

INSECTS OF MICRONESIA

Heteroptera: Aradidae

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INTRODUCTION

The Aradidae, or "flat bugs," are fungus feeders. They are commonly found under loose bark of dead trees, but some species live on surface fungi and a few occur on dead or dying foliage where fungal hyphae are present but inconspicuous. Apterous forms have been collected repeatedly in leaf mold and litter from the forest floor by means of a Berlese funnel.

Thirteen species of Aradidae have been reported from Micronesia in the past. The present report includes 40 species and is based on about 600 specimens collected by the following persons: H. S. Dybas, H. K. Townes, R. G. Oakley, P. A. Adams, R. J. Goss, K. L. Maehler, N. L. H. Krauss, J. W. Beardsley, J. L. Gressitt, R. W. L. Potts, Ellsworth Hagen, R. P. Owen, Y. Kondo, G. E. Bohart, R. M. Bohart, W. L. Necker, Z. Ono, O. H. Swezey, and R. L. Usinger. Previous papers on Micronesian Aradidae are by Usinger (1946, B. P. Bishop Mus., Bull. 189 : 34-39) and Esaki and Matsuda [1951, Mushi 22 (13) : 73-86].

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The following museums have participated in this project, and material will be distributed among them: The United States National Museum (holotypes and first specimens of most series plus H. K. Townes, R. G. Oakley, and K. L. Maehler material); Bishop Museum (second and third series when

available, and Kondo, Ono, Gressitt, Krauss, and Beardsley material); Chicago Natural History Museum (H. S. Dybas collector, extensive series of nearly all species, since Dybas was responsible for the bulk of the material, and Ellsworth Hagen specimens); California Academy of Sciences (R. W. L. Potts material); Museum of Comparative Zoölogy (R. J. Goss and P. A. Adams material). A representative set of specimens has been retained in the collection of R. L. Usinger.

The following symbols indicate the museums in which specimens are stored: US (United States National Museum), CM (Chicago Natural History Museum), and BISHOP (Bernice P. Bishop Museum).

DISTRIBUTION

Because of their secretive habits Aradidae are likely to be good indicators of faunal relationships when adequate collections have been made and faunal works have been published. At present, much material is available from Pacific islands in circum-pacific areas, but very little has been published on these valuable collections. Only China's brief account in *Insects of Samoa* (1930) and descriptive works by Horváth, Bergroth, and Distant—now half a century old—are available for comparison. Hence no broad generalizations will be attempted.

Distribution within Micronesia is summarized in table 1, from which it is obvious that the southern Marianas (Guam, Saipan), the Palaus, and Ponape are the sources of most of our species. This probably reflects more intensive collecting by more people on these islands, but the virtual lack of records from the Marshalls surely indicates a poor fauna. This is assumed because one of us (R. L. Usinger) failed to locate any aradids after an intensive search on Arno Atoll in the southern Marshalls.

In general, it would appear that aradids are common on the high islands of Micronesia. Other material before us suggests that they also occur in abundance on high islands of southeastern Polynesia, Samoa, Fiji, and elsewhere but not in the Hawaiian Islands and certainly not in numbers on low islands such as the Marshall, Gilbert, or Line Islands.

On the basis of present information, one fourth (10) of the species within Micronesia appear to be restricted to the southern Marianas and more than half (27) are confined to the Carolines. Twenty-nine species must be classed at the moment as one-island endemics but this number will surely change with more collecting.

