INSECTS OF MICRONESIA
Heteroptera: Reduviidae[1]

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INTRODUCTION

Reduviidae, or assassin bugs, are predaceous on a variety of insects. Some, such as the Emesinae, are delicate in form and nocturnal in habit, preying on small insects and spiders and flying to lights at night. Others, such as *Polytoxus* in the Saicinae, are diurnal and are commonly encountered in grass and rice fields. *Physoderes* lives in rotten stems of papaya and under logs.

Eight species were reported previously from Micronesia, all from Guam (Usinger, 1946, B. P. Bishop Mus., Bull. **189**: 41-51). In this report 30 species are listed, 15 of them described as new. Most of the specimens were collected by H. S. Dybas, J. W. Beardsley, J. L. Gressitt, G. E. Bohart, Teiso Esaki, O. H. Swezey, and R. L. Usinger. Previous papers on Micronesian Reduviidae by Usinger were published in 1946, *op. cit.*, and 1951 [Hawaiian Ent. Soc., Proc. **14** (2): 311].

Thanks are due to the following institutions and organizations for aid in this work: The United States Office of Naval Research, the Pacific Science Board (National Research Council), the National Science Foundation, Bernice P. Bishop Museum, and the John Simon Guggenheim Foundation (Wygodzinsky Fellowship, 1955). Field research was aided by a contract between the Office of Naval Research, Department of the Navy, and the National Academy of Sciences, NR 160-175. Individuals who were largely responsible for furthering this work are H. J. Coolidge, J. L. Gressitt, and H. S. Dybas.

The following symbols indicate the museums in which specimens are stored: US (United States National Museum), BISHOP (Bernice P. Bishop Museum), CM (Chicago Natural History Museum), CAS (California Academy of Sciences, MCZ (Museum of Comparative Zoölogy), and KU (Kyushu University).

The formula 1 + 1, 3 + 3, et cetera, used in keys and descriptions refers to spines or bristles bilaterally arranged, 1, 3, et cetera, on each side.

[1] This represents, in part, Results of Professor T. Esaki's Micronesian Expeditions (1936-1940), No. 103.

DISTRIBUTION

The distribution of Micronesian reduviids is summarized in the distribution list. Twenty-one of the 30 species discussed herein are endemic to Micronesia, and 18 are confined to single islands or small island groups, according to present knowledge. Endemic species are known only in the Reduviinae (two species), the Saicinae (three species), and Emesinae (16 species). It is not easy to explain this pattern of endemicity but Emesinae are small and delicate in body form and must have a special facility for inter-island dispersal with a consequent increase in speciation. The lack of records from atolls (except *Ploiaria insolida* collected by Usinger in the Marshall Islands) reflects the general paucity of insect groups under such conditions in contrast to the richer fauna of the high islands.

As in other groups, the Micronesian reduviids show close relationships with those on other Pacific islands (Samoa, Fiji, and New Caledonia; but not the Hawaiian Islands) and with the Philippine Islands and New Guinea.

SYSTEMATICS

Family REDUVIIDAE

Body elongate-oval or slender with legs variously incrassate and sometimes spined. Rostrum three-segmented, stout and curved, the tip reaching prosternal stridulatory sulcus (the latter a definitive characteristic of the family). Antennae four-segmented except in the Ectrichodiinae, where eight segments are visible. Head divided behind eyes by transverse sulcus. Abdominal spiracles 2 to 7 ventral. Hemelytra without cuneus. Adults with metathoracic scent gland openings concealed in acetabula of hind coxae. Eggs with distinct cap or lid.

Key to Subfamilies and Genera of Micronesian Reduviidae

1. Ocelli absent 2
   Ocelli present 8
2. Second rostral segment with spines in apposition to spines on undersurface of head; third tarsal segment subflattened (Saicinae) ..... **Polytoxus**
   Second rostral segment and undersurface of head without spines; third tarsal segment not subflattened (Emesinae) 3
3. Fore tarsus as long as, or longer than, half the length of fore tibia (figs. 1, *c*; 2, *b*; 3, *c*); hind lobe of pronotum not covering mesonotum in winged forms (fig. 1, *a*) ..... **Ploiaria**
   Fore tarsus much shorter than half the length of tibia; hind lobe of pronotum covering mesonotum (in fully winged forms) 4
4. Length 15 mm.; apterous; fore tibia half as long as femur ..... **Gardena**
   Length less than 10 mm.; winged; fore tibia more than half as long as femur 5
5. Large discal cell of fore wing with tiny, subquadrate, supplementary cell at base (figs. 5, *b*; 6, *f*; et cetera) ..... **Emesopsis**
   Above-mentioned supplementary cell absent (figs. 15, *h*; 16, *e*) 6

DISTRIBUTION OF MICRONESIAN REDUVIIDAE

	Micronesian Island Groups									Other Localities
			Caroline							
	Bonin	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	
Emesinae										
1. Ploiaria insolida		G†					×		×	Philippine Is., Samoa, Hawaiian Is., Marquesas
2. P. halosydne*			×							
3. P. thetis*				×						
4. P. phyllodoce*							×			
5. Gardena catenarium*						×				
6. Emesopsis nubilus		G								Tropicopolitan
7. E. scitulus*							×			
8. E. pallidicoxa		G								
9. E. amoenus*								×		
10. E. habros*				×						
11. E. bellulus*						×				
12. E. decoris*							×			
13. Emesopsis sp.			×							
14. Tridemula contumax*			×				×			
15. Ademula reticulatoides*			×							
16. A. gressitti*				×						
17. A. distincta		G								
18. Empicoris sp.			×							
19. E. minutus	×	G								Hawaiian Is.
20. E. tessellatoides*		×								Malay Peninsula
Saicinae										
21. Polytoxus distinctus*			×							
22. P. marianensis		G								Samoa, Fiji, New Caledonia
23. P. pilosus		G	×							
24. P. grandis*			×				×			
Stenopodinae										
25. Oncocephalus pacificus			×							New Britain, Fiji, Samoa, Philippine Is., Australia, New Caledonia
Reduviinae										
26. Peregrinator biannulipes		×				×				Tropicopolitan
27. Velitra micronesica*			×							
28. Physoderes minor		G					?			
Ectrichodiinae										
29. Scadra rufidens		G	×							Philippine Is.
Harpactorinae										
30. Polididus armatissimus			×							Oriental Realm

† G instead of × indicates Guam only.
* New species or new name.

6. Fore wing with small triangular basal discal cell in addition to large discal cell (fig. 15, *h*) ..... **Tridemula**
   Fore wing with only one closed discal cell (fig. 16, *e*) 7
7. General color whitish, with dark pattern elements not very extensive; fore tarsi three-segmented; pterostigma reaching apex of wing (fig. 17, *d*) ..... **Ademula**
   General color blackish, with not very extensive whitish pattern elements; fore tarsi two-segmented; pterostigma far removed from wing apex ..... **Empicoris**
8. First antennal segment much longer than head; body beset with long, erect spines (Harpactorinae) ..... **Polididus**
   First antennal segment not longer than head; body not beset with numerous long spines 9
9. Apex of scutellum bifid (Ectrichodiinae) ..... **Scadra**
   Apex of scutellum simple 10
10. Hemelytra with pentagonal or hexagonal cell between corium and membrane (Stenopodinae) ..... **Oncocephalus**
    Hemelytra without such a cell (Reduviinae) 11
11. Rostrum long, second segment much longer than first; front and middle tibiae without spongy fossae ..... **Physoderes**
    Rostrum shorter, second segment subequal to first 12
12. Body densely clothed with erect hairs; first antennal segment greatly exceeding apex of head, two-thirds as long as second segment ..... **Peregrinator**
    Body with only inconspicuous, appressed hairs; first antennal segment not exceeding apex of head, one-fourth as long as second ..... **Velitra**

Subfamily Emesinae

Genus **Ploiaria** Scopoli

Ploiaria Scopoli, 1786, Del. Faunae Florae Insubr. 1 : 60.

Type species: *Ploiaria domestica* Scopoli.

This large worldwide genus has only four species in Micronesia. Two of them belong to a rather peculiar group (*phyllodoce, thetis*) which is apparently restricted to the South Pacific; one (*halosydne*) belongs to a larger group, found in the Philippine Islands, but also in other parts of the world (Australia, South America, et cetera); while *insolida* is a species widely distributed over the Pacific, with related species in many parts of the world.

Key to Micronesian Species of Ploiaria

1. Size small, about 7 mm.; winged; mid- and hind femora uniformly dark brown; male hypopygium with slender, spine-like, apical process (fig. 1, *k*) ..... **1. insolida**
   Size larger, about 10 mm. or more; winged or apterous; mid- and hind femora not uniformly colored; male hypopygium without slender, spine-like process 2
2. Winged; eyes very large (fig. 1, *a*); hypopygium of male elongate (fig. 1, *h*), with wide, short, triangular projection posteriorly (fig. 1, *j*) ..... **2. halosydne**
   Apterous; eyes small (figs. 2, *a*; 3, *a*); hypopygium short, truncate (fig. 2, *g*) without median process posteriorly, posterolateral angles somewhat projected and with groups of conspicuous bristles or spines (figs. 2, *h*; 3, *f*) 3

3. Size about 11 mm.; hind lobe of pronotum not distinctly detached from fore lobe (fig. 3, *a*); basal portion of anteroventral series of spiniform setae of fore femur composed of two setae (fig. 3, *d*); posterolateral projections of male hypopygium with short spines (fig. 3, *f, h*) ..... **3. thetis**

Size about 15 mm.; hind lobe of pronotum distinctly detached from fore lobe (fig. 2, *a*); basal portion of anteroventral series of spiniform setae of fore femur composed of four to six setae (fig. 2, *c*); posterolateral projections of hypopygium of male with setae only (fig. 2, *h*) ..... **4. phyllodoce**

1. Ploiaria insolida (B. White). (Figure 1, *n*.)

Luteva insolida White, 1877, Ann. Mag. Nat. Hist. IV, 20 : 113.

Ploiaria uniformis McAtee and Malloch, 1926, Philippine Jour. Sci. 30 (1) : 142, n. syn.

Ploiaria uniformis, Usinger, 1951, Hawaiian Ent. Soc., Proc. 14 (2) : 317 (Marshall Is.).

DISTRIBUTION: Samoa, Hawaiian Is., Philippine Is., Marquesas, Mariana Is., Caroline Is., Marshall Is.

S. MARIANA IS. GUAM: Pt. Oca, male (BISHOP), July 13, 1945, G. Bohart and Gressitt.

PONAPE. Colonia-Dolen Eireke (Sankakuyama), female (KU), July 14, 1939, Esaki.

MARSHALL IS. ARNO: June 1950, Usinger.

The single female type of *P. uniformis* McAtee and Malloch has been examined. Although the specimen is not well preserved, with adequate illumination it can be observed that the color of the dorsal surface of the thorax is not uniform, contrary to the statement of the authors. The specimen agrees well with those of *insolida* we have examined. The species has been redescribed by China (1930, Insects of Samoa II, Hemipt. 3 : 145) in detail. The characteristic apex of the hypopygium with the claspers is illustrated in figure 1, *n*.

2. Ploiaria halosydne Wygodzinsky and Usinger, n. sp. (fig. 1, *a-m*).

Winged. Female, length 10.5 mm.; male, length 9.7 mm., head, 1 mm., thorax, 2.5 mm., abdomen, 6.2 mm. Body color stramineous, pattern elements piceous. Head light colored, extreme anterior apex and fascia laterally in front of eyes dark. Rostrum light colored, basal half of first and part of second segment dark. Antennae piceous; first segment with about ten not very distinct narrow yellowish annuli, the last of which, subapically located, much lighter and more distinct; second segment with about five narrow light annuli, apex narrowly whitish; third and fourth segments uniformly dark. Prothorax dark laterally and ventrally, pale above, with exception of anterior border, a few lateral spots and 1-1 sublateral spots on posterior lobe of pronotum; mesothorax dark laterally, pale ventrally and dorsally, median depression of mesonotum dark, as well as 1-1 large lateral spots on posterior two-thirds; scutellum pale colored; anterior two-thirds of metanotum blackish, posterior elevated portion pale; metapleura and sternum pale. Fore wings yellowish white, pattern elements as in figure 1, *g*, veins partially dark piceous, on membrane accompanied by tiny blackish spots. Fore coxa yellowish white on basal fourth, with irregular extensive dark spots on remaining surface; trochanter light with dark spots; femur with three, irregularly shaped, large, dark annuli, one basal, one submedian, and one subapical; tibiae dark with exception of one narrow sub-basal annulus; tarsus dark, basal third of

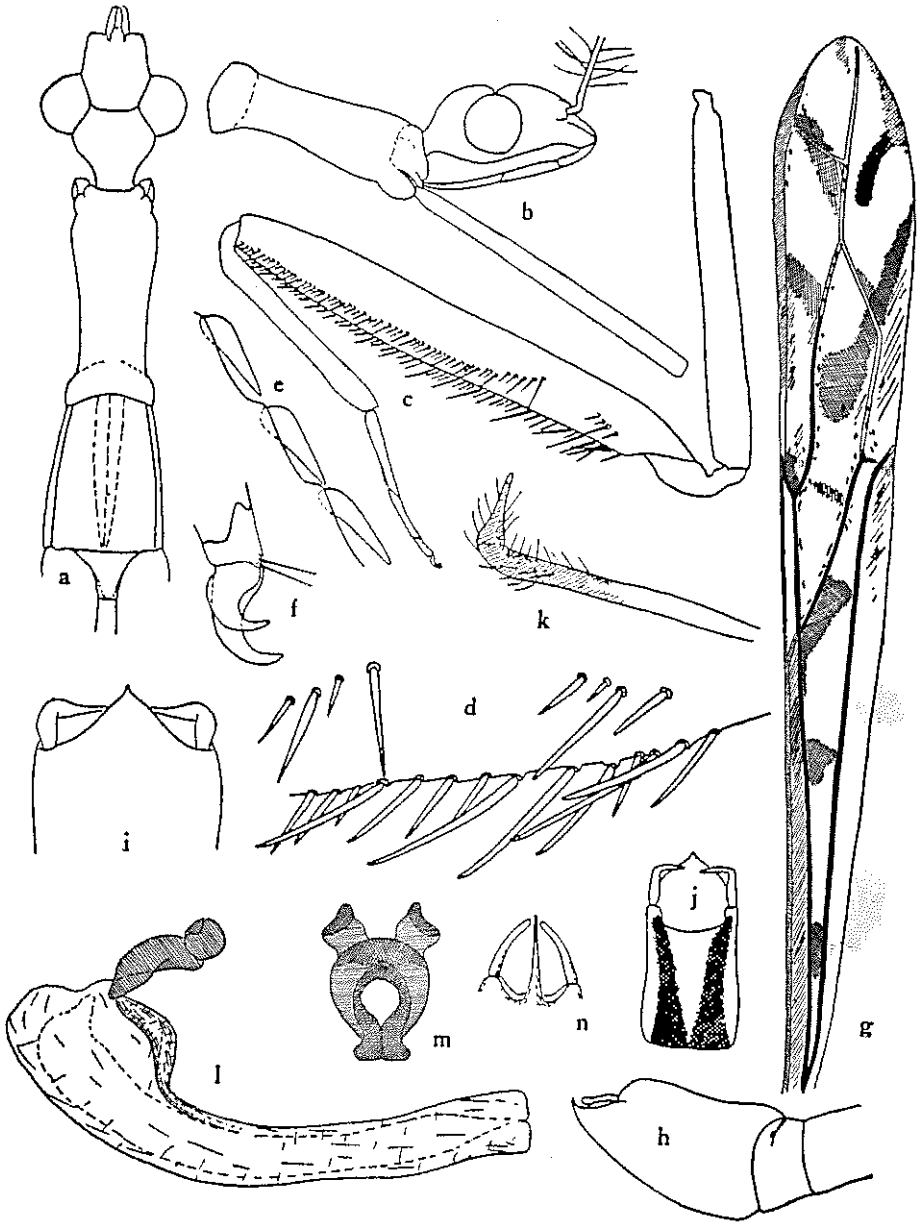

FIGURE 1.—a-m, *Ploiaria halosydne: a*, anterior portion of body, male, dorsal view; *b*, same, lateral view; *c*, fore leg, inner surface; *d*, base of series of spiniform setae of fore femur; *e*, spine-like setae of undersurface of fore tibia; *f*, fore praetarsus with claws; *g*, fore wing; *h*, apex of abdomen, male, lateral view; *i*, apex of hypopygium, ventral view; *j*, hypopygium, dorsal view; *k*, clasper; *l*, aedeagus, lateral view; *m*, basal plates. n, *P. insolida*, apex of hypopygium and claspers, rear view.

first segment yellowish white. Mid- and hind femora irregularly and faintly annulate with dark and light brown, a rather wide, yellowish-white annulus subapically, removed from apex by about twice its length; tibiae light brown, with numerous narrow, dark-brown annuli, a very narrow sub-basal annulus yellowish white. Abdomen light brown, irregularly spotted with dark brown. Hypopygium pale colored, with 1-1 submedian dorsal and 1-1 wide lateral longitudinal dark fasciae. Body surface smooth, slightly shining, strongly polished on anterior portion of head with antenniferous tubercles, base of antennae, rostrum, lateral and ventral surface of thorax, and legs all covered with very short pile.

Head as in figure 1, *a, b;* distance between eyes dorsally equal to their width in male, somewhat larger than their width in female (17 : 12); in lateral view, eyes almost attaining apparent dorsal and ventral surface of head in male, slightly shorter in female. First segment of antennae of male with numerous hairs which are many times longer than diameter of segment; these hairs also present on second segment, but less numerous; antennae of female bare. Length of first segment of antennae in male 6.3 mm.; relative length of segments 1 : 0.72 : 0.32 : 0.22. Rostrum as in figure 1, *b*.

Thorax as in figure 1, *a, b*. Pronotum subcylindrical, slightly convex above, hind lobe distinctly detached, faintly wrinkled transversely; mesonotum four-fifths as long as pronotum, its disc slightly elevated, with narrow, shallow, median longitudinal furrow.

Fore legs (fig. 1, *c-f*) slender. Coxa as long as pronotum and head to anterior border of eyes. Trochanter simple. Femur slender; ventral series composed of spine-like setae not inserted upon distinctive basal tubercles, slightly curved apically; anteroventral series composed of about 55 setae, those at base of article the strongest; anteroventral series widely interrupted at base with one to four setae basad of interruption, the remaining part composed of about 50 setae. Tibia slender, about half as long as femur, ventrally with one series of strong adpressed spine-like setae (fig. 1, *e*). Tarsus two-thirds of length of tibia, basal segment as long as apical ones together, third shorter than second; ventrally with one series of spines similar to those of tibia. Two simple subequal claws. Mid- and hind legs bare, hind femora surpassing apex of abdomen by about 3 mm.

Shape and venation of fore wings as in figure 1, *g*. Transverse thickening of hind wings broad.

Abdomen slender, parallel-sided. Male hypopygium longer than wide, its posterosuperior margin produced in a wide triangular process (fig. 1, *j*) continuous with surface of hypopygium. Claspers slender, rectangularly bent apically, pigmentation and chaetotaxy as in figure 1, *k*. Aedeagus (fig. 1, *l*) tubular. Basal plates as in figure 1, *m*. Abdomen of female pointed apically, without special characters.

Holotype, male (US 64521), Palau, Babelthuap, East Ngatpang, 65 m., Dec. 8-10, 1952, Gressitt; allotype, female, same data. Paratypes, all Palau: Four females, same data as for holotype; female, Babelthuap, wooded peak southwest of Ulimang, Dec. 20, 1947, Dybas; male (BISHOP), Auluptagel, 26 m., Dec. 19, 1952, Gressitt; female, Peleliu, Aug. 1, 1945, Hagen; male (CM), Peleliu, east coast, Aug. 1, 1945, Dybas.

DISTRIBUTION: Palau Is.

There is some variation in the intensity of pigment in the series examined. The fore wing illustrated belongs to the male holotype; in the topotypical females, the pigment is generally somewhat more intense and extensive. The specimens from Auluptagel and Peleliu are considerably darker than the Babelthuap specimens, but no morphological differences have been discovered to separate the populations; we prefer, however, to restrict designation of paratypes to the Babelthuap specimens.

