Caledonia, Australia, Fiji, Solomon Islands
9. Catacanthus species				
10. Parealda chrysoptera (Herrich-Schaeffer)				
Family Coreidae				
11. Leptoglossus australis (Fabricius)	×	?		Fiji, Society Islands, Austro-Oriental subregion
12. Plinachtus acicularis (Fabricius)				India
13. Leptocorisa acuta (Thunberg)		×		Oriental region
14. Melanacanthus margineguttatus Distant	×			Fiji, New Zealand, Australia
15. Leptocoris carnivorus, new species				Palau Island (Carolines)

Table 1. Distribution of Guam Hemiptera-Heteroptera—Continued

	Samoa	Philippines	Hawaii	Other Localities
Family Lygaeidae				
16. Graptostethus nigriceps Stål	×			Fiji, Ascension
17. Nysius pulchellus Stål				
18. Nysius caledoniae Distant		×		New Caledonia
19. Ninus insignis Stål		×		Ceylon, Java, Fiji
20. Oxycarenus bicolor Fieber				India, Saipan, Carolines
21. Clerada apicicornis Signoret	×	×	×	Tropicopolitan
22. Pachybrachius pacificus (Stål)	×			Fiji, Society Islands, Australia Tuamotus, Mangareva, Carolines
23. Pachybrachius limbatus (Stål)	×			Fiji, Niue
24. Pachybrachius nietneri (Dohrn)	×	×		Fiji and Oriental region
25. Pachybrachius nigriceps (Dallas)	×	×	×	Society, New Zealand, Australia
26. Pachybrachius chinai, new species				
27. Paromius pallidus (Montrouzier)	×			Fiji, Seychelles, New Caledonia, Australia, Mangareva, Oriental region
28. Paromius piratoides (Costa)		×		Carolines
29. Cligenes marianensis, new species				
Family Aradidae				
30. Mezira marianensis, new species				
31. Neuroctenus pacificus, new species				
32. Calisius dilaticeps, new species				
Family Tingidae				
33. Tingis guamensis Drake				
Family Enicocephalidae				
34. Oncylocotis swezeyi, new species		×		
Family Reduviidae				
35. Hadrocranella pallidicoxa, new species				
36. Emesopsis pilosus, new species				
37. Ademula distincta, new species				
38. Empicoris tessellatus McAtee and Malloch				Singapore
39. Empicoris minutus, new species			×	
40. Polytoxus pilosus, new species				
41. Polytoxus marianensis, new species				
42. Peregrinator biannulipes (Montrouzier and Signoret)	×	×		Fiji, New Caledonia, Tropicopolitan
43. Physoderes minor, new species				
Family Nabidae				
44. Nabis capsiformis Germar	×	×	×	Tropicopolitan
Family Cimicidae				
45. Cimex hemipterus (Fabricius)	×			Tropicopolitan
Family Anthocoridae				
46. Lasiochilus marianensis, new species				
47. Lasiochilus swezeyi, new species				
48. Physopleurella mundula (White)			×	
49. Poronotus sodalis (White)			×	
50. Cardiastethus fulvescens (Walker)			×	Oriental region
51. Cardiastethus minutissimus, new species				
52. Scoloposcelis parallelus (Motschulsky)				Oriental region
Family Miridae				
53. Trigonotylus brevipes Jakowlef	×	×		Cosmopolitan
54. Hyalopeplus guamensis, new species				
55. Macralonidea hyalinus, new species				
56. Creontiades stramineus (Walker)	×	×		South Pacific and Orient

Table 1. Distribution of Guam Hemiptera-Heteroptera—Continued

	Samoa	Philippines	Hawaii	Other Localities
57. Eurystylus costalis var. unicolor Poppius		×		Sumatra, Mentawei
58. Proboscidocoris malayus Reuter		×		Austro-Oriental region
59. Lygus guamensis, new species				
60. Lygus fullawayi, new species Lygus fullawayi var. rubroscutellatus, new variety				
61. Lygus cruzi, new species				
62. Lygus species				
63. Nesodaphne marianensis, new species				
64. Deraeocoris guamensis, new species				
65. Fulvius angustatus, new species				
66. Felisacus ochraceus, new species				
67. Felisacus crassicornis, new species				
68. Engytatus nicotianae (Koningsberger)				Java, Fiji, New Caledonia
69. Gallobelicus tenuis (Reuter)	×	×		Sumatra, Madeira, India, Florida, probably tropicopolitan
70. Zanchius fragilis, new species				
71. Zanchius piperi, new species				
72. Zanchius virescens, new species				
73. Cyrtorhinus lividipennis Reuter	×	×		Oriental region
74. Cyrtorhinus riveti Cheesman	×			Tahiti
75. Orthotylellus rufescens, new species				Fiji
76. Orthotylellus pallescens, new species				
77. Orthotylellus brunnescens, new species		?		
78. Aretas signatus, new species				
79. Aretas bifasciatus, new species				
80. Halticus insularis, new species				
81. Psallops oculatus, new genus and new species				
82. Campylomma breviceps, new species				
83. Campylomma pallida, new species				
84. Campylomma brunneicollis, new species				
Family Cryptostemmatidae				
85. Nesonannus saileri, new genus, new species				
Family Mesoveliidae				
86. Mesovelia orientalis Kirkaldy		×		Oriental region
87. Mesovelia pacifica, new species				
Family Gerridae				
88. Limnogonus fossarum (Fabricius)		×		Fiji, Saipan, Orient
89. Limnogonus luctuosus (Montrouzier)	×			New Caledonia, Society Islands, Caroline, New Hebrides, Murray Islands
90. Limnogonus lundbladi, new species				
91. Halobates mariannarum Esaki				Rota Island
Family Veliidae				
92. Microvelia douglasi Scott	×			Oriental region
93. Microvelia diluta Distant				Saipan and Oriental region
94. Halovelia marianarum, new species				
Family Saldidae				
95. Saldula balnearum Bergroth		×		
96. Saldula marianarum, new species				
97. Saldula swezeyi, new species				
Family Notonectidae				
98. Anisops cleopatra Distant	×			New Caledonia, Oriental region
99. Anisops nasuta Fieber	×			Australian and Oriental regions

To summarize, 49 species and one variety are known only from the Marianas Islands, mostly from Guam. Six species are wides common to Guam, Samoa, Hawaii, and the Philippines; four are common to Guam, Samoa, and the Philippines; 12 are common to Guam and Samoa and, in most cases, elsewhere but not the Philippines and Hawaii; and 12 are common to Guam and the Philippines and, in most cases, elsewhere in the Oriental region as well. Specific endemism is slightly higher in Samoa (51 percent) than in Guam (49 percent) and is much higher (approximately 80 percent) in Hawaii.

The distribution of genera is even more significant as an indication of the relationships of the Guam heteropterous fauna. The genera to which endemic Guam species belong are distributed as follows: two genera peculiar to Guam; 10 widespread genera common to Guam, Samoa, the Philippines, and Hawaii; 17 genera common to Guam, Samoa (or other Polynesian islands), and the Philippines; two genera common to Guam, Samoa, and other Polynesian islands; and 17 genera common to Guam, the Philippines, and the Oriental region.

Generic endemism is much higher in Samoa (12 percent) than in Guam (3 percent), but I suspect that the number of endemic genera on all Pacific islands except Hawaii will be greatly reduced with more thorough collecting. For example, *Orthotylellus,* known previously only from Samoa, was found commonly by us in Guam and the Philippines, and I have now seen specimens from Fiji and Queensland.

Genera here recorded for the first time from oceanic Pacific islands are *Psallops, Zanchius, Proboscidocoris, Eurystylus, Macralonidea, Nesonannus, Scoloposcelis, Neuroctenus, Hadrocranella, Emesopsis, Ademula, Physoderes,* and *Plinachtus.* All of these are known elsewhere in the Philippine, Austro-Oriental, or Oriental regions, except for the two new genera, *Psallops* and *Nesonannus.*

The families Neididae and Pyrrhocoridae found on Samoa have not yet been collected on Guam and Mesoveliidae, Enicocephalidae, and Cryptostemmatidae found on Guam have not been reported from Samoa.

In general, Guam may be said to have a depauperate heteropterous fauna, typical of oceanic islands. It fits into the general Pacific island zoogeographic picture, having a high percentage of specific endemics and very few endemic genera. Of the island groups the hemipterous fauna of which is adequately known, Guam is closest to Samoa and the Philippines. The Guam fauna shows no close affinity with Hawaii, the few species found in common being widespread tropicopolitan types. Judging by the distribution of genera, most of the endemic Heteroptera of Guam came originally from the Oriental region by way of the Philippines.

ZONAL DISTRIBUTION

Guam combines the topography and ecology of both coral and volcanic islands interestingly. Most of the northern part of the island consists of an elevated limestone platform rising abruptly back of the beaches to an altitude of several hundred feet. This area is quite level and densely covered with tropical trees and underbrush. Santa Rosa Mountain is the only elevation of any consequence in this area and the limestone is continuous over this relatively low prominence. Several mountain peaks, including Mt. Tenjo and Mt. Chachao, rise to about 1,000 feet through the surrounding limestone in the southern part of the island. Mt. Alifan in this area is the only peak with a limestone covering and consequently is the only peak covered with a dense forest. The other mountains have exposed volcanic slopes which have been burned by the natives and which support a sparse vegetation of sword grass, *Styphelia,* and a few other plants. In small, secluded valleys with small streams or rivers were found some of the most interesting and unique endemic Hemiptera. On Mt. Tenjo and Mt. Chachao, in particular, such pockets of dense native vegetation near the tops of the mountains were very productive.

The island may be divided conveniently into a series of zones defined by altitude, proximity to the ocean, and plant associations. The limits of these zones are sometimes rather vague, but the concept of ecologic zones is useful and facilitates the recording of particular habitats of species.

Pelagic Habitat

Within the protecting coral reefs, both *Halobates mariannarum* and *Halovelia marianarum* are common.

Strand

The shore line is characterized by open beaches, mangroves, coral ledges reaching to the water's edge, or grass-covered areas which usually extend to the water's edge near the mouths of rivers. On *Ipomoea, Messerschmidia, Scaevola,* and *Hibiscus* in this zone, the mirids *Zanchius fragilis* and *Campylomma breviceps* were found. *Cyrtorhinus riveti* occurred on low grasses along the shore in association with a small delphacid.

Lowland Zone

This includes the cultivated area and is confused with the lowland-limestone-forest association. Here are grown rice, corn, sugar cane, pineapple, taro, tomato, tobacco, many truck crops, citrus, coffee, kapok, manioc, mango, and many other cultivated plants. *Leptocorisa acuta,* the rice bug, occurs here and is perhaps the most injurious bug on Guam, its feeding punctures appearing as brown spots on the rice kernels. The two dicyphine bugs, *Engytatus nicotianae*

and *Gallobelicus tenuis,* are common pests of tomato and tobacco, feeding and ovipositing on the stems and causing "blossom drop" in tomatoes. *Halticus insularis* is a pest of cucumbers and beans. *Melanacanthus margineguttatus* feeds on the pods of pigeon pea, and *Leptoglossus australis* sucks the fruits of *Passiflora* and melons. The most useful bug on Guam is *Cyrtorhinus lividipennis.* This small green mirid is common everywhere in the lowlands and lives on the eggs of injurious delphacids, especially the corn leafhopper, *Peregrinus maidis.* The eggs of *Cyrtorhinus* may be seen protruding from the leaf surface, capped with a small disk. They are laid along the midribs of leaves among the delphacid eggs. Although commonest on corn, this *Cyrtorhinus* was found in abundance on sugar cane and rice.

Aquatic Hemiptera were found in lowland streams and at Agana Spring. On the surface were found the widespread Oriental and Pacific species *Mesovelia orientalis, Limnogonus fossarum, L. luctuosus,* and *Microvelia douglasi,* and on the shore, the endemic *Saldula marianarum.* The only true aquatic found in lowland waters was *Anisops nasuta.*

Sword Grass–Savanna Association

The barren hillsides support two sedges, *Scleria margaritifera,* the host plant of *Orthotylellus brunnescens,* and *Rhynchospora corymbosa,* the host plant of *Orthotylellus pallescens.* The sedge-inhabiting *Ninus insignis* also occurs in this zone. *Campylomma brunnescens* was found on *Scaevola koenigii* on these open slopes.

Limestone Forest

This is the dense, relatively dry forest zone of Guam. *Cycas, Ficus, Piper, Areca* palm, *Pipturus,* limon de Chine and many other trees and shrubs comprise this dense forest. Nearly all of the endemic Hemiptera of Guam occur in this zone. This merges with the lowland agricultural land, most of which has been reclaimed from native forest by clearing. Hence the fauna is confused at low altitudes, many obviously introduced species being found. At high altitudes, such as the top of Mt. Alifan and in the small valleys on Mt. Tenjo and Mt. Chachao, however, the native fauna remains fairly pure. Here were found the endemic aquatics, *Mesovelia pacifica* and *Limnogonus lundbladi,* as well as the more widespread *Anisops cleopatra* and *Microvelia diluta.* Most of the phytophagous species found here as well as the predaceous emesine reduviids proved to be natives.

COMPARATIVE MATERIAL AND METHODS

During this study, specimens were before me for comparison from almost every island group in the Pacific. Most complete collections were from Hawaii

(Usinger collections, Hawaiian Sugar Planters' Association, and Bishop Museum), central and southeastern Polynesia (Zimmerman and Swezey, Bishop Museum), Marquesas (Mumford and Adamson, in collection of the California Academy of Sciences and Bishop Museum), Fiji (W. M. Mann collection in the Museum of Comparative Zoology; Swezey and Zimmerman in Bishop Museum), Austro-Oriental islands (Muir collection and others in the California Academy of Sciences and the Hawaiian Sugar Planters' Experiment Station), Caroline Islands (Ono and Kondo collections, Bishop Museum), New Caledonia (F. X. Williams collection, Hawaiian Sugar Planters' Association) and Philippine Islands (McGregor collection from H. M. Parshley, and my own collection). An opportunity was afforded for comparison of Guam material with Samoan and Fijian types during a visit to Hawaii in 1943, and additional Guam specimens were studied at the United States National Museum during the same year.

Types of all new species are in the type collection of Bishop Museum. All descriptions were made with a Spencer binocular microscope with 18, 36, and 108 power magnification. At the lowest power, 20 micrometer units are equal to 1 mm.; at the intermediate power, 40 units equal 1 mm.

Superfamily PENTATOMOIDEA

Family PLATASPIDAE

1. Brachyplatys pacificus Dallas.

Brachyplatys pacifica Dallas, List Hemipt. Brit. Mus. 1: 70, 1851.

One specimen each collected by Fullaway, 1911, and Hornbostel, August 1923. Five specimens, Usinger, and three specimens, Swezey, Ritidian Point, at the end of the road, June 30. These were found on a wide variety of plants, but eggs were discovered on only two kinds of plants, one of which was *Pipturus*. The eggs were found in batches of nine eggs each, arranged alternately in two parallel rows. They are creamy white with the chorion finely punctate, approximately 1 mm. in length and 0.50 mm. wide. The micropylar end is circular and subflattened with its surface feebly convex. A distinct, pale carina surrounds this apical plate. Along the middle of the egg is a broad, elevated ridge which is laterally impunctate and medially depressed and punctate. Upon hatching, the micropylar end opens as a hinged lid, the hinge being at the longitudinal ridge. A T-shaped egg burster is present. As development proceeds, red eye spots appear as is usual with hemipterous eggs. One batch of eggs collected at Ritidian Point, June 30, was parasitized by *Ooencyrtus pacificus* Waterston, as determined by D. T. Fullaway. Fourteen more specimens were taken by Swezey at Ritidian Point on August 6, 1936, one at Orote Point, Sept. 27, one at Dandan, July 17, one at Machanao, June 4, and one on

Ipomoea on Mt. Alifan, June 19. I collected one on Mt. Alifan, May 26 and two on morning-glory at Machanao, June 4, 1936.

This species had previously been reported from the Marianas Islands (Distant, Nova Caled., Zool. 1: 370, 1914).

Family CYDNIDAE

2. **Geotomus pygmaeus** (Dallas).

Aethus pygmaeus Dallas, List Hemipt. Brit. Mus. 1: 120, 1851.

Piti, June, July, August, September, most frequently at light, 11 specimens, Swezey, and four specimens, Usinger.

3. **?Adrisa flavo-marginata** Vollenhoven, Versl. Akad. Amst., Natuurk. II: 177, 14, 1868.

One specimen, Machanao, June 4, on the ground, Usinger; one specimen, Mt. Alifan, June 27, Usinger; one specimen, Barrigada, July 22, under chips, Swezey.

These specimens were collected in a dead and dried condition with all appendages except a middle and a hind femur and rostrum of one specimen broken off. Hence the identification of these as a New Caledonian species is questionable. Even the generic assignment is doubtful because the number of antennal segments is not known.

The specimens agree fairly well with Signoret's description and figure (Soc. ent. France, Ann. VI, 1: 212, pl. 8, fig. 33, 1881) but the pronotum is almost entirely black and the ocelli are practically invisible. Only in one specimen is there even a trace of ocelli. This condition is at once suggestive of the New Zealand *Choerocydnus albosignatus* Buchanan White, but the Guam specimens differ from this in color, puncturation, and form of ostiolar canal.

Family SCUTELLERIDAE

Subfamily ELYISURINAE

4. **Coleotichus (Paracoleotichus) breddini** Schouteden.

Coleotichus breddini Schouteden, Hist.-Nat. Mus. Nat. Hung., Ann. 3: 344, 1905.

One specimen, Guam, Fullaway (1178); eight specimens, Yigo, May 19, on *Premna gaudichaudii,* Usinger; six specimens, Piti, Sept. 11, 12, 13, Oct. 14, Nov. 10, at light, Swezey.

5. **Coleotichus (Epicoleotichus) marianensis,** new species.

Moderately robust, predominantly fulvous with blue-green punctures. Lateral margins of head and pronotum nearly straight. Impunctate lateral margins of pronotum narrow but distinct. Connexival angles scarcely produced, almost right angles.

Head one fifth broader than long, 93:78; eyes one fourth as broad as interocular space, 15:60; sides of juga moderately sinuate, narrowly impunctate; disk of head very sparsely, shallowly punctate in ill-defined rows, densely and more coarsely punctate just within lateral margins; tylus shallowly punctate and feebly rugose just behind the apex; apex smooth, impunctate, and feebly elevated. Proportion of antennal segments one to five as 21:21:40:46:50. Rostrum reaching to base of third abdominal segment; third segment slightly longer than fourth, 56:53.

Pronotum strongly, evenly convex at least posteriorly, gradually and continuously sloping onto head anteriorly; less than twice as broad across humeral angles as long, 207:126; lateral margins nearly rectilinear, the expanded impunctate area narrowing anteriorly; humeri nearly right angles, rounded at apices; disk rather evenly, shallowly punctate in sinuate, often broken lines, the punctures about one puncture width apart in the lines and two or more puncture widths apart between the lines; punctures much coarser and denser sublaterally; callosities surrounded by a row of punctures and with an irregular row transversely at middle; longitudinal impunctate line distinct except posteriorly.

Scutellum almost three fourths as broad as long, 153:210; sides rounded just at base, then subparallel to slightly beyond middle beyond which they converge to broad, subtruncate apex; disk closely, rather evenly punctate, the punctures less than one puncture width apart except along extreme base between sublateral impunctate elevations and along ill-defined midline. Hemelytra moderately exposed, the costal margin smooth and impunctate, with a broad row of deep, confluent punctures sublaterally; membrane exceeding tip of scutellum. Connexivum moderately exposed, the postero-lateral angles scarcely produced, but little more than right angles except on last segment. Male genital capsule a little more than half again as broad as long, 55:35, not extending beyond the edge of scutellum or membrane and roundly emarginate posteriorly; parameres each with a short, inner, subapical protuberance, the apex evenly hooked. Female genital plates distinctive, the median ventral plates subtriangular, broad mesad, acute laterally and subacute apically; posterior or tergal plates more strongly rounded apically with a broad, deep notch at middle.

Color rather uniformly fulvous brown tinged with bluish green in the punctures, with paler ochraceous lateral pronotal margins, sublateral elevated spots at base of scutellum, connexivum except on postero-lateral angles, and entire under surface including legs and antennae. Claws, setal bundle of rostrum, sublateral pronotal fasciae, spot at inner edge of each callosity, spot at inner edge of each sublateral scutellar elevation, two sublateral and one median fasciae on scutellar disk, and connexival angles black.

Size: male, length 17 mm., width 9.25 mm.; female, length 19.5 mm.; width 10.5 mm.

Holotype female, Piti, at light, Aug. 20, Swezey; allotype male, same data, Oct. 6; paratypes, three males, six females, Piti, at light, August to October, Swezey, one female, Piti, at light, June 18, Usinger.

C. marianensis is perhaps closest to the Philippine *schultzei* Taeuber, a species which is much broader and more robust with broader glabrous areas along lateral margins of pronotum, more arcuate lateral pronotal margins, brown-colored punctures, broader male genital capsule which exceeds the limits of scutellum and membrane, and more uniformly broad median ventral female genital plates with broadly rounded apices.

Subfamily SCUTELLERINAE

6. Calliphara (Chrysophara) munda Stål.

Calliphara munda Stål, Berlin. Ent. Zeitschr. **10**: 153, 1866.

One damaged specimen, Guam, Fullaway (1177); six adults, two nymphs, and eggs, Ritidian Point, Aug. 6, on *Glochidion* and other trees, Swezey; 12

specimens, Piti, Aug. 12-27, on *Glochidion,* Swezey; eight specimens, Rota, Marianas, July 31, 1925, Hornbostel.

These specimens run directly to *C. munda* Stål and agree in size and color with Stål's description. However, the sides of the venter and the thorax and scutellum are said to be sparingly ("parce") punctate in Stål's male type which is from China. I have not seen specimens of this from China or elsewhere. The males lack connexival spines, thus agreeing with Stål's type, but the females have minute spines on the fourth, fifth, and sixth connexival segments. The male genital capsule is short and broadly, roundly widened and flaring posterolaterally with the apical margin broadly, roundly emarginate at middle.

Family PENTATOMIDAE

Subfamily PENTATOMINAE

7. Glaucias inornata (Stål).

Zangis inornata Stål, Öfv. K. Vet.-Akad. Förh. 27: 633, 1870.

A single female specimen is at hand, labeled "Island of Guam" from the collection of D. T. Fullaway (1179). I have no Philippine specimens with which to compare it, but the Guam specimen agrees with Stål's description of a male except that it is only 7.5 mm. wide across the humeri. A female from Angaur in the Carolines collected by Y. Kondo, April 15, 1936, is very similar but has black connexival angles.

8. Alciphron glaucus (Fabricius).

Cimex glaucus Fabricius, Syst. Ent., 714, 1775.

One specimen, Dededo, May 11, on *Cycas,* Usinger. Recorded previously from New Caledonia (type locality), Australia, and Fiji. The genus was proposed for this unique species by Stål (Enum. Hemipt. **5**: 67, 101, 1876). I have seen specimens from North Queensland, Illingworth, and Viti Levu, Valentine and Zimmerman. New records include five specimens from Tutuila, Fullaway, and three from Guadalcanal, Kusche. The Fijian and Guam specimens are smaller and greener than the others but are similar structurally.

9. Catacanthus species.

The head and appendages are missing. It is dark bluish black above with a striking, arcuate, transverse white fascia on the pronotum. This fascia is widest at the middle where it nearly touches anterior margin. It tapers laterally to humeri. The edges of pronotum, claval suture, embolar vein, and margins of corium are narrowly pale, the hind angles of connexival segments and extreme edges are dark, the narrow outer edges of connexivum are pale, the broad connexival plates are entirely black. The membrane is dark brown with a broad apical spot pale. The under surface is mostly pale, ochraceous. The abdominal spine extends forward between the front coxae and is subacute and slightly turned upward at tip. The male genital capsule is relatively small and is produced laterally as thick subrounded lobes rather than as subflattened, lamellate lobes such as occur in *taiti* Distant and *viridicatus* Distant. Size: length from anterior margin of pronotum to tip of abdomen, 17.5 mm.; width across humeri, 10 mm.

Mt. Alifan, June 27, one dead specimen, Usinger.

This is almost certainly a new species but I do not feel justified in proposing a new name on such a fragmentary specimen.

SUBFAMILY ASOPINAE

10. Parealda chrysoptera (Herrich-Schaeffer).

Asopus chrysopterus Herrich-Schaeffer, Wanz. Insekt. **7**: 114a, 115, fig. 781, 1844.

Cantheconidea chrysoptera Schouteden, Gen. Insect. **52**: 44, 1907.

Parealda bouvieri Schouteden, Soc. ent. Belg., Ann. **51**: 47, 1907. New synonymy.

Parealda bouvieri Schouteden, Gen. Insect. **52**: 65, pl. 5, fig. 3, 1907.

Asopus ? chrysopterus Bergroth, Ann. Mag. Nat. Hist. VIII, **15**: 484, 1915.

Two specimens, Guam, Fullaway (1418); one specimen, Guam, 1923, edge of forest, Hornbostel; one specimen, Mt. Alifan, April 21, E. H. Bryan, Jr.; one specimen, Inarajan, July 25, on *Triphasia,* Swezey.

This species was originally described from Guam by Herrich-Schaeffer and is easily recognizable from his colored illustration. As pointed out by Bergroth, Schouteden erroneously placed this in *Cantheconidea.* Bergroth, in suggesting that *chrysopterus* "belongs to an undescribed genus," overlooked the fact that Schouteden had already described a new genus and species, *Parealda bouvieri,* for this same insect and keyed it out in its proper place in his Genera Insectorum. Thus the specific name of Herrich-Schaeffer and the generic name of Schouteden stand, while Schouteden's specific name *bouvieri* falls as a synonym.

SUPERFAMILY COREOIDEA

FAMILY COREIDAE

SUBFAMILY COREINAE

TRIBE ANISOSCELINI

11. Leptoglossus australis (Fabricius).

Cimex australis Fabricius, Syst. Ent., 708, 1775.

One specimen, Guam, Fullaway (1190); two specimens, Guam, 1923, American sunflower and milkweed, Hornbostel; 13 specimens, Barrigada, June 12 and 14, on *Passiflora foetida,* Usinger; four specimens, Barrigada, June 24, on *Passiflora* fruit, Swezey; two specimens, Barrigada, Nov. 25, at school farm, on sunflower, Swezey; Piti, Oct. 10, on pumpkin, Swezey; two specimens, Piti, Sept. 26, on pumpkin, Swezey; two specimens, Piti, Aug. 28, on pumpkin, Swezey; three specimens, Piti, Sept. 5, Oct. 17, on beans, Swezey; two specimens, Talofofo, Nov. 18, Swezey; Yigo, May 19, Usinger.

Leptoglossus was found in greatest numbers at Barrigada where eggs, nymphs, and adults were found on *Passiflora foetida,* feeding on the fruit. *L. australis* is a conspicuous species of wide distribution. In addition to Samoa, China records it from New Caledonia, New Hebrides, Fiji, and the Society Islands. I have specimens from all of these regions and can add the Caroline Islands and the Philippines. The Philippine species has been recorded from earliest times as the widespread Ethiopian and Oriental *membranaceus* (Fabricius) but specimens before me from Mindanao and specimens which I collected on Luzon fall well within the range of variation seen in the Oceanian series. Regardless of possible synonymy, the name *australis* will remain for Pacific specimens because it was described six years earlier than *membranaceus.*

TRIBE GONOCERINI

12. Plinachtus acicularis (Fabricius).

Alydus acicularis Fabricius, Syst. Rhyng., 251, 1803.

Two specimens were kindly forwarded from the U. S. National Museum by H. G. Barber who made the identification. Collected on Guam, Oct. 17, 1938, R. G. Oakley (1247) on *Gymnosporia thompsonii.* These specimens agree perfectly with Distant's description and figures of specimens from India. The genus has not been recorded from Oceania except for *P. bellus* Stål in Fiji. Species are before me from Mangareva and from the Austral and Society Islands. These lack the acute spines on the humeri as does *bellus,* in contrast to the acutely spined Oriental *acicularis* of Guam.

SUBFAMILY ALYDINAE

TRIBE LEPTOCORISINI

13. Leptocorisa acuta (Thunberg).

Cimex acuta Thunberg, Dis. Ent. Ins. Spec. 2: 34, 1783.

This species is clearly *acuta* (see China's revision of the Oriental species, Bull. Ent. Res. **14**: 235-239, 1924) on the basis of the distinctive male genital claspers, and agrees with all specimens available to me from the Carolines and Philippines in antennal and rostral characters. However, the basal segment of the antennae is fulvous or darker in color with the apex often black. It seems evident that this color character is unreliable for the separation of species in the *acuta-varicornis* group. *Varicornis* is at hand from Fiji, Samoa, the Solomon Islands, and New Caledonia. Guam specimens of *acuta* include one collected by Fullaway (1192); one by Hornbostel in 1923; 16 specimens, Inarajan, May 7, May 14, June 8; eight specimens, Piti, May 1, May 9, and July 13; and two specimens, Agana Swamp, May 4. All collected by Swezey and Usinger on sedges, on *Paspalum orbiculare,* most commonly on rice, and at light.

TRIBE ALYDINI

14. Melanacanthus margineguttatus Distant, Ann. Mag. Nat. Hist. VIII, **7**: 585, 1911.

Twenty-two specimens, Piti, June 20 and 22, on *Crotalaria quinquefolia,* Usinger; one specimen, Yona, May 12, on pigeon pea, Usinger; one specimen, Piti, July 13, on sedges, Swezey; one specimen, Fullaway (1193). This is the northernmost record for this south Pacific species. I have three specimens from Fiji which fill an important gap in the distributional picture as outlined by China [Ins. Samoa 2(3): 97, 1930].

Eight eggs were laid on *Crotalaria* leaves on June 22. The egg is blue-gray, cup-shaped, and, when recently laid, shows two parallel reddish lines, indistinct on the flattened dorsal surface, extending longitudinally toward the micropylar end. Size, 1.3 mm. long and 0.9 mm. wide. At the micropylar end is a ring of about 14 pits, each with an inconspicuous process at its middle. The ring extends broadly around the anterior rounded portion of the egg and only slightly onto the flattened part. The surface of the chorion is covered with numerous, round, very shallow depressions. Incubation period five days.

SUBFAMILY RHOPALINAE

TRIBE LEPTOCORINI

15. Leptocoris carnivorus, new species (fig. 1, *a, b*).

Elongate-oval, reddish in color with black appendages and membrane and infuscated clavus and inner corium; upper surface clothed with a very short, inconspicuous pubescence, rostrum reaching to second or third visible abdominal segment. Pronotum with a strongly elevated anterior lobe and a well-developed median longitudinal carina which becomes obsolete posteriorly. Size: 12 to 15 mm.

Head three fourths as long as broad across eyes, 35: 47; tylus and juga convex, the tylus with a few, short, erect, black bristles anteriorly; vertex distinctly longitudinally sulcate at middle, with a swollen or elevated carina on either side in front of eyes extending to antenniferous tubercles; swollen postocular lobes about one third as long as eyes; eyes less than half as wide as interocular space, 10: 26; ocelli prominent, about twice as far apart as distance from an ocellus to an eye; bucculae short, decreasing just behind level of bases of antennae. Antennae five times as long as head and pronotum together, proportion of segments one to four as 17: 58: 58: 73. Rostrum reaching from middle of second to middle of third visible abdominal segment; proportion of segments one to four as 32: 36: 30: 30.

Pronotum half again as long as head, about one third broader than long; anterior lobe a little less than one fifth of total length of pronotum, strongly convex, abruptly depressed behind, with a rounded elevated marginal lobe on either side; anterior margin distinctly but narrowly elevated; posterior lobe only moderately elevated, distinctly, closely punctate except along lateral and posterior margins, sublaterally slightly depressed; a distinct median longitudinal carina interrupted only at anterior constriction and becoming obsolescent near posterior margin; posterior margin strongly depressed, carinate. Scutellum triangular, about as broad across base as long, feebly elevated and simple. Hemelytra exceeding tip of abdomen and concealing all of abdominal disk except narrowly at sides of middle of connexivum.

Under surface densely covered with a short, appressed, pale pubescence interrupted by numerous glabrous spots in which are inserted long, erect, pale hairs.

Male genital segment distinctive of the species, the ninth segment almost twice as broad at base as long to apices of posterior arms (26 : 14) ; these arms stout, subcylindrical, slightly converging posteriorly, the entire segment clothed with very long, erect hairs. Claspers long, slender and sinuate, curved downward apically, extending half again as far beyond level of apices of genital arms as total length of these arms.

Color bright red with black appendages and membrane, and more or less infuscated clavus, inner corium, thoracic sterna and pleura and faintly infuscated abdominal venter.

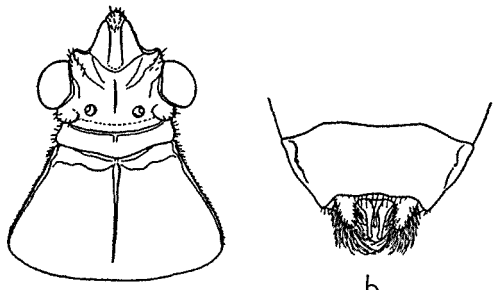

FIGURE 1.—*Leptocoris carnivorus:* **a,** outline of dorsal view of head and pronotum; **b,** ventral view of last abdominal segment of male showing hairy posterior arms, slender median process and slender claspers on each side of middle.

Holotype male, allotype female, and 24 paratypes, Cetti Bay, May 28, on *Thespesia populnea,* Swezey and Usinger; 11 specimens, Barrigada, July 22, on *Morinda,* Swezey; five specimens, Ritidian Point, June 2, Swezey and Usinger; four specimens, Mt. Alifan, June 27, Usinger; Barrigada, July 22, clustered by the hundreds on *Morinda* leaves, Swezey; one specimen, Guam, Sept. 28, 1938, on *Colubrina asiatica,* Oakley. A single, apparently perfectly typical male is at hand from Palau Islands, Ngeremlengui, Galmiskan, April 23, 1936, Z. Ono. At Ritidian Point, eggs, nymphs of all stages, and adults were common. They were also seen in large numbers at Machanao on June 5. The nymphs ran about on the ground and on dead leaves and were often seen feeding on dead nymphs and adults of their own species.

This species runs to *L. abdominalis* in Stål's key (Enum. Hemipt. 3 : 99, 1873) but differs from descriptions of that species in its smaller size (16 to 20 mm. in *abdominalis*) and its red abdomen (black in *abdominalis*). A more detailed comparison is impossible in the absence of authentically determined specimens but *taprobanensis* (Dallas), which Distant in 1902 placed as a variety of *abdominalis,* has very slender genital arms which are strongly convergent posteriorly. *L. ahnnei* (Cheesman) and related Polynesian species have much broader genital arms which are posteriorly strongly divergent. The Philippine *rufomarginatus* (Fabricius), although much larger, differently colored and with an entirely different pronotum, has genitalia somewhat similar to the Micronesian species. The arms are broader, however, and longer and

slightly divergent and the median claspers are relatively short, scarcely exceeding level of apices of arms. I have a single female from Luzon which resembles the Guam species very closely in structure but the head and pronotum are clothed with much longer, erect, black bristles, the pronotum is narrower behind and the clavus and corium are almost entirely infuscated. This last may be *augur* (Fabricius) whose lateral pronotal margins are described by Distant (Fauna Brit. India, Rhynch. 1: 420, 1902) as "moderately hirsute." A female of *insularis* Kirkaldy from Fiji differs in its uniformly darker coloration and longer rostrum.

SUPERFAMILY LYGAEOIDEA

FAMILY LYGAEIDAE

SUBFAMILY LYGAEINAE

TRIBE LYGAEINI

16. Graptostethus nigriceps Stål.

Graptostethus servus var. *nigriceps* Stål, Enum. Hemipt. 4: 117, 1874.

Three specimens, Fullaway (1186). Described by Stål from Guam, Ascension, and Fiji and subsequently recorded by China from Samoa, New Hebrides, and New Caledonia. Variation is great in members of this group but a Fijian example agrees well with one of the Guam specimens and confirms China's suspicions regarding the synonymy of *vitiensis* Kirkaldy. This species was not encountered by Swezey and me during our exploration of Guam.

TRIBE ORSILLINI

17. Nysius pulchellus Stål, Freg. Eugenies Resa, Ins., 244, 1859.

One specimen, Fullaway (1184). Twenty-eight specimens collected as follows: four specimens, Umatac, May 14, 17, on *Euphorbia hirta,* Usinger and Swezey; four specimens, Umatac, May 28, on *Pemphis,* Usinger; five specimens, Machanao, Aug. 6, on amaranth, Swezey; seven specimens, Piti, April 30, May 1, June 3, on *Nicotiana,* sedge, and *Styphelia,* Swezey and Usinger; one specimen, Mt. Tenjo, May 3, Swezey; one specimen, Upi Trail, May 5, Usinger; four specimens, Mt. Chachao, May 16, on *Styphelia,* Usinger; one specimen, Sumay, Aug. 17, Swezey.

This is a common species known only from Guam, where it was first collected on the Eugenies Resa Expedition. It is nearest to *Nysius picipes* Usinger from Wake Island. I am indebted to O. Lundblad for the loan of a cotype of *pulchellus* from the Naturhistoriska Riksmuseum, Stockholm.

Nysius pulchellus occurs most commonly on *Euphorbia hirta, Portulaca, Pemphis,* and *Vernonia.* Eggs are laid rather loosely in composite heads and may be obtained from captive bugs in cotton-stoppered vials, the eggs being

inserted into the cotton plugs. After two days, red eye spots appear, becoming more distinct as development progresses. The eggs hatch in seven days. The first-instar nymphs are decidedly reddish in appearance. They molt in three days, becoming considerably more robust and ferrugineous in color with longitudinal stripes on the head and mottled pale testaceous areas over the dorsum. The second instar lasts five days and the three succeeding nymphal instars each last three days. The total period of development from egg to adult is 24 days.

18. Nysius caledoniae Distant, Ann. Mag. Nat. Hist. IX, **6**: 151, 1920.

Thirty specimens collected at Piti, April 30, on *Emilia,* Usinger; one specimen, Piti, May 1, Usinger. This species was repeatedly observed throughout our stay on Guam on the recently (within the previous 10 years) introduced composite, *Emilia.* The incubation period of eggs in *Emilia* heads was five days. I collected the same species commonly at Los Banos and Montalban, Philippine Islands, on the closely related composite, *Erigeron.*

These specimens agree closely with topotypic New Caledonia material determined by Distant. They are close to *pacificus* China but have a slightly shorter and less dense pubescence dorsally, particularly on the hemelytra. The presence of *pacificus* on Tutuila, alone of the Samoan Islands, is not particularly remarkable since it was probably introduced there. I also have specimens from Fiji and Amboina. Specimens are at hand from India determined as *ceylanicus* Motschulsky by Distant. These also belong with *pacificus* while a paratype of *turneri* Evans from Tasmania is closely allied but has longer, erect pubescence, especially on the pronotum. These closely related species form a group which is widely distributed throughout the Austro-Oriental region. Representatives of this group are also at hand from south and central China and from Japan. The status of the various Oriental species of *Nysius* can only be determined by a thorough systematic revision based upon a study of type specimens.

Subfamily CYMINAE

19. Ninus insignis Stål, Freg. Eugenies Resa, Ins., 253, pl. 3, fig. 5, 1859.

Twenty-one specimens, Piti, May 1, on a high sedge, Usinger; one specimen, Piti, June 1, Usinger; two specimens, Piti, July 3, Swezey; two specimens, Sept. 21, Swezey; six specimens, Dandan, July 17, Swezey; one specimen, Fonte Valley, Aug. 7, Swezey; one specimen, Santa Rosa Peak, May 19, Swezey, all taken on sedges; three specimens, Mt. Alifan, April 20, Bryan; one specimen, Merizo, April 24, Bryan; two specimens, Umatac, May 14, Swezey; one specimen, Fullaway (1185).

This monotypic genus was originally described from Guam. Species subsequently referred to *Ninus* by Distant and Bergroth were shown by Bergroth (Philippine Jour. Sci. **13D**: 63, 1918) to belong to *Cymoninus* Breddin. Bergroth also synonymized *stylatus* Kirkaldy and *singalensis* Breddin with *insignis*

and gave the distribution as Ceylon, Fiji, the Philippines, and Guam. I have collected it in the Philippines and also have a specimen from Java.

Subfamily OXYCARENINAE

20. Oxycarenus bicolor Fieber, Rhynchotographieen, 39, 1851.

Thirty-three specimens, Fadian, Aug. 19, on *Sida,* Swezey; one specimen, Barrigada, June 12, Usinger; two specimens, Fullaway (1182).

Described from India and since recorded by Esaki from Saipan and Palau (Sixth Pacific Sci. Congr., Proc. 4: 411, 1941). I have two Peleliu specimens which are smaller with pale at apices as well as at bases of coria and with apical margin of membrane faintly paler. A pair from Laloki, Papua, have the costal margins generally pale and agree with *lugubris* as described by Distant (Fauna Brit. India, Rhynch. 2: 44, 1904). The Guam series is very black including the membrane, with bases and subapices of coria but not clavi, acetabula, ostiolar canal and hind tibiae at middle, white.

Subfamily RHYPAROCHROMINAE

Tribe CLERADINI

21. Clerada apicicornis Signoret in Maillard, Notes sur l'île de la Réunion, Ins., 28, pl. 20, fig. 8, 1862.

One specimen, Piti, June 21, collected at light, Swezey. Tropicopolitan.

Tribe MYODOCHINI

22. Pachybrachius pacificus (Stål).

Pamera pacifica Stål, Enum. Hemipt. 4: 149, 1874.

One specimen, headwaters of Talofofo River, June 17, Usinger; one specimen, Upi Trail, May 5, Usinger; two specimens, Piti, April 30, Usinger; two specimens, Piti, Nov. 5, swept from lawn grass, Swezey; one specimen, Ritidian Point, June 2, Usinger; one specimen, Agana Swamp, May 25, Usinger; one specimen, Mt. Alifan, May 21, on milkweed, Usinger; one specimen, Merizo, April 24, Bryan; one specimen, Yona, April 29, Bryan; one specimen, Tarague, May 17, on grass, Swezey.

Widespread over the Pacific region, having been recorded from Fiji, Samoa, and Tahiti, Raiatea, and Borabora, Society Islands. I can add Rimitara, Australs, Stokes; Makatea, Tuamotus, Wilder; Truk, Caroline Islands, Ono; Mangareva, Zimmerman.

23. Pachybrachius limbatus (Stål).

Pamera limbata Stål, Enum. Hemipt. 4: 149, 1874.

Two specimens, Upi Trail, May 5, Usinger; two specimens, Ritidian Point, June 2, Usinger; one specimen, Machanao, June 30, Usinger.

Recorded previously from Fiji, Samoa, and Savage Island [Niue]. Guam specimens agree perfectly with specimens before me from Fiji.

24. Pachybrachius nietneri (Dohrn).

Plociomerus nietneri Dohrn, Stett. Ent. Zeitung **21**: 404, 1860.

One specimen collected by Fullaway and bearing the determination label of C. S. Banks. Although both antennae are broken off, the specimen agrees well with the original description and runs to *nietneri* in Stål's key (Enum. Hemipt. **4**: 148, 1874).

25. Pachybrachius nigriceps (Dallas).

Rhyparochromus nigriceps Dallas, List Hemipt. Brit. Mus. **2**: 577, 1852.

Two specimens, Guam, Fullaway; nine specimens, Piti Hills, June 3, sweeping *Styphelia,* Swezey; 32 specimens, 2 miles south of Piti, June 13, on heliotrope, Usinger; one specimen, Piti, Nov. 22, at light, Swezey; one specimen each, April 30, Swezey and Usinger, May 1, May 2, May 26, Piti, Usinger; one specimen, Tarague, May 17, on *Tournefortia* [*Messerschmidia*], Usinger; one specimen, Mt. Chachao, May 16, on *Styphelia,* Usinger; two specimens, Ritidian Point, June 2, on *Euphorbia hirta,* Usinger.

Widely distributed over the islands of the Pacific. China [Ins. Samoa **2** (3): 129, 1930] remarks that it "is somewhat variable and is probably composite." Variation is most conspicuous in the form of the anterior lobe of the pronotum. Typical examples from Hawaii vary in this respect but average nearly half as long as broad. The Guam series averages two thirds as long as broad. Series from other islands, especially at the extremes of the range such as Rapa, suggest a *Rassenkreis* but the Guam series does not seem to be sufficiently extreme to warrant a special name at this time.

P. nigriceps was commonest on heliotrope on which eggs were laid on June 23. The eggs were deposited at the tip of a flower head among the small flowers. They were placed crosswise to one another and rather loosely in the open but were fastened together and to the flower calyx. They are elongate, slightly curved, about 1 mm. long by 0.35 mm. in diameter. The micropylar end is thicker, subtruncate, while the other end is tapering and rounded at the tip. The chorion is sculptured, exhibiting prominent hexagonal reticulations on the anterior (micropylar) third. Near the middle, these become inconspicuous or appear as slight rugosities. The posterior end is perfectly smooth. The whole surface is glabrous and the egg is almost water white in color. There are five small but very distinct processes forming a small ring on the surface of the micropylar end. The incubation period is six days.

26. Pachybrachius chinai, new species.

Elongate with sides subparallel, pronotum strongly constricted behind middle and rostrum relatively long, reaching to middle of metasternum. Head as long as broad across eyes, finely granulate-punctate above except surrounding ocelli, with subappressed white

pubescence anteriorly and laterally in front of eyes and posteriorly surrounding ocelli. With several erect, very long trichobothria-like hairs on vertex and adjacent to eyes and several shorter, erect hairs on surface of eyes. Interocular space over twice as wide as an eye, 16 : 7, and anteocular portion of head one fourth longer than an eye, 15 : 12. Rostrum relatively long, reaching to middle of metasternum, the first segment not reaching base of head, second segment reaching front coxae; proportion of segments 25 : 25 : 18 : 14; all segments beset with scattered, relatively short but erect hairs. Antennae about 2.5 times as long as width of pronotum across humeri, 115 : 45, first segment exceeding apex of head by slightly less than half its length, proportion of segments one to four as 16 : 36 : 28 : 35.

Pronotum one fifth longer than head on median line, one fourth broader across humeri than long, the disk sparsely clothed with subappressed pale hairs with a few erect long hairs. Postmedian transverse constriction relatively strong, the width at constriction only one fifth greater than width across anterior collar. Anterior lobe half again as broad as long, impunctate. Posterior lobe three times as broad as long, sparsely but distinctly punctate. Scutellum longer than broad, 29 : 23, elevated at base and subflattened apically. Hemelytra as in *ventralis* China. Thoracic pleura relatively coarsely, distinctly punctate. Legs and coloration of body and appendages as in *ventralis* China.

Size: male, length 4.4 mm., width (hemelytra) 1.2 mm.; female, length 4.7 mm., width (hemelytra) 1.3 mm.

Holotype male, allotype female, and 44 paratypes, Agana Swamp, May 4, sucking fruits of "Panama cherry", Usinger; three paratypes, same data but May 15, and one paratype, Umatac, May 14, on *Pemphis,* Usinger; one paratype, Inarajan, May 7, Usinger; one specimen, Talofofo, April 1, Bryan.

P. chinai is very close to the Samoan *ventralis* China, of which I have a relatively small (4.4 mm.) topotype from Fagasa. *P. ventralis* differs in its distinctly shorter rostrum, reaching only to middle of mesosternum, and in its relatively broader and less strongly constricted anterior pronotal lobe. *P. ventralis* was collected on Tahiti, Society Islands, and on Raivavai and Tubuai, Austral Islands, by Zimmerman.

Dedicated to W. E. China, whose Hemiptera fascicle of "Insects of Samoa" is one of the best contributions to our knowledge of the Hemiptera of Oceania.

27. Paromius pallidus (Montrouzier).

Plociomerus pallidus Montrouzier, Soc. Linn. Lyon (n.s.), Ann. 11 : 229, 1864.

Ten specimens, Piti, May 1, sweeping grass, Usinger and Swezey; five specimens, April 30, *Paspalum conjugatum,* Usinger; four specimens, Piti, July 13, on sedges, Swezey; two specimens, Mt. Tenjo, May 3, Usinger and Swezey.

If the recorded synonymy is correct, this species occurs from the Seychelles through Ceylon and Burma to Japan and southward to Samoa (fide Kirkaldy, not recorded by China), Fiji, and New Caledonia. I have specimens from Fiji which agree well with the Guam series, a long series collected by Zimmerman on Mangareva, and three specimens from Eidsvold, Queensland, sent for determination by A. L. Tonnoir from the Council of Scientific and Industrial Research collection at Canberra.

28. Paromius piratoides (Costa).

Plociomerus piratoides Costa, Mus. Zool. Napoli, Ann. 2:78, 1864.

One specimen, 3 miles south of Piti, May 23, 1936, Usinger.

This large species is at once distinguished from *pallidus* by the long rostrum reaching nearly to hind coxae and the longer antennae, with second segment one third longer than fourth segment (the two segments subequal in *pallidus*). All of the specimens before me from the Carolines belong here. The species was described from the Philippines.

TRIBE RHYPAROCHROMINI

29. Cligenes marianensis, new species (fig. 2).

Relatively small, oval, nearly glabrous with pronotal disk rather evenly punctate throughout except on humeri and with corium punctured in regular rows except for smooth area laterad of second row of punctures along claval suture and smooth costal area. Apical margin of corium strongly sinuate on inner half.

Head three fourths as long as broad across eyes, very finely, unevenly, rugosely punctate with impunctate glabrous points in front of ocelli and broadly impunctate area at hind margin. Anteocular portion of head about as long as an eye; interocular space slightly more than twice as wide as an eye, 11:4.5. Ocelli prominent, almost contiguous with eyes, the ratio of distance to eyes to distance between ocelli, 1:16. Antennae slightly more than one fourth longer than width of pronotum across humeri, 48:35, proportion of segments one to four as 10:13:10:15. Bucculae scarcely elevated but the rugose under surface of head with a distinct buccal trough. Rostrum reaching hind margins of middle coxae, the first segment not attaining base of head; proportion of segments one to four as 10:14:6:5.

Pronotum longer than head, 19:15; a little less than twice as broad across humeri as long, 35:19; converging anteriorly, the lateral margins slightly sinuate at middle and rounded to anterior angles. Hind margin distinctly but shallowly concave. Disk feebly elevated posteriorly, more strongly so anteriorly, relatively sparsely and evenly covered with setigerous punctures, the punctures from one (near anterior margin) to three or four puncture widths apart. Humeri impunctate.

Scutellum as long as pronotum and scarcely broader than long, 21:19. Disk broadly elevated and subflattened at middle of base, with a pair of converging impressions sublaterally, the disk abruptly depressed laterad of these at basal angles. Disk distinctly punctured, the punctures becoming sparser posteriorly.

Hemelytra slightly exceeding tip of abdomen and concealing the connexivum laterally. Clavus with two complete rows of punctures and a partial third row along inner margin. Corium with two rows of punctures laterad of claval suture. Beyond these rows with a broader impunctate area extending to median suture or furrow. Punctate laterad of this to impunctate costal margin, this last narrow basally but widening apically with the edge feebly reflexed. Costal margins curved outward subbasally, slightly inwardly sinuate before the middle and then gradually rounded to convergent apices. Apical margin of corium strongly sinuate, the inner half deeply concave. Clavus and corium subhyaline. Membrane clear, hyaline, with veins very ill-defined.

Under surface highly polished except on evaporating areas surrounding right-angled, apically tapering ostiolar canal. Thoracic pleura and sterna sparsely, coarsely punctate with an impunctate area at middle of propleura and on all of metapleura except along impression and near middle. Abdominal venter shining, clothed with backward-directed, short hairs and extremely long trichobothrial hairs.

Color light brown with darker brown eyes and hind lobe of pronotum, this last with humeri, hind margin narrowly at base of scutellum and a longitudinal line at middle, paler, ochraceous. Anterior margin of pronotum, antennae at least on basal half, rostrum and

legs except for slightly infuscated bases of femora, also pale. Scutellum brown, with a broad Y-shaped marking extending from basal angles to apex, ochraceous basally and white apically. Hemelytra pale and more or less hyaline except for infuscated apical portions of clavi; a fuscous spot on either side just before middle of costal margin extending inward to second row of punctures, and fuscous apical margin of corium, the sinuate portion narrowly infuscated and the entire apex of corium infuscated, except for a pale spot at extreme apex. Membrane immaculate.

Size: length 2.15 mm., width (base of hemelytra) 0.9 mm.

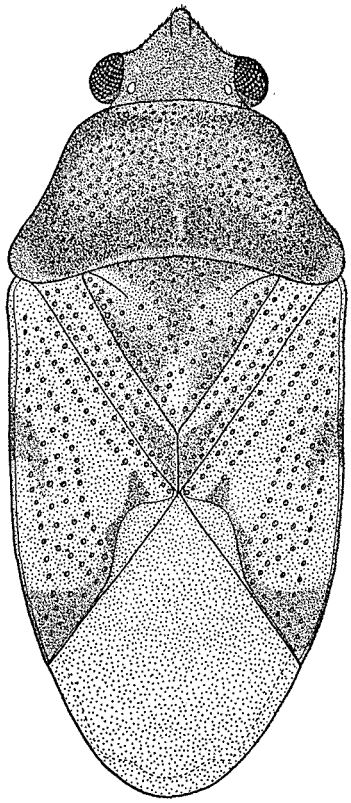

FIGURE 2.—*Cligenes marianensis:* dorsal view showing relative number and size of punctures and sinuate inner margin of membrane.

Holotype female, Piti, May 2, Usinger; three female paratypes, same locality, May 1, and May 11, Usinger, and July 27, Swezey. These specimens were attracted to light.

A closely related species from the Caroline Islands is much darker and has a strongly convex anterior pronotal disk. *C. flavicornis* Signoret is apparently closely related, but the second antennal segment is described as the longest with the others equal, and the hemelytra are differently colored.

This is a nearly cosmopolitan genus with a remarkable variety of species throughout the islands of the southwest Pacific. I have half a dozen undescribed species, the nearest to *marianensis* being one from Larat collected by Muir which is relatively broader with lateral margins of pronotum scarcely sinuate at middle and the pronotal disk ochraceous with large brown area at middle of anterior lobe and along posterior margin. *C. swezeyi* from Samoa differs in its impunctate pronotum as does the Philippine *assimulans*. Other geographically adjacent species lack the strongly sinuate apical corial margin.

Superfamily ARADOIDEA

Family ARADIDAE

Subfamily MEZIRINAE

Tribe MEZIRINI

30. Mezira marianensis, new species (fig. 3, *a, b*).

Suboval, second antennal segment much shorter than third, antero-lateral angles of pronotum distinctly lobulate, surface of body only sparsely granular, the granules similar in color to the body surface. Color predominantly black.

Head almost as long as wide across postocular spines, the anterior process relatively slender and scarcely widened anteriorly, reaching two thirds of length of first antennal segment, antenniferous tubercles reaching scarcely more than one third of length of first antennal segment, distinctly divergent and subacute at apices; eyes small, one fifth the width of interocular space; postocular spines straight, cylindrical, exceeding level of lateral margins of eyes by one half the width of an eye; surface with relatively small granules confined to anterior process, except apex of tylus, lateral margins and bases of antenniferous tubercles, and four longitudinal rows at middle of vertex and along lateral margins extending along inner margins of eyes. Antennae a little shorter than length of head and pronotum together, 50: 54, proportion of segments one to four as 15: 9: 18: 8; minutely granulate except at base of first segment. Rostrum reaching to hind margin of head, the buccal groove open behind.

Pronotum about two thirds as long as head on median line, 22: 30; about 2.5 times as broad across humeri as long, 57: 22, the width across anterior lobes about one fifth less than that across humeri, 48: 57. Anterolateral angles broadly and finely granular laterally, concave and smooth sublaterally on anterior margin and then coarsely granular and produced just behind eyes; collar smooth, concave and distinct. Posterior lobe distinctly delimited by deep lateral constrictions and median transverse impression, its lateral margins with relatively large, erect, blunt, spinelike granules. Disk of pronotum smooth except for four longitudinal rows of granules on anterior lobe and sparsely scattered granules on posterior lobe becoming denser on humeri. Hind margin scarcely concave, almost straight. Scutellum transversely rugose, laterally, basally and medially carinate, and sparsely granulate except finely along carinae and densely and coarsely in clusters sublaterally at base.

Coria moderately dilated basally, only one twelfth wider across basal lobes than across humeri, with two distinct veins on basal two thirds terminating in a prominent cross vein, this entire area sparsely, inconspicuously granulate. Apical third of corium similar to membrane in texture, vaguely delimited by an ill-defined apical ridge. Membrane with ill-defined, reticulate veins at middle. Abdomen moderately, evenly rounded, almost one third broader across middle than width across humeri. Connexival angles prominent, rounded at apices, the surface of connexivum relatively smooth, only sparsely beset with

short, round granules. Subconnexival area with a small cluster of granules on edge of carina on second visible segment and a circumgranular cup-shaped elevation on third and fourth visible segments. Spiracles of sixth visible abdominal segment just visible from above.

Male apical genital segment granular and convex above with a faint median longitudinal ridge, the apex rounded except for feebly, roundly projecting portion of this ridge. Lateral lobes of basal genital segment broadest subapically, projecting two ninths of their length beyond apex of second genital segment.

Female genital segments distinctive, the median lobe roundly or obtusely subtriangular, small, the lateral lobes reaching just to level of its apex, the lobes straight except for spiracular interruptions on outer sides and tapering on inner sides to obtusely angular apices.

Under surface very sparsely, inconspicuously granulate except laterally on head and thoracic pleura and on sixth visible abdominal segment.

Color dark brown to black with middle of third antennal segment sometimes paler, the clusters of granules and granular elevations at basal angles of scutellum and on subconnexival area of abdominal disk, subconnexival carina posteriorly, connexival angles, and spiracles pale ochraceous to white.

Size: male, length 7.5 mm., width (abdomen) 3.75 mm.; female, length 8 mm., width (abdomen) 4 mm.

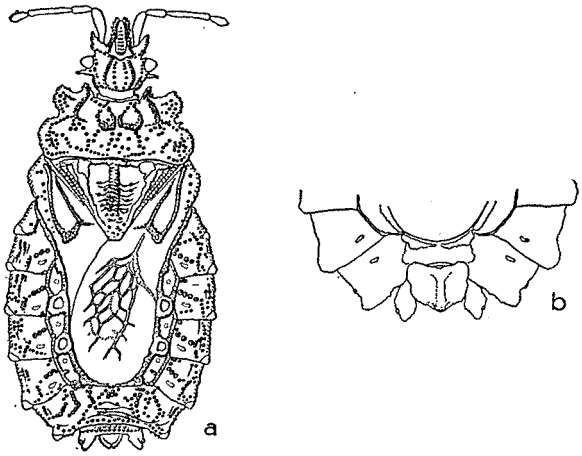

FIGURE 3.—*Mezira marianensis:* **a,** dorsal view of female; **b,** dorsal view of posterior abdominal segments of male.

Holotype male, allotype female, and nine paratypes, Machanao, June 30, Swezey and Usinger; one paratype, Barrigada, July 22, under bark of *Intsia bijuga,* Swezey.

Closely related to the Philippine *tagalicus* Stål and to an undescribed species from the Caroline Islands, both of which have the spiracles of sixth visible abdominal segment very near lateral margins. However, both the Philippine and the Caroline species are lighter brownish in color and much more densely covered with conspicuous pale granules. *M. tagalicus* is a little larger, 8.5 to 9.5 mm., with lateral lobes of first male genital segment shorter, not reaching

apex of second segment, and with lateral lobes of female genital segment much shorter, not reaching apex of large, rounded, median lobe. *Tagalicus* likewise has a shorter rostrum with the buccal cavity closed behind. Superficially similar Fijian and Samoan species are at hand. They resemble *tagalicus* in color and in degree of granulation but the spiracles of the sixth visible abdominal segment are remote from the lateral margins.

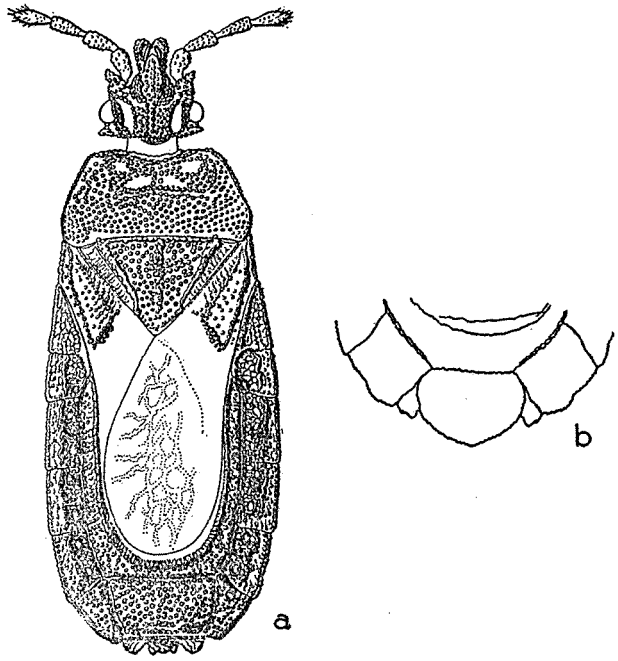

FIGURE 4.—*Neuroctenus pacificus:* **a**, dorsal view of female; **b**, posterior abdominal segments of male.

31. **Neuroctenus pacificus,** new species (fig. 4, *a, b*).

Elongate-oval, widest across abdomen but not strongly so, surface dull, granular. Color ferrugineous with some black granules, white base of membrane, and black apex of membrane. Antennae less than half again as long as head, the first segment not reaching apex of head, second segment slightly shorter than third and third a little shorter than fourth.

Head about as long, including neck region, as width across eyes, the anterior process narrowest just beyond base, widened apically and emarginate at tip, exceeding apex of first antennal segment by one third the length of first segment visible from above. Antenniferous tubercles reaching about to middle of first antennal segment, their outer margins slightly divergent and their apices subacute. Postocular tubercles reaching just about to outer margins of eyes, acute. Rostral groove about half as wide at middle as long, 9:20, abruptly tapering anteriorly and only feebly narrowed posteriorly. Antennae about one fourth longer than head, 48:39, all the segments, including the third, thin at base and enlarged apically, the first thickest, second only slightly thinner, third still thinner, fourth elongate-pyriform; proportion of segments 11:11:12:14.

Pronotum a little shorter than head on median line, 15:18, over twice as broad as long, 32:15, distinctly narrowed anteriorly, the sides narrowly carinate, sinuate at middle and rounded at anterior angles. Corium longer than scutellum, apical margin sinuate, the apical angle blunt.

Abdomen about one sixth broader than width of pronotum, 39:32. Male genital capsule relatively strongly convex above and beneath, rounded and extending beyond level of apices of sixth visible abdominal segment by slightly less than half its length, 4:9; its surface rather evenly granular. Lobes of first genital segment very short, narrow, blunt at apices, reaching scarcely half the distance from level of apices of sixth abdominal segment to apex of second genital segment. Female abdomen abruptly truncate, the hind margin of sixth segment straight, the genital lobes scarcely longer than median process, projecting about one fourth the length of sixth tergite, the lobes subtriangular, rounded apically, the median process with short, parallel sides and broad, subtruncate, slightly concave apex.

Color almost entirely fusco-ferrugineous with numerous black granules. Membrane white on basal fourth, black apically. Tarsi brown.

Size: male, length 5.1 mm., width (abdomen) 1.95 mm.; female, length 5.6 mm., width (abdomen) 2.15 mm.

Holotype male, allotype female, and 17 paratypes, Barrigada, July 6, under bark of *Intsia bijuga,* Swezey; five nymphs, same data; four paratypes, Mt. Alifan, May 26, in rotten log, Usinger; one paratype, same data as holotype but July 22; one paratype, Yona, May 12, Swezey; one specimen, Dededo, Nov. 8, on taro, Swezey. The smallest male paratype is 4.75 mm. and the largest female is 5.8 mm.

Related to the Oriental (Philippines and Java) *medius* Bergroth but distinguished from that species by the long apical antennal segment. I have a closely related species from Larat (Muir) which agrees with *pacificus* in size and color but which has a more cylindrical third antennal segment, a narrower rostral groove, and slightly longer, broader, and more rounded lateral female genital lobes. This is the first species of *Neuroctenus* to be recorded from a Micronesian or Polynesian oceanic island.

Tribe CALISIINI

32. Calisius dilaticeps, new species (fig. 5).

Elongate-oval, subflattened above, with lamellately dilated anterior margins of head and variegated coloration.

Head slightly longer than broad, 24:21, subflattened and densely, coarsely granulate above, the anteocular region reaching about to apex of third antennal segment, its sides depressed and distinctly lamellate; antenniferous tubercles short, scarcely attaining apices of first antennal segments, divergent, blunt at apices; postocular spines small but distinct, bent slightly forward, not reaching as far as lateral margins of eyes. Antennae slightly shorter than width of head including eyes, 19:21.5; proportion of segments one to four as 4:4:4:7.

Pronotum three fourths as long as head and about twice as broad across humeri as long, 38:18; six distinct but small tubercles on disk of anterior lobe and two on posterior lobe; lateral margins with four well-developed denticles on each side, each tooth stout and longer than broad; humeri rounded with ill-defined granular elevations.

Scutellum 2.5 times as long as pronotum, distinctly narrowing to slightly beyond middle, then briefly dilated at apical fifth beyond which it narrows roundly to subflattened

apex. Disk strongly triangularly elevated at middle of base with four basal tubercles, a subbasal, obliquely transverse carina laterally on either side, a marginal granular carina and a median longitudinal carina, this last decreasing posteriorly, granular, with two small white granules at apex. Connexivum less than half as broad as scutellum at level of apex of corium, 9:23, evenly arcuate, distinctly elevated laterally, with a double row of short but distinct, bluntly rounded denticles, 3 pairs to each segment, these denticles about half as long as denticles on antero-lateral margins of pronotum.

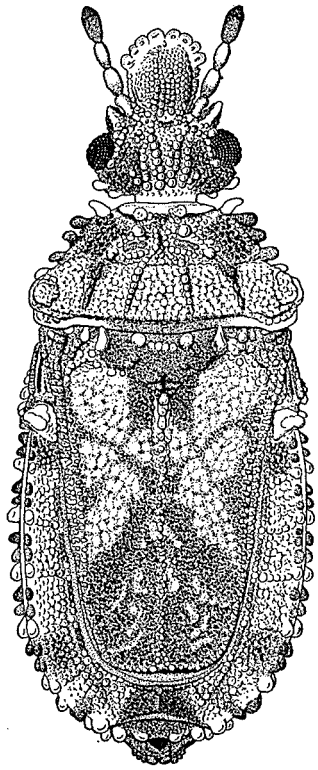

FIGURE 5.—*Calisius dilaticeps:* dorsal view of male showing number and arrangement of granules and tubercles.

Under surface convex and superficially punctured, the thoracic sterna flat and glabrous and impunctate at middle. Ostiolar canal with three prominent, blunt denticles along anterior margin. Eighth abdominal segment large beneath and produced postero-laterally into slender, apically obtuse arms on either side of genital segment. Male genital capsule convex, roundly elevated posteriorly and ventrally along middle and produced upward at middle postero-dorsally. A strongly arched median hood over genital capsule dorsally just behind connexivum proper, this short hood with a subflattened, elongate-oval tubercle on either side.

Color variegated white, ochraceous, and brown, the head white with brown eyes and postocular region laterally except for white postocular spines, the pronotum whitish ochraceous with brown antero-laterally, white anterior-most lateral denticles, and brown discal tubercles on posterior lobe; hind margin white with a brown submarginal carina just in front of scutellar base. Scutellum whitish with brown basal elevation and a brown

semilunar marking on either side just beyond this, a sublateral brown spot near middle of disk and irregularly brown apical fourth of disk extending further forward along either side of median carina. Connexivum ochraceous to whitish with first or first and second pair of denticles on each segment brown and entire disk just in front of genital segments brown. Antennae infuscated basally and apically. Legs pale with brown at base and middle of femora, at middle of tibiae and on claws. Under surface of thorax predominantly pale brownish, of abdomen whitish with brown genital segment medially.

Size: male, length 2.5 mm., width (pronotum) 0.95 mm., (connexivum) 1.05 mm.

Holotype male, and one male paratype, Machanao, June 30, beaten from dead leaves of a fallen tree, Usinger.

This species runs to the Australian *interveniens* Bergroth or the Papuan *cognatus* Horvath in Horvath's key (Hist.-Nat. Mus. Nat. Hung., Ann. **11**: 623, 1913) but differs from these and all other species known to me, except an undescribed species from Rapa, in its lamellately dilated margins of anteocular portion of head. The proportions of antennae, head, pronotum, and scutellum, and the size and arrangement of pronotal and connexival denticles are also distinctive. This is the first *Calisius* to be described from north or east of Fiji but I have species from Tahiti, Samoa, and Rapa, and others will surely turn up with further collecting. *C. pacificus* Kirkaldy from Fiji is impossible to place from Kirkaldy's inadequate description, and the head is missing from the type. It differs from *dilaticeps* in that the spines on the lateral margins of the pronotum are shorter, the scutellum is longer and feebly widened beyond apical third, and the median carina of the scutellum is more distinct.

Superfamily TINGOIDEA

Family TINGIDAE

33. Tingis guamensis Drake, Washington Acad. Sci., Jour. **31**: 142, 1941.

Six specimens, Tarague, May 17, on *Premna gaudichaudii,* Usinger; three specimens, Ritidian Point, June 2, Usinger.

Agrees fairly well with the original description except that the third antennal segment is nearly three times as long as fourth, 40: 14, the costal area is triseriate rather than mostly biseriate, the subcostal area four- or five-seriate rather than "six areolae deep in widest part." The lateral pronotal carinae are very indistinct in this species. Size in the present series is as follows: male, length 2.9 mm., width (hemelytra) 1.35 mm.; female, length 3 mm., width (hemelytra) 1.5 mm.

Superfamily REDUVIOIDEA

Family ENICOCEPHALIDAE

34. Oncylocotis swezeyi, new species.

Small, parallel-sided, hemelytra short, color uniformly dark brown above, densely clothed with an erect pubescence, the individual hairs bent at the tips.

Head about one third longer than pronotum on median line, the front lobe two thirds longer than hind lobe, eyes relatively small, one fourth as wide as interocular space. Hind lobe as wide as front lobe across eyes, three fourths as long as broad, evenly, transversely oval, the ocelli inconspicuous, scarcely projecting. Antennae as long as distance from head to middle of pronotum, the first segment exceeding apex of head, third and fourth segments relatively stout but fusiform; proportion of segments one to four as 7 : 20 : 15 : 18.

Pronotum broader than long, 40 : 36, the transverse impressions very distinct; proportional length of lobes from anterior to posterior on median line, 10 : 17 : 10; proportional widths of same, 18 : 34 : 40. Middle lobe with a distinct, inverted Y-shaped impression at middle and a distinct, glabrous, tripartite impression on either side. Front margin nearly straight, hind margin slightly concave.

Hemelytra short, not quite reaching tip of abdomen, the veins each with two rows of erect, long hairs bent at their tips. Venation as in *basalis* (Westwood) and all other members of this genus.

Legs stout, the front femora three times as long as greatest thickness. Tibiae four fifths as long as femora, a little more than one third as wide at apex as long, with several stout spines at inner apex. Hind femora but little longer than front femora and just as wide though subflattened and hence not so stout.