In general, the Micronesian aradids are related to species from Samoa, the Philippines, and islands of the southwestern Pacific, including New Guinea. The species that is most widely distributed is *Mezira membranacea* Fabricius. This large, conspicuous aradid occurs throughout the Oriental Region from India to Micronesia and southward to New Guinea. There are no records

TABLE 1.—DISTRIBUTION OF MICRONESIAN ARADIDAE

	MICRONESIAN ISLAND GROUPS								Other Localities
	Bonin	S. Mariana	Caroline					Marshall	
			Palau	Yap	Caroline Atolls	Truk	Ponape		
Aneurinae									
1. <i>Aneurus lobatus</i> *		G†							
2. <i>A. micronesicus</i>			×					×	
Calisiinae									
3. <i>Calisius longicornis</i> *								×	
4. <i>C. tinianensis</i> *		×							
5. <i>C. dilaticeps</i>		G							
6. <i>C. acutus</i> *			×						
7. <i>C. micronesicus</i> *			×						
8. <i>C. saipanensis</i> *		×							
9. <i>C. infuscatus</i> *		G							
10. <i>C. trukensis</i> *						×			
11. <i>C. araklai</i>			×						
Mezirinae (Tribe Carventini)									
12. <i>Lissocoris spinipes</i> *							×		
13. <i>Trigonaptera glabra</i> *			×						
Tribe Mezirini									
14. <i>Artabanellus infuscatus</i> *			×						
15. <i>Mastigocoris angulatus</i> *		×							
16. <i>Artabanus lativentris</i>			×					×	
17. <i>Neuroctenus abdominalis</i> *			×						
18. <i>N. angulatus</i> *		G							
19. <i>N. variegatus</i> *		G							
20. <i>N. pacificus</i>		×	×						
21. <i>N. palauensis</i> *			×						
22. <i>N. obsoletus</i> *				×					
23. <i>N. lobatus</i> *			×	×					
24. <i>Pictinus productus</i> *			×	×					
25. <i>P. nigripennis</i> *								×	
26. <i>P. acuminatus</i> *				×					
27. <i>P. longipennis</i> *								×	
28. <i>P. affinis</i> *			×						
29. <i>P. palauensis</i>			×						
30. <i>P. granulatus</i> *				×					
31. <i>P. crassicornis</i> *		×							
32. <i>P. rectus</i> *				×					
33. <i>P. minimus</i> *			×						
34. <i>Chiastoplonia pygmaea</i>			×		×			×	Samoa
35. <i>C. ponapensis</i>		×	×		×			×	
36. <i>Mezira membranacea</i>	×	×	×	×	×	×	×	×	Orient, New Guinea
37. <i>M. nanamaraki</i>			×					×	
38. <i>M. tagalica</i>			×	×					Philippines, New Guinea
39. <i>M. angularis</i>			×						
40. <i>M. marianensis</i>		×							

* Described as new.

† The G instead of × under S. Mariana indicates Guam only.

from Guam prior to World War II, but *M. membranacea* was evidently well established in the Carolines much earlier. The only other Micronesian species that are known from outside of our area are *M. tagalica* and *Chiastoplonia pygmaea*. *M. tagalica* belongs to a dominant group (*Arictus*) within the genus *Mezira*, which occurs over as wide an area as *M. membranacea*. *Chiastoplonia pygmaea* is not so widespread; but here again, according to numerous unpublished records, the group (*Chiastoplonia*) is widespread in the Orient.

SYSTEMATICS

FAMILY ARADIDAE

Body more or less flattened. Rostral setae very long, coiled within the apical part of the head, usually in an enlarged clypeal area. Rostrum four-segmented. Antennae four-segmented. Ocelli absent. Hemelytra, when fully developed, with corium, clavus, and membrane, the veins of membrane variously developed, sometimes obsolete. Usually macropterous but sometimes brachypterous, micropterous, or apterous. Tarsi two-segmented. Adults with metathoracic scent gland openings more or less developed. Nymphs with three dorsal abdominal scent gland openings, the second and third partly or completely reduced in some groups. Eggs simple, without distinct cap or lid.