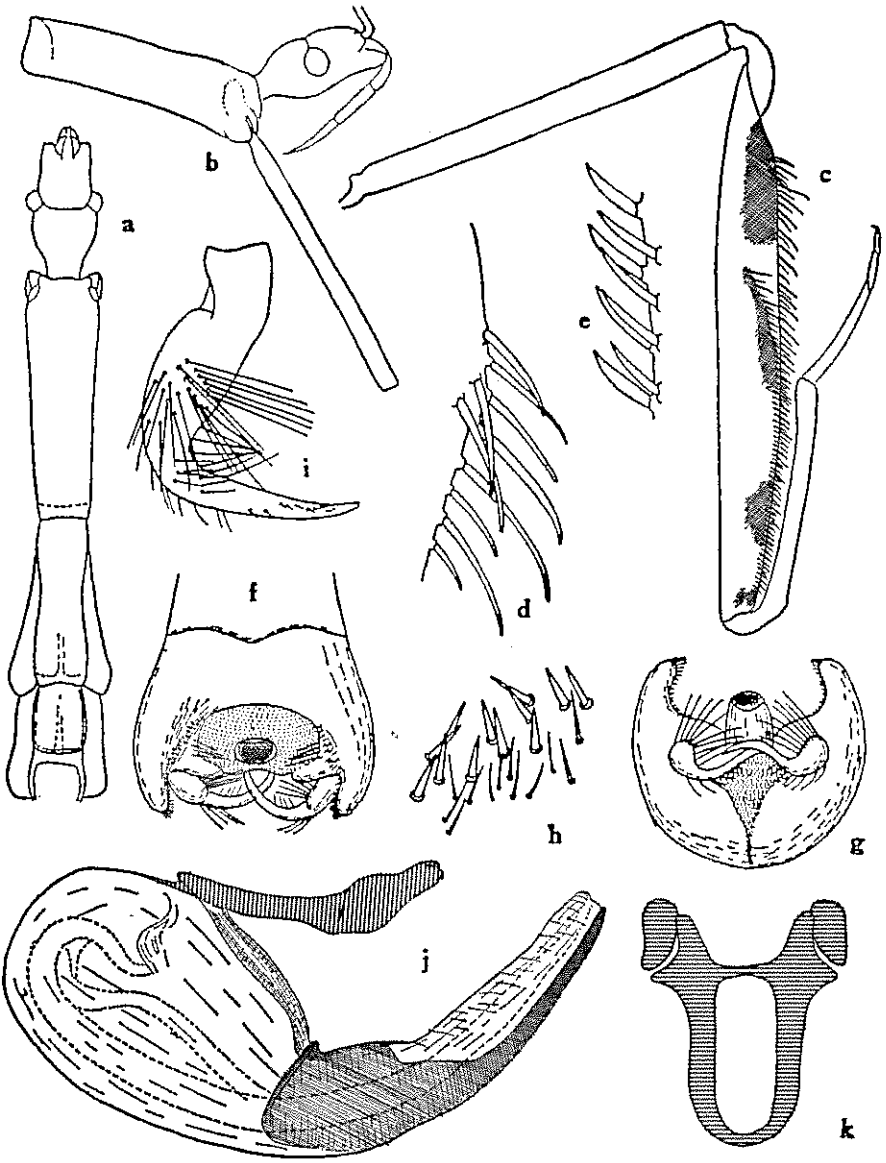

FIGURE 2.—*Ploiaria thetis*, male: **a**, anterior portion of body, dorsal view; **b**, head and pronotum, lateral view; **c**, fore leg; **d**, base of series of spine-like setae of fore femur; **e**, spines of undersurface of fore tibia; **f**, hypopygium, dorsal view; **g**, hypopygium, rear view; **h**, spines of lateral projections of hypopygium; **i**, clasper; **j**, aedeagus, lateral view; **k**, basal plates.

This new species seems to be related to *P. nitida* McAtee and Malloch [1926, Philippine Jour. Sci. 30 (1) : 145] from the Philippine Islands; it differs from the latter by numerous morphological and chromatic characters.

Halosydne is a name for Aphrodite.

3. **Ploiaria thetis** Wygodzinsky and Usinger, n. sp. (fig. 2).

Apterous male. Length 11.4 mm.; head 1.0 mm., thorax 3.7 mm.; abdomen 6.7 mm. General color dark brown. Head with some indistinct paler regions, especially before eyes dorsally and ventrolaterally; first segment of rostrum dark brown, second and third testaceous; first segment of antennae dark brown, with a narrow yellowish-white annulus at base and another apically; rest of antennae dark brown, second segment apically with extremely narrow whitish annulus. Thorax of the general color, very slightly paler dorsally and on acetabula. Fore coxa and trochanter almost uniformly dark brown; pattern of outer surface of femur much as in *P. phyllodoce* (fig. 3, *b*), but dark pigment somewhat more extensive; inner surface as in figure 2, *c;* tibia and tarsus dark brown, base of first and apex of third tarsal segment whitish. Mid- and hind femora brown, darker and paler regions only faintly marked, hind femora apically with rather wide, conspicuous, whitish annulus, tibiae practically uniformly dark brown. Abdomen rather uniformly dark brown, including spiracles; eighth segment with 1-1 rather large whitish spots dorsolaterally. Body surface slightly shining, with very short microscopic pile.

Shape of head as in figure 2, *a, b*. Eyes very small, the distance between them dorsally somewhat more than three times their width; elliptical, far removed from apparent upper and lower surface of head. Shape and relative length of segments of rostrum as in figure 2, *b*. Antennae bare; length of first segment 8 mm.; relative length of segments 1 : 0.75 : 0.22 : 0.21.

Thorax as in figure 2, *a, b*. Pronotum slightly convex above, its hind lobe short, almost indistinguishable from front lobe, very faintly wrinkled transversely; mesonotum two-thirds as long as pronotum, only faintly convex, more so on posterior half, median longitudinal sulcus almost imperceptible; metanotum less than one-half as long as mesonotum, both together as long as pronotum, the median longitudinal ridge of metanotum difficult to perceive.

Fore legs as in figure 2, *c-e*, rather similar to those of *P. phyllodoce,* but femur stouter; coxa slender, hardly longer than pronotum; trochanter bare; femur somewhat widened sub-basally; posteroventral series composed of about 60 setae of the same type as in *P. phyllodoce,* not forming a basal group; three setae basad of interruption of anteroventral series, the remaining part of series composed of about 55 setae; tibia slender, about half as long as femur, ventrally with two series of spines (fig. 2, *e*), one composed of slender spines, the other of slightly stouter spines, not tooth-like. Tarsus slender, about two-thirds as long as tibia, the relative length of segments, their spines, and size and shape of claws as in *P. phyllodoce.* Mid- and hind legs bare, elongate, hind femora surpassing apex of abdomen by about 5 mm.

General features of abdomen as in *P. phyllodoce,* last tergite more broadly salient behind (fig. 2, *f*) than in *P. phyllodoce.* Hypopygium as in figure 2, *f, g;* posterolateral angles strongly salient, with fascia of short, stout spines on surface directed medially. Claspers sickle-shaped, their chaetotaxy as in figure 2, *i*. Aedeagus as in figure 2, *j*. Basal plates as in figure 2, *k*, sclerotization of phallosoma very distinctive, with two long, slender, forwardly directed arms; endosoma not coiled.

Apterous female, general characters as in male. Abdomen slender, parallel-sided, narrowed posteriorly.

Holotype, male (US 64522), Yap, hill behind Yaptown, 50 m., Dec. 3, 1952, Gressitt. Paratypes, all Yap: Male, 1952, Krauss; male, female (BISHOP), Mt. Mataade, 95 m., light trap, Dec. 1, 1952, Gressitt.

DISTRIBUTION: Caroline Is. (Yap).

This species is very closely related to *Ploiaria phyllodoce*, found on Ponape. Some of the differential characters are mentioned in our key; others are apparent from our descriptions and illustrations.

The name of this species is from Thetis, a sea nymph.

4. Ploiaria phyllodoce Wygodzinsky and Usinger, n. sp. (fig. 3).

Apterous male. Length 15 mm.; head 1.5 mm., thorax 5.5 mm., abdomen 8 mm. General color dark brown. Head somewhat paler behind eyes; rostrum testaceous; apical half of first segment, apex of second segment, and third segment to varying degree brown; first segment of antennae light brown, base slightly paler, apex whitish, color piceous subapically; second segment piceous with narrow apical white annulus, third and fourth piceous. Thorax of the general color, dorsally with somewhat paler, median, longitudinal stripe; acetabula also somewhat paler. Fore coxa dark brown, sometimes with faint subbasal and subapical paler annulus; femur with extensive stramineous regions (fig. 3, *b*); tibia and tarsus light brown. Mid- and hind legs stramineous; coxae with two dark stripes; femora pale colored on basal third, followed by one narrower, and two very wide, dark annuli, the former as wide as, the latter wider than, the intervening pale regions, apical pale-colored region with more or less extensive dark distal spot; tibiae with narrow dark basal annulus followed by somewhat wider stramineous annulus, rest of article light brown; tarsi light brown. Abdomen of the general body color, spiracles testaceous; eighth sternite with 1-1 pale spots laterally. Body surface slightly shining, with very short microscopic pile.

Shape of head as in figure 3, *a, b*. Eyes very small, distance between them dorsally three times their width; in lateral view, subcircular, far removed from apparent upper and lower surface of head. Shape and relative length of segments of rostrum as in figure 3, *b*. Antennae bare; length of first segment 10 mm.; relative length of segments 1 : 0.77 : 0.22 : 0.20.

Thorax as in figure 3, *a*. Pronotum slightly convex above, its hind lobe short, distinctly separated from front lobe, faintly wrinkled transversely; mesonotum two-thirds as long as pronotum, rather strongly convex on posterior half, with very faint, median, longitudinal sulcus; metanotum about half as long as mesonotum, both together about as long as pronotum, with distinct median longitudinal ridge.

Fore legs as in figure 3, *b-f*. Coxa long and slender, slightly shorter than head and pronotum together; trochanter bare; femur strongly widened sub-basally; ventrally with long and strong setae of rather uniform size inserted on very short bases, hair color dark with exception of slightly curved apices. Posteroventral series composed of about 70 setae, the basal ten forming rather compact group, the remaining arranged in groups of four to six setae which become progressively longer. Anteroventral series very widely interrupted near base, with four to six setae forming rather compact group basad of interruption, the remaining part of the series strongly dorsally curved at base, composed of about 65 setae similar to those of other series, generally arranged in groups of three progressively longer ones. Tibia slender, half as long as femur, ventrally with two series of spines (fig. 3, *d*), one composed of slender, slightly curved, and the other of rather broad apically, strongly curved, tooth-like spines. Tarsus slender, about two-thirds as long as tibia, first segment about as long as twice second and third segments together; undersurface of tarsus with two series of simple, strong, spine-like setae (fig. 3, *e*); two simple claws of very different size (fig. 3, *f*). Mid- and hind legs bare, elongate, hind femora surpassing apex of abdomen by 6 mm.

Abdomen rather stout, subparallel, tergites and sternites simple; last tergite somewhat salient in middle behind, the projection not surpassing base of hypopygium. Hypopygium transverse, half as long as wide in dorsal view (fig. 3, *h*); its hind border concave;

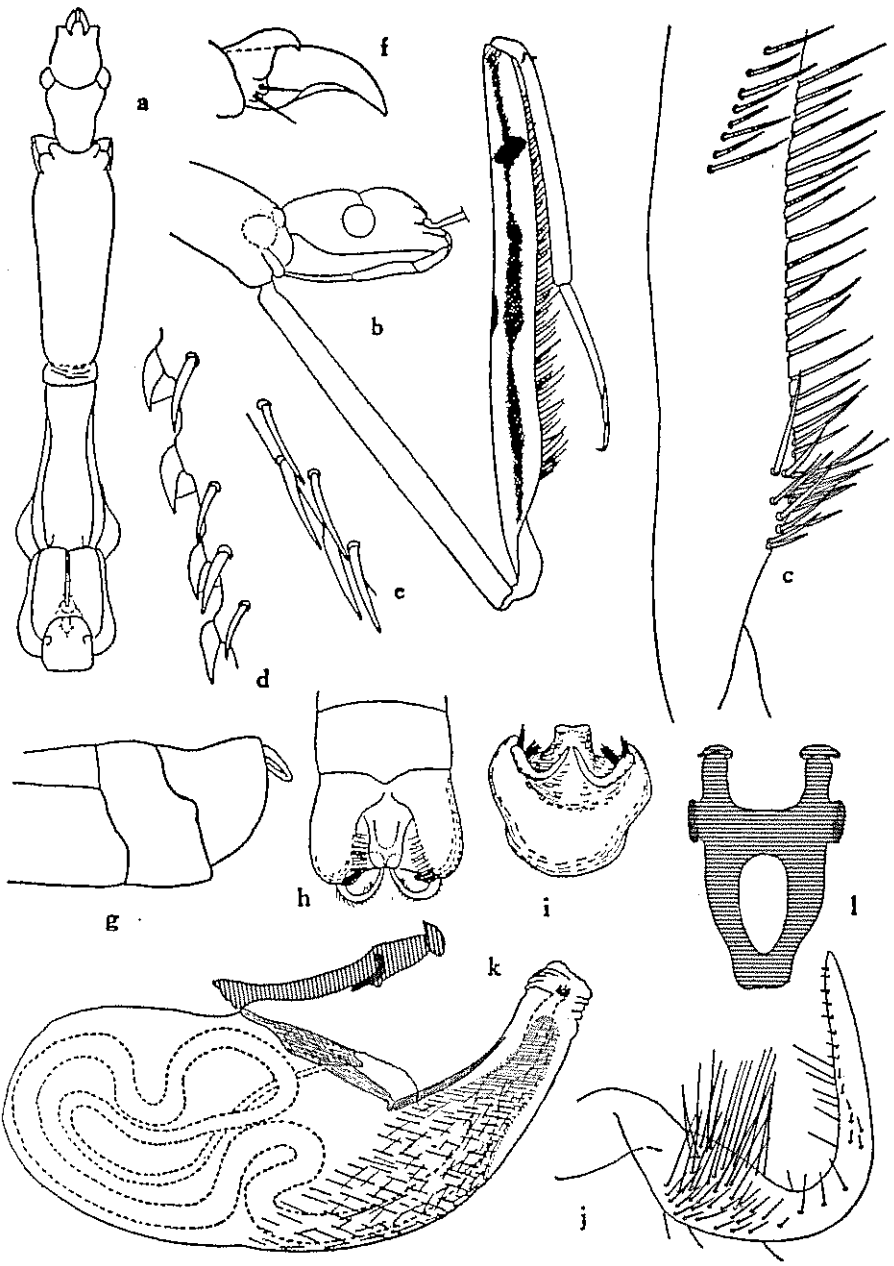

FIGURE 3.—*Ploiaria phyllodoce*, male: **a**, anterior portion of body, dorsal view; **b**, head and fore leg, lateral view; **c**, base of fore femur; **d**, spines of ventral surface of fore femur; **e**, spines of ventral surface of fore tarsus; **f**, fore claws; **g**, apex of abdomen, laterally; **h**, same, dorsal view; **i**, hypopygium, rear view; **j**, clasper; **k**, aedeagus, lateral view; **l**, basal plates.

posterolateral angles not projecting, each with one group of strong setae. Claspers sickle-shaped; their chaetotaxy as in figure 3, *j*. Aedeagus very large, when *in situ* occupying not only hypopygium but also entire eighth segment. Basal plates as in figure 3, *l;* phallosoma faintly sclerotized laterally; endosoma strongly coiled when not everted (fig. 3, *k*).

Holotype, male (US 64523), Ponape, Mt. Dolen Kiepw (Tolenkiup), June to Sept. 1950, Adams. Paratypes, Ponape: Male (BISHOP), Mt. Dolen Nankep, 510-570 m., Aug. 13, 1946, Townes; male (CM), Mt. Kupwuriso, north slope, 300-450 m., Mar. 11, 1948, Dybas.

DISTRIBUTION: Caroline Is. (Ponape).

The relationships of the species of *Ploiaria* are not well enough known to compare the new species correctly with previously described forms. Superficially *P. phyllodoce* resembles *P. antipodum* Bergroth (1927, New Zealand Inst., Trans. 57: 679) described from New Zealand, but that species differs, among other characters, by its fore tarsus which has two equally long basal segments and a very short apical segment, the single claw on the fore tarsus, and the simple tube-like phallosoma. There are several undescribed species of *Ploiaria* obviously more closely related to *phyllodoce* from Fiji, Samoa, and Yap.

The name of this species is from Phyllodoce, a sea nymph.

Genus **Gardena** Dohrn

Gardena Dohrn, 1860, Linn. Ent. **14**: 214.

Type species: *Gardena melinarthrum* Dohrn.

This is also a cosmopolitan genus; representatives are found on several Pacific islands. Not enough is known about this genus to enable us to trace the exact geographic relationships of the single Micronesian species.

5. **Gardena catenarium** Wygodzinsky and Usinger, n. sp. (fig. 4).

Apterous male. Length 15 mm.; head 1.2 mm., thorax 4.3 mm., abdomen 9.5 mm. General color dark reddish piceous; head somewhat paler laterally behind eyes and on anteocular portion; rostrum lighter brown; antennae uniformly dark piceous; mid- and hind femora dark brown, piceous subapically, with wide white annulus apically; mid- and hind tibiae light brown, somewhat darker sub-basally, with wide white annulus at base. Body surface subshining, the following parts highly polished; rostrum, first segment of antennae, acetabula, sides of hind lobe of pronotum, coxae and trochanters of mid- and hind legs. Body with extremely fine and short pile.

Shape of head as in figure 4, *a, b*. Distance between eyes dorsally 2.5 times their width; in lateral view, eyes not attaining apparent upper and lower surface of head. Rostrum as in figure 4, *b*. First segment of antennae with not very numerous hairs which attain about twice diameter of segment. Length of first segment 8 mm.; relative length of segments 1 : 0.87 : 0.45 : 0.27.

Thorax as in figure 4, *a, b*. Fore lobe of pronotum moderately convex, hind lobe distinctly detached subpentagonal, not sulcate along middle behind. Mesonotum slightly convex on disc; metanotum two-thirds as long as free portion of mesonotum, both together about two-thirds as long as pronotum.

Fore legs as in figure 4, *c-f*, very slender. Coxa as long as head and fore lobe of pronotum together. Posteroventral series of fore femur beginning at second third of this article, composed of seven to eight large, and numerous small or very small, spiniform setae inserted upon distinct basal tubercles, some of the larger ones together with bases about as long as diameter of segment. Basal spineless region twice as long as apical one. Anteroventral series as usual for the genus, viz., beginning at some distance distad of base of posteroventral series, composed of slender, spine-like setae not inserted on tubercles. Tibia half as long as femur, ventrally with one series of strongly chitinized peg-like spines. Tarsus with three subequal segments; claws as in figure 4, *c*. Hind femora surpassing apex of abdomen by about 4 mm.

Abdomen slender, subparallel, slightly widened on posterior third. Last tergite tongue-shaped, rounded apically, completely covering hypopygium. The latter (fig. 4, *g, j*) simple, rounded behind in lateral view, its postero-superior process spiniform, short, almost covered by apices of claspers. Claspers short, subcylindrical, their exact shape and chaetotaxy as in figure 4, *h*. Aedeagus simple.

Apterous female. A single poorly preserved specimen was examined which agrees with the male described above in its essential features. The eyes are slightly smaller, and the antennae are completely bare. The abdomen is not preserved.

Holotype, male (US 64524), Truk, Wena (Moen), Civ. Admin. Area, Mar. 30, 1949, Potts. Other specimen, female, same data as for holotype.

DISTRIBUTION: Caroline Is. (Truk).

The Eastern *Gardena* can be divided roughly into those of 15 mm. or less, and those of 19 mm. or more. *G. muscicapa* (Bergroth) from Indonesia is only 12 mm. long, and differs by many structural characters, such as the much shorter basal spineless section of the fore femur, and other characters. *G. fasciata* Distant (1909, Ann. Mag. Nat. Hist. VIII, 3 : 505) from Ceylon, is pale colored. *G. brevicollis* Stål (1870, Öfv. K. Vet.-Akad., Förh. 27 : 704), a very widespread species, differs among other characters by the differently shaped spines on the fore tibia and the narrowly triangular tergite of the male. All of the species mentioned before are winged, and their pronotum correspondingly very different from that of *catenarium*. Among the larger species, *G. geniculata* China (1930, Insects of Samoa II, Hemipt. 3 : 143) from Samoa, seems rather near our species, but in *geniculata* the hind lobe of the pronotum is truncate and slightly emarginate behind, the apex of the fore femur and the base of the fore tibia is white, et cetera. It is clear that *catenarium* is just one of the many rather closely related species found in the East.