Color uniformly brown above except for fulvous antenniferous tubercles and juga, and slightly paler extreme bases of coria. Antennae ochraceous, the second segment more brownish. Rostrum fulvous. Legs brown with ochraceous knees and tarsi.

Size: length 4.5 mm.

Holotype female, Agana Spring, May 4, in rotten *Pandanus* log, Swezey.

Very close to *bakeri* (Bergroth) from Laguna, Los Banos, and Mount Maquiling on Luzon. Topotypic specimens of both sexes of *bakeri* were collected by me on Mt. Maquiling. The females of *bakeri* are longer (5 mm.) and relatively more slender than in *swezeyi,* the hind lobe of the head is less strongly transverse and the color, as described by Bergroth, is quite distinctive. The hemelytra are dark brown with pale across their entire bases including clavus and corium and the hind lobe of the head is quite pale. Four female specimens from Manila, collected by C. S. Banks and loaned to me from the Museum of Comparative Zoology, are apparently identical with *swezeyi,* though I have not labeled them as paratypes because of the possibility of differentiation under insular isolation.

Other Oceanian species of this group are before me from Fiji (*fungicola* Kirkaldy), New Hebrides, the Solomon Islands and New Guinea. I am indebted to O. Lundblad of the Naturhistoriska Riksmuseum in Stockholm for the loan of one of Stål's cotypes of *nasuta,* the genotype of *Oncylocotis* Stål. It now becomes clear that all of the robust, densely pubescent species allied to *basalis* Westwood and formerly included in the genus *Enicocephalus* Westwood actually belong in Stål's genus.

I take pleasure in dedicating this first Micronesian species of Enicocephalidae to O. H. Swezey, my companion during the field work on Guam and a constant source of inspiration during my stay in the Pacific.

FAMILY REDUVIIDAE

SUBFAMILY EMESINAE

35. Hadrocranella pallidicoxa, new species (fig. 6).

Body and appendages without long, erect hairs, the head and pronotum largely clothed with a dense coat of appressed pubescence, antennae with very short, fine subappressed hairs, middle and hind legs scarcely, very inconspicuously pubescent. Front coxae, trochanters and femora with longer, erect hairs most of which are shorter than leg diameter.

Head one fourth longer than broad across eyes, anterior lobe with an anteriorly bifurcate glabrous area at middle of postantennal region. Hind lobe evenly convex and evenly rounded behind, not impressed. Antennae about half again as long as body, 162: 105; proportion of segments one to four as 68: 60: 25: 9; slender throughout. Proportion of rostral segments, 15: 7: 10, the first segment moderately thick and curved, second strongly swollen, thicker than first, third very slender, slightly curved apically.

Pronotum about as broad across humeri as length of head, one fourth longer than broad, the anterior lobe one third as long as posterior lobe, with a conspicuous, tripartite glabrous area on either side. Hind lobe moderately elevated with an ill-defined depression along middle, its posterior margin concave before mesonotum. Mesonotum small, convex, two thirds as long as broad and briefly, broadly angulate posteriorly without a spine. Metanotum with a distinct, slender, tapering, pubescent spine directed posteriorly and dorsally about on a level with hemelytra, scarcely longer than mesonotal disk. First abdominal tergite with a relatively short, erect, stout, pale spine bent backwards and rounded at apex.

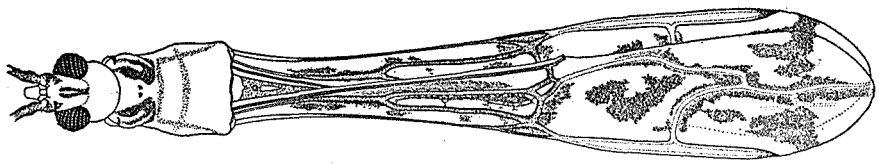

FIGURE 6.—*Hadrocranella pallidicoxa:* dorsal view of male showing venation and coloration of hemelytra.

Hemelytra long and slender, five times as long as greatest width, the venation as in *Emesopsis* (*Hadrocranella*) *neptunis* McAtee and Malloch. Abdomen about three times as wide subapically as subbasally. Legs very long, the hind femora exceeding tip of abdomen by three fifths the length of abdomen, very feebly thickened apically. Front legs without visible spines.

Median posterior process of male genital capsule broad and curved upward and outward on basal half, slender, tapering, and bent upward apically. Claspers long, broad, slightly narrowed subapically and rounded at apex, bent slightly inward towards the apex. Female abdomen simply tapering to subtriangular apex.

Color brown with gray pubescence on head and pronotum. Hemelytra pale and hyaline with brown veins on basal half except for extreme base, the stigma very pale fulvous. Cells with brown markings as follows: along outer side of main vein beyond level of apex of metanotal spine, narrowly and somewhat reticulately in elongate corial cell, generally at middle of hemelytron, at base of discal cell, broadly and subtriangularly at middle of discal cell with a broad hook-shaped pale area intruding from inner side, narrowly along lateral and apical margins of discal cell, along other veins in apical portion of hemelytron, and at middle of two apical cells. Antennae pale with fuscous annuli basally, subbasally, at middle, and subapically on first segment, subbasally on second segment and only vaguely elsewhere. Front coxae entirely pale or very faintly embrowned subapically, femora lightly infuscated on basal half, a little beyond middle, and broadly subapically. Tibiae brown

subbasally. Middle and hind legs pale, the femora fusco-annulate a little beyond middle and subapically and the tibiae subbasally.

Size: length 5 mm.

Holotype male, Dededo, May 11, on *Cycas,* Usinger; allotype female, three paratypes, Machanao, June 4, Usinger; three paratypes, Mt. Tenjo, May 3, Usinger; one paratype, Barrigada, June 12, Usinger.

Allied to *obsoletus* McAtee and Malloch from Singapore and *medusa* Kirkaldy from Fiji, but these species have distinctly fusco-annulate front coxae and the hemelytra are scarcely more than three times as long as broad. Horvath's name has been used in a generic sense because these Oceanian species differ in so many characters from the typical *Emesopsis.*

36. **Emesopsis pilosus,** new species (fig. 7).

Entire body and appendages clothed with long, fine, erect hairs with bent tips. Body relatively short and broad, pronotum strongly constricted, unarmed. Mesonotum unarmed, metanotum with a distinct spine and first abdominal tergite tuberculate.

Head longer than broad, 22: 17; densely clothed with an appressed pubescence interrupted on front lobe between eyes by two longitudinal, anteriorly divergent, glabrous lines. Hind lobe rounded behind, strongly convex, and almost imperceptibly longitudinally impressed along middle. Entire head beset with long, erect, apically curved hairs in addition to the short appressed pubescence. Antennae a little shorter than length of body from tip of tylus to apex of abdomen, 149: 155; proportion of segments one to four as 63: 38: 34: 14; the segments not noticeably enlarged apically; first segment with moderately long, apically shorter, apically directed, straight hairs, third and fourth segments with extremely fine, inconspicuous appressed hairs. Rostrum stout, curved, proportion of segments 12: 6: 8, the first segment distinctly pubescent, second segment swollen and glabrous, third slender.

Pronotum a little longer than head, 25: 22; strongly constricted, the front lobe two thirds as long as hind lobe, the hind lobe as broad across humeri as entire length of pronotum. Disk convex, without lateral carinae, the hind lobe roundly elevated to hind margin, this last roundly concave in front of scutellum. Disk irregularly clothed with short, appressed pubescence interrupted by three glabrous fasciae on either side of front lobe, and beset with many long, erect, apically curved hairs. Mesonotum about as long as wide, strongly convex but unarmed. Metanotum with a well developed spine, first abdominal tergite with an erect, blunt, spine-like tubercle.

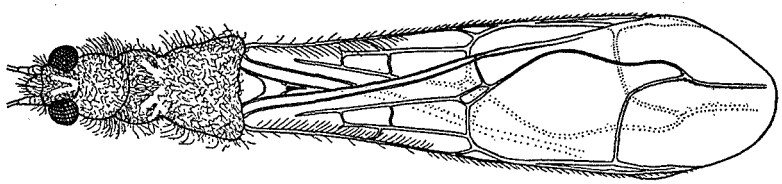

FIGURE 7.—*Emesopsis pilosus:* showing pilosity and details of venation.

Abdomen almost three times as wide just beyond middle as subbasally, the hind margin of first visible ventrite shallowly, roundly emarginate. Ventral surface beset with scattered, long, slender hairs.

Hemelytral venation as in *Emesopsis gaius* McAtee and Malloch (Philippine Jour. Sci. 30: pl. 1, fig. 3, 1926), the apical vein with a faint suggestion of a vein stump beyond apex of discal cell. Hemelytral margins with rows of fine, erect, apically curved hairs.

Legs relatively short, the hind femora reaching about to apices of hemelytra. Front tarsi two-segmented. Front femora with one or two inconspicuous spines among the dense

hairs at base. Front coxae and femora with relatively long, erect hairs. Middle and hind femora with exceedingly long, erect, apically curved hairs except at bases, the hairs about 4 or 6 times as long as diameter of femur. Tibiae with equally long hairs on basal half but diminishing apically.

Color rather uniformly light brownish to fulvous, the eyes dark brown, the legs very pale brown with the following slightly darker annulations faintly visible: apical half of front coxae and middle, subapices and apices of femora. Hemelytra with membranous areas subhyaline without fuscous markings.

Size: length 4.4 mm.

Holotype female, Machanao, June 30, Usinger.

This species occupies an anomalous position, not fitting precisely into any of the subgenera of McAtee and Malloch. It should perhaps be the type of a new subgenus but I do not wish to take such a step with only a single female specimen. It fits typical *Emesopsis* most closely but differs in having one or two spines at bases of front femora, distinct, trifasciate glabrous areas on either side of front lobe of pronotum and an obscure stump of a vein on apical vein just beyond discal cell. It differs specifically from the Oriental species of *Emesopsis* in its small size and immaculate hemelytra. From the Antillean genotype, *nubilus* Uhler, it differs in possessing the spines at base of front femora and in the relatively shorter third antennal segment.

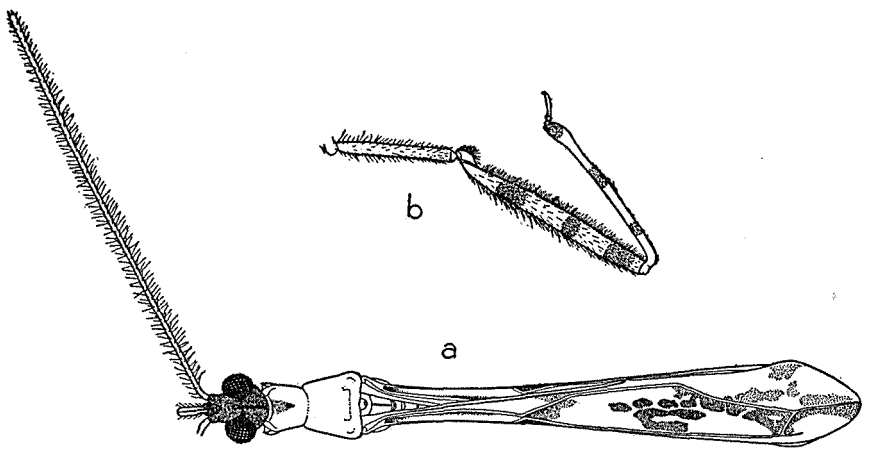

FIGURE 8.—*Ademula distincta:* **a**, dorsal view of male showing details of venation and pilosity of first antennal segment; **b**, foreleg showing pilosity and ventral spines on femur.

37. Ademula distincta, new species (fig. 8, *a, b*).

Head and pronotum above with only short pubescence, under surface of head, front coxae and femora and first antennal segment with long, erect hairs.

Head as long as wide, antenniferous tubercles projecting prominently above bases of juga. Eyes large, half again as broad as interocular space, hind lobe of head rounded behind, feebly longitudinally impressed along middle. Antennae over half again as long as

body, 209: 130, proportion of segments one to four as 83: 83: 30: 13; slender throughout. Proportion of rostral segments about 13: 10: 13; middle segment only moderately swollen at middle, not exceeding greatest thickness of first segment.

Pronotum strongly constricted in front of middle, the front lobe about two thirds as long as hind lobe, rounded and smooth laterally, slightly granular at middle and impressed just behind middle. Hind lobe more coarsely granular, moderately convex with a broad longitudinal impression along middle nearly as long as broad across humeri, 24: 26; laterally only faintly carinate. Anterior disk pubescent, especially laterally, posterior disk without pubescence and without spines or processes. Hind margin shallowly but distinctly angulately emarginate.

Mesonotum three fourths as long as broad, with an erect spine at middle, the spine half as long as mesonotum. Metanotum scarcely spined, with a very short subacute tubercle at apex. First abdominal tergite with a prominent, erect spine about the size of mesonotal spine.

Hemelytra very long and slender, six times as long as greatest width, the venation as figured for *Ademula reticulata* McAtee and Malloch (Philippine Jour. Sci. 30: pl. 3, fig. 23, 1926).

Legs relatively long and slender, the hind femora exceeding tip of abdomen by about one seventh their total length. Middle and hind femora not conspicuously enlarged apically. Front femora with four well-developed spines on basal half. Front tarsi apparently two segmented.

Abdomen more than twice as broad subapically as subbasally. Male with a short, rounded tubercle on either side of hind margin of pregenital segment. Genital capsule biemarginate apically as seen from behind with a broad, apically rounded process between, this process twice as long as broad at apex. Claspers elongate, about as long as posterior process, rounded apically. Female with a small, rounded process on either side of subapical tergite.

Color pale, testaceous, with brown head, brownish base and apex of rostrum, and irregularly and faintly infuscated first antennal segment except for pale apex. Subbasal, median, and subapical brown annulations on front femora and tibiae, at least subapical annulations on middle and hind femora and various brown hemelytral markings as follows: main veins at middle of basal third, broad suffusion slightly in front of middle of hemelytron rather broadly broken by large reticulations at middle, and along inner margin of apical half of discal cell and across this vein to middle of inner apical cell.

Size: length 6.3 mm.

Holotype male, allotype female, and seven paratypes, Mt. Tenjo, May 3, Usinger; two paratypes, Mt. Chachao, May 16, Usinger; three paratypes, Dedodo, May 11, on *Ochrosia* and *Cycas,* Usinger; one specimen, Upi Trail, May 5, Usinger.

Very close to *Ademula reticulata* McAtee and Malloch, from Singapore, Borneo, and the Philippines, despite the apparently two-segmented front tarsi and the absence of uniformly long hairs on head and anterior lobe of pronotum. The hemelytra are only about four times as long as greatest width in that species, and the fuscous markings of the hemelytra are more extensive. From the present material I am not able to judge whether this is an unwarranted extension of the generic concept of *Ademula* or not. I collected a new species which is very close to this at Los Banos, Luzon, but this species has much longer hairs on the legs and on the first antennal segment, the mesonotal spine is longer, the black subapical annulations are strikingly narrow on the first antennal segment and on the middle and hind femora, and the posterior process of

the male genital capsule is narrower at base and broader and rounded apically. Both of these species will run directly to *Empicoris* in McAtee and Malloch's key but they obviously have nothing to do with this genus, the venation, in particular, referring them directly to *Ademula.* Kirkaldy's Fijian *calamine* is related to *distincta* but has shorter hairs on the first antennal segment, has a smoother pronotum with long, fine hairs anteriorly and laterally, and is shorter and broader with differently colored hemelytra.

38. Empicoris tessellatus McAtee and Malloch, Philippine Jour. Sci. **30**: 131, 1926.

Piti, July 5, on mango leaves, Swezey.

A single, apparently perfectly typical female of this species. The unique type is from Singapore. Kirkaldy's Fijian *euryale* is close to this, but has long hairs on the first antennal segment and differs in coloration.

39. Empicoris minutus, new species.

Head as long as broad, the antenniferous tubercles prominently elevated anteriorly; hind lobe broadly rounded behind, longitudinally impressed along middle. Surface of head minutely pubescent, the hairs appressed to the surface. Antennae nearly half again as long as body, 207:142; proportion of segments one to four as 82:82:30:13; not swollen near apices of segments. Rostral segments as 8:5:7, glabrous, the middle segment moderately enlarged.

Pronotum about as long on median line as head and equally broad across humeri; only moderately constricted, the disk with a fine appressed pubescence interrupted by glabrous areas on anterior lobe. Lateral carinae distinct on anterior half of hind lobe, decreasing in height toward the middle of hind lobe. Hind margin trisinuate, the edge concave and a little elevated at middle, depressed on either side of this. Mesonotum with a well-developed spine projecting at about a 45-degree angle to the longitudinal body axis, usually straight and appearing to be minutely, finely granular-pubescent throughout. Metanotum with an equally prominent, more pubescent spine. Spine of first abdominal tergite prominent, erect, bent slightly backward and slightly globose at apex.

Hemelytra essentially as in *rubromaculatus* (Blackburn), scarcely more than 4 times as long as greatest width and distinctly exceeding tip of abdomen.

Male genital capsule produced posteriorly into two tapering, subapically outwardly bent arms, the distance between apices of these arms three fourths as great as the depth of the emargination thus formed. Claspers large, rounded at apices, as broad as distance across posterior genital arms.

Legs very long, the hind femora exceeding tip of abdomen by more than one third their length. Middle and hind legs not swollen except at bases of hind femora. Here at basal eighth, each femur is half again as thick as at middle.

Color brown with ochraceous ill-defined longitudinal carinae on disk of hind lobe of pronotum, pale hind margin of pronotum, white lateral carinae of pronotum, infuscated mesonotal spine, white metanotal spine and dark glabrous spine on first abdominal tergite. Hemelytra predominantly brown, broken up by a network of irregular pale lines, the stigma pale with two brown spots near the middle, the apex usually tinged with reddish or orange. Under surface brown, with very short, pale pubescence, white spiracles, pale genital capsule including arms, and dark brown claspers. Appendages white annulated with brown. Rostrum with 5 brown annulations. First antennal segment with 11 annulations, the first one at extreme base and the last the longest, subapical; second segment with 10; third with 3; fourth with 2. Front coxae with an ill-defined brown spot at basal third, the apical third almost entirely brown. Front femora brown except for two

pale rings just beyond middle and narrowly pale apex. Front tibiae pale at extreme base and just before and just beyond middle. Middle femora with 9 short brown annulations, the tibiae with 14 or 15, those near the apex being indistinct. Hind femora with 14, the one nearest apex about as long as apical pale area. Tibiae with 13 or 14 annulations.

Size: length 3.6 to 3.8 mm.

Holotype male, Inarajan, May 7, Swezey; allotype female, Machanao, June 4, Usinger; three paratypes, same data as allotype, collected on dead leaves of a fallen tree; one paratype, Machanao, June 30, Usinger; one paratype, Tumon Beach, May 30, in dead *Barringtonia* leaves curled by caterpillars, Swezey; one specimen, Piti, Sept. 26, on mango, Swezey.

Three specimens from Hawaii apparently belong here although they have not been included in the paratype series because of possible differences due to insular isolation. One of the Hawaiian examples was collected by Timberlake at Naalehu, Hawaii, August 19, 1919, on ferns, another is from Pupukea, Oahu, Jan. 23, 1929, E. H. Bryan, Jr., and a third, damaged, specimen is from Kewalo, Dec. 8, 1908.

Typical *rubromaculatus,* which I have collected from the slopes of Mauna Loa, is much larger, 5 to 5.5 mm., with the first antennal segment usually slightly longer than second, mesonotal spine white and usually bent downward parallel with the longitudinal axis of the body. The hind femora are only feebly thickened basally and the annulation nearest the apex is distinctly longer than apical pale area. The arms of the male genital capsule are most distinctive, being shorter and more strongly divergent posteriorly, the distance across apices being greater than the depth of the emargination thus formed.

Subfamily SAICINAE

40. **Polytoxus pilosus,** new species (fig. 9, *a-d*).

Relatively large, pale in color with obscure median longitudinal fascia above, clothed with long, fine, erect hairs.

Head a little longer than broad across eyes, 37 : 32. Antennae slightly shorter than body, 175 : 190, proportion of segments one to four as 75 : 26 : 50 : 24.

Pronotum on median line nearly twice as long as head, 70 : 40; front lobe elevated, narrowed anteriorly, nearly as long as broad behind, 35 : 40. Hind lobe about twice as broad across humeri as long, 58 : 30; lateral spines acute, four fifths as long as width across humeri, 48 : 58, directed laterally and slightly forward.

Mesonotal spine acute; about as long as pronotal spines. Metanotal spine blunt at apex, about half as long as the other spines.

Hemelytra reaching almost to apex of abdomen, the connexivum moderately exposed on either side. Legs relatively long, the hind femora slightly exceeding apex of abdomen.

Male genitalia distinctive, the claspers four times as long as greatest width, broadest on basal half, then bent upward and tapering to slender but obtuse, slightly inwardly bent apex. Posterior process arising from broadly produced apical margin of genital capsule, about two thirds as long as claspers, laterally compressed to form a thin, plate-like process which is about one third as wide just behind middle as long, narrowest at base and at apical third, the apex subtruncate, being more produced postero-ventrally.

Female with hind angles of last connexival segment produced into distinct, acute spines slightly inwardly turned at apices. Pygidium convex, broadly rounded dorsally, strongly rounded laterally and then convergent to broad, slightly arcuate ventral margin.

Color ochraceous to fulvous with brownish head, antennae, rostrum and an ill-defined longitudinal fascia along middle of thorax and hemelytra. Apices of pronotal and mesonotal spines brownish. Under surface largely pale, the thoracic pleura and abdominal venter faintly brownish. Legs pale with fuscous subapically on femora, apically on tibiae, and on tarsi.

Size: length 9.5 mm., width (across humeri) 1.5 mm.

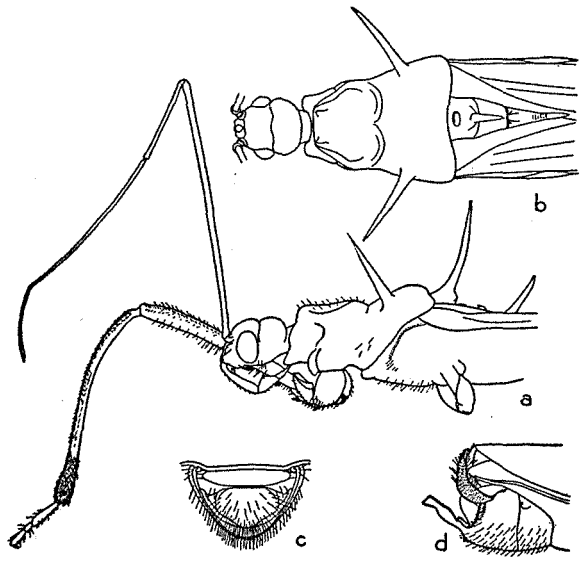

FIGURE 9.—*Polytoxus pilosus:* a, lateral view of head and thorax of female; b, dorsal view of head and thorax of female; c, posterior view of female genital segment; d, side view of genital capsule of male showing armlike claspers and median process.

Holotype male, allotype female, and eight paratypes, June 8, Inarajan, at bases of rice clumps, Swezey and Usinger; one paratype, June 25, Inarajan, Usinger.

Approaches the Samoan *similis* China in size but differs in the relatively shorter first and second antennal segments, the differently formed female genital plates, the longer metanotal spine, and probably in the pilosity and male genitalia, though these characters are not mentioned. The Philippine *longipes* Stål must be close to this according to the very brief and inadequate original description but runs to a different section of the genus devoid of a dorsal fuscous vitta in Stål's key (Enum. Hemipt. 4:91, 1874). *Pilosus* agrees closely with *vagans* Miller in size, form of male genitalia, apical abdominal spines of female and even in thoracic spines, though the pronotal spines are somewhat longer and the mesonotal spine is much longer in *vagans*.

41. Polytoxus marianensis, new species (fig. 10, *a-d*).

Small, sparsely, inconspicuously pilose with distinct longitudinal fascia dorsally, relatively short pronotal spines, and distinctive genitalia.

Head distinctly longer than broad across eyes, 37 : 27. Antennae five sixths as long as body, proportion of segments one to four as 60 : 20 : 40 : 25.

Pronotum about one third longer, on median line, than head, 53 : 37; almost as broad across humeri as long, 50 : 53; front lobe elevated, five sixths as long as broad, abruptly narrowed anteriorly, produced into short rounded elevations antero-laterally. Hind lobe about twice as broad across humeri as long on median line, the disk slightly depressed at middle and clothed with subappressed, silky hairs. Lateral spines relatively short, acute, slightly more than one third as long as width of pronotum across humeri, 18 : 50; directed laterally and scarcely forward, straight.

Mesonotal spine one third longer than pronotal spines, 25 : 18, acute, bent just before middle and directed upwards on apical half. Metanotal spine short, one third as long as mesonotal spine, bluntly rounded at apex and scarcely or only feebly bent upward apically.

Hemelytra reaching tip of abdomen, exposing connexivum moderately at sides.

Legs moderately long, the hind femora just reaching apex of abdomen; hind femora and front tibiae most conspicuously curved.

Male genitalia with claspers three times as long as greatest width, 25 : 8, nearly equal in width throughout, slightly and rather evenly curved upward, the apex broad, feebly bent inward and produced on inner dorsal angle as a small, triangular tooth. Posterior process broad at extreme base, abruptly tapering to slender main process and then scarcely tapering to acute apex which is provided with a subapical ventral tooth, thus appearing subtriangular at apex.

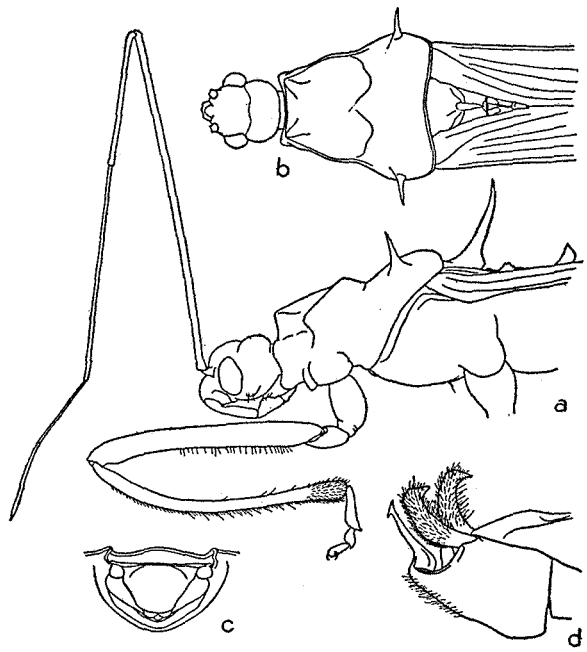

FIGURE 10.—*Polytoxus marianensis:* **a,** lateral view of head and thorax of female; **b,** dorsal view of head and thorax of female; **c,** posterior view of female genital segment; **d,** lateral view of genital capsule of male showing armlike claspers and slender median process.

Female with hind angles of last connexival segment not acutely produced, rounded. Pygidial plate rounded dorsally, concealed laterally by side pieces and thus appearing concave at ventrally convergent sides, briefly arcuate ventrally.

Color ochraceous to fulvous with a fuscous fascia well marked at middle of hind lobe of pronotum and thence extending posteriorly along middle to apices of hemelytra. Spines infuscated apically. Head, rostrum and antennae infuscated. Under side of body laterally dark brown to black. Legs pale with dark apices of femora, dark tibiae apically and subbasally, and tarsi; the knees reddish.

Size: male, length 7.65 mm., width (across humeri) 1.3 mm.; female, length 8 mm., width (across humeri) 1.4 mm.

Holotype male, allotype female, and seven paratypes, Inarajan, June 8, Usinger; four paratypes, same locality, June 25, Usinger; all taken at bases of rice clumps.

Fifty-six eggs were laid in a glass vial on June 8. When freshly laid, the eggs are white and are covered with a somewhat longitudinally striated, transparent layer of mucus which is drawn out at the micropylar end. The egg is 0.75 mm. long and 0.4 mm. at its greatest width. It is oblong-oval, broadly rounded on one side and scarcely rounded on the other, rounded posteriorly, and with micropylar end carinate around a relatively small cap, the diameter across cap half that of greatest diameter of egg. The chorion is very smooth, polished, without spines and processes, and the egg thus resembles eggs of *Reduvius* and *Triatoma* rather than those of Emesinae. Incubation period of eggs, eight days.

P. marianensis is very close to the Philippine *fuscovittatus* Stål in size and coloration but the pronotal spines in that species, according to Distant (Fauna Brit. India, Rhynch. 2: 219, 1904), are "about as long as pronotum." A more detailed comparison is impossible because of the inadequate descriptions of the Philippine species. *P. similis* China from Samoa is much larger with relatively longer second antennal segment, more acute and upright metanotal spine, and convex sides of female genital plate. A male from Houailou, New Caledonia, agrees with *marianensis* in size and in genital characters but the pronotal spines are much smaller, only one seventh as long as width of pronotum across humeri, and the color is quite different, the head, pronotum, and legs being tinged with red. The male genitalia resemble those of *selangorensis* Miller but that species is smaller with relatively longer pronotal spines.

Subfamily Reduviinae

42. Peregrinator biannulipes (Montrouzier and Signoret).

Opsicoetus biannulipes Montrouzier and Signoret, Soc. ent. France, Ann. (4)1: 69, 1861.

Machanao, June 4, Swezey, two specimens. A widely distributed tropical species recorded in the Pacific from the Marquesas, Tahiti, Fiji, Samoa, New Caledonia, and the Philippines.

43. Physoderes minor, new species (fig. 11).

Relatively small, the head half as broad as long, apical portion of scutellum about as broad as long, legs short and stout and color predominantly pale, fulvous to ochraceous on head, thorax, and appendages.

Head half as wide as long; transverse impression well developed, located just behind eyes, the anterior lobe thus delimited twice as long as the short, strongly transverse (17 : 10) posterior lobe; front lobe gradually tapering to blunt apex, the antennae inserted at its anterior third, antenniferous tubercles short, not produced, juga well developed, roundly convex, reaching to level of apices of antenniferous tubercles; eyes about one fourth as wide as interocular space. Hind lobe transverse, its hind margin broadly, evenly rounded, its sides roundly angled. Entire head sparsely clothed with curved hairs and with a pair of erect, posteriorly-directed hairs on hind margin of posterior lobe. Rostrum long, slender, tapering, proportion of segments one to three as 13 : 23 : 8. Antennae slightly longer than head, 37 : 35; proportion of segments one to four as 8 : 11 : 8 : 10.

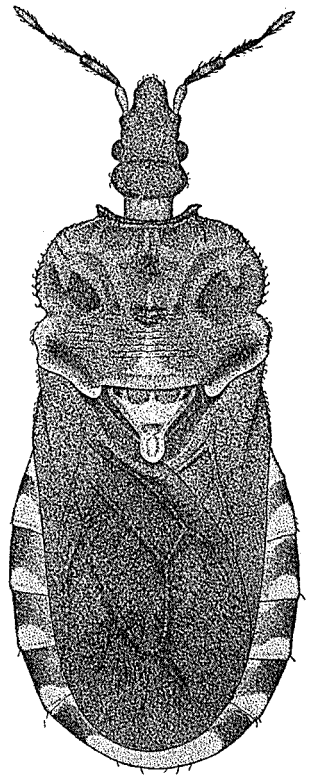

FIGURE 11.—*Physoderes minor:* dorsal view of male.

Pronotum as long on median line as head, almost half again as broad across humeri as long, 50 : 35; disk gradually sloping in back and more abruptly in front of transverse impression, the front lobe one seventh narrower than hind lobe, convex, elevated anteriorly at middle and carinate sublaterally, with four sinuate carinae on posterior part of front lobe, the two median ones connected to hind lobe which is subdepressed and transversely rugose at middle. Front margin strongly depressed and then a little reflexed, the lateral angles briefly, roundly produced. Lateral margins broadly, arcuately rounded, minutely

toothed and covered with stiff, curved hairs; constricted at transverse impression, and then abruptly flaring to rounded humeri. Hind margin feebly arcuate in front of scutellum, the parascutellar lobes relatively short, about half as long as width of posterior scutellar lobe, 3.5 : 6, straight on inner margins, sinuate on outer margins and rounded apically. Disk also depressed in front of middle of transverse impression and sublaterally beyond parascutellar lobes, glabrous between carinae of anterior lobe and very sparsely beset with sparse, subappressed hairs on posterior lobes.

Scutellum broader at base than long, 20 : 16; the sides sinuate and roundly carinate, the disk strongly depressed at base and deeply impressed as a trough on apical lobe, this last with subparallel sides, the width at this point nearly one sixth the total width of scutellum at base, 6 : 20; apex rounded.

Hemelytra complete, reaching to middle of apical abdominal tergite, exposing the connexivum a little more broadly at middle of sides of abdomen than posteriorly.

Female pygidium as broad dorsally as long, arcuate on dorsal margin, slightly concave and converging laterally, the ventral margin half as long as dorsal.

Femora relatively stout, the front femora one third as wide as long and provided with at least three very prominent spines one third as long as width of femur.

Color fulvous to dark brown and ochraceous, the head and pronotum brownish fulvous with antenniferous tubercles apically and discal carinae, lateral margins, posterior margin and posterior portion of pronotum at middle paler, fulvous to ochraceous. Scutellum whitish at least on apical two thirds, corium dark brown with paler veins apically, membrane dark. Connexivum dark brown with ochraceous posterior third to half of each segment. Under surface largely ochraceous with brownish longitudinal stripes and markings. Rostrum pale. Antennae with first segment, apical half of second and fourth segments, and joints between the segments pale. Legs ochraceous on coxae, trochanters, femora broadly at middle, tibiae subbasally and just beyond middle, and tarsi.

The male is a little smaller with the hemelytra slightly longer but still not reaching apex of abdomen.

Size: female, length 7.65 mm., width (hemelytra) 4.25 mm., (pronotum) 2.5 mm., (abdomen) 3.2 mm.; male, length 7.2 mm., width (hemelytra) 4.05 mm., (pronotum) 2.25 mm., (abdomen) 2.75 mm.

Holotype female, Dededo, May 19, taken in a rotten banana stump, Usinger; allotype male, Piti, May 22, beneath rotten breadfruit, Swezey; three paratypes, same data as holotype; five specimens, Piti, May 22, 23 and 26 and Oct. 27, in rotten banana log and breadfruit, Swezey and Usinger; four specimens, Mt. Alifan, May 26, in rotten papaya log, Usinger; and two specimens, Yigo, Nov. 13, in rotten banana stem, Swezey.

P. minor has the short head with the roundly angulate posterior lobe of *javanica* Miller but is smaller and has an unusually broad apical scutellar lobe. *P. fuliginosa* Stål, which I collected on Mt. Maquiling in the Philippines, differs in its larger size, darker coloration, longer and more slender head with rounded sides of posterior lobe, narrower apical scutellar lobe and more slender legs. *Physoderes* Westwood (= *Epirodera* Westwood) extends from Madagascar through the Oriental Region. The Oriental section of the genus is much the larger in described species, all of which differ from the Madagascar forms in the sulcate apical scutellar lobe. The center of distribution appears to be Java, Sumatra, and the Malay Peninsula. I have three species from the Philippines and a remarkable, nearly apterous species from Fiji. The Fijian and Guam species represent the easternmost extensions of the genus known to date.

FAMILY NABIDAE

44. Nabis capsiformis Germar, Sibermann's Rev. Ent. 5: 132, 1837.

Piti, three specimens, April 30, nine specimens, June 20, one specimen, June 26, Usinger; two specimens, Mt. Tenjo, May 3, Swezey and Usinger; one specimen, Piti, July 13, on sedges, Swezey; one specimen, Mt. Alifan, May 21, on *Ipomoea,* Swezey; one specimen, Fadian, Aug. 19, on *Sida,* Swezey; one specimen, 2 miles south of Piti, June 14, Usinger; three specimens, Upi Trail, May 5, Swezey and Usinger; three specimens, Machanao, Aug. 6, on spiny amaranth, Swezey; one specimen, Dededo, May 11, Usinger; one specimen, Dededo, Aug. 11, Swezey; one specimen, Talofofo, Nov. 18, Swezey.

An extremely widespread and apparently variable species. China [Ins. Samoa 2(3): 157, 1930] notes differences between typical Mediterranean and South African specimens and those from Pacific islands. He also finds that "the hind femur and the second antennal segment in the Samoan specimens are distinctly longer than in Hawaiian specimens, although the shape of the male parameres is the same."

The Guam specimens are of two types, those from Piti and Mt. Tenjo being pale in color with relatively feebly sinuate subbasal angle of male genital clasper, whereas those from Upi Trail, Machanao, Dededo, and 2 miles south of Piti are darker in color and have the male genital claspers strongly sinuate subbasally. These differences seem to fall within the limits of variation when compared with hundreds of specimens from nearly all of the principal island groups of the mid Pacific, but the presence of these two fairly distinct types on the single island of Guam is difficult to understand.

SUPERFAMILY CIMICOIDEA

FAMILY CIMICIDAE

45. Cimex hemipterus (Fabricius).

Acanthia hemiptera Fabricius, Syst. Rhyng., 113, 1803.

Agana, June 29, 1936, native collector. Recorded from New Hebrides and Samoa; probably occurs elsewhere in the western Pacific. *C. lectularius* Linnaeus is the bed bug of the Hawaiian Islands.

FAMILY ANTHOCORIDAE

SUBFAMILY LYCTOCORINAE

46. Lasiochilus marianensis, new species.

Relatively small, elongate-oval, pale at bases of coria and cuneal fractures, second antennal segment scarcely shorter than width of head across eyes. Male genital clasper, as seen from above, widened apically, with only a feeble basal ridge and without an entirely distinct apical lobe. Rostrum reaching to level of front margins of middle coxae.

Head slightly longer than broad across eyes, 17 : 14; anteocular portion a little longer than an eye, 6.5 : 5, and scarcely broader than length of an eye, 5.5 : 5; eyes relatively small, one third as wide as interocular space; disk smooth, shining, faintly rugose between ocelli and with a posteriorly arched impression between eyes. Tylus transversely rugose near middle. Disk with several long erect hairs located along inner margins and behind ocelli, between eyes, and anteriorly. Rostrum, when stretched to its fullest length, surpassing middle of mesosternum, reaching level of front margins of middle coxae; proportion of segments one to three as 6 : 16 : 9. Antennae one third longer than width of pronotum across humeri, 37 : 27, first segment reaching about to apex of head, second segment scarcely shorter than width of head including eyes, 13 : 14; proportion of segments one to four as 5 : 13 : 9 : 10.

Pronotum two thirds as long as head on median line, over twice as broad as long, 27 : 12, about half as wide at anterior margin (measured across postocular part of head) as at humeri, 13 : 27; sides feebly arcuate or almost straight posteriorly, broadly and strongly rounded only at anterior angles. Disk smooth, polished, with faint submarginal wrinkles anteriorly, a longitudinal impression faintly indicated on posterior half of large, moderately elevated median area, the short, flattened posterior area distinctly, transversely wrinkled. Middle of disk with only a few widely separated, backwardly directed hairs, becoming denser posteriorly and very dense along lateral margins, the sides with about four much longer, erect hairs and one of these on either side near anterior margin. Scutellum glabrous on basal fourth medially, dull and clothed with curved, subappressed hairs elsewhere.

Hemelytra exceeding tip of abdomen, the clavus, corium, and cuneus impunctate, uniformly clothed with moderately long, curved, subappressed, backwardly directed hairs. Embolium not quite as wide near cuneal fracture as inner portion of corium at the same level. Membrane dull except for shining narrow basal stripe.

Under surface with thoracic pleura naked, sterna with short hairs. Abdominal venter clothed with short, backwardly directed pubescence and with longer, erect hairs posteriorly and laterally. Ostiolar canal sinuate, curved slightly forward on hind margin basally and then backwardly rounded, not reaching postero-lateral margin. Legs shining, beset with scattered hairs, the front femora a little more than one third as thick as long, 6 : 16, hind femora slightly less incrassate and middle femora even less incrassate.

Male genital clasper, as seen from below (described from the Machanao paratype), sinuate, broad at base and then slightly bent forward and tapering to subacute apex which is bent feebly outward. Seen from above, the tapering portion is gradually broadened into a blade-like organ, one fifth as broad at apical fourth as entire length of clasper and rounded at apex.

Color brown, the head at apex, basal third of corium, extreme outer base of clavus, and cuneal fracture paler, ochraceous. Apical margin of membrane with a fringe of minute white hairs. Rostrum, trochanters, apices of femora, tibiae, and tarsi testaceous. Base and apex of second antennal segment often pale and last two segments dirty stramineous.

Size: length, male, 2.25 mm., female, 2.4 mm.

Holotype male, allotype female, Mt. Alifan, May 26, in rotten papaya log, Usinger; one paratype, Machanao, June 30, beating dead leaf-covered branches, Usinger; one paratype, Piti, June 10, at light, Swezey.

L. marianensis belongs to the subgenus *Dilasia* and differs in color, antennal, and rostral characters from the East Indian species *elongatus* Poppius, *bivittatus* Poppius and *fruhstorferi* Poppius. This last has been reported from Samoa [Knight, Ins. Samoa 2(5) : 228, 1935] but the identification must be regarded as provisional because no authentic material was available for comparison and the antennal proportions were noted as different. Such identifica-

tions based upon degree of correspondence to an inadequate description are of little value in this group. Reuter and Poppius evidently failed to note the striking differences existing in the form of male genital claspers in *Lasiochilus*. Furthermore, they considered *denigratus* (White) to be a single variable species with *decolor* as a variety. Kirkaldy (Haw. Ent. Soc., Proc. **1**: 196-197, 1908) showed that each of the main Hawaiian islands has a distinct species of *Lasiochilus*. Distant (Linn. Soc. London, Trans. **16**: 184-186, 1913) found an amazing number of endemics in the Seychelles and a large number of endemics may be expected among the numerous islands of Polynesia and Micronesia. *Denigratus* and other Hawaiian species differ from *marianensis, swezeyi,* and the undescribed species before me from Fiji in the large, inwardly bent apical lobe of the male genital clasper.

47. Lasiochilus swezeyi, new species.

Small, oblong-oval, with head as broad as long, pronotum strongly rounded at anterior angles, scutellum polished on entire basal half, male genital clasper very broad and flattened apically, one third as wide subapically as long.

Head about as broad as long, the anteocular part as long as an eye and as broad as length of an eye, upper surface smooth, polished, faintly rugose between ocelli; the arcuate impression between eyes obsolescent at middle. Interocular space four times the width of an eye. Tylus feebly, transversely rugose near the base. Disk with hairs much as in *marianensis*. Rostrum, when stretched out fully, reaching to intermediate coxae, the proportion of segments one to three as 7: 13: 9. Antennae one fourth longer than width of pronotum across humeri, 30: 23, first segment reaching apex of head, second distinctly shorter than width of head across eyes, 9: 12, proportion of segments one to four, 5: 9: 8: 8.

Pronotum as long as width of head and almost twice as broad across humeri as long, 23: 12; sides fairly straight on posterior half, broadly, strongly rounded anteriorly. Disk smooth, polished, slightly elevated on anterior half and continuing to hind margin at middle, depressed sublaterally on posterior half, the median elevated area with a distinct longitudinal impression becoming obsolete near anterior and posterior margins. Depressed posterior area transversely rugose. Pubescence short, scattered and inconspicuous except along hind margin and dense but short along lateral margins, with a few very long erect hairs laterally and near anterior angles.

Scutellum broadly smooth and polished on basal half except along extreme lateral margins, elsewhere dull.

Hemelytra not quite reaching tip of abdomen, the clavus, corium and cuneus impunctate, uniformly clothed with curved, subappressed, backwardly directed hairs. Embolium two thirds as wide at apex as inner corium at the same level.

Under surface much as in *marianensis,* but with ostiolar canal bent abruptly backward subapically. Femora swollen as in *marianensis*. Male genital clasper (described from the male paratype) strongly, lamellately ridged basally and broadened subapically, the greatest width one third the total length, tapering to subangulate apex.

Color brown with ochraceous apex of head, outer basal two thirds of clavus and base and inner two thirds of corium, apex of scutellum narrowly, first antennal segment, base and apex of second, and third and fourth segments, rostrum, trochanters, apices of femora, tibiae and tarsi. Coxae and femora fulvous or slightly infuscated.

Size: length, male, 2.13 mm., female, 2 mm.

Holotype male, allotype female, and one male paratype, Mt. Alifan, May 21, under bark of dead breadfruit twigs, Usinger; one specimen, Piti, Oct. 5, in dead breadfruit branches, Swezey.

Differs from *marianensis* in the broader pale areas of clavus and corium, smaller size, shorter antennae with apical three segments subequal in length, narrower pronotum with different discal sculpturing, apically more strongly dilated male genital clasper, and the large glabrous area on base of scutellum.

A single female, Upi Trail, May 5, under bark, Usinger, agrees structurally with the above description but is much darker with only the extreme bases of coria pale.

SUBFAMILY DUFOURIELLINAE

48. Physopleurella mundula (White).

Cardiastethus mundulus White, Ann. Mag. Nat. Hist. IV, **20**: 111, 1877.

Thirty-one specimens, Machanao, beaten from dead leaves of a fallen tree, June 4, Usinger; two specimens, Barrigada, June 24, Usinger.

These specimens seem to agree perfectly with topotypical specimens from Hawaii. I cannot see from the descriptions that the Japanese and Papuan species, *armata* Poppius and *obscura* Poppius, can apply to this series or that the slight differences mentioned between these two are significant.

49. Poronotus sodalis (White).

Cardiastethus sodalis White, Ann. Mag. Nat. Hist. V, **1**: 372, 1878.

Five specimens, Machanao, June 30, Usinger; 2 specimens, Piti, April 30, on *Hibiscus tiliaceus,* Usinger; one specimen, Tumon Beach, May 30, on dead *Barringtonia* leaves, Swezey; one specimen, Tarague, May 17, on cotton boll, Usinger; one specimen, Inarajan, June 8, on *Hibiscus tiliaceus,* Usinger.

Agrees perfectly with topotypic Hawaiian specimens. *Poronotus* Reuter, as redefined by Champion (Biol. Centr. Am., Hemipt.-Heteropt. **2**: 333, 1900), is known elsewhere from America, the islands of Madeira and Juan Fernandez, and from Tasmania.

50. Cardiastethus fulvescens (Walker).

Xylocoris fulvescens Walker, Cat. Heteropt. Brit. Mus. **5**: 160, 1872.

Four specimens, Machanao, June 4; one specimen, April 30, Usinger; one specimen, Piti, Oct. 9, on dead orange twigs, Swezey.

These specimens and a series from Hawaii agree fairly well with Walker's original description and with subsequent descriptions by Distant (*Amphiareus fulvescens,* Fauna Brit. India, Rhynch. 3: 4, fig. 3, 1906) and Poppius [Acta Soc. Sci. Fennicae 37(9): 19, 1909] but the second antennal segment is scarcely longer than the head width including eyes and the hind margin of the pronotum is more than twice as wide as the front margin. Specimens from Guam and Hawaii should be compared with Walker's type in the British Museum (Natural History) for positive identification. *C. fulvescens* has been recorded from Ceylon, Burma, Malacca, Singapore, Sumatra, Celebes, and New Guinea.

51. Cardiastethus minutissimus, new species (fig. 12, *a, b*).

Very small, elongate-oval, pale, the eyes and antennae strongly sexually dimorphic, rostrum reaching between front coxae.

Male: head distinctly broader across eyes than long, 15:13, the anteocular portion small, only half as long as an eye and about one third as broad as length of an eye. Eyes enormous, almost twice as wide as interocular space, 6.5:3.5, above and nearly contiguous beneath. The narrow interocular space above with ocelli closely approximate and nearly touching inner margins of eyes, slightly elevated. Rostrum reaching to apices of front coxae, the first segment very short, reaching about to level of bases of antennae; proportion of segments 4:10:5. Antennae relatively short, one sixth longer than width of pronotum across humeri, 28:24, first segment slightly surpassing apex of head, second greatly thickened, as thick apically as width of head apically, proportion of segments one to four as 4:12:5:7.

Pronotum over half again as wide as head including eyes, 24:15; distinctly shorter on median line than head, 9:13; the hind margin rather deeply concave. Side margins nearly straight, the edges distinctly carinate, especially anteriorly. Disk abruptly elevated within the sublateral depressed area, shallowly but distinctly punctate, with a distinct subflattened anterior collar and a second, convex collar behind this followed by the relatively smooth callosities. Disk deeply, broadly depressed behind callosities and then subflattened to posterior margin. Rather uniformly clothed with curved, backwardly directed hairs with similar dense hairs along lateral margins and a long, erect hair on either side at antero-lateral angle. Scutellum very superficially punctured, the disk transversely depressed, especially on either side, near the middle and clothed with moderately long, backwardly directed hairs.

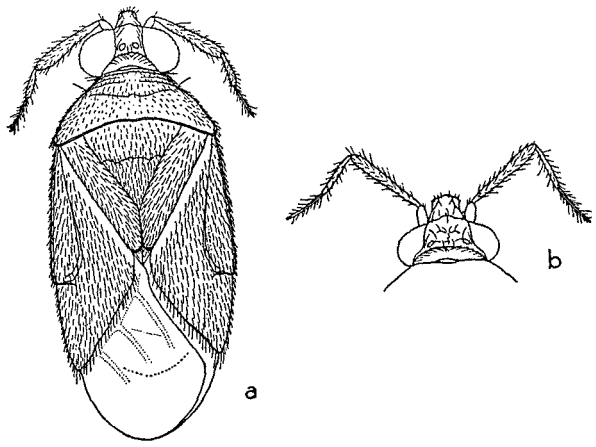

FIGURE 12.—*Cardiastethus minutissimus:* a, dorsal view of male; b, head and antennae of female.

Hemelytra broad and long, completely covering the abdomen, clavus, corium, and cuneus, scarcely punctate except for insertions of hairs, evenly and rather densely clothed with backwardly directed hairs as elsewhere, embolium about two thirds as wide near apex as inner corium at same level, costal margins feebly arcuate. Membrane with three very faintly indicated veins, one near inner margin, one near middle and one more distinct than the others at about outer third, all bent outward apically. With a fringe of fine, minute hairs along apical margin.

Under surface glabrous and punctate laterally on thoracic pleura, dull and densely punctate on metapleuron, with curved hairs on sterna and abdominal venter. Ostiolar

canal extending outward and joining postero-lateral carina which bends forward to form lateral margin of metapleuron. Legs relatively slender and unarmed, the front femora not thicker than other femora, about one fourth as thick as long.

Genital clasper about four times as long as broad, relatively simple, broadly arcuate, and bent inward as well near the tip.

Female: head slightly broader across eyes than long, 12: 11; anteocular portion nearly equal to length of an eye, 4.5: 5, and over half as wide as length of an eye, 3: 5; eyes much smaller than in the male, half as wide as interocular space, this last broadening posteriorly, the ocelli three times as far apart as width of an ocellus (one width of an ocellus apart in male) and the width of an ocellus distant from eyes, disk with some long hairs near ocelli and short erect hairs on eyes. Antennae but little longer than width of pronotum, 25: 23; first segment reaching apex of head, second much shorter than width of head, 9: 12, gradually thickened toward apex and there only two thirds as thick as width of head at apex; proportion of segments one to four as 3: 9: 5: 8. Costal margins a little more strongly arcuate behind middle than in male. Abdomen without an ovipositor.

Color ochraceous to yellowish testaceous, the hairs very pale, eyes brownish, ocelli tinged with red, membrane uniformly, lightly clouded. Under surface mostly pale fulvous and appendages testaceous.

Size: length, male, 1.7 mm., female, 1.5 mm.

Holotype male, allotype female, and six paratypes, Machanao, June 4, beaten from dead leaves of a fallen tree, Usinger; other paratypes: six, Agat, May 31, on *Calophyllum inophyllum,* Usinger; one, Agana Swamp, May 25, *camachile,* Usinger; one, Mt. Alifan, June 27, on dead, leaf-covered branches, Usinger; one, Ritidian Point, June 30, Usinger; three, Machanao, June 30, Usinger; two, Piti, April 30, in leaves of *Hibiscus tiliaceus* rolled by pyralid caterpillars, Usinger; one, Yona, May 12, on *Ficus,* Usinger; one, Agat, Oct. 17, on *Calophyllum,* Swezey; one, Piti, Oct. 27, on bamboo, Swezey.

This is not closely related to any *Cardiastethus* known to me and should possibly form the type of a new genus. However, it has the ostiolar canal of a *Cardiastethus,* lacks an ovipositor and keys out satisfactorily to this genus. It differs from *ophthalmicus* Reuter in its small size, pale coloration, and short second antennal segment. It agrees in some respects with *pergaudei* Reuter and *minutus* Poppius but differs in its shorter second antennal segment, relatively shorter head, and strong sexual dimorphism.

52. Scoloposcelis parallelus (Motschulsky).

Anthocoris parallelus Motschulsky, Soc. Nat. Mosc., Bull. 36(3): 89, 1863.

Thirty-five specimens, Machanao, June 30, under bark of dead *Elaeocarpus,* Swezey and Usinger; one specimen, Upi Trail, May 5, in dead limb of *pago,* Usinger.

The femoral spines are minute but distinct. The species has been reported from Ceylon, Engano, Mentawei, Aru Islands, Java, and Formosa, and is said to be widely distributed in tropical Asia (Poppius, Wien. Ent. Zeitung 29: 140, 1910).

FAMILY MIRIDAE

SUBFAMILY MIRINAE

53. Trigonotylus brevipes Jakowlef, Horae Soc. Ent. Ross. **11**: 63, 1880.

Five specimens, Upi Trail, May 5, on grass, Usinger; two specimens, Atantano, Sept. 3, rice seedling plot, Swezey; two specimens, Taragüe, May 17, on grass, Swezey; one specimen, Piti, Sept. 1, rice seedling plot, Swezey; one specimen, Piti, Nov. 5, swept from lawn grass, Swezey; one specimen, Guam, Fullaway (1198).

Reuter [Acta Soc. Sci. Fennicae 36(2): 6, 1909] and Poppius (Arch. Naturges. **80A**: 44, 1914) took a broad view of this species, recording it as widespread in the tropical and subtropical regions of the Old and New Worlds. Knight [Ins. Samoa 2(5): 210, 1935] questioned this but recorded the species without further comment from Samoa. My Oriental specimens from Guam, the Philippines, and Macao differ from California specimens as follows: the body is usually tinged with pink on the antennae and less conspicuously on the head, pronotum, coria, and apices of legs; the first antennal segment is shorter than width of head across eyes, 9: 12; the second antennal segment is but little longer than third, 26: 23; the first segment of hind tarsi is distinctly longer than the second and third together; and the rostrum usually reaches almost to apices of middle coxae. These characters might be considered sufficient to place it as *ruficornis* (Geoffroy) but the matter had best await a thorough study of this nearly cosmopolitan genus.

SUBFAMILY CAPSINAE

54. Hyalopeplus guamensis, new species (fig. 13).

Elongate with sides subparallel, shining above with pubescence limited almost entirely to costal margins posteriorly, disk of cuneus, and appendages.

Head broader across eyes than long, 27: 22; highly polished in front of eyes and duller behind this, the tylus strongly elevated, depressed at hind margin and disk of head convex behind this, the surface faintly, obliquely, arcuately rugose between the eyes. Rostrum reaching apices of middle coxae; proportion of segments 30: 32: 20: 30. Antennae one tenth shorter than length of insect to tip of abdomen, 135: 150; the second segment as long as costal margin of corium and first segment scarcely longer than width of anterior collar of pronotum, 20: 19; proportion of segments 20: 74: 25: 16; first segment thickest, second gradually enlarged to apex; third and fourth segments slender.

Pronotum as long as width of head across eyes, over half again as wide across humeri as long, 42: 27, and over twice as wide across humeri as width of anterior collar, 42: 19. Collar one fifth as long as wide, convex and strongly constricted behind, its surface not rugose. Callosities subdepressed and not conspicuously rugose, about twice as long as length of collar. Pronotal disk behind this rather strongly convex, very distinctly, densely rugose, the wrinkles interrupted by ill-defined punctures. Hind margin narrowly smooth and impunctate, feebly sinuate and turned down at middle, rounded and then sinuate and slightly reflexed sublaterally. Humeral angles extending, plate-like, over bases of hemelytra, nearly right-angular. Lateral margins slightly but distinctly concave, feebly sinuate

near the middle. Scutellum (including mesoscutum) slightly longer than pronotum, 30:27; longer than broad, 30:26. Disk behind mesoscutum feebly depressed at middle and distinctly, finely, transversely rugose.

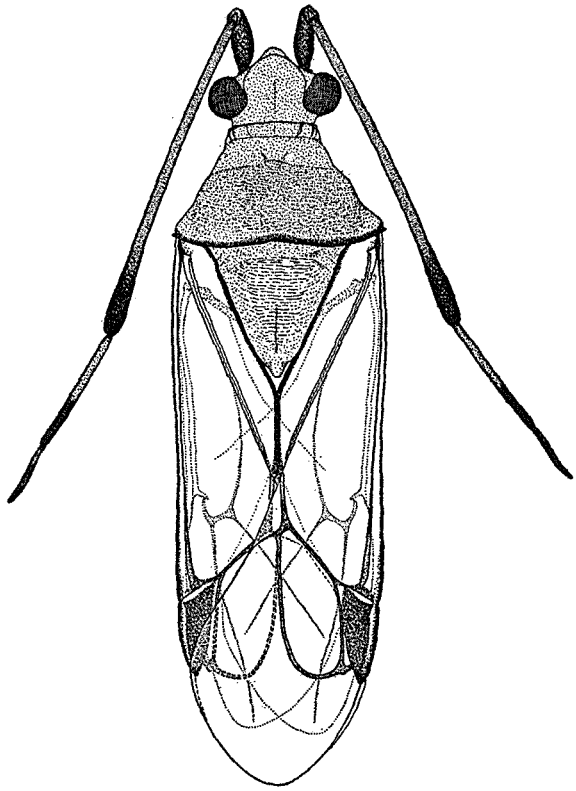

FIGURE 13.—*Hyalopeplus guamensis:* dorsal view of female.

Hemelytra greatly exceeding apex of abdomen, the costal margins gradually dilated to basal third, narrowed behind this and subparallel posteriorly; clavus, corium, and membrane clear hyaline, with only the costal margins and cuneus partially opaque and beset with short, stiff, black hairs postero-laterally.

Under surface smooth with short pubescence on abdominal venter and legs.

Color yellowish ochraceous with two long, interrupted brown stripes laterally and one short median stripe on tylus, a median longitudinal brown stripe on vertex, seven longitudinal stripes on collar. Brown elsewhere as follows: hind margin of pronotum narrowly, eyes, inner margin and commissure of clavus, veins of hind wings and membrane, and apex of rostrum. Cuneus mostly reddish and costal margin of corium and cuneus light brown to ochraceous posteriorly. Antennae reddish with brown at extreme base and apex and brown spots on inner basal half of first segment, brownish apex of second segment, and ochraceous bases and brownish apices of third and fourth segments. Front and middle legs pale with reddish apices of tibiae and reddish tarsi except for brown apices and claws. Hind femora pale with brown spots and red apices, tibiae and tarsi red with brown tarsal apices and claws.

Size: length 7.5 mm., width (basal third of hemelytra) 2.15 mm.

Holotype female, Cetti Bay, May 28, on *Thespesia populnea,* Usinger.

Runs to the west African *horvathi* Poppius in Poppius' key (Hist.-Nat. Mus. Nat. Hung., Ann. **10**: 416, 1912) but differs from this and all other species known to me in its immaculate and finely transversely rugose central pronotal disk, short, convex pronotal collar, and absence of hairs on head, pronotum, and scutellum. *H. guamensis* is related to the Hawaiian *pellucidus* in body form and opaque reddish cuneus, but *pellucidus* has the pronotum and scutellum distinctly pubescent. *Vitripennis* Stål, which is widespread in the Austro-Oriental region, is larger and paler with hyaline cuneus and three longitudinal stripes on the head and pronotum. *Bakeri* Poppius from the Philippines has a longer and differently colored pronotum.

55. Macralonidea hyalinus, new species (fig. 14).

Elongate, parallel-sided, nearly naked above, the head small, transverse, first antennal segment nearly as long as pronotum, second half again as long as first, third about as long as first, fourth less than half as long as third. Rostrum reaching to hind coxae. Pronotum narrow anteriorly, broadened and strongly convex posteriorly with distinctly punctate disk. Hemelytra hyaline. Wing cell without a hamus. Female ovipositor extending backwards four fifths of total length of abdomen.

Female: head transverse, shining, impunctate, one fourth broader across eyes than greatest length, strongly declivent anteriorly, tylus swollen at middle, narrowed anteriorly, juga and lora only feebly convex. Interocular space scarcely wider than an eye, 12: 11, the vertex very finely longitudinally sulcate. Rostrum exceeding middle coxae but scarcely reaching hind coxae, proportion of segments 19: 17: 13: 18. Antennae shorter than body to tip of membrane, 163: 186, first segment thickest, shorter than pronotum, 39: 45, second over half again as long as first, third subequal to first, fourth less than half as long as third, proportions 39: 67: 40: 17.

Pronotum broader than long, 52: 45, strongly narrowed anteriorly, the anterior margin being less than half as wide as hind margin across humeri, 24: 52, sides strongly narrowed, subparallel at and in front of callosities. Hind margin feebly concave in front of scutellum, then somewhat rounded to humeral angles. Disk strongly convex, especially posteriorly, rather uniformly, densely punctured throughout except narrowly sublaterally on humeri, narrowly along an ill-defined longitudinal carina at middle and on callosities, these distinct, depressed near middle and separated by an elevated area, convex laterally and practically reaching obscure lateral carina, as wide as anterior, punctate collar region.

Scutellum a little broader than long including mesonotum, 24: 20, with a puncture on either side of middle of hind margin of mesonotum. Disk impunctate, moderately elevated, subflattened anteriorly at middle, gradually depressed on apical third, the sides of disk roundly depressed and margined with deep punctures or depressions separating eight rounded lobes on either side before depressed apex.

Hemelytra greatly exceeding apex of abdomen, the apices of cunei nearly reaching abdominal tip; hyaline or subhyaline, with coarse punctures along claval suture. Corium without discal veins, large membranal cell reaching slightly beyond middle of membrane, rounded at inner angle. Costal margins nearly parallel, scarcely arcuate beyond middle.

Under surface with short hairs posteriorly and on legs; impunctate except on prothorax. Abdomen very deeply emarginate to accommodate long ovipositor, only the first, second, and very narrow third ventral segments visible at middle. Tibiae without stiff spines or bristles, the hind tarsi with very minute brown spots. Arolia free, divergent, reaching nearly to apices of claws. Last segment of hind tarsi longer than the preceding two together, slightly enlarged apically.

Color ochraceous with fulvous anteriorly on head, brown eyes, dark brown apex of second antennal segment and all of apical segments except for narrow white base of third. Pronotum with brown humeri and a brown fascia on either side of middle near hind margin. Scutellum yellow with black base (mesonotum), an ill-defined brown line along middle, and brown apex. Hemelytra clear, hyaline, the inner margins of clavus broadly dark brown to black, the outer punctate margin of clavus brown. Corium pale along costal margin and narrowly at apex of clavus, elsewhere along inner and apical margin brown. Cuneus dark brown at inner base, pale along outer margin. Membrane clear. Under surface mostly pale, brown at middle of abdomen. Apex of rostrum and tarsal apices brown.

Size: length 4.65 mm., width (pronotum) 1.3 mm.

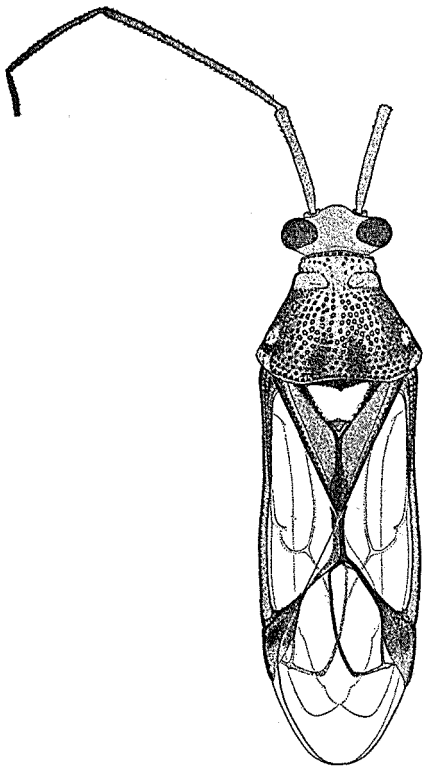

FIGURE 14.—*Macralonidea hyalinus:* dorsal view of female.

Holotype female, and three female paratypes, Ritidian Point, June 2, on *paipay* (*Guamia mariannae*), Usinger; one female paratype, Taragüe, May 17, Usinger.

Macralonidea Hsiao was recently described (U. S. Nat. Mus., Proc. **95**: 372, 1944), based upon the single new species, *M. cyanescens* Hsiao, from Borneo. *Cyanescens* is larger than *hyalinus* and has the anterior lobe of the pronotum strongly narrowed, almost collar-like.

56. Creontiades stramineus (Walker).

Capsus stramineus Walker, Cat. Heteropt. Brit. Mus. **6**: 120, 1873.

Four specimens, Piti, April 30, on *yerbas babue,* Usinger; three specimens, May 2, Swezey; one specimen, June 20, Usinger; one specimen, Piti, hills, on sedges, June 3, Swezey; two specimens, Mt. Tenjo, May 3, Usinger; two specimens, Mt. Tenjo, May 3, Swezey; two specimens, Dededo, May 11, on *Piper guahamense,* Swezey and Usinger; one specimen, Inarajan, May 7, Usinger; one specimen, Machanao, Aug. 6, on spiny amaranth, Swezey; one specimen, Fadian, Aug. 19, on *Sida,* Swezey; one specimen, Upi Trail, May 5, on ferns, Swezey; one specimen, Talofofo, Nov. 18, Swezey; one specimen, Mt. Alifan, May 21, Usinger; one specimen, Guam, Fullaway (1181); six specimens, Yigo, April 13, Bryan.

Reported from India, Ceylon, Java, Philippines, New Hebrides, Santa Cruz I., "Mariannen: Agrigan!, M. A. Marché", Fiji, Samoa, and Formosa.

Other material before me includes a specimen from Los Banos, Philippine Islands, a specimen from Amboina, collected by Muir, several specimens from Palau and Truk, Carolines, Ono, and one specimen from Tubuai, Austral Islands, Zimmerman.

Van Duzee's records of the New Caledonian *insularis* Poppius [Calif. Acad. Sci., Proc. 4(22): 115, 1937] are entirely confused. After studying his material, it is evident that the Solomon Island specimens are *stramineus,* though the first antennal segment is even longer than in specimens from other localities. One specimen from Pitcairn and one from Mangareva agree with *stramineus* while the remaining material, including one specimen from Pitcairn and all of the specimens from the Australs and the Marquesas, belongs to *samoanus* Knight. Both *samoanus* and *stramineus* are now known to occur on Tutuila and Upolu in Samoa, on Tubuai in the Australs and on Pitcairn. The much larger *insularis* Poppius from New Caledonia is quite distinct. The Tahitian *pacificus* Stål may not even belong to the Pacific island fauna, because many of the localities recorded on the Eugenies Resa expedition were erroneous (Kirkaldy, Soc. ent. Belg., Ann. **51**: 120-122, 1907).

57. Eurystylus costalis variety **unicolor** Poppius, Öfv. K. Vet.-Akad. Förh. **53A**(4): 6, 1911.

One specimen, Machanao, Aug. 6, Swezey; one specimen, Yona, May 12, on pigeon pea, Usinger.

The genus *Eurystylus* Stål (= *Eurycyrtus* Reuter, *Olympiocapsus* Kirkaldy, and *Paracalocoris* Distant part.) is widespread in Africa and in the Austro-Oriental region. The present specimens will not run to *costalis* Stål in Poppius' key (Öfv. K. Vet.-Akad. Förh. **53A**(4): 2, 1911) but agree with his description of the variety *unicolor.* The type locality of the variety is not given, but the species is reported from the Philippines, Sumatra, and Mentawei. The

rostrum reaches only to the apices of middle coxae in the Guam specimens and other specific characters might become obvious upon comparison with typical *costalis*.

58. Proboscidocoris malayus Reuter, Naturhist. Hofmus. Wien, Ann. **22**: 188, 1907.

One male, Agana Swamp, June 26, sweeping grasses and *Jussiaea,* Usinger; one female, Piti, Sept. 1, rice seedling plot, Swezey.

These differ slightly from Reuter's description, the apex of the scutellum and the lateral margins of the coria being narrowly pale. In this they agree with the nearly allied African *punctaticollis* Reuter but the golden pubescence mentioned for *malayus* is very conspicuous and is not present in the African species or in any of the Oriental species before me, including specimens from Java, Larat, Amboina, and Borneo.

P. malayus is widespread in the Austro-Oriental region. Poppius (Archiv für Naturgesch. **80A**: 42, 1914) mentions the following localities: Java, Lombok, Malacca, Sumatra, Mentawei, Celebes, New Guinea, Philippines, Formosa, and Japan.

59. Lygus guamensis, new species.

Oval, polished, and uniformly clothed above with rather short, backwardly directed, pale hairs except on head where the hairs are shorter, more irregular, and directed upward or forward. General color fulvous to brownish ferrugineous. Antennae long, slender, and pale. Rostrum slightly exceeding apices of hind coxae.

Head transverse, about two thirds as long as broad across eyes, 29: 42; produced less than half as far in front of eyes as length of an eye, 8: 20, the tylus, juga, and lora moderately swollen, the anteocular portion of head thus appearing short and rounded at sides. Inner margins of eyes strongly concave near insertions of antennae, the interocular space at this point over twice as wide as narrowest width across vertex, 36: 16; vertex at narrowest point more than one third as wide as head including eyes, 16: 42. Vertex distinctly margined posteriorly, the ledge feebly arcuate and the actual hind margin of head strongly depressed behind this margin. Disk of head impunctate. Rostrum exceeding apices of hind coxae but not exceeding apices of hind trochanters, proportion of segments 17: 20: 15: 20. Antennae shorter than body from head to apex of membrane, 150: 173, slender, the second segment very slightly and gradually thickened apically, proportion of segments 22: 68: 40: 20.

Pronotum about one third longer than head, 38: 29, less than twice as broad across humeri as long, 64: 38, collar very narrow, half as thick as base of second antennal segment, callosities poorly defined, the pronotal disk feebly depressed behind them, shallowly but evenly punctate. Side margins nearly straight, feebly arcuate anteriorly, hind margin broadly arcuate, feebly sinuate at middle. Scutellum moderately convex, impunctate but transversely rugose.

Hemelytra moderately long, the membrane surpassing apex of cuneus but not reaching apex of abdomen. Surface of clavus, corium, and even cuneus slightly roughened by shallow punctures, mostly at bases of hairs. Costal margin of corium moderately, evenly arcuate, one third longer than width of pronotum, 86: 64.

Under surface very sparsely pubescent. Hind femora 4.5 times as long as greatest thickness. Tibiae with a few erect spines.