KEY TO SUBFAMILIES, TRIBES, AND GENERA OF MICRONESIAN ARADIDAE

1. Scutellum enlarged, covering all of abdominal disk inside of connexival sutures, three-fourths as long and over half as wide as abdomen. Subfamily Calisiinae..... **Calisius**
 Scutellum much smaller, less than half as long as abdomen, reduced or absent in wingless forms..... 2
- 2(1). Rostrum arising from an atrium which is wide open anteriorly and ventrally. Scutellum well developed, rounded behind. Subfamily Aneurinae..... **Aneurus**
 Rostrum arising from a partially closed atrium through a longitudinal, slitlike opening, rarely with the opening widened anteriorly or with the rostrum arising from apex of anterior process. Scutellum, when present, subtriangular. Subfamily Mezirinae..... 3
- 3(2). Metathoracic scent gland openings without well developed channels extending to lateral margins of thoracic pleura behind middle legs. Apterous (in known Micronesian genera), without distinct scutellum, the thoracic and basal abdominal segments variously fused. Tribe Carventini..... 4
 Metathoracic scent gland openings with a well-developed, channel-like evaporating area extending to lateral margins. Macropterous or brachypterous (in known Micronesian genera), with subtriangular scutellum always distinct. Tribe Mezirini..... 5
- 4(3). Rostrum arising from apex of anterior process of head. Front tibiae with a small but distinct spine projecting inward at right angles just before apex..... **Lissocoris**
 Rostrum arising before apex of anterior process, with a slitlike opening to the atrium. Front tibiae without a small, subapical spine extending inward at right angles..... **Trigonaptera**

- 5(3). Rostral atrium open anteriorly..... 6
 Rostral atrium closed anteriorly..... 8
- 6(5). Anterior process of head reduced, extending scarcely beyond level of antenniferous tubercles. Macropterous..... **Chiastoplonia**
 Anterior process of head well developed, extending between antennae well beyond level of antenniferous tubercles. Brachypterous..... 7
- 7(6). Pronotum with a pair of discal tubercles and with an anterior, median and posterior tubercle on each side. Micropterous, the hemelytra reduced to small, suberect tabs just behind humeral angles..... **Artabanellus**
 Pronotum without discal or lateral tubercles. Hemelytral pads well developed, almost as long as pronotum, appressed to body and therefore difficult to distinguish from thoracic sclerites..... **Mastigocoris**
- 8(5). Third visible ventral segment with knife-like longitudinal ridges against which the file-like surface of apical half of hind tibia can scrape in stridulation **Artabanus**
 Without a stridulatory mechanism..... 9
- 9(8). Size small, less than 4 mm. in length. Sides of body subparallel. Spiracles of second to fifth visible abdominal segments nearer to lateral than to posterior margins **Pictinus**
 Size larger, more than 4 mm. in length. Sides of body more or less dilated or rounded. Spiracles of second to fifth ventral segments about as far from lateral as from posterior margins..... 10
- 10(9). Third, fourth, and fifth visible ventral segments each with a transverse carina at base. Size small, less than 6 mm..... **Neuroctenus**
 Third, fourth, and fifth ventral segments without a transverse carina at base. Size larger, more than 7 mm. in length..... **Mezira**

KEY TO NYMPHS OF MICRONESIAN ARADIDAE

1. Dorsal abdominal scent gland openings on hind margins of third, fourth, and fifth segments equally developed and evenly spaced. Antennae shorter than head. Clypeus inflated, the genae and juga not conspicuously developed on either side..... **Calisius**
 First dorsal abdominal scent gland opening well developed, the second and third openings usually reduced or obsolete. Antennae longer than head. Genae and/or juga extending along either side of clypeus, reaching near its apex 2
- 2(1). First abdominal scent gland opening only slightly displaced posteriorly, the hind margin of third visible segment scarcely sinuate. Body surface smooth, or finely wrinkled but without granules, hairs, or incrustation **Aneurus**
 First abdominal scent gland opening strongly displaced posteriorly, the hind margin of third visible segment bent deeply into fourth segment at middle. Body surface granular, hairy, or incrustate..... 3
- 3(2). Scent gland openings displaced posteriorly but equally spaced and the last two only a little smaller than first. All abdominal spiracles lateral and visible from above. Body surface extensively coated with a white incrustation **Lissocoris**
 Last two scent gland openings extremely reduced, some spiracles ventral, not visible from above. Body surface granular or hairy or both..... 4
- 4(3). Anterior process of head reduced, scarcely exceeding level of bases of antennae **Chiastoplonia**
 Anterior process of head well developed, extending well beyond bases of antennae 5