The name *catenarium* means of a chain (of species).

Genus **Emesopsis** Uhler

Emesopsis Uhler, 1893, Zool. Soc. London, Proc. 1893 : 748.
Calphurnia Distant, 1909, Ann. Mag. Nat. Hist. VIII, 3 : 502, n. syn.
Hadrocranella Horváth, 1914, Mus. Nat. Hungarici, Ann. 12 : 647, n. syn.

Type species: *Emesopsis nubilus* Uhler.

Horváth (1914, *op. cit.*) compares *Hadrocranella* with *Calphurnia* Distant (1909, *op. cit.*) ; the latter has as its type species *Calphurnia reticulata* Distant

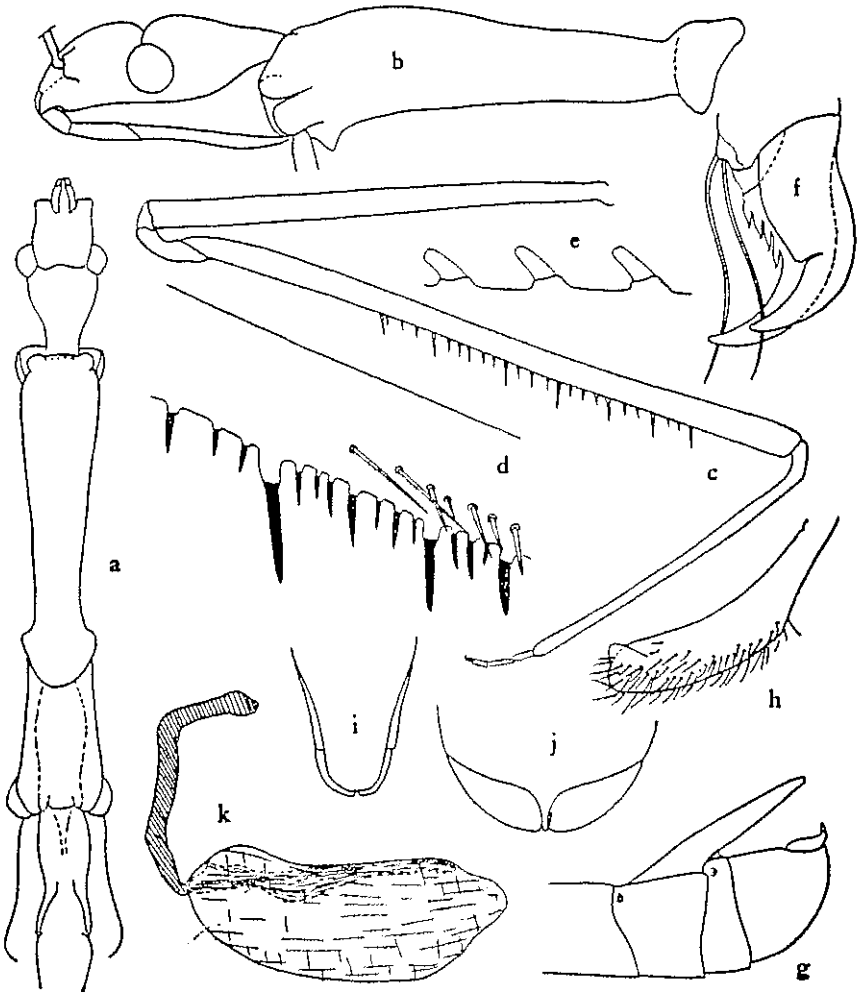

FIGURE 4.—*Gardena catenarium:* **a**, anterior portion of body, male, dorsal view; **b**, same, lateral view; **c**, fore leg; **d**, part of posteroventral and base of anteroventral series of spine-like setae of fore femur; **e**, spines of ventral surface of fore tibia; **f**, fore praetarsus and claws; **g**, apex of abdomen of male, lateral view; **h**, clasper; **i**, apex of abdomen, dorsal view; **j**, apex of hypopygium, rear view; **k**, aedeagus, lateral view.

(1909, *op. cit.*), a synonym of *Emesopsis nubilus* Uhler (1893, *op. cit.*), thus *Calphurnia* is a straight synonym of *Emesopsis*. Among the characters used by Horváth to differentiate his *Hadrocranella*, we might mention those of the head and length of antennae (purely specific features in the present group), the absence of transverse veinlets in the corium (all transitions between a completely veinless condition and the presence of very numerous veins shown in species belonging here), the shape of the basal discal cell (completely closed and pointed basally in *imbellis*, the two veins forming it connected by transverse veinlets basally in *nubilus*, open basally and the two veins not connected at all basally in *neptunis* McAtee and Malloch, et cetera), and the absence of spines on the undersurface of the fore femur. This latter character, if true, would be significant. In most *Emesopsis*, however, the ventral spines of the fore femur are very minute and easily overlooked, and as *Hadrocranella imbellis* agrees so well with the remaining species in its group, we feel safe in assuming that it really does have spines on the undersurface of the fore femur. Thus, no characters would remain to differentiate *Hadrocranella* from *Emesopsis*.

McAtee and Malloch [1926, Philippine Jour. Sci. 30 (1) : 121] consider *Hadrocranella* as a subgenus of *Emesopsis*. They use a set of characters for distinguishing the two groups which will be discussed here. A short stump of a vein emanating from the apex of the discal cell is present in *Hadrocranella*, absent in *Emesopsis*. In addition to the somewhat disturbing fact that this vein stump is apparently not present in the type species of *Hadrocranella*, its occurrence is not more than a specific character (see *E. bellulus* and *decoris* described below). The apical branch of M has a bifurcate branch toward the costal margin; although this is quite distinct in the type of *Hadrocranella* and related species, it occasionally occurs in individuals of *Emesopsis nubilus*. The dense pile of the anterior lobe of the pronotum is interrupted by a glossy trident-shaped area on each side; we have no information on this character in the genotype of *Hadrocranella;* the species ascribed by McAtee and Malloch to *Hadrocranella* show this bare area but so does *Emesopsis nubilus*, although McAtee and Malloch (1926, *op. cit.*) and following them, Usinger (1946, B. P. Bishop Mus., Bull. 189 : 42) overlooked this. The presence or absence of veinlets or vein-like spots at the base of the wing is equally a character that cannot be used for a generic or subgeneric distinction.

We have tried to find other characters that would allow us to classify the present assembly of species into two or more clear-cut groups, but have failed to achieve any success. There are species with the abdomen extremely narrowed sub-basally, as in figure 12, *g, h*, and others with its shape more normal (fig. 6, *g*) ; there seems to be some correlation between the degree of sub-basal narrowing of the abdomen and the intensity of the wing pattern, but apparently both characters vary widely between different species and intergradations are found. Some, but not all, of the species with moderately narrowed abdomen

and relatively faint spots on wings are also characterized by a relatively elongate pronotum, with the constriction between fore and hind lobe only faintly indicated. Such species as *scitulus* described below do not fit this scheme, as they have a very moderately narrowed abdomen and a relatively faint wing pattern, but their pronotum is relatively short and distinctly constricted. The male genitalia are of the same basic pattern in the entire group, with their very complex aedeagus and the short basal plates connected to the base of the phallosoma by 1-1 lateral shield-like sclerites (figs. 7, *f*; 13, *c*).

Thus we have come to the conclusion that at present we are unable to find any clear-cut differences between the admittedly somewhat heterogeneous components of the present group that would allow us to maintain any generic or even subgeneric division.

Emesopsis is primarily an Oriental genus; with one exception, the approximately 15 described species are restricted to that region. The type species, *E. nubilus* Uhler, although described from the Western Hemisphere, is spread practically all over the warmer regions of the world.

In addition to *nubilus,* six species are now known from Micronesia, all of which are apparently endemic.

This genus probably contains a considerably larger number of species than those described to date. It would seem that the genus centers around the tropical southwestern border of the Asiatic continent (Philippine Islands and Malaya), the relationships of the Micronesian species being with these. On the other hand, these small insects have not been much collected, and it is quite possible that future material will modify our view of the genus somewhat.

Key to Micronesian Species of Emesopsis

1. Head, pronotum, and legs with conspicuous long hairs in addition to short pile; general color rather uniformly light brown, pattern of fore wings difficult to perceive ..... **6. nubilus**

   Head, pronotum, and legs without long hairs; species not uniformly light brown, pattern of fore wings always distinct (figs. 6, *f*; 9, *e*; 10, *g*; 12, *l*; 14, *a*) 2

2. Spots of membrane of fore wings rather faint, two very dark conspicuous spots at base of basal discal cell and at base of apical discal cell (fig. 6, *f*); posterolateral angles of head rather salient ventrally (fig. 6, *b*); abdomen only moderately constricted at base (fig. 6, *g*) ..... **7. scitulus**

   Spots of membrane of fore wing prominent, all of approximately uniform intensity (figs. 9, *e*; 10, *g*; 12, *l*; 14, *a*); posterolateral angles of ventral surface of head not prominent (figs. 9, *b*; 10, *b*; 12, *b*); abdomen extremely narrow sub-basally (figs. 9, *f*; 10, *h*; 12, *g*, *h*) 3

3. Fore coxa whitish, almost imperceptibly darkened apically; subcostal area basad of basal discal cell with longitudinal pigment stripes ..... **8. pallidicoxa**

   Fore coxa with distinctive apical dark annulus (fig. 9, *d*); subcostal region basad of basal discal cell with transverse spots, or without pigment (figs. 9, *d*; 10, *c*; 12, *d*) 4

4. Subcostal area basad of basal discal cell with two transverse spots; large discal cell with numerous, isolated, relatively small spots (fig. 9, *e*).....**9. amoenus**
   Subcostal area basad of basal discal cell without spots; apical discal cell with one large spot in center, connected or not to pigment bordering apical veins of that cell (figs. 10, *g*; 12, *l*; 14, *a*)..... 5
5. Abdomen regularly widened posteriorly in male (fig. 10, *h*); posterior process of hypopygium of male tongue-shaped, rounded apically (fig. 10, *j*); dark portions of fore femur more extensive than pale areas (fig. 10, *c*); larger spines of posteroventral series of fore femur about twice length of short ones (fig. 10, *d*).....**10. habros**
   Abdomen strongly and abruptly widened on posterior third in male (fig. 12, *g*); posterior process of hypopygium of male with slender point apically (fig. 12, *k*); dark portions of fore femur not more extensive than pale areas (fig. 12, *d*); larger spines of fore femur much less than twice length of short ones (fig. 12, *e*)..... 6

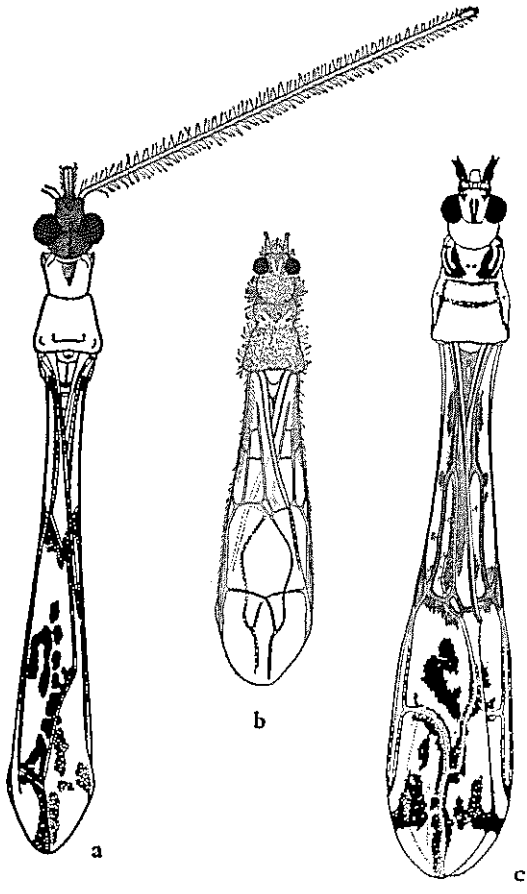

FIGURE 5.—a, *Ademula distincta;* b, *Emesopsis nubilus;* c, *E. pallidicoxa.*

6. Short free vein of apex of large discal cell well developed (fig. 12, *l*); pattern of fore wing as in figure 12, *l;* hypopygium dark at sides of base only (fig. 12, *g*); mid- and hind femora with submedian annuli practically imperceptible.....**11. bellulus**
Short free vein at apex of large discal cell almost imperceptible (fig. 14, *a*); pattern of fore wing as in figure 14, *a;* hypopygium dark with exception of extreme apex only; mid- and hind femora with two distinct submedian annuli.....**12. decoris**

6. Emesopsis nubilus Uhler (fig. 5, *b*).

Emesopsis nubilus Uhler, 1893, Zool. Soc. London, Proc. **1893** : 718.

Calphurnia reticulata Distant, 1909, Ann. Mag. Nat. Hist. VIII, **3** : 503, n. syn.

Calphurnia pacalis Horváth, 1914, Mus. Nat. Hungarici, Ann. **12** : 649, n. syn.

Ploiariola pallida Jeannel, 1919, Voyage Alluaud et Jeannel Afr. Orient., Res. Scient., Hemipt. **3** : 151, n. syn.

Emesopsis pilosus Usinger, 1946, B. P. Bishop Mus., Bull. **189** : 42, n. syn. (Guam).

DISTRIBUTION: Tropicopolitan; Mariana Is.

S. MARIANA IS. GUAM: Female, Fadang, beating vegetation, May 31, 1945, Dybas.

This is the type species of the genus. Detailed comparison between specimens from America, Africa, Mauritius, India, Hawaiian Islands, and Micronesia fails to show any differences as to size, pattern, or morphology in both sexes, including the genitalia.

The type specimens of *E. pallida, reticulata,* and *pacalis* were not seen but there is nothing in their descriptions that would warrant an independent status for them. Drawings of the venation of the fore wings and the male genital capsule of the type of *reticulata* were kindly sent by Mr. N. C. E. Miller and they confirm our hypothesis. Guam specimens of *E. nubilus* agree with the description of *E. pilosus* Usinger as well as with Antillean specimens of that species. The fact that *E. nubilus* Uhler has never been correctly described caused Usinger (1946, *op. cit.*) to consider the presence of spines on the undersurface of the fore femur and the existence of glabrous areas on the fore lobe of the pronotum as characters that would distinguish his material from *E. nubilus;* we now know that this does not hold true. Also the ratio of the antennal segments agrees well with that of *E. nubilus.*

E. nubilus is a very widespread species, and is now known to occur in tropical and subtropical zones all over the world.

7. Emesopsis scitulus Wygodzinsky and Usinger, n. sp. (figs. 6, *a-g;* 7, *a-f*).

Male and female. Length of apex of fore wing 4.5 mm. in male, 4.75 mm. in female, the fore wing surpassing apex of abdomen by 0.5 mm.

Head and thorax light brown, covered with dense adpressed white pile; bare polished areas of head and pronotum as in figure 6, *a*. Rostrum light brown, polished, first segment with large dark-brown spot on middle (fig. 6, *b*). First segment of antennae light brown,

apical tenth white, a narrow piceous annulus at base of white portion. Remaining segments whitish, indistinctly tinged with dark brown. Scutellum covered with pile; metanotum and spine concolorous light brown. Fore legs yellowish white, with not very sharply limited dark-brown annuli (fig. 6, *c*). Mid- and hind legs stramineous, apical tenth of femora and base of tibiae white, a piceous annulus at base of apical white region of femora, as well as two narrow submedian annuli of the same color; tibiae with one sub-basal annulus. Mid-coxa with large dark spot. Fore wings stramineous, pattern elements pale brown, not very conspicuous, with exception of one piceous spot at base of basal discal cell and another one at base of apical discal cell, the latter also occupying apex of subcostal area. Coloring of veins as in figure 6, *f*. Abdomen light brown, with short white pile.

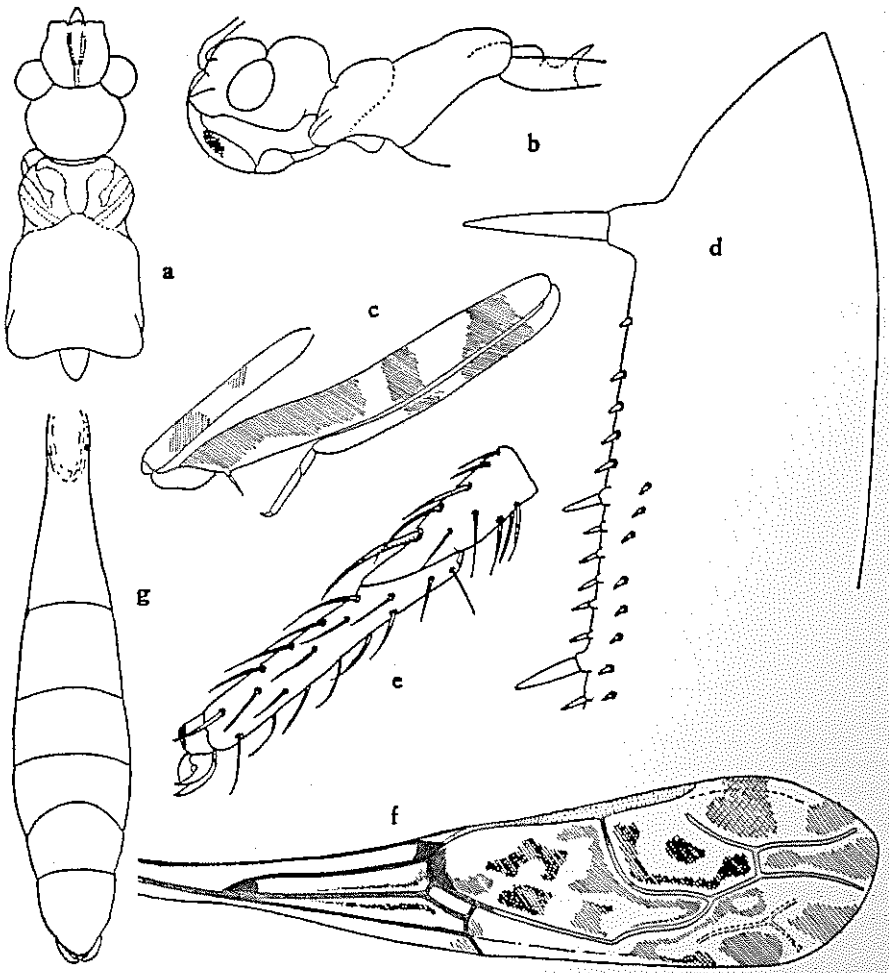

FIGURE 6.—*Emesopsis scitulus:* **a**, head and prothorax of male, dorsal view; **b**, same, lateral view; **c**, fore leg, pattern and only basal spine of femur; **d**, base of series of spines of fore femur; **e**, fore tarsus; **f**, fore wing; **g**, abdomen of male, ventral view.

Body with short hairs, a few isolated and barely perceptible long hairs on pronotum and on base of outer margin of fore wings.

Head of male as in figure 6, *a, b,* posteroventral angles of ventral surface rounded, salient, with shallow groove between them. Distance between eyes dorsally in male slightly larger than width of eye, almost twice their width in female; in lateral view, the eyes do not attain apparent dorsal or ventral surface of head. Rostrum as in figure 6, *b*. Antennae bare. Length of first segment 2.7 mm.; relative length of segments 1 : 0.7 : 0.35 : 0.2.

Shape and proportions of prothorax as in figure 6, *a, b*. Scutellum short, rather narrow. Metanotum large with long upwardly and backwardly directed spine.