Color pale fulvous on head and pronotum with brown and red oblique stripes at middle of head and generally reddish anterior portion of head. First and second antennal segments

entirely pale ochraceous, the last two segments embrowned. Rostrum ochraceous with reddish base and black apex. Disk of pronotum brown antero-laterally including outer portions of callosities and broadly brown posteriorly (not reaching humeri) except for narrow testaceous posterior margin. Scutellum pale fulvous to ochraceous with white apex and with two ill-defined reddish longitudinal vittae at middle. Hemelytra brownish ferrugineous, the costal margins narrowly pale basally and broadly pale at middle. Cuneus subhyaline, white laterally, red apically and along inner margin. Membrane uniformly, faintly clouded, the veins reddish. Under surface brown on thorax, ochraceous on abdomen, with reddish laterally. Legs pale, testaceous tinged with reddish, the hind femora, except at bases, brownish ferrugineous.

Size: length 4.34 mm., width (hemelytra) 1.9 mm.

Holotype female, Tumon Beach, May 30, taken from a spider web, Usinger.

L. guamensis runs to *rosaceus* Poppius from Sumatra in Poppius' key to the Indo-Australian species (Hist.-Nat. Mus. Nat. Hung., Ann. **12**: 337, 1914) but *rosaceus* lacks the brown basal portion of pronotum, has a narrower vertex, longer second antennal segment and a relatively longer last antennal segment.

60. Lygus fullawayi, new species.

Small, oval, covered with a fine pubescence of pale hairs above. Rostrum not quite reaching apices of hind coxae. Vertex distinctly margined. Color yellow with black clavus, inner apex of corium, and inner angle of cuneus. First two antennal segments entirely pale.

Head about one third broader across eyes than long, 39: 28; produced only one third as far in front of eyes as length of an eye, the tylus distinctly swollen and lora broadly rounded. Interocular space, in the male, 2.5 times as broad across antennal concavities as at narrowest portion of vertex; two times as broad in the female. Vertex at narrowest point one fourth as wide as head across eyes in the male, one third as wide in the female. Vertex polished and impunctate, distinctly margined posteriorly, the actual posterior margin strongly depressed behind and beneath this concave ledge. Rostrum reaching but not surpassing hind coxae, proportion of segments 15: 13: 8: 14. Antennae shorter than body from head to tip of membrane, 125: 141, the second segment gradually and only feebly enlarged from base to apex; proportion of segments 20: 59: 31: 15.

Pronotum about as long as head, 29: 28, less than twice as broad across humeri as long, 51: 29, collar about as thick as base of second antennal segment; disk rather evenly convex, the callosities scarcely elevated; disk finely and rather densely punctate; hind margin broadly arcuate and almost imperceptibly sinuate at middle.

Scutellum moderately elevated, sloping posteriorly, the apex acute.

Hemelytra relatively long, the apex of cuneus slightly exceeding tip of abdomen, costal margin of corium evenly arcuate, one fifth longer than width of pronotum. Disks of clavus and corium distinctly, shallowly punctate, disk of cuneus roughened.

Under surface sparsely pubescent. Hind femora about four times as long as greatest thickness. Tibiae with stiff, erect bristles. Hind tarsi with first and second segments subequal.

Left genital clasper of male broadly sickle-shaped, thickened basally and slightly narrowed toward the blunt apex. Right clasper very broad, widening apically, the upper apical angle produced into a short, slender, downward curved hook.

Color yellowish ochraceous, the hind margin of pronotum narrowly white, eyes brown, apical two antennal segments and apex of rostrum infuscated. Clavus black with brownish outer margins. Corium broadly at inner apex and inner angle of cuneus forming a large black area. Membrane generally embrowned with slightly paler veins. Under surface entirely pale, the abdomen brown dorsally. Apices of hind femora ringed with brown subapically.

Size: male, length 3.5 mm., width 1.5 mm.; female, length 3.5 mm., width 1.6 mm.

Holotype male, allotype female, and one paratype, Mt. Tenjo, May 3, on *Piper guahamense,* Usinger; one paratype, Machanao, Aug. 6, on *Piper guahamense,* Swezey; one paratype, Fullaway (1206); three paratypes, Tarague, May 17, Usinger. One of these paratypes has a red-tinged scutellum suggestive of the variety described below and the black area of the clavus is confined to the inner half on some specimens. Two specimens, Ritidian Point, April 16, Bryan.

L. fullawayi runs to *erimensis* Poppius from New Guinea but that species is larger, differently colored, and has the last two antennal segments together somewhat longer than the second.

This species is dedicated to D. T. Fullaway of the Board of Agriculture and Forestry, Honolulu, in recognition of his early insect survey of Guam.

Lygus fullawayi variety **rubroscutellatus,** new variety.

Structurally similar to the typical form but with the scutellum, meso- and metapleura and apical half of hind femora red.

Holotype male, allotype female, and 14 paratypes, Upi Trail, May 5, on a small-leafed *Ficus,* Usinger; one paratype, Piti, May 2, on *Cestrum pallidum,* Usinger; two additional specimens, Ritidian Point, June 2, Usinger.

61. Lygus cruzi, new species.

Elongate-oval, convex above, the surface rugosely punctate and clothed with numerous backwardly directed hairs.

Head nearly half again as broad as long, 34:24; eyes large, nearly three times as long as anteocular region, 17:6; and about as wide as narrowest point of vertex, 11.5:11; surface impunctate, minutely rugose and clothed with very scattered inconspicuous hairs; vertex distinctly carinate. Rostrum short, its tip obscured but apparently reaching only to apices of middle coxae; proportion of segments one to three, 14:13:10. Antennae over twice as long as width of pronotum, 98:46; proportion of segments, 17:40:23:18.

Pronotum less than twice as broad as long, 46:28; longer than head on median line, 28:24; disk rather strongly convex, the callosities poorly defined but slightly elevated, smooth; hind margin scarcely concave at middle.

Scutellum about as long as wide at base; slightly more than half as wide as pronotum, 25:46; disk quite strongly convex, smooth only apically.

Hemelytra long, the membrane exceeding tip of abdomen by two fifths of its total length; commissure of clavus four fifths as long as scutellum.

Color brown above, the front of head reddish on juga and lora and brownish between eyes except for yellow at bases of antennae and along inner margins of eyes. Antennae with first segment pale basally and ferrugineous apically, second segment ferrugineous basally and dark brown apically, third segment white on basal half and dark brown on apical half, fourth segment white on basal fourth and darker apically. Pronotum with pale anterior collar, posterior margin and humeri. Scutellum pale apically. Hemelytra pale brownish with darker brown at middle of clavus, extreme inner apex of corium, and apical two thirds of cuneus. Outer apex of corium tinged with reddish and base of cuneus clear, hyaline. Membrane faintly embrowned throughout. Under surface pale brown tinged with red, the middle of abdominal venter yellow and tarsi very pale.

Size: length 4.1 mm., width (pronotum) 1.53 mm.

Holotype male, Upi Trail, May 5, miscellaneous sweeping, Swezey.

The characteristic markings will distinguish this species from other *Lygus* of Guam and elsewhere. This species is named in honor of Antonio Cruz, Guam agriculturist, who helped us in so many ways during our visit.

62. Lygus species.

A single, badly damaged female, Guam, Fullaway (1183) may belong here. All of the tarsi are broken off and the apical portion of the membrane is gone. The specimen is dark brown with ochraceous basal margin of pronotum and base of cuneus. The antennae are relatively strongly incrassate, the vertex is margined behind, and the rostrum is short, though the head is so distorted that it is difficult to determine whether the rostrum would reach the intermediate coxae.

63. Nesodaphne marianensis, new species.

Elongate-oval, densely pubescent, the second antennal segment with two white rings on basal fourth.

Head three fourths as long as broad, 23 : 31; abruptly narrowed in front of the eyes, the width of head at this point, one third of total head width, 10.5 : 31; interocular space about one third as wide as head, 10 : 31; inner margins of eyes deeply concave anteriorly. Clypeus strongly convex, widened apically, beset with numerous long hairs, depressed at base. Juga strongly convex. Vertex carinate posteriorly. Rostrum reaching a little beyond middle of mesosternum, the first segment reaching about to base of head; proportion of segments, 14 : 11 : 9 : 14. Antennae over twice as long as head and pronotum together, 119 : 54; proportion of segments, 27 : 52 : 23 : 17.

Pronotum half again as long as head, 32 : 23; two thirds as long as broad, 32 : 45; strongly and regularly narrowed anteriorly, the width at anterior collar one third as great as across humeri, 16 : 45. Collar one fourth as long as wide, 4 : 16, feebly convex and briefly emarginate at middle. Pronotal disk moderately convex, slightly depressed behind poorly defined callosities, and beset with ill-defined punctures and long, erect hairs. Disk with 10 clumps of stiffer, black hairs regularly placed, two near middle, six across posterior disk at and between humeri and two behind this near middle.

Scutellum scarcely broader than long, 23 : 21; convex with a broad depression at middle of base, the disk with poorly defined punctures, long pale hairs, and two clumps of long black hairs.

Hemelytra over twice as long as width of pronotum, 100 : 45, impunctate, sparsely clothed with erect pale hairs and more densely clothed with appressed white hairs, the actual surface covered with a soft tomentum. Commissure of clavus longer than scutellum, 24 : 21, the clavus moderately convex. Corium subflattened, the embolar region depressed and costal margin a little reflexed, moderately arcuate. Corium less than three times as long as its greatest width, 62 : 23. Cuneus twice as long as wide, 21 : 10, its outer margin feebly arcuate.

Color pale testaceous and brownish, the head pale with fulvous on vertex. Rostrum brown at apex. Antennae pale with an oblique brown fascia at base and a broad fulvous area at apex of first segment. Second segment brown with short white pubescence and with two pale rings on basal fourth, one at middle, and one at apex; third segment dark brown except for pale ring at apex, and fourth segment entirely brown. Pronotum fulvous with paler anterior margin of collar, disks of callosities, humeri, and narrow hind margin. Scutellum brownish with a white tomentum, the apex white. Clavus brown with white tomentose spots basally and apically. Corium with numerous pale spots occupying most of basal half, the costal area interrupted with only two brown areas. Apical half more

broadly brown. Cuneus brown at middle and at apex. Membrane dark brown at base, infumate apically, with white on apical angle of areole. Under surface largely pale. Legs pale with median and subapical brown rings on femora, two brown rings on anterior tibiae, three on middle tibiae, and four on posterior tibiae. Tarsi brown.

Length 4.83 mm.; width (pronotum) 1.5 mm., (hemelytra) 1.76 mm.

Holotype male, Fullaway (1200). This specimen was kindly loaned from the U. S. National Museum by R. I. Sailer. It was discovered among miscellaneous Oriental mirids by T. Y. Hsiao who referred it to me as an undescribed species.

N. marianensis is closely allied to *knowlesi* Kirkaldy, which I have seen from Fiji (Kirkaldy's type), Samoa (Swezey and Zimmerman) and Tahiti (J. M. Clements). *N. knowlesi* has a smoother head which is less abruptly narrowed in front of the eyes; the rostrum is slightly longer, reaching beyond the middle of the mesosternum; the second antennal segment has only a single basal pale ring; and the hemelytra are more extensively brown basally.

It will be necessary to use the name *Tinginotum* Kirkaldy (Ent. Soc. London, Trans., 263, 1902) in place of *Nesodaphne* Kirkaldy (Linn. Soc. N. S. Wales, Proc. 33 : 380, 1908) if a study of the genotypes shows the two to be congeneric.

Subfamily Deraeocorinae

64. **Deraeocoris guamensis,** new species.

Elongate-oval, convex, the upper surface almost entirely naked. Scutellum and head impunctate, the head transversely carinate at hind margin. Pronotum and hemelytra coarsely punctate. Rostrum not reaching hind margins of middle coxae. Color brown, marked with reddish ochraceous on head, pronotum, scutellum, and cuneus and with a pale longitudinal fascia on corium adjacent to claval suture.

Head a little broader than long, 45 : 40, interocular space as wide as an eye; vertex impunctate, distinctly, transversely carinate at base, tylus moderately swollen, feebly impressed at base; juga short, convex, bucullae prominent, flaring. Rostrum reaching onto middle coxae, proportion of segments 25 : 22 : 20 : 28. Antennae less than twice as long as width of pronotum, 152 : 85; proportion of segments 25 : 74 : 29 : 24, the second segment slightly thickened toward apex.

Pronotum half again as broad across humeri as long, 85 : 57; rather strongly convex, especially posteriorly, the callosities smooth, impunctate, moderately elevated and somewhat confluent at middle, the rest of disk coarsely punctate, the punctures more than one puncture width apart; feebly depressed behind middle. Sides roundly carinate, strongly sinuate at middle, rounded at anterior angles. Collar nearly as wide as thickest portion of second antennal segment. Hind margin broadly, convexly rounded and a little sinuate sublaterally.

Scutellum almost half again as broad across base as long, 38 : 28; strongly convex and impunctate. Clavus and corium distinctly punctate. Cuneus more finely and indistinctly so.

Color dark brown with reddish ochraceous on basal half of vertex, at insertions of antennae, and laterally and at apex of tylus. Pronotum with three reddish fasciae behind callosities, the longest at middle, tapering posteriorly, and a shorter one on either side sublaterally. Humeral angles reddish ochraceous. Scutellum tinged with red at basal angles and at apex. Hemelytra brown with a partially obscured pale longitudinal line

on either side of claval suture. Cuneus reddish at outer basal angle. Membrane entirely clouded, palest apically, brown on and around veins. Under surface brown, the ostiolar area paler. Antennae brownish, the first segment somewhat paler, second segment with a pale ring at base and another at middle, third and fourth narrowly pale basally. Rostrum and legs ochraceous, the femora more or less infuscated with one or two pale rings subapically, tibiae brown, ringed with ochraceous subbasally, at basal fourth, and broadly beyond middle. Tarsi brown basally and apically, pale at middle.

Size: length 6.2 mm., width (hemelytra) 2.5 mm.

Holotype female, Fullaway (1183).

Allied to such large species as *celebensis* Poppius and *discoidalis* Poppius but differing in color and antennal proportions.

Subfamily Cylapinae

Tribe Fulviini

65. **Fulvius angustatus,** new species.

Slender with margins of coria only moderately rounded, evenly beset with short, thick, appressed hairs on upper surface, the hairs most conspicuous on hemelytra, restricted to middle of vertex on head.

Head slightly longer than broad, 22: 20, the anteocular portion slightly shorter than an eye, 9: 10. Interocular space in the male but little wider than an eye, 7: 6, the vertex feebly longitudinally impressed at middle. Rostrum slightly exceeding apices of hind coxae, the first segment not reaching base of head; proportion of segments approximately 15: 17: 17: 14. Antennae one third longer than costal margin of corium and cuneus, 80: 60, the first segment as long as pronotum at middle, second segment as long as width of pronotum at base, gradually thickened toward apex; proportion of segments 15: 32: 14: 19.

Pronotum much shorter on median line than head, 15: 22, about as wide across anterior collar as long and over twice as broad posteriorly as long on median line, 32: 15. Anterior collar distinct, front margin feebly concave at middle. Side margins distinctly concave, sinuate, hind margin rather deeply, broadly concave, thus broadly exposing mesonotum. Pronotal disk very finely granulate-punctate as are the disks of head and scutellum, the middle of pronotal disk broadly convex, the subdepressed posterior disk feebly, transversely rugose medially. Mesonotum and scutellum together almost as long at middle as broad at base, the disk of mesonotum smooth and naked antero-laterally and with shorter hairs than scutellum medially.

Hemelytra distinctly surpassing tip of abdomen in the male, the cuneus one fifth as long as costal margin of corium (embolium), the so-called embolium (depressed lateral area) occupying only one sixth of total width of corium at level of apex of clavus.

Femora with a few very long, fine, erect hairs. Tibiae and tarsi densely clothed with short hairs.

Female with relatively smaller antennae, less than one third longer than costal margin of corium and cuneus, 79: 70, the first segment shorter than pronotal length at middle, 15: 17; the second segment distinctly shorter than width of pronotum at base, 31: 35, scarcely thickened toward the apex; proportion of segments 15: 31: 15: 18. Interocular space relatively wider, one third wider than an eye, 8: 6. Hemelytra not quite reaching apex of abdomen.

Color dark brown, the basal fourth of head and extending briefly beyond at middle of vertex, brownish ochraceous. Mesonotum laterally brownish-ochraceous. Extreme base of corium pale and outer apex of corium just before cuneus white for about the width of embolium. Membrane uniformly infuscated except for a small pale spot at inner base and darker brown vein. Hairs of upper surface pale. First antennal segment brown, second paler brownish, fulvous to ochraceous, last two segments more or less infuscated

and clothed with long, pale hairs. Rostrum fulvous. Under side brown with somewhat paler base of abdomen. Trochanters, tibiae, and tarsi testaceous. Coxae and femora brownish, the latter paler at apices.

Size: male, length 2.9 mm., width (hemelytra) 1 mm.; female, length 3.25 mm., width (hemelytra) 1.1 mm.

Holotype male, allotype female, and 14 paratypes, Mt. Alifan, taken in a rotten papaya log, May 26, Usinger; five paratypes, Machanao, four on June 4 and one on June 30, Swezey and Usinger, one under bark and another under a fallen *Pandanus* fruit; one paratype, Mt. Tenjo, May 3, Usinger; one paratype, Barrigada, July 6, Swezey; two specimens, Yigo, Nov. 13, ex dead papaya leaves, Swezey.

This species does not run out satisfactorily to any of the species in Poppius' key [Acta Soc. Sci. Fennicae **37**(4) : 29, 1909]. Of the species described since that time, it is perhaps closest to *tagalicus* Poppius from the Philippines and *macgillavryi* Poppius from Java. *F. tagalicus* has a relatively longer pronotum, as long as the head and nearly as long as broad across hind margin, and *macgillavryi* has a broader vertex.

Subfamily Bryocorinae

66. Felisacus ochraceus, new species (fig. 15).

Elongate, shining, pale ochraceous with brown eyes, and brown inner clavus and inner margin of corium apically, the inner half of cuneus red or yellow. Eyes longer than postocular portion of head.

Head almost half again as broad across eyes as long, 24 : 17, interocular space less than twice as wide as an eye, 10 : 7. Eyes very large, longer (as seen from above) than length of postocular portion of head, 9 :8. Head cylindrical to basal sixth and then arcuately flaring to hind margins of eyes where the head is two thirds as wide as width across eyes. Rostrum reaching beyond middle of mesosternum. Antennae a little longer than body, 159 : 150, first segment cylindrical, only sparsely pubescent, second more slender, the last two very slender and curved; proportion of segments 38 : 48 : 53 : 20.

Pronotum over half again as long on median line as head, 28 :17; about one fourth broader across humeri than long, 34 : 28, the disk evenly convex on both anterior and posterior lobes except for depressed areas sublaterally near humeri; strongly constricted in front of middle and punctate in the constriction. Hind margin distinctly, roundly emarginate in front of scutellum.

Hemelytra long, the corial margin a little over twice as long as total length of pronotum, 63 : 30, very feebly arcuate posteriorly, the costal margins nearly parallel.

Right genital clasper of male straight on basal half, tapering and sickle-shaped on apical half and bent posteriorly. (Broader at base and tapering on apical two thirds in *felicicola* Kirkaldy.) Left clasper broad on basal half, abruptly narrowed and slender on apical half, this apical arm feebly curved inward and upward.

Color testaceous to ochraceous, the hind margin of pronotum at bases of clavi, inner half of clavus, inner margins of corium adjacent to apex of clavus and extending to cuneus, brown. Cuneus reddish or yellow on inner half. Costal margins of corium at least apically and veins of membrane ochraceous. Elsewhere clear hyaline. Eyes brown to black. First antennal segment white on basal fourth, fulvous apically, second fuscous tinged with red on apical half, third and fourth infuscated. Under surface pale yellowish testaceous. The legs pale with infuscated tarsal apices.

Size: male, length 3.75 mm., width (hemelytra) 0.9 mm.; female, length 4 mm., width (hemelytra) 1 mm.

Holotype male, and allotype female, Upi Trail, May 5, Usinger; three paratypes, same data as above, but collected on ferns, Swezey; 10 paratypes, Piti, Aug. 24, on ferns, Swezey; eight specimens, Ritidian Point, April 16, Bryan.

F. felicicola Kirkaldy, which I have from Rewa, Fiji, Muir is very similar to *ochraceus* but has smaller eyes (shorter than postocular portion of head,

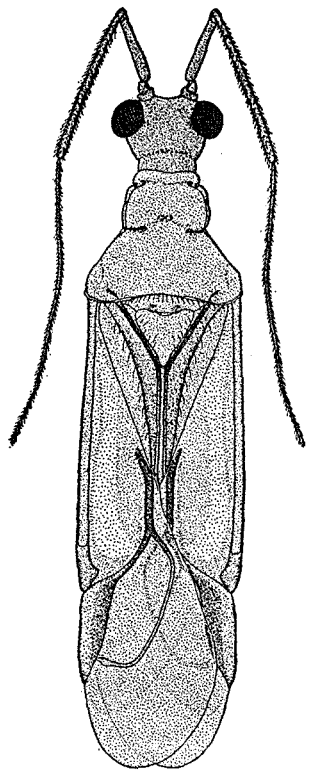

FIGURE 15.—*Felisacus ochraceus:* dorsal view.

8:9), a slightly longer first antennal segment and proportionately shorter second antennal segment (ratio of first and second, 39:44). The color of *felicicola* is distinctly fulvous on head and pronotum and the right genital clasper of the male differs as mentioned above. I have a series from Amboina which differs slightly from either of these, but clearly pertains to the same group of the genus.

67. Felisacus crassicornis, new species (fig. 16).

Elongate, shining, the head broader than long, first antennal segment shorter than pronotum and distinctly swollen subbasally.

Head about one fifth broader across eyes than long including antenniferous tubercles, 22:18; a little more than two thirds as broad immediately behind eyes as width across eyes, 16:22, and thence gradually narrowed to base of head, ratio of width behind eyes to width at base, 16:13. Eyes small, less than half as wide as interocular space, 5:12. Anterior portion of head strongly vertical, abruptly tapering to narrow apex. Rostrum scarcely attaining hind coxae. Antennae shorter than body, 113:138; the first segment shorter than pronotum, 26:29, a little longer than width of head, 26:22, thickest at basal third and tapering to just before apex, the apex slightly thicker than slender subapex; second segment slender, cylindrical; third and fourth slender and curved; first segment with only a few inconspicuous hairs, remaining segments distinctly pubescent; proportion of segments 26:29:38:20.

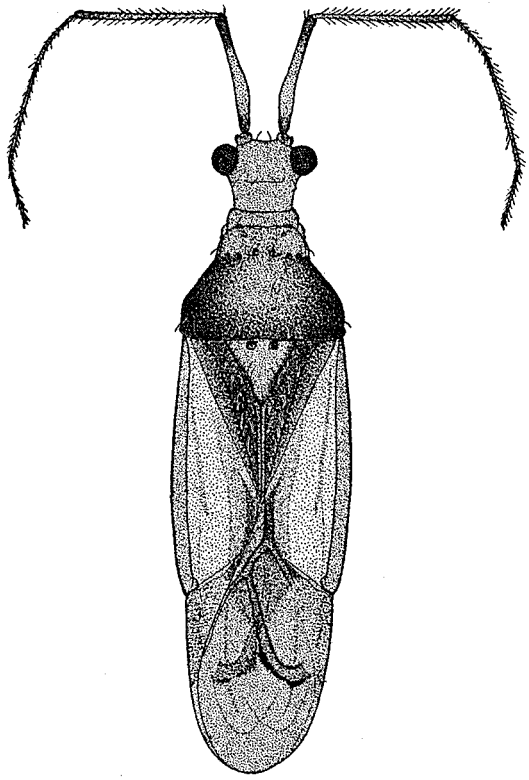

FIGURE 16.—*Felisacus crassicornis:* dorsal view.

Pronotum over half again as long as head, 29:18; the apical collar one seventh the total length of pronotum, antemedian stricture marked by deep punctures across the entire disk, the punctures at middle placed slightly forward. Width across humeri over twice the width at anterior margin, 34:15, hind margin nearly straight, only very feebly concave. Scutellum moderately elevated, smooth except for two large punctures on basal margin.

Hemelytra long, the costal margin of corium slightly less than twice as long as pronotum, 54:29, thick and feebly arcuate, especially posteriorly. Cuneus a little less than one third as long as corium, 19:54. Veins of membrane prominent. Right genital clasper of male very slender, sickle-shaped. Left clasper short, half as wide as long, feebly curved on outer edge.

Color ochraceous to fulvous, the eyes red, the sides of hind lobe of pronotum broadly brown, the inner, elevated portion of clavus light brown, inner margins of corium adjacent to and beyond apex of clavus brown, membrane faintly clouded, the veins dark. Costal margins white to ochraceous, the disk of corium subhyaline, partially suffused with white and finely, sparsely punctured. Clavus pale fulvous, subhyaline. First antennal segment ochraceous at middle, fulvous basally and black at apex. Second narrowly black at base and thence ochraceous, becoming infuscated apically. Apical segments dark brown to black. Under surface in great part testaceous, the legs pale with lightly infuscated tarsal apices.

Size: female, length 3.5 mm., width (hemelytra) 1 mm.; male, length 2.9 mm., width (hemelytra) 0.75 mm.

Holotype female, one female paratype, Machanao, Nov. 25, Swezey, allotype male, Machanao, June 4, Usinger; one female paratype, Guam, Fullaway (1210). Seven specimens, two damaged, are at hand from Upi Trail, May 5, on ferns, Swezey and Bryan.

This species is related to *magnificus* Distant and *pulchellus* Poppius in having a subbasally swollen first antennal segment, but these species differ entirely in color; and these and a pale species which I collected at Los Banos differ in having a narrower head which is scarcely broader than long. I have specimens of *magnificus* from Amboina and Java (Muir).

Subfamily DICYPHINAE

68. Engytatus nicotianae (Koningsberger) (fig. 17, *a, b*).

Leptoterna nicotianae Koningsberger, Mededeel. Lands Plantent. **64**: 32, pl. 4, fig. 8, 1903.

Cyrtopeltis (?) *nicotianae* Kirkaldy, Linn. Soc. N. S. Wales, Proc. **33**: 377, 1908. New synonymy.

Dicyphus nicotianae, Fulmek, Deli Proefstation, Bull. **25**: 2, 1925.

One specimen, Piti, May 2, and two specimens, Piti, April 30, on *Nicotiana,* Usinger; seven specimens, Yona, May 12, on *Nicotiana,* Usinger.

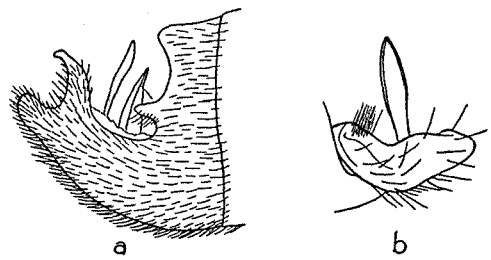

Figure 17.—*Engytatus nicotianae:* **a**, posterior view of end of abdomen of male from right side showing broad prolongation of last segment and its broad dorsal arm with a small curved projection at its apex; **b**, postero-dorsal view from the left side of the left clasper showing its stout, curved form with long bladelike projection extending at a right angle from middle.

I follow Fulmek in assuming that this is the species described by Koningsberger from Java, though the length is given as 4 mm. in the original description, whereas my series is uniformly about 3.5 mm. *E. nicotianae* may be separated from *tenuis,* aside from the distinctive male terminalia, by the dark dorsal pubescence, and by the third antennal segment which is pale even at the base.

Judging from the damaged female types, Kirkaldy's *Cyrtopeltis* (?) *nicotianae* from Fiji belongs here. Whether Froggatt's *Dicyphus tabaci* (Agric. Gaz. N. S. Wales 31:715-716, figs., 1920) from Australia belongs here or elsewhere is impossible for me to determine from the brief description. I have seen *nicotianae* from Noumea, New Caledonia, on *Datura,* F. X. Williams.

69. Gallobelicus tenuis (Reuter) (fig. 18, *a, b*).

Cyrtopeltis tenuis Reuter, Rev. d'Ent. **14**: 139, 1895.

One specimen, Piti, May 1; 10 specimens, Piti, May 10, all on tomato, Usinger; one specimen, Agana Swamp, May 4, Usinger; two specimens, Talofofo, Nov. 18, Swezey; one specimen, Guam, Fullaway (1196); 16 specimens, Machanao, June 30, on *Nicotiana,* Usinger; one specimen, Fonte Valley, Aug. 7, on weeds, Swezey. Swezey and Zimmerman took specimens of *tenuis* in Samoa.

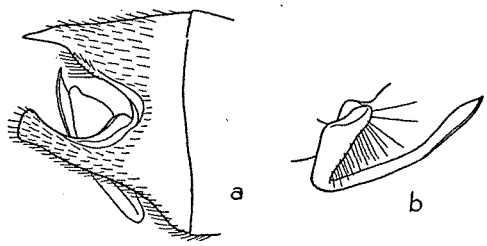

FIGURE 18.—*Gallobelicus tenuis:* a, posterior ventral view of last abdominal segment of male showing long truncate projection and shorter tapering projection; b, posterior ventral view of left clasper of male showing short basal portion, abrupt elbow and long slender bladelike portion.

Few species of insects are in a more confused state both taxonomically and nomenclatorially than the dicyphine pests of tobacco and tomato. Their small size and superficial similarity have contributed to this but do not excuse the situation, for the male terminalia exhibit striking differences which are specifically distinct and point the way to a sound generic classification. The literature on the subject was summarized by China (Ann. Mag. Nat. Hist. XI, 1: 604-607, 1938) although Kirkaldy's description of *Cyrtopeltis* (?) *nicotianae* (Linn. Soc. N. S. Wales, Proc. 33: 377, 1908), Froggatt's description of *Dicyphus tabaci* (Agric. Gaz. N. S. Wales 31: 715, 1920), and Knight's discussion of the genus *Cyrtopeltis* (Brooklyn Ent. Soc., Bull. 17: 65-67, 1922) were omitted.

China concluded that *nicotianae* Koningsberger, *crassicornis* Distant, *javanus* Poppius, and *nocivus* Fulmek were all synonyms of *tenuis* Reuter, stating that Fulmek's figures of the left genital claspers of different species (Deli Proefstation, Bull. **25**: 4, 1925) were not of the same organ but of different parts of the same insect. To quote China further, "Judging by the shape of the *Haftzange* in *nicotianae* it appears to be a broken portion of the inferior lateral margin of the pygophor (ninth abdominal segment) viewed from the left side of the pygophor but with the drawing actually reversed."

In the case of *nocivus* he figured the actual paramere, calling it again the *"linke Haftzange."* Careful comparison of Fulmek's figures with the two species which I found on tobacco on Guam reveals that Fulmek was correct, his drawings actually being of homologous structures of two distinct species. The left clasper of *nicotianae* is truly an amazing structure and corresponds, except for minor details in structure of the apex of the broad lobe, with my Guam specimens. The last abdominal segment also differs strikingly in the two species, *nicotianae* having a bifurcate posterior process suggestive of the American tobacco bug, *Engytatus geniculatus* Reuter (fig. 19, *a, b*), whereas *tenuis* (= *nocivus* Fulmek) has a simple main posterior process (see China's excellent figure of a cotype).

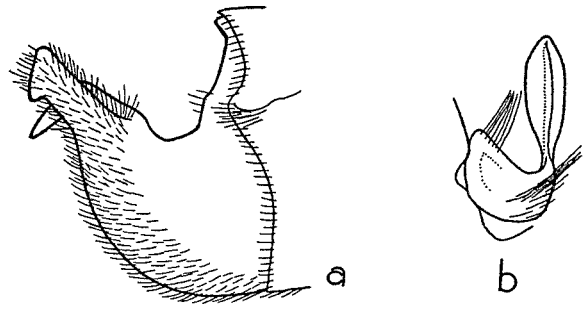

FIGURE 19.—*Engytatus geniculatus:* **a,** posterior ventral view of last abdominal segment of male showing two curved arms; **b,** posterior dorsal view of left clasper of male showing stout basal portion, abrupt elbow and bladelike apical portion.

The generic classification of the Dicyphinae has long been confused so that Reuter, Poppius, and Horvath as well as other, lesser, authorities changed species from one genus to another with no apparent reason, only to change them back again. Knight has lumped many of these into the genus *Cyrtopeltis,* a practice which is at least consistent though making it almost impossible to use his keys to the genera. In this work I have concluded that the male terminalia provide us with the only sound basis for a generic classification of the Dicyphinae. Reluctance to base a higher classification upon characters of one sex is

understandable but this practice has been found necessary in other groups (scale insects and Lepidoptera) and seems justifiable in the Dicyphinae considering the hopeless confusion that has resulted from attempts to classify these bugs on the basis of such superficialities as size of eyes or color of head and pronotum.

The following characters will suffice to distinguish the questionable Dicyphine genera in so far as my material is concerned. Modifications will undoubtedly be necessary when further material is examined. I have not seen the types of *Dicyphus* and *Macrolophus*.

Dicyphus Fieber (type *pallidus* Herrich Schaeffer). Left genital clasper thickened at base, bent at middle, and tapering to acute apex. Last abdominal segment not produced into long spines, knobs, or processes. Pronotum more or less constricted at middle and eyes relatively large.

Macrolophus Fieber (type *nubilus* Fieber). Left genital clasper thickened at base, bent near middle, and flattened into a broad but apically tapering blade. Last abdominal segment not produced into long spines, knobs or processes. Eyes relatively small.

Cyrtopeltis Fieber (type *geniculata* Fieber). Left genital clasper as in *Macrolophus*. Last abdominal segment roundly produced as a short, broad, upturned lobe posteriorly and with a prominent rounded knob on the left side of the segment. Eyes relatively large. This is apparently monotypic.

Engytatus Reuter (type *geniculatus* Reuter). Left genital clasper as in *Macrolophus* or with the thickened basal portion much enlarged and extending beyond the point of origin of the bladelike arm (as in *nicotianae*). Last abdominal segment more or less strongly produced ventrally into an upturned process which branches into two arms apically. Eyes variable in size. *Confusa* Perkins and *hawaiiensis* Kirkaldy belong here. *Geniculatus* Reuter was a secondary homonym in *Cyrtopeltis,* where Reuter and Knight placed it. Hence the name of the next oldest synonym, *varians* Distant, was used. According to the Banks and Caudell Code and the recommendations of the British Commission on Entomological Nomenclature, the name *geniculatus* may now be restored but the International Code is not so clear on this point.

Gallobelicus Distant (type *crassicornis* Distant = *tenuis* Reuter). Left genital clasper abruptly elbowed and typically with the apical arm very long and tapering. Last abdominal segment produced ventrally into a more or less prominent, unbranched arm and with a second projection near base of clasper at least in the type species. I have collected another species of this genus on Luzon, and Knight's Marquesan species (B. P. Bishop Mus., Bull. **142**: 173-177, 1938) may belong here.

SUBFAMILY ORTHOTYLINAE

70. Zanchius fragilis, new species (fig. 20, *a, b*).

Elongate, entirely pale except for eyes and antennal annulations. Sparsely clothed above with pale pubescence. Surface smooth, shining impunctate.

Head broader than long, 22 : 15, the eyes prominent, suboval, less than half as wide as interocular space, 5 : 12, located anteriorly on head, the postocular portion of head two thirds as long as an eye. Head strongly declivous in front of eyes, tylus moderately convex. Vertex with a broad, shallow depression on either side near eyes and a faint longitudinal impression between them at middle. Hind angles of head behind eyes broadly rounded, a brief, transverse, rounded carina just before hind margin. Rostrum surpassing hind coxae, proportion of segments one to four as 8 : 10 : 19 : 14. Antennae longer than body to apex of membrane, 137 : 120; the first segment thickest, second more slender, cylindrical, third and fourth most slender; proportion of segments 15 : 55 : 32 : 35.

Pronotum as long on median line as head, almost twice as broad across humeri as long, 28 : 15, the sides sinuate, roundly converging anteriorly, roundly diverging posteriorly to humeral angles. Front margin distinctly concave at middle, with a minute ledge or collar. Hind margin broadly concave in front of mesoscutum and slightly sinuate at middle. Disk elevated anteriorly, depressed a little behind middle and sublaterally on posterior lobe. Mesoscutum large, half as long as scutellum, the width at base of mesoscutum about equal to length of mesoscutum and scutellum together.

Hemelytra long and slender, the apices of cunei exceeding tip of abdomen. Costal margins of coria 2.33 times as long as width of pronotum, subparallel, only feebly arcuate on basal half. Cuneus less than one third as long as corium, 20 : 66. Membrane long and narrow, extending beyond apex of cuneus for a distance equal to one third the length of cuneus. Clavus, corium, and cuneus subhyaline, scarcely, sparsely, minutely punctured and with very scattered hairs except along costal margins.

Legs long and slender, the tibiae with very fine, long spines. Arolia distinct, flaplike and converging apically.

Right genital clasper of male short and broad, with a short, inward curved spine on upper edge and a slightly curved, slender, tapering apical arm as long as the basal portion of clasper, with acute apex. Left clasper relatively simple, curved. Appendages of aedeagus remarkably complex.

Color entirely pale, testaceous, the eyes pale brown, and with brown at apex of first antennal segment, at basal fourth and slightly beyond middle of second segment, at apex of rostrum, and at apices of male genital processes. Hemelytra subhyaline, sometimes faintly tinged with green, the membrane faintly clouded, more distinctly so within the areole.

Size: male, length 3.1 mm., width (hemelytra) 0.9 mm.; female, length 3.4 mm., width (hemelytra) 1 mm.

Holotype male, allotype female, and one teneral specimen, Machanao, June 4, on *Macaranga,* Usinger; one paratype, Piti, April 30, Usinger; two paratypes and one damaged specimen, Piti, July 30, on *Ipomoea,* Swezey; two paratypes and one teneral specimen, Dededo, May 19, on *Terminalia,* Usinger; one paratype, Guam, Fullaway (1431) and one specimen in poor condition, Barrigada, July 22, on *Hibiscus,* Swezey.

Poppius [Archiv für Naturgesch. 80A(8) : 59, 1914] redescribed Distant's genus *Zanchius* (Fauna Brit. India, Rhynch. 2 : 477, 1904), and placed it in the Macrolophinae (= Dicyphinae), probably because the arolia "sind schmal, mit den Klauen verwachsen und etwas über die Mitte derselben sich erstreckend." Poppius also mentions the distinct apical stricture of the pro-

notum. The arolia are of course not visible in Distant's figure and are not mentioned in his description but there is certainly no trace of a collar in Distant's genus. As mentioned above, *fragilis* has a very small collar, visible only under highest magnification (108 diameters). The arolia are free and convergent apically as in typical Orthotylinae. I refer this species to *Zanchius* because it agrees so perfectly with Distant's description and figure, differing only in the more slender body form and in the absence of a "cell-like process at apex of corium", though the costal margin widens near the apex. I have seen species of *Zanchius* from Samoa and Fiji.

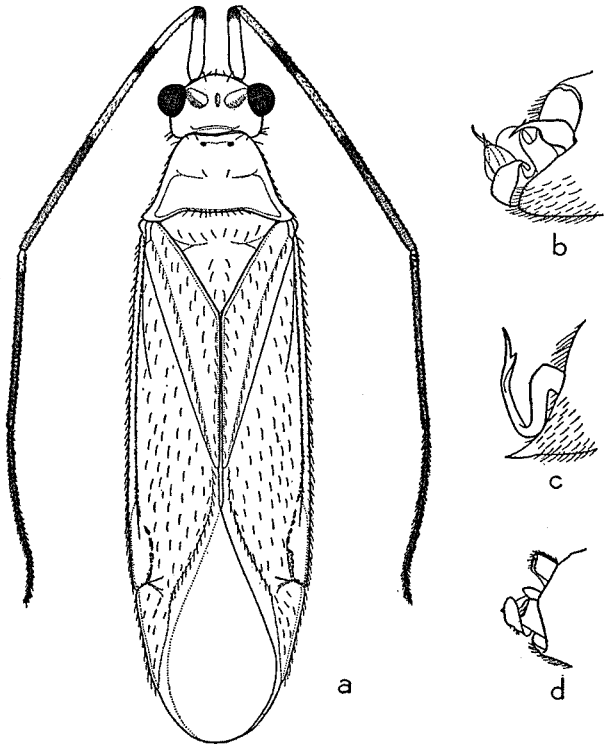

FIGURE 20.—**a, b,** *Zanchius fragilis: a,* dorsal view; *b,* lateral view of last abdominal segment of male showing the right genital clasper broad basally and narrow and curved apically; **c,** *Zanchius piperi:* right genital clasper of male; **d,** *Zanchius virescens:* last abdominal segment of male showing the clasper short and simply lobelike.

71. **Zanchius piperi,** new species (fig. 20, *c*).

Elongate, entirely pale, the upper surface almost entirely impunctate, with scattered, pale hairs. Right genital clasper long, sickle-shaped, angulately bifurcate apically, with inner and outer angles acute.

Head three fourths as long as broad across eyes, 15:20, eyes half as wide as interocular space, 5:10. Vertex almost imperceptibly longitudinally impressed and faintly

impressed on either side near eyes. A feeble transverse carina before hind margin. Rostrum extending well beyond apices of hind coxae; proportion of segments one to four as 12 : 11 : 15 : 14. Antennae longer than body to apex of membrane, 115 : 106, proportion of segments 11 : 46 : 28 : 30.

Pronotum shorter than head on median line, 13 : 15, twice as broad across humeri as long, the sides relatively straight, only feebly concave at middle and very shallowly broadly concave on hind margin, the front margin distinctly sinuate and minutely margined. Disk swollen anteriorly, distinctly depressed behind callosities.

Mesoscutum and scutellum together relatively short, one fourth broader across base of former than length of two together.

Hemelytra long, the apices of cunei considerably surpassing apex of abdomen. Costal margins of coria over twice as long as width of pronotum, 57 : 26, gradually arcuate throughout their length, and distinctly widened at apex to form a cell. Cuneus less than one third as long as corium, 17 : 57. Clavus, corium, and cuneus subhyaline and only faintly, sparsely punctate.

Right genital clasper long, narrow, and sickle-shaped with the outer apical angle produced into a strong, acute spine and the inner apical angle produced into a short, acute spine. Left clasper relatively simple, sickle-shaped. Processes of aedeagus less prominent than in *fragilis* but complicated and apparently distinctive.

Color entirely pale testaceous except for brownish eyes and brown apices of male terminalia.

Size: male, length 2.75 mm., width (hemelytra) 0.95 mm.; female, length 2.9 mm., width (hemelytra) 1 mm.

Holotype male, allotype female, and one male paratype, Dededo, May 11, on *Piper guahamense,* Usinger. A fourth specimen was collected on the same host at Machanao, Aug. 6, Swezey.

Shorter and broader than *fragilis* with differently proportioned antennae and without the dark antennal annulations. Right male genital clasper distinctive. The broadened costal margin of corium at apex results in a cell which may be the "cell-like process" mentioned by Distant although details are lacking in his figure (Fauna Brit. India, Rhynch. 2 : 477, fig. 309, 1904).

72. **Zanchius virescens,** new species (fig. 20, *d*).

Elongate, sparsely pubescent, pale with large green areas on clavus, corium, and in the cells of membrane. Right genital clasper in male small, lobelike, without curvature, spines or processes.

Head two thirds as long as broad across eyes, 16 : 24, the eyes large, half as wide as interocular space, 6 : 12. Entire vertex broadly depressed at center but this may be due to shriveling of specimen. Clypeus strongly convex, transversely impressed at base. Rostrum extending well beyond apices of hind coxae, proportion of segments 11 : 14 : 18 : 13. Antennae about as long as body including membrane, proportion of segments 14 : 60 : 35 : 28.

Pronotum longer on median line than head, 18 : 16, less than twice as wide across humeri as long, 33 : 18, the sides strongly sinuate behind middle, rounded anteriorly, the front margin concave at middle and minutely margined. Hind margin broadly, shallowly concave. Disk smooth, moderately elevated anteriorly where it is feebly longitudinally impressed, hind lobe subdepressed.

Hemelytra very long, the apices of coria exceeding apex of abdomen, corial margins slightly arcuate, over twice as long as width of pronotum, 76 : 33; 3.5 times as long as cuneus. Corial margins widened at apex. Clavus, corium, cuneus, and area within membranal cells subhyaline.

Male right genital clasper short, narrow, simple, uncurved, without spines of processes. Left clasper wide, arcuate, not forming a complete semicircle.

Color entirely pale, whitish ochraceous with brown apex of rostrum and processes of aedeagus. Hemelytra subhyaline spotted with numerous small white punctures apically and sublaterally on corium and near base of membranal cells. Clavus tinged with green at middle of basal half. Corium broadly covered with small green punctures on basal half except at extreme base, with a broad green area beyond middle, another at apex, and two large green areas in membranal cell. Cuneus clear, hyaline, with testaceous margin and green apex. Membrane outside of cells clear hyaline.

Size: male, length 3.5 mm., width (hemelytra) 1 mm.

Holotype male, Upi Trail, May 5, Usinger.

Longer and more slender and differently colored than in other species with distinctive male genitalia.

73. Cyrtorhinus lividipennis Reuter.

Cyrtorrhinus lividipennis Reuter, Ent. Tidskr. **5**: 199, 1884.

Nine specimens, Piti, Sept. 14, *Ipomoea,* in corn field, Swezey; 12 specimens, Inarajan, May 7, in rice field, Swezey; one specimen, Inarajan, May 7, in rice field, Usinger; six specimens, May 7, two specimens, May 14, one specimen, Sept. 30, all in rice fields, Inarajan, Swezey and Usinger; one specimen, Yona, Nov. 18, on corn, Swezey; six specimens, Merizo, Oct. 2, on rice seedlings, Swezey; five specimens, Atantano, Sept. 30, rice seedling plot, Swezey; one specimen, Agana Swamp, May 25, on grass, Usinger; one specimen, Merizo, June 11, grape vine, Usinger; three specimens, Piti, Sept. 1, rice seedling plot, Swezey; one specimen, Piti, Aug. 13, on *Glochidion,* Swezey; one specimen, Guam, Fullaway (1197).

C. lividipennis was associated with *Peregrinus maidis* (Ashmead) on corn (see Usinger, Haw. Ent. Soc., Proc. **10**: 271, 1939), the eggs of the fulgorid apparently being its preferred food. It was also common on rice where it preyed upon the eggs of *Nilaparvata lugens* (Stål). It has been reported from Great Nicobar, Formosa, Java, Ceylon, Burma, Sumatra, Japan, the Philippines, China, and Samoa. It was introduced into the Hawaiian Islands recently in an effort to control the corn leafhopper, but did not become established.

74. Cyrtorhinus riveti Cheesman.

Cyrtorrhinus riveti Cheesman, Ann. Mag. Nat. Hist. IX, **19**: 94, 1927.

One specimen, Inarajan, May 7, Usinger; one specimen, Atantano, Sept. 3, rice seedling plot, Swezey; one specimen, Tarague, May 17, on grass, Swezey; and three specimens, three miles south of Piti, May 23, on *Sporobolus* grass, Swezey. As recorded by me (Haw. Ent. Soc. Proc. **10**: 273, 1939), this species was found sucking the eggs of *Sogata ochrias* (Kirkaldy) on *Sporobolus virginicus* and of *Nilaparvata lugens* (Stål) on rice. *C. riveti* is known elsewhere from Samoa and Tahiti.

75. Orthotylellus rufescens, new species.

Elongate-oval, rufescent with pale laterally on humeri and hemelytra, clothed above with rather fine subappressed hairs and a few shorter appressed hairs.

Head broader than long, 23:19; anteocular portion nearly as long as an eye, 8:9 in the male, equal to length of an eye in the female. Interocular space less than three times as wide as an eye in the male, 13:5, three times as wide in the female, 15:5. Upper surface moderately convex, rather smooth and shining with sparse concolorous erect hairs and a few short, appressed pale hairs. Vertex feebly but distinctly depressed just before hind margin of head, the hind margin feebly sinuate at middle. Rostrum reaching to middle of fifth visible abdominal segment in the male, the first segment reaching onto front coxae, somewhat shorter in the female but reaching well beyond apices of hind trochanters. Antennae about twice as long as width of pronotum, first segment rather short, reaching about to apex of head, second segment slightly longer than head across eyes, 25:23; proportion of segments in the male, 6:25:15:14, in the female, 6:27:16:14.

Pronotum much shorter than the head, 13:19, over twice as broad as long, 30:13; disk rather smooth, the callosities scarcely elevated. Hind femora about three and one half times as long as thick.

Color reddish brown with paler bucculae and gula, and with ochraceous humeral angles, outer margin of clavus at least basally, corium broadly basally and laterally and cuneus laterally, the upper surface thus appearing rufescent medially and broadly pale laterally. Membrane clouded, especially medially, the veins reddish. First antennal segment reddish brown, the remaining segments pale. Rostrum pale with black apex. Front legs including coxae entirely pale except for black apical halves of tarsi. Middle and hind legs pale in region of trochanters, on tibiae except for small reddish brown spots from which the pale tibial bristles arise, and on tarsi except for dark apices. Elsewhere on coxae and most of femora reddish brown. Under surface broadly rufescent with pale abdominal margins.

Size: male, length 2 mm., width (hemelytra) 0.9 mm.; female, length 2.3 mm.; width (hemelytra) 1 mm.

Holotype male, allotype female, and 30 paratypes, Mt. Chachao, May 16, on a species of sedge taller than *Rhynchospora corymbosa,* Usinger.

O. rufescens differs from *samoanus* Knight in its shorter rostrum and different coloration, the sides of hemelytra not pale either in the typical form of *samoanus* or in the variety *nigrellus.* I have seen specimens of *Orthotylellus* from Cairns, Queensland.

A single male labeled "Fiji, 1905" appears to be identical with *rufescens,* though I cannot be certain of this without a series of better preserved specimens. A second specimen, from Rewa, Fiji, 1909, collected by Muir has the second antennal segment half again as long as width of head and differs in type of pubescence and coloration.

76. **Orthotylellus pallescens,** new species.

Oval, rather uniformly pale in color with long, fine hairs above intermixed with short, appressed silvery hairs.

Head two thirds as long as broad, 15:22; produced in front of eyes almost as far as length of an eye, 7:8; eyes less than half as wide as interocular space, 5:12; disk moderately convex, shining, with long hairs very sparse, the short, appressed, silvery hairs more conspicuous. Vertex feebly transversely impressed just before hind margin. Rostrum reaching sixth visible abdominal segment in the male, shorter in the female but extending well beyond apices of hind trochanters. Antennae less than twice as long as width of pronotum, 51:27; second segment slightly shorter than width of head, 21:22; proportion of segments 6:21:13:11.

Pronotum shorter than head, 11:15; over twice as broad as long, 27:11, the disk relatively smooth with callosities scarcely elevated. Pubescence of pronotum, scutellum,

clavus, corium, and cuneus consisting of fine subappressed hairs with a few short, appressed golden hairs intermixed.

Color light brown, the head fulvous, the eyes reddish, the callosities of pronotum fulvous, the rest of upper surface paler fulvous to ochraceous, the humeri still paler. Membrane faintly clouded. First antennal segment brown, the remaining segments ochraceous. Rostrum pale with black apex. Legs pale with middle and hind femora reddish brown apically and with tarsi infuscated apically. Under surface pale with a broad longitudinal rufescent stripe on either side sublaterally.

Size: male, length 1.75 mm., width (hemelytra) 0.8 mm.; female, length 2 mm., width (hemelytra) 0.8 mm.

Holotype male, allotype female, and six paratypes, Inarajan, June 8, on a sedge, *Rhynchospora corymbosa,* Usinger; one paratype, Inarajan, May 7, on rice, Usinger; six paratypes, 5 miles south of Piti, June 23, on sedge in mangrove swamp, Usinger; seven paratypes, Agana Spring, May 15, on *Rhynchospora corymbosa,* Usinger.

Closely allied to *rufescens* but with much shorter antennae and paler coloration.

77. **Orthotylellus brunnescens,** new species.

Elongate-oval, brown, with conspicuous, short, appressed, silvery hairs intermixed with the longer, fine, subappressed pubescence.

Head about three fourths as long as broad, produced about three fourths as far in front of eyes as length of eye, 7:9, in the male, and nearly as far as length of an eye, 8:9, in the female. Eyes half as wide as interocular space in the male, scarcely more than one third as wide as interocular space in the female, 5:14. Disk relatively smooth, polished and moderately elevated, the hind margin almost imperceptibly transversely impressed subbasally. Pubescence of disk sparse and somewhat irregular, of the two types mentioned above. Rostrum reaching about to middle of fifth visible abdominal segment in the male and considerably exceeding the apices of hind trochanters in the female. Antennae over twice as long as width of pronotum, 67:31, in the male, 64:31 in the female, second segment distinctly longer than width of head in the male, 27:24, slightly shorter than width of head in the female, 23:24; proportion of segments in the male, 7:27:18:15, in the female, 7:23:17:16.

Pronotum about two thirds as long as head, over twice as broad as long, 31:13. Disk very faintly transversely rugose, shining, with rather regular, fine, subappressed hairs and sparse, appressed, silvery hairs as on scutellum and hemelytra.

Color rather uniformly brown with very obscure transverse darker stripes on head, and with paler anterior margin of pronotum, apex of scutellum, lateral portions of coria broadly, cuneal fracture and apex of cuneus. Membrane generally clouded, the veins pale. Antennae brown, the second segment broadly pale at middle. Rostrum pale with black apex. Legs fulvous or paler with brown bases of coxae, hind femora except at apices, and infuscated apices of tarsi. Under surface brown except for pale margins of thoracic pleurites and pale ostiolar area.

Size: male, length 2 mm., width (hemelytra) 0.85 mm.; female, length 2.1 mm., width (hemelytra) 1 mm.

Holotype male, allotype female, and seven paratypes, Piti, June 20, on *Scleria margaritifera,* Usinger; one paratype, 5 miles south of Piti, June 23, Usinger; two paratypes, Inarajan, May 7, Usinger, May 7, on rice, Swezey; two specimens, Guam, Fullaway (1203).

Quite distinct in general appearance from *pallescens* and *rufescens* because of the dark color and conspicuous silvery pubescence. This is very close to, if not identical with, a series of specimens which I collected at Montalban, Luzon, Philippine Islands, July 14, 1936 and differs only slightly from a single specimen which I collected at Los Banos on July 17.

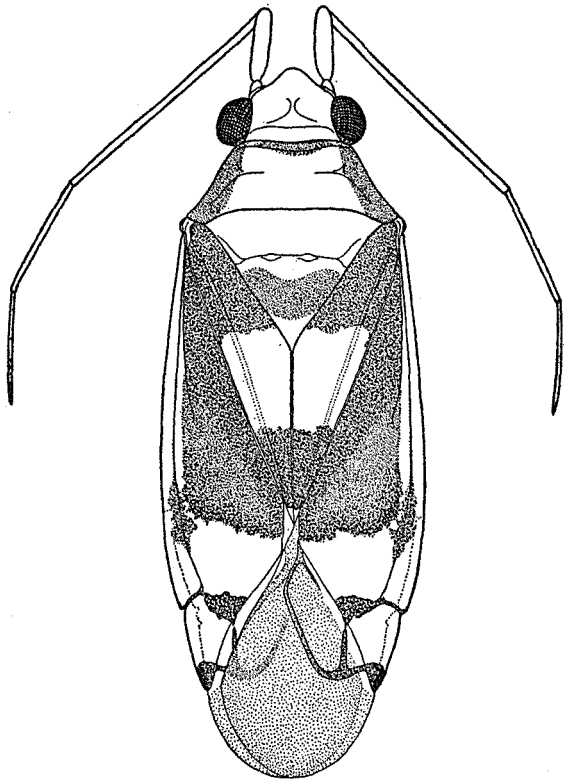

FIGURE 21.—*Aretas signatus:* dorsal view of female showing color pattern.

78. **Aretas signatus,** new species (fig. 21).

Elongate-oval, shining, and densely clothed with a pubescence of pale, mostly backwardly directed hairs which average about 0.1 mm. in length and which are inserted closer together than the length of a hair.

Head broader across eyes than long, 28:21; the eyes less than half as wide as interocular space, 6.5:15; twice as long as broad; vertex narrowly depressed at base, feebly transversely sulcate subbasally, these impressions joining to form a shallow median longitudinal sulcus which extends forward to middle of vertex. Vertex broadly convex between bases of antennae and then abruptly depressed to base of vertical tylus. Lora distinctly inflated midway between front margins of eyes and loral apices. Rostrum scarcely surpassing apices of middle coxae, the four segments subequal in length. Antennae one ninth shorter than length of insect to tip of membrane, 120:135; the first segment

shorter than head, 17:21; proportion of segments one to four as 17:53:26:24; first segment with stiff, erect bristles and all segments with short, fine pubescence.

Pronotum only three fourths as long on median line as head, 16:21, over twice as broad across humeri as long, 40:16; anterior margin feebly concave at center; disk faintly impressed surrounding callosities and very obscurely longitudinally impressed at middle in front of callosities. Posterior disk minutely, irregularly roughened. Lateral margins feebly concave, with three erect hairs in addition to the general backwardly directed hairs which clothe the entire surface.

Mesonotum and scutellum large and broadly exposed, together five sevenths as long as broad and only one eighth narrower at base than pronotum; mesonotum about one half as long as scutellum. Pubescence continuing over these disks as well as on clavus, corium, and cuneus.

Male with left genital clasper briefly produced as a slender arm and then dilated into a stout lobe twice as wide as long, projecting farther caudad than cephalad and rounded at apices. Right clasper extending dorsally into an arm abruptly elbowed at its middle and ventrally into an arm which is more roundly bent downward subbasally.

Color pale, ochraceous, the eyes brown, the vertex fulvous, the tylus and juga reddish, the lora red and brown, the rostrum pale with black apex, antennae entirely pale, or the first segment slightly tinged with pink. Pronotum tinged with red anteriorly and distinctly brown laterally. Mesonotum and narrow basal portion of scutellum ochraceous, middle of scutellum broadly brown its apex nearly white. Hemelytra very distinctively marked, the clavi red on basal third, extending nearly to level of apex of scutellum, then abruptly ochraceous to apical fourth where they are again red to apices. Entire inner areas of coria red to slightly beyond level of apex of commissure of clavus, then broadly, transversely ochraceous to front margin of cuneus which is narrowly red laterally and broadly red medially. Middle of cuneus pale, its apex red at joining of red membranal veins and dark brown at tip. Costal margin of corium entirely pale, the pale area broader than embolium except at level of apex of commissure of clavus. Membrane rather uniformly infuscated, with an ill-defined paler area across center. Under surface and legs entirely pale except for brown claws.

Size: female, length 3.4 mm., width (hemelytra) 1.3 mm.; male, length 3.3 mm., width (hemelytra) 1.2 mm.

Holotype female, Yona, May 12, on *Ficus,* Usinger; allotype male, Mt. Alifan, May 26, on *Pipturus,* Usinger; one paratype, same data as holotype, and one same data as allotype; six paratypes, Piti, Aug. 13, 18, and 24, on *Glochidion,* and Sept. 12, on *Pithecolobium,* Swezey; two paratypes, Merizo, Oct. 2, on golden shower tree, Swezey; one paratype, Dededo, May 19, Usinger; two paratypes, Tarague, May 17, on *Premna gaudichaudii,* Usinger; one specimen, Mt. Alifan, April 20, Bryan.

The paratypes show some color variation, there being reddish flecks around the eyes in some specimens, an occasional reddish tinge on the scutellum, and a suggestion of brown subapically on hind femora. The brown of the lateral margins of pronotum extends over onto a portion of the propleura. The most distinctive feature of this species, other than the male genitalia, is the red central area of hemelytra with contrasting ochraceous across the middle of clavi. This is a common species on Guam and is obviously not host specific.

A. signatus will run to *flavus* Knight or *imperatorius* Distant in Knight's key (B. P. Bishop Mus., Bull. 142: 167, 1937) but does not agree with these or any other described species in color or in shape of male genital claspers.

79. Aretas bifasciatus, new species (fig. 22).

Elongate-oval, clothed with long, backwardly directed hairs much as in *signatus.*

Head broader than long, 25 : 19, the interocular space twice as wide as an eye, 13 : 6.5; eyes nearly twice as long as wide, 12 : 6.5. Vertex depressed basally and sulcate longitudinally much as in *signatus,* the frons convexly produced between bases of antennae and then abruptly depressed to base of tylus. Lora likewise feebly lobed. Rostrum slightly exceeding apices of middle coxae, the segments subequal. Antennae nearly as long as insect to tip of membrane, 122 : 129, the first segment about as long as head; proportion of segments 18 : 56 : 26 : 22; first segment with stiff, erect hairs, all segments with a short, fine pubescence.

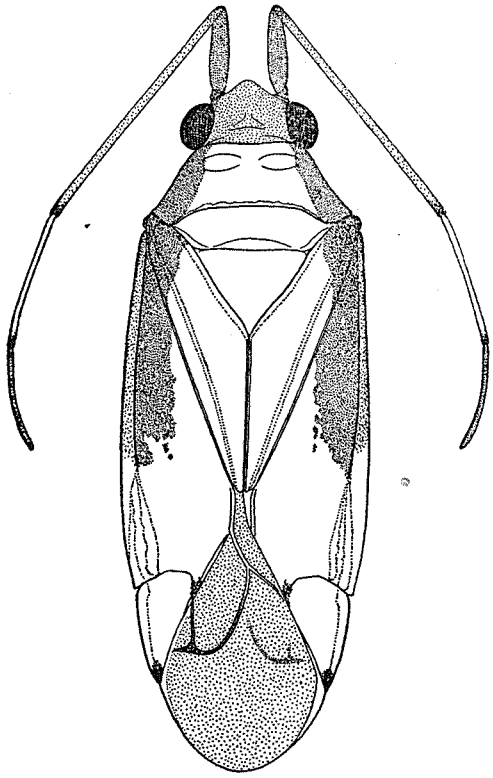

FIGURE 22.—*Aretas bifasciatus:* dorsal view of female showing color pattern.

Pronotum shorter than head on median line, 15 : 19; over twice as broad across humeri as long, 37 : 15; the anterior margin convex and sinuate at middle, lateral margins very feebly concave, hind margin shallowly, broadly concave. Disk feebly impressed around callosities, with some erect hairs antero-laterally.

Other structural characters except male genitalia as in *signatus.*

Left genital clasper twisted subbasally and enlarged into a broad organ with a straight, stout outer arm which is blunt at apex and a longer, slender, sinuate inner arm which is minutely truncate at apex. Right clasper shorter, strongly convex and enlarged with a slender, inwardly turned arm.

Color flavous to ochraceous with red as follows: on portions of tylus, juga, and lora, eyes and areas immediately adjacent, lateral margins of pronotum and extending over

the sides onto propleura, lateral margins of hemelytra on basal two thirds including extreme outer basal angles of scutellum, bases of clavi, and embolia and outer portions of coria. Pale beyond and within this red area except for a pale spot at middle and another at outer angle of each apical corial margin. Veins of membrane tinged with reddish, the membrane pale but infumate. First antennal segment mostly red, the inner dorsal side more or less pale. Second segment often tinged with red basally and apically. Legs in great part pale but with the femora often vaguely embrowned or tinged with red subapically.

The male is considerably darker, the hemelytra entirely dark reddish brown except for narrowly pale inner margins and commissure of clavus, outer apical area of corium near cuneus, and cuneus except at inner base and at apex.

Size: female, length 3.3 mm., width (hemelytra) 1.2 mm.; male, length 3.4 mm., width (hemelytra slightly spread) 1.2 mm.

Holotype female, Piti, Sept. 21, on *Glochidion,* Swezey; allotype male, Piti, Aug. 13, on *Glochidion,* Swezey; 18 paratypes, Piti, same data as type except for two, Aug. 24, and one, Oct. 12; two paratypes, Upi Trail, May 5, Usinger; two specimens, Piti, Aug. 18, on *Glochidion;* one specimen, Nov. 21, on bamboo, Swezey.

A. bifasciatus will not run directly to any of the species in Knight's key and the situation is further complicated by the sexual dimorphism in color. The male genitalia are distinctive. Both *signatus* and *bifasciatus* have the frons convex and produced slightly between bases of antennae, a condition described by Knight in *nigribasicornis* and *rubroclavus* as "frons abrupt above base of tylus."

Study of the type shows that *Tichorhinus vitiensis* Kirkaldy (Linn. Soc. N. S. Wales, Proc. 33: 377, 1908) is an *Aretas.* I have seen undescribed species of *Aretas* from New Caledonia and Australia.

80. Halticus insularis, new species.

Broadly oval, convex above, sparsely clothed with subappressed black hairs; head shining, the rest of dorsal surface dull.

Head directed downward, nearly as long to apex of tylus as broad across eyes, 23: 24; tylus convex, subrounded at apex; labrum less than half as wide at base as greatest width of tylus, tapering apically, twice as long as wide. Disk of head highly polished, minutely rugose-punctate, feebly convex. Hind margin moderately arcuate, a little reflexed, overlapping anterior margins of pronotum. Rostrum stout, reaching to apices of hind coxae; proportion of segments 7: 7: 9: 4. Antennae much longer than body, over three times as long as width of pronotum, 97: 30, the second segment scarcely longer than length of costal margin of corium, 35: 34; proportion of segments one to four as 8: 35: 25: 29; first segment thickest, not reaching apex of head, with one or two long erect hairs beyond middle; remaining segments slender, cylindrical, covered with short, stiff, apically directed hairs.

Pronotum one fourth broader across humeri than head width including eyes, 30: 24; twice as broad as long, and two thirds as wide at anterior margin as across humeri, sides straight, humeri briefly rounded, hind margin broadly rounded and very feebly concave in front of scutellum. Disk only feebly elevated, very minutely punctate or almost shagreened, obsoletely, transversely rugose.

Scutellum a little less than twice as broad at base as long, 12: 7, the disk similar to pronotal disk, feebly elevated basally and gradually depressed apically to acute angular apex.

Hemelytra strongly convex, the costal margins strongly arcuate, the cuneal fracture deep, surface of clavus, corium, and cuneus shagreened and pubescent. Membrane complete, surpassing tip of abdomen.

Under surface largely naked and shagreened on thoracic pleura and coxae, highly polished and pubescent on abdominal venter.

Legs shining and pubescent, the front and middle legs slender, the hind femora slightly over one third as thick as long, 11 : 29. Hind tarsi with first segment two thirds as long as second and third, which are subequal.

Color black with ferrugineous eyes, brownish membrane becoming paler around apical margin. Antennae pale, testaceous, with infuscated apex of second segment, more or less on apical half of third segment and all of fourth except for pale base. Legs entirely pale except for fuscous claws and black basal half or two thirds of hind femora.

The male has even longer antennae, 3.5 times as long as width of pronotum, 99 : 28; with the second segment much longer than costal margin of corium, 37 : 30.

Size: 1.75 mm. long, 1 mm. wide across hemelytra.

Holotype female, Ritidian Point, June 2, Swezey; allotype male, Piti, Sept. 17, on pumpkin leaves, Swezey; 12 paratypes, same data as allotype; six paratypes, Piti, Sept. 14, on *Ipomoea* in a cornfield, Swezey; one paratype, same data as holotype; one paratype, Agana Swamp, May 4, on cucumber, Usinger; one paratype, Fullaway (1205).

Allied to *tibialis* Reuter which I have from Amboina and Macassar, collected by Muir. In *tibialis* the antennae are shorter, less than three times as long as width of pronotum across humeri, 87 : 30; all of the femora are black except at apices and the hind tibiae are broadly infuscated on basal half except at extreme base. *H. tibialis* has been reported from Africa, Ceylon, Java, and the Carolines. *H. minutus* Reuter from Ceylon, Singapore, and Cochin China is said to have the second antennal segment shorter, about as long as costal margin of corium, and the infuscated basal half of the hind tibiae is not mentioned by Distant (Fauna Brit. India, Rhynch. 2 : 480, 1904). Otherwise it seems to agree, except for its smaller size, with *tibialis*. Distant records *minutus* from *Ipomoea* in Ceylon, collected by Green, and Esaki records *tibialis* as injurious to beans in the Carolines.

Subfamily PHYLINAE

Genus **PSALLOPS,** new genus

Elongate-oval, densely clothed with long, posteriorly directed, stiff hairs. Head almost entirely deflected, nearly vertical, eyes large, the interocular space narrower than width of an eye, surface of eyes subflattened, hind margins touching anterior margin of pronotum and extending ventrally where they practically touch front coxae. Vertex sharply margined posteriorly. Tylus scarcely evelated, not separated from frons. Rostrum very long, reaching to apical third of abdomen. Antennae inserted a little before inner apices of eyes, over half again as long as width of pronotum, the first segment half as long as head but exceeding apex of head, second three times as long as first, slightly and gradually increasing in thickness toward apex, third and fourth segments subequal, together a little shorter than second.

Pronotum a little shorter than head and over twice as broad as long, subflattened posteriorly with nearly straight hind margin, roundly deflected anterolaterally beneath the subflattened lobelike eyes, the front margin with a transverse, flattened fold at middle simulating a collar.

Mesoscutum broadly exposed, the width at base one third greater than combined lengths of mesoscutum and scutellum.

Hemelytra broad and long, completely covering the abdomen, the apex of cuneus exceeding tip of abdomen by half the length of cuneus. Clavus broad, subflattened, the commissure one third longer than combined lengths of mesoscutum and scutellum. Corium slightly less than half again as long as width of pronotum, the disk moderately convex, depressed along costal margin, the flattened area thus formed slightly widened posteriorly but only one sixth the total width of corium at posterior margin. Cuneus one third as long as corium. Membrane exceeding apices of cunei by less than the length of cuneus, broadly rounded posteriorly, the cells short, the inner apical angles rounded and the vein joining inner margin of cuneus just beyond middle.

Under surface smooth, nearly naked anteriorly, clothed with fine hairs on abdomen. Legs moderately pubescent, the tibiae with fine erect spines. Femora partially collapsed in the only available specimen, but incrassate, the hind femora twice as long as greatest width near middle. Claws uncleft, pseudarolia absent, arolia short, inconspicuous, bristlelike.

Genotype: *Psallops oculatus,* new species.

Psallops is allied to *Psallus* and *Sthenarus* but is unique in possessing large, subflattened eyes, a strongly declivous head, sharply margined vertex posteriorly, a very long rostrum, and a vestiture of long, stiff, posteriorly directed and slightly curved hairs.

81. Psallops oculatus, new species (fig. 23, *a, b*).

Head broader than long, 21 : 17; produced in front of eyes for a distance less than half as great as length of an eye, 5 : 12; eyes very large, wider than interocular space at narrowest point, 7 : 6; the narrowest point being at basal fifth of head before which inner margins of eyes gradually round to insertions of antennae near front margins, and behind which they abruptly diverge to hind margin. Upper surface of head finely granular, with stiff, erect hairs posteriorly, and finer, anteriorly directed hairs anteriorly. Rostrum reaching to apical third of abdomen, the first segment reaching to apical third of front coxae; proportion of segments 12 : 14 : 11 : 10. Proportion of antennal segments, 8 : 24 : 11 : 10; the first two segments finely pubescent, the last two with additional erect hairs.

Pronotum with callosities scarcely elevated. The entire pronotal disk covered with small elevations which are conspicuous only when the light casts a shadow, with backwardly directed, curved hairs arising from each, these hairs much longer individually than the distance between hairs.

Scutellum and hemelytra except costal margins less densely but just as conspicuously clothed with bristlelike hairs, the hairs arising from conspicuous elevations on clavus and corium. Pubescence of cuneus shorter and finer.