- 5(4). Antenniferous tubercles scarcely produced. Size small.....**Pictinus**
 Antenniferous tubercles well developed. Size large..... 6
- 6(5). Hind tibiae bent into a stridulatory file on apical half and surface of third
 ventral segment with a patch of short ridges.....**Artabanus**
 Without a stridulatory apparatus..... 7
- 7(6). Head subangulate behind eyes, not produced outward beyond eyes. Surface
 of body with dense, rounded granules.....**Neuroctenus**
 Head produced behind the eyes, as a flattened lobe or spine, extending well
 beyond outer margins of eyes. Body surface with coarse, elevated, almost
 spine-like tubercles or hairs (*Mezira*)..... 8
- 8(7). Head with postero-lateral angles produced as spines. Body surface coarsely
 tuberculate. Third antennal segment longer than second....**Mezira tagalica** group
 Head with postero-lateral angles produced as broad, anteriorly curved lobes.
 Body surface with short, stiff, curved hairs. Second and third antennal
 segments subequal.....**Mezira membranacea** group

SUBFAMILY ANEURINAE

The Aneurinae are almost paper-thin, shining bugs with the clavus and corium so reduced that the hemelytra consist almost entirely of membrane. The rostrum arises from an open excavation beneath the head. The anterior-most nymphal scent gland opening is well developed but not displaced backward. The others are reduced.

Genus *Aneurus* Curtis

Aneurus Curtis, 1825, British Entomology 2 : pl. 86 (type: *A. laevis* Fabricius).—Bergroth, 1914, Mus. Nat. Hungarici, Ann. 12 : 89-108.

Clypeus with juga and genae well developed, extending on either side. Body surface smooth or finely granular and variously wrinkled. Scutellum rounded behind. Abdominal spiracles lateral, at least on first and sixth and seventh visible segments in some species groups.

Aneurus is a worldwide genus of tropical and temperate regions. It is evidently well established on high islands of Micronesia but has not been found in southeastern Polynesia, Samoa, or Fiji. Specimens are found under bark.

KEY TO MICRONESIAN SPECIES OF ANEURUS

1. Small, 2.5 to 2.8 mm. Antennae short, relative length of antennal segments
 6.5 : 6.5 : 7.0 : 12. First, sixth, and seventh spiracles lateral.....**lobatus**
 Larger, 3.4 to 3.8 mm. Antennae with last segment longer than the two pre-
 ceding segments together, relative length of antennal segments 9 : 10 : 10 : 24.
 First, fourth, fifth, sixth, and seventh spiracles lateral.....**micronesicus**
1. ***Aneurus lobatus*** Matsuda and Usinger, n. sp. (figs. 1, *a*; 2, *a*, *b*).

A relatively small, slender species with the last antennal segment shorter than the two preceding segments and with the first, sixth, and seventh pairs of abdominal spiracles lateral.

Head as long as wide (24.0 : 24.5). Anterior process with apex extending slightly beyond apex of first antennal segment. Antenniferous tubercles rather acute at tips. Post-ocular lobes just reaching sides of eyes. Interocular laevigate spots round, as large as eyes, the area behind laevigate spots finely transversely rugose. Antennae rather short, less than one and one-half times as long as head (32 : 24), relative length of segments 6.5 : 6.5 : 7.0 : 12, the first segment a little longer than wide, widest at middle, apex obtusely rounded; second segment thinner than first; third thinner than second, gradually thickened anteriorly, apex subtruncate; fourth shorter than the two preceding segments together, clothed with fine pubescence throughout. Rostrum not reaching posterior margin of eyes. Ventral surface transversely strigose.