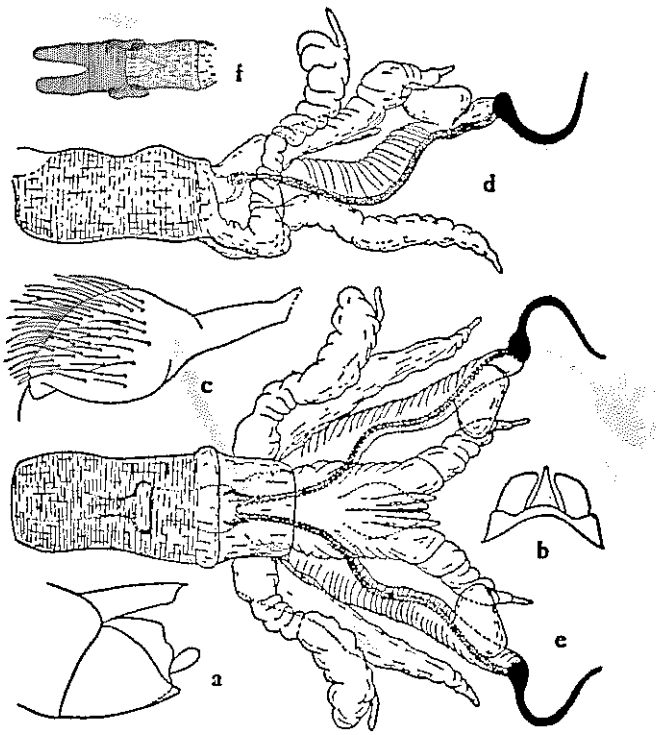

FIGURE 7.—*Emesopsis scitulus*, male: **a**, apex of abdomen, lateral view; **b**, apex of hypopygium with claspers, rear view; **c**, clasper; **d**, aedeagus, lateral view; **e**, aedeagus, dorsal view; **f**, basal plates with base of phallosoma.

Shape of fore legs as in figure 6, *c*. Coxa slightly shorter than pronotum. Femur rather stout, about ten times as long as wide. Posteroventral series with one very large basal spine, the length of which, together with the basal tubercle, almost attains that of the diameter of the femur; four to five shorter, and about 40 very short, spines. Anteroventral series composed of 70 very short spines (fig. 6, *d*). Tibia ventrally with two series of slender curved setae, in addition to ordinary hairs. Tarsus as usual for the genus, first segment subapically on ventral surface with one rather long and strong seta. Claws as in *E. bellulus*. Mid- and hind legs slender, bare, femora swollen apically, those of third pair surpassing apex of fore wings by 0.5 mm.

Shape and venation of fore wings as in figure 6, *f;* basal discal cell without reticulate fascia; bifurcate branch of apical section of M well developed.

Abdomen (fig. 6, *g*) only moderately narrowed at base. Genital region of male as in figure 7, *a;* eighth sternite almost completely covering hypopygium on undersurface. Apical process of hypopygium set within border of same, narrowly triangular, slightly surpassing apex of claspers. The latter very narrow on basal third, widely oval on apical two-thirds, their exact shape and chaetotaxy as in figure 7, *c*. Basal plate as in figure 7, *f*, aedeagus as in figure 7, *d, e*.

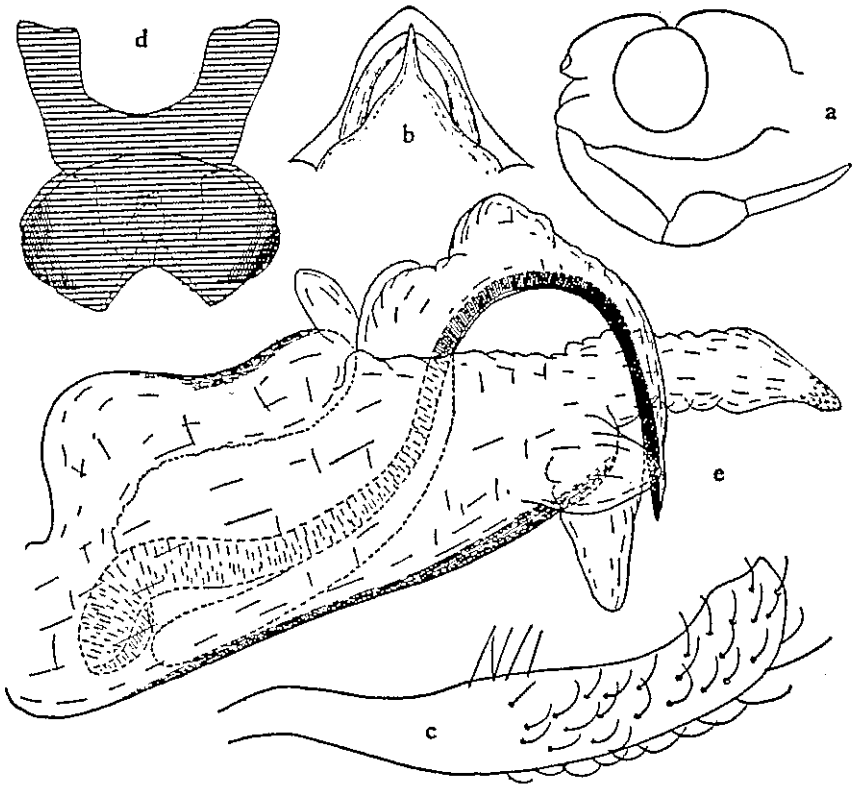

FIGURE 8.—*Emesopsis pallidicoxa*, male: **a**, head, lateral view; **b**, apex of hypopygium with claspers, rear view; **c**, clasper; **d**, basal plates; **e**, aedeagus, lateral view.

Holotype, male (US 64525), Ponape, Mt. Temwetemwensekir, summit, 450 m., Mar. 23, 1948, Dybas; allotype, female, same data as for holotype. Paratype, male, same locality as for holotype, slope, 150-300 m., Feb. 29, 1948, Dybas.

DISTRIBUTION: Caroline Is. (Ponape).

The characters indicated in our key are sufficient to show the rather isolated position of this species among the Micronesian *Emesopsis;* the very peculiar genitalia of the male further stress this point.

8. Emesopsis pallidicoxa (Usinger), n. comb. (figs. 5, *c;* 8).

Hadrocranella pallidicoxa Usinger, 1946, B. P. Bishop Mus., Bull. 189 : 41 (Guam).

DISTRIBUTION: S. Mariana Is.

S. MARIANA IS. GUAM: Female, Mt. Santa Rosa, June 3, 1945, G. Bohart and Gressitt.

In accordance with what has been said above, Usinger's species is herewith transferred to *Emesopsis*. The original description and illustration are here supplemented with drawings of the head, genital region, and various details of the claspers and phallosoma.

The apex of the large discal cell is either slenderly truncate, as in figure 5, *c*, or pointed.

9. Emesopsis amoenus Wygodzinsky and Usinger, n. sp. (fig. 9).

Male and female. Length to apex of abdomen 5 mm. in male, 6 mm. in female. Head and thorax dark brown, covered with dense and coarse adpressed yellowish-white pile; bare polished areas of head and pronotum as in figure 9, *a* (stippled). Rostrum polished, yellowish white, basal half of first and second segments dark brown. Antennae whitish; first segment with three narrow brown annuli: one basal, one sub-basal, and one sub-apical, the latter removed from apex by several times its width; second segment with faint narrow basal and apical annulus; third and fourth segments white. Scutellum covered with pile; metanotum bare, with pile on apex only, its spine black. Basic color of legs white, annuli brown. Pattern of fore legs as in figure 9, *d*. Coxae and trochanters of mid-legs brown, of hind legs whitish. Mid- and hind femora almost uniformly whitish, with very faint and narrow subapical brown annulus; tibiae with one or two very narrow, sub-basal, dark-brown annuli. Fore wings white, iridescent, pattern dark brown, as in figure 9, *e;* spots of membrane rather small and numerous, not ocellate; costal area at level of basal discal cell with three spots, basad of discal cell with two spots; veins limiting small supplementary cell and transverse veins originating from it dark brown, as well as section of R + M limiting basal discal cell. Abdomen rather uniformly light brown, almost whitish at base, especially so in male, eighth sternite and hypopygium of male whitish. Body and appendages without long hairs.

Head and rostrum as in figure 9, *a, b*. Distance between eyes dorsally as wide as eyes in male, slightly wider in female (6 : 5). In lateral view, eyes do not attain apparent dorsal and ventral surface of head. Antennae bare in both sexes. Length of first segment 3.25 mm.; relative length of segments 1 : 0.85 : 0.31 : 0.15.

Shape and proportions of prothorax as in figure 9, *a*. Scutellum and metanotum as in *E. bellulus*.

Shape of fore legs as in figure 9, *d*. Coxa about as long as pronotum. Femur slender, about 13 times as long as wide. Spines of femur and structure of tibia and tarsus with claws as in *E. bellulus*. Hind femora surpassing apex of abdomen by 0.5 mm.

Shape and venation of fore wings as in figure 9, *e*. No short free vein at apex of large discal cell. Bifurcate branch of apical portion of M well developed.

Abdomen very slender sub-basally, regularly widened posteriorly. Basal tergite elevated, with very small whitish spine. Genital region of male as in figure 9, *g;* posterior process of hypopygium large, surpassing apex of claspers, spiniform, regularly narrowed toward apex. Shape and chaetotaxy of claspers as in figure 9, *i*. Aedeagus as in figure 9, *j*.

Holotype, male (KU), Kusaie, Malem, Dec. 14-20, 1937, Esaki; allotype, female, same data. Paratypes, all Kusaie: Male, two females, specimen without

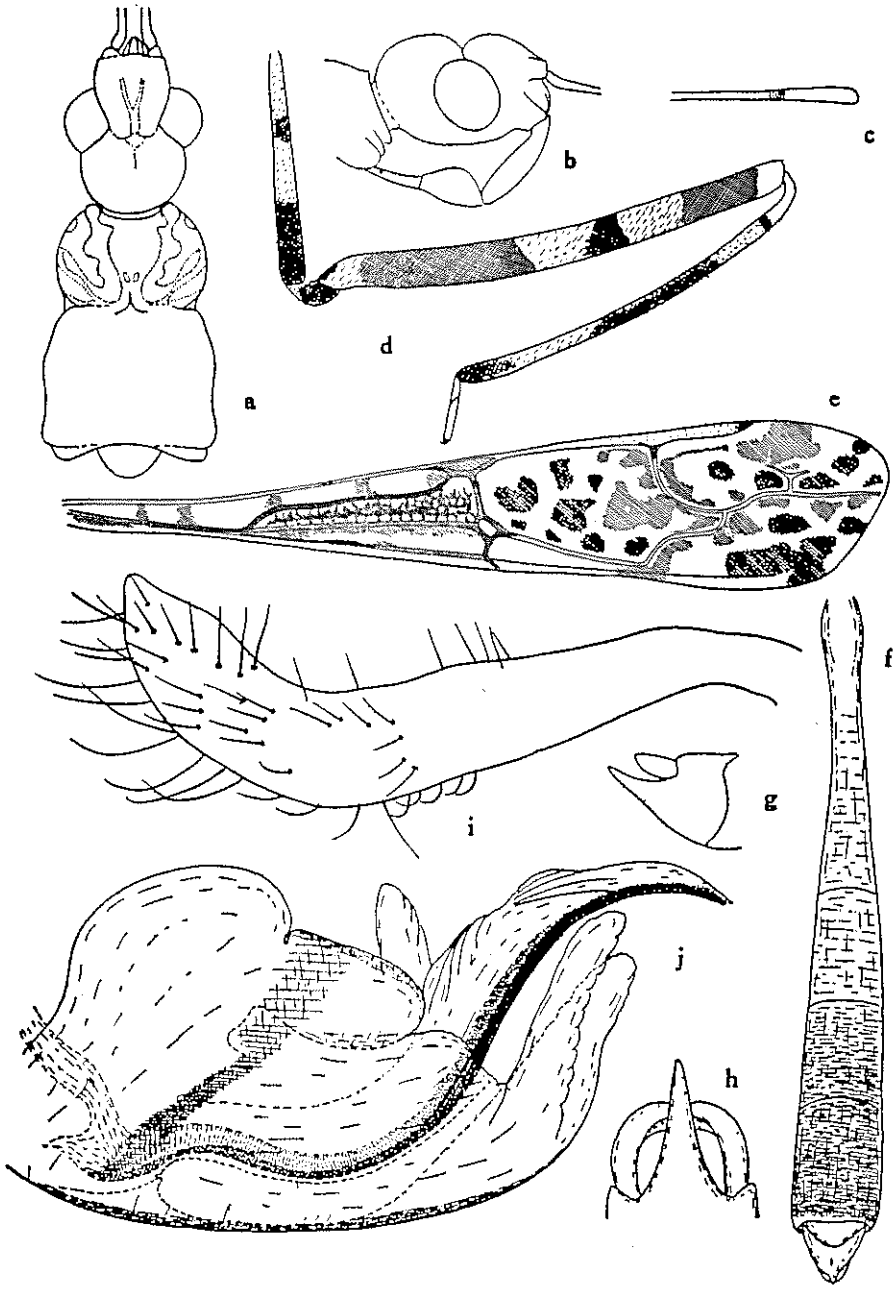

FIGURE 9.—*Emesopsis amoenus:* a, head and pronotum, male, dorsal view; b, same, lateral view; c, apex of hind femur, pigmentation; d, fore leg, spines omitted; e, fore wing; f, abdomen of male, ventral view; g, apex of abdomen of male, lateral view; h, apex of hypoygium, rear view; i, clasper; j, aedeagus, lateral view.

abdomen (KU), same data as for holotype; male, female (US), Mutunlik, 22 m., Feb. 14-15, 1953, Clarke; male (BISHOP), Mt. Fuinkol (Fenkol), Feb. 24, 1953, Gressitt.

DISTRIBUTION: Caroline Is. (Kusaie).

In addition to the characters given in the key, this new species can also be distinguished from related ones by the structure of the male genitalia.

10. Emesopsis habros Wygodzinsky and Usinger, n. sp. (figs. 10; 11).

Male. Length to apex of fore wings, 4.8 mm. Head and thorax dark brown, covered with dense adpressed yellowish-white pile; bare polished areas of head and pronotum as in figure 10, *a*. Rostrum polished, basic color whitish, dark brown on middle of first and base of second segment, third segment slightly darkened toward apex below. Antennae yellowish white; first segment with very faint sub-basal and submedian annulus, and one more distinct subapically, narrow, removed from apex by several times its own length;

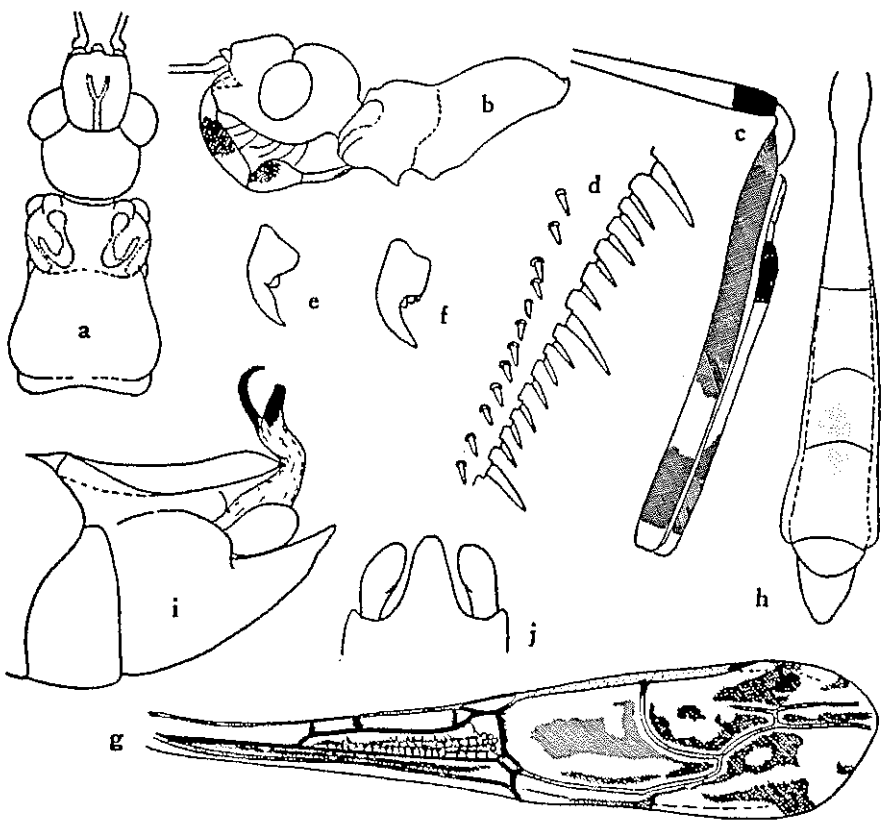

FIGURE 10.—*Emesopsis habros*, male: a, head and pronotum, dorsal view; b, same, lateral view; c, fore leg, spines omitted; d, base of series of spines of fore femur; e, one fore claw; f, other fore claw; g, fore wing; h, abdomen, ventral view; i, apex of abdomen, lateral view; j, apex of hypopygium, rear view.

second segment white at base and extreme apex, with not very distinct dark annulus subbasally beyond white region, and subapically. Scutellum covered by pile; metanotum bare with exception of extreme apex, its spine pale, slightly darkened toward apex. Legs yellowish white, their annuli dark brown. Pattern of fore legs as in figure 10, *c*. Coxae of mid-legs dark brown, those of hind legs with basal dark stripe. Mid- and hind femora with very faint narrow submedian and distinct subapical annulus, the latter narrow, several times shorter than apical white portion. Tibiae with two sub-basal, narrow, dark-brown annuli. Fore wings nacreous, pattern dark brown, as in figure 10, *g*. Subcostal area with three spots at level of basal discal cell; no spots basad of that cell. Pigmentation of veins as in figure 10, *g*. Abdomen stramineous ventrally, with fine, short, white pile; slightly darkened on posterior third. Body and appendages without long hairs, with exception of some isolated long hairs on ventral surface of head and thorax, and rather numerous ones on fore trochanter.

Head and rostrum as in figure 10, *a, b;* distance between eyes dorsally slightly larger than their width; in lateral view, eyes rather far removed from apparent dorsal and ventral surface of head. Antennae bare; length of first segment 2.8 mm.; relative length of segments 1 : 0.85 : 0.34 : 0.18.

Shape and proportions of pronotum as in figure 10, *a, b*. Scutellum short, elevated. Metanotal spine long, acute, with a few hairs.

Shape of fore legs as in figure 10, *c*. Coxa about as long as pronotum. Spines of undersurface of femur as in figure 10, *d*, those of anteroventral series uniform, small, those of posteroventral surface with larger ones about twice as long as short ones, larger ones about one-fifth of diameter of segment. Number of large spines in posteroventral series about seven, small spines 70; anteroventral series not interrupted at base, with about 60 spines. Tibiae ventrally with two series of slender curved setae, in addition to ordinary

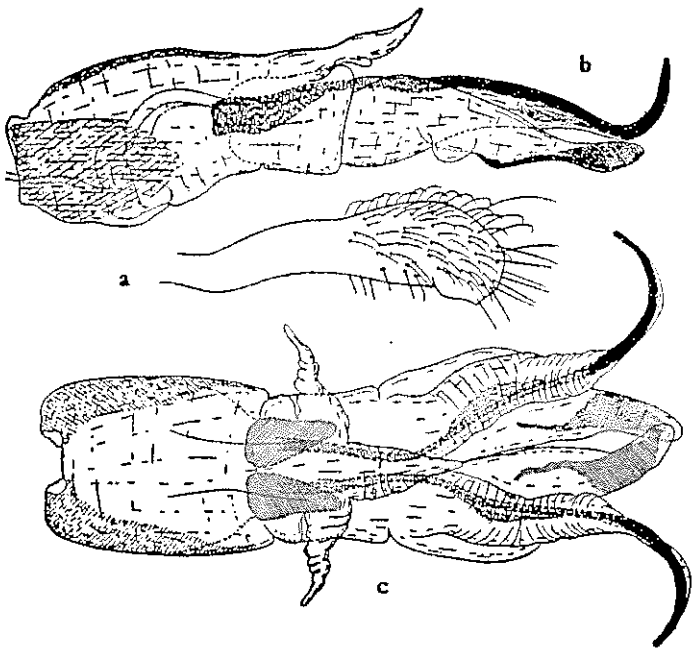

FIGURE 11.—*Emesopsis habros,* male: a, clasper; b, aedeagus, lateral view; c, same, dorsal view.

hairs. Tarsus as usual in the genus; claws as in figure 10, *e, f.* Mid- and hind legs with femora rather strongly swollen apically; hind femora reaching apex of wings.

Fore wings slightly surpassing apex of abdomen; their venation as in figure 10, *g;* bifurcate branch of apical vein well developed.