Color ferrugineous on head and pronotum, the eyes and pronotal disk and pubescence brown. Rostrum reddish at base, pale at middle and brown at apex. Antennae pale, ochraceous, the last two segments infuscated. Mesoscutum broadly brown at basal angles and at middle. Scutellum brown at middle of base, white elsewhere, tinged with red laterally at base. Clavus and corium white with brown elevations from which the pale fulvous hairs arise. Cuneus deep brown on basal half, then tinged with reddish, and white at apex. Membrane most densely clouded at base, veins posteriorly white. Under surface reddish with pale base and middle of abdomen. Ostiolar areas white. Legs white with red or

red-brown apically on front femora and on apical half of hind femora except for white extreme apices. Bristles of tibiae white.

Size: length 2.4 mm., width (hemelytra) 1 mm.

Holotype female, Machanao, June 4, on *Asplenium nidus,* Usinger.

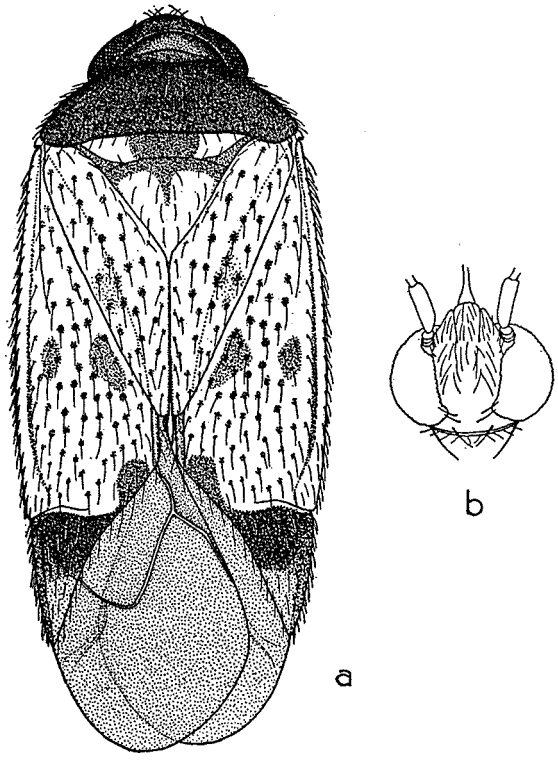

FIGURE 23.—*Psallops oculatus:* **a,** dorsal view of female showing form, color pattern, stiff hairs and elevations at bases of hairs of pronotum; **b,** front view of head to show shape of its upper surface.

82. **Campylomma breviceps,** new species (fig. 24, *a*).

Broadly oval, uniformly pale above with pale, subappressed pubescence.

Head relatively short, three fifths as long as broad across eyes, 15:25; the eyes half as wide as interocular space in the male, 6.5:12, 5.5:12 in the female; rostrum reaching apices of middle coxae, the segments subequal in length. Antennae about as long as distance from tip of tylus to apex of commissure of clavus, the second segment slightly shorter than width of head across eyes; proportion of segments 7:23:14:11.

Pronotum as long as head on median line and over twice as broad as long, 34:15; callosities very feebly elevated, disks of scutellum, clavus, corium and cuneus all moderately shining and clothed with subappressed pubescence similar to that of head and pronotum, the latter with an erect bristle on either side antero-laterally.

Color almost entirely pale, testaceous, the head ochraceous, the eyes light brown, the antennae pale with apex of last segment slightly infuscated, rostrum black at apex,

front and middle femora each with a black spot at inner ventral subapices, hind femora with a series of spots along hind margin, one of these very faint at middle of basal half, two very conspicuous and equally spaced near and beyond the middle, three smaller subapical spots laterally. Tibiae with black spines but without black spots. Membrane scarcely clouded, hyaline.

Size: male, length 2.7 mm., width (hemelytra) 1.1 mm.; female, length 2.3 mm., width (hemelytra) 1 mm.

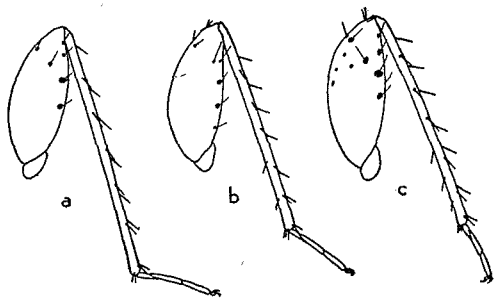

FIGURE 24.—*Campylomma* species, hind leg showing size and arrangement of spots and bristles on femur: **a**, *breviceps;* **b**, *pallida;* **c**, *brunneicollis.*

Holotype male, allotype female, and three paratypes, 2 miles south of Piti, April 30, on *Hibiscus tiliaceus,* Usinger; one specimen, Talofofo, April 11, Bryan.

Related to *adamsoni, tahitica,* and *pallida,* but distinguished by the combination of characters: short head and pronotum, short rostrum, and spots on hind femora.

83. Campylomma pallida, new species (fig. 24, *b*).

Oval, shining, uniformly clothed with a pale, subappressed pubescence.

Head much broader across eyes than long, 25:18; the interocular space wider than an eye, 11:7, male, 12:6, female, vertex without conspicuous punctures. Tylus and juga only moderately convex. Rostrum relatively long, distinctly surpassing hind coxae, reaching about to apices of hind trochanters, proportion of segments 10:12:8:12. Antennae about as long as head, pronotum, and scutellum, the second segment four fifths as long as head width including eyes in the male, three fourths as long as head width in the female; proportion of segments, male, 6:20:11:7; female, 6:18:11:7.

Pronotum one ninth shorter than head and slightly more than twice as broad across humeri as long, 33.5:16, the disk quite smooth, without conspicuously raised callosities.

Hemelytra subhyaline, the clavus, corium, and cuneus covered with the same type of hairs as head, pronotum, and scutellum.

Color entirely pale testaceous to ochraceous with brown eyes, faintly clouded membrane, brown apex of rostrum, several stiff black bristles at apices of femora, stiff black bristles on tibiae, and femoral spots as follows: one spot ventrally and subapically on front femora; one postero-ventrally and one postero-dorsally between middle and apex of intermediate femora; and four conspicuous spots postero-ventrally on hind femora, one of these subbasal and three near the middle. There are additional vague setigerous spots apically and dorsally but they are too poorly defined to describe.

Size: male, length 2.4 mm., width (hemelytra) 1 mm.; female, length 2.3 mm., width (hemelytra) 0.95 mm.

Holotype male, allotype female, and 12 paratypes, Taragüe, May 17, on *Messerschmidia,* Usinger; one specimen, Ritidian Point, April 15, on ferns, Bryan.

Runs to *adamsoni* Knight in Knight's key to the Marquesan species (B. P. Bishop Mus., Bull. **142**: 181, 1938) but with shorter second antennal segment and longer rostrum. *C. tahitica* Knight is another closely allied species which has a shorter rostrum, slightly different dots on hind femora, and, presumably, no dots on the front and middle femora, since they are not mentioned in the description.

84. Campylomma brunneicollis, new species (fig. 24, *c*).

Oval, more or less extensively brown colored with short pubescence at middle of head and long, subappressed pubescence elsewhere.

Head nearly half again as broad as long, 24: 17, the anteocular portion very short, scarcely more than one third as long as an eye, 5: 11 in the male, 4: 11 in the female; eyes a little over half as wide as interocular space in the male, 6.5: 11; half as wide in the female, 6: 12. Disk with longer hairs anteriorly and long, stiff hairs near posterior margin, the middle with very short hairs; relatively smooth anteriorly and with a few punctures near hind margin, the entire disk shining. Rostrum reaching or slightly surpassing apices of hind coxae. Antennae as long as head, pronotum and scutellum together, the second segment much shorter than width of head, 20: 24 in the male, 18: 24 in the female; proportion of segments 5: 20: 12: 8 in the male.

Pronotum shorter than head on median line, 15: 17, over twice as broad as long, 33: 15; disk obscurely punctate-rugose, not impressed or elevated near the callosities. Pubescence quite even and dense over entire disk. Scutellum, clavus, corium, and cuneus with somewhat longer, sparser, and more irregular pubescence.

Color predominantly dark brown on head and pronotum, the under surface of head and a band across hind margin of vertex ochraceous. Pronotum sometimes lighter brown anteriorly at middle. Eyes red or brown, antennae pale, rostrum pale with black apex, scutellum pale, ochraceous, more or less brown basally at middle. Clavus and base of corium white, apical half of corium more or less generally infuscated, especially on inner portion. Cuneus pale, hyaline. Membrane lightly embrowned medially. Under surface pale marked with brown on pro and mesopleura and laterally and apically on abdomen. Legs testaceous, the front and middle femora each with a subapical spot postero-ventrally and middle femora each with three spots along antero-ventral side in apical half and one subapical spot antero-dorsally, all but the basal of these spots setigerous. Hind femora with 11 prominent black spots in apical half and with the entire apical half sometimes lightly infuscated. Tibiae with long black spines, most of which arise from black spots.

Size: male, length 2.3 mm., width (hemelytra) 1 mm.; female, length 2.7 mm., width (hemelytra) 1.1 mm.

Holotype male, allotype female, and two paratypes, Mt. Tenjo, May 3, on *Scaevola koenigii,* Usinger; five paratypes, Mt. Alifan, May 21, on milkweed, Usinger; one paratype, Inarajan, May 7, Usinger, and one, Piti, April 30, Usinger.

The variation in color in this series is remarkable, one of the Mt. Alifan males having an entirely brown head except for the characteristic ochraceous base, entirely light brown scutellum, the clavus and corium brown except narrowly at base, and even the cuneus infuscated except basally and laterally.

The under surfaces of thorax and abdomen are entirely brown, the hind femora are entirely brown except for pale bases and apices, thus nearly obscuring the slightly darker black spots, and the antennae are pale but vaguely infuscated. Other specimens from Alifan appear to be perfectly typical, so I assume that this represents an extreme form of color variation. In some specimens the rostrum scarcely exceeds the apices of middle coxae but the condition of the specimen determines whether the rostrum is fully extended or not. I know of no close relatives of this distinctive species.

Superfamily Cryptostemmatoidea

Family Cryptostemmatidae

Genus **NESONANNUS,** new genus

Elongate-oval, naked except for long antennal bristles. Head strongly declivous and pronotum moderately so. Ocelli distinct, contiguous to eyes. Eyes relatively small, scarcely longer than anteocular portion of head and about one third as wide as interocular space, overlapping anterior angles of pronotum, the first two segments short and stout, the last two long and slender and beset with several bristles which are longer than the segments.

Pronotum twice as broad as long, with a deep, transverse, arcuate impression at anterior fourth. Propleura moderately inflated beneath the eyes. Scutellum half as wide as pronotum and half as long as wide, the disk deeply, transversely impressed.

Hemelytra complete, membranous, extending well beyond apex of abdomen, costal margins very thick and without a fracture. Venation unique, with only two free veins in apex of wing, the third vein curving upward to join second and form a closed discal cell. Vein along hind margin of clavus not crossing clavus before apex.

Under surface largely obscured but with coxae apparently only moderately enlarged, legs relatively slender, the tibiae cylindrical and beset with very short, inconspicuous hairs. Tarsi 3-segmented, the clavus simple, without arolia. Male genital capsule asymmetrical, with a long slender black process crossing to the right side of capsule and then briefly bent posteriorly. In addition there is a broad, sickle-shaped organ on the right side of capsule which has a small, subapical, fingerlike process directed forward and to the left.

Genotype: *Nesonannus saileri,* new species.

Nesonannus clearly pertains to the Schizopterinae as defined by McAtee and Malloch [U. S. Nat. Mus., Proc. 67(13): 3, 1925] but has a relatively larger scutellum, only two free veins in the apex of the hemelytron and a distinctive basal venation. R. I. Sailer kindly compared this specimen with the extensive material in his charge at the U. S. National Museum and found no close relatives.

85. **Nesonannus saileri,** new species.

Head half again as broad as long, 26: 17; convex above, the surface naked and finely granular. Tylus distinctly set apart by a suture, even at base, parallel-sided, convex, and polished, with two erect bristles on either side. Eyes small, about as long as anteocular portion of head and about one third as wide as interocular space, 5: 16. Ocelli distinct, one fifth as wide as an eye, widely separated from each other, being contiguous

to inner margins of compound eyes. Antennal proportions 3 : 5 : 14 : 17, the first two segments with short sparse hairs, the third segment with several bristles as long as the segment, inserted near base; fourth segment with several bristles longer than the segment. Rostrum and thoracic sterna obscured in the unique type.

Pronotum feebly convex, the surface finely shagreened, humeral angles narrowly rounded, hind margin feebly concave. Scutellum with sides concavely sinuate before middle, convex beyond middle and abruptly narrowed and briefly, roundly produced at apex.

Hemelytra less than twice as long as width of pronotum, 70 : 40; costal margin thicker than hind femur, deeply impressed along inner margin; terminating along embolar suture and curving upward at end of thickened costa to form a long, narrow cell. A small cell beneath this beyond middle and two larger discal cells beyond basal discal cell and between R+M and Cu. Apical area with two free veins reaching apical margin and a third innermost vein curved outward to enclose a large discal cell.

Color rather uniform fulvous above with the membranous areas of hemelytra paler, the under surface and appendages fulvo-testaceous. Eyes and ocelli tinged with reddish.

Length (measured from above in a single plane) 1.43 mm.; width (pronotum) 0.66 mm.

Holotype male, Barrigada, on hau, July 22, Swezey.

This is the first schizopterid to be recorded from an oceanic island in the Pacific but I have seen another species (apparently not congeneric) from Fiji. I take pleasure in dedicating this species to Dr. R. I. Sailer, hemipterist at the U. S. National Museum, whose generous assistance has greatly facilitated my recent work.

Superfamily Gerroidea

Family Mesoveliidae

86. Mesovelia orientalis Kirkaldy, Mus. Civ. Stor. Nat. Genova, Ann. II, **20**: 808, 1901. (See figure 25, *b*.)

Two specimens, Agana Swamp, May 2, Usinger; seven specimens, Agana Swamp, May 4, Usinger; all apterous. The May 2 specimens are darker in color than the others. These agree well with a specimen collected by me at Montalban, Luzon, Philippine Islands, July 14, 1936, and with two specimens before me from Garoet, Java, collected by Linsley. The middle femora have a row of short spines on the under side and the eighth abdominal segment in the male has a clump of short spines on the middle of the ventral surface and a clump of long hairs on either side. The second segment of the hind tarsi is longer than the third, the rostrum scarcely reaches to the level of the front margins of the hind coxae and the last two antennal segments are subequal (or the last slightly longer) and less than twice as long as the second segment. The apical arm of the male clasper is shorter and broader basally and thus appears subtriangular, rather than long and tapering as figured by Lundblad (Arch. Hydrobiol. Suppl. **12** : 187, 1933), but the form of these claspers is known to vary within wide limits (Usinger, Brooklyn Ent. Soc., Bull. **37** : 177-178, 1943) so a new species does not seem to be justified. The claspers are long and taper-

ing and bent apically in both the Philippine and Javanese specimens, but slight variations in form are apparent. *M. orientalis* is known elsewhere from India and Ceylon through the East Indies to New Guinea, the Philippines, and Formosa. It was considered as a synonym of *vittigera* Horvath by Horvath in his monograph (Hist.-Nat. Mus. Nat. Hung., Ann. 13 : 550, 1915) but was resurrected by the same author in 1924 (op. cit., 21 : 35, 1924).

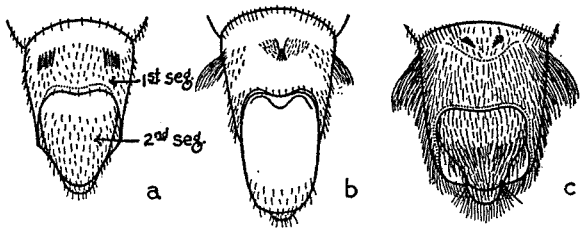

FIGURE 25.—*Mesovelia* species, details of ventral surface of first genital segment: a, *pacifica;* b, *orientalis;* c, *mulsanti.*

87. Mesovelia pacifica, new species (fig. 25, *a*).

Elongate, slender, the head slightly longer than broad across eyes, eyes sinuate at inner posterior margins, anterior angles of pronotum only briefly rounded, mesonotum less than twice as long as metanotum at middle, hind femora without spines beneath, first genital segment in male without spines or processes but with 6 to 8 stiff black bristles on either side of middle, the bases of these bristles concealed when the genital segment is retracted in its normal position. Male genital claspers abruptly bent at basal third, directed forward and tapering apically. Second segment of posterior tarsi distinctly longer than third.

Male: head longer than broad across eyes, 23 : 20; the eyes half the width of interocular space, sinuate on inner posterior margins. Rostrum reaching almost to apices of hind coxae. Antennae almost as long as body, 84 : 86; first segment only about two thirds as long as head, 18 : 23; proportion of segments 18 : 13 : 27 : 26.

Pronotum one third as long on median line as head, 7 : 21; three times as broad as long, 21 : 7; hind margin feebly but distinctly sinuate; anterior angles briefly rounded. Mesonotum a little longer at middle than pronotum, 9 : 7, the hind margin curved forward sublaterally. Metanotum over half as long as mesonotum, 5.5 : 9, the hind margin nearly straight.

Abdomen only moderately expanded, the connexival plates a little over one third as wide as dorsal abdominal disk at the same level, the connexivum only moderately reflexed, the entire abdomen slightly narrower at widest part than greatest width of thorax.

First genital segment almost as long above as broad at base, 10 : 12, less than half as long beneath as broad, 5 : 12; with 6 to 8 stiff black bristles on either side of middle ventrally, the bristles covered basally by the preceding segment. Claspers very broad and abruptly but roundly bent subbasally, slender and tapering to acute apex on apical half.

Legs simple, the femora without distinct spines on under surface. Second segment of hind tarsi longer than third, 23 : 20.

Female similar to male in most body proportions but relatively broader, the abdomen in particular broader, the greatest width across connexival margins one sixth greater than width of thorax, 31 : 26.

Color yellowish or greenish ochraceous with variable brown markings. Palest specimens with a brown stripe on either side of middle of metanotum, brown on all of second tergite, the middle of third and the middle of fourth tergites, and with brown dorsal abdominal sutures. Connexival plates pale with narrowly brown lateral edges. Eyes

brownish. Antennae more or less infuscated, especially apically. Abdominal venter with a sublateral longitudinal line. Rostrum brown at apex. Legs pale brown especially at joints. Erect bristles of legs brown. Darkest specimens almost entirely brown above, pale only on anterior portion of pronotum, middle of mesonotum and metanotum, laterally on fourth and generally on seventh tergite, posteriorly on eighth tergite and on middle of connexival plates. Under surface testaceous at middle, brownish laterally. Legs pale basally, brownish elsewhere.

Size: male, length 2.25 mm., width (abdomen) 0.6 mm.; female, length 2.6 mm., width (abdomen) 0.8 mm.

Holotype male, allotype female, and three paratypes, all apterous, Mt. Chachao, May 16, Usinger.

Runs to *thermalis* in Horvath's key (Hist.-Nat. Mus. Nat. Hung., Ann. **13**: 544, 1915) but lacks the two subbasal black tubercles of the first genital segment of that European species. *M. orientalis* Kirkaldy is superficially quite similar but has a distinct median tubercle on the first genital segment. The present species differs from *indica* Horvath, in which the second segment of the hind tarsus is shorter than the third and the eyes are not sinuate at inner bases, and in which no mention is made of the black bristles found in *pacifica* on the first genital segment. *M. hungerfordi* Hale from Australia is larger and has "two elevated tufts of brownish-black spines on the venter of the first genital segment" (Hale, South Austr. Mus., Rec. 3: 200, 1926) as in *mulsanti, thermalis,* and *subvittata.* The spines that comprise these "tufts" are very short and dense in contrast to the long, posteriorly directed bristles of *pacifica.*

The only other *Mesovelia* reported from an oceanic island in the Pacific is *mulsanti* White (fig. 25, *c*), a common species in taro patches in the lowlands of the Hawaiian Islands. This was doubtless introduced quite recently from America. I have seen a Fijian *Mesovelia* in the recent collection of E. C. Zimmerman and New Caledonia specimens in the collections of F. X. Williams.

Family GERRIDAE

Subfamily GERRINAE

88. Limnogonus fossarum (Fabricius).

Cimex fossarum Fabricius, Syst. Ent., 727, 1775.

Two specimens, Inarajan, May 7, Usinger; two specimens, stream mouth south of Agat, June 19, Usinger; one specimen, Fullaway (1191); all specimens macropterous.

These agree perfectly with Esaki's figures [Ins. Samoa 2(2): 70, 1928] and Lundblad's excellent description and figures (Arch. Hydrobiol. Suppl. **12**: 374, 1933). Specimens are before me from Java, the Philippines, and Fiji. It has been reported elsewhere from India, Ceylon, China, Formosa, Sumatra, and Celebes, and Esaki collected both macropterous and brachypterous specimens on Saipan.

In addition to the above-mentioned macropterous specimens from Guam, five brachypterous specimens from Agana Swamp, May 4, Usinger, and one brachypterous specimen from south of Facpi Point, May 28, Usinger, agree in genital characters and hence have been placed here. The occurrence of brachypterous specimens resembling *fossarum* is suggestive of the situation in Samoa, where *L. pacificus* Esaki was described from an exclusively brachypterous series and differentiated from *fossarum* only by minor genitalic characters.

The Guam series agrees with *fossarum* rather than *pacificus,* though some variation is exhibited, particularly in the shape of the posterior ventral margin of the sixth abdominal segment in the male and in the degree to which the sternite of the last abdominal segment is reflexed dorsally.

89. Limnogonus luctuosus (Montrouzier).

Gerris luctuosa Montrouzier, Soc. Linn. Lyon, Ann. (n. s.) **11**: 242, 1864.

Three macropterous females, Agana Swamp, May 4, Usinger. These are slightly smaller, 7.75 mm., than female examples from Tahiti and have the yellow lateral lines of the sides of the mesothorax as in Lundblad's figure 2, *b* (B. P. Bishop Mus., Bull. **113**: 124, 1934), but not constricted near the middle and with the truncated end connected at its upper angle to an additional pale spot behind the black-rimmed spiracular slit. In other respects these Guam specimens agree with Lundblad's revised description (Arch. Hydrobiol., Suppl. **12**: 380, 1933). Known elsewhere from New Caledonia, New Hebrides, Samoa, Tahiti, Raiatea, Murray, and Caroline Islands.

90. Limnogonus lundbladi, new species (fig. 26).

Relatively short and stout, dorsally humped at middle in apterous forms, with tremendously enlarged male genital segments and strongly, acutely produced last abdominal segment ventrally in female.

Apterous male: head two thirds as long as broad across eyes, the eyes large, two thirds as wide as interocular space, distinctly roundly emarginate on inner margins posteriorly. Rostrum reaching well onto mesosternum, the third segment reaching about to level of hind margins of front trochanters. Antennae almost as long as body, 99: 108; proportion of segments one to four as 31: 21: 20: 27.

Pronotum relatively short and strongly convex, widest anteriorly and rounded anterolaterally, narrowed at about middle and thence gradually rounding to rounded apex; the ratio of subbasal width to width at middle to length as 25: 22: 42. Disk slightly depressed either side of middle anteriorly and feebly at about the middle. Metanotum and abdominal tergites strongly declivent, bounded laterally by strongly reflexed connexiva, the connexiva joining sinuate metathoracic carinae basally, strongly dilated at base of abdomen and arcuately converging posteriorly, about twice as wide at level of second visible abdominal segment as at apex of seventh. Basal abdominal tergites short, one fourth or less the length of seventh tergite at middle.

Under surface strongly convex, depressed between meso and metasterna. Metasternum almost as long at middle as the first five visible abdominal ventrites together, 7: 9, sixth visible ventrite (actually the seventh abdominal segment as counted dorsally) about half as long as the previous abdominal segments together, 5: 9, deeply concave posteriorly.

Eighth and ninth abdominal segments (genital segments) together almost as long ventrally as meso and metasterna together, 30: 33, the eighth segment triangularly produced beneath ninth at middle, the apex subrounded, the length on median line slightly

over half the length of ninth segment, 11 : 19. Ninth segment strongly convex, three fourths as broad at base as long on median line, 15 : 19, abruptly compressed on either side before middle to half the basal width and then subparallel to rounded apex. Eighth tergite about half as long as seventh but wider and distinctly roundly emarginate at middle of hind margin. Ninth tergite about as long as seventh but much narrower, broadest and feebly convex at base, tapering and rounded apically.

Legs relatively short and stout, front femora about as long as pronotum and about one fifth as thick at middle as long, arcuate along dorsal side and concave on basal half beneath; front tibiae scarcely shorter, 43 : 40, slightly curved; tarsi about one third as long as tibiae, the basal segment approximately half as long as apical segment, 9 : 19. Middle legs with femur, tibia, and first and second tarsal segments as 87 : 78 : 34 : 8. Hind legs, 94 : 56 : 11 : 7.

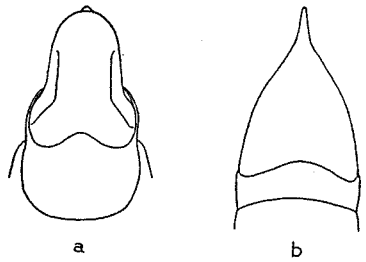

FIGURE 26.—*Limnogonus lundbladi,* ventral view (diagrammatic) of genital segments: **a,** male; **b,** female.

Body surface not conspicuously shining except anteriorly on pronotum, eyes, and posterior abdominal tergites. Pubescence inconspicuous and typical of the genus but with silver hairs confined to dorso-lateral areas of acetabula and the genital segments with a dense, erect, brown pubescence, especially ventrally.

Color dark brown to black above with head ochraceous at base and longitudinally sublaterally. Pronotum entirely surrounded with ochraceous, most broadly anterolaterally with a longitudinal ochraceous stripe at middle and a pale spot on either side of middle anteriorly. Abdominal tergites with a pale longitudinal line at middle, starting just behind metatergum and ending at middle of seventh abdominal segment. Middle connexival segments tinged with ochraceous sublaterally. Ventral and lateral surfaces largely pale with brown as follows: on prothorax behind eyes; mesothorax along upper margins of pleurites; at middle of pleurites anteriorly; at base of pleural suture; laterally at apex of acetabulum, and surrounding spiracular opening; metathorax surrounding pleurites and laterally on apical half of acetabulum; abdomen sublaterally beneath hind acetabula and coxae; and eighth sternite at apex and ninth laterally and apically. Antennae and middle and hind legs rather uniformly infuscated, rostrum pale with brown middle of front portion of third segment and black apex. Front femora pale with broad brown areas, tibiae brownish with more or less pale bases and apices, tarsi pale brownish.

Size: length, 5.25 mm., width (middle acetabula) 2.1 mm.

Apterous female: very similar to male but with front legs straighter and more slender, the femora distinctly shorter than pronotum, 37 : 42; proportion of segments 37 : 37 : 4 : 9. Venter evenly convex, not depressed at base of metasternum, metasternum about twice as long as the first five visible abdominal segments together, the fifth (actually the sixth) with posterior margin feebly, broadly, roundly produced, the seventh segment long, strongly, acutely produced at middle apically, the length on median line almost as great as the remaining abdominal segments together, 23 : 24, the ventral spine thus formed greatly exceeding female genital segments which are relatively short and rounded and visible only from above.

Size: length, 5.67 mm., width (middle acetabula) 2 mm.

Macropterous male: similar to apterous male but with pronotum widest across humeri, the proportion of width to length, 33: 51, the disk more convex than in related species. Hemelytra complete, exceeding tip of abdomen, the veins black and membranous areas grayish. Mesothorax with a yellow lateral line on either side suggestive of *fossarum* but not tapering so conspicuously.

Size: length 6.8 mm., width (middle acetabula) 2.3 mm.

Holotype male, allotype female, male paramorphotype, and nine apterous paratypes, Mt. Chachao, May 16, Usinger; one apterous paratype, headwaters of Talofofo River, June 17, Usinger.

This species was found only on the inland streams in the mountains of Guam. It is entirely distinct from any *Limnogonus* known to me though it might be considered as a member of the *fossarum* group, judging by the lateral thoracic stripes of the macropterous form. The short, stout body form approaches that of *boninensis* Matsumura (see figure in Iconographia Insectorum Japanicorum, 1646, 1932) but is shorter and more humped. The genitalia are entirely distinct.

This species is dedicated to Dr. O. Lundblad of the Naturhistoriska Riksmuseum in Stockholm who has given us a sound basis for the taxonomy of *Limnogonus*.

Subfamily HALOBATINAE

91. Halobates mariannarum Esaki, Tenthredo **1**: 357, 1937.

Thirteen specimens, Piti, May 12, Usinger; 50 specimens, Piti, May 22, Usinger; four specimens, Tumon Beach, May 30, Usinger; one specimen, Tumon, April 22, Bryan.

Described from the nearby island of Rota.

Family VELIIDAE

Subfamily VELIINAE

92. Microvelia douglasi Scott, Ann. Mag. Nat. Hist. IV, **14**: 448, 1874; Lundblad, Arch. Hydrobiol., Suppl. **12**: 347, 1933 (complete synonymy).
Microvelia samoana Esaki, Ins. Samoa **2**(2): 67, 1928.

Macropterous male and apterous female, Merizo, June 11, Usinger; apterous male and apterous female, Mt. Chachao, May 16, Usinger; apterous female, Agana Swamp, May 4, Usinger.

These specimens fall well within the range of variation described by Lundblad. The last antennal segment is slightly shorter than the preceding two, as in the type of *samoana,* and the right genital clasper in the male is obliquely and a little roundly truncate at the tip. *M. douglasi* is also known from India, Ceylon, Sumatra, Samoa, and Japan, and doubtfully from Java and the Seychelles.

93. Microvelia diluta Distant, Ann. Mag. Nat. Hist. VIII, 3: 500, 1909; Lundblad, Arch. Hydrobiol., Suppl. 12: 307, 1933; Esaki, Tenthredo 1: 351, 1937.

Fifty-seven apterous specimens, Upi Trail, May 5, Usinger; eight apterous specimens, Mt. Chachao, May 16, Usinger; one specimen, apterous, head waters of Talofofo River, June 17, Usinger.

The extraordinary sexual dimorphism was noted by Lundblad who also remarked on the occurrence of the small males in copulation with the females in his series of preserved specimens. Esaki (Tenthredo 1: 352, 1937) apparently overlooked this characteristic of *diluta* in his discussion of *Microvelia notophora* from the Carolines, for he stresses the "unique" habit of males habitually riding on the backs of the larger females and does not compare his new species with *diluta*. He reports the capture of a macropterous female of *diluta* at light on Saipan. Most of the Guam specimens were collected together, the small male clasped to the back of the female by means of his legs. None of these pairs was actually in copulation. *M. notophora* differs from *diluta* in that only the fore tibiae possess an apical comb and this comb is nearly one third the length of the tibia. *Notophora* differs further, according to Esaki's description, in the very short pronotum which is only about one third as long as the mesonotum. The size of apterous males and females of *notophora* is about as in *diluta* but the Guam males differ from this, being slightly larger, 1.4-1.5 mm. *M. diluta* Distant is known elsewhere from India, Ceylon, Sumatra, and Saipan.

Subfamily Haloveliinae

94. Halovelia marianarum, new species (fig. 27).

Male: rather evenly oval in outline. Pubescence very dense, brown to gray. Body subflattened beneath and only feebly convex above.

Head a little broader across eyes than long, 20: 17; produced in front of eyes for a distance greater than length of an eye, 8: 7; eyes small, about one fourth as wide as interocular space, 3.5: 13. Vertex rather strongly convex. Rostrum slightly exceeding apices of front coxae. Antennae about two thirds as long as body, 38: 58; proportion of segments one to four as 12: 8: 8: 10.

Pronotum less than one third as long at middle as head, 5: 17; broader laterally, the posterior suture slightly sinuate at middle and distinctly sinuate sublaterally. Meso and metanota together as long as their width measured between impressed lines within lateral carinae.

Male genital claspers long, extending upward beyond upper apex of genital segments and there crossing, beyond which they are curved and tapering. Clearly visible from above and behind.

Front legs relatively short, the femora as long as head, one fourth as thick at middle as long, tibiae scarcely shorter than femora, 16: 17, enlarged apically and bearing a prominent comb on under side, the comb slightly exceeding apex of tibia and longer than basal portion of tibia before comb, 27: 23. Tarsus scarcely half the length of tibia, 7.5: 16; first segment narrow at base, a little widened apically, the second enlarged, over three times as long as first, 18: 5. Middle legs long, the femora three fourths as long as body, 42: 58; tibiae scarcely shorter than femora, 41: 42; tarsus about two thirds as long as

tibia, 28 : 41; the first segment only slightly longer than second, 15 : 13. Hind legs proportioned as follows, 23 : 18 : 3.5 : 5.

Female: much larger and more robust; proportions of head and antennae as in the male. Thorax strongly convex above connexiva, much more strongly elevated than in the male, nearly vertical. Rostrum slightly shorter, reaching to apices of front coxae. Antennae a little more than half as long as body, 46 : 87. Proportions of front femora, tibiae, and first and second tarsal segments, 25 : 22 : 2 : 8.5; intermediate legs, 62 : 60 : 25 : 19; posterior legs, 33 : 27 : 5 : 8.

Color of male brown anteriorly and ventrally, the appendages shining, brownish black. Coxae, trochanters, and middle of venter paler brown. Base of vertex brownish ochraceous at middle. Female with base of head ochraceous.

Size: male, length 1.5 mm., width 1 mm.; female, length 2.25 mm., width 1.2 mm.

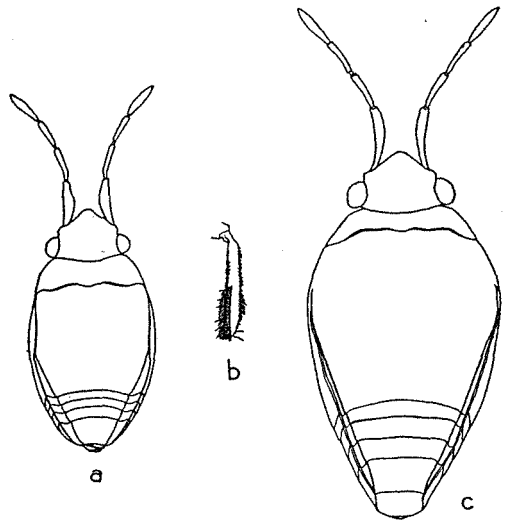

FIGURE 27.—*Halovelia marianarum:* a, dorsal view of male; b, detailed enlargement of inner face of front tibia showing tibial comb occupying slightly more than apical half of tibia; c, dorsal view of female.

Holotype male, allotype female, and 35 paratypes, Finile, May 28, Usinger; nine paratypes, Asanite Bay, June 25, Usinger. Found near the rocky coral shore, usually within or around 3- or 4-foot coves or embayments. They occur singly or in threes and fours rather than in large numbers. Several pairs were captured in copulation.

Esaki (Tenthredo 1 : 355, 1937) records his New Guinean species *bergrothi* from the Carolines and from the coast of Rota Island, only a few miles away from Guam. It seems unlikely that two closely related but distinct species of marine insects, one of them presumably widespread, would occur so close together in the Marianas Islands, but my specimens do not agree with Esaki's original description of *bergrothi* (Hist.-Nat. Mus. Nat. Hung., Ann. 23 : 161, figs. 12, *c-e,* 1926). *H. bergrothi* was captured "on the surface of a few cup-

fuls of rain-water, which was accumulated on a very thick root of a tree which laid about a half meter high from the earth in the half-dark shade of a dense wood", on Seleo, a coral island near New Guinea. I have seen a closely related species from Fiji.

In Esaki's key (op. cit., p. 164) *marianarum* runs to *papuensis* but the head is much longer than broad between the eyes. It may be that the first dichotomy should read "Head nearly as long as broad across eyes." In any case, *marianarum* is closest to *bergrothi,* agreeing with that species in the subequal second and third antennal segments and in the strongly convex mesonotum. *Bergrothi* differs, according to Esaki's description and figures, in the longer meso and metanota, front tarsus not shorter than half the length of tibia, first segment of middle tarsi one and one half times as long as second, and hind tarsus slightly longer than half the length of tibia. The male of *bergrothi* is longer and more slender (1.8 mm. by 0.8 mm.), and the female is considerably longer and slightly broader (2.7 mm. by 1.3 mm.).

Hale (South Austr. Mus., Rec. 3: 204, 1926) calls attention to the remarkable anterior tibial comb which occupies three sevenths of the length of the anterior tibia in *maritima* Bergroth. Although Esaki quotes Hale's work he ignored this important character in his description.

I consider that the subfamily Haloveliinae Esaki belongs in the Veliidae where Bergroth (Ent. Mo. Mag. II, 4: 277, 1893) originally placed it and where Hale also placed it. The lateral thoracic scent glands of the Veliidae are distinct and functional (judging by small globules of hardened exudate at the openings in some specimens) in *Halovelia,* whereas gerrids have a single scent-gland opening (omphalium) at the middle of the metasternum.

Superfamily LEPTOPODOIDEA

Family SALDIDAE

95. Saldula balnearum (Bergroth).

Acanthia balnearum Bergroth, Philippine Jour. Sci. 13D: 123, 1918.

Four adults and one nymph, Mt. Chachao, May 16, Usinger.

The males are 3 mm. in length, the females 4 mm. These specimens are similar in color and agree fairly well with the description of Bergroth's species from Los Banos, although he describes the male as larger than the female. A detailed comparison is impossible because I have no specimens of the Philippine species.

96. Saldula marianarum, new species.

Body oval in form and shining above on head and thorax, rather dull on hemelytra.

Head half again as broad across eyes as long in front view, the eyes large but less than twice as broad as narrowest portion of interocular space, 13: 8; clypeus over twice as long as broad, 9: 4, broadest and rounded posteriorly; transverse lobes at base of

clypeus wider than base of clypeus, 5:4, and half as long as wide. Front shining and densely, finely punctate, pubescent, and longitudinally sulcate in front of elevated ocellar area. Ocelli much closer to each other than to eyes, the distance between ocelli being less than the diameter of an ocellus. Vertex behind ocelli narrowly shining at base of head and polished on inner emarginations of eyes, elsewhere dulled by dense granulate punctures. Rostrum reaching apices of hind coxae. Antennae about as long as head, pronotum, and scutellum as measured from above; proportion of segments one to four as 12:16:16:16.

Pronotum one fifth wider across humeri than width of head across eyes, 42:35; a little over one third as long on median line as broad, 15:42; front lobe strongly elevated, transverse, foveate at middle, not quite reaching lateral margins, surrounded by an impressed row of punctures; surface less densely pubescent on elevated area than on posterior lobe and lateral margins, these last nearly straight anteriorly, rounded posteriorly, with a distinct submarginal impression extending to middle of humeral area. Hind margin rather broadly, evenly, arcuately concave in front of scutellum.

Scutellum moderately convex, about as broad as long, a little less than two thirds as broad as pronotum, 26:42; the surface granulate-punctate anteriorly and rugosely punctate posteriorly, pubescent, transversely arcuately impressed before middle and feebly depressed before apex.

Hemelytra complete, the membrane greatly exceeding tip of abdomen, with four complete cells, the innermost being longest but only moderately produced beyond base of second cell. Clavus and corium rather densely, evenly pubescent, the veins of corium poorly defined but visible, the inner vein forked to form a cell at apex and connected at apical third to median vein.

Under surface covered with a rather long, silky pubescence except for glabrous area on inner propleuron and front acetabulum laterally. Last two segments of hind tarsi subequal in length.

Color black on head and thorax, the clypeus, paraclypeal and basal lobes, a spot on either side of ocelli and ocelli ochraceous. Eyes ferrugineous. Clavus black with a white spot subapically and brownish apex. Corium entirely pale, ochraceous with a light brownish cast on inner half, spotted with white subbasally, at middle, and near the apex, exocorium generally whitish, slightly embrowned near middle and subapically, embolar area entirely pale, subhyaline. Membrane obscurely pale with brown veins and fuscous at base and near the middle. Pubescence golden on pronotum and scutellum and with a few golden hairs on clavi. The remaining pubescence black. Under surface of head and thorax black, of abdomen brown with lighter hind margins of segments. Labrum, tips of bucculae and rostrum ochraceous to fulvous. First two antennal segments pale, the apical segments black. Coxae brown with the remainder of legs pale, testaceous except for brown tibial and tarsal spines, extreme apices of tibiae and apices of tarsi.

Size: length 2.65 mm.; width (hemelytra) 1.25 mm.

Holotype male, Agana Swamp, May 4, Usinger.

S. balnearum differs in its larger size, black corium with white spots and white embolium, distinct corial veins, feebly sinuate basal emargination of pronotum, broader vertex, pubescent propleura and sides of front acetabula, and longer second antennal segment.

None of the Guam species appears to be related to the Hawaiian saldids or to saldids which are before me from the Society Islands, these mid-Pacific species having greatly reduced membranal venation.

97. **Saldula swezeyi,** new species.

Elongate-oval, moderately convex above, the entire surface clothed with short, fine, backwardly directed hairs.

Head broader than long, 21.5 : 16; subtriangular, the anteocular portion only half as long as an eye, gradually tapering to broad, blunt apex; eyes about two thirds as wide as interocular space, 6.25 : 9; ocelli prominent, located at middle of interocular space, as far apart as distance from ocelli to eyes; surface rather dull, finely punctate, and pubescent posteriorly, more polished anteriorly, with the clypeus glabrous. Antennae less than twice as long as width of pronotum, 53 : 34; segments of nearly uniform thickness except for the considerably thicker first segment; proportion of segments, 8 : 17 : 14 : 14.

Pronotum over three times as broad as long on median line, 34 : 10; disk subdepressed laterally, with a moderately elevated callus at middle curving forward behind eyes and enclosing a small anterior, median, transverse impression; anterior angles concealed from above by the overlapping eyes, sides arcuate, hind margin broadly, shallowly concave.

Scutellum a little broader than long, 25 : 21; elevated basally, depressed behind middle at an inverted V-shaped impression.

Hemelytra complete, long, exceeding tip of abdomen; commissure of clavus three fifths as long as scutellum; veins of corium poorly defined but present; costal margin arcuate at base, scarcely sinuate at basal third and gradually arcuate apically; membrane four fifths as long as corium, with three long, complete, closed cells, the veins with occasional erect hairs and outer portion of membrane outside of cells and beyond corium pubescent.

Under surface finely pubescent. Details of rostrum concealed, but its apex reaching distinctly beyond hind coxae.

Color dark brownish black, the coria each with a broad sinuous white fascia joining at base of membrane, extending briefly along claval suture, then laterally to embolar suture to basal third. Outer apex of corium with a white area. Under surface and appendages paler brown, the tibiae and tarsi testaceous.

Size: length 3.66 mm.; width (pronotum) 1.13 mm., (hemelytra) 1.3 mm.

Holotype female, Tarague, April 19, 1936, E. H. Bryan, Jr.

This distinctively marked species is relatively more slender than the other Guam species and does not resemble any other Oriental saldid known to me.

Superfamily NOTONECTOIDEA

Family NOTONECTIDAE

98. **Anisops cleopatra** Distant, in Sarasin and Roux, Nova Caled., Zool. **1** (4) : 386, pl. 11, fig. 8, 1914.

Nine specimens, Mt. Chachao, May 16, Usinger.

These specimens are slightly over 5 mm. in length and agree in general with Lundblad's description (Arch. Hydrobiol., Suppl. **12** : 171, 1933). However, the front legs of the male differ in detail from those figured, the tarsi having a few short, stiff spines in a row on inner surface. These are not shown in Lundblad's figures of *A. cleopatra.* Also the combs at the bases of the front tibiae are nearly at right angles to the outer margins of the tibiae. Fijian specimens before me agree with Lundblad's figures in these respects but have a row of spines on the inner ridge which extends along tibia from the comb. The front femora and tibiae are slightly more robust in the Guam males.

Differences in detail between Javan, Sumatran, New Caledonian, and Samoan specimens led Lundblad to consider this as a single variable species to be separated later, if the differences appeared to be constant, into several closely

related species forming the "*cleopatra*-Gruppe." I am in no position to take such a step at this time but it is noteworthy that the two forms studied here from Fiji and Guam are quite constant within each series and differ in the above mentioned points from other forms thus far described.

Anisops hyperion Kirkaldy was reported from the Marianas Islands (Paris Museum) and from Fiji (Hamburg Museum) by Kirkaldy with some doubt, the type of *hyperion* being from Australia. Hale (South Austr. Mus., Rec. **2**: 403, 1923) has redescribed *hyperion* and has shown that the pronotum of the male is nearly as long as broad, thus excluding the present material. Furthermore, *hyperion* is a larger species, though size is a somewhat variable character.

99. Anisops nasuta Fieber (under *A. niveus* Fabricius), Rhynchotographieen. Abh. Bohm. Ges. Wiss. V, **7**: 484, sep. 60, 1851.

Eight specimens, Inarajan, May 7, Usinger.

The single male in the present series agrees perfectly with Lundblad's description and figures (Arch. Hydrobiol., Suppl. **12**: 168, 1933). The distinctly produced vertex in the male will distinguish this from other Oceanian species. I collected a second species with produced vertex in the Philippines which is smaller, and has much stouter and differently formed front tibiae. *A. nasuta* has been reported from India, Ceylon, Java, Sumatra, Celebes, New Guinea, Australia, Samoa, Formosa, and China.

HOMOPTERA

FULGOROIDEA AND JASSOIDEA OF GUAM

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The present paper is a report on the Homoptera collected by O. H. Swezey and R. L. Usinger. As was to be expected, the collection is quite extensive and interesting. The fauna of Guam, as an isolated Pacific island, is of great interest to students of zoogeography. In addition to the forms of economic importance, most of which are widely distributed species, which have already been reported by Swezey (30, pp. 150-182),[1] the species described below give Guam a sizeable homopterous fauna. And when this fauna is properly correlated with the faunas of the adjacent regions, we should have a much better understanding of the zoogeography of this part of the world. My thanks are due Mr. Swezey for the opportunity to examine this interesting and valuable collection. To make the present paper as complete as possible, I have appended notes on the known distribution of the economic species previously reported by Mr. Swezey, though I have not seen some of these. Types of the new species are to be deposited in the collection of the Experiment Station, Hawaiian Sugar Planters' Association, Honolulu.

FAMILY CIXIIDAE SPINOLA

Genus **MYNDUS** Stål

Myndus Stål, Berlin. Ent. Zeitschr. **6**: 307, 1862. Logotype, *Myndus musivus* Germar.

Head narrower than pronotum; posterior margin of crown broadly rounded and mesonotum tricarinate; crown broad and posterior tibiae without lateral spines; venation of tegmina distinct; radius, media and subcosta united at the base; subcosta and radius bifurcate near the nodal cell; radius with three branches; media unbranched before the branching of subcosta and radius.

This is a large genus with about 48 known species which have been described from all of the major regions of the world except South America, Africa, and Australia. Five species have been described from the Pacific—four from Samoa and one from Fiji.

1. Myndus bifurcatus, new species (fig. 1, *a-d*).

Crown broad and rather short, conspicuously narrowed anteriorly with a transverse carina at the anterior margin of the eyes and a second transverse carina at the anterior margin of the crown. Face broad, the lateral margins strongly elevated; the median carina strongly elevated dorsad, rather faintly elevated on the ventral half.

[1] Numbers in parentheses refer to Bibliography, page 147.

Male pygofer short and broad with a median elongate triangular tooth on the posterior border; genital styles elongate, bifurcate at the apex; aedeagus complex with two elongate apical spines which are strongly depressed; anal segment short, broadly reflexed ventrad; anal style elongate, conical.

General color quite variable, usually tawny olive, sometimes face and mesonotum blackish brown; legs and venter sometimes cinnamon-buff; compound eyes blackish; abdomen usually cinnamon, sometimes blackish; tegmina yellowish translucent with the apical fourth infuscated.

Length: to apex of abdomen, 2.4 mm.; to apex of tegmina, 3.6 mm.

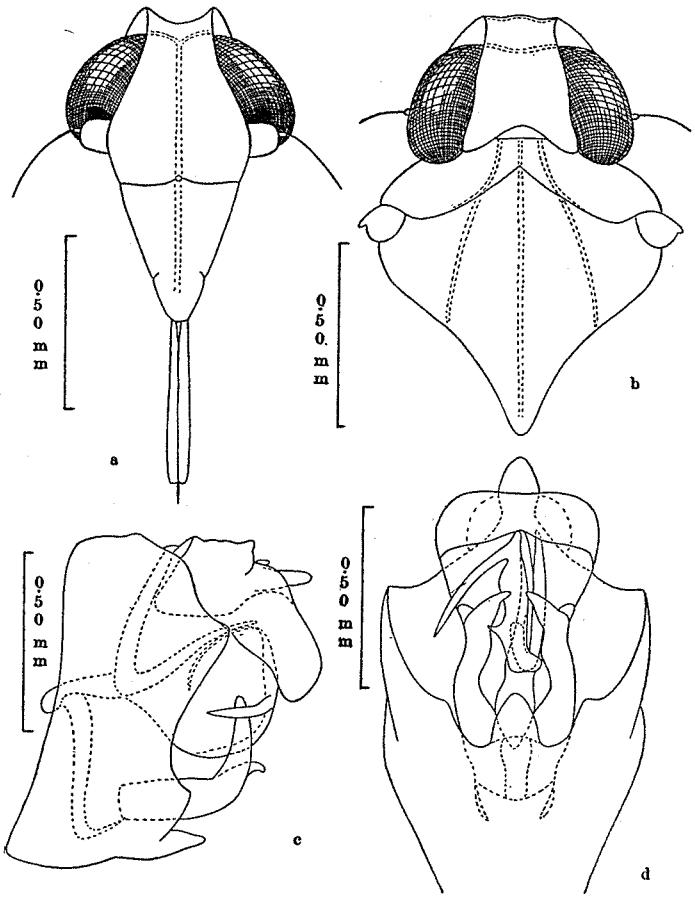

FIGURE 1.—*Myndus bifurcatus:* a, frontal view; b, dorsal view of head and thorax; c, lateral view of male genitalia; d, ventral view of male genitalia.

Holotype male, Machanao, June 4, from *Pandanus,* Swezey; allotype female, Mt. Alifan, May 21, from *Macaranga,* Usinger; paratypes: Mt. Alifan, three males; Orote Peninsula, one male; Mt. Alifan, six females; Ritidian Point, one female.

This species has the tegmina infuscate on the apical fourth, and the genital styles of the male bifurcate apically.

Family ARAEOPIDAE Metcalf (formerly DELPHACIDAE)

Genus **UGYOPS** Guérin-Méneville

Ugyops Guérin-Méneville, Zoologie, Insectes, 477, 1834. Haplotype, *Ugyops percheronii* Guérin-Méneville.

This is a genus of the subfamily Asiracinae, with the calcar subulate or awl-like. *Ugyops* belongs to a group of genera in this subfamily which has elongate antennae with the first and second segments about equal and the mesonotum quinquecarinate; the median facial carina is very variable, being sometimes single, sometimes forked at the middle of the face or below and sometimes forked from the clypeal border. The genitalia of the various species are frequently quite different. I suspect that this genus represents a complex of genera, but, until more material is available, it is not possible to distinguish the different forms.

Thirty-nine species have been described from various parts of the world, chiefly from the Eastern Hemisphere. In the Western Hemisphere, there are only two known species, both from Puerto Rico. In the Eastern Hemisphere, species have been recorded from the Seychelles, eastward across the Malay Peninsula to Indo-China, northward to Japan, southward through the larger East Indian islands, and New Guinea, south to Lord Howe Island, and eastward to Fiji and Samoa. They seem to be strangely absent from India, Ceylon, Australia, and the Hawaiian Islands. There are two species of this interesting genus in the present collection.

1. **Ugyops kinbergi** Stål, Hemiptera, Konigl. Sven. Freg. Eugenies Resa, Zoologi 4: 274, pl. 4, fig. 2, 2 a, b, 1859. (See figure 2, *a-d.*)

Crown elongate, narrow, about three times as long as the basal width. Frons elongate, narrow between the eyes, somewhat widened ventrally; the median carina forking on the basal third, the two branches running parallel to each other to the apex of the head where they are united for a short distance on the median line and then diverge and are connected with the lateral margins of the crown a short distance before the posterior margins of the crown. Antennal segments subequal; the first somewhat club-shaped; the second terete, densely pustulate; the flagellum longer than either segment, but not as long as both segments combined.

Male genitalia with the pygofer rather robust, about twice as long as its greatest width; the ventral emargination a deep triangle with the median area produced into a short tongue-like tooth; genital styles elongate, slender, their bases approximate, rather robust, the stems diverging for about half their length and gradually reduced in size; the apical half bent, more acuminate, meeting on the median line; the apices appressed, slender, acuminate; diaphragm with the dorsal margin broadly circularly excavated without genital armature; anal segment short, ventral margin broadly excavated, no anal spines; anal style short, broadly triangular, greatly flattened; aedeagus a much elongate coiled tube.

General color of the paler specimens ochraceous yellow with the eyes brown and with a faint indication of marbling on the lateral areas of the head in front of the eyes. Tegmina yellowish subhyaline and the apical fourth posterior to the branches of media brownish fuscous; with small brownish fuscous spots along the apical border of the cells between the costal border and media; with a small fuscous spot at the apex of clavus on the commisural margin; the posterior apical area of the hind wing infuscated. The specimens with intermediate coloration are colored about as in Stål's description. There is, however, a single darker female which has the general color smoky testaceous with very heavy fuscous markings on the lateral areas of the frons and on the sides of the head in front of the eyes. There is also a broad fuscous vitta starting behind the eyes and extending across the lateral fields of the pronotum, mesonotum and across the clavus to the apex of the tegmina.

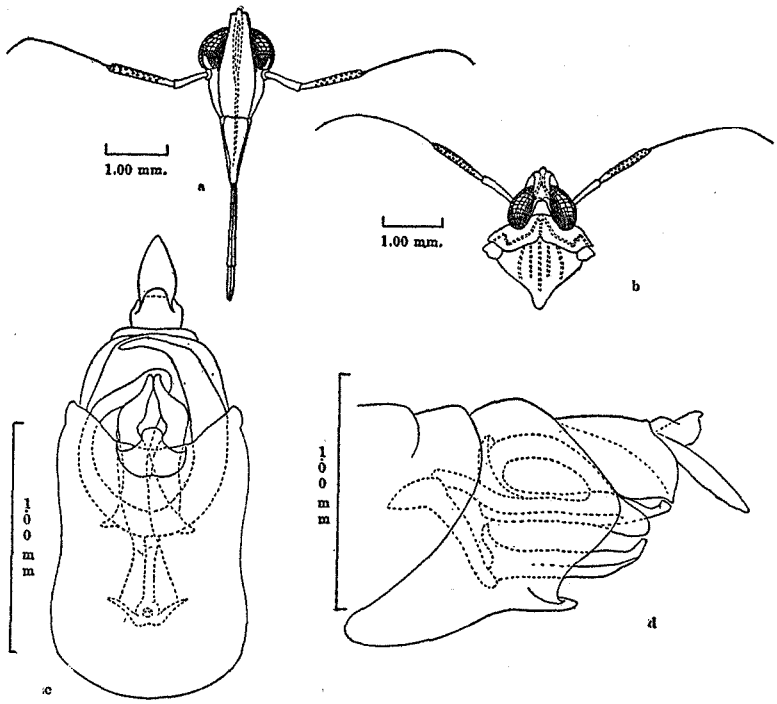

FIGURE 2.—*Ugyops kinbergi:* **a**, frontal view; **b**, dorsal view of head and thorax; **c**, ventral view of male genitalia; **d**, lateral view of male genitalia.

Yigo, April 13, Tarague, April 19, Talofofo, April 1, E. H. Bryan, Jr.; Machanao, Nov. 25, Barrigada, July 22, on *Intsia bijuga,* Swezey; Upi Trail, May 5, Usinger.

This species was described originally from Ponape, Caroline Islands. It has since been recorded from Java but not elsewhere in the Pacific. There is a series in the present collection which agrees in all essential details with Stål's short description and with his illustrations except that, in general, the specimens before me seem to be more heavily marked with fuscous on the body and

on the tegmina than Stål's description and illustration would seem to indicate. However, the other details agree so well that I consider it best to fix Stål's name upon the present specimens rather than to erect a new species for them. Stål's illustrations do not show the suture between the clypeus and the frons, and he does not illustrate the genitalia; I have, therefore, included the most outstanding characteristics which supplement his short description, and have illustrated the genitalia.

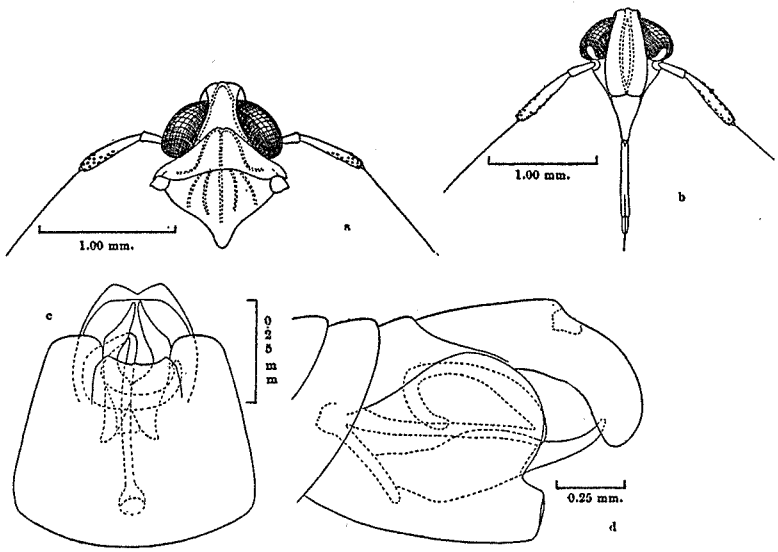

FIGURE 3.—*Ugyops samoaensis:* **a**, dorsal view of head and thorax; **b**, frontal view; **c**, ventral view of male genitalia; **d**, lateral view of male genitalia.

2. **Ugyops samoaensis** Muir, Haw. Ent. Soc., Proc. **4**: 573, pl. 10, fig. 10, 1921. (See figure 3, *a-d.*)

Ugyops sulcata Muir, Austr. Mus., Rec. **18**: 70, figs. 12-14, 1931.

There is, so far as I can see, no essential difference between these two species. *U. samoaensis* was described from Samoa and Savage Island [Niue], and *U. sulcata* was described from the New Hebrides. This species, therefore, would seem to have a wide distribution in the Oceanic region. All the specimens have the tegmina short, barely covering the abdomen; in the male genitalia the ventral margin of the pygofer is produced in a broad flaplike tooth which is concave on the posterior margin; the genital styles are broadly curved inward with the acute apices approximate; the aedeagus is a simple, elongate, coiled tube.

Umatac, May 28, on *milo;* Fadian, Aug. 19, on *Pemphis;* Agat, May 31, on *milo,* all Swezey; Piti, April 30, Usinger.

3. Perkinsiella thompsoni Muir.

Described from Guam on sugar cane; also known from Java. Recorded by Swezey (30, p. 309).

4. Megamelus proserpina Kirkaldy.

A pest of taro. It has a wide distribution in the Pacific area, being known from Fiji, Philippine Islands, Queensland, Amboina, Malaysia, Java, Niue, New Hebrides, Samoa, Tahiti, Society Islands, Hawaiian Islands, Luzon, Los Banos, Tonga. Recorded by Swezey (30, p. 310).

5. Peregrinus maidis (Ashmead).

The well-known corn planthopper is a pest of corn in the warm temperate and tropical regions of the world. It has been recorded previously from Florida, Ceylon, Texas, Hawaii, Queensland, Fiji, Java, West Indies, Australia, Jamaica, Costa Rica, North America, India, New South Wales, South Carolina, Cuba, Alabama, Mexico, Nicaragua, Brazil, North Carolina, southern states, Nigeria, Seychelles, Luzon, Philippine Islands, Formosa, Malay Peninsula, Amboina, west Africa, Borneo, Puerto Rico, southern India, Natal, Polynesia, Haiti, Barbados, Oriental region, Central America, South America, east Africa, Rodrigues Island, Mentawei Islands, South Africa, Samoa, Tahiti, Cape Province, Sierra Leone, Gold Coast, Bermuda, Washington, D. C., Tennessee, Ohio, Trinidad, Hawaiian Islands, Tanganyika, Oahu, Kauai, Lower California, Illinois, Louisiana, Dutch East Indies, and Rhodesia. Recorded by Swezey (30, p. 308).

6. Nilaparvata lugens (Stål).

A pest of rice in the Oriental region. Recorded by Swezey as very abundant. It has been listed previously from Java, Ceylon, Queensland, Fiji, Philippine Islands, India, China, Ceram, Sumatra, Sebesi, Indo-China, Malay Peninsula, Dutch East Indies.

Genus **LIBURNIA** Stål

Liburnia Stål, Hemiptera Africana 4: 179, 1866. Logotype, *Delphax vittacollis* Stål.

As at present constituted, this genus contains nearly 60 species. Many species which are at present assigned to the genus *Delphacodes* Fieber were previously assigned to *Liburnia*. *Liburnia furcifera* has a nearly world-wide distribution in the warm temperate and tropical regions of the world. This genus may be characterized briefly as follows: slender species with the head about as wide as the pronotum; carinae of the head and pronotum usually conspicuous; face with a single median carina; vertex produced only slightly in front of eyes; intermediate carinae of pronotum converging, reaching the pos-

terior border. The male genital styles usually broad with the inner angle produced; the diaphragm usually large and the anal segment usually has a pair of elongate slender recurved spines.

7. Liburnia furcifera (Horváth).

This species has been recorded previously from the following localities: Japan, Ceylon, Mexico, Sicily, Indo-China, Oriental region, Jamaica, Queensland, Egypt, Florida, Bermuda, West Indies, Formosa, India, Nicaragua, Cuba, southern states, Louisiana, Kenya, Philippine Islands, Fiji, Amboina, Malaysia, Ceram, China, Seychelles, Africa, Nigeria, Malay Peninsula, Central America, Brazil, Ecuador, British Guiana, Madeira, Cape Province, Natal, Puerto Rico, Sebesi, Korea, Ryukyu Islands, Siberia, south Europe, Manchuria, Europe, Sumatra, Zanzibar, South Africa, east Africa, Canal Zone, North Carolina, Costa Rica, and Java.

It is well represented in the present collection and seems to be fairly typical of this widely distributed and very variable species. All the males are dark colored and have macropterous tegmina; one of the specimens has a distinct pale vitta across the mesonotum. The females are all pale in color and have brachypterous wings. The specimens in the present collection were collected from grasses and sedges. Agana, June 26, Usinger; Piti, May 8, on grass, Swezey.

Genus **DELPHACODES** Fieber

Delphacodes Fieber, Zool.-Bot. Ges. Wien, Verh. **16**: 524, 1866. Logotype, *Delphax mulsanti* Fieber.

Head usually as wide as the pronotum; crown usually as broad as long; face elongate with a single median carina forked at the apex of the head. Intermediate carinae of the pronotum curved, not reaching hind margin; tibial spurs thin with teeth on the hind margin; male pygofer usually short and simple; genital styles flat, usually simple; inner apical angles produced; anal segment short; anal spines small or reduced.

The genus *Delphacodes* Fieber is one of the largest genera of fulgorids, containing at the present time nearly 300 species from various parts of the world. Species can be determined only by reference to the male genitalia, and these structures furnish perhaps the best generic characters also.

8. Delphacodes guamensis, new species (fig. 4, *a-c*).

Crown slightly longer than broad, nearly quadrate; face elongate; the lateral margins nearly parallel; carinae of the head distinct; the second segment of the antennae elongate, expanded apically.

Pygofer rather large; anal angles strongly produced and rounded; anal segment short, with slender recurved anal spines; genital styles short and broad, almost bifurcate, with the inner and outer angles strongly produced.

General color brownish. Vertex and pronotum pale ochraceous buff; carinae of head, antennae and legs ochraceous buff; tegmina subhyaline, faintly milky with a faint brownish cloud at the apex of the clavus; veins concolorous.

Length: to apex of tegmina, 2.7 mm.

Holotype male, Upi Trail, May 5, on grass, Swezey.

This species resembles *Delphacodes pacifica* Crawford from California perhaps more closely than any other species. It is, however, sufficiently distinct

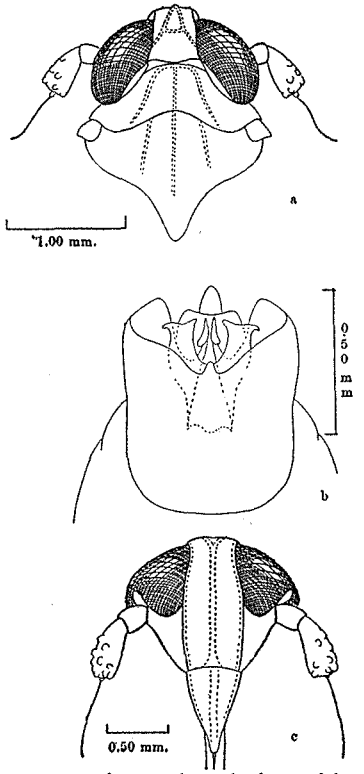

FIGURE 4.—*Delphacodes guamensis:* **a**, dorsal view of head and thorax; **b**, ventral view of male genitalia; **c**, frontal view.

FAMILY DERBIDAE SPINOLA

1. Proutista moesta (Westwood).

A pest of sugar cane in various parts of the world, having been reported previously from India, Philippine Islands, Flores, Assam, Java, Ceylon, Bombay, Palawan, Formosa, China, Borneo, Amboina, Sumatra, Bengal, Luzon, Siberut, Sipora, Negros, Seychelles, Lombok, and Sumbawa.

Genus **PYRRHONEURA** Kirkaldy

Pyrrhoneura Kirkaldy, Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. 1(9): 434, 1906. Haplotype, *Pyrrhoneura sacchariçida* Kirkaldy.

This genus may be separated from other genera of the tribe Otiocerini by the following combination of characters: media separated from the stem of

subcosta-radius; head when viewed laterally broadly rounded, following the contour of the compound eyes; antennae short, without a subantennal process.

Nine species are known in this genus. They seem to be rather widely distributed in the East Indian and Pacific islands. Muir has described a species from Nyasaland which is the only species known outside the Pacific area.

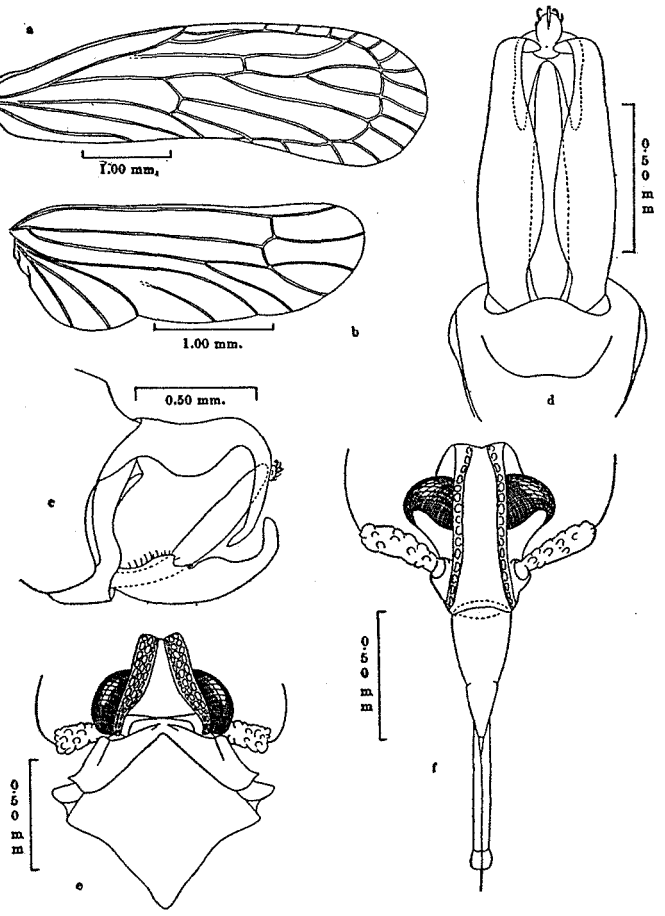

FIGURE 5.—*Pyrrhoneura bivittata:* **a**, tegmen; **b**, hind wing; **c**, lateral view of male genitalia; **d**, ventral view of male genitalia; **e**, dorsal view of head and thorax; **f**, frontal view.

2. **Pyrrhoneura bivittata,** new species (fig. 5, *a-f*).

Vertex triangular, projecting distinctly in front of eyes, nearly as broad as long; the lateral margins strongly elevated, nearly meeting on the apex of the head, with a double row of small pustules. Frons elongate, nearly four times as long as the width between the compound eyes; lateral margins nearly parallel to clypeal border and then suddenly flaring, with a single row of small pustules; median carina indistinct. First segment of antennae short; second nearly seven times as long as first, reaching to the

middle of the compound eyes; strongly pustulate. Pronotum short, deeply incised posteriorly, strongly flared; mesonotum large, ecarinate.

Genital plates of male elongate, narrow; apex produced into a broad triangular tooth which is directed dorsad; anal segment elongate, about as long as the genital plate.

General color of the body including the legs ochraceous yellow with a lateral blackish fuscous vitta; tegmina milky subhyaline; wings milky subhyaline; veins concolorous.

Length: to apex of abdomen, 2.9 mm.; to apex of tegmina, 5 mm.

Holotype male, Yigo, Nov. 13, on *Cacao,* Swezey; allotype female, Dededo, Sept. 7, on *Guettarda,* Swezey; paratype, one female, Dededo, Sept. 7, on *Ficus tinctoria* (*hodda*), Swezey.

This species may be readily recognized by the blackish fuscous fascia across the base of the frons which is continued across the lateral margins of the head and thorax as a blackish fuscous vitta and to the apex of the tegmina as a broad pale fuscous vitta.

3. **Lamenia caliginea** (Stål).

This species has been reported from Guam by Fullaway. Apparently not of economic importance, it has a very wide distribution in the Pacific region. Previous records include Tahiti, Samoa, Tutuila, Niue, Savaii, Manua, Upolu, Ellice Islands, Tonga, Society Islands, Raiatea, north Borabora, south Borabora, and Funafuti.

Genus **MUIRALYRICEN,** new genus

Head small, consisting almost entirely of the large compound eyes and the strongly elevated contiguous carinae; vertex small, deeply incised posteriorly; lateral carinae strongly elevated, contiguous. Frontal carinae contiguous to the level of the base of the antennae, then flaring to the wide clypeal border. Subantennal process large. Shoulder keels large, auriculate. Antennae with the basal segment minute, second segment flattened, ovate. Tegmina broad, costal cell broad with a recurved cross vein near the middle; a heavy straight cross vein extending from media across subcostal and radial cells to the costal margin; cubital vein ending in the extended claval vein.

Orthotype, *Muiralyricen ruber,* new species.

This genus would fall in Muir's key (18, p. 238) next to *Paralyricen* Muir, but differs in essential details of head structure and wing venation. It agrees with *Paralyricen* in having the frontal carinae contiguous and in having both shoulder keels and subantennal processes with the antennae short. The first segment is minute.

4. **Muiralyricen ruber,** new species (fig. 6, *a-f*).