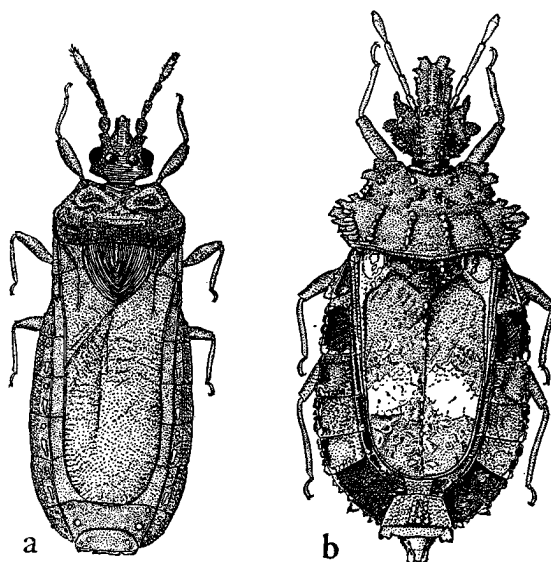


FIGURE 1.—a, *Aneurus lobatus*, female; b, *Calisius longicornis*, female.

Pronotum more than twice as wide as long (42 : 19), shorter than head (19 : 24). Anterior margin concave behind neck, antero-lateral angles obtusely rounded, lateral margins slightly concavely sinuate in front of middle, posterior half of lateral margins subparallel, posterior margin very shallowly concave; anterior lobe granulate except on raised portion of callosities, transversely strigose at middle just behind head.

Scutellum a little shorter than wide (21 : 25), slightly longer than pronotum, striae converging posteriorly, and joining roundly in posterior half, longitudinally slightly elevated at middle for about half its length.

Hemelytra with costal margin subparallel at base, membrane extending a little beyond posterior margin of the fifth visible abdominal segment in both sexes.

Abdomen slightly dilated at middle, relative width of segments 1 to 5 at posterior angles 48.5 : 53 : 54 : 51 : 45 in male, 52 : 56 : 58 : 55.5 : 47 in female. All connexival segments elongate, upper surface finely granulate in outer half, with a pair of tubercles located along inner margin, the posterior one in each case elongate and much larger than anterior one on segments 1-5. Spiracles on first, sixth, and seventh segments lateral, those on segments 2-5 ventral, located closer to inner margin of respective connexival segments except the fifth, which is central.

Male: Sixth abdominal segment with apical margin much more strongly concave than basal margin, sixth connexival segment gradually narrowed apically, rather strongly narrowed near apex, apical margin straight and short. Seventh connexival segment robust, subtriangular, apical margin slightly rounded. Genital segment a little wider than long, apical margin broadly rounded, not extending beyond apex of preceding segment.

Female: Sixth abdominal segment with basal margin almost straight except laterally where it is slightly curved posteriorly, apical margin broadly emarginate. Sixth connexival segment elongate, subtriangular, lateral margin gently rounded. Seventh segment with apical margin feebly concave, basal margin broadly concave, about two and one-half times as wide as long. Eighth segment feebly extending beyond apical margin of preceding segment, the apical margin feebly concave.

Coloration: Reddish brown to nearly black. Head above, including antennae, infuscated. Eyes silvery white in all specimens examined. Prothorax infuscated except for callosities, which are paler. Corium infuscated, membrane at base paler, the rest nearly black. Connexivum pale reddish brown. Body beneath pale.

Length of body: male, 2.5-2.6 mm.; female, 2.7-2.8 mm.

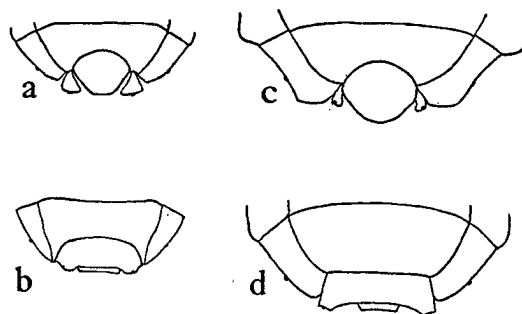


FIGURE 2.—*Aneurus lobatus*, terminal abdominal segments: a, male; b, female. *A. micronesicus*, terminal abdominal segments: c, male; d, female.