Abdomen slender sub-basally, regularly widened to apex of seventh segment (fig. 10, *h*). Genital region as in figure 10, *i.* Posterior process of hypopygium tongue-shaped, slightly scooped apically, surpassing apex of claspers (fig. 10, *j*). Shape and chaetotaxy of latter as in figure 11, *a.* Phallosoma as in figure 10, *b, c;* basal plates much as in *E. bellulus* (fig. 13, *c*).

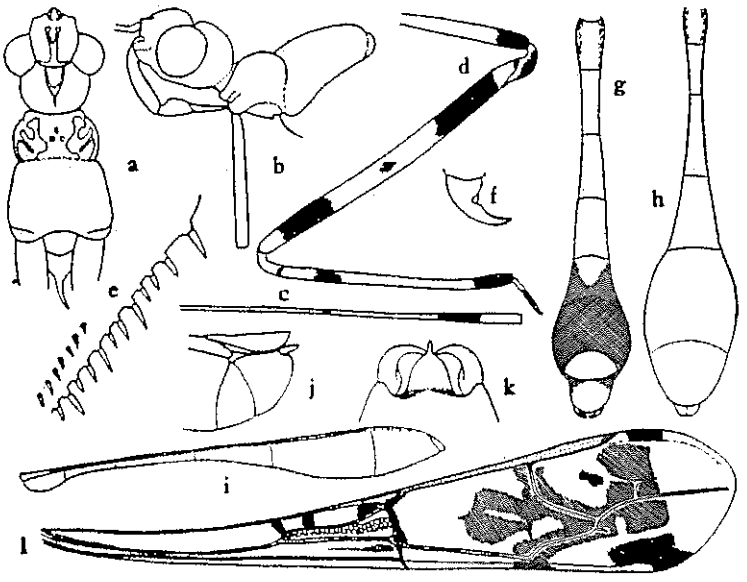

FIGURE 12.—*Emesopsis bellulus:* a, anterior portion of body, male, dorsal view; b, same, lateral view; c, apex of hind femur, pigmentation; d, fore leg, spines omitted; e, base of series of spines of fore femur; f, fore claw; g, abdomen of male, ventral view; h, same, female; i, same, female, lateral view; j, apex of abdomen of male, lateral view; k, apex of hypopygium, rear view; l, fore wing.

Holotype, male (BISHOP 2744), Yap Is., Yap, Dugor-Rumu, 10 m., Nov. 29, 1952, Gressitt.

DISTRIBUTION: Caroline Is. (Yap).

This species is closely related to *E. bellulus* and *decoris.* In addition to the characters given in the key, it differs in the clasper and mainly in the aedeagus, as the illustrations show.

11. Emesopsis bellulus Wygodzinsky and Usinger, n. sp. (figs. 12; 13).

Male and female. Length to apex of fore wing 4.8 mm. in male, 5.2 mm. in female. Head and thorax dark brown, covered with dense and coarse adpressed yellowish-white pile; bare polished areas on head and fore lobe of pronotum very distinct (stippled on figure 12, *a*). Rostrum polished, first and second segments dark brown, third whitish.

Antennae whitish; first segment with light-brown tinge beyond base, with rather short subapical annulus dark brown, apex white, second segment with three short, dark-brown annuli: one basal, one sub-basal, sometimes difficult to perceive, and one apical; third and fourth segments uniformly whitish. Scutellum completely covered by pile; metanotum bare, its spine black. Legs whitish; their annuli dark brown. Pattern of fore legs as in figure 12, *d*. Mid-coxae and trochanters dark, those of hind legs whitish. Mid- and hind femora whitish, with one distinctive dark, subapical annulus which is as wide as, or slightly wider than, apical white portion and two (rarely one) very faint, narrow, submedian annuli. Mid- and hind tibiae with two distinct, very narrow, sub-basal annuli. Fore wings white, iridescent, pattern dark brown, as in figure 12, *l;* subcostal area with three spots at level of basal cell, sometimes the median or basal lacking, even when present on other fore wing of same specimen; no spots basad of basal discal cell. Abdomen whitish, somewhat darkened on dorsal surface on posterior third in female, with dark color attaining lateral margins of ventral surface in same region; that region blackish dorsally and ventrally in male (fig. 12, *g*); eighth sternite white, hypopygium dark laterally at base.

Body and appendages without long hairs.

Head and rostrum as in figure 12, *a, b*. Distance between eyes dorsally as wide as eyes in male, slightly wider in female (6:5). In lateral view, eyes do not attain apparent dorsal and ventral surface of head. Antennae bare in both sexes. Length of first segment 3.5 mm.; relative length of segments 1:0.9:0.32:0.14.

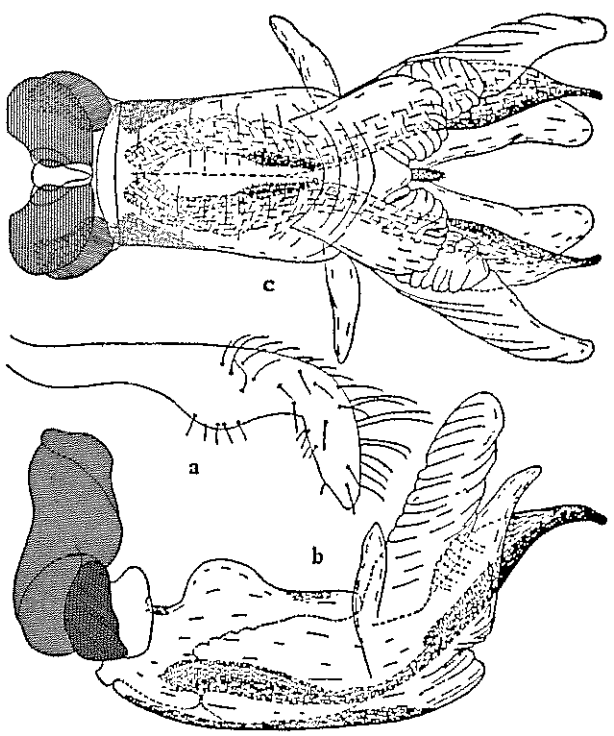

FIGURE 13.—*Emesopsis bellulus*, male: a, clasper; b, aedeagus, lateral view; c, same, dorsal view.

Shape and proportions of prothorax as in figure 12, *a, b*. Scutellum short, somewhat elevated. Metanotum large, apically with long, upwardly-directed, pointed spine.

Shape of fore legs as in figure 12, *d*. Coxa slightly shorter than pronotum. Femur slender, about 15 times as long as wide, ventrally with two series of very short, semi-hyaline spines inserted on small but distinct bases (fig. 12, *e*), the larger of which does not surpass one-third diameter of femur. Posteroventral series composed of 55 to 60 larger spines, anteroventral series of slightly more than 100 smaller spines, not interrupted at base. Tibia ventrally with slender curved setae only. Tarsus with first segment about half as long as second; both claws with median indentation and appendage as in figure 12, *f*. Mid- and hind legs slender, bare, femora slightly swollen apically, hind femora surpassing apex of wings by about 1 mm.

Shape and venation of fore wings as in figure 12, *l*. Short free vein at apex of large discal cell distinct; bifurcate branch of apical portion of M well developed.

Abdomen very slender sub-basally, especially so in female (fig. 12, *g, h*), rather abruptly widened on posterior third. Basal tergite elevated, with very small, whitish spine. Genital region of male as in figure 12, *i*; posterior process of hypopygium broad at base, slender, and pointed at extreme apex (fig. 12, *k*). Claspers widened at middle, curved apically; their exact shape and chaetotaxy as in figure 13, *a*. Aedeagus as in figure 13, *b, c*.

Holotype, male (US 64526), Truk Is., Truk, Pis, June 3, 1946, Townes; allotype, female (US), same data. Paratypes, five males, female (US), same data as for holotype.

Other specimens, all Truk: Specimen without abdomen, same data as for holotype; male (BISHOP), Ton (Tol), Mt. Unibot, native forest, Dec. 30, 1952, Gressitt.

DISTRIBUTION: Caroline Is. (Truk).

The specimens from Pis Island are very uniform; the male from Ton (Tol) Island is somewhat darker, the pigment more intense and slightly more extensive than in the specimen belonging to the type series, and the hypopygium almost completely dark with exception of the apical fifth. The claspers and aedeagus of this specimen, however, agree completely with those of the males of the type series.

12. **Emesopsis decoris** Wygodzinsky and Usinger, n. sp. (fig. 14).

This species is very similar to *E. bellulus* described above; only the differential characters will be mentioned here.

First antennal segment with three conspicuous brown annuli: one sub-basal, one submedian and one subapical; the three annuli on second segment very distinctive.

Mid- and hind femora with narrow submedian annuli very conspicuous.

Fore wings as in figure 14, *a*, similar to those of *E. bellulus*, but the pattern elements less extensive. Basal two spots of subcostal area at level of basal discal cell, either separated (as in figure 12, *l*) or often confluent (fig. 14, *a*). Veins limiting small supplementary cell and transverse veins originating from it, as well as portion of R + M limiting basal discal cell, dark piceous.

Abdomen colored as in *E. bellulus*, but hypopygium dark with exception of extreme apex.

Short free vein at apex of apical discal cell barely perceptible.

Apical process of hypopygium as in *E. bellulus*. Claspers as in figure 14, *b*. Aedeagus as in figure 14, *c*, the apical hyaline processes less developed, distal portion of vesica more largely sclerotized.

Holotype, male (KU), Ponape, Madolenihm (Matalanim), Jan. 11, 1938, Esaki; allotype, female (BISHOP 2745), Ponape, Mt. Temwetemwensekir, 100 m., Jan. 11, 1953, Gressitt. Paratypes, all Ponape: Male, same data as for holotype; two males (MCZ, BISHOP), Agric. Exper. Sta., June-Sept. 1950, Adams; male, Palikir-Colonia, Jan. 16, 1938, Esaki; male (US), Idena Pk., June-Sept. 1950, Adams; male (KU), Rohnkiti-Palikir, Jan. 15, 1938, Esaki.

DISTRIBUTION: Caroline Is. (Ponape).

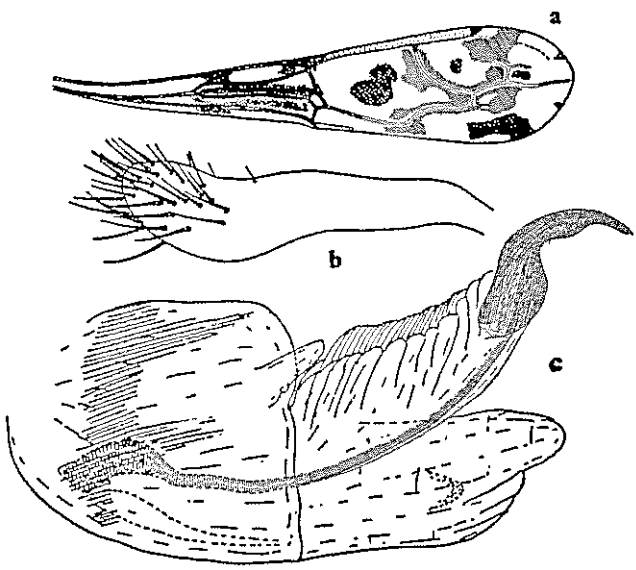

FIGURE 14.—*Emesopsis decoris*, male: a, fore wing; b, clasper; c, aedeagus, lateral view.

13. Emesopsis sp.

DISTRIBUTION: Caroline Is. (Palau).

PALAU. BABELTHUAP: East Ngatpang, female, 65 m., sweeping, Dec. 8, 1952, Gressitt. KOROR: Female, Mar. 1954, Beardsley.

The two females examined seem to agree rather closely with the male of *E. decoris* as to their color and general morphological characters. Their abdomen is simply elliptical (not abruptly swollen as in the female of the related *E. bellulus*) and of almost uniform light-brown color. In the present group of species, determination of females without correlated males is difficult. Although we cannot lay hands on any single character that would safely distinguish these females from the male of *E. decoris*, we prefer not to identify them with that species, considering the large distance that separates the respective localities (Ponape vs. Babelthuap and Koror) and the apparent geographical restriction of most of the Micronesian *Emesopsis*.

Genus **Tridemula** Horváth

Tridemula Horváth, 1914, Mus. Nat. Hungarici, Ann. 12 : 645.

Type species: *Tridemula pilosa* Horváth.

This genus is widely distributed over the Oriental Region. The single Micronesian species is apparently related to an Australian form, but our imperfect knowledge of the genus prevents us from drawing any zoogeographical conclusions from this fact.

14. **Tridemula contumax** Wygodzinsky and Usinger, n. sp. (fig. 15).

Male. Length 7.0 mm.; head 0.6 mm., thorax 1.6 mm., abdomen 4.8 mm.

General color whitish to stramineous; pattern elements light brown to piceous. Pattern of head as in figure 15, *a*, *b*, not always very distinct; base of rostrum faintly pigmented. Antennae whitish, first segment with broad, preapical, light-brown annulus. Color pattern of pronotum as in figure 15, *a*, *b;* coloring of fore lobe not sufficiently distinct to determine. Pattern of lateral surface of prothorax as in figure 15, *b*. Mesonotum and metanotum dark brown, their spines white. Meso- and metapleura and sterna uniformly dark brown. Basic color of fore legs white, their pattern as in figure 15, *c*. Mid- and hind legs white; femora with few, almost imperceptible, yellowish annuli and very distinctive, broad, subapical piceous annulus, the distance of which from apex of segment is as great as, or slightly less than, its width. Tibiae rather uniformly whitish, sometimes with very faintly indicated yellowish annuli. Pattern of fore wings as in figure 15, *h*, somewhat variable in extent and intensity; basic color nacreous, pattern elements light to dark brown; apex of stigma sometimes with reddish tinge. Abdomen uniformly yellowish brown.

Body and appendages polished, fore lobe of pronotum less so, hind lobe dull. Body surface with short hairs only.

Shape of head and rostrum as in figure 15, *a*, *b*. Eyes large, distance between them dorsally somewhat smaller than their width; in lateral view, they attain the dorsal but are rather far removed from ventral surface of head. Fore and hind lobes of head relatively high, the former near hind border with short longitudinal sulcus. First segment of antennae with numerous long hairs, its length 4.2 mm.; relative length of segments 1 : 1 : 0.5 : 0.21.

Shape of pronotum as in figure 15, *a*, *b;* fore lobe with small circular depression on posterior third; hind lobe laterally with distinct though low carina fading on posterior fifth; near hind border dorsally at center with distinct, triangular, laterally compressed elevation. Scutellum small, strongly convex, its spine small (fig. 15, *b*); metanotum faintly convex, its spine distinctly longer than that of scutellum.

Fore legs as in figure 15, *c-g*, with short pile, femur dorsally near base with one not very distinctive tuft of longer hairs. Coxa slightly longer than pronotum; relative length of remaining segments as in figure 15, *c*. Posteroventral series of femur composed of seven to ten larger, and about 60 small, short spines inserted upon distinct tubercles, the basal spine the largest; anteroventral series not interrupted at base, composed of one relatively very large, and about 60 small, spines similar to those of the other series. Tibia ventrally with one series of slender curved setae hardly distinguishable from ordinary setae. Tarsus as usual for the genus, one claw with two small basal processes (fig. 15, *f*), the other without. Mid- and hind femora somewhat thickened apically, on basal half with few scattered hairs slightly longer than diameter of segment. Hind femora hardly surpassing apex of abdomen.

Fore wings reaching base of hypopygium; their shape and venation as in figure 15, *h*.

Abdomen slender, not excessively narrowed at base. Last tergite rounded, covering basal third of hypopygium only; shape of the latter as in figure 15, *i*. Posterior process

of hypopygium very small, laminate, its shape as in figure 15, *j*. Claspers stout basally, apically broadly sickle-shaped, their chaetotaxy as in figure 15, *k*. Aedeagus with basal plates as in figure 15, *l*.

Holotype, male (US 64527), Ponape, Nanipil, Net, Feb. 25, 1948, Dybas. Paratypes, all Ponape: Male (CM), same data as for holotype; male, Mt. Temwetemwensekir, 180 m., light trap, Jan. 18, 1953, Gressitt; male (BISHOP), Mt. Temwetemwensekir, 100 m., Jan. 11, 1953, Gressitt; male (US), Mt. Dolen Nankep, 550 m., Aug. 11, 1946, Townes; male, Mt. Kupwuriso, north slope, 300-450 m., beating vegetation, Mar. 11, 1948, Dybas; male (KU), Longar (Langar), Jan. 6, 1938, Esaki. Paratype, male, Palau, Peleliu, west coast, Feb. 2, 1948, Dybas.

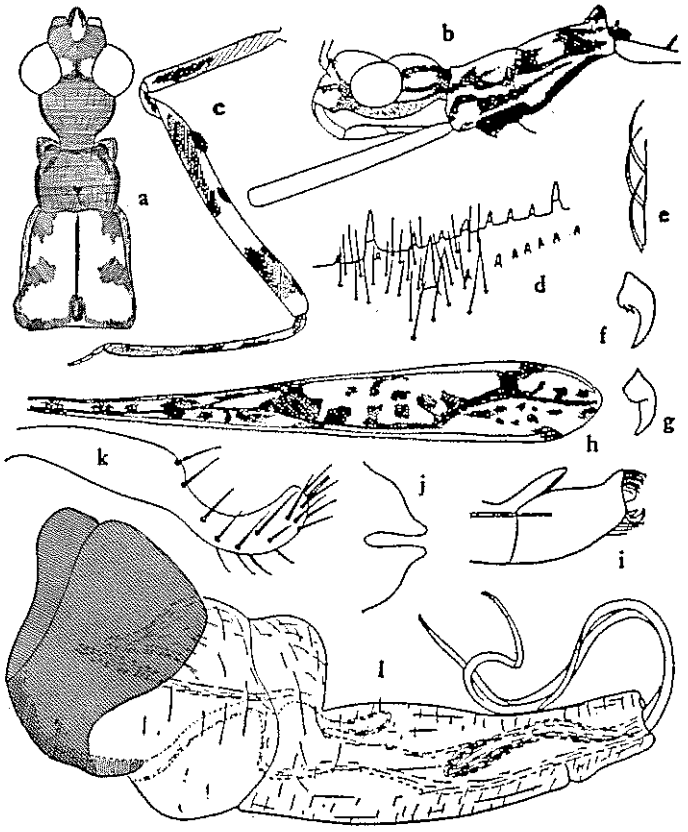

FIGURE 15.—*Tridemula contumax*, male: a, head and pronotum, dorsal view; b, anterior portion of body, lateral view; c, fore leg, spines omitted; d, basal portion of series of spines on fore femur; e, setae of ventral surface of fore tibia; f, one fore claw; g, other fore claw; h, fore wing; i, apex of abdomen, lateral view; j, apex of posterior process of hypopygium; k, clasper; l, aedeagus, lateral view.

Other specimens, all Ponape: Incomplete specimen, Mt. Temwetemwensekir, 180 m., light trap, Jan. 18, 1953, Gressitt; incomplete specimen, Mt. Temwetemwensekir, 180 m., Jan. 20, 1953, Gressitt; incomplete specimen, Madolenihm (Matalanim) Plantation, June-Sept. 1950, Adams; poorly preserved specimen, Colonia, hydroelectric plant, Aug. 9, 1946, Townes.

DISTRIBUTION: Caroline Is. (Ponape, Palau).

This new species belongs to that group of *Tridemula* which is characterized by the reduction of the tufts of hairs on the dorsal surface of the fore femora. It comes closest to *T. metabates* Wygodzinsky (1956, Univ. Calif. Pub. Ent. 11: 211) from Queensland, Australia. The two species differ in the pattern of the pronotum and the presence of the large process on the hind border of the pronotum in *T. contumax*, practically absent in the Australian species, as well as differences in the male genitalia.

Genus **Ademula** McAtee and Malloch

Ademula McAtee and Malloch, 1926, Philippine Jour. Sci. 30 (1) : 125.

Type species: *Ademula reticulata* McAtee and Malloch.

This widely spread oriental genus reaches Australia in the south; one species is known from Sierra Leone, West Africa, and another one, so far undescribed, occurs on Madagascar. Three apparently rather localized species have now been found in Micronesia, although this probably does not represent the total number of species in the area.