Vertex narrow, elongate, projecting in front of the eyes, consisting of little more than the strongly elevated lateral margins; deeply incised posteriorly. Frontal carinae contiguous to the level of the insertion of the antennae; lower part of frons an equilateral triangle. Clypeus broad, flat; lateral carinae strongly elevated; median carina indistinct. Margin of head following the contour of the compound eyes. Subantennal process strongly developed. Shoulder keels large. Antennae short; first segment minute; second segment

about as long as broad, somewhat ovate in shape. Median area of the pronotum short, deeply incised posteriorly, extending almost to the level of the middle of the compound eyes anteriorly; lateral fields strongly developed. Mesonotum with well-developed median and intermediate carinae. Lateral margins of the metanotum strongly carinately elevated. Anterior tibiae and femora compressed. Tegulae large. Abdomen short, compressed.

General color bright red, fading below to ochraceous yellow. Legs ochraceous yellow. Tegmina and wings faintly smoky hyaline; veins and cross veins bright red; eyes black; antennae ochraceous yellow.

Length: to apex of abdomen, 1.7 mm.; to apex of tegmina, 3.4 mm.

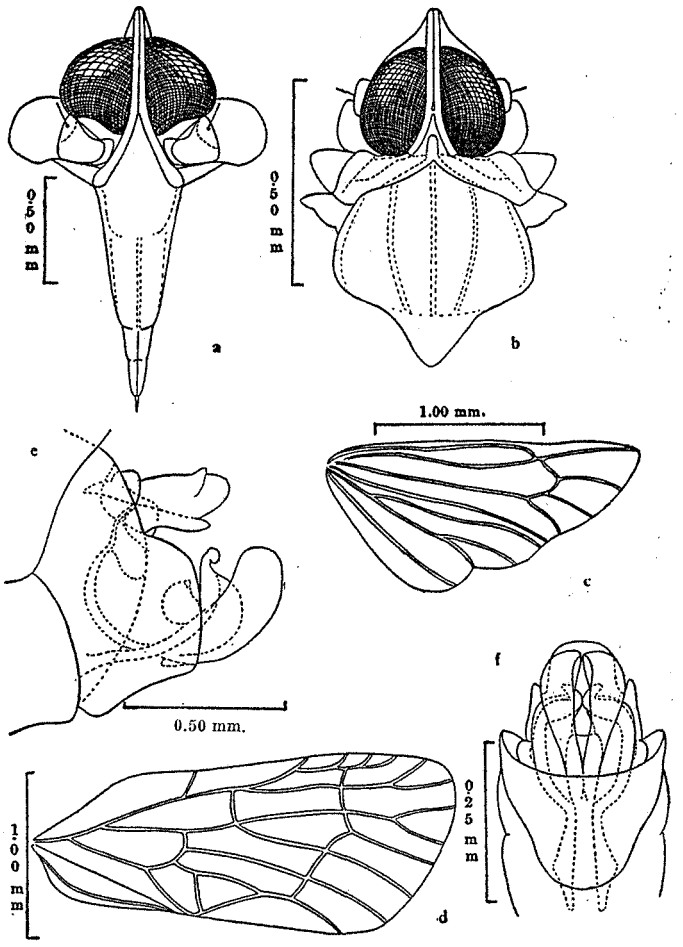

FIGURE 6.—*Muiralyricen ruber:* **a**, frontal view; **b**, dorsal view of head and thorax; **c**, wing; **d**, tegmen; **e**, lateral view of male genitalia; **f**, ventral view of male genitalia.

Holotype male, Talofofo, June 17, Swezey; paratypes: one male, Mt. Chachao, from *Icacorea* [*Ardisia*]; 1 male, Ritidian Point, E. H. Bryan, Jr.

5. Muiralyricen pallescens, new species (fig. 7, *a-c*).

A pale species with the tegmina somewhat longer than in *ruber;* milky subhyaline in color, clouded with fuscous along the veins and cross veins.

Crown very narrow, deeply incised caudad, projecting for nearly half its length in front of the compound eyes. Frons with the lateral carinae contiguous to the level of the lower margin of the compound eyes only, then widely separated to the broader clypeal border. Pronotum with the median carina strongly produced, projecting only slightly between the eyes; lateral fields of the pronotum not as large as in *ruber.* Mesonotum large, median carina very distinct, intermediate carinae indistinct. Tegmina somewhat longer than in *ruber;* venation similar.

General color of the body, including the legs and abdomen, light ochraceous buff, more or less covered with a waxy white powder. Compound eyes brown. Tegmina milky subhyaline with an irregular cloud of tawny across the medium area of the corium and a narrower fascia across the apical cross veins; veins and cross veins milky white except in the areas crossed by the tawny cloud where the veins and cross veins are blackish fuscous.

Length: to apex of tegmina, 4.3 mm.

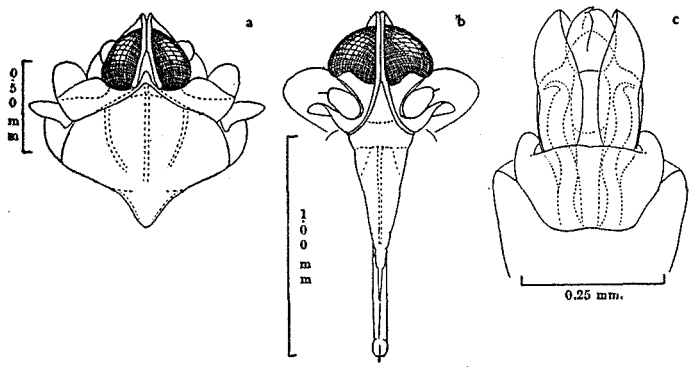

FIGURE 7.—*Muiralyricen pallescens:* **a,** dorsal view of head and thorax; **b,** frontal view; **c,** ventral view of male genitalia.

Holotype male, Piti, Sept. 1, Swezey; allotype female, Piti, Aug. 3, on *Ipomoea* sp., Swezey; paratype, one male, Orote Point, Aug. 2, on *Ipomoea* sp., Swezey.

FAMILY TROPIDUCHIDAE STÅL

Genus **SWEZEYARIA,** new genus

Crown produced for more than half its length in front of the eyes; the lateral margin strongly elevated, converging to the obtuse apex; the median carina faint. Frons elongate, narrow, widening gradually from the obtuse dorsal border to near the clypeus and then suddenly constricted to the narrower clypeus. Pronotum short; the median area triangularly produced to approximately the anterior margin of the compound eyes; lateral margin carinate; median carina distinct; posterior margin of the pronotum deeply incised. Mesonotum tricarinate. Tegmina transparent with a single definite subapical line extending from the nodal cell to the apex of clavus; a few irregular cross veins in front of the subapical line but not forming a distinct line; subcosta very close to the costal border; radius with three branches before the subapical line; media with two; and cubitus branched at the apex of the basal third of the tegmina; most of the longitudinal veins branched

beyond subapical line without cross veins beyond the subapical line. Posterior tibiae with three lateral spines, the third near the distal end.

Orthotype, *Swezeyaria viridana,* new species.

This is one of the genera of the tribe Tambiniini which has a distinct cephalic process. It is perhaps closest to *Tambinia* Stål, but differs in the shape of the crown and pronotum, and in venation.

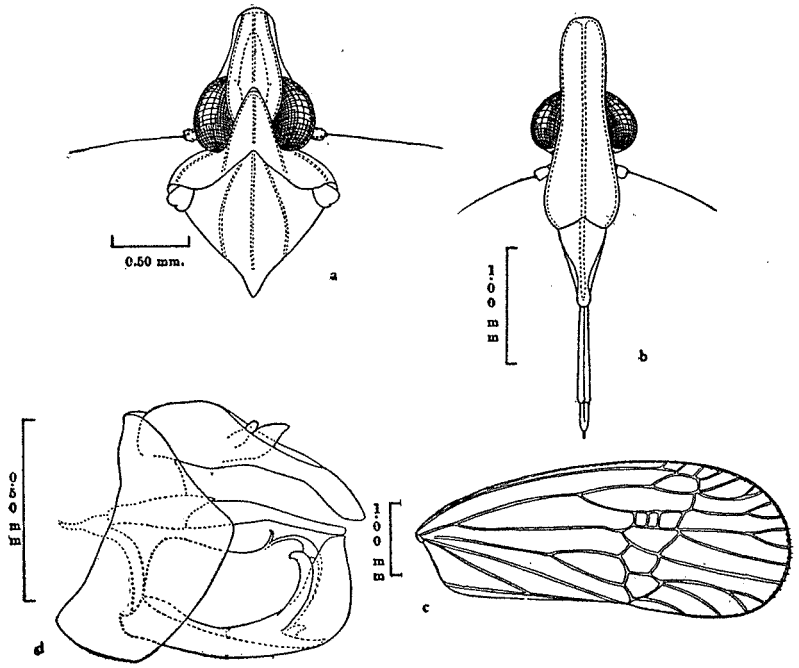

FIGURE 8.—*Swezeyaria viridana:* **a,** dorsal view of head and thorax; **b,** frontal view; **c,** tegmen; **d,** lateral view of male genitalia.

1. Swezeyaria viridana, new species (fig. 8, *a-d*).

A dull-green species tending to fade to ochraceous green with the carinae of the head marked with fuscous; the eyes brown; the stigmatal spot fuscous and the segments of the abdomen marked with testaceous laterad.

Crown nearly three times as long as the width between the eyes; the lateral margin bowed outward; the median carina fading out anteriorly. Head including the compound eyes only about half the width of the pronotum. Pronotum very short. Mesonotum nearly as long as the head and pronotum combined.

Male genitalia with the pygofer short, ringlike; the genital styles elongate, flat, meeting on the median line for about three fourths of their length, then the inner margin suddenly excavated and the styles narrowed to elongate triangular teeth which are directed dorsad and overlapping at the apex; the anal segment elongate, produced into an elongate triangular median process below the anal style.

Length: to apex of abdomen, 4.6 mm.; to apex of tegmina, 6.3 mm.

Holotype male, two paratype males, Ritidian Point, June 2, on *Pandanus,* Usinger.

Genus **TAMBINIA** Stål

Tambinia Stål, Berlin. Ent. Zeitschr. 3: 316, 1859. Logotype, *Tambinia languida* Stål (*Ossa* de Motschulsky, Soc. Nat. Moscou, Bull. **36**: 106, 1863; haplotype, *Ossa dimidiata* de Motschulsky).

This genus may be recognized by the following combination of characters: head flat; face nearly horizontal; crown produced, tricarinate; pronotum short, broad, tricarinate, anterior margin produced between the eyes, posterior margin usually deeply excavated; mesonotum elongate, tricarinate; tegmina translucent, parallel-margined, the apical margin broadly rounded; subapical line oblique, distinct, a few cross veins beyond the subapical line not arranged in a regular row; subcosta and radius united to near the subapical line; media not branched before the subapical line; cubitus one branched about halfway between the base of the tegmina and the subapical line; hind tibiae usually with two spines.

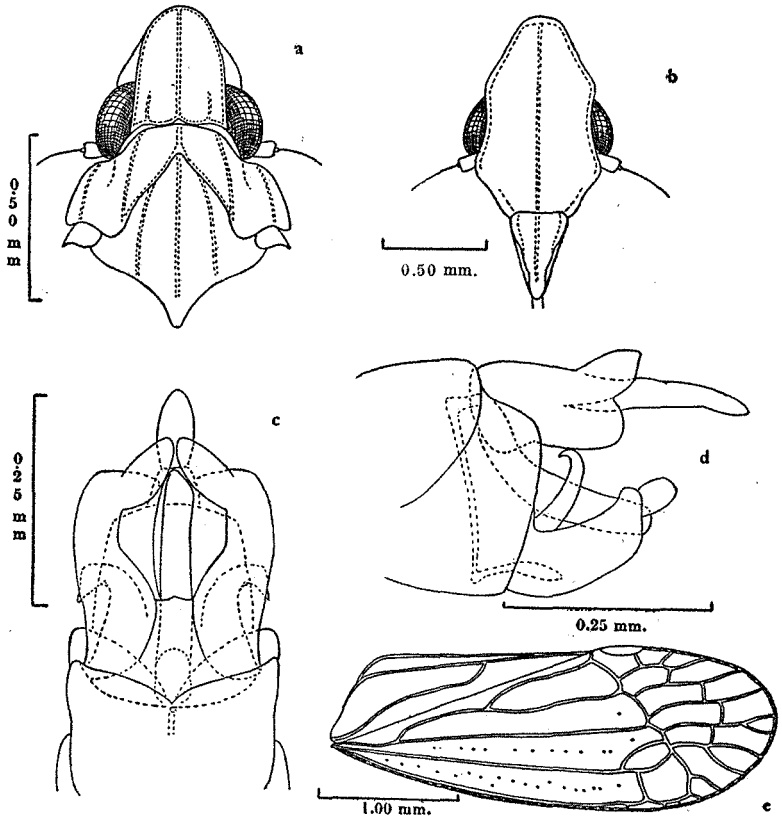

FIGURE 9.—*Tambinia guamensis:* **a**, dorsal view of head and thorax; **b**, frontal view; **c**, ventral view of male genitalia; **d**, lateral view of male genitalia; **e**, tegmen.

2. **Tambinia guamensis,** new species (fig. 9, *a-e*).

Crown about one third longer than the width between the eyes; the lateral margin narrowed around the apex; median carina percurrent; posterior border sinuate with a definite notch on the median line. Face slightly longer than its greatest width; the dorsal

margin narrow, broadly rounded, expanded to about the level of the compound eyes, then sinuate to just about the level of the antennae then narrowed to the clypeus; median carina percurrent, indistinct in the central depressed area. Pronotum about eight times as wide as its median length; anterior margin nearly straight; posterior margin deeply incised; the intermediate and median carinae conspicuous; the intermediate carinae merging with the median carinae at the anterior border; all three carinae percurrent. Mesonotum tricarinate; metanotum distinct. Tegmina with characteristic venation; costal and apical borders with a single row of small tubercles; the tubercles in costal and radial cells small but distinct.

General color of venter ochraceous yellow including legs; dorsal area of head and thorax ochraceous green; dorsal area of abdomen green; tegmina with a greenish cast.

Length: to apex of abdomen, 4.3 mm.; to apex of tegmina, 6 mm.

Holotype male, allotype female, Agat, May 31, on *Hernandia* sp., Swezey; paratypes, one male, one female, Agat, May 31, on *Hernandia,* Swezey; one male, Talofofo, June 17, Swezey; one female, Upi Trail, May 5, Usinger; one male, Machanao, June 4, on *Piper guahamense,* Swezey; one male, Machanao, June 2, Swezey; two females, Mt. Alifan, May 21, Swezey.

This species resembles *boninensis* and *crini* in having the face impressed in the median area. It differs, however, from these species in coloration, genitalia and other, minor, characters; therefore, I believe it best to describe it as new.

Family JASSIDAE Amyot and Serville

Genus **JAMITETTIX** Matsumura

Jamitettix Matsumura, Ins. Matsumurana **15**: 40, 1940. Orthotype, *Jamitettix kotonis* Matsumura.

Vertex short, more than five times as broad as long; anterior margin broadly curved; posterior margin broadly curved, nearly parallel to the anterior margin.

This genus was described to include those species closely related to *Drabescus* Stål which do not have the anterior femora furcate or ridged, and the posterior margin not dilated. The veins of the tegmina are smooth throughout, not granulate in the anterior area as they are in *Drabescus.*

1. Jamitettix guamensis, new species (fig. 10, *a-e*).

Crown slightly conically produced in front, finely rugulose with the rugae radiating from the apex of crown; two faint and somewhat irregular transverse carinae below the ocelli; posterior margin broadly, circularly incised, nearly parallel to anterior margin. Face faintly rugulose; postclypeus narrow, slightly longer than broad; the dorsal margin nearly three times as wide as the ventral margin; preocular region broad; juga nearly semicircular in outline. Pronotum nearly twice as broad as its median length; the anterior margin produced beyond the anterior margin of the compound eyes; posterior margin shallowly excavated, with the entire surface finely transversely rugulose. Mesonotum about twice as broad as long, anterior area smooth; posterior area finely rugulose.

Last ventral segment of the female but little longer than the penultimate; posterior margin slightly notched at the median line; the posterior border shallowly crenulate. Male plate broadly triangular basad, produced caudad into acuminate processes which

curve dorsad. Pygofer fairly stout, exceeding the plate slightly, with about a dozen stout setae.

Internal male genitalia: aedeagus elongate, tubular; styles slender, elongate, almost as long as the plates, broadly curved, meeting on the median line caudad; lateral processes short, stout, the apices curved laterad.

General color olive-buff with the face, crown, pronotum, and mesonotum heavily mottled with blackish fuscous. Venter and legs heavily spotted with blackish fuscous. Tegmina translucent, olive-brown; veins brown.

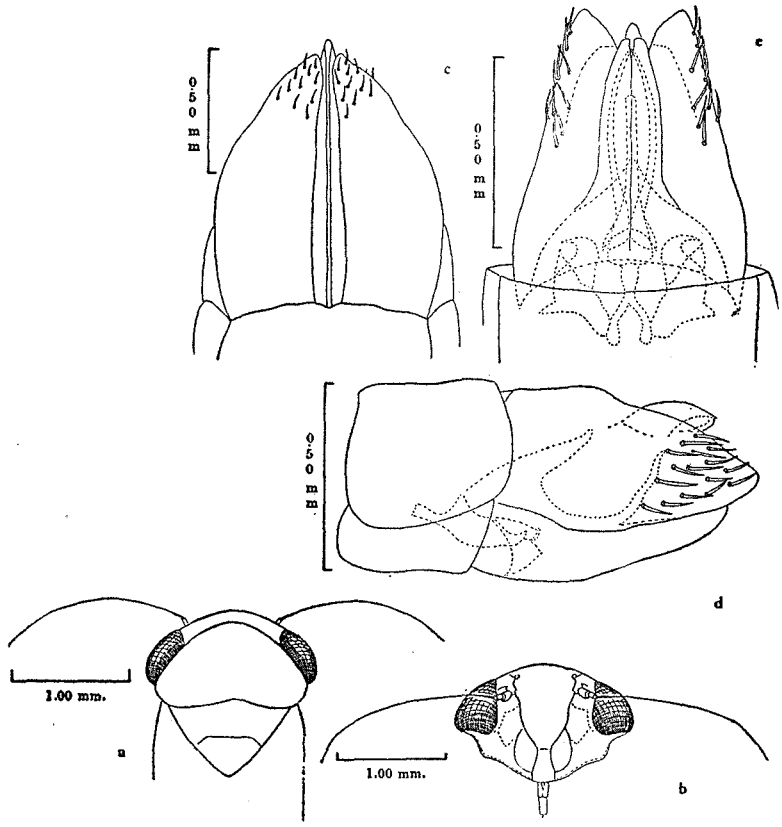

FIGURE 10.—*Jamitettix guamensis:* **a,** dorsal view of head and thorax; **b,** frontal view; **c,** ventral view of female genitalia; **d,** lateral view of male genitalia; **e,** ventral view of male genitalia.

Holotype female, Upi Trail, May 5, Usinger; allotype male, Machanao, June 30, Swezey; paratypes: one female, Upi Trail, May 5, Swezey, one female, Sinajana, June 8, Usinger.

This species differs chiefly from *kotonis* Matsumura in much heavier, darker markings and in the decidedly different genitalia. In *kotonis,* the last ventral segment is broadly excavated; in *guamensis,* the last ventral segment is slightly notched.

Genus **EUSCELIS** Brullé

Euscelis Brullé, Homoptères, Expéd. sci. Morée 3(1) : 109, 1832. Haplotype, *Euscelis lineolatus* Brullé.

The genus *Euscelis* may be characterized briefly as follows: head broad, as broad as or broader than the pronotum; crown short and broad, obtusely angled. Tegmina variable in length, sometimes slightly shorter and sometimes slightly longer than the abdomen, with three anteapical cells.

I place the species which are described below in *Euscelis* with some hesitation. This is a large genus, including at the present time some 50 recognized species of almost world-wide distribution although no species have hitherto been recognized from any of the East Indian or Pacific islands. It is a genus which apparently contains several diverse elements, although material is not at hand for working out all of the details. The characters for this genus have never been very clearly defined. A great many species which do not rightfully belong have been placed in the genus, and the recent revisions of the genera in the group to which *Euscelis* belongs have been rather limited in their scope and have not been carefully correlated with previous work. Edwards (4) gave a key to the British genera and established five new genera without further description and without genotype designation. Haupt (10, p. 263) gives a key to the European genera without including any of the genera established by Edwards in 1922. Ball (1, p. 1) gives a key to some North American genera but does not consider the work of Haupt. He does include one of the genera established by Edwards in 1922. He gives *Cicada striola* Fallén as the genotype for *Drylix* Edwards in spite of the fact that Haupt in 1927 had given *striola* Fallén as the type of the genus *Limotettix* Sahlberg. The present species can be placed, therefore, in *Euscelis* until the genera of this family can be revised on a world-wide basis.

In this connection it might not be amiss to attempt to straighten out the synonymy of *Limotettix*. As far as I can determine, the facts are as follows: *Limotettix* was described by Sahlberg (23, p. 224) and he included 23 Palearctic species, three of which were new. No type was designated by Sahlberg, and as far as I can determine, no type was selected until Haupt (9, p. 25) selected *Cicada striola* Fallén, one of the originally included species, as the type. If this is correct, Ball's selection of *striola* as the type of *Drylix* will not stand, and the type of this genus will be the only other included species, *Thamnotettix atricapilla* Boheman. I have not been able to examine a specimen of *atricapilla* to determine whether it is sufficiently distinct to constitute a genus separate from *Limotettix* with *striola* as type. Neither can I be sure that *Limotettix* as described by Edwards to include *quadrinotata* is a valid genus separate from *Limotettix* Sahlberg with *striola* as the type.

2. Euscelis transversus, new species (fig. 11, *a-e*).

Head broad; crown obtusely angulate; last ventral segment of the female triangularly emarginate, notched; general colors ochraceous buff with a blackish submarginal transverse fascia between the eyes.

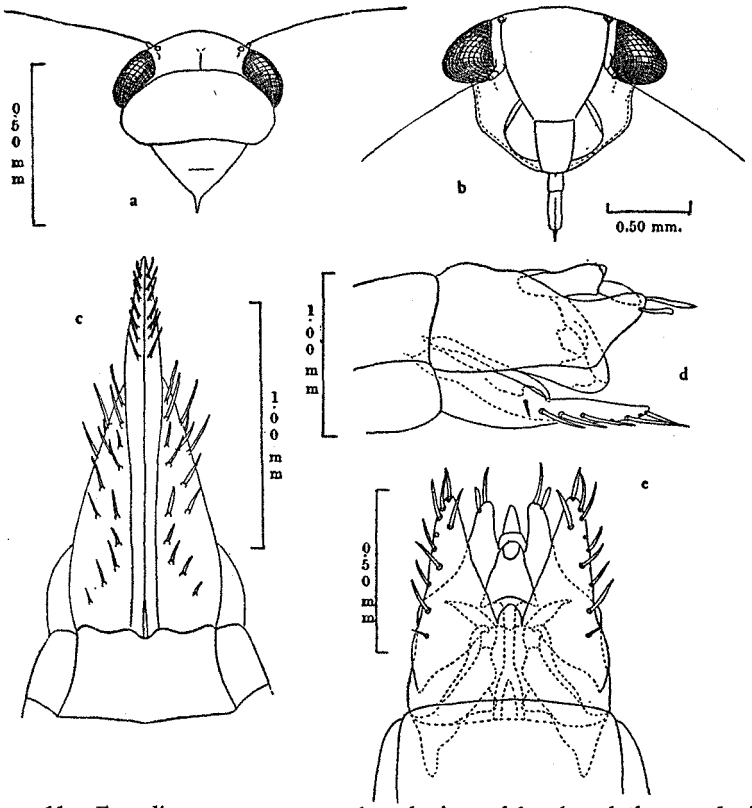

FIGURE 11.—*Euscelis transversus:* **a,** dorsal view of head and thorax; **b,** frontal view; **c,** ventral view of female genitalia; **d,** lateral view of male genitalia; **e,** ventral view of male genitalia.

Crown obtusely angulate, about three times as broad as long with obscure longitudinal rugae; ocelli visible in dorsal view. Postclypeus about as broad as its median length; lateral margins nearly parallel to the level of the antennae, then broadly curved to the upper margin of the juga and then suddenly constricted to the clypeal suture, slightly inflated; finely punctulate; anteclypeus broad and short, about 1.5 times as long as its basal width; juga broad and short, the outer margin broadly curved; preocular region about twice as long as its greatest width. Antennae inserted about the level of the middle of the eyes; genae broad; outer margin obtusely angulate. Pronotum nearly three times as broad as long, the anterior margin broadly curved; the posterior margin nearly straight. Mesonotum nearly twice as broad as long, triangular. Tegmina translucent, venation distinct.

Last ventral segment of the female nearly three times as long as the penultimate segment; the posterior margin broadly, triangularly notched on the median line; the posterior lateral borders shallowly excavated with the posterior lateral angles somewhat produced.

Male genitalia with the last segment very short on the median line; anterior margin broadly curved posteriorly and the posterior margin broadly curved anteriorly; valve elongate, produced, triangular; genital plates elongate, nearly as long as the pygofer, triangular, diverging, with a row of elongate submarginal spines along the posterior lateral border.

General color light ochraceous buff, usually ochraceous orange on the crown, the face, venter, and legs. Crown ochraceous buff or ochraceous orange with a broad blackish submarginal fascia between the eyes; face ochraceous orange with a series of about seven blackish fuscous arcs gradually decreasing in length toward the clypeal suture. Pronotum ochraceous buff with a series of three or four short dashes behind each eye. Mesonotum ochraceous orange in front of the transverse impressed line; ochraceous buff behind the line. Tegmina light ochraceous buff with the veins usually tawny.

Length: to apex of tegmina, average 4.5 mm.

Holotype female, Piti, April 30, Usinger; allotype male, Upi Trail, May 5, Swezey; paratypes, 10 females and 12 males from various localities in Guam.

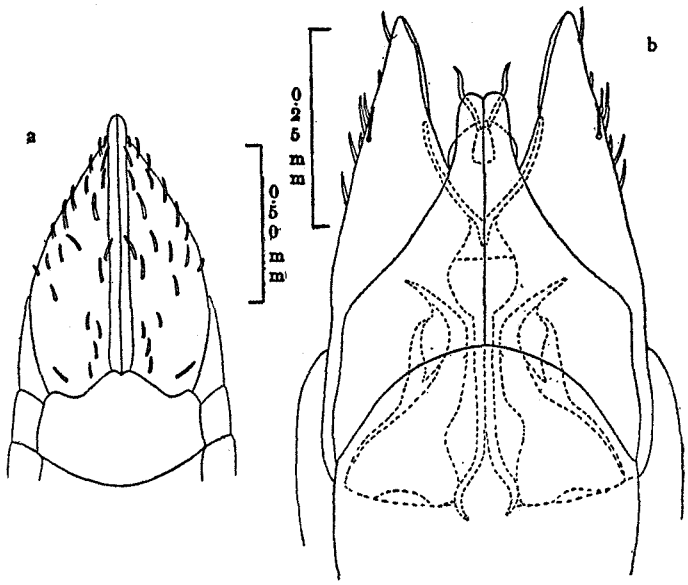

FIGURE 12.—*Euscelis picturatus:* a, ventral view of female genitalia; b, ventral view of male genitalia.

3. **Euscelis picturatus,** new species (fig. 12, *a, b*).

Crown short and broad, nearly three times as broad as its median length, only about one third as long as the pronotum; anterior and posterior borders nearly parallel; surface smooth and shiny. Face smooth and shiny; the postclypeus about as long as the width between the ocelli; the ocelli close to the eyes but not touching; the lateral margins of the postclypeus diverging to the level of the antennae and then converging to the narrow anteclypeus; anteclypeus narrow at base, somewhat broadened, spatulate toward the apex; cheeks broad; the outer margins somewhat angulate. Antennae inserted at about the level of the eyes. Pronotum about three times as broad as its median length, but little narrower than the compound eyes; anterior margin broadly curved; posterior margin nearly transverse; smooth and shining. Tegmina rather thick and opaque; venation typical with three anteapical and four apical cells.

as broad as its median length; deeply and somewhat triangularly excavated on the posterior border.

General color above greenish testaceous, below, including the face and legs, chiefly testaceous with the eyes and the lateral pieces of the abdomen fuscous; tegmina translucent with a greenish cast; the veins whitish; wings milky subhyaline.

Length: to apex of abdomen, average 2.50 mm.

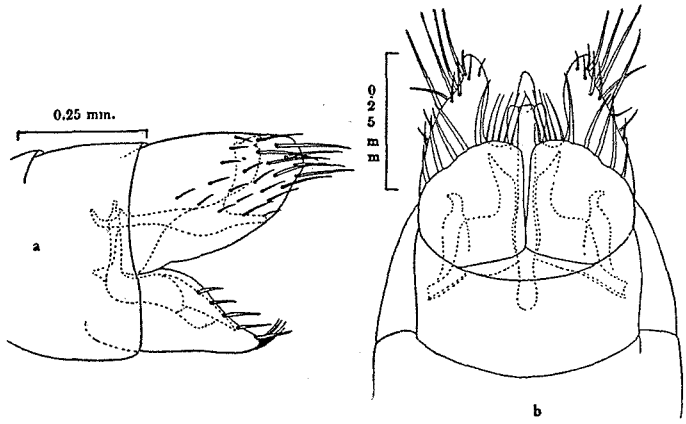

FIGURE 13.—*Stirellus subviridis:* **a,** lateral view of male genitalia; **b,** ventral view of male genitalia.

Holotype male, allotype female, Piti, Nov. 5, Swezey; paratypes: 18 males, six females, Piti, Nov. 5, Swezey; two females, Upi Trail, May 5, Swezey.

This is a greenish-testaceous species, with the crown about as long as the basal width.

Genus **NEPHOTETTIX** Matsumura

Nephotettix Matsumura, Termes. Füzetek **25**: 378, 1902.

Logotype, *Selenocephalus cincticeps* Uhler (*Cicada bipunctata* Fabricius).

Body somewhat cylindric. Crown broad, somewhat conically produced in front of the eyes, about twice as broad as its median length. Face broader than its median length; postclypeus rather gradually narrowed from the dorsal margin to the clypeal suture; anteclypeus short and broad; juga small. Pronotum short and broad. Mesonotum triangular. Tegmina usually coriaceous, venation indistinct.

6. **Nephotettix bipunctata** (Fabricius) (fig. 14, *a, b*).

Cicada bipunctata Fabricius, Syst. Rhyng. 78, 1803.
Pediopsis apicalis de Motschulsky, Étud. Ent. **8**: 110, 1859.
Pediopsis nigromaculatus de Motschulsky, Étud. Ent. **8**: 111, 1859.
Thamnotettix nigropicta Stål, Öfv. K. Vet.-Akad. Förh. **27**: 740, 1870.
Selenocephalus cincticeps Uhler, U. S. Nat. Mus., Proc. **19**: 292, 1896.

Crown short, and broad, about twice as broad as its median length, somewhat conically produced in front of the eyes; postclypeus with the dorsal margin about twice as long as the clypeal suture; the lateral margins slightly curved; anteclypeus about 1.5

times as long as its width on the clypeal border; juga small, extending dorsad slightly beyond the clypeal suture. Pronotum about three times as broad as its median length; anterior margin broadly curved, not projecting in front of interior-posterior angles of the compound eyes, not separated from the anterior-lateral borders; posterior margin shallowly sinuate, broadly curved into the posterior-lateral margin. Mesonotum broad and flat, with a distinct posterior impressed line. Tegmina usually coriaceous with the venation indistinct.

Female genitalia: last ventral segment nearly twice as long as the penultimate on the median line; posterior margin broadly, triangularly incised; the margins of the incision shallowly sinuate; the lateral angles roundly produced; median area quadrately notched with the anterior margin of the notch produced in a broad triangular tooth. Male genitalia: with the valve broadly triangular, nearly twice as broad as its median length; the genital plates broadly triangular, longer than the pygofer, their apices somewhat rounded and upturned; the inner margin slightly sinuate and overlapping on the apical third; posterior-lateral margin with a series of about eight elongate stout spines; pygofer shorter than the subgenital plate, each with a cluster of thick, short, stout spines on the apical margin and a single elongate spine; tenth segment elongate, eleventh segment short, not as long as broad; anal style elongate, conical, about three times as long as its basal width.

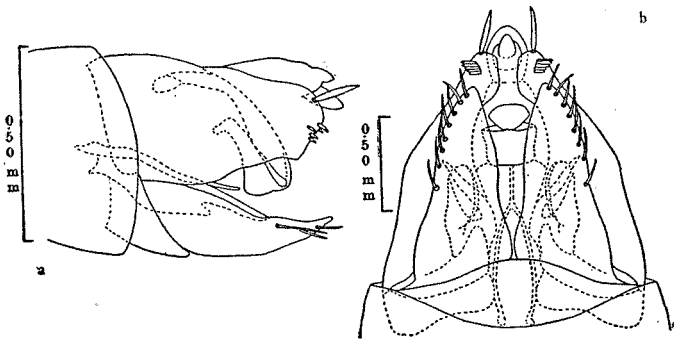

FIGURE 14.—*Nephotettix bipunctata:* **a**, lateral view of male genitalia; **b**, ventral view of male genitalia.

Color so variable that it is difficult to describe. The lighter specimens have the basal two thirds of the tegmina and the central field of the pronotum bright green, with the crown, the anterior, and the anterior-lateral margins of the pronotum, and the mesonotum, face, and entire venter buff with the face with a few, usually six, narrow, light brown arcs and the apical third of the tegmina milky subhyaline. The darker specimens, usually males, have the posterior areas of the pronotum and the basal two thirds of the tegmina bright green; the anterior margin of the pronotum and the mesonotum usually light green. The crown has a broad subapical blackish fascia and a narrow basal fascia. The apical third of the tegmina is blackish fuscous; the commisural margin is usually narrowly, sometimes broadly marked with blackish; the claval suture is usually narrowly bordered, sometimes broadly bordered with blackish fuscous to the anterior third where the colors spread out as a large blackish fuscous spot on the disk of the corium. The face and the entire venter except the legs are entirely blackish except the narrow posterior borders of the abdominal segments and the borders of the genital plates which are ochraceous orange in color. Between these two extremes are all sorts of variations.

Inarajan, May 7, 14, June 8, July 25, on rice, Swezey; Piti, Sept. 1, on rice, Swezey.

This species has a wide distribution in the tropical and warm temperate regions of the eastern hemisphere having been recorded in North Africa from Morocco to Egypt and the Anglo-Egyptian Sudan, and in southern Africa from Tanganyika to Natal and South Africa including Madagascar. From Africa, it ranges east to Ceylon and India, to the East Indies and Queensland, and north through Indo-China, Siam, China, Formosa, Ryukyu Islands to Japan.

As indicated by the synonymy, this species has been described no less than five different times. Most recent authors have kept *apicalis* de Motschulsky separated from *bipunctata* Fabricius on the basis of differences in color. However, an examination of a fairly long series in the present collection, and long series from other collections from the Oriental region has showed that there are no structural characters which can be used to separate these two forms. The color characters blend into each other in a continuous series, from those that are light green in color with the face of the male marked with a series of brown arcs, to those that have the tegmina heavily marked with black along the commisural margin and along the claval suture with a large blackish spot confluent on the basal third of the corium, the apical third of the tegmina entirely blackish fuscous, and the face completely black or with a small area of greenish yellow in the center. It is doubtful, therefore, whether these two forms should be kept separated even as color varieties.

Genus **TARTESSUS** Stål

Tartessus Stål, Soc. ent. France, Ann. 5(4): 156, 1865. Logotype, *Bythoscopus malayus* Stål.

Head broad, broader than pronotum; vertex short, very broad; eyes large; postclypeus large; anteclypeus small; labium short, broad. Pronotum large, projecting anteriorly well in front on the eyes; posterior margin broadly sinuate; posterior lateral margins very short. Mesonotum large, nearly as long as the pronotum. Tegmina with two basal, three anteapical, and five apical cells; three cross veins between media and cubitus.

This is a large genus of some 36 known species. The species range from India through the Malay Peninsula eastward, through the East Indian islands to New Guinea, the Solomon Islands and New Caledonia south to Australia; northward, the species range through Indo-China, Formosa, the Ryukyu Islands to Japan. The new species described below are the first species to be recorded from Micronesia, as far as I can discover.

Distant selected *Tartessus ferrugineus* as the type of this genus apparently on the basis that Stål synonymized his *Bythoscopus malayus* with *ferrugineus*. However, later authors have not made these two synonymous, and, if the details illustrated by Signoret are correct, the genitalia are sufficiently distinct to keep the two species separated. I have, therefore, designated *Bythoscopus malayus* as the type of this genus until the matter can be studied further.

7. Tartessus ochraceus, new species (fig. 15).

Crown very short, about half as long on the median line as next the eyes; nearly six times as wide as its greatest length; anterior margin triangularly produced, nearly a right angle, posterior margins slightly rounded; postclypeus nearly 1.5 times as long as median length; greatest width at the level of the ocelli, then the lateral margin concavely emarginate to the middle of the eye, then expanded to the base of the antennae, and then narrowed to the anteclypeus; a distinct transverse ruga extending across the postclypeus at the level of the compound eyes; above this ruga the surface of the postclypeus is finely rugose; below the ruga, the surface is smooth. Antennal flagellum with two basilar segments, the first with elongate lateral seta about half as long as the antenna and flagellum, the second with a lateral seta about half as long as the seta on the first segment. Pronotum about twice as broad as its median length, the anterior margin acutely projecting in front of the eyes, posterior margin broadly incised; lateral margins short; the whole surface of the pronotum finely, transversely rugulose. Mesonotum nearly 1.5 times as long as its greatest width.

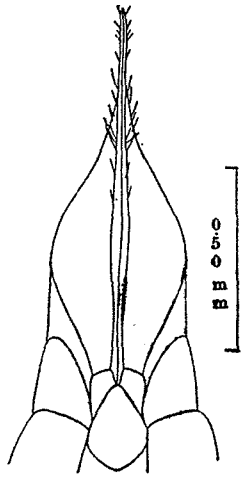

FIGURE 15.—*Tartessus ochraceus:* ventral view of male genitalia.

Last ventral segment of the female strongly compresso-elevate; the posterior margin deeply incised; the incision nearly four times as deep as its greatest width; ovipositor and ovipositor sheath about one third longer than the pygofers.

General color ochraceous buff; compound eyes brown; some of the veins of the tegmina infuscate; face with a broad transverse fascia of rosy red just below dorsal margin; another narrow and distinct transverse fascia at the level of the antennae, ochraceous orange.

Length: to apex of tegmina, 9 mm.

Holotype female, Piti, Sept. 21, on *Glochidion* sp., Swezey.

This species may be readily recognized by its pale ochraceous-buff color and distinct female genitalia. The last ventral segment is compresso-elevate and deeply notched posteriorly.

8. Tartessus swezeyi, new species (fig. 16, *a-d*).

Vertex very short, only about half as long on the median line as next the eye, projecting distinctly in front of the eyes. Postclypeus longer than broad, separated into two distinct areas by an irregular transverse ridge which runs parallel to the anterior margin of the head. Anteclypeus broad, flat with a fairly distinct median carina; preocular region elongate, narrow, about three times as long as broad, forming a distinct ledge above the small antenna. Pronotum 1.5 times as broad as long; the surface finely, irregularly, transversely rugulose; anterior margins strongly produced; posterior margin broadly incised.

Female genitalia: last abdominal segment broader than long; the produced posterior margin with a median U-shaped sinus; the posterior lateral angles of the sinus obtusely, triangularly produced. External male genitalia: last ventral segment elongate, produced, posterior lateral margins broadly rounded to a median V-shaped notch; genital plates narrow, elongate, nearly four times as long as basal width, tapering to obtuse apices. Internal male genitalia: aedeagus short, conical, genital styles with the basal half nearly quadrate, interior apical angle produced into elongate, outwardly directed, acute spines.

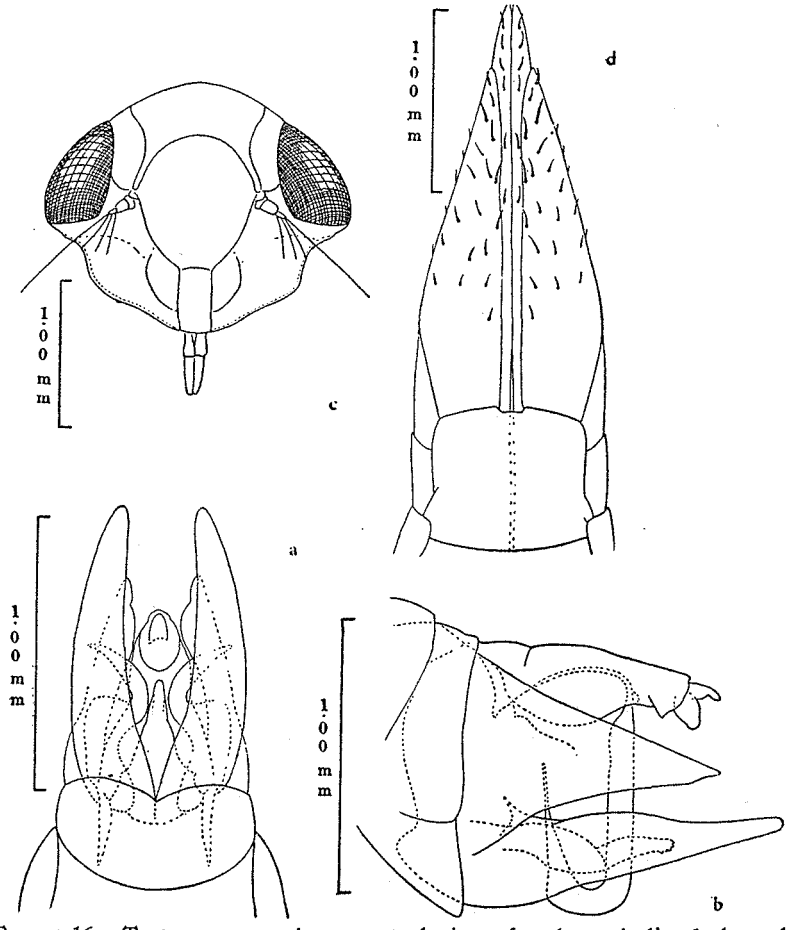

FIGURE 16.—*Tartessus swezeyi:* **a,** ventral view of male genitalia; **b,** lateral view of male genitalia; **c,** frontal view; **d,** ventral view of female genitalia.

General color of the darker females fuscous, with the head, thorax, legs, and pregenital plate ochraceous tawny. Compound eyes black, preocular area at the base of the antennae black, a large spot on the mesopleura and metapleura black; all the femora lined with blackish. Tegmina ochraceous olive with the veins blackish fuscous. First sternite chiefly ochraceous tawny; other sternites chiefly fuscous with the posterior borders ochraceous tawny; tergites chiefly black with elongate ochraceous tawny spots in the basal area. Typically the males are much darker and more heavily marked than the females. The head and thorax in the males chiefly ochraceous orange. The tegmina are chiefly blackish fuscous with the veins black; clavus pale green with the veins black. Vertex ochraceous orange; posterior border narrowly black. Face ochraceous orange with a narrow border of black just below the vertex; a broadly curving fascia of black at the level of the antennae; below this band there is a central spot on the postclypeus which is black; the lateral borders of the postclypeus are narrowly black connecting across the narrow part of the postclypeus below the central black area and then the ventral area of the postclypeus ochraceous orange with the lateral borders heavily marked with black. The anteclypeus is also bordered with black. Venter of thorax chiefly black. Fore and middle legs ochraceous orange heavily marked with black; posterior legs chiefly black or blackish fuscous. Abdomen entirely black.

Length: to apex of tegmina of male, 7.25 mm.; of female, 9 mm.

There are nymphs of at least four different stages in the present collection. They are chiefly ochraceous yellow in color, more or less marked with black; eyes usually black; lateral and posterior margins of the tegminal pads chiefly black and the lateral borders of some of the dorsal abdominal segments marked with black; face has two bright orange curving fasciae, one on the dorsal margin and one at about the level of the antennae. The front legs very much stouter than the corresponding limbs in the adults. In the youngest of the nymphs, the posterior border of the whole femur is sparsely ciliate with long setae. The tibia which is greatly flattened is closely ciliate on both the anterior and posterior border with elongate setae forming a curious basket-like structure which must be correlated with the life of the nymph.

Holotype male, allotype female, Asan, Aug. 22, on *Ficus* sp., Swezey; paratypes: two males and three females, Asan, Aug. 22, on *Ficus* sp., Swezey; one male, Barrigada, July 22, on *Premna* sp., Swezey; one male, Upi Trail, May 5, Usinger; two males and one female, Ritidian Point, April 22, E. H. Bryan, Jr.; one male and one female, Aug. 6, Swezey; one male and two females, Maçhanao, June 30, Swezey; one male, Mt. Chachao, May 16, Swezey; two males and one female, Piti, Aug. 18, on *Glochidion* sp., Swezey; three males, Santa Rosa Peak, May 19, Swezey; one male, Mt. Alifan, April 20, E. H. Bryan, Jr.

Structurally this species seems to be closest to *Tartessus fieberi* Stål, but the genitalia are sufficiently distinct and the coloring is quite distinct.

Genus **THARRA** Kirkaldy

Tharra Kirkaldy, Haw. Sugar Plant. Assoc. Expt. Sta. Ent. Bull. 1(9): 324, 1906. Haplotype, *Tharra labena* Kirkaldy.

Vertex elongate, angularly produced in front of eyes; ocelli large; face elongate, lateral margin sinuate at the level of the antennae; clypeal suture indistinct. Mesonotum somewhat longer than vertex; pronotum shorter. Tegmina with veins M one plus two wanting; first intermediate cell not divided into anteapical and basal cells; with a narrow appendix. Wings with a broad appendix and five apical cells.

This genus was erected for species from Australia and the Fiji Islands. Since that time Baker has described a species from the Philippines. The present species has all the essential characters of the genus, and I believe should be placed here.

9. Tharra ocellata, new species (fig. 17, *a-e*).

Vertex one fourth longer than its basal width, distinctly foveate, with a slender median basal carina which extends for more than half the length of the vertex; the whole surface of the vertex finely but distinctly rugulose; the rugae extending diagonally from the median area. Postclypeus about two and one-half times as long as dorsal width; finely rugulose dorsad; most of the area, however, entirely smooth, no median carina; lateral margins diverging from dorsal margin to above the base of the antennae, then rather deeply sinuate and converging to the base of the narrow clypeus; clypeal suture very indistinct; anteclypeus somewhat expanded ventrally; juga is strongly produced dorsad; preocular region narrow. Pronotum shorter than the vertex, about three times as broad as its median length, posterior margin broadly and shallowly sinuate. Mesonotum longer than the vertex, slightly wider than medium length.

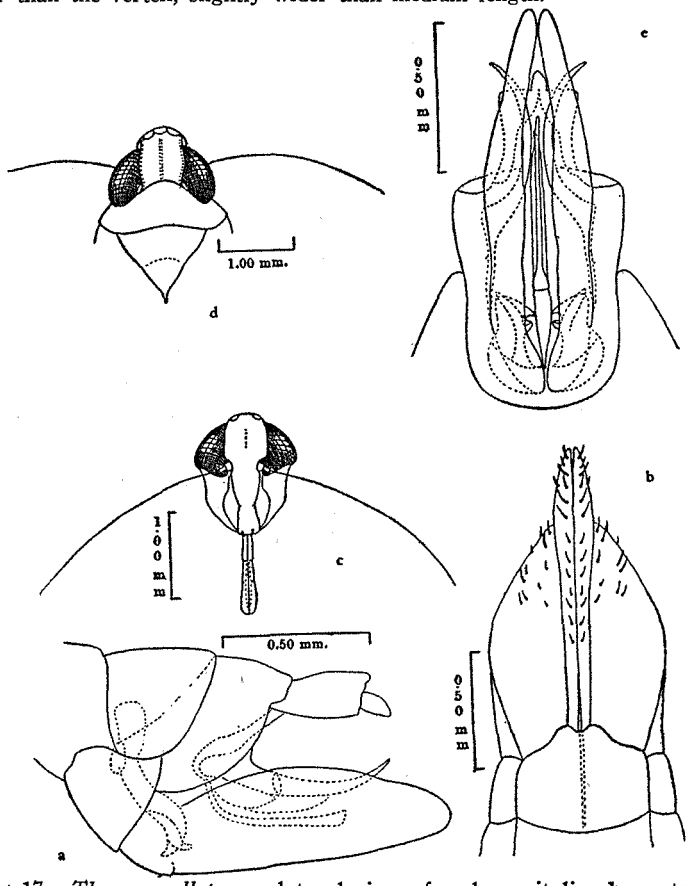

FIGURE 17.—*Tharra ocellata:* **a,** lateral view of male genitalia; **b,** ventral view of female genitalia; **c,** frontal view; **d,** dorsal view of head and thorax; **e,** ventral view of male genitalia.

Female genitalia with the last ventral segment longer than the penultimate; posterior margin produced, with a triangular V-shaped incision on the median line; pygofer slender; ovipositor and ovipositor sheath longer than pygofer. Male plates elongate, slender parallel-sided, somewhat curved; the apices approximate, somewhat rounded apically. Aedeagus elongate, slender, tubular; genital spines with elongate bases, widely separated, converging, broadly curved to attenuate apices.

General color ochraceous tawny. The tegmina ochraceous brown; legs and venter ochraceous buff; eyes blackish; hind wings smoky brown. In the male, the dorsal third of the face blackish fuscous.

Length: to apex of tegmina of female, 6.5 mm.; of male, 5.5 mm.

Holotype male, Ritidian Point, April 16, E. H. Bryan, Jr.; allotype female, Upi Trail, May 5, Usinger; paratypes: female, Machanao, Aug. 6, Swezey; female, Upi Trail, May 5, E. H. Bryan, Jr.; male, Machanao, June 30, Swezey.

In general structural characters, like *carinata* Baker, and in coloration somewhat like *ogygia* Kirkaldy. The last ventral segment of the female of this species is distinctive.

Genus **CICADULINA** China

Cicadulina China, Bull. Ent. Research **17**: 43, 1926. Orthotype, *Cicadulina bipunctella* Matsumura (*zeae* China).

This genus was established for a single species from Kenya. The venation of the tegmina and wings, and the characters of the male genitalia are quite distinct, especially the peculiar spine on the pygofer which seems to be characteristic for the species of this genus.

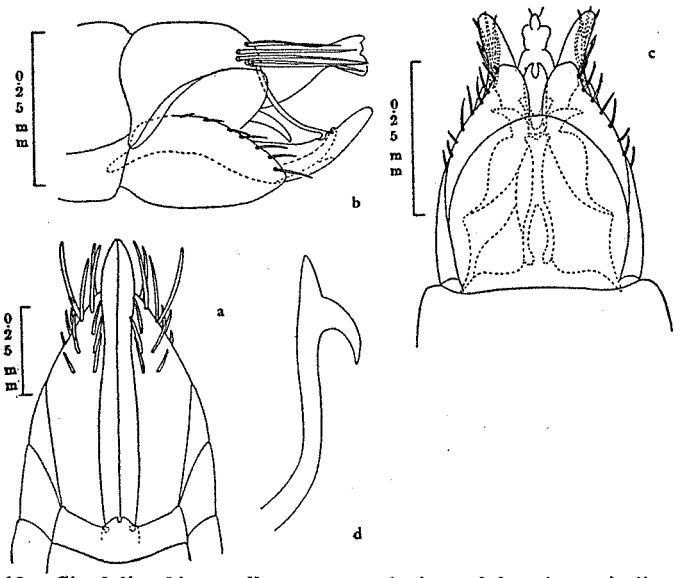

FIGURE 18.—*Cicadulina bipunctella:* **a**, ventral view of female genitalia; **b**, lateral view of male genitalia; **c**, ventral view of male genitalia; **d**, spine of pygofer.

10. Cicadulina bipunctella (Matsumura) (fig. 18, *a-d*).

Cicadula bipunctella Matsumura, Coll. Sci. Tokyo, Jour. 23: 12, 1908.

Cicadulina zeae China, Bull. Ent. Research 17: 43, 1926.

Dr. Paul Oman has suggested that these two species are synonymous. *C. bipunctella* was described from Egypt and *zeae* from Kenya. The specimens in the present collection agree in all essential details with Matsumura's description and China's description and illustration. It occurs rarely on corn and grass in Guam. Piti, May 2 and 8, on grass; Dededo, May 11, on corn, Usinger.

11. Cicadulina viridis, new species (fig. 19, *a-c*).

A pale olive-yellow species, uniformly colored except the darker compound eyes. Crown much broader than in any other species known to me, being more than three times as broad as its median length.

Female genitalia: last ventral segment not strongly produced, but little broader than its median length, posterior margin straight. External male genitalia: valve small; posterior border rounded; plates attenuate, not quite as long as the pygofer, with a row of six stout spines along the lateral margins; pygofer large, broadly expanded posteriorly concealing the anal style. Internal male genitalia: genital styles slender terminating in acute, laterally directed spines; aedeagus long, slender, strongly recurved and directed cephalad, suddenly expanded apically. Spine of pygofer elongate, spirally curved, broadly expanded apically.

Length: to apex of abdomen, 2.75 mm.; to apex of tegmina, 3.5 mm.

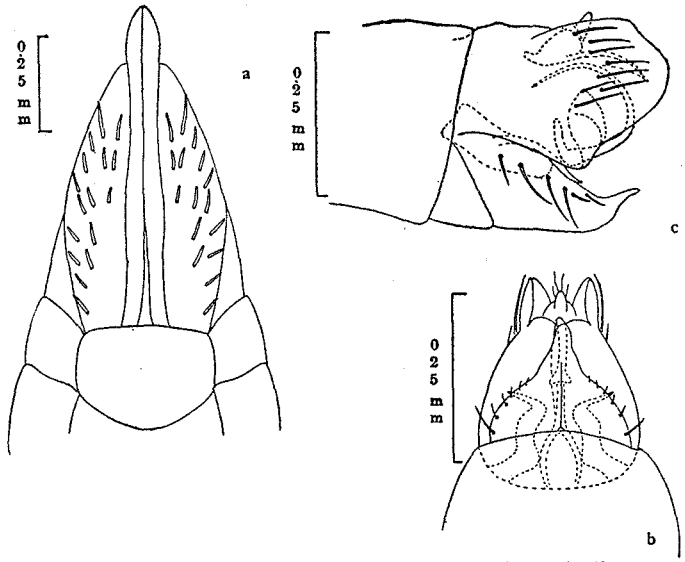

FIGURE 19.—*Cicadulina viridis:* **a,** ventral view of female genitalia; **b,** ventral view of male genitalia; **c,** lateral view of male genitalia.

Holotype male, Piti, May 1, Usinger; allotype female, Piti, June 3, Swezey. Paratypes: 11 females and 10 males, Piti, May, June, July, Swezey; three females, Piti, Usinger; one male and two females, Sasa, Usinger; two males and one female, Inarajan, Usinger; all on sedges.

12. **Cicadulina uniformis,** new species (fig. 20, *a-d*).

A uniform pale testaceous-green species with a very short, broad crown. Crown short, nearly five times as broad as its median length; anterior and posterior border parallel. Pronotum about four times as long as the crown, slightly wider than the eyes. Mesonotum not as long as pronotum.

External male genitalia: valve intermediate in size between *viridis* and *bipunctella,* posterior border broadly rounded; genital plates exceeding the valve by about half their length, contiguous on the median line; apices rounded; pygofers elongate, about twice as long as the plates; spine of pygofer attenuate, somewhat sinuate, apex acute, simple without lateral spines. Female genitalia: last ventral segment as long as its greatest width; posterior border with a deep V-shaped notch extending about one third of the length of the segment; pygofers elongate, rather slender.

Length: to apex of tegmina, 3.6 mm.

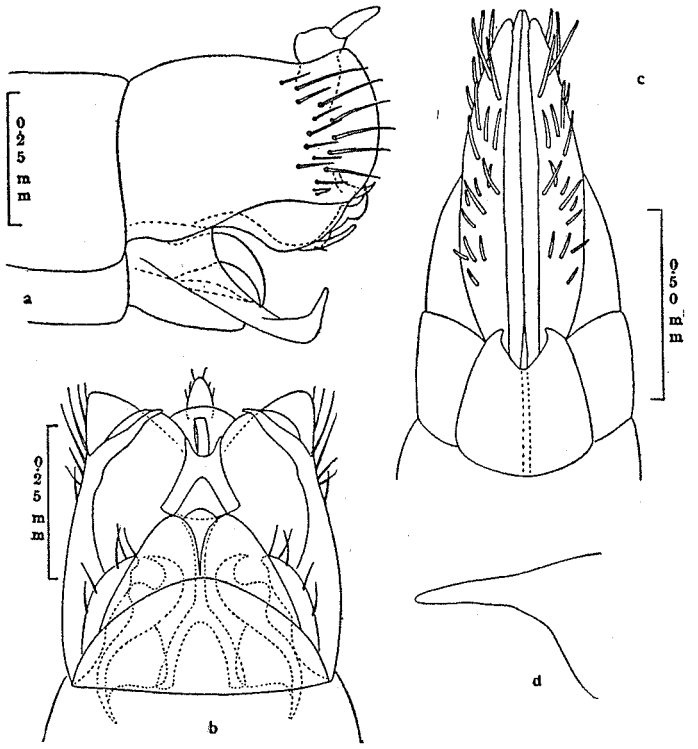

FIGURE 20.—*Cicadulina uniformis:* **a,** lateral view of male genitalia; **b,** ventral view of male genitalia; **c,** ventral view of female genitalia; **d,** spine of pygofer.

Holotype male, Piti, July 27, Swezey; allotype female, Piti, May 1, Usinger; paratype, one female, Mt. Tenjo, May 3, Swezey.

FAMILY BYTHOSCOPIDAE DOHRN

Genus **BYTHOSCOPUS** Germar

Bythoscopus Germar, Rev. Ent. Silbermann 1: 180, 1833. Logotype, *Cicada lanio* Linnaeus.

The genus may be characterized briefly as follows: Head usually nearly as broad as the pronotum; crown short and broad; face short and broad with the ocelli well below the level of the dorsal margin. Pronotum short and broad; the anterior margin not projecting in front of the anterior margin of the compound eyes. Mesonotum short, broadly triangular. Tegmina translucent; venation indistinct.

This is a genus of about 90 species of world-wide distribution. Osborn (21) described four new species from Samoa and listed a fifth species, previously recorded from Ceylon, for this region. Only one other species has been recorded from Pacific islands, and no species have heretofore been recorded from Micronesia.

1. **Bythoscopus viridoflavidus,** new species (fig. 21, *a-c*).

General color olive-yellow fading to ochraceous buff. Head including eyes broader than pronotum. Female genital segment broadly excavated. Male plate broadly produced posteriorly.

Crown of head very short, nearly eight times as broad as long; face including anteclypeus about as long as broad; juga narrow, elongate reaching to the base of the antennae; genae broad, the outer margins broadly curved; anteclypeus short and broad, about twice as long as its greatest width. Pronotum twice as broad as its median length; the whole surface finely rugulose; anterior margin broadly curved projecting only slightly in front of the posterior-interior angle of the compound eyes, curving imperceptibly into the anterior-lateral margin; posterior margin very shallowly excavated.

Female genitalia: last ventral segment with the median length nearly twice as long as the median length of the penultimate segment; the posterior margin broadly excavated; pygofer elongate, robust, not exceeded by the ovipositor or the ovipositor sheath, exceeded, however, by the conical anal spines. Male genitalia: plates strongly produced, more than half as long as the pygofer.

General color olive-yellow; compound eyes brown; tegmina translucent, almost transparent; the claval suture and the commisural margin embrowned.

Length: to apex of tegmina, female 4.5 mm.; male, 3.45 mm.

Holotype male, Mt. Alifan, May 21, Swezey; allotype female, Machanao, Aug. 6, Swezey. Paratypes: one female, Dededo, May 11, from *Piper guahamense,* Swezey; one male, Mt. Alifan, April 20, E. H. Bryan, Jr.

2. **Bythoscopus atrifrons,** new species (fig. 22, *a-c*).

Quite similar in general structure and coloration to *B. viridoflavidus* with a short narrow crown. Male with the face except ocelli entirely black. Male last ventral segment bisinuate; plates elongate, shorter than the pygofer, gradually diverging, apices slender;

genital style narrow, about as long as the aedeagus. Female last ventral segment deeply excavated on the posterior border; the pygofer elongate, slender.

Length: to apex of tegmina, 4.5 mm.; to apex of abdomen, 4 mm.

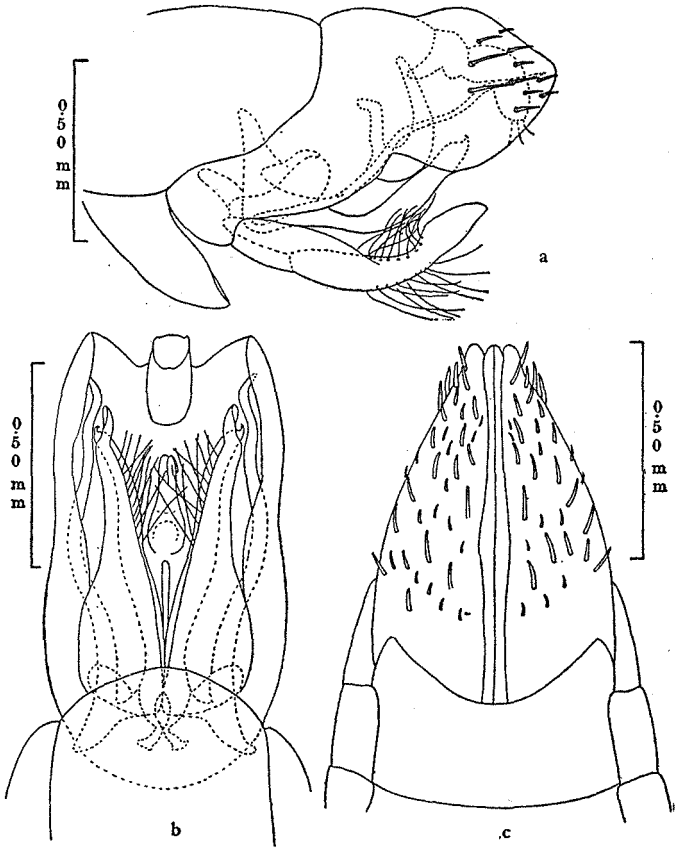

FIGURE 21.—*Bythoscopus viridoflavidus:* a, lateral view of male genitalia; b, ventral view of male genitalia; c, ventral view of female genitalia.

Holotype male, Barrigada, July 22, from *Morinda* sp., Swezey; allotype female, Barrigada, June 12, Swezey; paratype, one male, Upi Trail, May 5, Swezey.

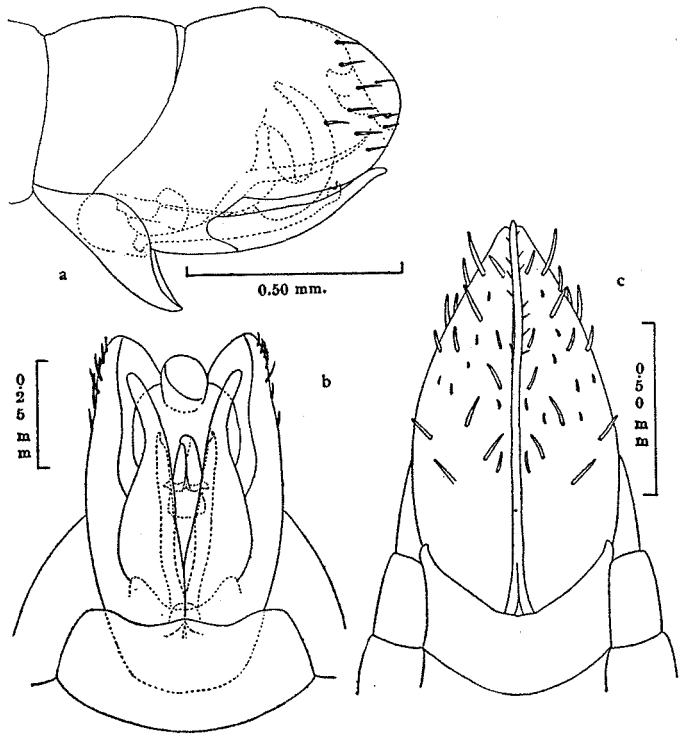

FIGURE 22.—*Bythoscopus atrifrons:* **a**, lateral view of male genitalia; **b**, ventral view of male genitalia; **c**, ventral view of female genitalia.

FAMILY CICADELLIDAE VAN DUZEE (FORMERLY EUPTERYGIDAE)

Genus **EMPOASCA** Walsh

Empoasca Walsh, Boston Soc. Nat. Hist., Proc. **9**: 315, 1864. Logotype, *Empoasca viridescens* Walsh.

Empoasca may be recognized by the following combination of characters: crown usually rounded or subangulate; ocelli distinct; tegmina with four apical cells; wings with a single apical cell; the last ventral segment of female and the external and internal male genitalia are usually diagnostic.

This is a genus with a large number of species which are small or very small, usually plain green, greenish, or golden yellow in color. Only the species in the Nearctic and Palearctic faunas have been extensively studied and very few species have been reported previously from the Pacific islands.

1. Empoasca yona, new species (fig. 23, *a-d*).

A greenish-yellow species with reddish-brown eyes but without other markings. Crown slightly broader than its median length, distinctly rounded before; posterior margin subparallel, not as long as the pronotum.

Female genitalia: last ventral segment slightly sinuately produced in the median area, with a distinct though shallow V-shaped notch on the median line. External male genitalia: plates very long, when viewed ventrally somewhat divergent; apices obtuse when viewed laterally with the apical two thirds expanded into a broad plate with a dorsal circular margin. Internal male genitalia: aedeagus simple, slender based; styles elongate, slender; apices slender, accuminate; lateral processes elongate, nearly as long as the genital styles, bifucate.

Length: to apex of tegmina, 2.75 mm.; to apex of abdomen, 2.25 mm.

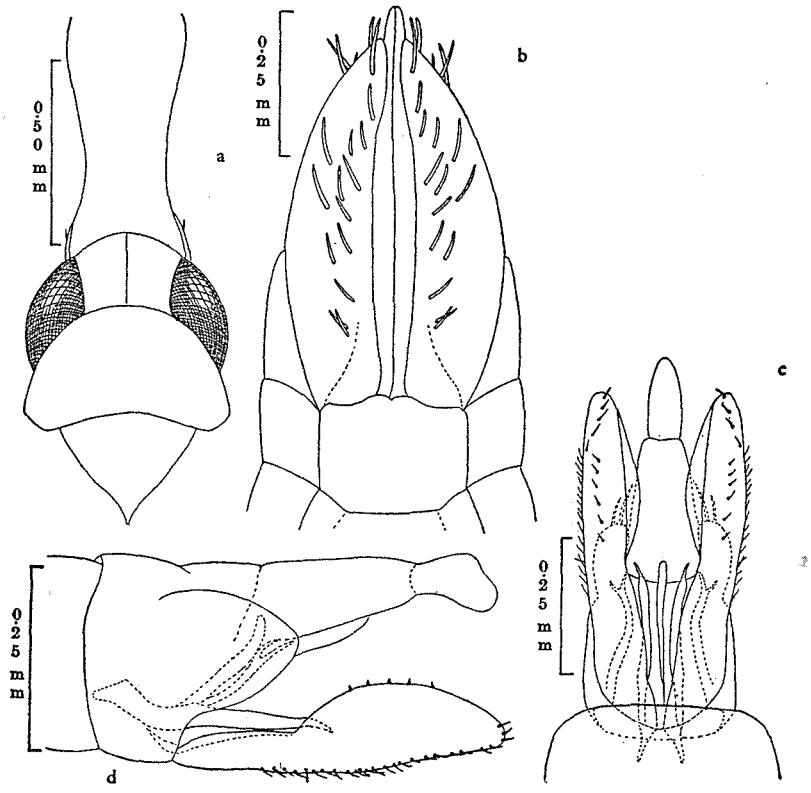

FIGURE 23.—*Empoasca yona:* **a**, dorsal view of head and thorax; **b**, ventral view of female genitalia; **c**, ventral view of male genitalia; **d**, lateral view of male genitalia.

Holotype male, allotype female, Piti, June 15, Usinger, at light; paratypes: 14 females, Yona, May 12, Usinger; one female, June 5, Usinger.

2. Empoasca morindae, new species (fig. 24, *a, b*).

Golden yellow with reddish-brown eyes but without other color markings.

Head with the compound eyes wider than the pronotum; crown subangulate, as long as its greatest width and as long as the median length of the pronotum; face above the antennae somewhat protuberant; below the antennae flat. Pronotum with anterior and posterior margins nearly parallel. Mesonotum subequal to pronotum in length.

Female genitalia: last ventral segment broader than long; posterior lateral angles roundly produced; the posterior border between the lateral angles almost truncate. External male genitalia: plates very long, almost as long as the apex of the anal style, slender, triangular; apices obtuse; dorsal border of the plate somewhat sinuate. Internal male genitalia: aedeagus simple, somewhat expanded near the apex; short, not more than one third as long as the genital plates; lateral processes short, about half as long as the genital plates; bisinuate with broad bases gradually tapering to slender, outwardly directed apices; genital styles flat, somewhat triangular, with obtuse apices about two thirds as long as the genital plate.

Length: to apex of tegmina, 3 mm.; to apex of abdomen, 2.5 mm.

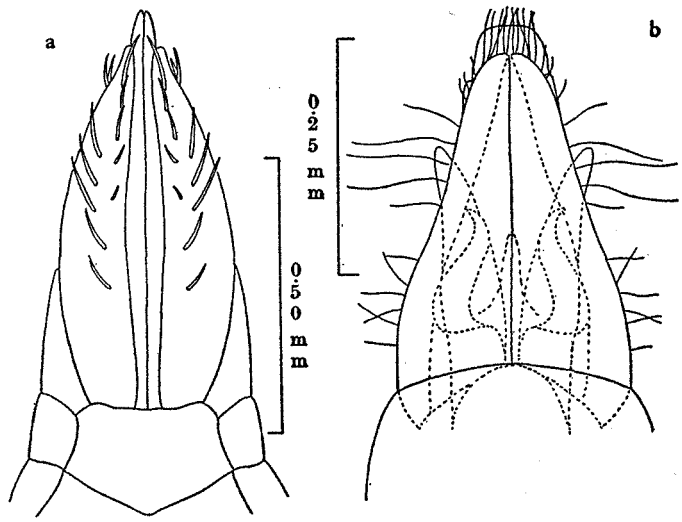

FIGURE 24.—*Empoasca morindae:* **a**, ventral view of female genitalia; **b**, ventral view of male genitalia.

Holotype male, Barrigada, July 6, on *Morinda* sp., Swezey; allotype female, Barrigada, July 22, on *Morinda* sp., Swezey. Paratypes: five males, Barrigada, July 6, four males, Barrigada, July 22, all by Swezey on *Morinda* sp.; three males, Piti, May 1, on *Morinda* sp., Usinger; six females, Barrigada, July 6, two females, Barrigada, July 22, all by Swezey on *Morinda* sp.; one female, Piti, May 1, one female, Dededo, May 1, one female, Orote Peninsula, May 24, one female, Machanao, June 2; all by Usinger from *Morinda* sp.

3. **Empoasca barringtoniae,** new species (fig. 25, *a-e*).

A bright golden-yellow species with crown, pronotum, and mesonotum subequal in length. Crown strongly projecting, subacute with the sides forming almost a right angle. Head and thorax light ochraceous buff, compound eyes tawny; tegmina golden yellow, transparent on the apical third.

External male genitalia: plates long, triangular, flat, contiguous on the basal half, diverging to rather acute apices on the apical half, almost reaching the apex of the anal style, fringed with elongate, slender setae on the lateral borders. Internal male genitalia: aedeagus simple, tubular, about as long as the lateral processes; genital styles broad, flat, their acute apices curved inward; lateral processes broad, flat, converging to slender acute apices on the median line. Female genitalia: last ventral segment elongate, posterior lateral angles projecting; the median area slightly produced.

Length: to apex of abdomen, 2 mm.; to apex of tegmina, 2.5 mm.

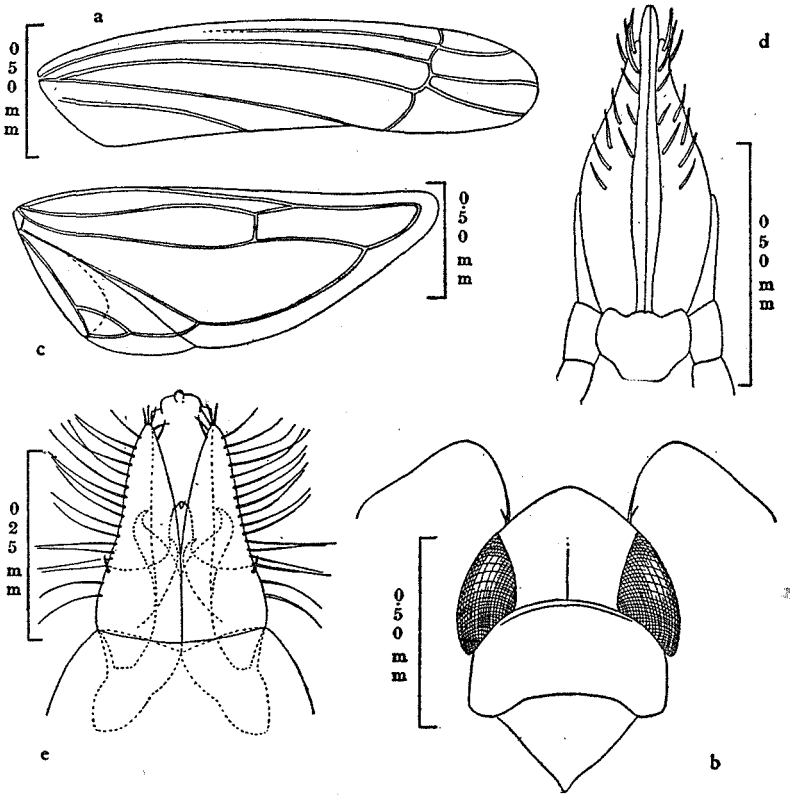

FIGURE 25.—*Empoasca barringtoniae:* **a,** tegmen; **b,** dorsal view of head and thorax; **c,** wing; **d,** ventral view of female genitalia; **e,** ventral view of male genitalia.

Holotype male, allotype female, Fadian, Aug. 19, on *Barringtonia speciosa,* Swezey. Paratypes: one male, five females, Fadian, Aug. 19, on *Barringtonia* sp., Swezey; five males, eight females, Tumon, May 30, on *Barringtonia speciosa,* Swezey.

4. Empoasca macarangae, new species (fig. 26, *a, b*).

A pale greenish-yellow species with an obtuse, slightly subangulate vertex which is not quite as long as the pronotum; mesonotum longer than the pronotum.

Female genitalia: last ventral segment elongate, longer than broad; the posterior margin produced at the median half, nearly straight. External male genitalia: plates very long, longer than the anal spine, gradually divergent; inner margin nearly straight, the outer margin and dorsal margin slightly sinuate; apices obtuse, with a number of stout spines; tenth segment with a short, recurved spine. Internal male genitalia: aedeagus very short, only about a fourth as long as the genital plates; genital style elongate, narrow, about half as long as the genital plates; apex deflected to a short acute spine which is directed laterad; lateral processes about as long as the genital style, converging, slender, the tips produced into a slender acute spine.

Length: to apex of tegmina, 3.25 mm.; to tip of abdomen, 2.75 mm.

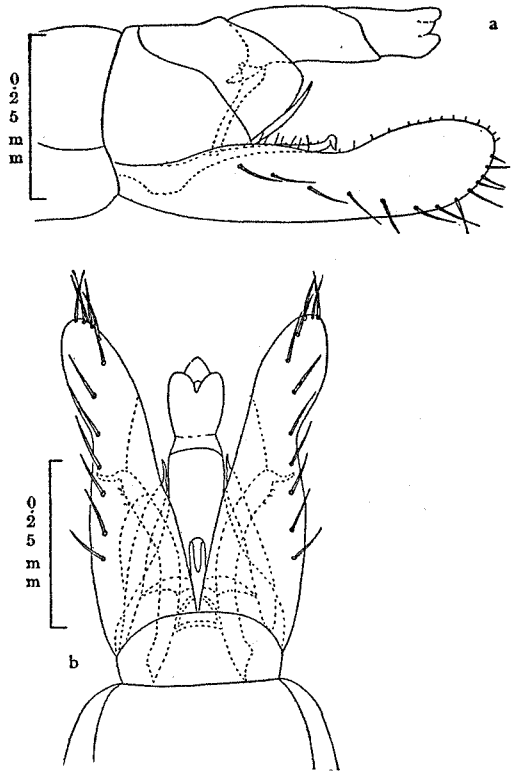

FIGURE 26.—*Empoasca macarangae:* **a,** lateral view of male genitalia; **b,** ventral view of male genitalia.

Holotype male, Mt. Alifan, May 21, from *Macaranga* sp., Usinger; allotype female, Mt. Alifan, May 21, Usinger; paratypes, four males and six females, Mt. Alifan, from *Macaranga* sp., Swezey and Usinger.

5. Empoasca pipturi, new species (fig. *27, a-d*).

An ochraceous yellow species with the crown nearly twice as broad as its median length, rounded before.

Female genitalia: last ventral segment nearly twice as long as its greatest width, projecting; posterior margin strongly produced with a V-shaped median notch. External male genitalia: plates flat, elongate, longer than the anal style, slightly twisted; genital styles elongate, about three fifths as long as the plates; the apices attenuate, crossing over each other.

Length: to apex of abdomen, 1.75 mm.; to apex of tegmina, 2.5 mm.

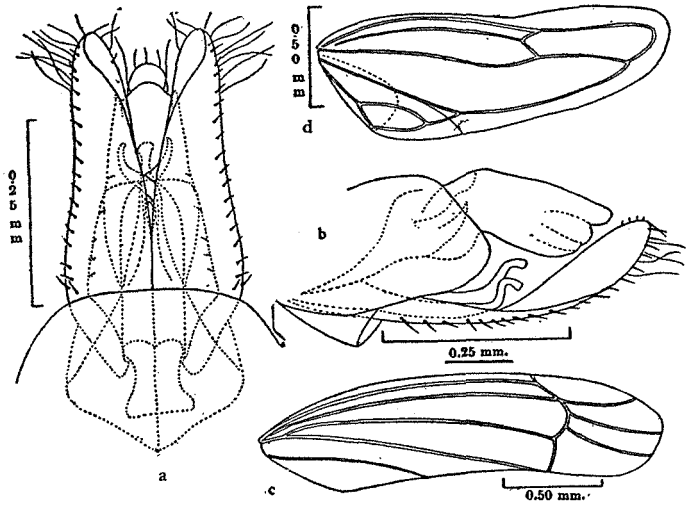

FIGURE 27.—*Empoasca pipturi:* **a,** ventral view of male genitalia; **b,** lateral view of male genitalia; **c,** tegmen; **d,** wing.

Holotype male, allotype female, four male and four female paratypes, Mt. Alifan, June 27, on *Pipturus* sp., Swezey.

6. Empoasca fuscovitta, new species (fig. 28, *a-c*).

An ochraceous orange species with a pair of fuscous vittae which start at the clypeal suture, extend over the lateral margin of the face, the apex of the head, and are continued across the crown and the pronotum to the apex of the mesonotum.

Crown narrow, obtuse, only about one third wider than its median length; face elongate, slightly protuberant, twice as broad as median length; lateral margin of cheek straight. Pronotum nearly twice as long as the crown, as wide as compound eyes, not quite twice as wide as its median length.

Male genitalia: genital plates much elongate, only slightly narrowed to divergent obtuse apices; plates and pygofer longer than the anal spine; anal styles broad, the apices suddenly constricted to somewhat divergent and recurved processes. Female genitalia: last ventral segment elongate, about 1.5 times as long as its greatest width, somewhat compressed; posterior lateral angles somewhat projecting; the posterior margin with a broad, shallow U-shaped excavation which occupies about three fourths of the width of the segment; the median line with a shallow V-shaped notch which is continued anteriorly as a slight ridge.

General color ochraceous buff, paler beneath and darker above, almost ochraceous orange on the dorsal part of the head and the thorax; crown with a pair of fuscous vittae percurrent; these vittae about the same width as the paler area between; the fuscous vittae continued across the pronotum, widened somewhat posteriorly; another pair of fuscous vittae behind the compound eyes; the lateral margins of the pronotum are broadly ivory-white; mesonotum with the median line ochraceous orange, the lateral area fuscous; tegmina milky subhyaline; clavus broadly clouded with fuscous along the commisural margin; costal margin with a blackish stripe extending almost to the apical cells; the corium clouded with smoky from the base to almost the apex of clavus; another cloud beyond the apex of the clavus and the apical area with a smoky cloud; face with a pair of lateral vittae which unite on the lower third to form a large fuscous cloud.

Length: to apex of tegmina, 2.5 mm.; to apex of abdomen, 1.75 mm.

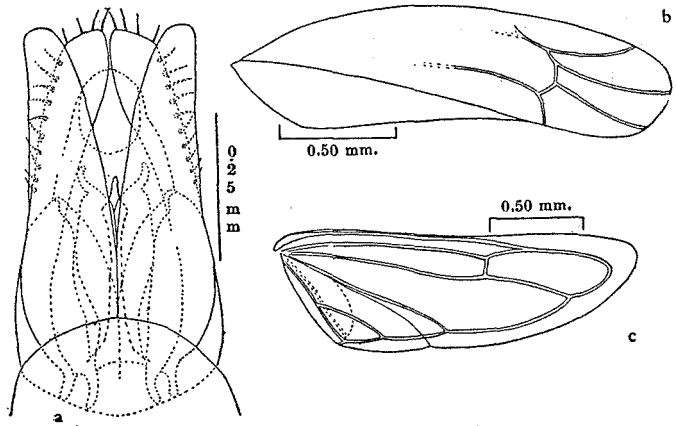

FIGURE 28.—*Empoasca fuscovitta:* **a**, ventral view of male genitalia; **b**, tegmen; **c**, wing.

Holotype male, allotype female, Machanao, June 30, Swezey.

7. **Empoasca bipunctulata,** new species (fig. 29, *a-e*).

Crown as long as its width between the eyes, obtusely rounded anteriorly; face narrow, elongate, more than twice as long as the width between the eyes. Pronotum about twice as broad as long; the posterior margin broadly excavated.

Male genitalia: unique; genital plate and genital styles elongate, slender, suggestive of certain species in the subfamily Jassinae; genital plate elongate, slender, the basal two thirds about the same width throughout, then elbowed, narrowed, directed mesad and ending in obtuse apices with elongate setae; genital styles not as long as the anal spine, the basal portion of about the same width, then suddenly constricted and terminating in elongate, slender flagellate processes; the lateral processes somewhat sickle-shaped, attenuated to acute apices which are directed laterad; aedeagus elongate, slender, about half as long as the pygofer, terminating in a slender process. Female genitalia: with last ventral segment about 1.5 times as broad as long; the posterior lateral angles strongly projected; the posterior border excavated in a broad U-shaped sinus; the median area projected into a broad sharp triangular tooth with a shallow median V-shaped notch.

Color of the venter including the legs and abdomen pale ochraceous buff; face ochraceous orange with a pale, rather indistinct median vitta and two pairs of oblique vittae, the dorsal pair starts at the apex of the head and slopes laterad to the middle of the eyes; the ventral pair is broader and starts at the top of the median vitta and slopes laterad to the antennae; crown ochraceous orange with a pale median vitta starting about

the center of the crown and terminating anteriorly in two recurved fasciae above the ocelli and extending almost to the compound eyes; behind these fasciae there is a pair of broad, short dashes directed caudad which extend from the margin of the compound eyes for about a fourth of the width of the crown; pronotum chiefly ochraceous orange; median vitta ivory-white; lateral fields broadly ivory-white; tegmina translucent with ochraceous greenish reflections; a large black spot between media and the cross veins just posterior to these.

Length: to apex of tegmina, 2.75 mm.; to apex of abdomen, 2.25 mm.

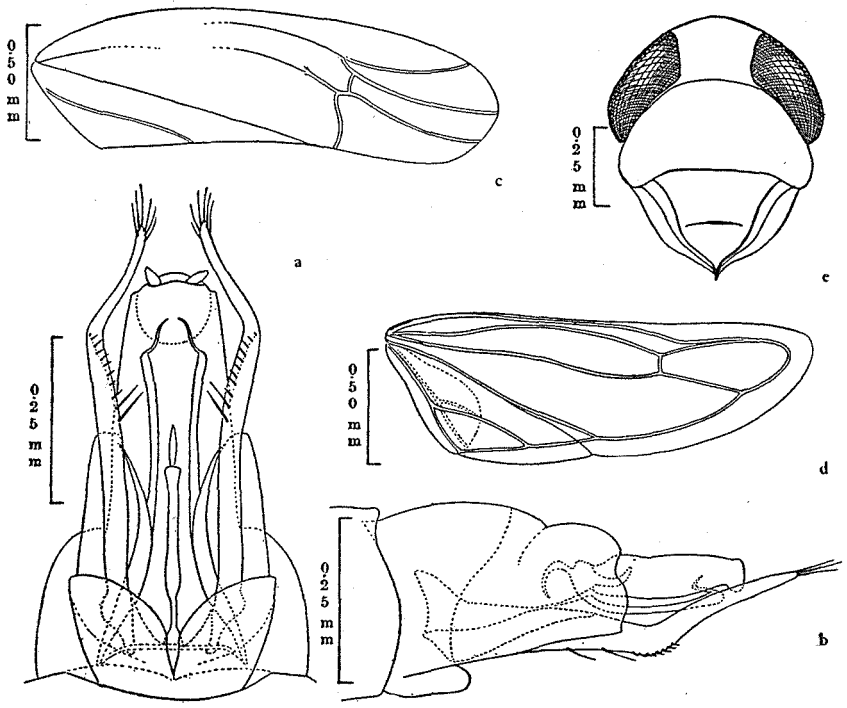

FIGURE 29.—*Empoasca bipunctulata:* **a**, ventral view of male genitalia; **b**, lateral view of male genitalia; **c**, tegmen; **d**, wing; **e**, dorsal view of head and thorax.

Holotype male, Piti, May 1, from sedges, Usinger; allotype female, Piti, May 1, from sedges, Swezey; paratype, one female, Umatac, May 14, Usinger.

This species is colored ochraceous orange and ochraceous buff. The pronotum has a median pale vitta and tegmina with a circular black spot on the corium beyond the apex of the clavus. The genitalia are quite different from any other species of *Empoasca* known to me, but the other structural characters place this species in this genus.

8. Empoasca pitiensis, new species (fig. 30, *a-c*).

A greenish species with obtusely angulate head and distinct genitalia.

Crown obtusely angulate, about 1.5 times as broadly as its median length, not as long as the pronotum; face including anteclypeus more than twice as long as the width between the eyes; pronotum and mesonotum subequal; pronotum about twice as broad as its median length, narrower than the head including the compound eyes.

External male genitalia: posterior margin of last ventral segment with a deep V-shaped notch extending cephalad for more than a third of the length of the segment; genital plates elongate, diverging, the inner margin slightly sinuate; the apices obtuse. Internal male genitalia: of the type of *Empoasca obtusa* (Walsh) with the following differences; genital styles broad at base, gradually tapering to acute divergent apices; lateral processes bifid, not longer than the genital styles; aedeagus simple, without apical, lateral processes. Female genitalia: with the last ventral segment about twice as broad as long; the posterior margin transverse.

Length: to apex of tegmina, 3 mm.; to apex of abdomen, 3.25 mm.

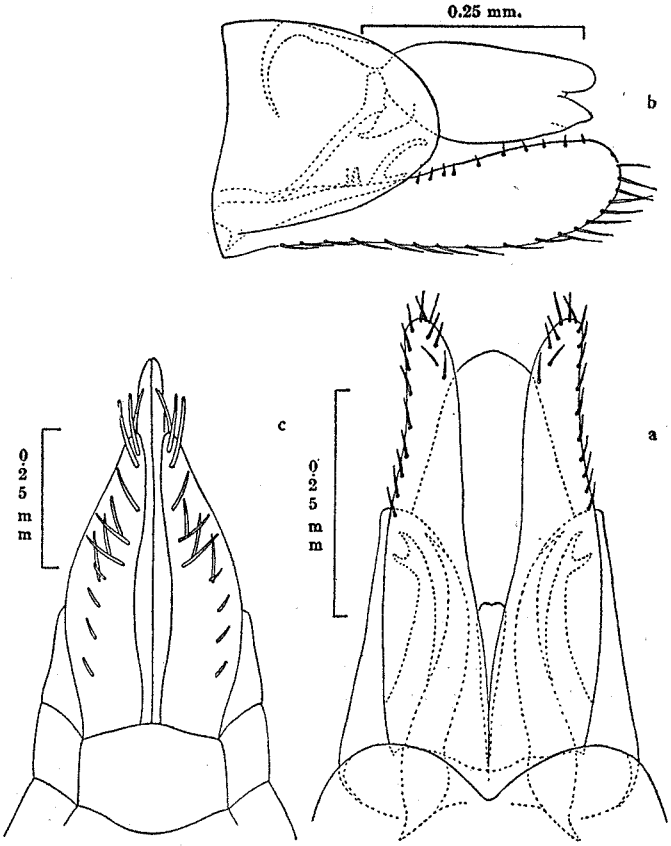

FIGURE 30.—*Empoasca pitiensis:* a, ventral view of male genitalia; b, lateral view of male genitalia; c, ventral view of female genitalia.

Holotype male, allotype female, four male and three female paratypes, Piti, May 23, from beans, Swezey.

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NOTES ON SOME FULGOROIDEA OF GUAM

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Experiment Station, Hawaiian Sugar Planters' Association, Honolulu

The species of Guam leafhoppers collected in 1936 and included in this paper were determined chiefly by comparison with types in the collection of the Hawaiian Sugar Planters' Experiment Station, before the balance of the Fulgoroidea and Jassoidea was sent to Z. P. Metcalf for study. A number of new species were found by Dr. Metcalf, especially among the Jassoidea which were nearly all new species. As noted below, a few species in the lot are associated with crop plants and can be rated as pests.

Family DICTYOPHORIDAE

Dictyophora nakanonis Matsumura, Sapporo Nat. Hist. Soc., Trans. 3: 109, 1910; Melichar, Mon. Dictyophoriden, 130, 1912.

Piti, April 30, Usinger, May 2, on *Physalis,* Swezey, May 3, 31, Swezey, May 23, on *Emilia,* Usinger, June 13, on sugar cane, Swezey, July 26, Swezey, Nov. 14, on *Glochidion,* Swezey; Inarajan, May 7, Swezey; Agana, June 6, Swezey; Dandan, July 17, Swezey; Orote Peninsula, Sept. 27, on *Pipturus* and *Sida,* Swezey. More specimens were collected on the *Physalis* weed than on any other plant. The nymphs occurred on this plant also. We found this insect widely distributed in Guam, quite general in habits and never numerous enough on any one plant to be injurious.

This rather large fulgorid with a long prolongation of the head was determined by P. W. Oman, by comparison with U. S. National Museum specimens from the Philippines determined by Dr. L. Melichar as *nakanonis.* It is closely similar to *D. pallida* (Donovan) which has a wide range in the Orient from India to China, Formosa, Philippines, Java, Sumatra, and Borneo, and is described under several different names. Dr. Oman states that it is possible that on further study of this group, *nakanonis* and *pallida* may prove identical.

Family CIXIIDAE

1. **Myndus palawanensis** Muir, Philippine Jour. Sci. 22: 162, pl. 1, fig. 3, 1923.

This species was described from Palawan, Mindanao, and Borneo, and also occurs in Ceram and Larat. It was not previously recorded in Guam. We found it abundant on *Pandanus* leaves in two localities: Santa Rosa Peak, May 19, Swezey; Barrigada, June 12, Usinger. In the records of its occurrence in the Philippines and East Indies, no mention was made of its food plant.

2. **Myndus seminiger** Muir, Ins. Samoa 2(1): 6, fig. 6, 1927.

Described from Samoa and hitherto not recorded elsewhere. It also occurred on *Pandanus* in Guam, but not as abundantly as the preceding species. Tarague, May 17, Swezey; Santa Rosa Peak, May 19, Swezey; Machanao, June 4, Swezey, Usinger; Orote, Aug. 2, Swezey.

Family ARAEOPIDAE

The leafhoppers of this family which we collected are apparently all widely distributed immigrants. The majority of them are found on grasses. A few which may be rated as pests are confined to particular plants such as sugar cane, corn, rice, and taro, each of which has a single species attached to it. The species on cane, however, was rare, and never found in sufficient numbers to be injurious.

1. **Perkinsiella thompsoni** Muir, Haw. Ent. Soc., Proc. 2: 240, 1913.

Piti, May 2; Fonte Valley, Aug. 7; Dededo, Aug. 11. All by Swezey.

This sugar cane leafhopper was described from specimens collected in Guam by Fullaway in 1911. It was later collected more abundantly by Muir in Java, which is more likely its home. Eventually it may be found on intervening islands. We found it scarce in Guam. It was never conspicuous or numerous enough to be injurious to the cane.

Whenever eggs were found, they were heavily parasitized by a mymarid which apparently is the same species which was introduced from Queensland to Hawaii in 1904 (*Paranagrus optabilis* Perkins). At Sinajana, June 8, of 43 eggs examined, 80 percent were parasitized. At Fonte Valley, Aug. 7, the few eggs found were all parasitized. At Dededo, Aug. 11, eggs examined were 78 percent parasitized. At the Agricultural School Farm, Piti, April 30, one exit hole of *Ootetrastichus* was seen in a cane leaf, but no other evidence of this parasite was found. It is apparent that *Paranagrus* has sufficient control of this leafhopper to prevent its being a pest.

2. **Peregrinus maidis** (Ashmead).

Delphax maidis Ashmead, Psyche 5: 323, 1890.

Peregrinus maidis, Kirkaldy, Entomologist 37: 176, 1904.

The corn leafhopper was first recorded from Florida where it was noted as an immigrant pest in 1888. It is now known wherever corn is grown in the tropics. It was reported in Guam by Fullaway in 1911 as a pest on corn, though not so injurious as it is in Hawaii. Its greatest importance lies in the fact that it transmits a streak disease which stunts the growth of the corn plants and prevents production of ears. The variety of corn grown in Guam is mostly resistant to this disease, but some examples of it are occasionally seen. The leafhoppers were usually to be found in small numbers on corn

in all districts, but our collections include them from only a few places: Dededo, May 11, Usinger; Merizo, June 11, Swezey; Piti, July 21, 31, Swezey.

At Dededo, an egg parasite was reared which was determined by A. B. Gahan as *Anagrus flaveolus* Waterhouse. A small green bug, *Cyrtorhinus lividipennis* Reuter, is associated with the corn leafhopper, feeding by sucking the eggs where inserted into the midribs of the leaves. It is no doubt effective in the control of the leafhopper, keeping it from becoming so abundant as to be a serious pest.

3. **Nilaparvata lugens** (Stål).

Delphax lugens Stål, Öfv. K. Vet.-Akad. Förh., 246, 1854.

Delphax sordescens Motschulsky, Soc. Nat. Moscou, Bull. **36**: 109, 1863.

Nilaparvata greeni Distant, Fauna Brit. India, Rhynch. **3**: 473, fig. 260, 1906.

Dicranotropis anderida Kirkaldy, Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. **3**: 133, 1907.

Nilaparvata lugens (Stål), Metcalf, Cat. Hemip., Fulgoroidea (3): 296, 1943.

In 1936, we found the rice leafhopper wherever rice was growing. Our collections of it were as follows: Inarajan, May 7, Bryan, Swezey, Usinger; Inarajan, June 8, Sept. 30, Swezey; Merizo, Oct. 2, Swezey; Piti, Sept. 1, Nov. 22, Swezey; Atantano, Sept. 3, Swezey. At Inarajan, Sept. 30, the leafhoppers were so numerous in rice seedling plots as to ruin the young plants. At that time they were coming to lights by hundreds in the village more than half a mile distant. At Merizo, Oct. 2, they were abundant in the seedling plots, but not destructive. In the evening of Nov. 30, this leafhopper was swarming at the electric lights on the dock at Piti.

This is one of several leafhoppers known on rice in the Orient. This particular one has a wide distribution, and is known under different names in different places from India, Ceylon, Java, and the Philippines. On the authority of Muir, the names given above are synonyms (Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. **15**: 16, 17, 1924), and *lugens* Stål has priority of date.

This rice leafhopper must have been a rather recent immigrant in Guam, for the first record I have found of it was in the Governor's Report for 1934, where a *Megamelus* is reported on rice at Merizo, Piti, Asan, Atantano, and Agat. As these include nearly all the localities where rice is grown, this leafhopper must have been already generally distributed. There was no mention of it in entomological notes of the Guam Experiment Station reports, which were issued up to the time the station was discontinued in 1932.

Usually the little green mirid bug *Cyrtorhinus lividipennis* was associated with infestations of this leafhopper, and no doubt feeds on its eggs as it does

on the corn leafhopper eggs. At Inarajan, June 8, several leafhoppers were collected having dryinid larvae attached, and one male dryinid was reared. Its identity is unknown. Two species of ladybeetles were usually common in rice fields (*Harmonia arcuata* and *Coelophora inaequalis*) and are thought to feed to some extent on the leafhoppers.

4. **Megamelus proserpina** Kirkaldy, Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. 3: 147, pl. 10, figs. 5-7, pl. 12, figs. 19-21, 1907.

Gulch near Mt. Tenjo, May 3; Agana, May 15; Merizo, Oct. 2; Dededo, Nov. 8; Libugon, Nov. 10. All by Swezey.

The taro leafhopper was described from Suva, Fiji, without mention of food plant. It is now known as a taro pest in Samoa, Niue, Queensland, Amboina, Java, the Philippines, and Hawaii. It was first reported in Guam in 1924. In 1927, under the name *Megamelus* sp., it was reported as epidemic, and its attacks were followed by a fungus disease (*Gloeosporium* sp.) that often ruined the entire crop. In 1936 I did not see any serious injury by the taro leafhopper in Guam. In fact, it was rather scarce on dryland taro, the predominant variety grown. In a few places where there were small plantings of wet taro by ditches the leafhopper was very abundant, but did not seem to affect the taro seriously.

A dryinid parasite attacks this leafhopper to a slight extent. Parasitized leafhoppers and parasite cocoons were found on taro leaves at Dededo, Merizo, and Libugon. Three female dryinids and one male were obtained from these cocoons. It is the same species (*Haplogonatopus vitiensis* Perkins) which is now attacking the taro leafhopper in Hawaii. It was introduced from Fiji in 1906 as a parasite for the sugar cane leafhopper.

Attempts were made to breed out egg parasites, but none were obtained. Two fungus diseases killed some of the leafhoppers, the dead ones adhering to the leaves.

5. **Stenocranus agamopsyche** Kirkaldy, Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. 1(9): 409, 1906; 3: 138, pl. 11, figs. 1-4, pl. 17, figs. 6-7, 1907.

Agana Swamp, May 15, Swezey, Usinger; gully near Mt. Chachao, May 16, Swezey; Fonte Valley, Aug. 7, Swezey; Piti, Sept. 21, Swezey.

This leafhopper was described from Queensland where it occurred on grasses and sedges. It was not previously known in Guam. We found it sparsely on a large swamp reed (*Trichoon roxburgii*).

At Agana Swamp, eight parasites were obtained from the eggs of this leafhopper. They are an undetermined species of the trichogrammatid genus *Oligosita*.

6. Liburnia ochrias (Kirkaldy).

"Delphax" ochrias Kirkaldy, Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. 3 : 157, 1907.

Sogata ochrias, Muir, Ins. Samoa 2(1) : 12, 1927.

Liburnia ochrias, Metcalf, Cat. Hemip., Fulgoroidea (3) : 366, 1943.

A grass leafhopper, described from Fiji and Australia. Also known from Samoa, and now recorded from Guam, where it was swept from low grasses. It was very abundant on *Sporobolus virginicus* on the beach at Fadian, Aug. 19, Swezey. A few were collected also on grass by the roadside near Piti, May 23 and Mt. Tenjo, May 3, Swezey.

7. Liburnia eupompe (Kirkaldy).

"Delphax" eupompe Kirkaldy, Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. 3 : 162, pl. 10, figs. 3-4, pl. 12, figs. 16-18, 1907.

Sogata eupompe, Muir, Ins. Samoa 2(1) : 12, 1927.

Liburnia eupompe, Metcalf, Cat. Hemip., Fulgoroidea (3) : 355, 1943.

Described from Fiji and Australia. Also known from Samoa, and now recorded from Guam. Five specimens swept from grass at beach, Inarajan, May 7, Usinger; Mt. Tenjo, May 3, Usinger, Swezey; Agat, May 20, on grass at beach, Swezey, Usinger; Piti, May 1, Swezey; Fadian, Aug. 19, very abundant on *Sporobolus virginicus* on beach, the males all macropterous and the females mostly brachypterous, Swezey. Three specimens from Inarajan and one from Agat were parasitized by a stylopid, possibly *Elenchoides perkinsi* Pierce, a species recorded as abundant on delphacids in Fiji and Queensland under the name *Elenchus tenuicornis,* a misidentification according to Pierce, who names it as above.

8. Liburnia kirkaldyi (Muir).

Kelisia kirkaldyi Muir, Haw. Ent. Soc., Proc. 3 : 329, 1917.

Sogata kirkaldyi Muir, Ins. Samoa 2(1) : 12, 1927.

Liburnia kirkaldyi, Metcalf, Cat. Hemip., Fulgoroidea (3) : 363, 1943.

Described from Fiji. Occurs also in Samoa, Queensland, Philippines, and Formosa. Now recorded for the first time in Guam, swept from low grasses, Upi trail, May 5, Swezey; Agat, May 20, Swezey; Agana, May 25, Usinger.

9. Liburnia paludum (Kirkaldy).

Kelisia paludum Kirkaldy, Fauna Hawaiiensis 2(7) : 579, 1910.

Sogata paludum, Muir, Ins. Samoa 2(1) : 12, 1927.

Liburnia paludum, Metcalf, Cat. Hemip., Fulgoroidea (3) : 366, 1943.

This leafhopper was described from Hawaii, and is now known to occur in Samoa, Fiji, Queensland, Java, Ceylon, and Philippines. This is its first record in Guam, where it occurs in low grasses. Collected at the following places: Upi trail, May 5, Swezey; Agana, May 25, Usinger; Piti, Nov. 2 and 5, abundant in lawn grass, Swezey.

10. Chloriona albotristriata (Kirkaldy).

"Delphax" albotristriatus Kirkaldy, Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. 3 : 154, pl. 10, fig. 15, pl. 14, figs. 1-3, 1907.

Chloriona albotristriata, Metcalf, Cat. Hemip., Fulgoroidea (3) : 322, 1943.

Described from Queensland, and now recorded from Guam for the first time. Five specimens swept from grass at beach, Inarajan, May 7, Usinger.

11. Dicranotropis cognata Muir, Haw. Ent. Soc., Proc. 2 : 317, pl. 6, figs. 34, 34a, 1917; Ins. Samoa 2(1) : 13, 1927.

Another widely distributed species, described from Fiji, Queensland, and Philippines, later known in Samoa and now in Guam. Piti, May 1, on *Paspalum orbiculare,* Usinger, Swezey; Mt. Tenjo, May 3, Swezey, Usinger.

12. Dicranotropis nigropunctata (Motschulsky).

Mestus ? nigropunctatus Motschulsky, Soc. Nat. Moscou, Bull. 36(3) : 112, 1863.

Dicranotropis nigropunctatus, Melichar, Hom. Fauna Ceylon, 160, pl. 3, fig. 12a, 1903.

Dicranotropis nigropunctata, Metcalf, Cat. Hemip., Fulgoroidea (3) : 240, 1943.

This grass leafhopper was previously known in Ceylon and Java and is now recorded from Guam. Upi trail, May 5, Swezey, Usinger; Agat, May 20, Swezey.

13. Delphacodes dryope (Kirkaldy).

"Delphax" dryope Kirkaldy, Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. 3 : 154, 1907.

Delphacodes dryope, Muir, Haw. Ent. Soc., Proc. 3 : 333, 1917.

Described from Fiji and Queensland. Known to occur also in Samoa, and now recorded from Guam. Upi trail, May 5, on grass, Swezey; Taragüe, May 17, on grass, Swezey; Piti, Nov. 5, swept from lawn grass, Swezey.

14. Ugyops samoaensis Muir, Haw. Ent. Soc., Proc. 4 : 573, fig. 10, 1921.

Described from Samoa and Niue. Our collections were from general sweeping on trees and shrubs in several regions. Sometimes only young stages were obtained. Piti, April 30, on *Hibiscus tiliaceus,* Usinger; Upi trail, May 5, Bryan, Usinger; Dededo, May 11, on *Piper guahamense,* Swezey; gully near Mt. Chachao, May 16, on *Cycas circinalis* and *Discocalyx megacarpa,* Swezey; Umatac, May 28, on *Thespesia populnea,* Swezey; Agat, May 31, on *Thespesia populnea* and *Calophyllum inophyllum,* Swezey, Usinger; Inarajan, June 8, one specimen on cane, Swezey; Fadian, Aug. 19, on *Pemphis acidula,* more numerous than any of the other records, Swezey.

15. **Ugyops kinbergi** Stål, Freg. Eugenies Resa, Ins. **4**: 274, pl. 4, fig. 2, 1859.

A much larger species, collected by individuals from the following places: Talofofo, April 1, Bryan; Yigo, April 13, Bryan; Tarague, April 19, Bryan; Upi trail, May 5, Usinger; Barrigada, July 12, on *Intsia bijuga,* Swezey; Machanao, Nov. 25, Swezey.

Described from Ponape, Caroline Islands, and also recorded from Java.

FAMILY MEENOPLIDAE

1. **Nisia atrovenosa** (Lethierry).

Meenoplus atrovenosus Lethierry, Mus. Civ. Stor. Nat. Genova **26**: 466, 1888.

Nisia atrovenosa, Melichar, Hom. Fauna Ceylon, 53, 1903.

This species has a wide distribution in Indo-Malaya, Africa, and Australia, and has been recorded from Samoa. Not previously recorded in Guam. We found it abundant on *Scirpus lacustris* in a few places: Sasa, June 20, Usinger; Sumay Road, June 22, Swezey; Agana swamp, June 26, Swezey.

FAMILY DERBIDAE

1. **Lamenia caliginea** (Stål).

Delphax caliginea Stål, Öfv. K. Vet.-Akad. Förh., 246, 1854.

Lamenia caliginea Stål, Freg. Eugenies Resa, Ins., Hem. **4**: 277, 1859.

Ritidian Point, April 15, 16, Bryan; Mt. Alifan, April 20, Bryan; Upi Trail, May 5, Usinger; Agat, May 20, on *Hernandia* and grass, Swezey; Agat, May 31, on *Calophyllum,* Usinger; Santa Rosa Peak, May 19, on mango, Swezey; Machanao, June 4, Usinger; Machanao, June 30, Swezey; Talofofo, June 17, Swezey; Barrigada, July 22, Swezey; Inarajan, July 25, on *Barringtonia racemosa,* Swezey; Machanao, August 6, Sept. 22, Nov. 25, Swezey; Asan, August 22, Swezey; Dededo, Nov. 8, on taro, Swezey; Mata, Nov. 11, on banana, Swezey; Tumon, Nov. 13, on mango, Swezey.

This species was described from Tahiti. It also occurs in others of the Society Islands, Samoa, Ellice Islands, Tonga, and Funafuti. It was collected in Guam by Fullaway in 1911. Described by Muir as *Thyrocephalus fullawayi,* it was later synonymized by him with Stål's species. We collected it on quite a variety of trees and plants, but never abundantly.

2. **Proutista moesta** (Westwood).

Derbe moesta Westwood, Ann. Mag. Nat. Hist. II, **7**: 209, 1851.

Proutista moesta, Muir, Philippine Jour. Sci. **12D**: 95, 1917.

Piti, June 13, on cane, Swezey; Piti, July 30, on banana, Swezey; Piti, Sept. 1, Sept. 17, on cane, Swezey.

Described from India, and occurs also in Assam, Ceylon, and the Philippines. It is recorded on sugar cane at Los Banos. The few that we found in Guam were chiefly on sugar cane.

Family ISSIDAE

Capelopterum punctatellum Melichar, Mon. Issiden, 212, 1906.

Ritidian Point, April 22, Bryan; June 2, on *Pandanus,* Usinger; Upi trail, May 5, Swezey, Usinger; Mt. Chachao, May 16, on *Cycas,* Swezey; Santa Rosa, May 19, Usinger; Orote Peninsula, May 24, on *Psychotria,* Usinger; Machanao, June 2, Swezey, June 4, Usinger; Aug. 6, on *Piper,* Swezey; Paasan, June 15, Usinger; Talofofo, June 19, on *Premna,* Usinger; Mt. Alifan, June 27, Usinger.

Described from Solomon Islands, and I have found no other record of its occurrence. Our 15 specimens are somewhat variable, but agree well with Melichar's description. We collected them by general sweeping on various trees and shrubs in the forest, pretty generally distributed; a few nymphs were obtained also.

COCCIDAE OF GUAM

By D. T. Fullaway
Board of Agriculture and Forestry, Honolulu

The records in this list are based on my collections of 1911; reports of S. R. Vandenberg, 1925-1931; collections by O. H. Swezey and R. L. Usinger, 1936; records of R. G. Oakley, 1938-1939; and records of interceptions by the U. S. Bureau of Entomology and Plant Quarantine.

Subfamily MONOPHLEBINAE

1. **Icerya purchasi** Maskell, New Zealand Inst., Trans. **11**: 221, 1878.
On *Citrus* and ironwood, Fullaway; on orange and lime, Oakley; on lemon, Vandenberg. Well controlled by the ladybeetle, *Rodolia cardinalis* (Mulsant), which was introduced from Hawaii in 1926 by Vandenberg.

Subfamily ERIOCOCCINAE

2. **Pseudococcus boninsis** (Kuwana).
Dactylopius boninsis Kuwana, New York Ent. Soc., Jour. **17**: 161, 1909.
On sugar cane, Agricultural School Farm, Piti, July 27, Swezey; Dededo, Aug. 11, Swezey. At Piti parasitized by *Pseudococcobius terryi* (Fullaway).

3. **Pseudococcus brevipes** (Cockerell).
Dactylopius brevipes Cockerell, The Entomologist **26**: 267, 1893.
On pineapple, Fullaway, Usinger, Swezey; on sugar cane, Yona, May 12; Piti, July 27, Swezey; on tuberose, Usinger; on *Pandanus,* Usinger, Oakley.

4. **Pseudococcus** species near **brevipes.**
On pineapple and *Barringtonia,* Oakley.

5. **Pseudococcus cocotis** (Maskell).
Dactylopius cocotis Maskell, New Zealand Inst., Trans. **22**: 149, 1889.
On coconut, Fullaway, Swezey, Usinger, Oakley; on coconut and oil palm, Vandenberg.

6. **Pseudococcus comstocki** (Kuwana).
Dactylopius comstocki Kuwana, Calif. Acad. Sci., Proc. 3(3): 52, 1902.
On cotton, Usinger.

7. **Pseudococcus lilacinus** Cockerell, Davenport Acad. Nat. Sci., Proc. **10**: 128, 1905.
Mt. Alifan, May 21, on male inflorescence of seeded variety of breadfruit, *Artocarpus communis,* Swezey; on *Terminalia catappa,* Oakley.

8. **Pseudococcus** species close to **lilacinus.**
Umatac, May 28, on large-leaved *Ficus;* Machanao, June 30, Swezey.

9. **Pseudococcus** species close to **lilacinus.**
On *Citrus,* Fullaway; on *Randia racemosa* and *Guamia mariannae,* Swezey, Usinger.

10. **Pseudococcus** species (*citri* group).
On *Citrus,* Fullaway; on orange, Oakley.

11. **Pseudococcus** species (not *citri*).
On *Pandanus,* Oakley; on *Premna gaudichaudii,* Swezey, Oakley.

12. **Pseudococcus** species.
At base of fruit of *Crescentia alata,* Swezey.

13. **Pseudococcus** species.
On coffee, Fullaway, Oakley.

14. **Pseudococcus** species.
On rice, Oakley.

15. **Pseudococcus** species.
On tuberose, Oakley.

16. **Ferrisia virgata** (Cockerell).
Dactylopius virgatus Cockerell, The Entomologist **26**: 178, 1893.
On peanut, cotton, Ceara rubber, eggplant, soursop, Fullaway; Inarajan, May 7, on *Citrus,* Swezey, Usinger; Yona, May 12, on pigeon pea, Swezey; on cactus, mango fruits, *Allamanda,* Oakley.

17. **Trionymus sacchari** (Cockerell).
Dactylopius sacchari Cockerell, Trinidad Naturalists' Club, Jour. **2**: 195, 1895.
On sugar cane, Fullaway, Swezey, Usinger, Oakley.

18. **Antonina boutelouae** Parrott, Kansas Expt. Sta., Bull. **98**: 138, 1900.
On Bermuda grass, Fullaway.

SUBFAMILY ASTEROLECANIINAE

19. **Asterolecanium bambusae** Boisduval, Insectologie Agricole, 1869.
On bamboo, Fullaway, Oakley; Piti, April 30, on bamboo stems, Swezey.

20. **Asterolecanium miliaris longum** (Green).
Planchonia miliaris var. *longa* Green, Indian Mus. Notes **4**: 5, 1896.
Piti, Sept. 26, Oct. 27, on bamboo leaves, Swezey.

21. **Asterolecanium pustulans** (Cockerell).
Asterodiaspis pustulans Cockerell, Inst. Jamaica, Jour. 1 : 143, 1892.
On cotton, Oakley.

SUBFAMILY LECANIINAE

22. **Pulvinaria psidii** Maskell, New Zealand Inst., Trans. 25 : 223, 1892.
On coffee, Fullaway, Oakley; Sumay, Aug. 2, on corn, Swezey; Piti, on *Gardenia,* Swezey.

23. **Pulvinaria** species near **tyleri.**
On sweet potato leaves, Fullaway, Oakley.

24. **Saissetia nigra** (Nietner).
Lecanium nigrum Nietner, Enemies of the coffee tree, 9, 1861.
On cotton, Ceara rubber, kapok, Fullaway, Oakley; Tumon, May 30, on *Barringtonia speciosa,* Swezey; Sumay, Aug. 2, on corn, Swezey; Sumay Road, June 21, on *Premna gaudichaudii,* Swezey; on *Pandanus,* corn, *Asplenium nidus,* Oakley. Parasitized by *Tomocera californica.*

25. **Saissetia hemisphaerica** (Targioni).
Lecanium hemisphaericum Targioni, Studii sul. cocciniiglie, 26, 1867.
On coffee, Fullaway, Oakley.

26. **Saissetia** species.
On *Morinda,* Swezey.

27. **Saissetia** species.
On pigeon pea, Fullaway.

28. **Saissetia** species.
On peanut, Fullaway.

29. **Coccus acuminatus** (Signoret).
Lecanium acuminatum Signoret, Soc. ent. France, Ann. 5(3) : 397, 1873.
On *Ochrosia* and *Gardenia,* Oakley.

30. **Coccus elongatus** (Signoret).
Lecanium elongatum Signoret, Soc. ent. France, Ann. 5(3) : 404, 1873.
On *Hibiscus,* croton, *Pithecolobium dulce, Psophocarpus tetragonolobus,* Oakley.

31. **Ceroplastes floridensis** Comstock, U. S. Dept. Agric., Rept. (1880), 331, 1881.
On mango, Vandenberg, Swezey.

32. **Ceroplastes rubens** Maskell, New Zealand Inst., Trans. 25 : 214, 1892.
On mango, sunflower, *Barringtonia,* Oakley.

SUBFAMILY DIASPIDINAE

TRIBE PARLATORINI

33. **Parlatoria proteus** (Curtis).
Aspidiotus proteus Curtis, Gardener's Chronicle, 676, 1843.
On *Gardenia,* Swezey, Oakley.

34. **Parlatoria cinerea** Hadden, Canadian Ent. **41**: 299, 1909.
On grapefruit, Oakley.

TRIBE LEPIDOSAPHINI

35. **Lepidosaphes beckii** (Newman).
Coccus beckii Newman, The Entomologist **4**: 217, 1869.
On lemon, Bureau of Entomology and Plant Quarantine.

36. **Lepidosaphes mcgregori** Banks, Philippine Jour. Sci. **1**: 233, 1906.
On coconut leaf, Vandenberg, Swezey, Oakley, Bureau of Entomology and Plant Quarantine.

37. **Lepidosaphes duponti** Green, Bull. Ent. Research **7**: 195, fig. 3, 1916.
On coconut trunk, Fullaway, Oakley, Bureau of Entomology and Plant Quarantine.

38. **Lepidosaphes tubulorum** Ferris, Bull. Ent. Research **12**: 216, 1921.
On asparagus, Chinese inkberry, Oakley.

39. **Lepidosaphes** species near **tubulorum.**
On rose, Swezey; on rose and sweet potato, Oakley.

40. **Lepidosaphes** species near **tubulorum.**
On mango fruit, Swezey.

41. **Lepidosaphes** species.
On *Areca* palm, Bureau of Entomology and Plant Quarantine.

42. **Ischnaspis longirostris** (Signoret).
Mytilaspis longirostris Signoret, Soc. ent. France, Bull. VI, **2**: xxxv, 1882.
On *Jasminum sambac,* Swezey; *Pandanus,* Oakley; palm, Bureau of Entomology and Plant Quarantine; Piti, May 2, on mango; Piti, July 30, Swezey.

43. **Pinnaspis** species.
On *Hibiscus,* Oakley.

TRIBE ASPIDIOTINI

44. **Aspidiotus destructor** Signoret, Soc. ent. France, Ann. IV, **9**: 120, 1869.
This scale was first reported on coconut in 1924 by C. W. Edwards, having

been discovered late in December of the previous year. It soon threatened the destruction of the coconut trees in Guam, as it had destroyed them on Saipan. However, a small black ladybeetle (*Telsimia nitida* Chapin) which was found to be feeding on the scale prevented the catastrophe. In 1927, *T. nitida* was reported to have effected complete control of this scale in Guam. In 1936, no infestations were found, and only small colonies were occasionally found on coconut leaves, banana, grape, mango, *Ochrosia* fruits, and avocado. Reported also on papaya and *Dioscorea alata* by Oakley.

45. **Aspidiotus lataniae** Signoret, Soc. ent. France, Ann. IV, **9**: 124, 1869.
Piti, July 30, on rose, Swezey; on *Leucaena glauca,* Oakley; on coconuts, Bureau of Entomology and Plant Quarantine.

46. **Aspidiotus** species near **lataniae.**
On rose, Oakley.

47. **Aspidiella (Targionia) sacchari** (Cockerell).
Aspidiotus sacchari Cockerell, Inst. Jamaica, Jour. **1**: 255, 1893.
On *Sporobolus* grass, Swezey, Usinger; on sugar cane, Oakley.

48. **Aspidiella (Targionia) hartii** (Cockerell).
Aspidiotus hartii Cockerell, Psyche **7,** Suppl. 1: 7, 1895.
On *Dioscorea* species, Bureau of Entomology and Plant Quarantine.

49. **Aonidiella inornata** McKenzie, Microentomology **3**: 10, 1938.
On orange and *Ochrosia,* Oakley; on *Citrus* as *Chrysomphalus aurantii,* Fullaway, Vandenberg.

50. **Aonidiella sotetsu** (Takahashi).
Chrysomphalus sotetsu Takahashi, Gov. Inst. Formosa, Rept. **60**: 57, 1933.
On *Citrus,* Swezey.

51. **Aonidiella orientalis** (Newstead).
Aspidiotus orientalis Newstead, Indian Mus. Notes 3(5): 26, 1894.
On rose and *Citrus,* Swezey.

52. **Aonidiella** species.
On orange and *Ochrosia,* Oakley.

53. **Chrysomphalus dictyospermi** (Morgan).
Aspidiotus dictyospermi Morgan, Ent. Mo. Mag. **25**: 352, 1889.
On lemon, Bureau of Entomology and Plant Quarantine.

54. **Chrysomphalus** species.
On coconut, Bureau of Entomology and Plant Quarantine.

55. Duplaspidiotus tesseratus (de Charmoy).

Aspidiotus tesseratus de Charmoy, Soc. Amic. Sci., Proc. p. 23, 1899.

On coffee, Fullaway.

TRIBE DIASPINI

56. Phenacaspis inday (Banks).

Chionaspis inday Banks, Philippine Jour. Sci. 1: 787, 1906.

On palm, Bureau of Entomology and Plant Quarantine. Perhaps this is the scale reported on coconut by Vandenberg as *Hemichionaspis minor*.

LEPIDOPTERA

GEOMETRIDAE, ARCTIIDAE, AGROTIDAE, AND PYRALIDAE OF GUAM

By O. H. Swezey
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Family GEOMETRIDAE

1. **Eumelea rosalia** (Cramer).

Phalena rosalia Cramer, Pap. Exot. 4: 152, pl. 368, fig. F, 1781.

Eumelea rosalia, Hampson, Fauna Brit. India, Moths 3: 320, fig. 155, 1895.

This orange-yellow moth has a distribution throughout India, Ceylon, Burma, China, Formosa, and Malayan and Austro-Malayan subregions. We obtained a single specimen in Guam. It was reared from a looping caterpillar on *Macaranga thompsoni,* Mt. Alifan, May 21, Swezey. The adult moth issued June 6. Similar looping caterpillars were collected from *Macaranga* at Dededo, August 11 and Fadian, September 18, but they failed to mature, so it is not certain whether they were the same species.

2. **Craspedia** species.

Tarague, May 17, Swezey; Piti, May 9, June 1, 20, July 15, 26, Aug. 9, Sept. 11, 13, 16, Oct. 14, Nov. 4, Swezey; Dededo, Sept. 7, reared from looping caterpillar on *Guettarda speciosa,* adult issuing Sept. 22, Swezey.

This small ochreous species we found abundant in Guam, mostly taken at light. The single male has long ventral lateral tufts which are not mentioned in any description. Size is smaller also.

3. **Craspedia** species.

Piti, May 9, at light, Usinger; Piti, July 26, at light, Swezey. Two larger paler specimens.

4. **Craspedia** species.

Piti, May 9, at light, Usinger. One specimen still larger with more distinct markings.

5. **Chrysocraspeda** species.

Piti, at light, June 20, Aug. 8, Sept. 7, Swezey, three specimens.

6. **Anisodes** species.

One specimen from a pupa on leaf, Fadian, Aug. 19, Swezey; one at light, Piti, Sept. 7, Swezey.

7. **Timandra aventiaria** Guenée, Phal. 2: 3, 1852; Hampson, Fauna Brit. India, Moths 3: 459, fig. 206, 1895.

Piti, June 29, July 22, Sept. 12, 20, Oct. 23, all from slender looping caterpillars on *Pithecolobium dulce,* Swezey; Merizo, May 14, reared from caterpillar on rose, Swezey. All specimens reared.

This moth occurs throughout India, Ceylon, and Burma, and in Java, Formosa, and Australia. It is now recorded for the first time in Guam.

8. **Thallassodes pilaria** Guenée, Spec. Gén. Lép. 9: 361, pl. 15, fig. 2, 1858.
Thallassodes quadraria Hampson, Fauna Brit. India, Moths 3: 507, fig. 225, 1895.

Piti, June 8, Aug. 8, 20, Sept. 12, at light, Swezey; Piti, Sept. 15, two reared from eggs found on *Intsia bijuga,* hatched Sept. 16, full-grown Sept. 24, adult moths Oct. 1, 3, Swezey.

This light green species has a wide range throughout India, Ceylon, and Burma, the Malayan subregion and Australian region, also recorded from Samoa. Now recorded from Guam for the first time.

Family ARCTIIDAE

1. **Argina cribraria** Clerck.
Ph (alaena) cribraria Clerck, Icon. Ins. 2: pl. 54, fig. 4, 1764.
Argina cribraria, Hampson, Fauna Brit. India, Moths 2: 51, fig. 24, 1894.

Sasa, June 20, Usinger; Sasa, June 22, Swezey; Machanao, June 30, Usinger; Inarajan, Sept. 30, Swezey. Three specimens in U. S. National Museum and one in Bishop Museum, Fullaway, 1911.

This moth is widely distributed from Madagascar, Mauritius, throughout India, Ceylon, Burma, China, Philippines, Christmas Island (Indian Ocean), New Guinea, New Hebrides, and has been reported from Samoa and Fiji. It was not previously recorded from Guam. We found it rather rare. We reared it from caterpillars feeding on leaves and in pods of *Crotalaria quinquefolia* occasionally growing on dikes in fallow rice fields.

2. **Utetheisa pulchelloides** subspecies **umata** Jordan.
Utetheisa pulchelloides Hampson, Ann. Mag. Nat. Hist. VII, 19: 239, 1907.
Utetheisa pulchelloides umata Jordan, Nov. Zool. 41: 281, 1939.

Umatac, March 28, Bryan; Tarague, May 17, Swezey, Usinger, reared from numerous caterpillars on *Messerschmidia argentea.*

This pretty red-spotted moth is widely distributed from the Seychelles and Ceylon to Singapore and Formosa, Gilbert, Marshall, Ellice and Solomon Islands, New Guinea, Queensland, Samoa, Tuamotus, and Wake Island. Jordan has given subspecific names to the forms occuring in the different groups of islands. The differences are very slight. The form *umata* was

described from four male and two female specimens from Guam, October 1894 and April 1895, in the Rothschild collection.

The pupa is 13 mm., formed in a slight webbing in a crumpled leaf or secluded place; very dark brown, nearly black. Apex very blunt, cremaster with a few slender bristles.

Family AGROTIDAE

The arrangement of this family follows the classification used by W. H. T. Tams in Insects of Samoa [3(4): 196-237, 1935], in which he gives his reasons for the use of the family name Agrotidae. The species marked with asterisks were determined by J. F. G. Clarke, U. S. National Museum.

Subfamily AGROTINAE

1. **Heliothis armigera** (Hübner).

Noctua armigera Hübner, Europ. Schmett., Tab. Noctua, pl. 79, fig. 370, 1802-1808.

Heliothis armigera, Hampson, Fauna Brit. India, Moths 2: 174, fig. 114, 1894.

Heliothis armigera, Tams, Ins. Samoa 3(4): 196, 1935.

Sinajana, June 15, Swezey; Machanao, June 30, Swezey, Usinger; Piti, at light, July 26, Swezey; Libugon, Aug. 12, Swezey; Dededo, Sept. 7, Swezey; Piti, Sept. 14, Swezey. One at U. S. National Museum and one at Bishop Museum, Fullaway, 1911.

This cosmopolitan pest was recorded in Guam by Fullaway in 1911. We found it to be the worst pest of corn, many of the ears being attacked by one to three caterpillars. A few caterpillars could always be found on tobacco, and an occasional one on taro. Most of our specimens were reared. In the citation above, Tams gives reasons why the name *Heliothis armigera* should be used for this cosmopolitan pest. He says: "It is to be hoped that nothing will occur to disturb further the name *Heliothis armigera.*"

Subfamily HADENINAE

2. **Cirphis loreyi** (Duponchel).

Noctua loreyi Duponchel, Lep. France 7: 81, pl. 105, fig. 7, 1827.

Cirphis loreyi, Hampson, Cat. Lep. Phalaenae 5: 492, fig. 153, 1905.

This widely distributed moth is recorded in Europe, Africa, Southern Asia, Japan, Formosa, Philippines, Java, Queensland. It was not previously recorded in Guam. We collected only two specimens. Inarajan, May 7, in rice field, Swezey; Piti, Sept. 21, reared from a caterpillar on sword grass, *Xiphagrostis floridula,* Swezey.

SUBFAMILY ACRONICTINAE

3. Callopistria meridionalis nauticorum Tams.

Callopistria meridionalis Collenette, Ent. Soc. London, Trans. **71**: 471, fig. 1, pl. 21, fig. 4, 1928.

Eriopus maillardi Guenée, Rebel, Denk. K. Akad. Wiss. Wien. Math.-Nat., Kl. **85**: 425, 1910.

Callopistria meridionalis nauticorum Tams, Ins. Samoa **3**(4): 199, pl. 12, fig. 8, 1935.

The species *meridionalis* was described from Rapa and Austral Islands. The subspecies *nauticorum* is described from Samoa. One specimen which appears to be the latter was taken at light, Piti, Guam, Sept. 24, Swezey.

4. Prodenia litura (Fabricius).

Noctua litura Fabricius, Syst. Ent., 601, 1775.

Prodenia litura, Hampson, Cat. Lep. Phalaenae **8**: 245, 1909.

Although caterpillars or their work were found in every garden we visited in the different districts of the island, the moths of our collection were obtained mostly at Agana and Piti as follows: Agana swamp, May 4, reared from caterpillars on taro, Swezey; Machanao, June 2, reared from caterpillars on tobacco, Swezey; Piti, Aug. 13, Sept. 3, at light, Swezey; Piti, Oct. 25, Nov. 24, reared from caterpillars on banana, Swezey.

This is called the cotton moth in Egypt. It is a pest in the tropics around the world. It does not yet occur in Hawaii, but is known in most islands of the Pacific. It was collected by Fullaway in 1911 but not recorded at the time. It was first recorded there in 1927 as a pest on taro. In 1936, caterpillars were found on a large variety of host plants, taro, banana, tobacco, tomato, onion, bean, cabbage, corn, and amaranth. More were found on banana and taro than on other plants, but they were not numerous enough to cause extensive injury. In cages, caterpillars fed and thrived on morning-glory, pumpkin, and papaya leaves, but none were found on these plants in the open. The eggs are laid in large clusters of one layer on the under side of the leaves. One cluster contained 1,224 eggs, but the usual number was 200 to 400. On hatching, the larvae feed gregariously for a time, but eventually scatter. While small, they eat only the surface of the leaf, but when larger consume the whole substance of the leaf blade.

The full-grown caterpillar is about 35 to 40 mm., of a general mottled fuscous coloration with two dorsal lines of segmental black marks, wide apart, and the marks usually have yellow on their ventral edge. The spiracles are black and situated in the ventral edge of fuscous spots, a whitish dot is situated above and a little behind each. Apparently very few of the caterpillars reached maturity, as large-sized caterpillars were never found in proportionate abundance to the number of young hatching from the egg clusters. It is likely that

the abundant *Polistes* and *Icaria* wasps were preying on them while still of small size, though we did not observe them doing this. These wasps were in such abundance as to require quantities of caterpillars as food for their young, and young *Prodenia* caterpillars would furnish the most ready supply for them.

While we were in Guam a supply of the egg-parasite *Telenomus nawai* was sent from the Experiment Station, Hawaiian Sugar Planters' Association, Honolulu. These parasites readily bred on *Prodenia* eggs, and were reared for distribution at the Agricultural School until they became well established.

5. Spodoptera mauritia (Boisduval).

Hadena mauritia Boisduval, Nouv. Ann. Mus. Hist. Nat. Paris 2(2) : 240, 1833.

Spodoptera mauritia, Hampson, Fauna Brit. India, Moths 2 : 248, 1894.

Piti, at light, May 9, 13, August 8, 9, 12, 13, 17, 18, Sept. 4, 7, 16, 24, Oct. 18, Nov. 26, Swezey; Sasa, Sept. 3, reared from larvae and pupae in rice seedling plots, Swezey; Piti, May 12, reared from larva on grass, Swezey; Sept. 11, reared from an egg cluster found on porch screen; Oct. 6, reared from larvae and pupae under stones in pasture; Oct. 25, reared from egg cluster on rose bush, Swezey.

An ichneumonid, *Echthromorpha conopleura* Krieger, was reared from pupae of this moth.

This moth has a wide distribution in the Old World tropics and the islands of the Pacific. For a long time it was supposed to be present in Hawaii, where it had become known as the nutgrass armyworm, and sometimes severely injured cane fields which were infested with nutgrass. Recently, however, the correct name for the pest in Hawaii was determined as *Laphygma exempta* (Walker), which has much the same geographical distribution and habits as *Spodoptera mauritia.*

Fullaway reared *Spodoptera mauritia* from Bermuda grass in 1911. In more recent years it has been known as a rice pest, often becoming numerous in the rice fields, or in the seedling beds. Eggs were abundantly laid on under side of leaves of rose bushes in lawn at our residence. The caterpillars, never numerous, did not feed on the rose but ate several kinds of grass. Some of the caterpillars hatching from eggs were fed to maturity on grass. The caterpillars are very similar to those of *Laphygma exempta* in Hawaii. The *Telenomus nawai* from Honolulu became established on the *Spodoptera* eggs, as well as on *Prodenia* eggs.

6. *Perigea illecta (Walker), List Lep. Ins. Brit. Mus. 32 : 684, 1865; Tams, Ins. Samoa 3(4) : 201, pl. 7, figs. 10, 11, pl. 8, figs. 6, 7, 1935.

Euplexia conducta Walker, Cat. 10 : 296, 1856.

This moth occurs throughout India, Ceylon, Burma, Andaman Islands, Fiji, Samoa, and no doubt other Pacific Islands. Now recorded for the first time from Guam. Four specimens were taken at light, Piti, Sept. 24, Oct. 14, Swezey; one specimen, U. S. National Museum, Fullaway, 1911.

7. Chasmina sericea (Hampson).

Clinophlebia sericea Hampson, Ill. Het. **9**: 92, pl. 161, fig. 7, 1893.

Chasmina sericea, Hampson, Cat. Lep. Phalaenae **9**: 322, fig. 161, 1910.

This pure white moth is known from Ceylon, Burma, Cocos Keeling Island, Christmas Island (Indian Ocean), and New Caledonia. It was not previously recorded in Guam, although there is one specimen in U. S. National Museum, collected by Fullaway in 1911. It came commonly to our screen at night at Piti. Specimens were taken Aug. 18, 19, 20, Sept. 4, 7, 11, 12, 13, Oct. 2, 10. We collected it in the open only twice; Sumay Road, in mangrove swamp, May 23, Usinger; Tumon, swept from *Thespesia populnea,* May 30, Swezey. We did not find its caterpillar, so learned nothing of its habits.

SUBFAMILY ERASTRIINAE

8. Eublemma anachoresis (Wallengren).

Xanthoptera anachoresis Wallengren, Wien. Ent. Monatschr. **7**: 148, 1863.

Eublemma anachoresis, Hampson, Cat. Lep. Phalaenae **10**: 131, 1910.

Piti, Aug. 24, Swezey; Barrigada, Aug. 28, Swezey.

This pretty little moth has a wide distribution in central and South Africa, India, Ceylon, Andaman Islands, Java, and Queensland. I have seen a specimen from Fiji, but do not know if it has been recorded from there. This is the first record of its occurrence in Guam. Our specimens were all reared from caterpillars on *Waltheria americana.* The caterpillars were feeding in the terminal bud and webbed together undeveloped leaves.

9. *Amyna octo (Guenée).

Perigea octo Guenée, Spec. Gén., Noct. **1**: 233, 1852.

Amyna octo, Hampson, Moths Ind. **2**: 251, fig. 142, 1894; Cat. Lep. Phalaenae **10**: 468, fig. 132, 1910; Tams, Ins. Samoa **3**(4): 203, 1935; Collenette, B. P. Bishop Mus., Bull. **114**: 205, 1935.

Agana, April 17, at light, Bryan; Fadian, Aug. 19, Sept. 18, reared from *Sida,* Swezey; Piti, Sept. 11, Oct. 14, at light, Swezey; Orote Peninsula, Sept. 27, reared from *Sida,* Swezey.

This variable moth has a very wide range of distribution: southern United States, Mexico, Central America, West Indies, South America, Africa, Arabia, India, Ceylon, Burma, Andaman Islands, Christmas Island (Indian Ocean), China, Japan, Borneo, Samoa, Marquesas, Society Islands, Fiji, Rarotonga, Tonga, Ellice Islands, Gilbert Islands, New Hebrides, Solomon Islands, New Guinea, Australia. Now recorded from Guam for the first time.

The species has 23 synonyms, and a considerable variation. J. F. G. Clarke considers that a thorough study of the male genitalia might result in distinguishing several good species in the lot. In his study of the male genitalia of Guam material, it came nearest to specimens from Texas, and was different from material from the Orient.

It was quite common in Guam, the slender, green, looping caterpillars feeding on *Sida acuta.*

SUBFAMILY EUTELIINAE

10. Bombotelia jocosatrix (Guenée).

Penicillaria jocosatrix Guenée, Spec. Gén., Noct. 2: 304, 1852.

Bombotelia jocosatrix, Hampson, Cat. Lep. Phalaenae **9**: 11, fig. 6, 1912.

This moth is known in India, Ceylon, Java, Philippines, Fiji, and Queensland. Only one specimen was obtained in Guam, reared from a green caterpillar on mango, Inarajan, June 8, Swezey.

SUBFAMILY STICTOPTERINAE

11. Stictoptera subobliqua (Walker).

Steiria subobliqua Walker, Cat. **13**: 1136, 1857.

Stictoptera subobliqua, Hampson, Cat. Lep. Phalaenae **11**: 156, 1912.

This moth is recorded from Ceylon, Sikhim, North Assam, Singapore, and British New Guinea. Now recorded for the first time from Guam. Eight specimens were taken on the screen as they came to light at our residence: Piti, Aug. 9, 19, 20, Sept. 4, 7, 11, 12, 13, Swezey; Fadian, Aug. 19, four caterpillars on leaves of *Ochrocarpus obovalis* from which one moth matured Sept. 4, Swezey. The latter and four other specimens are of aberration 1. One in Bishop Museum, Fullaway, 1911.

12. Stictoptera timesia Swinhoe, Ann. Mag. Nat. Hist. VI, 12: 218, 1893; Hampson, Cat. Lep. Phalaenae **11**: 157, pl. 177, fig. 30, 1912.

This moth was described from Singapore, and I have not found other records. Three specimens were taken at light, Piti, Aug. 20, Sept. 12, Nov. 3, Swezey. Nothing was learned of its habits. One specimen in U. S. National Museum, Fullaway, 1911.

SUBFAMILY SARROTHRIPINAE

13. *Characoma nilotica (Rogenhofer).

Sarrothripa nilotica Rogenhofer, Zool.-Bot. Ges. Wien, Verh., 26, 1881.

Characoma nilotica, Hampson, Cat. Lep. Phalaenae **11**: 231, fig. 76, 1912.

Inarajan, June 8, larvae found feeding in terminal leaf buds of *Hibiscus tiliaceus,* one moth reared, Swezey; Piti, 3 moths at light, July 12, Aug. 20, Nov. 4, Swezey.

This species is recorded from Texas, Mexico, Central America, Bahamas, West Indias, Canary Islands, Egypt, Sierra Leone, Gambia, Nigeria, Madras, Ceylon. The record from Guam is at a considerable distance from the other recorded localities. As I reared it from *Hibiscus tiliaceus* which is widely spread in the Pacific islands, no doubt this moth will yet be found more widely in the Pacific area.

14. *Mniothripa lichenigera (Hampson).

Giaura lichenigera Hampson, Ann. Mag. Nat. Hist. VII, **16**: 543, 1905.

Mniothripa lichenigera, Hampson, Cat. Lep. Phalaenae **11**: 261, 1912; Tams, Ins. Samoa 3(4): 209, 1935.

Piti, May 9, July 12, 13, 27, Sept. 7, at light, Swezey; Piti, Sept. 15, reared from foliage of *Intsia bijuga,* Swezey; Tarague, May 17, Swezey; Fadian, Aug. 19, swept from *Pemphis* at seashore, Swezey.

This moth was described from Sierra Leone, Sikhim and Singapore, and has been recorded from Samoa. Now recorded from Guam for the first time. Most of our material was taken at light.

SUBFAMILY WESTERMANNIINAE

15. Earias fabia (Stoll).

Noctua fabia Stoll, Pap. Exot., 4, pl. 355, fig. H, 1782.

Earias fabia, Hampson, Fauna Brit. India, Moths **2**: 133, 1894; Cat. Lep. Phalaenae **11**: 507, 1912.

Sasa, June 22, reared from caterpillar feeding in flowers of *Abelmoschus esculentus,* Usinger; Piti, July 8, at light, Swezey; Piti, Sept. 17, Oct. 10, reared from caterpillars boring the tips of branches of a weed, *Malachra capitata,* Swezey.

This moth is distributed from India and Ceylon to Burma, Java, Andaman Islands, Philippines, Australia, and Fiji. In India, it is called the cotton bollworm on account of the injury to cotton bolls by its caterpillars. In Guam, it was recorded by Fullaway in 1911 as a stem borer in cotton. We reared the moths from caterpillars mostly on weeds.

SUBFAMILY CATOCALINAE

16. Lagoptera regia (Lucas).

Thyas regia Lucas, Linn. Soc. New South Wales, Proc. II, **8**: 151, 1894.

Lagoptera regia, Hampson, Cat. Lep. Phalaenae **12**: 415, pl. 213, fig. 6, 1913.

Piti, Aug. 19, at light, Swezey; Fadian, Aug. 19, reared from a caterpillar on leaf of *Barringtonia speciosa,* Swezey; Piti, Nov. 9, at light, Swezey. One specimen at Bishop Museum, Fullaway, 1911; and one at U. S. National Museum labeled *"L. honesta"* which I believe to be *regia,* Fullaway, 1911.

This is a large moth known in New Guinea, North Australia, North Queensland and Fiji. Three specimens were obtained in Guam.

17. Grammarodes geometrica (Fabricius).

Noctua geometrica Fabricius, Syst. Ent., 599, 1775.

Grammarodes geometrica, Hampson, Fauna Brit. India, Moths 2: 531, fig. 296, 1894; Hampson, Cat. Lep. Phalaenae **13**: 18, fig. 4, 1913.

This moth has a very wide distribution, in Africa, southern Europe, southern Asia, Formosa, Java, Queensland. We collected only one specimen in Guam, at Piti, Oct. 22, at light, Swezey.

18. Anua coronata (Fabricius).

Noctua coronata Fabricius, Syst. Ent., 596, 1775.

Anua coronata, Hampson, Cat. Lep. Phalaenae **12**: 427, fig. 101, 1913; Tams, Ins. Samoa 3(4): 214, 1935.

Agana, April 12, Bryan; Piti, Oct. 14, at light, Swezey; one in U. S. National Museum, Fullaway, 1911.

This large moth has a wide distribution in India, Ceylon, Burma, Andaman Islands, Penang, Singapore, Java, Philippines, Christmas Island (Indian Ocean), Cocos Keeling, north Australia, Society Islands, Samoa and Gilbert Islands. Two specimens were obtained in Guam. Nothing was learned of its habits.