Key to Micronesian Species of Ademula

1. Head and anterior lobe of pronotum bare above 2
   Head and anterior lobe of pronotum dorsally with long hairs ..... **15. reticulatoides**
2. Spots in discal cell of fore wing along Cu (inner border of cell) forming continuous series (fig. 16, *c*); apical portion of vesica of aedeagus of male short, not strongly sclerotized, with distal bristle-like appendage (fig. 16, *i*) ..... **16. gressitti**
   The spots mentioned above forming series interrupted on basal third of cell (fig. 5, *a*); apical portion of vesica slender, elongate, pointed and strongly chitinized apically (fig. 17, *e*) ..... **17. distincta**

15. **Ademula reticulatoides** Wygodzinsky and Usinger, n. sp. (fig. 17, *a-d*).

Female. Length to apex of abdomen 6 mm.

General color yellowish white. Head without distinct pattern. Rostrum with some brown pigment on first two segments. Antennae stramineous, first segment with two faint sub-basal and one subapical narrow annulus. Pronotum stramineous, anterior lobe slightly darker, posterior lobe almost imperceptibly darker along middle and on sides. Scutellum and metanotum dark on disc, whitish along borders, metanotum with carina also whitish. Lateral and ventral surfaces of thorax stramineous. Fore legs yellowish white, with pale-brown annuli as in figure 17, *b*, apical annulus of tibiae and whole tarsus dark brown. Mid- and hind legs yellowish white, extreme apex of femora white, a rather dark-brown annulus at base of white portion, as wide as latter; tibiae sub-basally with

two narrow, brown annuli. Fore wings yellowish white, their pattern light brown, distribution of pattern elements as in figure 17, *d* (less contrasty than in illustration). Abdomen light brown. Body surface with long hairs on various regions.

Head and rostrum laterally as in figure 17, *a;* distance between eyes dorsally as large as width of eye; in lateral view, eyes not attaining apparent upper and lower surfaces of head. Upper and lower surfaces of head with long hairs in moderate number. Short sulcus on anterior lobe and median depression of posterior lobe as in *A. gressitti,* furrow of hind lobe somewhat more pronounced. First segment of antennae with moderate number of long hairs on basal third. Length of first segment 3.5 mm.; relative length of segments 1 : 1 : 0.35 : 0.16.

Pronotum as in *A. gressitti;* fore lobe polished, hind lobe delicately rugose; number of long setae on fore lobe large, on hind lobe small. Spine of scutellum large, at least as long as length of scutellum, with a few long hairs. Metanotum bare, its median longitudinal carina low, its posterior spine very short.

Shape of fore legs as in figure 17, *b.* Coxa as long as pronotum; femur about nine times as long as wide. Coxa, trochanter, femur, and base of tibia with long hairs; those of coxa about as long as diameter of segment, those of femur partly longer than diameter of segment, those of ventral surface of trochanter very dense, intermixed with some rather short, almost spine-like bristles. Lower surface of femur with two well-defined series of spines. Posteroventral series composed of four large, about equidistant, spines, the length of which, together with their bases, is somewhat less than one-third of diameter of segment; four small spines between first two large ones, two between second and third, one between third and fourth. Anteroventral series composed of slightly more than 50 small spines, two larger ones at base of series (fig. 17, *c*). Tibia and tarsus as described for *A. gressitti.* Mid- and hind legs bare; hind femora surpassing apex of abdomen by about 1 mm.

Shape and venation of fore wings as in figure 17, *d;* five times as long as their greatest width, not quite attaining apex of abdomen.

Abdomen slender, only slightly widened on posterior third, pointed apically.

Holotype, female (US 64528), Palau, Koror, Mar. 1954, Beardsley. Paratypes, all Palau: Two females, same data as for holotype; female (BISHOP), Babelthuap, East Ngatpang, 65 m., Dec. 10, 1952, Gressitt.

DISTRIBUTION: Caroline Is. (Palau).

This new species is very near *Ademula reticulata* McAtee and Malloch [1926, Philippine Jour. Sci. 30 (1) : 125] from Singapore and Borneo. The main differences in the females are the distinct annuli of the mid- and hind femora in the new species (almost invisible in *reticulata*) and the pattern of the fore wings. The large discal spot of the cell of the membrane is entire and wedge-shaped in *A. reticulata,* with its point at the subcostal border (oval and ocellate in this species) and the spots along the inner margin of the discal cell are not fused as in *A. reticulatoides,* but clearly isolated. It is very probable that a detailed examination of the male genitalia, when that sex is available, will show additional differences.

16. Ademula gressitti Wygodzinsky and Usinger, n. sp. (fig. 16).

Male and female. Length to apex of fore wings 5.8 to 6.2 mm.

General color yellowish white. Head without distinct pattern. First and second segments of rostrum with same very pale-brown pigment. Antennae light brown, first segment white at base and apex. Pronotum light brown, very slightly darker on fore lobe and along median line and sides of hind lobe; however, no distinct pattern perceptible. Scutellum

and spine light brown, metanotum somewhat darker. Lateral and ventral surfaces of thorax light brown. Fore legs yellowish white, with faint, though distinctly perceptible, light-brown annuli as in figure 16, *c*. Mid- and hind legs whitish, femora with very faint, light-brown, wide, subapical annulus as wide as apical white area; tibiae with two, narrow, brownish annuli, sometimes hardly perceptible. Fore wings whitish, their pattern elements light brown (less contrasty than in fig. 16, *e*), pattern characterized by uninterrupted band of spots in discal cell along inner margin; several distinct spots basad of discal cell in addition to spot at base of fore wing. Abdomen uniformly yellowish white. Body surface bare, with exception of long hairs on fore legs, underside of head, and antennae of male.

Head as in figure 16, *a, b;* undersurface with moderate number of short to long hairs. Rostrum as in figure 16, *b*. Eyes large; interocular distance dorsally in male 1.5 times

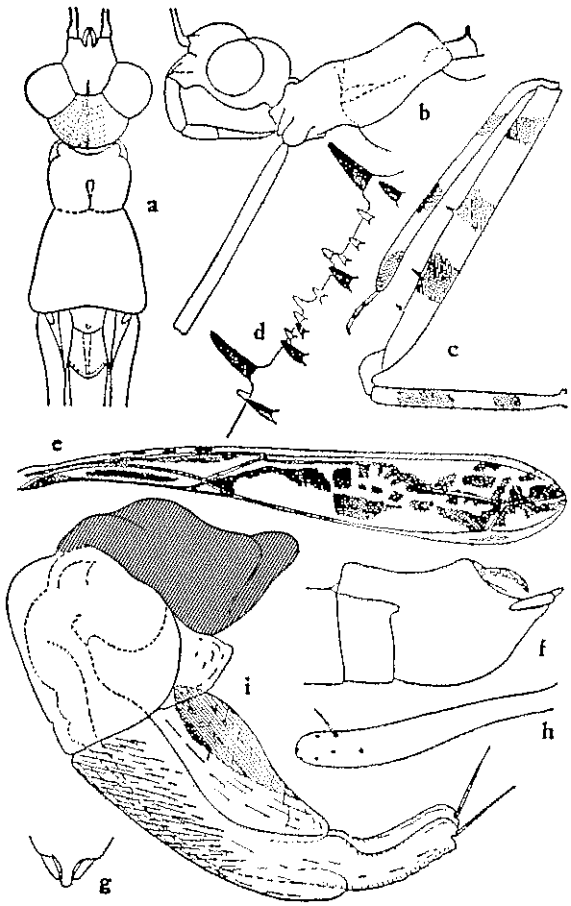

FIGURE 16.—*Ademula gressitti:* **a**, anterior portion of body, male, dorsal view; **b**, same, lateral view; **c**, fore femur, smaller spines omitted; **d**, detail of spines of fore femur; **e**, fore wing; **f**, apex of abdomen of male, lateral view; **g**, apex of hypopygium, rear view; **h**, clasper, most bristles lost; **i**, aedeagus, lateral view.

width of eyes, in female equal to width; in lateral view, eyes do not quite attain apparent dorsal and ventral surfaces of head. Dorsal surface of head with very short, median sulcus immediately before interocular constriction; hind lobe with shallow median depression. Antennae of female bare, first segment in male with numerous erect hairs several times length of diameter of segment; length of first segment 3.8 mm.; relative length of segments 1 : 1 : 0.35 : 0.19.

Pronotum as in figure 16, *a, b*. Fore lobe of pronotum polished, with deep median depression. Hind lobe faintly rugose. Scutellum with long hairs, apical spine short, not as high as length of scutellum. Metanotum bare, with median longitudinal carina.

Fore legs as in figure 16, *c*. Coxa slightly longer than pronotum; relative length of other segments as in figure 16, *c*. Femur slightly less than ten times as long as wide. Length of hairs on dorsal and ventral surfaces of coxa and dorsal surface of femur in moderate number, their length somewhat more than half diameter of respective segment. Lower surface of femur at base with numerous spines in one to two irregular series between anteroventral and posteroventral series; the latter with three large, strongly chitinized spines which, together with their bases, do not attain one-third of diameter of segment. Anteroventral series not interrupted at base, composed of several, larger, more strongly sclerotized and many smaller spines. Total number of spines of ventral surface of femur, in addition to three, very large ones of posteroventral series, about 65. Ventral surface of tibia with two series of long inclined setae. Tarsus with three segments decreasing in length toward apex. Claws as in *Emesopsis bellulus* (fig. 12, *f*). Mid- and hind legs bare, hind femora surpassing apex of fore wings by about 0.5 mm.

Shape and venation of fore wings as in figure 16, *e*, six times as long as their greatest width.

Abdomen slender, only very slightly widened posteriorly. Eighth sternite of male fully exposed, with narrow projection at superior border posteriorly. Posterior process of hypopygium short, faintly knobbed apically. Clasper rod-like with a few bristles apically (fig. 16, *h*). Aedeagus as in figure 16, *i*.

Holotype, male (US 64529), Yap, Yap, hill behind Yaptown, 50 m., Dec. 3, 1952, Gressitt; allotype, female (BISHOP 2746), Yap, Yap, Mt. Madaade (Matade), 60-95 m., Dec. 1-2, 1952, Gressitt. Paratypes: Male, same data as for holotype; three females, same data as for allotype.

DISTRIBUTION: Caroline Is. (Yap).

This species is doubtless very closely related to *Ademula distincta* Usinger (1946, B. P. Bishop Mus., Bull. 189 : 43) from Guam. With the exception of the slightly but constantly different wing pattern, the species are impossible to distinguish without dissection of the male genitalia. The claspers are practically identical, but the apical portion of the aedeagus is quite different, as shown in figures 16, *i* and 17, *e*.

This species is dedicated to its collector, in acknowledgement of his great contribution to the knowledge of Micronesian insect fauna.

17. **Ademula distincta** Usinger (figs. 5, *a;* 17, *e*).

Ademula distincta Usinger, 1946, B. P. Bishop Mus., Bull. 189 : 43 (Guam).

No additional material has come to hand. Usinger (*op. cit.*) mentions the "apparently two-segmented front tarsi." A new examination of several of the paratypes reveals the presence of three tarsal segments on the fore legs, thus

the species does not constitute an exception in the genus. For comparative purposes, we present a drawing of the apical portion of the aedeagus of this insect (fig. 17, *e*); the basal portion is much as in *A. gressitti;* the same applies to the clasper.

Genus **Empicoris** Wolff

Empicoris Wolff, J. P., 1811, IN Wolff, J. F., Icones Cimicum Desc. Illus., Fasc. 5 : iv.

Type species: *Gerris vagabundus* Linnaeus.

This large cosmopolitan genus is represented in Micronesia by three species. Although many species have been named in this genus, practically nothing is known about their interrelationships; thus it is quite impossible to say anything about the zoogeographical aspects of *Empicoris* in Micronesia.

Key to Micronesian Species of Empicoris

1. Hind lobe of pronotum with laterally compressed subtriangular tubercle on middle before hind margin.....**18.** sp. indet.
   Hind lobe of pronotum without such tubercle..... 2
2. Lateral carina of pronotum distinct only on anterior half; length of insect less than 4 mm.....**19. minutus**
   Lateral carina of pronotum occupying almost whole length of pronotum; size over 4 mm.....**20. tesselatoides**

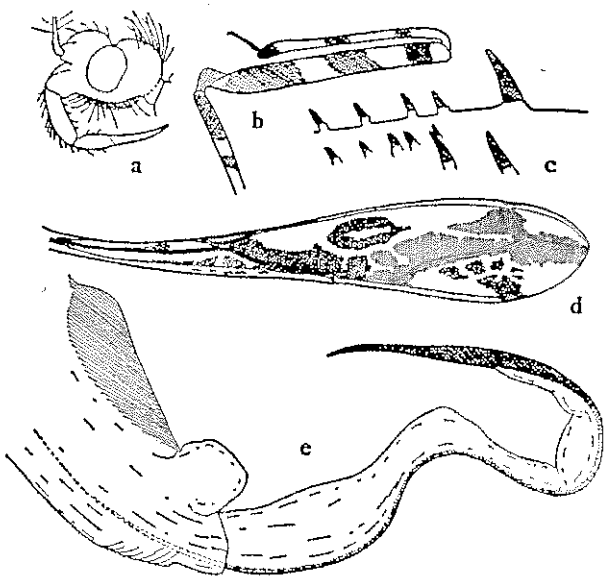

Figure 17.—**a-d**, *Adcmula reticulatoides*, female: *a*, head, lateral view; *b*, fore leg, spines omitted; *c*, detail of spines of fore femur; *d*, fore wing. e, *A. distincta*, aedeagus, lateral view.

18. Empicoris sp. indet.

DISTRIBUTION: Caroline Is. (Palau).

PALAU. AULUPTAGEL: Male, 25 m., Dec. 13, 1952, Gressitt.

We have examined a single specimen of a species apparently different from all the other *Empicoris*. Its small size (3.8 mm.) and the large tubercle on the posterior margin of the hind lobe of the pronotum are characteristic. The poor state of preservation of this individual, together with the uncoordinated available descriptions of the named species of this cosmopolitan genus, make it inadvisable to describe and name this specimen at present.

19. Empicoris minutus Usinger.

Empicoris minutus Usinger, 1946, B. P. Bishop Mus., Bull. 189 : 45. (Guam).

DISTRIBUTION: Hawaiian Is., S. Mariana Is., Bonin Is.

BONIN IS. CHICHI JIMA: Omura, female, June 10, 1949, Mead.

S. MARIANA IS. GUAM: Asan, one mile southeast, two males, 180-240 m., Oct. 31, 1947, Dybas.

20. Empicoris tesselatoides, n. name.

Empicoris tesselatus McAtee and Malloch, 1926, Philippine Jour. Sci. 30 (1) : 131 [nec *Ploeariola* (= *Empicoris*) *tesselata* Bergroth, 1914, Göteborgs K. Vet.-Vitt.-Samh., Handl. 16 (2) : 8].

Empicoris tesselatus, Usinger, 1946, B. P. Bishop Mus., Bull. 189 : 45 (Guam).

DISTRIBUTION: Malay Peninsula, S. Mariana Is.

S. MARIANA IS. GUAM: Mt. Santa Rosa, male, May 16, 1945, G. Bohart and Gressitt. TINIAN: Mt. Lasso, two females, Apr. 9, 1946, Townes.

The need for the new name is evident.

SUBFAMILY SAICINAE

Genus **Polytoxus** Spinola

Polytoxus Spinola, 1858, Ins. Artr., 47.

Type species: *Acanthothorax sanguineus* Costa.

This genus is widely distributed in the Old World Tropics and is represented in Europe, Asia, Africa, and Australia. It is closely related to the New World genus *Saica.* In the Pacific it is a curious fact that two distinct species seem to occur together wherever adequate collecting has been done. The degree of island endemicity is difficult to assess at the moment because of the limited series but it is interesting that only one Micronesian species, *Polytoxus distinctus,* is at present known from a single island (Koror). The others are

widely distributed, *P. grandis* from Ponape and the Palau Islands, *P. pilosus* from Guam and Koror Islands, and *P. marianensis* from Guam, Samoa, Fiji, and New Caledonia. *P. similis* China is included in the key for the sake of completeness and is here reported from Fiji as well as Samoa. *P. acanthifera* Montrouzier and Signoret (= *acanthophorus* Stål) and *P. jourdani* Montrouzier, both from New Caledonia, and *P. hebridanus* Villiers (1943, Mus. Nat. Hist. Natur. Paris, Bull II, 15: 195) from Mallicolo Island, New Hebrides, are not included in the key because they are not known to us. Neave (1940) credits the genus to Gené [1842, IN Costa, Eserc. Acc. Aspir. Nat. 2 (21)], but this has not been checked.

Villiers (1943, *op. cit.*) illustrated the aedeagus of several species of *Polytoxus*. As in those, the aedeagi of the Micronesian *Polytoxus* are characterized by their asymmetry. The shape of the basal plates, the sclerotized portions of the phallobase, and especially the shape and position of the various endosomal processes furnish excellent specific characters, which, though highly complex, are very constant, even in specimens considerably separated geographically.

The thick spines on trochantera, femora, and tibiae of fore legs often stick together as if united by a glue-like substance. Detailed examination of these spines does not show them to contain any ducts, but their surface is very delicately striate (fig. 21, *d*). The number and arrangement of these spines are apparently typical for each species, although all intermediates exist between species like *P. grandis* (fig. 21, *c*) where the spines are extremely numerous and form clumps on the ventral surface of the femora and those like *P. marianensis* (fig. 19, *d*) where they are few in number and very scattered.

Key to Pacific Island Species of Polytoxus

1. Size small, 7 to 8 mm.; portion of M limiting apical discal cell roundly bent near its base; apex of fore wing without bifurcate vein originating from M; no vein or fold extending into discal cell from its apex 2

   Size larger, 10 to 14 mm.; portion of M limiting apical discal cell in most cases angularly bent near its base; apex of fore wing with faint bifurcate vein arising from M; sometimes vein or fold extending into discal cell from its apex 3

2. Second antennal segment less than half as long as third (0.45: 1); metanotum with small, transverse, semicircular elevation anteriorly, its disc without longitudinal carina; hypopygium of male almost truncate behind in lateral view, its posterior process without median projections; penultimate tergite of female rounded behind ..... **21. distinctus**

   Second antennal segment more than half as long as third (0.6: 1); metanotum with two low, rounded elevations behind anterior transverse ridge; disc with irregular, low, longitudinal ridge; hypopygium of male strongly projected behind in lateral view, its posterior process with 1 + 1 small median projections ..... **22. marianensis**

3. Second antennal segment less than half as long as third; disc of metanotum without distinct, median, longitudinal carina; posterior process of hypopygium

of male broad in lateral view; angles of last connexival segment of female produced backward into distinct slender spine.....**23. pilosus**

Second antennal segment more than half as long as third; disc of metanotum with distinct, median, longitudinal carina; posterior process of hypopygium of male slender in lateral view; angles of last connexival segment of female not produced backward into spine..... 4

4. Size large, about 14 mm.; second and third segments of fore tarsus together slightly more than one-half as long as first (0.6: 1.0); disc of scutellum reddish, concolorous with general color of body; abdomen uniformly reddish testaceous; anteocular part of head, in lateral view, almost as long as postocular; first segment of head eight times as long as elevated portion of anterior lobe of pronotum.....**24. grandis**

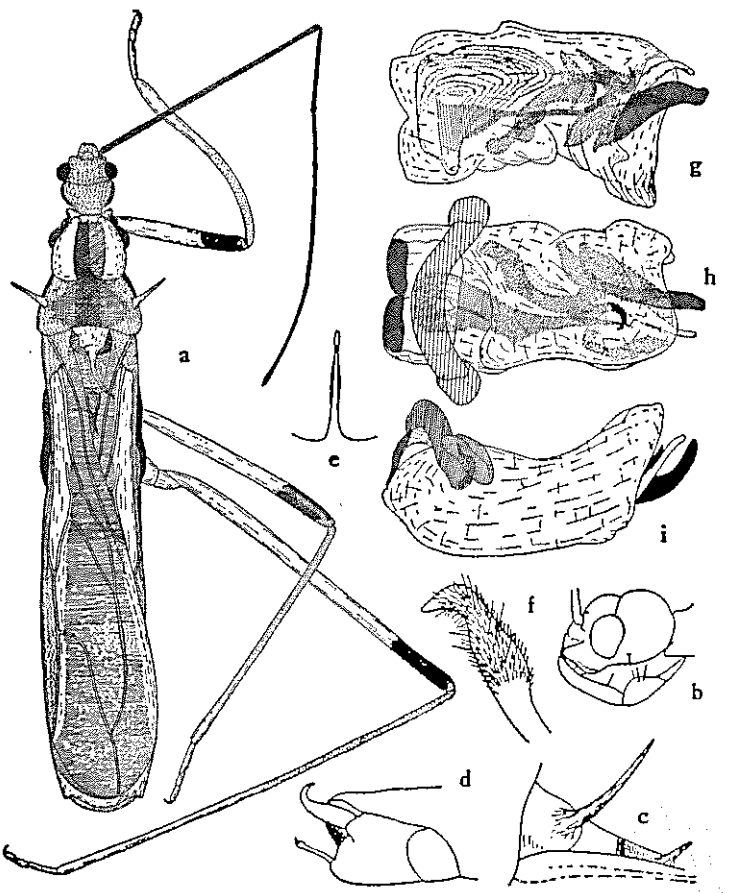

FIGURE 18.—*Polytoxus distinctus:* a, female, dorsal view; b, head, lateral view; c, scutellum and metanotum; d, apex of abdomen, male, lateral view; e, process of hypopygium, rear view; f, clasper; g, aedeagus, ventral view; h, same, dorsal view; i, same, lateral view.