19. Anua tongaensis Hampson, Cat. Lep. Phalaenae **12**: 434, pl. 214, fig. 11, 1913; Tams, Ins. Samoa 3(4): 215, 1935.

Two specimens were procured in Guam: Machanao, June 2, Swezey; Piti, May 1, three small looping larvae on *Styphelia* in the hills above the town, one of which was reared, Swezey. One specimen in U. S. National Museum, Fullaway, 1911.

This moth is not yet widely known, having been recorded from Tongatabu, Fiji, and American Samoa.

The full grown caterpillar was 50 mm.; grayish, with yellowish background and numerous longitudinal crinkly blackish lines; head whitish with several longitudinal brown lines; spiracles oval, pale; abdominal prolegs on segments 6, 7, 8, 9, those on segments 6 and 7 smaller than the others; two dorsal, slightly prominent tubercles on segment 11. Pupation took place June 25, 65 days from its capture. The pupa was formed in leaves webbed together. It was 23 mm.; dark brown; wing sheaths terminating roundly at apical margin of the fourth abdominal segment; cremaster not produced, a few hooks on thickened dorsal edge of apical segment. The adult moth issued July 7, after 12 days in pupal stage.

20. Achaea janata (Linnaeus).

Geometra janata Linnaeus, Syst. Nat., 10th ed., 527, 1758.

Ophiusa melicerte Hampson, Fauna Brit. India, Moths **2**: 494, 1894.

Achaea janata, Collenette, B. P. Bishop Mus., Bull. **114**: 206, 1935; Tams, Ins. Samoa **3**(4): 216, 1935.

Four specimens were obtained: Piti, May 3, Aug. 26, at light, Swezey; Talofofo plateau, June 17, pupa found in spun-together leaves on *Eugenia* tree, moth issued June 21, Swezey; Piti, reared from egg found on rose petal, Aug. 25, Swezey. The egg hatched Aug. 28, and the caterpillar was fed continuously on rose petals. It was 60 mm. when full grown, Sept. 20. Probably the rose is not its regular food plant. The cocoon was formed of debris spun together, and the moth issued Oct. 5. Two specimens in U. S. National Museum, Fullaway, 1911.

This moth has a very wide distribution throughout India to Australia and New Zealand, the island groups from Formosa, Philippines, all through Polynesia to the Marquesas. Now recorded from Guam for the first time.

21. **Achaea serva** (Fabricius).

Noctua serva Fabricius, Syst. Ent., 593, 1775.

Achaea serva, Hampson, Cat. Lep. Phalaenae **12**: 521, fig. 123, 1913; Tams, Ins. Samoa **3**(4): 216, 1935.

This moth has about as wide a range as *A. janata,* but has not been recorded quite so extensively from Polynesia, only as far east as Samoa. Our eight Guam specimens were mostly collected at light: Piti, Sept. 13, 20, Oct. 12, Nov. 3, Swezey. One was reared from a pupa found among paper rubbish by a student at the Agricultural School, Piti, Oct. 28. One specimen in U. S. National Museum, Fullaway, 1911.

22. **Mocis undata** (Fabricius).

Noctua undata Fabricius, Syst. Ent., 600, 1775.

Mocis undata, Hampson, Cat. Lep. Phalaenae **13**: 91, fig. 25, 1913.

Agat, June 27, Swezey; Piti, Aug. 7, Oct. 27, Nov. 3, at light, Swezey.

This moth is widely distributed in Africa, India, China, Japan, Formosa, Philippines, Java. Now recorded for the first time in Guam. Our five specimens were mostly taken at light, so we learned nothing of its habits.

Subfamily Plusiinae

23. **Plusia chalcites** (Esper).

Noctua chalcytes Esper, Die Schmett. 4: 447, pl. 141, fig. 3, 1789.

Phytometra chalcytes, Hampson, Cat. Lep. Phalaenae **13**: 484, fig. 122, 1913.

Phytometra chalcites, Collenette, B. P. Bishop Mus., Bull. **114**: 206, 1935.

Plusia chalcites, Tams, Ins. Samoa **3**(4): 219, 1935.

This cosmopolitan moth was not reported in Guam by Fullaway in 1911, and we did not find it common in 1936. Santa Rosa Peak, May 18, Swezey;

Barrigada, June 14, Swezey; Piti, Aug. 25, Sept. 14, reared from caterpillars on morning-glory leaves, Swezey; Piti, Sept. 11, at light, Swezey. One in U. S. National Museum, Fullaway, 1911.

SUBFAMILY OPHIDERINAE

24. **Catephia acronyctoides** (Guenée), Spec. Gén., Noct. 3:47, 1852; Hampson, Moths of India 2:482, 1894; Tams, Ins. Samoa 3(4):219, 1935.

Piti, Oct. 14, two specimens, at light, Nov. 3, in garage at Agricultural School, Swezey.

This moth is widely distributed from west and south Africa, throughout India, Ceylon, Burma, Andaman Islands, Java, Australia, Samoa. Now recorded from Guam for the first time. Identified by comparison with specimens in the U. S. National Museum.

25. **Catephia sericea** (Butler).

Anophia sericea Butler, Ann. Mag. Nat. Hist. V, **10**:230, 1882.

Catephia sericea, Tams, Ins. Samoa 3(4):220, 1935.

One specimen at Bishop Museum, Fullaway, 1911.

26. **Ericeia inangulata** (Guenée).

Hulodes inangulata Guenée, Spec. Gén., Noct. 3:210, 1852.

Polydesma inangulata, Hampson, Fauna Brit. India, Moths 2:470, fig. 262, 1894.

Ericeia inangulata, Tams, Ins. Samoa 3(4):221, 1935.

This species has a wide distribution from Africa to India, Burma, China, Australia, and Samoa. Now recorded for the first time from Guam. Piti, Sept. 12, Nov. 3, 4, four specimens, all at light, Swezey. Two in U. S. National Museum and two in Bishop Museum, Fullaway, 1911.

27. **Polydesma umbricola** Boisduval, Faun. Ent. Madag., Lep., 108, pl. 13, fig. 5, 1833; Hampson, Fauna Brit. India, Moths 2:468, 1894.

Ritidian Point, April 22, Bryan; Piti, May 2, 10 moths issued from numerous pupae under bark of dead *Pithecolobium dulce,* Usinger; Piti, Aug. 26, Oct. 24, Nov. 5, at light, Swezey. One in U. S. National Museum, Fullaway, 1911.

Widely distributed in west and south Africa, Madagascar, India, Ceylon, Burma, Andaman Islands, and Society Islands. Now recorded for the first time in Guam, where it is now quite common. We never found its caterpillar, so did not learn of its food plant. The finding of pupae under bark of *Pithecolobium* would seem to indicate that the caterpillars had fed on that tree, yet they may have sought that location only as a safe place for making their cocoons.

28. Othreis fullonia (Clerck).

[*Phalaena*] *fullonia* Clerck, Icones 2: pl. 48, 1764.

Ophideres fullonica, Hampson, Fauna Brit. India, Moths 2: 560, fig. 317, 1894.

Othreis fullonia, Tams, Ins. Samoa 3(4): 224, 1935.

Piti, June 16, at light, Usinger; Asan, Nov. 2, a chrysalis found in webbed leaf on *Erythrina indica,* moth issued Nov. 9, Swezey. A few small caterpillars on an *Erythrina* tree at Agat, Oct. 17, may have been this species but we were not successful in rearing them. The tree was nearly defoliated, as though the caterpillars had been very abundant previously. There is one specimen in U. S. National Museum and one in Bishop Museum, Fullaway, 1911.

This fine large moth has a wide distribution from Africa throughout the Oriental region to New Guinea and Australia, and to Fiji and Samoa. We record it for the first time in Guam.

29. Cosmophila flava flava (Fabricius).

Noctua flava Fabricius, Syst. Ent., 601, 1775.

Cosmophila flava flava, Tams, Ent. Soc. London, Trans. 21, pl. 1, fig. 1; pl. 2, fig. 3; pl. 3, fig. 6, 1924; Ins. Samoa 3(4): 225, 1935.

Mt. Alifan, May 21, on *Hibiscus tiliaceus,* Swezey; Piti, Sept. 17, on *Malachra* and *Urena,* Swezey; Piti, Sept. 26, on *H. tiliaceus,* Swezey.

Widely distributed throughout the tropics of the Old World, Japan, Formosa, and the Pacific islands to Fiji, Samoa, Society Islands, and Marquesas. Not previously recorded from Guam. All of our dozen specimens were reared from green caterpillars feeding on *Hibiscus tiliaceus, Malachra capitata,* and *Urena sinuata,* all plants of the Malvaceae. They were more often found on *Malachra* than on the other plants mentioned.

30. Lacera alope (Stoll).

Phal[*aena*] *alope* Stoll in Cramer, Uitl. Kapellen 3(24): 168, pl. 286, figs. E, F, 1780.

Lacera alope, Hampson, Fauna Brit. India, Moths 3: 491, fig. 277, 1894.

Widely distributed from South Africa, Madagascar, throughout India, Ceylon to China, Japan, Fiji, and Samoa. We obtained only one specimen in Guam: Agana, April 28, in Government House, Swezey.

31. *Anticarsia irrorata (Fabricius).

Noctua irrorata Fabricius, Spec. Ins. 2: Appendix, 506, 1781.

Anticarsia irrorata, Tams, Ins. Samoa 3(4): 227, 1935.

Piti, Sept. 11, one specimen at light, Swezey. Oakley collected it more abundantly in 1938.

This moth was described from India. It is also recorded from Madagascar, Rapa, Society Islands, and Samoa, indicating a wide range of distribution. Now recorded from Guam for the first time.

SUBFAMILY HYPENINAE

32. **Hypena abyssinialis** Guenée, Delt. et Pyral., 39, 1854; Hampson, Fauna Brit. India, Moths 3: 86, 1895.

Piti, Aug. 24, Sept. 20, Swezey. Three moths were reared from slender green caterpillars on a low weed called *yerbas babue* (no botanical name was learned for it).

Widely distributed in Africa, India, Ceylon, Burma, and Australia. Now recorded from Guam.

SUBFAMILY HYBLAEINAE

33. **Hyblaea sanguinea** Gaede, Deutsch. Ent. Zeitschr., 26, 1917; Tams, Ins. Samoa 3(4): 237, 1935.

Eighteen specimens: Yona, May 12, Swezey; Umatac, May 14, Swezey; Tumon, May 30, Swezey; Machanao, June 30, Swezey; Sumay, July 15, Swezey; Orote Peninsula, July 18, Sept. 1, Swezey; Piti, July 13, Aug. 17, Sept. 12, at light, Swezey. One in Bishop Museum, Fullaway, 1911.

This beautiful moth was described from Fiji and is also known in Samoa. It was very common in Guam, where we record it for the first time. Its caterpillars were always to be found on the leaves of *Premna gaudichaudii*. The leaves are spun together for shelter or hiding place, and pupation takes place in the same situation. The full-grown caterpillar is 25 mm. long; black, with two narrow, white dorsal lines, an interrupted white line above the spiracles, and a white line below the spiracles; spiracles narrow oval, whitish; underside and legs pale; head entirely black; setae of abdomen white, of moderate length. Chrysalis 15 mm. long; light brown; wing sheaths extend to apical margin of fourth abdominal segment; cremaster black, produced and hooked into silk. Most of our specimens were reared from *Premna*; one was from an undetermined Philippine tree. The caterpillars were often observed, but rearing was not attempted.

FAMILY PYRALIDAE

The arrangement of the Guam material of this family is according to the classification used by W. H. T. Tams [Insects of Samoa 3(4): 243-289, 1935]. Only a few of the subfamilies are represented in Guam. Besides our 1936 collections, records of D. T. Fullaway's collecting in 1911 are included. The species marked with asterisks were determined by Carl Heinrich, U. S. National Museum. There were a few species sent to Tams at the British Museum which have not yet been reported on.

SUBFAMILY CRAMBINAE

1. **Crambus malacellus** Duponchel.

Crambus malacellus Duponchel, Lep. Fr. 8: 61, pl. 270, fig. 5, 1827.

Crambus malacellus, Hampson, Fauna Brit. India, Moths 4: 17, 1896.

Piti hills, May 1, Usinger; Piti hills, June 3, swept from sedges, Swezey; Barrigada, July 22, Swezey; Piti, July 26, Aug. 18, at light, Swezey. One specimen in U. S. National Museum, Fullaway, 1911 and one in Bishop Museum.

A widely distributed species, occurring in Palaearctic, Ethiopian, Oriental, and Australian regions. It is very common in grasslands, the moths flying up when disturbed.

SUBFAMILY PHYCITINAE

The phycitids lacking specific determination are in the hands of Carl Heinrich for study, and are not yet reported on.

2. **Heterographis** species.

Orote Peninsula, July 19, two moths reared from larvae feeding among thrips-infested terminal leaves of small-leaved *Ficus,* Swezey.

3. **Heterographis** species.

Piti, May 26, two moths reared from larvae on leaves of *Peltophorum inerme,* Swezey.

4. **Euzophera** species.

Piti, June 1, on screen, Aug. 11, at light, Swezey; Fadian, Aug. 19, reared from larvae in old seeds of *Ochrocarpus obovalis,* Swezey.

5. **Euzophera** species.

Dededo, May 11, larvae numerous beneath webs on under side of leaves of *Guettarda speciosa,* a dozen reared, Swezey; Mt. Alifan, May 27, eight reared from same tree, Swezey. A parasite, *Macrocentrus pallidus* Fullaway, was often reared from the larvae of this moth.

6. **Nephopteryx** species.

Yona, May 12, two specimens reared from leafrollers on pigeon peas; Piti, Nov. 4, one at light, Swezey.

7. **Nephopteryx** species.

Piti, May 9, June 12, 20, July 9, 11, 12, 15, 26, Aug. 8, 11, 13, 18, 20, Sept. 7, at light, Swezey. No caterpillars of this species were found.

8. **Nephopteryx** species.

Barrigada, July 6; Dededo, Aug. 11, Sept. 11, Yigo, Oct. 18; all reared from larvae on leaves of *Gymnosporia thompsonii,* Swezey.

9. Nephopteryx species.

Piti, Aug. 20, one at light, Aug. 24, one swept from *Glochidion marianum,* Swezey.

10. Cryptoblabes augustipenella Ragonot, Nouv. Gen., 6, 1888; Hampson, Fauna Brit. India, Moths 4: 105, 1896.

Orote Peninsula, May 24, Swezey; Tumon, May 30, Swezey; Merizo, June 11, Swezey; Piti, June 3, 9, 12, 21, July 12, 28, Aug. 9, Sept. 4, 7, Oct. 16, at light, Swezey; one in Bishop Museum, Fullaway, 1911.

This scavenger moth is known in India and Ceylon. We found it very common in Guam, the caterpillars feeding in dead dry plant materials. Moths were reared from caterpillars feeding in old fruits of *Barringtonia speciosa,* also on dried leaves, flowers and buds, and from leaves of *Barringtonia racemosa,* from larvae feeding among old seed clusters of *Mallotus moluccanus,* dried rose petals, and sunflower heads.

11. Cryptoblabes species.

One reared from larva on leaf of *Barringtonia speciosa,* Fadian, Sept. 18, Swezey; Piti, July 12, at light, Sept. 13, on screen, Swezey.

12. Etiella zinckenella (Treitschke).

Phycis zinckenella Treitschke, Schmett. Eur. 9(1): 201, 1832.

Etiella zinckenella, Hulst, Am. Ent. Soc., Trans. 17: 170, 1890; Hampson, Fauna Brit. India, Moths 4: 108, 1896.

This is a cosmopolitan pest in bean and pea pods and many other legumes. In Guam we found it in only one region, the larvae very abundant in pods of *Crotalaria saltiana* in a fallow corn field. Some specimens were reared from these larvae, a few were collected. Barrigada, June 14, 24, Swezey.

SUBFAMILY HYDROCAMPINAE

13. Nymphula fluctuosalis Zeller, K. Vet.-Akad. Handl., 27, 1852; Hampson, Fauna Brit. India, Moths 4: 193, fig. 115, 1896.

This rice pest is distributed throughout India, southern China, and Formosa, and is also in Australia and Hawaii. Apparently it was first recorded in Guam by Briggs in 1918, but the determination was no more definite than that it belonged to Nymphulinae. We collected one specimen at Piti, May 21. Apparently it is not now as abundant as when reported in 1918, when it was said that this and other insects caused the loss of the entire rice crop.

14. Nymphula species.

Agana, May 25, one example; Talofofo, June 17, one example, Swezey.

15. Aulacodes plicatalis Walker, Cat. 34: 1332, 1865; Hampson, Fauna Brit. India, Moths 4: 214, 1896.

Occurs in India, Java and Celebes. One specimen taken at light, Piti, Sept. 4, Swezey.

16. *Tatobotys biannulalis (Walker).

Botys biannulalis Walker, List. Lep. Ins. Brit. Mus. 34: 1439, 1865.

Tatobotys biannulalis, Tams, Ins. Samoa 3(4): 263, 1935.

Occurs in India, Malay Archipelago, Solomons, New Guinea, New Hebrides, Fiji, Samoa, Society Islands.

This moth was reared quite abundantly from caterpillars found feeding in decaying leaves at base of rice plants at Inarajan, June 8, Swezey; in grass, Piti, May 22, 31, and at light, Aug. 9, Swezey; Sasa, June 22, collected in fallow rice field, Swezey.

17. Piletocera signiferalis (Wallengren).

Isopteryx signiferalis Wallengren, Wien Ent. Monatschr. 4: 175, 1860.

Piletocera signiferalis, Tams, Ins. Samoa 3(4): 269, 1935.

Occurs in Samoa, Marquesas, Society Islands, Austral Islands, Fiji, Ellice, and Caroline Islands. Piti, Sept. 1, 12, at light, Swezey. One specimen in Bishop Museum, Fullaway, 1911.

SUBFAMILY PYRAUSTINAE

18. *Sufetula choreutalis (Snellen).

Pseudochoreutes choreutalis Snellen, Tijd. vor Ent. 23: 202, 1880; 26, pl. 6, figs. 8, 8a, 1883.

Sufetula sunidesalis Walker, Hampson, Fauna Brit. India, Moths 4: 252, fig. 150, 1896.

Sufetula choreutalis, Tams, Ins. Samoa 3(4): 273, 1935.

Recorded from India, Assam, Ceylon, Malayan subregion. Three specimens were taken at light, Piti, Aug. 8, 9, Sept. 3, Swezey. One specimen in U. S. National Museum and one in Bishop Museum, Fullaway, 1911.

19. *Entephria cribrata (Fabricius).

Phalaena cribrata Fabricius, Ent. Syst. 3(2): 215, 1794.

Spilomela caberalis Guenée, Delt. et Pyral., 284, 1854.

Pycnarmon caberalis, Hampson, Fauna Brit. India, Moths 4: 258, 1896.

Entephria cribrata, Hampson, Zool. Soc. London, Proc., 619, 1898.

Widely distributed: Africa, India, Ceylon, China, Java, Celebes, Formosa, Flores, Sumbawa, Fiji. Now recorded for the first time from Guam. Ten specimens reared from leafroller caterpillars on *agalunde* (a shrub for which I could get only the Chamorro name), Asan, Aug. 22, Swezey. One specimen in Bishop Museum, Fullaway, 1911.

20. Hymenia recurvalis (Fabricius).

Phalaena recurvalis Fabricius, Ent. Syst., 644, 1775.

Hymenia recurvalis, Tams, Ins. Samoa 3(4): 274, 1935.

Sasa, June 22, Swezey; Piti, Sept. 3, at light, Swezey; Talofofo, Nov. 18, reared from spiny amaranth, Swezey.

Very widely distributed in southern Asia to Japan, and to Australian regions, Samoa, Fiji, Marquesas, and Hawaii. Recorded in Guam as a beet pest by Fullaway in 1911. We found its caterpillars abundant on spiny amaranth. *Apanteles guamensis* var. was reared from some of the larvae. Only a few moths were collected or reared.

21. Eurrhyparodes tricoloralis (Zeller).

Botys tricoloralis Zeller, Lep. Micropt. Caffr., 31, 1852.

Eurrhyparodes tricoloralis, Hampson, Fauna Brit. India, Moths 4: 264, 1896; Tams, Ins. Samoa 3(4): 275, 1935.

Talofofo, May 7, Nov. 18; Agana, May 16; Mt. Alifan, May 21; Dededo, Sept. 7; Mt. Tenjo, Sept. 22; Piti, Nov. 4, at light. All by Swezey.

Of wide distribution in Africa, India, Ceylon, Java, Australia, Fiji, Samoa and Austral Islands. Now recorded for the first time in Guam. Its caterpillars were abundant as leafrollers on *yerbas babue.* Nearly all of our specimens were reared from this weed.

22. Marasmia trapezalis (Guenée).

Salbia trapezalis Guenée, Spec. Gén., Lép. 8: 200, 1854.

Marasmia trapezalis, Hampson, Fauna Brit. India, Moths 4: 277, 1896; Tams, Ins. Samoa 3(4): 276, 1935.

Dededo, May 11; Mt. Alifan, May 26; Barrigada, June 24; Piti, July 31, all reared from corn by Swezey. Four specimens in U. S. National Museum, Fullaway, 1911.

This corn leafroller is distributed around the world in the tropics. It occurs in many Pacific islands, but not in Hawaii. It was recorded in Guam by Fullaway in 1911. We found young corn plants commonly attacked by the larvae of this moth everywhere in Guam. They roll the tip of the leaf for a hiding place or protection while feeding within. If growing conditions are favorable the plant is not much checked, especially as the plant becomes older. Some are parasitized by a braconid, *Apanteles guamensis* Fullaway.

23. Marasmia venilialis (Walker).

Asopia venilialis Walker, List Lep. Ins. Brit. Mus. 17: 373, 1859.

Marasmia venilialis, Hampson, Fauna Brit. India, Moths 4: 276, 1896; Tams, Ins. Samoa 3(4): 275, 1935.

Piti, May 2, 8, 22, Sept. 1, 15; Talofofo, May 7; Agana, May 15, 25; Sasa, June 22; Mt. Alifan, June 19; Dededo, Sept. 7, all reared by Swezey, except a few taken at light. One specimen in Bishop Museum and two in U. S. National Museum, Fullaway, 1911.

This is a smaller moth than the preceding and is a leafroller on various grasses. We reared it from *Panicum barbinode, Paspalum conjugatum,* and *Oplismenus compositus.* This moth also has a wide distribution in the tropics:

Africa, Asia, Japan, Borneo, Australia, Solomons, Fiji, Samoa, Society Islands, and Austral Islands, but not in Hawaii. Its work on grass was noted in 1911 by Fullaway, but its name was not determined.

24. Susumia exigua (Butler).

Samea exigua Butler, Ann. Mag. Nat. Hist. V, 4: 453, 1879.

Susumia exigua, Marumo, Oyo-Dobuts. Zasshi 2: 41, fig., 1930; Kawata, Icon. Insectorum Japonicorum, 1391, fig., 1932.

Inarajan, May 14; Piti, July 12, Sept. 1; Agat, Sept. 20, Swezey.

This rice leafroller was described from Japan, and I have not found it recorded elsewhere. No doubt it has been present in Guam for some time, as I find mention of a rice pest in the November 1933 number of The Guam Recorder which is apparently this insect: "The yearly invasion of the rice leaf folder upon young rice in the seed beds has made its appearance. This pest is harmful only while in the larva stage, injuring the plant by folding the leaf edges and fastening them together with a mucilaginous secretion. With this protection it feeds, but the principal damage is done by preventing the leaves from performing their proper functions, thus retarding growth. This year the invasion of the folder is in much greater proportions than in previous years." I saw similar work in rice seed beds, and also on maturing rice, but without serious results. I reared moths from the larvae found and presume it is the same pest as described in the quotation. Some of the larvae were parasitized by *Apanteles guamensis* Fullaway.

This moth is very similar to the preceding species which is a leafroller on grasses. Another similar species recorded on rice in the Philippines and India has the name *Cnaphalocrocis medinalis* (Guenée).

25. Syngamia abruptalis Walker, Cat. 17: 371, 1859; Hampson, Fauna Brit. India, Moths 4: 279, 1896.

Talofofo plateau, June 17; Sumay road, June 22; Dandan, July 17; Piti, Oct. 12, Swezey. One specimen in the U. S. National Museum, Fullaway. 1911.

Occurs in west Africa, throughout India, Ceylon, Burma, Andamans, Java, Australia, Fiji. Now recorded for the first time from Guam. The larvae are leafrollers on a common weed, *Elephantopus capitata.*

26. Nacoleia diemenalis (Guenée).

Asopia diemenalis Guenée, Spec. Gén., Lép. 8: 203, 1854.

Nacoleia diemenalis, Hampson, Fauna Brit. India, Moths 4: 316, 1896; Tams, Ins. Samoa 3(4): 278, 1935.

Agana, May 4, 25; Talofofo, May 7; Yona, May 12; Inarajan, June 14; Sumay Road, June 22; Piti, Sept. 8, 15, Oct. 2, 6, 17; Asan, Aug. 19, all by Swezey. One specimen in Bishop Museum, Fullaway, 1911.

This bean leafroller is distributed from Africa, India, and Ceylon to Burma, Andamans, Sumatra, Java, Celebes, Formosa, Fiji, Society Islands, Austral Islands, and Samoa. It does not seem to have been previously recorded in Guam. We found it quite common, and bean leaves were often considerably injured by its caterpillars. Our specimens were reared mainly from pole beans, also from pigeon pea and *Flemingia strobilifera*. A few moths were taken at light.

27. Sylepta derogata (Fabricius).

Phalaena derogata Fabricius, Ent. Syst., 641, 1775.

Sylepta multilinealis Guenée, Hampson, Fauna Brit. India, Moths **4**: 334, 1896.

Sylepta derogata, Tams, Ins. Samoa 3(4) : 279, 1935.

Piti, April 30; Yigo, Oct. 21, Nov. 8, all reared by Swezey. One specimen in Bishop Museum, Fullaway, 1911. The work of the larvae was seen in many places. An ichneumonid (*Echthromorpha conopleura* Krieger) issued from some of the pupae.

This widely distributed moth occurs from west Africa through south Asia to Japan, and the Malayan and Australian regions. It is in Samoa and no doubt other Pacific island groups. In some countries its larvae feed on cotton, but in Guam it is a leafroller on *pago* (*Hibiscus tiliaceus*). We found it often abundant, many of the leaves being partially rolled up for hiding places. The pupa was formed in the same place.

28. Agathodes ostentalis (Geyer).

Perinephela ostentalis Geyer, in Hübner, Zutr. Samml. Ex. Schm. **5**: 11, figs. 833, 834, 1837.

Agathodes ostentalis, Hampson, Fauna Brit. India, Moths **4**: 345, fig. 190, 1896.

Agat, Oct. 17; Asan, Nov. 2, Swezey. One in Bishop Museum, Fullaway, 1911.

Occurs in India, Ceylon, Burma, Andamans, Java, Sumbawa. Now recorded in Guam for the first time. Its caterpillars are leafrollers on *Erythrina indica*. All our specimens were reared.

29. Margaronia indica (Saunders).

Eudioptes indica Saunders, Ent. Soc. London, Trans. 2(1) : 163, pl. 12, figs. 5-7, 1851.

Glyphodes indica, Hampson, Fauna Brit. India, Moths **4**: 360, 1896.

Margaronia indica, Tams, Ins. Samoa 3(4) : 282, 1935.

This cucumber and melon pest occurs throughout Ethiopian, Oriental, and Australian regions, Fiji, Samoa, and Marquesas. It was not previously reported from Guam, and we found only an occasional caterpillar on cucumber,

melon, and pumpkin leaves. The only two reared were from Yigo, May 19, on honeydew melon; Piti, Sept. 30, on pepino melon, Swezey. Two caterpillars on cucumber leaves at Agana swamp were parasitized, probably by *Cremastus flavo-orbitalis,* but as the parasites died in cocoons, I cannot be positive of their identity.

30. Margaronia samoana Swinhoe, Ann. Mag. Nat. Hist. VII, **18**: 414, 1906; Tams, Ins. Samoa 3(4): 283, 1935.

Moths were reared from the following places: Inarajan, June 8; Asan, Aug. 22; Agat, Sept. 26; Sumay road, Oct. 1, Swezey; Piti, Sept. 11, 13, at light, Swezey. One specimen in Bishop Museum, Fullaway, 1911.

Described from Samoa, I have found no other record of it. In Guam it occurred as a leafroller on *hodda* (*Ficus tinctoria*). The Guam specimens have the white portions of the wings pure white, whereas in specimens from Samoa at Bishop Museum these areas have a creamy tinge.

31. Margaronia multilinealis (Kenrick).

Glyphodes multilinealis Kenrick, Zool. Soc. London, Proc., 83, pl. 4, fig. 173, 1907.

Margaronia multilinealis, Tams, Ins. Samoa 3(4): 284, 1935.

Moths were reared from Yona, May 12, Machanao, June 30, Orote Peninsula, Sept. 1, Swezey; Piti, at light, Aug. 13, 17, Swezey. One specimen at U. S. National Museum and one at Bishop Museum, Fullaway, 1911.

Described from New Guinea. Recorded also from Samoa and Society Islands. In Guam we reared it from leafroller caterpillars on a species of *Ficus* with narrow leaves. The young terminal leaves were rolled and fastened together, and the caterpillar fed within. They were sometimes very abundant.

32. Margaronia mysteris (Meyrick).

Cydalima mysteris Meyrick, Ent. Soc. London, Trans., 223, 1886.

Margaronia mysteris, Tams, Ins. Samoa 3(4): 281, 1935.

Described from the New Hebrides, and also known from Samoa; now recorded from Guam. One moth was reared from a leafroller caterpillar on *Colubrina asiatica* at Fadian, Aug. 19, Swezey; one moth collected at Fadian, Sept. 18, Swezey.

33. Margaronia species.

A green species near *marginata* was reared from a colony of caterpillars which had webbed together the terminal leaves on a branch of *Ochrosia marianensis* in the forest at Machanao, June 4. There were 54 caterpillars in the colony. From them, 34 moths issued June 18-21 (some as cripples, which were not saved); 15 larvae and pupae died; thread worms issued from three; tachinid larvae issued from two (one of these died in puparium, the other issued a cripple).

The full-grown caterpillar was 30 mm. long; light yellow, with the tubercles broad, flattish, shining black, giving the caterpillars a black appearance, setae fine, pale, short. Spiracles nearly circular, yellow, margined with white. Head uniformly light brown, eyes black. Legs black, yellow tipped. The usual abdominal prolegs, pale.

34. Margaronia species.

Agana, April 28, Swezey; Barrigada, June 24, Swezey; Piti, July 13, Aug. 9, 12, 13, 18, 20, Sept. 1, Swezey. One specimen in Bishop Museum, Fullaway, 1911.

An ochreous species which came frequently to light at Piti. Its caterpillars were not found nor its host plant learned.

35. Crocidolomia binotalis Zeller, K. Vet.-Akad., Handl. (1852), 66, 1854; Hampson, Fauna Brit. India, Moths **4**: 372, 1896.

Piti, May 14, reared from cabbage, Swezey; Piti, Aug. 13, 26, Oct. 14, at light, Swezey. Three specimens at Bishop Museum, Fullaway, 1911.

This moth is widely distributed from South Africa through southern Asia to Formosa, Java, Australia and Norfolk Island. The caterpillars feed on mustard, radish, cabbage, and other cruciferous plants in India. I found it on cabbage at Piti, Guam, but not as commonly as *Hellula undalis*.

36. Hellula undalis (Fabricius).

Phalaena undalis Fabricius, Ent. Syst. 3(2): 226, 1794.

Hellula undalis, Hampson, Fauna Brit. India, Moths **4**: 373, fig. 200, 1896.

This cabbage pest is widely distributed in tropical regions, also the Mediterranean region and the United States. It occurs in Hawaii, and was recorded by Fullaway in Guam in 1911, as found on radish and horseradish. It attacks plants of the mustard family generally. I reared moths from cabbage at Piti, May 14 and June 9, and from Chinese cabbage June 6. One specimen at U. S. National Museum and one at Bishop Museum, Fullaway, 1911.

37. Maruca testulalis (Geyer).

Crochiphora testulalis Geyer, in Hübner, Zutr. Samml. Ex. Schm. 4(4): 12, figs. 629, 630, 1832.

Maruca testulalis, Hampson, Fauna Brit. India, Moths **4**: 393, 1896; Tams, Ins. Samoa 3(4): 286, 1935.

This is a bean pest widely spread in the tropics of Africa, Asia, and the Pacific islands, Japan, and Australia. It occurs in Hawaii, but was not previously recorded from Guam. Small caterpillars were found in bean pods at Piti, Oct. 17, and two moths were taken at light, Oct. 14, Swezey.

38. Psara licarsisalis (Walker).

Botys licarsisalis Walker, Cat. **18**: 686, 1859.

Pachyzancla licarsisalis, Hampson, Fauna Brit. India, Moths **4**: 402, 1896.
Psara licarsisalis, Tams, Ins. Samoa **3**(4) : 286, 1935.

Piti, May 8, 22, July 27, Aug. 11, 16, 24, Sept. 4, 11, 12, 13, 28, Oct. 6, 18, Nov. 26; Agana, May 15; Tarague, May 17; Orote Peninsula, Aug. 2. All by Swezey. Five specimens in U. S. National Museum and one in Bishop Museum, Fullaway, 1911.

Widely distributed from India, Ceylon, Malacca, China, Japan, Java, Borneo, Marshall Islands, Fiji, Samoa, Society Islands, Austral Islands, and Australia. It was common in Guam, many coming to light at Piti. Fullaway reported a pyraustid moth (probably this species) which was destructive to lawns in 1911. We did not find it so abundant as to be injurious, but found its caterpillars feeding in the turf in grasslands, hiding under bits of board and under edges of dried cow droppings, or in webbed dead grass leaves. The moths were very abundant among weeds in a cornfield adjacent to a *Panicum* grass field, but at the time I did not find any caterpillars.

39. Psara stultalis (Walker).

Botys stultalis Walker, List Lep. Ins. Brit. Mus. **18**: 669, 1859.
Pachyzancla stultalis, Hampson, Fauna Brit. India, Moths **4**: 405, 1896; Meyrick, B. P. Bishop Mus., Bull. **114**: 340, 1934.
Psara stultalis, Tams, Ins. Samoa **3**(4) : 286, 1935.

This moth has much the same distribution as the preceding species including Samoa and the Marquesas. The only two specimens obtained in Guam were reared from leafroller caterpillars on *agalunde,* or a similar plant, Barrigada, Aug. 28, Swezey.

40. *Diasemia accalis Walker, Cat. **19**: 1015, 1859; Hampson, Fauna Brit. India, Moths **4**: 411, 1896.

One specimen reared from fruit of *Barringtonia speciosa,* Tumon, May 30, Swezey. Recorded from Shanghai, Dharmsala, and Burma.

41. Pyrausta phoenicealis (Hübner).

Pyralis phoenicealis Hübner, Zutr. Samml. Ex. Schm. **1**: 22, figs. 115, 116, 1818.
Pyrausta phoenicealis Hampson, Fauna Brit. India, Moths **4**: 431, 1896.

Talofofo plateau, June 17, reared from leafroller on *Elephantopus spicatus,* Swezey; Sasa, June 22, Swezey; Piti, July 13, 28, Oct. 6, Nov. 4, reared from *Elephantopus,* and two specimens at light, Swezey; Dandan, July 17, reared from *Elephantopus* and a weed of the mint family, Swezey. One specimen in Bishop Museum, Fullaway, 1911.

This moth has a very wide distribution: North and South America, West Indies, Africa, India, China, and Australia. Now recorded from Guam for the first time.

42. Pyrausta nubilalis (Hübner).

Pyralis nubilalis Hübner, Zutr. Samml. Eur. Schm., Pyr. **14**: Sechste Horde, 24, 14, fig. 94, 1796.

Pyrausta nubilalis, Meyrick, Handbook Brit. Lep., 416, 1895; Hampson, Fauna Brit. India, Moths 4: 435, 1896; Caffrey and Worthley, U. S. Dept. Agric., Bull. **1476**: 1-154, 1927; Briggs, Guam Agr. Expt. Sta. Rept. (1920), 39, 1921; Vandenberg, Guam Agr. Expt. Sta. Rept. (1930-32), 20, 1933.

Tumon, May 30; Ypan, June 8; Libugon, June 24; Machanao, June 30, Aug. 6; Piti, Aug. 26, Sept. 4, 15; Barrigada, Aug. 28. All collected or reared by Swezey. Three specimens in U. S. National Museum and one in Bishop Museum, Fullaway, 1911.

This moth is the notorious European corn borer, which has become widespread in the United States during the past 20 years. Its distribution is throughout central and southern Europe, Egypt, west-central and northern Asia, northern India, Siberia, Japan, Philippines, and Guam. The first record of it in Guam was by Fullaway in 1911 under the name *Pyrausta vastatrix,* given by Schultze in Manila, a name which was later recognized as a synonym. It became a very serious pest in Guam, and by 1920 was reported damaging 50 percent of the corn crop in some regions. Parasite introduction was attempted in 1926 to 1931. Several kinds of parasites were imported. In 1936 we found that a tachinid, *Lydella stabulans* var. *grisescens* Robineau-Desvoidy, was established and so efficient that very little damage was done to the corn crop by the European corn borer. Whenever we found corn borer larvae in corn stalks, usually 50 to 100 percent of them were parasitized. Often in examining the corn borer burrows in corn stalks, the puparia of the parasite would be found, usually one or two and occasionally three per burrow. This tachinid was introduced from Japan by Vandenberg in 1931. At first it was known in Guam reports as *Masicera senilis,* later as *Ceromasia lepida.* In subsequent studies of it, experts in the Tachinidae settled on the name *Lydella stabulans* var. *grisescens.* One other parasite, *Cremastus flavo-orbitalis* (Cameron), introduced from Japan by Vandenberg in 1931 became established in Guam. I reared it from several species of leafroller moths, but not from the corn borer.

DIPTERA

SOME NEW SPECIES OF NEMOCEROUS DIPTERA FROM GUAM

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Recently O. H. Swezey of the Hawaiian Sugar Planters' Association Experiment Station sent me a small collection of nemocerous Diptera that were collected on Guam in 1936. Among these are eight species representing five genera of the family Scatopsidae, Ceratopogonidae, and Chironomidae described herewith. In addition to these, the genera *Forcipomyia, Dasyhelea, Anatopynia,* and *Pentapedilum* are also included in the collection as well as a specimen of the genus *Eusimulium,* family Simuliidae. Since the five genera last mentioned are each represented by but one or two female specimens, some of them defective, it was not thought advisable to attempt to describe or name them.

FAMILY SCATOPSIDAE

1. Scatopse guamensis, new species (fig. 1, *a-e*).

Male and female: black, including antennae, halteres, and legs except the tarsi which are yellow. Dorsum of thorax and abdomen dull, almost velvety, pleura and venter more or less shiny. Antennae of the male about half again as long as the transverse diameter of the head, the terminal segment a half longer than wide, the others transverse. Antennae of the female a little longer, the terminal segment about twice as long as wide. Thorax with short, suberect pubescence. Hind basitarsus twice as long as the second segment. Abdomen depressed, widest just beyond the middle. Terminalia of the male usually retracted (extended in fig. 1, *c*), the claspers broadened apically, tapering toward the base (fig. 1, *b*), mesosome about as long as broad (fig. 1, *d*). Terminalia of the female (fig. 1, *e*) with a pair of prominent cerci, the last two sternites of characteristic shape; the anal segment somewhat extended in the figure. Spermatheca single, spherical, sclerotized. Wing (fig. 1, *a*) hyaline, anterior veins dark, posterior veins colorless, microtrichia dense, coarse, and uniformly distributed. Venation as figured; the second cubital vein strongly curved as in the *S. fuscipes* group; second costal division a fourth shorter than the first. Length of body 1.5 mm.; of wing, measured from the humeral crossvein, 1.2 mm.

Piti, July 21; Sumay, June 22, Swezey. Holotype and allotype in the Cornell University collection; paratypes in the collections of Cornell University and the Experiment Station, Hawaiian Sugar Planters' Association.

This species differs from *Scatopse fuscipes* Meigen in having the first cubital vein extending to the wing margin and in the form of the median fork. *S. fuscipes* is the genotype of Enderlein's genus *Rhaeboza,* which is distinguished from *Reichertella* by the strongly curved second cubital vein. *Scatopse,* as interpreted here (following Edwards, 1925, and Duda, 1934), includes species both with and without the spur at the base of the anterior branch of

the media, thus embracing both *Scatopse* sensu stricto and *Reichertella.* The character upon which *Rhaeboza* is based scarcely warrants generic rank. The nomenclature of wing venation followed here is that of Comstock and not of Edwards (Ann. Applied Biology 12: 271, 1925).

FAMILY SCIARIDAE

2. Psectrosciara brevicornis, new species (fig. 1, *f, g*).

Female: head and thorax black, subshining; antennae (fig. 1, *g*) blackish, pubescent, shorter than the head, nine-segmented, the apical segment a third longer than wide. Eyes broadly contiguous, lower ocellus nearly twice its diameter above the level of the upper margin of the eye; eyes with a short and delicate seta, less in length than the diameter of a facet, placed at each facet angle, best seen in a slide mount. Palpi short, apparently one-segmented. Abdomen black, subshining, becoming more brownish posteriorly, pubescent. Wings clear hyaline, radial veins blackish, the other veins colorless; venation as figured (figure 1, *f*); subcosta and anal vein delicate, the others sharply defined; base and tip of the anterior branch of the media distinct, though somewhat weak; apex of anterior branch of cubitus obliterated. Microtrichia coarse, macrotrichia lacking in the costal cell and the basal part of the radial cell, elsewhere, including on the veins, sparsely but well distributed. Halteres dark. Legs more or less yellowish brown; strong; tibiae slender at base gradually broadening toward tip, in the hind leg three times as broad apically as at base. Basitarsi approximately twice as long as the following segment. Proportions of the hind leg segments in the ratio 40:40:18:10:8:5:8. Length 1.6 mm., of wing 1.07 mm., measured from the humeral crossvein, of the antenna 0.25 mm.

Sumay, June 22, 1936, Swezey.

Holotype in the Cornell University collection; paratype in the Experiment Station, Hawaiian Sugar Planters' Association.

This species resembles *P. mahensis* Kieffer from the Seychelles, but differs slightly in wing venation, in having nine instead of 10 antennal segments, and a distinctly shorter terminal segment. Kieffer's statement as to the number of antennal segments in *P. mahensis* has been corrected by Enderlein (1912).

FAMILY CERATOPOGONIDAE

3. Atrichopogon rarus, new species.

Male and female: head and antennae dark brown, the pedicel of the antenna and the mouth parts yellow. Thorax yellowish brown to brown, more or less shining, mesonotum with three dark brown vittae, in some cases coalescent, in other cases scarcely darker than the background, lightly yellow pollinose. Scutellum yellowish brown to brown, scarcely lighter than the mesonotum. Abdomen fuscous, contrasting with the lighter thorax and terminalia. Legs, including coxae, yellow to yellowish brown, tarsi somewhat darker apically. Hind basitarsal-tibial ratio 0.4. Claws cleft. Eyes contiguous, bare. Antennae 15-segmented (counting the minute scape); in the male segments 12 to 15 combined about a third longer than segments 3 to 11 combined, 3 to 11 short fusiform, 12 to 15 cylindrical, the latter having the proportions 7:20:14:17; apical segment with stylet. In the female antennal segments 11 to 15 combined nearly 2.5 times as long as 3 to 10 combined, 15 slightly longer than 14, 11 to 14 subequal; 3 to 10 approximately spherical. Palpi in both sexes five-segmented, third longest and with a sense pit, fourth and fifth subequal, the fifth somewhat spatulate.

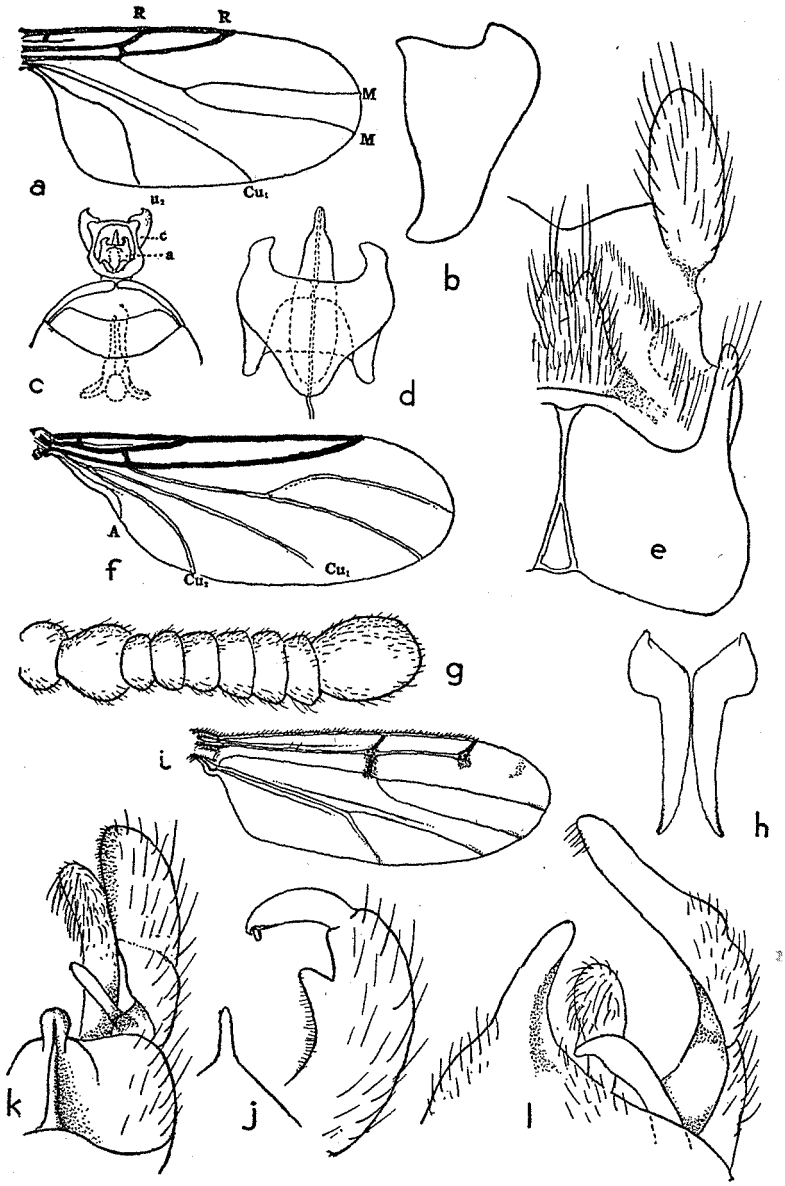

FIGURE 1.—**a**-**e**, *Scatopse guamensis: a,* wing of female × 34; *b,* clasper of male × 225; *c,* hypopygium of male, ventral aspect × 45 (*a,* mesosome, *c,* clasper); *d,* mesosome of male, ventral aspect × 225; *e,* terminalia of female, ventral aspect × 225. **f**, **g**, *Psectrosciara brevicornis: f,* wing of female × 45; *g,* antennae of female × 225. **h**, *Culicoides guttifer* deMeijere, var. *histrio,* inner processes of male, caudal end directed downward × 225. **i**, *Eukraiohelea inusitata,* wing of female × 24. **j**, *Smittia insulsa,* ventral aspect of half of hypopygium × 225. **k**, *Chironomus insolens,* ventral aspect of half of hypopygium × 112. **l**, *Chironomus eximius,* latero-ventral aspect of half of hypopygium × 225.

Wings in both sexes with coarse microtrichia, that of the male without macrotrichia, of the female with macrotrichia on the distal third but extending back over the cubital cells. In the male the costa ends at 0.7 wing length measured from the cubital crossvein, that of the female at about 0.75 wing length; in both sexes the first radial cell is about a fourth as long as the second; angle between branches of the cubitus less than 70 degrees in the male, nearly 90 degrees in the female, its fork on level of the tip of first radial cell; petiole of the media shorter than the r-m crossvein. Halteres brownish. Length of body 2.25 mm., of wing 1.8 mm.

Piti, swarming on leaves of *Intsia bijuga,* Sept. 14, May 9, Nov. 4, Swezey; Agat, Oct. 17, Swezey.

Holotype and allotype in the collection of Cornell University, paratypes in the collections of Cornell University and of the Experiment Station, Hawaiian Sugar Planters' Association.

4. Culicoides guttifer deMeijere, var. **histrio,** new variety (fig. 1, *h*).

Male and female: dark brown, including legs and halteres; immediately above and below the knees slightly paler. The mesonotum cinereous with subshining black markings as follows: a pair of narrow vittae anteriorly (in some cases contiguous) between the shining humeral pits; a pair of elongate oval spots in the prescutellar depression, a broader pair of elongate lateral vittae behind the humeral pits, a transverse spot covering and in front of the scutellar suture, and a more or less elongate oval area in front of each wing base. These marks resemble somewhat those of *C. crepuscularis* Malloch (1915) but the median lines have parallel sides. The extent of these marks seem subject to some variation and in some cases are more brownish. The hypopygium resembles that of *C. copiosus* Root and Hoffman (Am. Jour. Hygiene 25: 17, 1937) rather closely, including claspers, aedeagus, and apico-lateral processes of the tergite, but the inner processes (so-called harpes) are less tapering (fig. 1, *h*) and not so attenuated apically. Wings with about 16 round hyaline areas on a gray background, those at the base of the wing more or less diffuse. The elongate dark stigmal spot covers the distal half of the first and all of the second anterior radial cell. The large hyaline area covering the crossvein encroaches on the basal half of the first radial cell. The venation and the wing markings are like those of *C. guttifer* deMeijere as shown by Edwards (Bull. Ent. Res. 13: 169, fig. 2, 1921). Length 1.25 mm., wing, measured from the humeral crossvein, 1 mm.

Piti, August to November, Swezey; Libugon Farm, July 10, Swezey.

Holotype and allotype of this variety in the Cornell University collection; paratypes in the collections of Cornell University and of the Experiment Station, Hawaiian Sugar Planters' Association.

5. Eukraiohelea inusitata, new species (fig. 1, *i*).

Female: head and large basal segment of antenna yellowish brown; palpi, mouth parts, and flagellum of antenna, dark brown. Antenna short bristly haired, slender, about two thirds as long as the body, intermediate segments fusiform, terminal segments slender, cylindrical, progressively increasing in length. Thorax dusky yellow, ground color of mesonotum brown, slightly shining, with three slender pruinose vittae that are transversely connected beyond the middle by some broader pruinose bands; laterad of the vittae are several pruinose spots. Posterior margin of the scutellum pruinose. Abdomen brown, posterior margins of the segments pruinose, more extended on posterior segments. Legs, including coxae, yellow, tips of tibiae blackened, fourth tarsal segment short and strongly bilobed, fifth segment longer and more slender, each with one long claw and a short basal lateral tooth; hind tibiae broadened at tip. Wing venation as figured (fig. 1, *i*); costa bristly; petiole of radius with a pair of short bristles before the middle; other veins bare,

the wing margin fringed; microtrichia present, macrotrichia absent. The wing spots that narrowly margin the tips of the veins, and more prominently the crossvein, and at the angle of the radial sector near its tip and a small crescent beyond this, owe their brown color to coarser microtrichia. Wing surface faintly yellow tinged, costa and radial veins yellow. Halteres dark brown. Fore femora each with a single spine near the middle on the under side. Length 2.2 mm.; wing, measured from the humeral crossvein, 1.9 mm.

Agana, June 26, Usinger.

Holotype in the Cornell University collection.

Ingram and Macfie have described two closely related species, the first as *Parabezzia poikiloptera* (Ann. Trop. Med. **16**: 278, 1922), the second as *Stilobezzia ugandae* (Bull. Ent. Res. **14**: 62, 1923). The wing venation in both is similar to the above described species, but they differ in lacking the spine on the underside of the fore femur. By definition, the Guam species falls in with the genus *Eukraiohelea* of Ingram and Macfie (Ann. Trop. Med. **15**: 347, 1921), because of the presence of the femoral spine; but in other characters it seems more closely related to *P. poikiloptera.* Most species of *Stilobezzia* have two anterior radial cells, whereas the three species noted above have but one. Whether it is more expedient to include these and other similar forms in *Stilobezzia* or whether they should be placed in *Eukraiohelea* by broadening its scope is left for the future. It seems that the most reasonable course would be to broaden the scope of *Stilobezzia* and include the aberrant forms under subgenera. Until the female of *Parabezzia petiolata* Malloch is found, the position of the genus *Parabezzia* with respect to related genera is in doubt.

Family CHIRONOMIDAE

6. Smittia (Pseudosmittia) insulsa, new species (fig. 1, *j*).

Male: thorax and abdomen velvet black, scutellum fuscous, pleura more or less shining. Antennae pale brown, basal segment and head black. Legs yellow, femora slightly darker. Dististyle of the terminalia sordidly white. Wings milky hyaline, without microtrichia, veins and halteres cream-white. Eyes bare. Ratio of 14th antennal segment to segments 2 to 13 united, 1.16; last segment somewhat thickened. Thoracic bristles black, suberect. Costa of the wing well produced beyond the level of the tip of the posterior branch of the radius, second radial branch distinct, ending about midway between the tips of the adjacent veins, tip of the posterior branch of the radius ends slightly distad of the level of the tip of the anterior branch of the cubitus, media ends behind the wing tip, the cubital fork slightly distad of the level of the tip of the first radial branch, posterior cubital branch nearly straight, anal vein ends well before the cubital fork. Squamae not fringed, colorless. Hypopygium normal in size, the basistyle with large, acute angled inner lobe (fig. 1, *j*),dististyle with terminal spine of moderate size, anal point slender. Pulvilli absent, empodium about as long as the claws; the basitarsal-tibial ratio of the fore legs about 0.55, middle and hind tibiae with long spur, hind tibiae with a comb of bristles at apex.

Female: dorsum of thorax pale yellow, with three wide black vittae, the laterals connected by a narrow black line in front of the scutellar suture; scutellum yellow; pleura and sternum dark. Abdomen velvet black. Halteres and legs cream colored. Antennae six-segmented, last segment thicker and nearly twice as long as the fifth, intermediate

segments each with a few strong curved bristles. Pronotal collar normal. Costa and the first and third radial branches with a few black bristles; costa produced far beyond the tip of the third radial branch and ending nearer the apex of the wing than the media; first radial branch ends slightly distad of the level of the cubital fork; cubitus forks at the level of a third of the distance between the r-m crossvein and the tip of the third branch of the radius; anterior branch of the cubitus ends about the level of the tip of the third branch of the radius; second radial branch distinct; anal vein ends far short of the cubital fork; lobe of wing obtusely rounded as in the male. In other respects like the male. Length of male 1.2 mm.; wing, 1.1 mm.; female 0.85 mm.; wing, measured from the humeral crossvein 0.8 mm.

Agana, May 25, Usinger.

Holotype and allotype in the Cornell University collection; paratypes in the collection of the Experiment Station, Hawaiian Sugar Planters' Association.

This species would fall in group D of Edwards (1929) except that the anal vein ends well before the fork of the cubitus. The third branch of the radius ends rather farther distad than in other species placed under *Pseudosmittia* by Goetghebuer (1932).

7. Chironomus insolens, new species (fig. 1, *k*).

Male: head and thorax, including halteres and scutellum, yellow; mouth parts, basal antennal segment, thoracic vittae, metanotum, and sternum, brown; median thoracic vitta divided by a fine line. Abdomen dark brown, hairs pale. Legs, including coxae, yellow; tarsal segments, beyond the first, somewhat infuscated. Pronotum complete, notched anteriorly in the center. Wings hyaline, crossvein slightly darkened; third branch of the radius and the media end about equidistant from the apex of the wing; cubitus forks very slightly distad of the crossvein. Squamae fringed. Antennae and fore tarsi broken off. Frontal tubercles present. Fore tibiae terminating in a blunt scale, middle and hind tibiae each with a comb, each comb with a short spur; pulvilli and empodium well developed. Basal segment of palpus short, second and third more than twice as long as the first, fourth half again as long as the third. Hypopygium rather small (fig. 1, *k*); claspers short, dististyle oval, not attenuated apically, with numerous short hairs on inner surface instead of the usual longish hair tuft near apex; superior appendages slender, bare, somewhat curved, ending nearly opposite apex of basistyle; inferior appendages reaching almost to apex of dististyle, cylindrical, nearly straight, and provided with the usual long curved hairs. Tergal spur with deep keel, sharply bent downward toward apex, the free part broad and very short. Length 3 mm.; wing 1.9 mm.

Female: two defective specimens believed to belong here, in general like the male in coloring, but with the abdomen still darker. Intermediate antennal segments fusiform with short necks. Basitarsal-tibial ratio of fore legs, 1.65.

Piti, May 23, Swezey.

Holotype in the Cornell University collection.

This species falls in group B of the subgenus *Chironomus* as defined by Edwards (1929), but differs from the members of the three series of this group in the form of the hypopygium, the dististyle lacking the tuft of stout, longish hairs at the tip on the inner side characteristic of series 1, and in having well-developed, bare superior appendages and distinct frontal tubercles, differing in this respect from series 3 (*Xenochironomus*).

8. Chironomus eximius, new species (fig. 1, *l*).

Male: head, including basal antennal segment, brown; flagellum and its hairs paler brown; palpi yellowish. Thorax reddish yellow, including vittae of mesonotum, pleura, metanotum, and sternum; the humeri, scutellum and space between the thoracic vittae pale yellow, whitish pruinose, the scutellum more shining. Anterior abdominal segments pale yellow, with greenish tinge in some specimens, posterior segments darkened; in some cases the abdomen is more uniformly yellowish brown. Legs yellow, extreme tips of tarsal segments darkened. Wings hyaline, more or less milky, the crossvein slightly darkened. Squamae fringed. Halteres yellow, apex of knob dark.

Antennae with 12 segments, the last segment nearly three times as long as segments 2 to 11 combined; frontal tubercles present; palpi as in the preceding species. Pronotal collar complete, with notch anteriorly in the middle. Venation as in the foregoing *C. insolens.* No tarsal beard; proportions of segments of fore legs, 33:28:50:24:23:21:11; the basitarsal-tibial ratio therefore about 1.75. Fore tibiae with scale, middle and hind tibiae each with two combs, each comb with a short spur; empodium and pulvilli well developed. Hypopygium (fig. 1, *l*) resembles that of *C. dorsalis* of Europe, with the superior appendages well developed, bare, somewhat enlarged toward the apex. Inferior appendages nearly straight, with the usual curved hairs. Dististyles narrowed apically, with the tuft of hairs on the inner side. Tergal spur slender. Total length 4 mm.; of wing, measured from the humeral crossvein, 2.2 mm.

Piti, July 5, May 2, Swezey and Usinger; Inarajan, May 7, July 25, Swezey and Usinger; Sumay Road, June 23, Swezey and Usinger. Holotype in the Cornell University collection; paratypes in the collections of Cornell University and the Experiment Station, Hawaiian Sugar Planters' Association.

Two female specimens collected July 5 and believed to belong here differ from the males in having darker thoracic markings and the brown coloring of the abdomen more extended, fore legs more or less brownish tinged. Other female specimens from other parts of the island have the abdomen a uniform brown, in some cases almost black. The latter closely resemble those of *C. insolens* in coloring, differing in having a larger leg ratio (1.75).

SOME MISCELLANEOUS DIPTERA OF GUAM

By O. H. Swezey
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This list of miscellaneous Diptera includes records of the collections made in Guam by R. L. Usinger and O. H. Swezey in 1936, and by D. T. Fullaway in 1911. Most of these species are readily determinable, because they are also found in Hawaii. Species which do not occur in Hawaii are marked with asterisks.

Work on the Guam Diptera in the hands of J. R. Malloch was not finished in time for this publication.

Family OMPHRALIDAE

1. **Omphrale nigra** (de Geer).

Nemotelus niger de Geer, Mem. Hist. Ins. **6**: 188, pl. 11, figs. 5, 6, 1776.

Scenopinus nigra, Meigen, Syst. Beschreib. **4**: 116, 1824.

Omphrale nigra, Kertez, Cat. Diptera **5**: 174, 1909.

One specimen collected on surface of water in water barrel, Piti, Aug. 20, Swezey; three specimens in Bishop Museum, Fullaway, 1911.

Family SYRPHIDAE

2. **Lathyrophthalmus arvorum** (Fabricius).

Syrphus arvorum Fabricius, Mant. Ins., 335, 1787.

Eristalis punctulatus Grimshaw, Fauna Hawaiiensis 3: 82, 1902.

Eristalis arvorum, Brunetti, Fauna Brit. India, Diptera 3: 181, pl. 4, figs. 6, 7, 1923.

Lathyrophthalmus arvorum, Bryan, Haw. Ent. Soc., Proc. **8**: 413, 1934.

One specimen at light, Piti, Oct. 2, Swezey. Four specimens in Bishop Museum, Fullaway.

3. **Ischiodon scutellaris** (Fabricius).

Scaeva scutellaris Fabricius, Systema Antliat., 252, 1805.

Xanthogramma grandicornis (Macquart), Grimshaw, Fauna Hawaiiensis 3: 19, 1901.

Ischiodon scutellaris, Bezzi, Diptera of the Fiji Islands, 72, 1928.

Mt. Alifan, June 27, Swezey; Piti, Aug. 24, Sept. 15, Swezey; common, the larvae feeding on *Aphis maidis* on corn. Three specimens in Bishop Museum, Fullaway.

FAMILY TACHINIDAE

4. ***Lydella stabulans** var. **grisescens** (Robineau-Desvoidy).

Ceromasia lepida Meigen, Nakayama, Chosen Govt. Agr. Expt. Sta., Ann. 4:95, 1929.

Ceromasia lepida, Vandenberg, Guam Agr. Expt. Sta., Rept., 1931-32, 21, 1933.

Lydella grisescens Robineau-Desvoidy, Clark, U. S. Dept. Agric. Tech. Bull. **455**: 19, 1934.

Lydella stabulans var. *grisescens* (Robineau-Desvoidy), Baker in letter.

This tachinid fly was introduced from Japan into Guam in 1931 by S. R. Vandenberg, as a parasite on the European corn borer, *Pyrausta nubilalis.* It was first known as *Ceromasia lepida* Meigen, but later the name *Lydella stabulans* variety *grisescens* (Robineau-Desvoidy) came into use in the United States, where the fly had been introduced and become established in the region around the west end of Lake Erie. In 1936, we found that this tachinid was satisfactorily controlling the European corn borer in Guam. Usually only a small proportion of the corn stalks was injured, and the injury was not sufficient to prevent a well-formed ear. Usually about 50 percent of the caterpillars found were parasitized, sometimes 80 percent or more. There were one to three tachinid maggots per caterpillar, but more often only one maggot per host was found. This fly was found in all regions where the corn borer was found.

FAMILY SARCOPHAGIDAE

5. **Sarcophaga dux** Thomson, Freg. Eugenies Resa, Diptera, 534, 1868; Grimshaw, Fauna Hawaiiensis 3 : 27, 1901 ; Bezzi, Diptera of Fiji Islands, 190, 1928.

Sarcophaga subtuberosa Parker, U. S. Nat. Mus., Proc. **54**: 89, 1917.

Originally described from Honolulu; known also in Fiji and Samoa. Described as *S. subtuberosa* by Parker from specimens in the U. S. National Museum, collected in Guam by Fullaway in 1911. Bezzi considers *subtuberosa* as a synonym of *dux.*

Five specimens in Bishop Museum, collected by Fullaway, were determined by C. S. Banks as *S. frontalis* Thomson which may be a synonym of *dux.* It is described on the page following that on which *dux* is described. Undoubtedly the Fullaway specimens in Bishop Museum are the same species as those at the National Museum.

FAMILY CALLIPHORIDAE

6. **Chrysomyia megacephala** (Fabricius).

Musca megacephala Fabricius, Ent. Syst. 4: 317, 1792.

Chrysomyia megacephala, Patton, Bull. Ent. Research **13**: 110, 1922; Bezzi, Diptera of Fiji Islands, 187, 1928.

Talofofo, April 11, Bryan; Tarague, April 19, Bryan; Merizo, April 24, Bryan; Orote Peninsula, May 4, Bryan; Merizo, June 11, Usinger; Piti, Aug. 18, Swezey; Libugon, Nov. 10, attracted to dead slugs, Swezey.

This fly is distributed from India to China, Philippines, Java, Borneo, New Hebrides, Australia, Fiji and Hawaii. Collected in Guam by Fullaway.

7. Chrysomyia rufifacies (Macquart).

Lucilia rufifacies Macquart, Diptera Exotiques, Suppl. **2**(3): 303, 1843.

Chrysomyia rufifacies, Bezzi, Diptera of Fiji Islands, 187, 1928.

This Australian species is also known in New Zealand, Fiji, and Hawaii. We found it in Guam: Piti, July 26, at light, Swezey; Libugon, Nov. 10, attracted to dead slugs, Swezey.

FAMILY MUSCIDAE

8. Stomoxys calcitrans (Linnaeus).

Conops calcitrans Linnaeus, Syst. Nat. **2**: 1004, 1761.

Stomoxys calcitrans, Macquart, Diptera Exotiques, Suppl. **2**(3): 271, 1843.

Yona, April 27, Bryan; Piti, July 2, on bullock, Swezey; Orote Point, July 19, Swezey; Piti, July 24, ex carabao dung, Swezey; in Bishop Museum, five specimens, Fullaway, 1911. A cosmopolitan species.

9. Musca domestica Linnaeus, Syst. Nat. 10th ed., 596, 1758.

This cosmopolitan fly was extremely abundant everywhere in Guam. The maggots fed abundantly in cow dung and carabao dung, the latter of which was plentiful for the purpose. Many specimens were collected. Five specimens in Bishop Museum, Fullaway.

FAMILY ANTHOMYIIDAE

10. Ophyra chalcogaster (Wiedemann).

Anthomyia chalcogaster Wiedemann, Auss. Zweifl. **2**: 427, 1830.

Ophyra chalcogaster, Malloch, Ins. Samoa **6**(3): 170, 1929.

Ritidian Point, April 15, Bryan; Umatac, May 26, Swezey; Piti, June 3, July 24, Aug. 11, Sept. 21, Nov. 29, Swezey; Barrigada, June 14, Swezey; Sasa, June 26, Usinger; one specimen in Bishop Museum, Fullaway.

Described from Java. Occurs also in China, Samoa, Society Islands, and Hawaii. Abundant in Guam, breeding in carabao dung and cow dung.

11. Atherigona excisa var. **trilineata** (Stein).

Atherigona excisa Thomson, Freg. Eugenies Resa, Diptera, 560, 1868.

Atherigona trilineata Stein, Termes. Füzetek **23**: 157, 1900.

Atherigona excisa var. *trilineata,* Malloch, B. P. Bishop Mus., Bull. **98**: 201, 1932.

Piti, May 22, ex rotten breadfruit, Swezey; Barrigada, July 22, ex rotten breadfruit, Swezey; Barrigada, Aug. 28, puparium found in tunnel of European corn borer, Swezey; Piti, Oct. 6, ex rotten bean pods, Swezey; three specimens in Bishop Museum, Fullaway.

This small anthomyid, under several synonyms, is widely distributed in the Pacific area.

12. *Pygophora lobata (Stein).

Coenosia (*Pygophora*) *lobata* Stein, Termes. Füzetek **23**: 147, 1900.

One specimen in Bishop Museum, Fullaway. Determined by Malloch as *Pygophora lobata* (Stein).

FAMILY LAUXANIIDAE

13. *Trigonometopus setosus Knab, Ins. Inscit. Mens. **2**: 132, 1914.

Described from three specimens in U. S. National Museum, Fullaway

FAMILY MILICHIIDAE

14. *Milichia orientalis Malloch, Ins. Inscit. Mens. **1**: 109, 1913.

Described from seven specimens in U. S. National Museum, Fullaway.

15. Milichiella lacteipennis (Loew).

Lobioptera lacteipennis Loew, Berlin. Ent. Zeitschr. **9**: 185, 1865.

Ophthalmomyia lacteipennis, Williston, Ent. Soc. London, Trans., 427, 1896.

Milichiella lacteipennis, Bryan, Haw. Ent. Soc., Proc. **5**: 292, 1923 (teste Knab); Bezzi, Diptera of Fiji Islands, 162, 1928.

Described from Cuba. Widely distributed in America and the Old World, and occurs in Australia, Fiji, Samoa, and Hawaii. Three specimens in Bishop Museum, Fullaway.

FAMILY MICROPEZIDAE

16. *Calobata galbula (Osten-Sacken).

Calobata (*Taeniaptera*) *galbula* Osten-Sacken, Berlin. Ent. Zeitschr. **26**: 202, 1882.

Calobata galbula, Bryan, Haw. Ent. Soc., Proc. **8**: 33, 1932.

Agana, June 2, Aug. 5, in Governor's office, Swezey; Piti, Oct. 16, ex rotten sugar cane, Swezey; Piti, Nov. 7, Swezey; three specimens in Bishop Museum, Fullaway. Described from the Philippines.

FAMILY OTITIDAE

17. Notogramma stigma (Fabricius).

Musca stigma Fabricius, Ent. Syst., Suppl., 563, 1798.

Notogramma stigma, Loew, Smithsonian Misc. Coll. **11,** art. 3: 148, 1873.

Piti, Aug. 18, one specimen, swept from *Glochidion marianum,* Swezey.

An American species which occurs in Hawaii; now recorded from Guam for the first time.

18. *Scholastes aitapensis Malloch, Linn. Soc. N. S. Wales, Proc. **64**: 128, pl. 5, fig. 24, 1939; B. P. Bishop Mus., Bull. **172**: 207, 1942.

Two specimens in Bishop Museum, labeled *S. bimaculatus* Hendel, Fullaway.

19. *Scholastes hirtiventris Malloch, B. P. Bishop Mus., Bull. **172**: 208, 1942.

Three specimens in Bishop Museum, Fullaway. Determined by C. S. Banks as *S. sexvittatus* Walker.

FAMILY TRYPETIDAE

20. Dacus cucurbitae Coquillett, Ent. News **10**: 129, 1899.

This is the notorious melon fly which was described on material from Hawaii, where it appeared as an immigrant cucumber and melon pest prior to 1899. It has also been recorded in India, Ceylon, Java, Timor, Philippines, Singapore, southern China, Japan and Australia.

It was first discovered in Guam on November 7, 1936, when we found infested cucumbers in a school garden at Piti. From these cucumbers, 161 flies issued on November 16 to 18. Apparently it was of somewhat recent introduction in Guam and had not yet become widely spread, for the principal cucumber growers had not reported any injury by it. Search for the pest was made in November in various districts of Guam. In a garden on the plateau above Agana, one malformed cucumber was found which showed injury by the maggots, and two small pumpkins were infested with maggots. On November 21, at the Agana vegetable market, an infested cucumber was found which had come from a Talofofo garden. No evidence was found of the pest in other localities at that time.

FAMILY EPHYDRIDAE

21. Discomyza maculipennis (Wiedemann).

Notiphila maculipennis Wiedemann, Anal. Entom., 57, 1824.

Discomyza maculipennis, Bezzi, Diptera of Fiji Islands, 154, 1928.

A cosmopolitan species, occurring in Hawaii, and now recorded in Guam for the first time. Piti, May 1, Usinger, Sept. 13, Swezey; three specimens in Bishop Museum, Fullaway.

FAMILY AGROMYZIDAE

22. *Phytomyza spicata Malloch, Hist.-Nat. Mus. Nat. Hung., Ann. **12**: 1914.

Dededo, May 11, especially abundant; Yigo, May 19 and Nov. 13; Mt. Alifan, May 26; Barrigada, June 24; Piti, July 31 and Aug. 9.

Described from Formosa and occurs in Fiji and Samoa. Not previously recorded in Guam, where we found it very abundant. The larvae are leafminers in young corn plants, producing narrow, longitudinal, parallel mines and often as many as 100 per leaf. Very injurious to the early growth of corn plants. Apparently well controlled later by the eulophid parasite, *Hemiptarsenoideus semialbiclava* Girault, which reared out abundantly. Leafminer work was observed nearly everywhere on young corn.

HYMENOPTERA

NEW SPECIES OF GUAM CHALCIDOIDEA

By D. T. Fullaway
Board of Agriculture and Forestry, Honolulu

The material upon which these descriptions are based was in the hands of A. B. Gahan at the United States National Museum for determination and description. However, due to the pressure of his other duties, it was arranged that I describe the new species. Holotypes are to be deposited in the United States National Museum; paratypes, where available, are in the collection of the Hawaiian Sugar Planters' Association Experiment Station.

Family CHALCIDIDAE

1. Haltichella swezeyi, new species.

Female: 2.5 mm. long, shining black, the abdomen largely polished, antennal scape, tegulae, and tarsi brown, base and apex of the femora and tibiae, apex of the coxae and the trochanters brownish. Head and thorax (pronotum, mesoscutum, scutellum, and axillae) rather coarsely, closely and shallowly punctuate, the sculpture on the occiput becoming so coarse and that on the front and face so shallow that the punctuations disappear and reticulations take their place; propodeum areolate on the disk, coarsely reticulately sculptured on the lateral wings; mesepisterna for the most part coarsely sculptured but partly smooth and polished or striate, the posterior sclerite somewhat grooved or eroded and the diagonally directed anterior margin marked by a long row of minute shallow foveae. Abdomen smooth above to apical margin of 2d segment although this is finely aciculate on the side, following segments finely sculptured and shining, 1st segment at base fluted, hind coxae and femora finely sculptured also; a silvery pubescence accompanies the punctuation.

Head wider than thorax, transverse; as viewed from above, width about three times length, eyes fairly large, short oval, convex, naked, reaching to top of head and to a point on side which is 0.75 their length removed from base of mandibles; antennae fairly long, slender, cylindrical, attached fairly close together near the mouth opening, 13-segmented, scrobes united in a deeply eroded smooth groove which reaches to the top of the head, below a short ridge between antennal sockets; scape reaches top of head and is as long as five following segments, pedicel obconic, 2.5 times as long as wide, following joint the shortest and globular in shape, remaining joints of the flagellum are each a little longer than wide and very gradually increasing in thickness outwardly, the last one pointed apically. Frontovertex and face confluent, both slightly convex, mandibles moderately stout, 1.5 times as long as wide at base, apical margin toothed; malar space four to five times width of mandibles; genae wide below but narrowing above middle of eye; occiput convex but eroded in middle; ocelli in form of obtuse triangle, lateral members one diameter removed from eye margin, two from anterior member.

Thorax twice as long as wide and as wide as deep; pronotum transverse, convex above and at sides, declivous in front where it narrows into a short neck, mesoscutum twice as wide as long, anterior margin arcuate, the curve outward, posterior margin straight, convex, parapsidal grooves distinct, converging posteriorly but quite far apart at posterior margin, scutellum scutate, rounded behind, the disk convex, posteriorly

margined and slightly overhanging, axillae triangular, inner angles meeting at center, metanotum transverse, declivous, propodeum extended in horizontal plane but convex, wide at base narrowing to a fairly broad neck.

Abdomen about same length as thorax, suboval but apically extended and pointed, convex above, compressed laterally, first segment occupying nearly half the length, following segments 2 to 5 transverse, more or less narrow, ovipositor concealed beneath; front and middle legs slender, hind legs stouter, especially the coxae, femora, and tibiae; the femora flattened, lenticular and with a toothlike projection and a finely denticulate, wide, flat comb on the lower margin; tibiae with grooved upper surface.

Forewings more or less spatulate, hyaline with brownish suffusions in middle interrupted by an upper and lower round clear area; submarginal vein long, marginal shorter, less than half the length of the submarginal, stigmal short, postmarginal still shorter, the venation not reaching beyond middle of anterior margin of wing; marginal ciliation inconspicuous, discal fine but in the proximal infumate area under the marginal vein it is longer.

In the male, the small third joint of the antennae is transverse instead of globular and the pedicel is less than twice as long as wide.

Piti, Nov. 7, ex bean leafminer, holotype female, one paratype male, Swezey; Piti, Aug. 16, ex bean leafminer, allotype male, Swezey. Three additional specimens, Agana, May 15, Swezey; Agana, May 25, Usinger; Piti, June 13, Swezey.

Family EUPELMIDAE

2. Zaischnopsis usingeri, new species.

Female: 2.5 mm. long, metallic blue-green, the legs fuscous to the tarsi which are pale yellow, the coxae and antennae metallic green, antennae fuscous outwardly, hind femora golden-yellow at base. Mostly smooth and shining, fine pin-point punctuation on head, scutellum shagreened and dull; patches of short appressed silvery hairs on the face and episternae in front, on the axillae and hind coxae, also on underside of abdomen.

Head semiglobular, the eyes large oval, reaching top of head above, and below three fourths the distance to base of mandibles, the inner margins diverging anteriorly, the outer curved and forming lateral margin of head; frontovertex small, just large enough to enclose the ocelli, which are arranged in the form of an equilateral triangle, the lateral members placed close to the eye margin; face narrow above, widening below to three to four times its upper width and occupied largely by the antennal scrobes, which are deeply excavate; below, a triangular flat-topped ridge lies between basal third of the scapes; genae and occiput fairly wide and convex, a distinct carina separating the genae from the face; antennae long (reaching apical margin of thorax), slender, geniculate, attached to lower face not far from mouth opening and rather widely separated at base, 13-jointed, the scapes long, slender, curved, and somewhat flattened (concave inner side, convex outer), the flagellum slender, filiform, widening somewhat outwardly, the distal three segments comprising the club flattened to some extent; mandibles fairly long and stout, apically toothed.

Thorax several times longer than wide, somewhat flat, prothorax longer than wide and narrowed apically to a slender neck, the dorsal surface longitudinally furrowed down the middle; mesonotum slightly convex on the sides, sunken in the center behind a triangular boss and between two sharp longitudinal ridges; scutellum scutate, apically rounded and declivous behind, hardly convex, rather flat and bearing on the disk an extensive brush of short, stiff, erect black hairs posteriorly; axillae small, triangular flat sclerites lying in longitudinal rather than transverse direction with saw-toothed basal margin and widely separated so that the inner angles are far apart; episternum elongate,

convex; metanotum and propodeum depressed, conspicuously elevated and convex at the posterior lateral angle.

Abdomen shorter than thorax, oval, depressed, ovipositor extruded but slightly.

Forewings three times as long as greatest width, spatulate, marginal and submarginal veins nearly of equal length, postmarginal longer than stigmal, which diverges from the costal margin at 15-degree angle beyond middle of wing; marginal and discal ciliation short, fine, and complete; a large part of the wing infumate, only the apical fourth and a triangular area behind stigma hyaline.

Legs fairly stout, femora and tibiae compressed or flattened to some extent.

Piti, Oct. 5, reared from eggs of a katydid, holotype and two paratypes, all females, Swezey.

Family TORYMIDAE

3. **Sycoryctes guamensis,** new species.

Female: 3 mm. long, from head to tip of ovipositor, the body itself being only 0.75 mm., aeneus, antennae fuscous beyond the pedicel but it and the scape yellowish brown, legs also, except the coxae, which are mostly concolorous with the body. Wings hyaline.

Head and thorax shagreened, abdomen more finely sculptured. Head transverse, more than twice as wide as long, eyes oval, convex, red, frontovertex twice as wide as long, ocelli in form of obtuse angle on vertex, the lateral members close to eye margin (less than one diameter removed). Face equally wide. Antennae attached in lower center, on line with lower level of eyes and close together, the genae, postgenae and occiput full and rounded. Antennae rather short (hardly longer than thorax), composed of scape, pedicel, ring joint, 5-jointed funicle and 3-jointed club; scape somewhat expanded basally, more than three times as long as pedicel, which is obconic and twice as wide at apex as the transverse ring joint, funicle joints no wider and subequal in length, which is about twice the width, club not as long as scape but more than twice length of pedicel, all these outer joints bearing whorls of stout hairs and many sensory pits.

Body depressed; prothorax transverse, about three times as wide as long behind but narrowed in front; mesonotum transverse, twice as wide as long, with parapsidal grooves extending inward from the anterior lateral angle less than half the length of the sclerite; scutellum large, with wide base and rounded apically, almost flat; metanotum transverse. Abdomen elongate-ovate, with wide base and pointed apically. Ovipositor extending beyond the tip four times the length of the abdomen, reddish brown for most of its length, but black at base and apex, where it is a little swollen. Legs normal, hind ones stout and flattened throughout, fore tibiae with a strong spur, middle tibiae quite long and with two spurs, tarsi 5-jointed. Forewings short, fairly wide and rounded apically, the disk beset with fine short hairs resembling puncture points, and hind margin bearing a fringe of rather short hairs less than one tenth as long as greatest width of wing; marginal and postmarginal veins subequal and together not much longer than the submarginal; radius diverging at an angle which is quite wide but less than ninety degrees, its length about one half the postmarginal vein, thin at base but expanded apically to form a triangular spur and with four pustular organs in a line extending inward from outer edge near apex. There are also a number of setaceous hairs on the vein and in the field of the disk lying beneath the marginal nervure.

Barrigada, June 24, holotype; Yigo, Oct. 21, six paratypes; Mt. Chachao, May 16, one paratype; Sumay Road, June 15, 10 paratypes; all ex figs of large-leaved *Ficus,* Swezey.

4. Megastigmus mariannensis, new species.

Female: 2 mm. long, with ovipositor which is somewhat curved, and extended beyond the tip of the abdomen; yellowish brown, abdomen infuscated; antennae also, outwardly, legs straw-yellow; ovipositor black. Wings hyaline. Microscopically fine sculpture present throughout but still dully shining; some extremely fine transverse striae on pro and mesonotum.

Head orbiculate, viewed from above transverse and nearly twice as wide as long; eyes laterally placed, fairly large, convex, red; the rather wide occiput, thin frontovertex and quadrate face, together with the rather full cheeks, comprising a continuous, convex, smooth and shining surface, broken only by the antennal scrobes, which join in upper half, are there quite deep, and reach as far as the ocelli. These are located on frontovertex in the form of an obtuse triangle, the lateral members removed from each other about two diameters and from the eye margin about one; sparse hairy clothing present, the most notable feature of which is the line of black setae on either side of the face lying about midway between the inner eye margin and the outer scrobal margin; antennae are of moderate length, composed of scape, pedicel, five funicle joints and three-jointed club. Scape long and slender, more than twice as long as pedicel which is obconic, both pale straw-yellow; funicle joints, except slender first joint, short, hardly longer than wide, gradually increasing in size outwardly; club as long as funicle and twice as thick, clothed with hairs; clypeus not definitely set off by a suture; oral opening small; mandibles short triangular, apical margin bearing several teeth.

Thorax of rather slender build, not as wide as head, more than twice as long as wide, convex; the prothorax nearly as long as the mesothorax, fairly wide behind but narrowed in front; mesonotum divided into three lobes by rather prominent and well-marked parapsidal grooves; scutellum roughly hexagonal in outline, separated from middle lobe of mesonotum by a shallow groove; the axillae triangular and obscurely separated from the lateral lobes of the mesonotum; metanotum transverse and declivous; all sparsely clothed with black setaceous hairs.

Abdomen depressed above and compressed laterally, plowshare-shaped with a strong curved ovipositor of equal length, all clothed with pale or blackish hairs. Legs normal, of moderate length, rather slender. Wings long and narrow, marginal and postmarginal of equal length and shorter than submarginal, which receives a thin, straight nervure identified as pseudo-basal; stigmal vein with a rather large round knob, which is almost sessile; marginal setae short, rather fine on posterior margin but stouter on anterior; discal ciliation rather dense clothing of very short hairs beyond basal nervure, sparser proximad.

Male: similar to female except in secondary sexual characters.

Yigo, Oct. 21, ex small fig, holotype female; Tarague, May 17, ex larger fig, one female, one male; Barrigada, June 24, ex *Ficus mariannensis,* one female, one male, paratypes. All collected by Swezey.

5. Otitesella swezeyi, new species.

Female: 1.5 mm. long, metallic green, shagreened, punctuate, the punctuations minute and rather sparse, the mesonotal sculpture appearing as fine transverse striae, basal segments of the antennae and the legs distally from the coxae yellowish brown, eyes red, wings hyaline.

Head orbiculate, viewed from above transverse, somewhat menisciform, width about three times the length; occiput, frontovertex, face, and genae forming one continuous moderately convex surface; frontovertex and occiput both rather narrow, the ocelli situate on the former and arranged in form of a very obtuse triangle, the lateral members less than one diameter from eye margin and more than three from the median, anterior

member; eyes lateral, oval, long diameter vertical, convex, antennae attached in middle of face, above line drawn from lower margin of eyes, short, not as long as thorax, composed of scape, pedicel, several ring joints, five funicle joints and three-jointed club; the antennal scrobes are rather deep but short, not nearly reaching the ocelli; the scape is several times longer than wide, pedicel obconic, 1.5 times as long as wide, funicle joints transverse, increasing in thickness outwardly, the club a little more so, its three joints combined less than one half the length of the funicle, both well clothed with short, stiff, gray hairs, cheeks and postgenae fairly wide, the latter narrowing down to the slighter width of the occiput.

Thorax twice as long as greatest width, moderately deep, convex dorsally and ventrally, pronotum transverse, wide behind but narrowed in front, quite short; mesonotum considerably wider than long, with well-marked, inwardly (front to back) curved parapsidal grooves and a deep sulcus on the scutellar margin; axillae small; scutellum quite large, scutiform and only moderately convex; metanotum narrow in the middle but widening considerably at sides.

Abdomen sessile, as long as thorax and head together, fairly wide basally, compressed from the sides, only the first tergite more or less flat dorsally, the following are knife-edged, sparsely hairy on sides; ovipositor slightly protruded, the valves flat and heavy.

Legs normal, the coxae, femora, and tibiae somewhat flattened, of equal length, the tarsi slender and a little longer.

Wings fairly wide and long, the veins thin and pale, marginal much shorter than submarginal and twice as long as either the postmarginal or stigmal, which are subequal in length, discal and marginal ciliation inconspicuous.

Piti, Oct. 10, ex fruit of small-leaved fig, holotype, Swezey.

Family ENCYRTIDAE

6. **Ooencyrtus guamensis,** new species.

Female: 1 mm. long, stout, black with metallic bluish or greenish reflections, antennae and legs outwardly to tibiae fuscous, the latter as well as tarsi pale yellowish brown.

Head transverse, moderately lenticular, frontovertex lying in the horizontal plane, a little longer than wide, ocelli in form of an equilateral triangle, the lateral members close to the vertical and ocular margin, surface finely shagreened and sparsely punctuate with fine pin-point punctuations, eyes lateral, short oval in shape, large, convex, hairy, face in the vertical plane widening considerably toward mouth and rather deeply excavate above where antennal scrobes join, below separated by a rather wide flat ridge. Antennae fairly long (as long as head and thorax together), and only moderately stout, more or less filiform, scape elongate, slender, and extending a little beyond upper limit of face; pedicel short, only twice as long as wide at apical end, obconic, nearly twice as long as any of the funicle joints, which are scarcely if any longer than wide, club as long as the last three joints of the funicle together, somewhat expanded and flattened, ending in a blunt point, all clothed with short silvery hairs, mandibles short and stout, toothed apically on outer third of apposed edges, the remainder of the cutting edge truncate and blunt, genae long and narrow, three fourths length of eye.

Pronotum transverse, narrow above, declivous in front, mesonotum convex, transverse, ovoid in shape with front and hind margins both curved outward, therefore longest down the middle line where the length is less than half the width, smooth and shining but uniformly and rather closely punctuate, the fine pin-point punctuations bearing short, stiff, appressed silvery hairs, scutellum rather large, convex, triangular, with rounded apex, shagreened and a dull black, also sparsely clothed with rather long black hairs, axillae triangular, smooth, and shining, apices not meeting medially, metanotum short, transverse, pleura large, discoid, convex, both shining blue-green. Abdomen short, hardly

as long as thorax and widest along apical margin of first segment where width exceeds that of thorax, abruptly narrowing beyond to terminate in a blunt point, much depressed and dorsally sunken. Ovipositor scarcely extruded.

Wings hyaline, long ovate in shape with the posterior margin straight from beyond middle to base, marginal vein punctiform, stigmal vein short but twice as long as postmarginal and hooked at apex, discal ciliation fine and close to speculum, which widens posteriorly, basally beyond speculum the ciliation is not so close and fine and extends only half way to base of wing, where the wing is quite bare, submarginal vein bearing a few setiferous hairs, marginal ciliation short and close. Legs moderately long and stout.

Male: smaller, the frontovertex wider than long, antennae and legs yellowish brown, the former decidedly filamentous, the funicle joints twice as long as wide, club not expanded and shorter than the last two funicle joints, clothed with whorled hairs on flagellum.

Piti, Sept. 15, reared from puparium of a syrphid fly, on corn leaf, 13 females, 6 males (holotype, allotype, and paratypes), 15 other specimens, Swezey.

7. **Ooencyrtus swezeyi,** new species.

Females: 0.7 mm. long, cadmium yellow to fuscous on head and thorax, but with scutellum dark metallic green, metanotum and pleurae, also apical segments of abdomen, eyes, antennae, and hind tibiae black or blackish.

Body compact, head not decidedly lenticular but somewhat so in outline when viewed from above; seen from the side, the outline is that of an isosceles triangle with the line of the front and face forming the two short sides. Eyes lateral, short oval in shape, large, convex; frontovertex more than twice as long as wide (shorter and wider in male) with the ocelli in the vertical end arranged in an equilateral triangle; front half punctuate along the eye margins, the punctuations fine pin-point punctures bearing short black hairs; front not meeting face abruptly but the two planes merging gradually in a well-rounded junction; face widening considerably in the direction of the mouth, the antennal scrobes rather broad and shallow. Antennae fairly long and stout, nearly as long as the thorax, scape long and slender, somewhat fusiform, reaching a little beyond the upper limit of face, pedicel obconic, more than twice as long as the apical width, twice as long as any of the six funicle joints, which are separately a little longer than wide, club as long as the last three funicle joints, entire funicle cylindrical, the club a little stouter, all the joints clothed with black hairs (individual joints flecked with white in some specimens). Pronotum declivous, separated from mesonotum by a distinct carina which is transverse, three times as wide as long, smooth and shining but uniformly punctuate, the fine pin-point punctuations bearing short black hairs; scutellum rather large, convex, nearly as long and as wide at base as mesoscutum, scutiform, with shagreened surface and fine pin-point punctuations seating short black hairs as in mesonotum; axillae small, narrow, not meeting medially; metanotum and pleurae smooth and shining. Abdomen small, shorter by one half than the thorax, triangular in shape, depressed; ovipositor scarcely extruded. Wings hyaline, marginal vein punctiform, not much longer than wide, stigmal vein a little longer than postmarginal, expanded some at apex and hooked or clawed, longer than the body and about one third as wide, long ovate in shape with the posterior margin straight from beyond middle to base; discal ciliation fine and close to speculum, which widens posteriorly; basally beyond the speculum the ciliation is not so close and fine and extends only half way to base of wing where the wing is quite bare; submarginal vein bearing seven or eight fairly long and stout hairs; marginal ciliation short and close. Legs moderately long and stout, generally concolorous with body.

Piti, July 30, six specimens reared from eggs of *Herse convolvuli* (Linnaeus) on *Ipomoea* leaves, holotype female and allotype male on one tag, four

paratype females on separate tags; Orote Peninsula, July 19, one male paratype, head missing, ex sphingid egg on *Caesalpinia;* Dededo, May 11, one female paratype collected from *Piper guahamense;* Dededo, Sept. 7, one female paratype, reared from sphingid egg on *Guettarda.* All collected by Swezey.

8. Cheiloneurus chrysopae, new species.

Female: 1.5 mm. long, golden-yellow with metallic green infuscations on head (cheeks and frontovertex), thorax (mesonotum), and abdomen basally. Antennal club, eyes and scutellar brush black, legs pallid, the femora and tibiae slightly fuscous.

Head approaching the hemispherical in shape, viewed from above nearly circular in outline, from the side the outline is that of an obtuse triangle with the line of the occiput forming the long side and that of the face and the frontovertex respectively the two shorter sides, the respective planes of the frontovertex almost at right angles to each other, the former being horizontal and the latter nearly vertical; the eyes are of moderate size, oval, convex, naked; frontovertex elongate, hourglass-shaped, twice as wide in front and behind as in the middle and six times as long as the width there, with its surface coarsely shagreened; ocelli small, the anterior member marking the point of an acute angle, the lateral members close to the eye margin and not far from the vertex. Face considerably excavated to form the widely separated antennal scrobes, central field elevated and convex. Antennae attached not far from the mouth opening, generally cylindrical and rather short and stout, consisting of nine segments (scape, pedicel, six funicle joints, and undivided club). Scape long and slender, somewhat fusiform, reaching beyond the upper margin of the face and to lower margin of eye, pedicel obconic, less than one sixth length of scape, funicle joints all transverse and widening outwardly, the sixth twice as wide as the first, all six together shorter in length than the scape, club still wider at mid length, flattened and equal in length to the funicle, all the joints clothed with short silvery pile; cheeks coextensive with the lower part of frontovertex, rather wide and convex, and shagreened; mandibles short, blunt and three-toothed.

Pronotum short, transverse, convex; mesonotum transverse, twice as wide as long, convex, shagreened and heavily clothed with short, appressed, silver-gray hairs; scutellum scutiform, convex, also clothed with longer, coarser hairs which form a brush at apex; axillae triangular, apices touching in middle line; metanotum transverse, declivous.

Abdomen roughly ovate, pointed apically, considerably shorter than the thorax, widest at apical margin of first segment, median segments considerably depressed, sparsely clothed with silvery hairs apically. Ovipositor not projecting beyond tip of abdomen.

Forewings spatulate, three times as long as wide, marginal vein only half as long as submarginal, reaching halfway along costal margin, stigmal and postmarginal short, marginal ciliation short outwardly, a little longer on caudal margin basally, eight to ten longer setaceous hairs on submarginal vein, the discal ciliation close and fine, the disk of wing infumate in outer two thirds almost to apical margin with a short clear streak below stigma. Legs fairly long and stout, the spur on median pair as long as metatarsus.

Male: smaller and more dusky, head entirely metallic green, frontovertex wider than in female, wider than eyes but still longer than wide; antennae pallid, filiform, clothed with whorls of long hairs, all the funicle joints twice or more longer than wide, club not enlarged or flattened; wings hyaline, entirely without infumation.

Described from five females and three males (holotype, allotype and paratypes) as follows: holotype female and allotype male mounted on a single point, two more points, each with one male and one female paratype, and one point with two female paratypes, labeled Merizo, June 11, reared from a *Chrysopa* cocoon, Swezey. Six other specimens.

9. Cerchysius guamensis, new species.

Female: length 2.75 mm. exclusive of ovipositor which is 1.75 mm. long; robust, metallic blue-green in color, eyes and antennae black, sheaths of ovipositor and legs brown, tarsi, however, particularly hind tarsi, infuscated; wings hyaline, slightly infumate.

Head semiglobular, convex in front, concave behind, vertical in position (viewed from above lenticular in outline, from the side approaching the semicircular, from front subcircular), transverse (width more than twice length anteriorly-posteriorly and about equal the depth), occipital margin rounded, eyes fairly large, oval, touching occipital margin above and reaching three fourths the distance to oral margin; frontovertex and face confluent, convex, frontovertex not as wide at narrowest to greatest width of eye but widening both behind and in front (if anterior margin is fixed at upper limit of antennal scrobes it is twice as long as narrowest width), finely shagreened, ocelli placed in an equilateral triangle in posterior part, the lateral members touching ocular margin but removed several diameters from the occipital; face twice as wide below as above, with the antennae attached fairly close together at about the middle, the scrobes therefore short (less than one third length of scape) with a prominent ridge between, both frontovertex and face sparsely punctuate with fairly large but shallow punctuations, these occurring for the most part above in a double line along the ocular margin but more widely spread on the lower face which is clothed with short silvery hairs; antennae filiform, long and slender (if extended would reach beyond thorax), scape elongate, as long as depth of head, pedicel obconic, about one sixth length of scape, funicle joints six and with club all of equal or nearly equal length and each more than twice as long as the funicle, about three times as long as wide, somewhat flattened outwardly and clothed with a fine pile; mandibles stout, twice as long as wide and toothed on the broad cutting edge; genae distinctly separated from the face, fairly wide and convex, narrowing to a point above middle of eye where it meets occiput.

Prothorax transverse, short anteriorly-posteriorly and convex, declivous in front, posterior margin arcuate; mesonotum also convex, nearly as long as wide, both anterior and posterior margins arcuate, the curve being outward, finely shagreened and finely, evenly and fairly closely punctuate, the punctuations bearing short black appressed hairs; scutellum scutiform, convex and rounded apically, also finely but more sparsely punctuate and hairy; axillae triangular, apices meeting medially; metanotum transverse, declivous behind, smooth and shining, the side pieces with conspicuous spiracle, pleura also smooth and shining, convex.

Abdomen as long as thorax and as wide at first segment but beyond gradually narrowing to a point and depressed dorsally; ovipositor extended strongly and quite stout.

Wings spatulate, 2.5 times as long as wide, marginal vein quite short, not as long as the short postmarginal and stigmal, submarginal not nearly reaching middle of costal margin of wing and bearing about 20 setaceous hairs, which become more crowded outwardly; marginal ciliation inconspicuous, discal ciliation fine and close outwardly from the wedge-shaped speculum which extends diagonally inward from stigma; proximad of this the ciliation is a little sparser and uneven. Legs long and stout, the spur on the middle tibiae almost as long as the metatarsus.

Male: similar to female in most respects but with following differences: smaller in size, the frontovertex wider (width between eyes almost equaling length and just short of the width of the eye); ocelli arranged in an obtuse triangle, distance between the laterals greater than distance between laterals and anterior member; antennae more heavily clothed with whorls of long hairs, shorter, the scape about half the depth of the head.

Fadian, Sept. 18, ex *Ceresium* larvae, Swezey. Described from two females and one male (holotype, allotype, and paratype) mounted on pin points; two additional specimens, one male, one female.

All specimens issued from the same host. They had pupated within the dried skin of the larva of *Ceresium unicolor* which was found in wood of an unidentified tree (native name *paipay*).

10. Pseudhomalopoda guamensis, new species.

Female: 1 mm. long, metallic blue-green on head and thorax dorsally, abdomen and ventral surface of thorax bluish black without metallic reflections, legs fuscous except at the joints where they are a dirty white, antennae dusky with the club and distal joint of the funicle sordid white. Head: frontovertex rather coarsely shagreened, face and cheeks finely so, mesonotum microscopically reticulately sculptured, a few fine pin-point punctuations bearing fine black hairs scattered over the surface, scutellum shagreened on the triangular disk and bearing three hairs in a row on both lateral margins; otherwise body so finely sculptured as to appear smooth and shining.

Head transverse, viewed from above lenticular, width three times length anteriorly-posteriorly, flat, lying in horizontal plane, in side view triangular with the frontal and occipital margins forming the short sides, the retracted face the long side; eyes fairly large, oval, convex, partly on the top and partly on side of head, the lowest point in the margin lying beneath the attachment of the antennae; frontovertex occupying a third of the top of the head, nearly quadrate in form, the posterior (occipital) margin rather deeply incised, the anterior (frontal) margin carinate; the ocelli are situated in the middle and form an obtuse triangle, the lateral members less than one diameter removed from the ocular margin and several diameters from the anterior member, a stout, erect, black scalelike hair arises from the occipital margin on either side behind eye; the face widens considerably below eyes; the antennae are attached at about the middle of the face and are far apart; the upper part of the face is excavated to form the scrobes although between the lower scapes there is a short flat ridge; the genae are quite wide; the mandibles are small, slender, and pointed apically; antennae short and fairly stout (as long as width of head) consisting of nine segments, scape as long as head and with a leaflike expansion downward apically, pedicel obconic, less than a third the length of the scape and less than twice as long as apical width; of the four funicle joints, the 1st and 4th are quadrate, the 2d and 3d transverse or wider than long, the combined length of the four less than that of the scape and about equal to that of the club, which is somewhat flattened and apically pointed, the apical joint shorter than the other two.

Thorax longer than wide and not very deep (more or less depressed), pronotum transverse, crescentic, both anterior and posterior margins arcuate, the curve in both cases being cephalad; mesonotum also transverse, twice as wide as long, anterior margin coinciding with hind margin of pronotum, posterior margin nearly straight, more or less convex; scutellum scutate, posteriorly rounded, and bearing two stout scalelike hairs on posterior margin; axillae small, triangular, apices directed inward and touching at about midline; metanotum and propodeum declivous and rather flat behind, as wide as the mesonotum and fairly long, the posterior angles full and bearing a prominent spiracle.

Abdomen as long as the thorax and at base as wide but narrowing apically to a blunt end with the ovipositor projecting behind about a fourth the abdominal length, the abdomen itself generally flat or depressed.

Legs only moderately long and not particularly stout, the spine on the middle tibiae longer than the metatarsus.

Forewings nearly three times longer than greatest width, spatulate, the marginal vein within the proximal half of wing short and thick and bearing many crowded stiff black hairs or bristles, submarginal long, probably 10 times longer than the marginal, with nine stout bristles evenly distributed along its length, stigmal half the length of marginal and very thin, diverging from costal margin at a 15-degree angle and bearing a line of three sensory pits apically, postmarginal vein indistinct; marginal ciliation short to apex of wing where it increases in length several times and on caudal margin becomes even

longer, probably one tenth the width of the wing; discal ciliation follows generally the pattern of infumation although apically and caudally there is a ciliated area not obfuscated; there are three hyaline areas along the costal margin and three corresponding areas along caudal margin; the base of the wing is also hyaline and the outer costal hyaline area is triangular in shape with apex directed apically.

Piti, Oct. 27, swept from scale-infested bamboo, Swezey. Described from 12 specimens, all females, six mounted on points and six on a slide (holotype and paratypes); 12 additional specimens, mounted on points, from same source.

NOTES ON SOME GUAM CHALCIDOIDEA

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The material reported on in this paper includes specimens collected by me in Guam in 1936 and by D. T. Fullaway in 1911 (Haw. Ent. Soc., Proc. 2:285-288, 1913). Most of it was sent to A. B. Gahan at the United States National Museum for study, but, as Mr. Gahan lacked the time to prepare a report on the collections, representatives of 10 new species were turned over to Mr. Fullaway for description (p. 201) and I added Gahan's identifications to this paper. Many species in the list remain undetermined because of paucity of material.

I wish to thank Mr. Gahan for his aid and cooperation in identifying the specimens.

Family AGAONIDAE

1. **Blastophaga innumerabilis** Fullaway, Haw. Ent. Soc., Proc. 2: 286, 1913.

The species was reared abundantly by Fullaway from the fruit of native *Ficus* trees in 1911, and by Swezey in 1936 from fruit of a narrow-leaved *Ficus* at Yigo, Oct. 21 and Nov 8.

2. **Blastophaga** species ?

Another species of *Blastophaga* was reared from a different species of *Ficus*. The specimens were referred to Dr. Grandi in Italy for determination, and have not yet been reported on.

Family TORYMIDAE

3. **Odontofroggattia** species.

Barrigada, June 14, ex fruits of small-leaved *Ficus,* Swezey. One slide mount, retained at National Museum.

4. New genus.

Near Mt. Chachao, Sept. 22, 10 specimens ex fruits of a large-leaved *Ficus,* Swezey.

5. Genus?

Thirty-nine specimens, ex fruits of small-leaved *Ficus:* Barrigada, June 14; near Mt. Chachao, June 16; Yigo, Oct. 21 and Nov. 8, Swezey.

6. Genus?

Yigo, Oct. 21, a single specimen ex fruit of small-leaved *Ficus,* Swezey.

FAMILY CHALCIDIDAE

7. **Brachymeria hammari** (Crawford).
Chalcis hammari Crawford, Ins. Inscit. Mens. 3 : 89, 1915.
Chalcis sp., Fullaway, Haw. Ent. Soc., Proc. 2 : 285, 1913.
Dededo, May 11, ex pupa on leaf of *Guettarda speciosa,* Swezey; Taragüe, May 17, Swezey; Mt. Alifan, May 21, Usinger; Agat, May 31, ex cocoon of coconut moth, *Agonoxena pyrogramma* Meyrick, Swezey; Ypan, June 8, ex pupa of European corn borer, *Pyrausta nubilalis* (Hübner) Swezey; Piti, June 29, ex pupa of *Timandra aventiaria* Guenée on *Pithecolobium,* Swezey; Piti, Sept. 12, swept from *Pithecolobium,* Swezey; Agat, Sept. 20, ex pupa of rice leafroller, *Susumia exigua* (Butler), Swezey. Nine specimens, five of which are retained in U. S. National Museum. Mostly reared specimens. Eleven specimens in Bishop Museum collected by Fullaway in 1911 and recorded as *Chalcis* sp.
This is a parasite on lepidopterous pupae.

FAMILY EURYTOMIDAE

8. **Eurytoma** species.
Upi Trail, May 5, one specimen swept from ferns, Swezey.

FAMILY EUCHARIDAE

9. **Chalcura upeensis** Fullaway, Haw. Ent. Soc., Proc. 2 : 285, 1913.
An ant parasite, described by Fullaway from a single male specimen. Two specimens, Upi Trail, May 5, in the same district where it was collected by Fullaway in 1911. Two specimens, one retained in U. S. National Museum.

10. **Schizaspidia,** new species.
A single specimen, Barrigada, June 12. Retained in U. S. National Museum.

FAMILY PTEROMALIDAE

11. **Merisus** (?) species.
Piti, May 1, a single male ex dipterous leafminer in *Morinda,* Swezey.

12. **Isoplata** species Fullaway, Haw. Ent. Soc., Proc. 2 : 286, 1913.
Three specimens in Bishop Museum, collected by Fullaway in 1911.

FAMILY MISCOGASTERIDAE

13. **Tomocera californica** Howard, U. S. Dept. Agric., Div. Ent., Ann. Rept. (1880), 368, 1881.
Umatac, May 14; Orote, May 24; Santa Rosa Peak, May 19; Sumay, June 6 and 21, ex hemispherical scale; Mt. Alifan, June 19; Sinajana,, June 15; Piti,

Oct. 27 and 29, Nov. 15, nearly all by sweeping, Swezey and Usinger. Fourteen specimens, five retained in U. S. National Museum. There are four specimens in Bishop Museum, collected by Fullaway in 1911. A scale parasite.

FAMILY SPALANGIIDAE

14. **Spalangia philippinensis** Fullaway, Haw. Ent. Soc., Proc. 3: 292, fig. 1, 1917.

Piti, May 23, swept from bean vines, Swezey; Machanao, Aug. 6, swept from *Piper guahamense,* Swezey; Piti, Sept. 21, ex puparium of *Ophyra chalcogaster* Wiedemann in cow dung, Swezey; Piti, Nov. 15, swept from bamboo, Swezey.

This dipterous parasite was introduced into Hawaii from the Philippines in 1914. It was introduced from Hawaii to Guam in 1928. By 1930 it became so well established that house fly and stable fly puparia collected about the Experiment Station grounds showed a parasitism of 75 to 80 percent. Four specimens, one retained in U. S. National Museum.

15. **Spalangia cameroni** Perkins, Fauna Hawaiiensis 2(6): 656, 1910.

Recorded by Fullaway from his 1911 collecting.

16. **Chaetospila elegans** Westwood, Thesaur. Entom. Oxon., 137, pl. 25, fig. 10, 1874.

Spalangia metallica Fullaway, Haw. Ent. Soc., Proc. 2: 286, 1913.

Described by Fullaway from a single specimen collected in 1911. Later it was found to be synonymous with *C. elegans.* We did not collect it in 1936.

FAMILY CLEONYMIDAE

17. **Ptinobius** species.

Piti, Oct. 9, a single specimen ex larva of *Agrilus occipitalis* (Eschscholtz) in orange branch, Swezey. One specimen, retained in U. S. National Museum.

FAMILY EUPELMIDAE

18. **Anastatus picticornis** (Cameron).

Solindenia picticornis Cameron, Ent. Soc. London, Trans., 189, 1898.

Piti, May 1, in house, Usinger; Piti, July 5, 9, and 19, in house and on mango leaves, Swezey; Piti, Sept. 24, Swezey. Eight specimens, four retained in U. S. National Museum.

A parasite of roach egg capsules. Described from the Hawaiian Islands.

19. **Anastatus** species.

A single male, Dededo, May 11, Usinger.

20. Eupelminus (?) species.

Ritidian Point, April 16, Bryan; Upi Trail, May 5, Bryan; Barrigada, June 12, Swezey; Yona, Nov. 18, swept from coconut leaves, Swezey. Five specimens, three retained in U. S. National Museum.

21. Eupelminus species.

Santa Rosa Peak, May 19, on *Pandanus,* Swezey; Piti, Aug. 13, swept from *Glochidion,* Swezey. Two specimens, one retained in U. S. National Museum.

22. Eupelmus species.

A single specimen, Machanao, June 5, Usinger; Tumon, Nov. 13, swept from mango, Swezey. Two specimens, one retained in U. S. National Museum.

23. Eupelmus species.

Six specimens in Bishop Museum, collected by Fullaway in 1911.

24. Eusandalum species.

A single specimen from *Passiflora foetida* vine, Barrigada, June 14, Usinger.

FAMILY ENCYRTIDAE

25. Encyrtus barbatus Timberlake, Haw. Ent. Soc., Proc. **4**: 209, 1919.

Ritidian Point, June 2, Usinger; Barrigada, July 6, swept from *Intsia bijuga,* Swezey. Two specimens.

26. Blepyrus insularis (Cameron).

Encyrtus insularis Cameron, Manchester Lit. and Philos. Soc., Mem. **10** (3): 483, 1886.

Blepyrus insularis (Cameron), Timberlake, Haw. Ent. Soc., Proc. **5**: 429, 1924.

Piti, May 2, on *Cestrum pallidum,* Usinger; Agana, May 25, Usinger; Paasan, June 15, Usinger; Sumay Road, July 15, Swezey. This is a parasite of the mealybug *Ferrisia virgata* (Cockerell). Eight specimens, two retained in U. S. National Museum. About a dozen specimens at Bishop Museum were collected by Fullaway in 1911.

27. Pseudococcobius terryi (Fullaway).

Aphycus terryi Fullaway, Haw. Ent. Soc., Proc. **2**: 281, 1913.

Pseudococcobius terryi (Fullaway), Timberlake, Haw. Ent. Soc., Proc. **5**: 431, 1924.

Piti, July 27, reared from the mealybug *Pseudococcus boninsis* (Kuwana) on sugar cane, Swezey. Two slide mounts, one retained in U. S. National Museum; two specimens on a point.

28. Adelencyrtus chionaspidis (Howard).

Encyrtus chionaspidis Howard, U. S. Nat. Mus., Proc. **18**: 637, 1896.

Piti, May 23, two specimens swept from grass, Swezey.

29. Echthrogonatopus exitiosus Perkins, Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. **1**(8): 256, 1906.

Agana, May 4, one swept from mango leaves, near a taro patch, Swezey; Inarajan, May 7, reared from dryinid cocoon from a delphacid leafhopper on *Sporobolus* grass, Usinger; Piti, May 12, reared from dryinid cocoon on taro leaf, Swezey; Piti, May 23, swept from lawn grass, Swezey; Merizo, Oct. 2, four reared from dryinid cocoon on taro, Swezey; Libugon Farm, Nov. 10, eight reared from dryinid cocoons on taro leaves, Swezey. Two slide mounts, one retained at U. S. National Museum; 13 specimens on points, four retained at U. S. National Museum. A parasite of Dryinidae. The host of the dryinid whose cocoons were on taro leaves was the taro leafhopper *Megamelus proserpina* Kirkaldy.

30. Ooencyrtus pacificus Waterston, Bull. Ent. Research **6**: 307, fig. 1, 1915.

Ritidian Point, June 30, ex eggs of the bug *Brachyplatys pacificus* Dallas, Swezey; Barrigada, June 12, Usinger. Two slide mounts; one retained at U. S. National Museum.

Described from Fiji on same host. Determined by D. T. Fullaway.

31. Encyrtid, genus and species?

Piti, Nov. 5, one specimen swept from lawn grass, Swezey.

32. Pentelicus species.

Listed by Fullaway in 1913.

FAMILY ELASMIDAE

33. Elasmus philippinensis Ashmead, U. S. Nat. Mus., Proc. **28**: 138, 1904.

Recorded by Fullaway in his 1911 collection in Guam. A specimen collected at Piti, July 24, is possibly merely a variety of *philippinensis.*

34. Elasmus species.

Dededo, May 19, ex lepidopterous leafminer in *Terminalia catappa,* Swezey; two specimens.

FAMILY APHELINIDAE

35. Aphytis chrysomphali (Mercet).

Aphelinus chrysomphali Mercet, Real. Soc. Espan. Hist. Nat., Bol. **12**: 135, 1912.

Aphytis chrysomphali (Mercet), Timberlake, Haw. Ent. Soc., Proc. **6**: 315, 1926.

Merizo, June 11, ex *Aspidiotus destructor* Signoret on banana leaf, Swezey. Two slide mounts, one retained in U. S. National Museum.

36. **Proaphelinoides elongatiformis** Girault, Descr. Stell. Nov., 4, 1917.
Piti, Oct. 27, swept from bamboo leaves infested with *Asterolecanium miliaris longum* (Green), Swezey. One slide mount, retained in U. S. National Museum.

37. **Aneristus ceroplastae** Howard, Canad. Ent. **27**: 351, 1895.
Piti, Aug. 18, one specimen swept from *Glochidion,* Swezey.

38. **Aphelinus**? new species.
Inarajan, May 14, ex *Aphis gossypii* Glover on taro, Swezey; Piti, May 28, ex *Aphis gossypii* Glover, Usinger. One slide mount, retained in U. S. National Museum.
Apparently near *flavipes* Kurdjumov (Rev. Russe d'Ent. **13**: 270, 1913).

39. **Coccophagus orientalis** Howard, U. S. Nat. Mus., Proc. **18**: 633, 1896.
Listed by Fullaway in 1913.

FAMILY EULOPHIDAE

40. **Cirrospiloideus guamensis** Fullaway, Haw. Ent. Soc., Proc. **2**: 287, 1913.
Inarajan, May 7, ex bean leafminer, Swezey; Orote Peninsula, May 24, ex leafminer in undetermined plant, Swezey; Umatac, May 28, ex leafminer in large-leaved *Ficus,* Swezey; Orote Peninsula, July 19, ex leafminer in *Caesalpinia bonducella,* Swezey; Inarajan, July 25, ex leafminer in undetermined vine; Machanao, June 30, ex leafminer in *Glochidion marianum,* Swezey. Thirteen specimens, five retained in U. S. National Museum. Reared by Fullaway in 1911 from lepidopterous leafminers in *Terminalia catappa* and *Heritiera littoralis.* We reared it from several leafminers.

41. **Cirrospiloideus japonica** (Ashmead).
Sympiesomorpha japonica Ashmead, New York Ent. Soc., Jour. **12**: 163, 1904.
Inarajan, May 7, ex bean leafminer, Swezey; Piti, May 23, ex bean leafminer, Swezey. Three specimens, two retained in U. S. National Museum.

42. **Hemiptarsenus semialbiclavus** (Girault).
Hemiptarsenoideus semialbiclava Girault, Queensland Mus., Mem. **5**: 220, 1917.
Orote Peninsula, May 24, ex corn leafminer, Swezey; Piti, Aug. 9, 17, ex leafminer, *Agromyza spicata* in corn, Swezey; Asan, Aug. 22, ex leafminer in *hamlat,* Swezey; Piti, Nov. 7, ex bean leafminer, Swezey. Thirty-nine specimens, 18 retained in U. S. National Museum.

43. **Asympiesiella india** Girault, Canad. Ent. 48: 341, 1916.

Barrigada, July 22, ex leafminer in *Intsia bijuga,* Swezey; Dededo, Aug. 11, ex leafroller on undetermined tree, Swezey. Two specimens, one retained in U. S. National Museum.

44. **Euplectrus** (?) **xanthocephalus** Girault, Queensland Mus., Mem. 2: 273, 1913.

Upi Trail, May 5, swept from ferns, Swezey; Machanao, June 4, reared from a caterpillar (*Prodenia?*) on spiny amaranth, Swezey. Six specimens, three retained in U. S. National Museum.

45. **Euplectrus** sp. near **leucostomus** Rohwer, Ann. Mag. Nat. Hist., IX, **7**: 134, 1921.

Machanao, June 30, reared from an unidentified caterpillar on *Eugenia,* Swezey. Three specimens, one retained in U. S. National Museum.

46. **Tetrastichus hagenowii** (Ratzeburg).

Entedon hagenowii Ratzeburg, Ichneumon. der Forstins. 3: 211, 1852.

Merizo, Oct. 2, one specimen, Swezey. Bishop Museum has 13 specimens, collected by Fullaway in 1911.

47. **Melittobia hawaiiensis** Perkins, Haw. Ent. Soc., Proc. 1: 124, 1907.

Piti, May 20, Swezey; Piti, Sept. 27, reared from pupae found Sept. 24 in a cocoon of *Pison argentatum.* On another occasion there were six cocoons of *Pison argentatum* in cells of a mud nest, and each cocoon had exit holes where *Melittobia* had issued, which shows the prevalence of this wasp parasite. Three slide mounts, two retained in U. S. National Museum; one specimen mounted on a point.

48. **Melittobiopsis ereunetiphila** Timberlake, Haw. Ent. Soc., Proc. 6(2): 319, 1926.

Piti, May 2, Swezey; Agana, May 4, swept from mango, Swezey. Two specimens, one retained in U. S. National Museum.

49. **?Sympiesis** species.

Piti, Nov. 7, ex bean leafminer, Swezey. Two specimens, one retained in U. S. National Museum.

50. **Euderus** species.

Upi Trail, May 5, swept from ferns, Swezey; Sumay Road, July 15, Swezey. Two specimens, one retained in U. S. National Museum.

51. **Elachertus** species.

Piti, May 9, one specimen at light, Swezey.

52. Elachertus species.

Barrigada, June 12, a single specimen ex fruit of small-leaved *Ficus,* Swezey.

53. Ootetrastichus species.

Piti, May 23, one specimen swept from bean vines, Swezey.

54. Elachertini,? genus near **Entedonomorpha** Girault.

Ritidian Point, April 15, swept from ferns, Bryan. Two specimens, one retained in U. S. National Museum.

55. Closterocerus species.

Listed by Fullaway in 1913.

FAMILY TRICHOGRAMMATIDAE

56. Trichogramma minutum Riley, Missouri Third Ann. Rept., 158, 1871.

Barrigada, June 14, ex eggs of *Cosmolyce boeticus* on *Crotalaria,* Swezey; Piti, Sept. 15, ex eggs of *Herse convolvuli* (Linnaeus), Swezey; Piti, Oct. 10, ex tortricid eggs, Swezey; Piti, Oct. 10, ex egg of *Catopsilia crocale* (Cramer) on *Cassia grandis,* Swezey. Five slide mounts, two retained in U. S. National Museum.

57. Trichogramma nanum (Zehntner).

Chaetosticha nana Zehntner, Arch. voor de Java-Suikerindustrie 4: 400, pl. 5, figs. 9-11, 1896. (The figure is labeled *Trichogramma nana.*)

Barrigada, June 14, ex eggs of *Cosmolyce boeticus* on *Crotalaria,* Swezey; Piti, Oct. 10, 11, 28, ex eggs of *Catopsilia crocale* (Cramer) on leaves of *Cassia grandis,* Swezey. Two slide mounts, one retained in U. S. National Museum.

58. Trichogramma species.

Piti, Nov. 5, one specimen swept from lawn grass, Swezey.

59. Oligosita species, apparently close to **O. cratitia** Waterston.

Chaetosticha cratitia Waterston, Bull. Ent. Research 13: 184, 1922.

Agana Swamp, May 15, ex eggs of *Stenocranus agamopsyche* Kirkaldy in marsh reed (*Trichoon roxburghii*), Swezey. One slide mount, retained in U. S. National Museum.

60. Oligosita species.

Upi Trail, May 5, ex orthopterous egg in dead bark of *Hibiscus tiliaceus* Swezey. One slide mount, retained in U. S. National Museum.

FAMILY MYMARIDAE

61. Mymar tyndalli Girault, Queensland Mus., Mem. 1: 168, 1912.
Piti, Nov. 5, one specimen swept from lawn grass, Swezey.

62. Alaptus caecilii Girault, Ent. Soc. Am., Ann. 1: 189, 1908.
Sumay Road, Oct. 17, ex eggs of *Caecilius analis* on sugar cane, Swezey.

63. Paranagrus optabilis Perkins, Haw. Sugar Plant. Assoc. Expt. Sta., Ent. Bull. 1(6): 199, 1905.
Piti, April 30, ex eggs of *Perkinsiella thompsoni* Muir in sugar cane leaves, Swezey. Three slide mounts, one retained in U. S. National Museum.

64. Anagrus flaveolus Waterhouse, Bull. Ent. Research 4: 87, 1913.
Dededo, Nov. 13, ex eggs of *Peregrinus maidis* (Ashmead) in corn leaves, Swezey. One slide mount, retained in U. S. National Museum.

ICHNEUMONIDAE, EVANIIDAE, AND BRACONIDAE OF GUAM

By D. T. Fullaway
Board of Agriculture and Forestry, Honolulu

Data on the material obtained on the Guam insect survey of 1936, and the host records of the reared material are contributed by O. H. Swezey.

Family ICHNEUMONIDAE

Subfamily PIMPLINAE

1. **Echthromorpha conopleura** Krieger, Zool. Mus. Berlin, Mitt. 4(2) : 321, 1909.

Mt. Alifan, April 21, Bryan; Ritidian Point, April 14, 22, Bryan; Piti, April 30, issued from pupa of *Sylepta derogata* on *Hibiscus tiliaceus,* Swezey; Piti, May 2, Usinger; Piti, Aug. 2, Sept. 17, reared from *Cosmophila flava flava* on *Urena lobata* var. *sinuata,* Swezey; Mt. Tenjo, May 3, Swezey, Usinger; Inarajan, May 6, Usinger; Mt. Chachao, May 16, Swezey; Agana, May 25, Swezey; Asan, Aug. 8, reared from a *Nacoleia diemenalis* on an unidentified legume, Swezey; Fadian, Aug. 19, Swezey; Sasa, Sept. 3, reared from pupae of *Spodoptera mauritia* in rice seedling plot, Swezey; Yigo, Nov. 8, reared from *Sylepta derogata,* Swezey. Occurring rather commonly.

This species was described from Brazil. There is no record of its occurrence elsewhere except in Guam. It is the species recorded from Guam by me in 1913 as *Echthromorpha continua* (Brulle) (?). It was recently studied by R. A. Cushman at the U. S. National Museum, from material sent from Guam by R. G. Oakley. Cushman determined it as *Echthromorpha conopleura* Krieger, so named because of the conical protuberance on the mesopleura which distinguishes it from other species.

As no other species of *Echthromorpha* is known to occur in the Western Hemisphere, and as this species was described from only four specimens in the Berlin Museum, with partially illegible label, it may be possible that the locality "Brasil" is in error. It will be of great interest to learn of its occurrence in any additional localities.

2. **Lissopimpla nigricans** Fullaway, Haw. Ent. Soc., Proc. 2(5) : 288, 1913.

Machanao, June 30, Swezey; Piti, July 20, at light, Swezey; Piti, Nov. 3, in garden, Swezey; three specimens.

This is a black species described from Guam, and there is no record of its occurrence elsewhere.

SUBFAMILY TRYPHONINAE

3. **Diplazon laetatorius** (Fabricius).
Ichneumon laetatorius Fabricius, Spec. Ins. **1**: 424, 1781.
Bassus laetatorius, Morley, Ichn. Brit. Mus. **3**: 125, 1914.
Diplazon laetatorius, Kelly, Jour. Econ. Ent. **7**: 294, 1914.
Only one specimen of this cosmopolitan syrphid parasite was obtained at Piti, Sept. 16, Swezey.

SUBFAMILY OPHIONINAE

4. **Paniscus latro** Holmgren, Freg. Eugenies Resa, Ins. **6**: 412, 1868; Fullaway, Haw. Ent. Soc., Proc. **2**(5): 289, 1913; Morley, Ichn. Brit. Mus. **2**: 124, 1913.
Piti, Sept. 13, Nov. 12, 22, at light, three specimens, Swezey.
This ophionid was described from Guam. According to Morley, the *Paniscus samoanus* Kohl described from Upolu, Samoa, in 1905 is the same species.

5. **Allocamptus giganteus** (Szépligeti).
Dicamptus giganteus Szépligeti, Gen. Ins., Fasc. **34**: 28, 1905.
Allocamptus giganteus, Morley, Ichn. Brit. Mus. **1**: 26, 1912.
Agana Swamp, May 25, Usinger.
This large ophionid is known in Java and the East Indies. The single specimen collected by Usinger is its first record in Guam.

6. **Henicospilus merdarius** (Gravenhorst).
Ophion merdarius Gravenhorst, Ichn. Europ. **3**: 698, 1829.
Henicospilus merdarius, Morley, Ichn. Brit. Mus. **1**: 46, 1912.
Ritidian Point, April 15, among ferns, one specimen, Bryan.
This is a European species which has been taken rarely in India, Malay Peninsula, Asiatic Siberia.

7. **Cremastus flavo-orbitalis** (Cameron).
Tarytia flavo-orbitalis Cameron, Bombay Nat. Hist. Soc., Jour. **17**: 589, 1907; Morley, Fauna Brit. India, Hym. **3**(1): 506, 1913.
Cremastus flavoorbitalis, Cushman, Ent. Soc. Wash., Proc. **35**(5): 73, 1933.
Mt. Alifan, May 21, reared from *Eurrhyparodes tricoloralis* (Zeller), a leafroller on a low weed called *yerbas babue,* Swezey; Mt. Chachao, June 16, reared from a leafroller on *Gymnosporia thompsonii,* Swezey; Piti, June 22, reared from tortricid larva in pod of *Pithecolobium dulce,* Swezey; Machanao, June 30, reared from *Margaronia multilinealis* on *Ficus tinctoria,* Swezey; Talofofo, Nov. 18, collected among spiny amaranths infested with *Hymenia fascialis,* one of its favorite hosts, Swezey.

This species has a wide distribution in the Orient from India to Japan. It reached Hawaii as an immigrant, being first noticed in 1910. It was described and known for a long time under the name *Cremastus hymeniae* Viereck. It was introduced from Japan into the United States as a parasite of the European corn borer, and was also introduced from Japan into Guam in 1931 for the same purpose. It became established, but Mr. Swezey did not rear it from the European corn borer in 1936. It was, however, reared from several other species of moths.

Subfamily CRYPTINAE

8. Hemiteles guamensis, new species.

Female 3 mm. long, shining black and, for the most part, highly polished, the legs, mandibles, basal joint of antennae and tegulae pale to golden-yellow, antennae beyond the first joint light brown; smooth throughout except for the fine pin-point punctuation on the face, costae, and carinae on scutellum and propodeum; the face, propodeum laterally and abdomen apically clothed more or less densely with fine silvery-gray hairs.

Head transverse, wider than the thorax, width twice the length (as seen from above), eyes large, oval, convex, bare; ocelli lying between on the vertex, arranged in the form of an obtuse triangle, the lateral members removed from the eye margin and from each other about two diameters, anterior member not much over one; frontovertex still wider than long, flat on top, declivous in front; face nearly quadrate but still noticeably wider than long, with the antennae attached at the top and between the eyes at about their middle, in rimmed sockets lying at base of a depression; clypeus not separated but probable line of separation marked by a short sulcus at the sides; antennae 20-segmented, long and slender, nearly as long as the body, not widely separated at base, basal joint short, stout, apically tangentially excised at outer side and hollowed, the second segment or pedicel sunk in the cup, flagellum filamentous, segments 3 to 5 subequal and four to six times longer than wide, the following segments progressively shorter, the apical segment a little longer and somewhat flattened and pointed; mandibles short, flat, narrowing apically and bidentate, base about equaling in width the malar space; genae and postgenae moderately wide and convex; maxillary palpi slender, 5-jointed; labial palpi shorter and 3- or 4-jointed.

Thorax long, moderately wide and deep, prothorax visible from above, extended in front in a short neck; mesoscutum as wide as long, convex, margins carinate and perfectly rounded, notauli present extending five sixths the length, converging medially behind but not meeting; scutellum triangular, slightly convex, separated from the scutum by a deep costate groove with ridged sides; metathorax transverse, marked by a transverse depression with ridged anterior and posterior margin; propodeum convex and declivous behind, finely reticulately sculptured and completely areolated, areola closed, a deep fovea directly in front of it, the median area behind it slightly depressed, carinae of lateral margins with an anterior and posterior spinous projection on either side; mesothoracic pleurae with a shallow depression next posterior margin; metathoracic spiracle small, oval.

Abdomen elongate, subpetiolate, fusiform, greatest width at apical margin of 2d segment; 1st segment the longest, 2d longer than wide, 3d wider than long, following shorter, transverse; 1st segment bent and expanded apically, the spiracle in middle slightly raised at end of lateral groove; ovipositor exserted about one third length of abdomen.

Wings hyaline, stigma triangular, moderately wide, areolet incomplete.

Legs moderately long and slender.

Piti, May 2, one specimen, holotype female, reared from grass leafroller, *Marasmia venilialis,* Swezey. Type in collection of Experiment Station, Hawaiian Sugar Planters' Association.

9. Bathymetis species.

Upi Trail, May 5, swept from ferns, one specimen, Swezey.

10. Pezomachus species.

Upi Trail, May 5, swept from ferns, one male, Swezey; Orote Point, May 24, one female, Swezey; Machanao, June 4, one female, Swezey; Sinajana, June 15, one male, Swezey. There may be more than one species.

Family EVANIIDAE

Evania appendigaster (Linnaeus).

Ichneumon appendigaster Linnaeus, Syst. Nat., 10th ed. 1: 566, 1758.

Evania appendigaster, Fabricius, Syst. Ent., 345, 1775.

Merizo, May 24, Bryan; Piti, May 10, June 8, Usinger; Piti, May 27, July 13, 27, Swezey; Sumay, Sept. 28, Swezey.

This cosmopolitan parasite of roach oothecae was reported in Guam by Fullaway in 1911.

Family BRACONIDAE

1. Macrocentrus pallidus Fullaway, Haw. Ent. Soc., Proc. 2(5): 289, 1913.

Dededo, May 11, four specimens, reared from phycitid abundant on leaves of *Guettarda speciosa;* Agat, May 31, one specimen reared from cocoon on leaf (probably of coconut tineid); Mt. Alifan, June 27, three specimens reared from phycitid on *Guettarda;* Orote Peninsula, two specimens, reared from leafroller on unidentified tree; Merizo, Oct. 2, one specimen, reared from cocoon of coconut tineid. All collected by Swezey.

2. Chelonus guamensis, new species.

Female 3 mm. long, shining black, basal third of abdomen, legs, antennae, and mandibles brown, the mandibular teeth black, flagellum of the antennae fuscous, as are also the hind coxae, apical half of hind tibiae, and the tarsi; covered with a close microscopic silky pubescence, although the disk of the scutellum and the mesopleurae are, for the most part, bare; variously sculptured.

Head transverse, wide as thorax, about twice as wide as long (as viewed from above), eyes oval, convex, hairy, ocelli on the vertex in the form of an obtuse triangle, lateral members less than one diameter apart but removed from eye margins about four, frontovertex twice as wide as long, convex, finely striate, excavated in front for the antennal scrobes, face only a little wider than long, also striate, clypeus below indicated by a shallow linear impression with pit on either side, antennae attached at top and at about middle distance of eyes, widely separated and not far from eyes, about two thirds length of body, consisting of 16 segments, the basal segment quite stout, following segments filamentous and decreasing in length outwardly, mandibles fairly stout and toothed apically,

the width of base much less than that of malar space, genae and postgenae fairly wide, convex, striate, smoothly rounded to occipital margin, which is distinctly carinate, maxillary palpi 5-jointed, labial palpi 3-jointed, white.

Thorax stout, fairly long and deep, pronotum transverse, collarlike, hardly visible from above, mesonotum wider than long, convex above, declivous in front, finely punctuate and in part striate, scutellum triangular, convex, a transverse row of circular pits along the basal margin; metanotum transverse, the anterior and posterior margins of the apical half carinate with a costate groove between, basal half on either side of the scutellum also costate, propodeum about as long as metanotum, flat on top, declivous behind and on the sides, coarsely rugulose.

Abdomen as long as head and thorax combined, corbiculate, elongate oval, the tergum convex, the ventrites basally collapsed against the tergites leaving a hollow cavity, the tergum without indication of segmentation and generally rugoso-striate, ovipositor exserted and about half the length of the abdomen.

Legs fairly long and stout, the hind pair much larger than the fore and middle pairs.

Wings hyaline, stigma large, triangular, more than half as wide as long, with the parastigma, which is quite conspicuous, as long as the metacarp, radial cell not nearly reaching apex of wing, recurrent nervure interstitial with 1st cubital crossvein, 1st cubital and discoidal not separated, subdiscoidal nervure not interstitial but joining the discoidal below the middle of the apical section, nervulus postfurcal.

Sumay Road, July 15, holotype female, Swezey. Type in collection of Experiment Station, Hawaiian Sugar Planters' Association.

3. **Chelonus** species.

Inarajan, May 14, one specimen, reared from bean leafminer, Swezey.

4. **Phanerotoma melanocephala** Fullaway, Haw. Ent. Soc., Proc. 2(5): 290, 1913.

Described from a single specimen collected in Guam by Fullaway in 1911; not collected in 1936.

5. **Phanerotoma** species.

Mt. Chachao, June 16, one specimen, reared from leafroller on *Gymnosporia thompsonii,* Swezey.

6. **Apanteles guamensis** (Holmgren).

Microgaster guamensis Holmgren, Freg. Eugenies Resa, Ins. 6: 432, 1868.

Apanteles guamensis, Fullaway, Haw. Ent. Soc., Proc. 2(5): 290, 1913.

Inarajan, May 7, 14, June 25, reared from rice leafroller, *Susumia exigua,* Swezey; Dededo, May 11, reared from corn leafroller, *Marasmia trapezalis,* Swezey; Mt. Alifan, May 26, reared from corn leafroller, Swezey; Piti, July 13, reared from *Pyrausta phoenicealis,* a leafroller on *Elephantopus spicatus,* Swezey.

This braconid was described from Guam. It was collected by Fullaway in 1911, and was quite common in 1936.

6a. **Apanteles guamensis** variety?

Ypan, June 8, one specimen reared from *Hymenia fascialis,* Swezey; Talofofo, Nov. 18, four specimens reared from *Hymenia fascialis,* Swezey.

7. Apanteles species.

Taragüe, May 17, one specimen, swept from grass, Swezey.

8. Apanteles species.

Agana, May 4, one specimen, Swezey; Orote Peninsula, Aug. 2, one specimen, reared from leafminer in *Ipomoea,* Swezey.

9. Opius longicaudatus (Ashmead).

Biosteres longicaudatus Ashmead, U. S. Nat. Mus., Proc. **28**: 970, 1905.

Biosteres = *Opius,* Gahan, U. S. Nat. Museum, Proc. **49**: 65, 1916.

This braconid was described from Manila, and now is recorded from Guam for the first time. Ritidian Point, Aug. 6, reared from the fruitfly *Dacus ochrosiae* Malloch in *Ochrosia* sp. Search was made for it in other parts of the island. The fruitfly was reared from *Ochrosia* fruits from several places, but no other parasites were obtained except the first ones. In November 1937, R. G. Oakley reported that the parasite had been recovered from infested *Ochrosia* fruits at Orote Point, and infested *Ximenia* fruits between Dededo and Yigo.

10. Microbracon species.

Taragüe, May 17, three specimens swept from grass, Swezey.

11. Ischiogonus pallidiceps Perkins, Fauna Hawaiiensis **2**(6): 684, 1910.

Piti, May 2, one collected on *Pithecolobium dulce,* Usinger; Upi Trail, May 5, one specimen swept from ferns, Swezey; Fadian, Sept. 18, 21 reared from a mass of cocoons in burrow of *Ceresium unicolor* in log of *paipay,* Swezey.

This species was described from Hawaii, where it is parasitic on larvae of cerambycid beetles.

12. Ischiogonus palliatus (Cameron).

Monolexis ? palliatus Cameron, Ent. Soc. London, Trans., 560, 1881.

Ischiogonus palliatus, Ashmead, Fauna Hawaiiensis **1**(3): 362, 1901.

Machanao, June 4, Usinger; Barrigada, June 12, four specimens reared from cocoons found in cerambycid burrows in dead trunk of *Hibiscus tiliaceus,* Swezey.

This species was also described from Hawaii. We procured five specimens in Guam.

13. Spathius guamensis, new species.

Female: 4 mm. long, yellowish brown to brown to reddish brown to black, tegulae and legs stramineous brown with tarsi fuscous; antennae fuscous brown, sheath of ovipositor fuscous brown; mandibles brown with black tips; wings hyaline.

Head a little wider than the thorax, a little wider than long, extended somewhat behind the eyes, which are short oval, convex and bare; ocelli arranged in a small obtuse triangle just below the summit of the head and about half way between the insertion

of antennae and vertical margin, distance between lateral members about one third distance to eye margin; frontovertex convex above, smooth and polished, declivous in front of ocelli, where the surface is rugoso-striate except for a narrow strip along eye margin, behind highly polished and smoothly rounded on to occiput, which has the margin strongly carinate on the sides; face more or less in the vertical plane although somewhat retracted below, wider than long, widening out below to about 1.5 times the width at its upper limit, finely aciculate and rugulose, and hairy; clypeus small, distinctly separated, anterior margin carinate and slightly curved; mandibles below oral orifice short, stout, apically pointed, basal width about equaling that of malar space; antennae attached at middle distance of eyes behind a frontal prominence, the sockets oval, fairly far and wide apart, rather close to eye margin with a deep groove or depression between, a little longer than the body, consisting of 35 segments, which decrease in length gradually from 3d segment outwardly although the first three segments of the flagellum are hardly different in length, segments 1 and 2 are stout, the flagellum slender; maxillary palpi long and slender, 5-jointed; labial palpi shorter, 3-segmented, genae and postgenae quite wide.

Prothorax prominent with the anterior and posterior margins carinate, the saddle rather coarsely reticulately sculptured; mesoscutum longer than wide, convex, its surface shagreened; parapsidal furrows deep, converging and confluent before reaching posterior margin; scutellum scutate, that is, triangular but apically truncate with a wide and deep costate furrow at base, disk slightly convex, sculpture microscopically fine; metanotum a transverse furrow with posterior margin strongly carinate; propodeum nearly as long as mesoscutum, convex, rugulose, areolated, the central areola pentagonal with apex directed anteriorly, this and several other areolae striate; spiracles minute, circular; mesopleurae smooth and shining below, striate above, a row of circular fossae along the carinated posterior margin, duplicated on the margin of the side of the propodeum.

Abdomen elongate oval, more or less depressed, petiolate, the petiole rather short, 1st abdominal segment one third the length of the abdomen, bent near the middle where the spiracle is, somewhat flat, narrow basally but widening apically to twice the basal width, the tergite rugoso-striate, 2d segment about three fourths as long as 1st but wider than long, following tergites transverse, smooth, and shining behind the first; ovipositor as long as or possibly a little longer than the abdomen.

Legs fairly stout, spinulose.

Wings rather long and narrow, stigma large, lanceolate, recurrent nervure received at lower inside angle of 2d cubital cell, which is five-sided, long, and narrow, only half as wide at base as it is apically; nervulus slightly postfurcal, radius reaching apical margin of wing.

Male: similar except in pygidial characters peculiar to the sex, though generally smaller and with fewer antennal segments (28-30).

Machanao, June 30, described from 19 females and two males (holotype, allotype, and paratypes) reared from two clusters of cocoons in burrows of cerambycid collected under bark of *Elaeocarpus joga* log, Swezey. Types in the collection of the Experiment Station, Hawaiian Sugar Planters' Association.

14. Spathius species.

Upi Trail, May 5, from ferns, one female, Swezey; Mt. Chachao, May 16, two females, Usinger; Machanao, June 2, miscellaneous sweeping, three females, Swezey. These may include more than one species.

CORRECTIONS TO VOLUME I

Page 7, line 25. For *"rubricincta"* read *"rubrocincta."*

Page 9, lines 6 and 11. For "Karny" read "(Karny)."

Page 15, line 6. For "Oct. 1" read "Oct. 7."

Page 18, line 4. *Lallemandana upiana,* new name. V. Lallemand first called this insect *upiana* then changed the name to *swezeyi.* He later recalled having used the name for a species in the genus *Clovia* which was subsequently placed in the genus *Lallemandana.* The name *swezeyi,* therefore, could not stand for the Guam species. Unfortunately, due to war conditions, Lallemand's request to change the name back to *upiana* was not received until after the bulletin had gone to press. Hence the necessity for the correction to *Lallemandana upiana* at this time.

Page 32, line 3 from bottom. For "Eschscholtz" read "(Eschscholtz)."

Page 34, line 12. For "de" read "der."

Page 40, line 21. For *"Ipomoea* species" read *"Ipomoea* spp."

Page 56, line 32, and all other references to "June 5" should read "June 4."

Page 57, line 28. For "Swezey" read "Usinger."

Page 69, line 35. For "17" read "7."

Page 72, line 8. For "6" read "7."

Page 75, line 7. For "obscurus" read "obscura."

Page 84, line 37. For "convexus" read "convexa."

Page 93, line 29. For "74" read "174."

Page 95, lines 47 and 50. For "1921" read "1931."

Page 95, line 49. For "226" read "266."

Page 97, line 10. For "Sept. 11" read "Sept. 7."

Page 100, line 3 from bottom. For "some" read "same."

Page 107, line 31. For "seem" read "seems."

Page 109, line 4. For "Karsh" read "Karsch."

Page 117, line at bottom. Delete "and June 5."

Page 129, line 43. Insert "more" before "narrowly."

Page 134, line 19. Remove "Guam" in key.

Page 131, line 9. For "June" read "May."

Page 138, line 35. For "1855" read "1885."

Page 148, line 24. For *"Lucaena"* read *"Leucaena."*

Page 168, line 35. For *"mindanaoana"* read *"mindanaona."*

Page 175, line 38. For "20" read "26."

Page 202, line 25. For "Schiner" read "(Schiner)."

Page 212. *"Dihammus marianarum* 169" to be inserted in index.

INDEX

ENTOMOLOGY

New genera and species are in bold-face type, synonyms are in italic.

Host Plants