Size smaller, about 10 mm.; second and third segments of fore tarsus together more than three-fourths as long as first segment (0.8: 1.0); disc of scutellum dark violaceous or piceous, quite different from general color of dorsal body surface; abdomen stramineous, with wide, lateral, dark band on each side; anteocular portion of head, in lateral view, only slightly more than one-half as long as postocular; first segment of antennae five times as long as elevated portion of anterior lobe of pronotum.....**similis**

21. **Polytoxus distinctus** Wygodzinsky and Usinger, n. sp. (fig. 18).

Male. Length 7.15 mm. Width (humeri but not including spines) 1 mm. Head .85 mm. long, pronotum 1.3 mm. Hemelytra 4.75 mm. Color fulvous, marked with reddish and darker brown. Head reddish ochraceous with brown eyes. Pronotum brown on elevated portion of anterior lobe, pale laterally with brown stripe on and just above acetabula. Hind lobe reddish brown at middle, paler reddish at sides, the humeral spines pale basally, reddish brown apically. Hemelytra broadly infuscate at middle, pale laterally on coria with costal margin reddish. Undersurface pale at middle, brown laterally. Rostrum pale brown. Antennae darker brown. Legs generally fulvous, coxae paler, testaceous, femora darker brown apically with red at extreme apices. Tibiae reddish at bases, elsewhere fulvous.

Head longer (excluding constricted neck region) than wide across eyes (1.3: 1); interocular space four times as wide as eye seen from above. Anteocular portion of head about as long as eye. Hind lobe of head almost twice as wide as long (1.9: 1). Antennae almost as long as body, proportion of segments one to four 1: 0.35: 0.8: 0.44. Pronotum three-fourths as wide across humeri as long (0.75: 1), hind lobe three-fourths as long as elevated front lobe. Humeral spines one-half as long as width of pronotum across humeri, slender, tapering to acute apices, spines divergent and nearly straight. Scutellar spine one-third longer than humeral spines, slightly curved upward. Metanotal spine very short, about one-third as long as humeral spines, directed upward and backward. Hemelytra with vein M at apical margin of discal cell roundly bent near base. Front legs with femora feebly curved inward sub-basally and downward apically, inner face with a longitudinal row of short spines and another inconspicuous row along underside. Hairs fine, not arranged in clumps. Front tibiae with short, inconspicuous spines on inner face. Tarsal proportions 1: 0.4: 0.6. Middle femora nearly straight, hind femora bent at basal fourth. Tarsi with first segment subequal to, or slightly longer than, second and third segments together.

Male hypopygium as illustrated, not broadly produced at insertion of median process, process very slender, bent upward and backward, apex with feebly rounded lobe with acute upper angle. Claspers broad at base, bent inward apically, with tips hooked as in illustration. Aedeagus as in figure 18, *g-i*.

Female with abdominal apex rounded as seen from above, apical connexival angles elevated slightly but not produced backward.

Holotype, male (BISHOP 2747), Palau Is., southwest Koror, 25 m., light trap, Dec. 19, 1952, Gressitt. Other specimens, male, two females (BISHOP, US), Palau, Koror, at light, Jan. 26, 1953, Beardsley.

DISTRIBUTION: Mariana Is. (Palau).

A single female [KU, Koror, Ngarbaged (Arabaketsu), May 30, 1938, Murakami] differs in having the long bristles of the front femora clumped in twos or threes, and the apex of the abdomen subtruncate, as seen from above.

This species is closest to *P. marianensis* Usinger from Guam, Samoa, Fiji, and New Caledonia but differs in its shorter second antennal segment and different genitalia in the male.

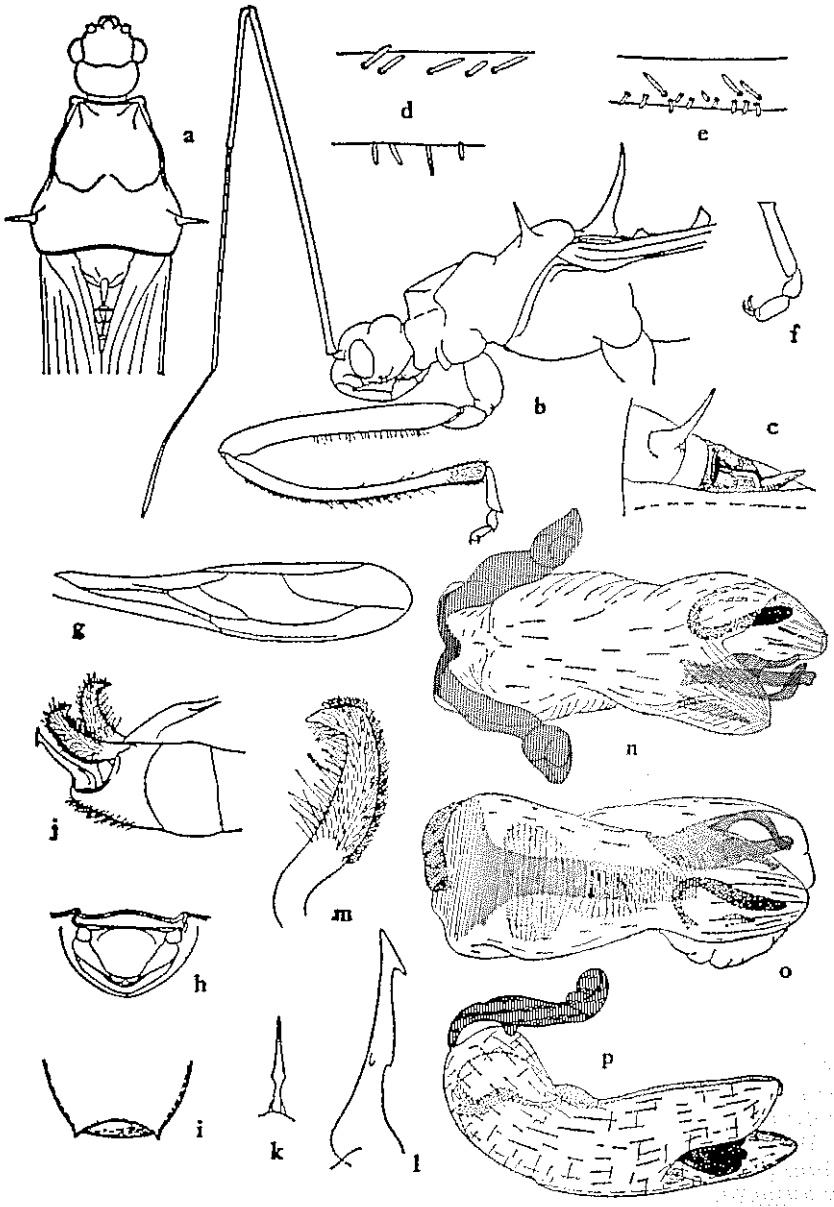

FIGURE 19.—*Polytoxus marianensis:* **a**, anterior portion of body, dorsal view; **b**, same, lateral view; **c**, scutellum and mesonotum; **d**, spine-like setae of fore femur; **e**, spine-like setae of fore tibia; **f**, fore tarsus; **g**, venation of fore wing; **h**, apex of abdomen, female, rear view; **i**, same, dorsal view; **j**, same, male, lateral view; **k**, process of hypopygium, rear view; **l**, same, lateral view; **m**, clasper; **n**, aedeagus, dorsal view; **o**, same, ventral view; **p**, same, lateral view.

22. **Polytoxus marianensis** Usinger (fig. 19).

Polytoxus marianensis Usinger, 1946, B. P. Bishop Mus., Bull. 189: 48 (Guam).

Specimens of this species are now at hand from Upolu, Samoa (Zimmerman and Swezey), Rewa, Fiji (Pemberton), and New Caledonia (Houailou, W. H. Ford, Usinger, *op. cit.*) and Boguen River, New Caledonia (T. E. Woodward). These specimens vary in the length of the humeral spines, from approximately one-third the width of the pronotum (Guam) to one-ninth the width (New Caledonia). Since all other characters, including the male genitalia, are similar, this is considered as a single widespread Pacific species. *P. fuscovittatus* Stål (1859, Freg. Eugenies Resa, Ins., 262) from the Philippine Islands and *P. selangorensis* Miller (1940, Federated Malay States Mus., Jour. 18: 426) from Malaya should also be examined in this connection because the brief descriptions do not suffice to separate these species. The illustrations will facilitate further comparisons.

23. **Polytoxus pilosus** Usinger (fig. 20).

Polytoxus pilosus Usinger, 1946, B. P. Bishop Mus., Bull. 189: 46 (Guam).

In addition to the differential characters mentioned in the key, this species is also distinct because of its very long humeral and metanotal spines, as well as the aedeagus of the male.

A single female from Ngarbaged (Arabaketsu), Koror, Palau Islands, Feb. 8, 1938, Murakami, agrees with the Guam paratypes in morphological characters; its color is very much like that of *P. vagans* Miller (1940, Federated Malay States Mus., Jour. 18: 424) from Malaya, and it seems doubtful that the two species are really distinct.

24. **Polytoxus grandis** Wygodzinsky and Usinger, n. sp. (fig. 21).

Male. Length 14.5 mm., width (humeri but not including spines) 1.9 mm. Head 1.65 mm. long, pronotum 2.49 mm. Hemelytra 10.2 mm. Color pale testaceous with reddish tinge. Eyes brown.

Head one-half again as long as wide across eyes (1.5: 1); interocular space nearly four times as wide as eye (3.7: 1). Anteocular portion of head distinctly longer than eye (1.6: 1). Hind lobe of head nearly twice as wide as long (1.8: 1). Proportion of rostral segments one to three 1: 0.52: 0.4. Antennal proportions 1: 0.48: 0.54: 0.28, total antennae one-third longer than body (1.3: 1.).

Pronotum four-fifths as wide across humeri as long (1.25: 1), hind lobe two-thirds as long at middle as elevated front lobe. Humeral spines half as long as width of pronotum across humeri, slender, acute, divergent, and bent slightly inward apically. Scutellar spine approximately one-third longer than humeral spines, sinuate. Postscutellar region with transverse ridge, behind which are two broad, backwardly and inwardly directed flaps. Behind this disc elevated into narrow longitudinal ridge. Posteriorly, short, turned-up, blunt spine (broken in the type).

Hemelytra with vein M at apical margin of discal cell angulate and with small vein arising at angle and extending for short distance into cell; apex of fore wing with faint bifurcate vein arising from M.

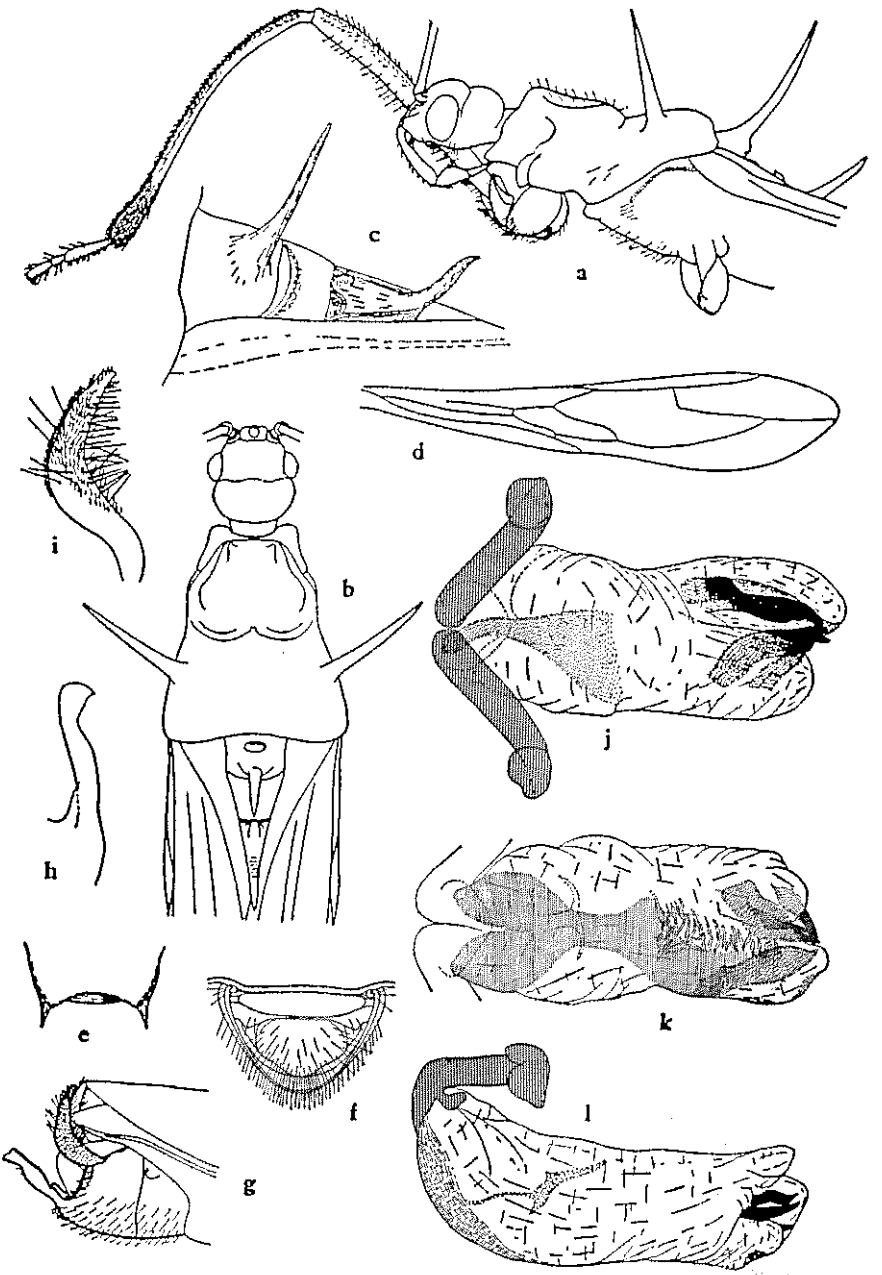

FIGURE 20.—*Polytoxus pilosus:* a, anterior portion of body, lateral view; b, same, dorsal view; c, scutellum and metanotum; d, venation of fore wing; e, apex of abdomen, female, dorsal view; f, same, rear view; g, same, male, lateral view; h, process of hypopygium, lateral view; i, clasper; j, aedeagus, dorsal view; k, same, ventral view; l, same, lateral view.

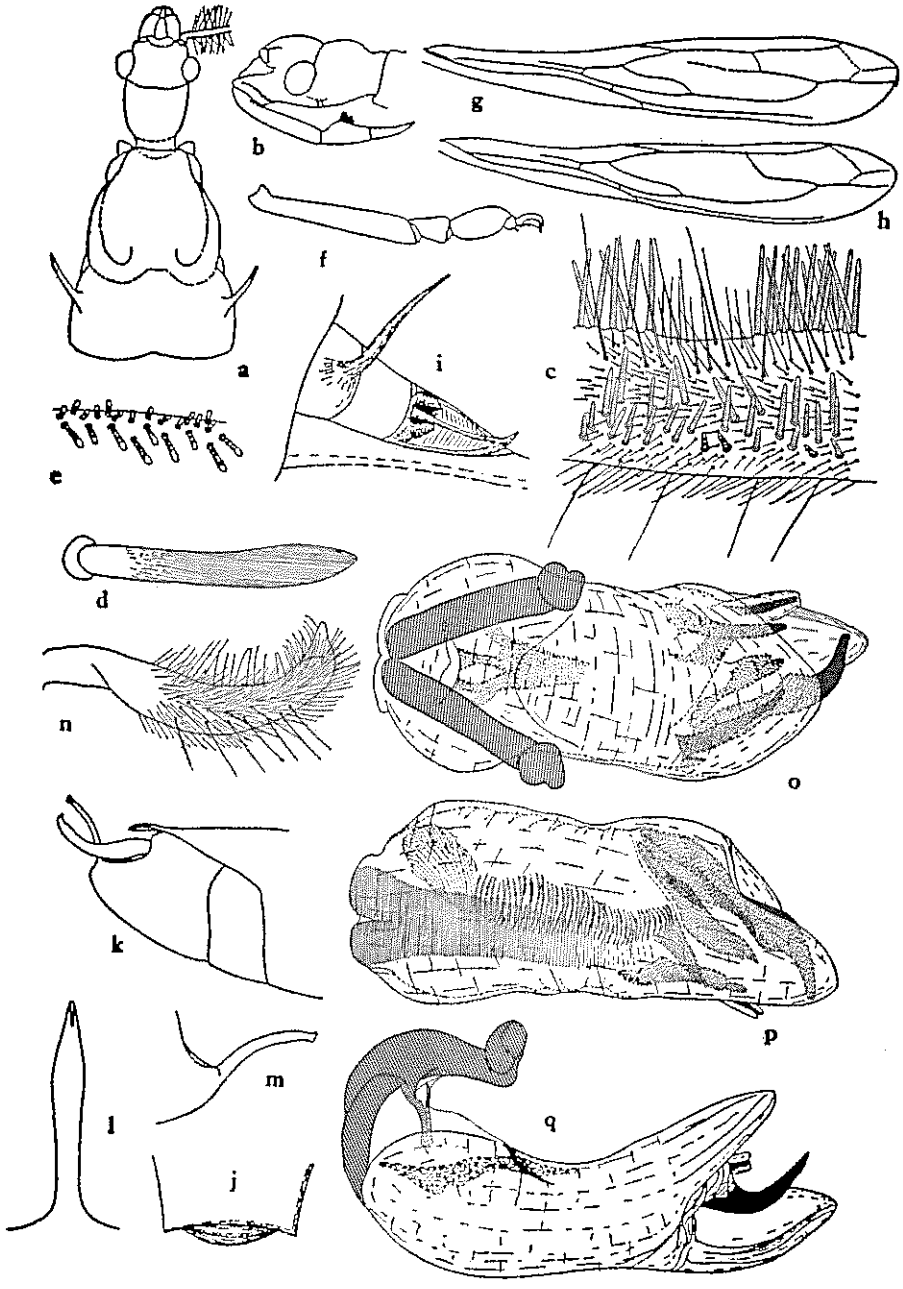

FIGURE 21.—*Polytoxus grandis:* a, head and pronotum, dorsal view; b, head, lateral view; c, hairs and spines of fore femur; d, one spine, high magnification; e, spines of fore tibia; f, fore tarsus; g, wing venation, Ponape specimen; h, same, Koror specimen; i, scutellum and metanotum; j, apex of abdomen, female, dorsal view; k, same, male, lateral view; l, process of hypopygium, rear view; m, same, lateral view; n, clasper; o, aedeagus, dorsal view; p, same, ventral view; q, same, lateral view.

Front legs with femora only slightly curved apically, inner face with row of thick bristles of uniform length and several bristles wide. Inner face also with thick bristles, in addition to the usual thin bristles everywhere abundant, but in this case with the thick bristles in clumps. Front tarsal proportions 1 : 0.25 : 0.40. Mid- and hind legs only feebly bent, tarsi with first segment over one-half again as long as second and third segments together (1.65 : 1).

Male hypopygium as illustrated, broadly produced at middle with median process slender in lateral view, extending upward and backward, slightly widened at middle, obliquely truncate at tip, when seen from behind. Claspers broad on basal half, bent inward and upward, narrowed beyond middle, slightly swollen subapically, and constricted to blunt, finger-like apex. Aedeagus as in figure 21, *o-q*.

Female similar to male, but with first antennal segment lacking dense, erect hairs, with fine hairs only and these bent forward. Abdominal apex subtruncate as seen from above, apical connexival angles scarcely produced and blunt.

Holotype, male (US 64530), Ponape, Mt. Dolen Nankep, 510-570 m., Aug. 13, 1946, Townes; allotype, female, Ponape, Mt. Nahnalaud, southeast slope, 300 m., Mar. 17, 1948, Dybas. Paratypes (CM, US, MCZ, KU, BISHOP), all Ponape: Male, female, same data as for holotype; female, same data as for allotype; male, female, Mt. Nahnalaud, 300-600 m., Mar. 19, 1948, Dybas; male, female, Nanipil, Net Distr., Mar. 14, 1948, Dybas; male, Nanipil, Net Distr., Feb. 27, 1948, Dybas; male, female, Mt. Kupwuriso, summit, 600 m., Mar. 8, 1948, Dybas; male, Dolotomw (Tolotom), southeast, 360 m., June-Sept. 1950, Adams; male, Mt. Temwetemwensekir, 420 m., June-Sept. 1950, Adams; female, Uh-Colonia, July 23, 1939, Esaki; male, Madolenihm (Matalanim)-Nihpit, Jan. 12, 1938, Esaki; female, Nihpit-Rohnkiti, Jan. 14, 1938, Esaki.

Other specimens, all Palau: Male, Babelthuap, Ngaremeskang, 25 m., Dec. 20, 1952, Gressitt; two females, Auluptagel (Aurapushekaru), Sept. 1952, Krauss; female, Koror, northeast, 40 m., limestone ridge, Dec. 14, 1952, Gressitt; two males, Koror, Mar. 1954, Beardsley; female, Koror, Nov. 22, 1947, Dybas; female, Koror, July 20, 1946, Oakley.

DISTRIBUTION: Caroline Is. (Ponape, Palau).

The angulate condition of vein M is constant in the Ponape series but is not so in the Palauan specimens. This, however, does not appear to be sufficient grounds for separating the otherwise similar populations into separate subspecies.

Subfamily STENOPODINAE

Genus **Oncocephalus** Klug

Oncocephalus Klug, 1830, IN Ehrenberg, Symbolae Physicae, Ins. 2 : Sign. e.

Type species: *Oncocephalus notatus* Klug.

This is a truly worldwide genus with species described from each of the zoogeographical realms. It was monographed by Reuter (1882, Acta Soc. Sci. Fenn. **12**: 1-86, 3 plates).

25. Oncocephalus pacificus Kirkaldy (fig. 22).

Oncocephalus pacificus Kirkaldy, 1908, Linn. Soc. New South Wales, Proc. 33: 368.

DISTRIBUTION: Fiji, Samoa (as *pacificus*), Philippine Is. (as *assimilis*), Australia (as *confusus*), New Caledonia (as *velutinus*), New Britain, Caroline Is.

PALAU: KOROR: Ngarbaged (Arabaketsu), two males, Mar. 24, May 25, 1938, Murakami. PELELIU: Female, 1934, Yoshino; Akarokuru-Ashiasu-Ngardololok (Garudoroko), male, Aug. 11, 1939, Esaki; north central, male, Aug. 12, 1945, Dybas.

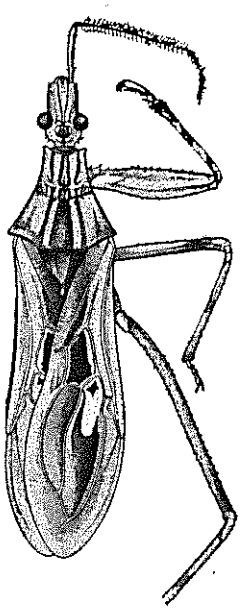

FIGURE 22.—*Oncocephalus pacificus*, male, Palau Is.

This species was recorded by China (1930, Insects of Samoa II, Hemipt. 3: 155) from Samoa and was compared with the Philippine *Oncocephalus assimilis* Reuter and the North Australian *O. confusus* Reuter. Specimens are before us from the Philippine Islands, Australia, Fiji, New Britain, and New Caledonia. The Micronesian specimens differ somewhat, being slightly larger than a specimen from Los Banos, and a little darker than a series from Viti Levu. The proportions of eyes to the interocular space and the degree of widening of the anteocular portion of the head vary between individuals from the same and from different localities. Since no consistent difference of specific

importance has been noted, the series is here considered as a single, widespread, and somewhat variable species. Whether the valid name should be one of Reuter's (1882, *op. cit.*) or perhaps *O. velutinus* Montrouzier (1864, Soc. Linn. Lyon, Ann. XI, 2: 239) from New Caledonia [Distant, 1914, IN Sarasin and Roux, Nova Caledonia, Zool. IV, 1 (10): 386] can best be determined by a detailed analysis of series of specimens and a study of the types. *O. montalbanus, disparilis, scaber,* and *celator,* all described by Miller (1948, Roy. Ent. Soc. London, Trans. 99: 418) from Luzon, should also be examined in this connection.

SUBFAMILY REDUVIINAE

Genus **Peregrinator** Kirkaldy

Microcleptes Stål, 1866, Öfv. K. Vet.-Akad., Förh. 23: 240.
Peregrinator Kirkaldy, 1904, Entomologist 37: 280.

Type species: *Opsicoetus biannulipes* Montrouzier and Signoret.

Microcleptes Stål (1866, *op. cit.*) was preoccupied by *Microcleptes* Newman (1840, Entomologist 1: 11) in the Coleoptera. The type species is tropicopolitan. A second species, *maculosum,* was described by Distant [1903, IN Annandale and Robinson, Fasc. Malayenses, Zool. 1 (2): 260] from Perak and two species were described by Miller 1940, Federated Malay States Mus., Jour. 18: 558), *arboricolum* from Selangor and *borneensis* from Borneo. Distant's and Miller's species were described in *Alloeocranum* Reuter (1881, Acta Soc. Sci. Fenn. 12: 332) which is really a distinct genus *fide* Bergroth, in China (1925, Ann. Mag. Nat. Hist. IX, **15**: 164).

26. Peregrinator biannulipes Montrouzier and Signoret (fig. 23).

Opsicoetus biannulipes Montrouzier and Signoret, 1861, Soc. Ent. France, Ann. IV, 1: 69.
Microcleptes biannulipes, Stål, 1866, Öfv. K. Vet.-Akad., Förh. 23: 240.
Reduvius laniger Butler, 1876, Ann. Mag. Nat. Hist. IV, 17: 411.
Peregrinator biannulipes, China, 1925, Ann. Mag. Nat. Hist. IX, **15**: 164.

DISTRIBUTION: Mexico, Central America, Cuba, Réunion I., Rodriquez, Philippine Is., New Guinea, Larat, Amboina, New Caledonia, Fiji, Society Is., Marquesas, Samoa, S. Mariana Is., Caroline Is.

S. MARIANA IS. SAIPAN: Tanapag, one to two miles east, two males, nymph, Nov. 21, 1944, Dybas. GUAM: Agana Spring, ten males, rotting aquatic plants, July 1945, Gressitt.

TRUK. Two females, Jan. 20, 1945, Esaki; Utot (Udot), two nymphs, May 25, 1946, Townes.

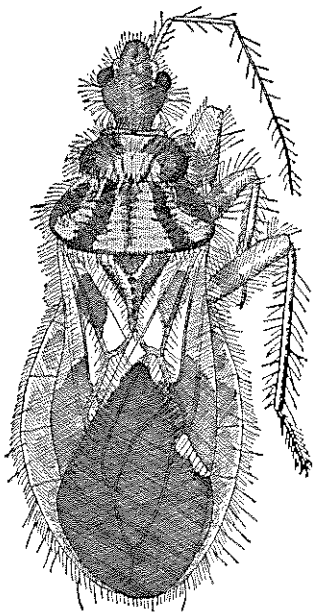

FIGURE 23.—*Peregrinator biannulipes*, male, Guam.

Genus **Velitra** Stål

Velitra Stål, 1865, Hemipt. Africana 3 : 122.

Type species: *Opinus rubropictus* Amyot and Serville.

Velitra occurs throughout the Oriental Region from India to Formosa. Judging from the material before us, it is particularly well represented in New Guinea. The present record from Micronesia represents a significant extension in the known range and the first record from other than strictly continental islands.

27. **Velitra micronesica** Wygodzinsky and Usinger, n. sp. (fig. 24).

Length 14 mm.; width (pronotum) 4 mm., (abdomen) 5.2 mm. Body relatively short and broad, surface clothed with very short, subappressed pubescence, becoming longer and more erect on appendages.

Head longer than wide including eyes (1.17 : 1), width of interocular space subequal to width of eye. Anteocular part of head twice as long as postocular, sub-rounded apically, the juga swollen and divergent on either side of inflated clypeus. Proportion of antennal segments one to four 1 : 4.4 : 3.6 : 3.3; last two segments with scattered, long, erect bristles.

Pronotum broader than long (1.2 : 1) and longer than head (1.4 : 1); anterior margin strongly depressed, forming distinct collar with rounded anterolateral angles. Anterior lobe convex but scarcely raised above level of subflattened posterior lobe, with glabrous depressions forming regular pattern between raised, pubescent areas. Median longitudinal impression prominent on posterior portion of front lobe and anteriorly on hind lobe, disappearing before hind margin. Sublateral depressed area mesad of each humerus delimited

by five distinct, but shallow, transverse rugae or punctures. Hind lobe with dense, fine appressed pubescence.

Scutellum about as long as broad and one-half as long as pronotum, convex on either side sub-basally with deep depression at middle. Apex cylindrical.

Hemelytra exceeding tip of abdomen in male, not reaching apex in female.

Legs only moderately incrassate, fore femora about four times as long in extreme measurement as greatest thickness (3.9 : 1). Tibial fossae of front and middle legs about one-third as long as tibiae. Hind tibiae a little longer than femora (1.1 : 1).

Color dark brown, paler on either side of hind lobe of head and with pale area in form of inverted W on each corium extending inward and backward near base of membrane. Base and apex of corium broad and dark brown to black. Apical half of clavus pale. Membrane brown with veins only slightly darker. Connexivum pale above and beneath. Venter and rest of undersurface brown. Legs light brown. Antennae with first segment dark brown, remaining segments paler.

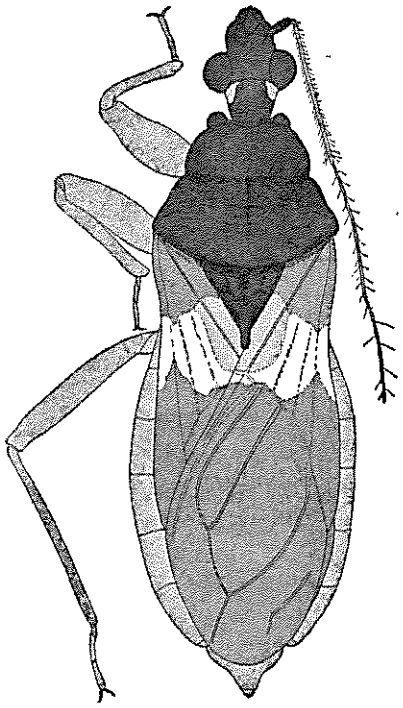

FIGURE 24.—*Velitra micronesica*, female, Peleliu I.

Holotype, male (CM), Palau, Peleliu, north central, Aug. 17, 1945, Dybas; allotype, female, same locality, Aug. 5, 1945, Dybas. Nymphs, all Palau: One, Peleliu, east coast, Aug. 3, 1945, Dybas; three (BISHOP, US), Peleliu, Akarokuru-Ashiasu-Ngardololok (Garudoroko), Aug. 11, 1939, Babelthuap, Ngardok-Ngaremeskang (Ngarmisukan), Feb. 11, 1938, Babelthuap, Ngardok Colony, Feb. 10, 1938, all Esaki.

DISTRIBUTION: Caroline Is. (Palau).

The nymphs are interesting because they are covered with setigerous tubercles and especially because they have only two well-developed dorsal abdominal scent glands, one between the third and fourth segments and the other between the fourth and fifth segments.

This species is near *V. fuscinervis* Reuter from New Guinea which, however, has a pale membrane with dark veins and a different color pattern on the corium and legs. It also agrees to some extent with *V. marginata* Signoret from New Guinea which has the front and middle femora entirely black and the hind femora pale only at the base. The only other species of approximately the same size, *V. exsugiens* Stål from the island of Waigiu, is described as having differently colored legs. It is awkward to have to rely on such seemingly superficial characters as size and color in comparisons, but the revisions of Stål [1874, K. Sven. Vet.-Akad., Handl. **12** (1) : 69] and Distant [1904, Ann. Mag. Nat. Hist. VII, **14** (81) : 219-222] use color almost exclusively and structural characters are rarely mentioned in the early descriptions. This species clearly belongs to the *fuscinervis* group but differs consistently from known and undescribed species before us in the characters mentioned.

Genus **Physoderes** Westwood

Physoderes Westwood, 1845, Ent. Soc. London, Proc. **1845**: 115.
Epirodera Westwood, 1847, Ent. Soc. London, Trans. **4** (4) : 247.

Type species: *Epirodera notata* Westwood.

Westwood (1847, *op. cit.*) renamed his genus to prevent confusion with *Physodera* Eschscholtz (1829, Zool. Atlas 2 : 8), but the International Rules now in effect do not sanction this procedure. The genus is widespread, from Madagascar, whence two allied genera have recently been described (Miller, 1955, Nat. Hist. Mus. Wien, Ann. **60** : 273-276) to Australia, Fiji, and Micronesia. The center of distribution seems to be the Oriental Region. Miller (1954, Tijdschr. Ent. **97** : 82-85) proposed a new subfamily, Physoderinae, for these bugs, but such splintering of the large and variable subfamily Reduviinae can only be justified after a thorough evaluation of higher group characters in this and other sections of the Reduviidae.

28. **Physoderes minor** Usinger (fig. 25).

Physoderes minor Usinger, 1946, B. P. Bishop Mus., Bull. **189**: 50.

DISTRIBUTION: S. Mariana Is. (Guam), Caroline Is. (Ponape).

S. MARIANA IS. GUAM: Pilgo River, male, four females, four nymphs, in rotten papaya, May 26, 1945, G. Bohart and Gressitt; Fadang, male, female, nymph, under log, May 31, 1945, Dybas; Asan, three females, two males, one

mile southeast, 180-240 m., Oct. 31, 1947, Dybas; Pt. Oca, two nymphs, beating vegetation, May 28, 1945, nymph, bamboo stump, June 1, 1945, nymph, staminate strobilus of *Cycas*, June 2, 1945, three nymphs, two females, June 2, 1945, male, June 5, 1945, all Dybas; Pt. Oca, two females, May 1945, female, May 14, 1945, female, May 15, 1945, male, May 19, 1945, female, June 2, 1945, all G. Bohart and Gressitt; Mt. Santa Rosa, two females, May 16, 1945, Bohart and Gressitt; Port Ajayan, two males, June 6, 1945, Dybas; Piti (Pati) Pt., nymph, June 4, 1945, Dybas; Agana, nymph, 540 m., southwest, in petiole of dead coconut frond, June 1, 1945, Dybas; Yona, nymph, Oct. 1952, Krauss.

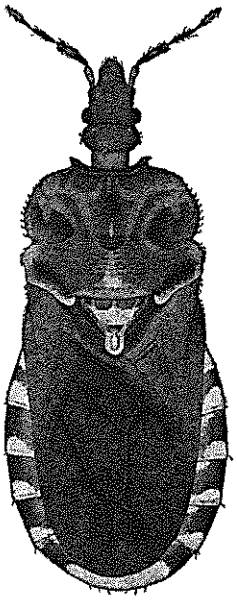

FIGURE 25.—*Physoderes minor*, male, dorsal view, Guam. (From Usinger, 1946.)

PONAPE. Mt. Dolen Kiepw (Tolenkiup), nymph, June-Sept. 1950, Adams.

In the original description, size differences were noted between the sexes but dimorphism of the pronotum was not mentioned. Miller (1954, Tijdschr. Ent. 97: 86) refers to the female of *P. buruensis* (which he compares with *minor*) as "having the anterior lobe of the pronotum much narrower than the posterior lobe," whereas in the male it is as wide as the posterior lobe. In the series of specimens of *P. minor* now before us, this sexual dimorphism is strikingly evident. The proportion of greatest width of anterior to posterior pronotal lobes is 1 : 1 in the male and 1 : 1.14 in the female.

SUBFAMILY ECTRICHODIINAE

Genus **Scadra** Stål

Scadra Stål, 1859, Öfv. K. Vet.-Akad., Förh. **16**: 176, 182-183.

Type species: *Physorhynchus lanius* Stål.

Scadra ranges from Ceylon and India through the Sunda Islands and Malay Peninsula to Borneo, the Philippine Islands, and China. We are now able to record it from the Mariana, Caroline, and Ryukyu Islands.

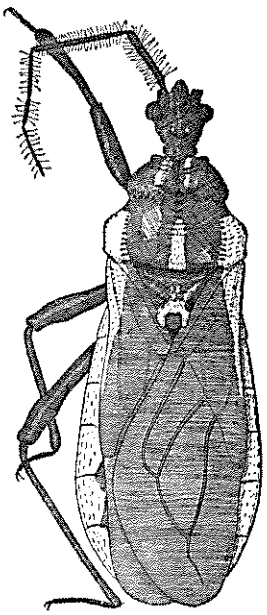

FIGURE 26.—*Scadra rufidens*, Guam.

29. **Scadra rufidens** Stål (fig. 26).

Scadra rufidens Stål, 1859, Öfv. K. Vet.-Akad., Förh. **16**: 183 (Manila).

DISTRIBUTION: Philippine Islands, S. Mariana Is., Caroline Is.

S. MARIANA IS. GUAM: Asan, male, female, one mile southeast, 180-240 m., Nov. 4, 1947, male, Oct. 30, 1947, nymph, Oct. 31, 1947, all Dybas.

PALAU. BABELTHUAP: Ngiwal, female, Aug. 7-15, 1951, nymph, Oct. 16, 1951, male, Nov. 20-26, 1951, all Gressitt. KOROR: Male, July 18, 1946, Oakley; male, June 5, 1954, Beardsley. ANGAUR: Male, Feb. 3, 1948, Dybas.

Micronesian specimens agree with specimens from Panay and Mindanao. The hind lobe of the pronotum has a pale median spot in one specimen as described for *Scadra illuminata* Distant (1910, Philippine Jour. Sci. D **5**: 61; Negros) which will probably prove to be a synonym of this species.

SUBFAMILY HARPACTORINAE

Genus **Polididus** Stål

Polididus Stål, 1858, Öfv. K. Vet.-Akad., Förh. **15**: 448.

Type species: *Polididus spinosissimus* Stål.

This distinctive genus is known from Africa and the Oriental Region.

30. **Polididus armatissimus** Stål (fig. 27).

Polididus armatissimus Stål, 1859, Öfv. K. Vet.-Akad., Förh. **16**: 376 (Ceylon).

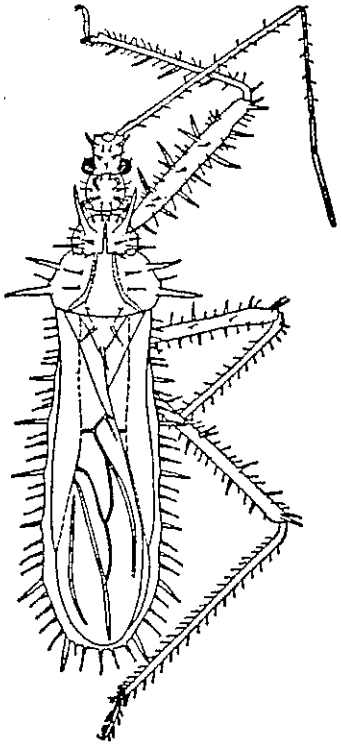

FIGURE 27.—*Polididus armatissimus*, Palau Is.

DISTRIBUTION: Philippine Is., Burma, China, Malaya, Japan, Formosa, Hawaiian Is., and Caroline Is.

PALAU. BABELTHUAP: Emertao, female, Feb. 13, 1938, Esaki. KOROR: Male, female, at light, Aug. 7, 1952, Beardsley; Ngarbaged (Arabaketsu), female, May 10, 1939, S. Miyate.