Holotype, female (US 63472), Guam I., 2 km. southeast of Asan, Oct. 31, 1947, alt. 200 m., Dybas. Allotype, male, and three males and one female paratypes, Guam I., Fadang, sweeping and beating vegetation, June 3, 1945, Dybas.

DISTRIBUTION: Southern Mariana Is. (Guam).

This new species is easily distinguishable from the other known Micronesian species, *A. micronesicus* Esaki and Matsuda, in its much smaller body, short antennae, different structure of connexival segments, location of spiracles, and other characteristics. It runs close to *A. socialis* Bergroth in Bergroth's key (1914, Mus. Nat. Hungarici, Ann. 12: 104), but it differs in the relative length of the antennal segments.

2. *Aneurus micronesicus* Esaki and Matsuda (fig. 2, c, d).

Aneurus micronesicus Esaki and Matsuda, 1951, Mushi 22 (13): 83-84.

DISTRIBUTION: Caroline Is. (Palau and Ponape, after Esaki and Matsuda).

PALAU. NGURUKDABEL (Uruktapel) : Nine males, Nov. 16, 1947, Dybas.
PELELIU : East coast, 17 males, 10 females, under bark, Aug. 3-5, 1945, Dybas
and Hagen ; one male and one female, Jan. 24-26, 1948, Dybas.

SUBFAMILY CALISIINAE

This subfamily comprises very small, robust bugs with the scutellum enlarged to cover all of the central abdominal disc. The clypeus is bulbous. The type genus is found throughout the tropics and subtropics. A strikingly distinct genus that belongs to this subfamily is the Oriental *Aradacanthia* Costa.

Genus *Calisius* Stål

Calisius Stål, 1860, K. Svenska Vet.-Akad., Handl. 2 (1) : 67 (type: *C. pallipes* Stål, Brazil).—Horváth, 1913, Mus. Nat. Hungarici, Ann. 11 : 624.
Aradosyrthis Costa, 1864, Mus. Zool. Naples, Ann. 2 : 132 (type: *A. ghilianii* Costa, Italy).

Body relatively stout, side margins with only short, spine-like process or lobes. Antennae usually shorter than head. Middle and hind femora more or less elevated at middle of inner face and with a short tubercle. Abdomen sometimes with a smooth area in an arc corresponding to the path of femoral tubercles. All three dorsal abdominal scent gland openings equally developed and spaced normally in nymph.

Calisius is widely distributed and is known from the Oligocene of Europe (*C. balticus* Usinger). Species are before us (some still undescribed) from each of the island groups of southeastern Polynesia and from most of the high islands of Micronesia that have been adequately collected. The known species from Micronesia now outnumber those of any other genus of Aradidae. *Calisius araklai* Esaki and Matsuda is not included in the following key because no specimens are immediately available for comparison.

The habits of *Calisius* are not known but Usinger (1946)¹ collected *C. dilaticeps* on Guam by beating the dead leaves of a fallen tree, and numerous records are now available (Dybas, Micronesia; Zimmerman, Samoa, Fiji, Rapa) to indicate that foliage and dead branches of trees are the normal habitat of these bugs.

KEY TO MICRONESIAN SPECIES OF CALISIUS

- | | | |
|-------|---|---|
| 1. | Large species, the length of body exceeding 4 mm. Third antennal segment longer than second..... | 1 |
| | Much smaller, the length of body never exceeding 3.0 mm. Third antennal segment subequal to or shorter than second..... | 2 |
| 2(1). | Apex of anterior process of head dilated and lamellate..... | 3 |
| | Apex of anterior process not lamellate..... | 4 |

¹ Dates in parentheses refer to citations in the general bibliography for this series (volume 2).

- 3(2). Relative width of abdomen to total length of body 0.446 in male. Predominantly fuscous brown in coloration. Length of body 2.45 mm. in male.....
*tinianensis*
 Relative width of abdomen to total length of body 0.497 in male. Much paler. Lamellate anterior margin of anterior process of head more conspicuous. Length of body 2.5 mm. in male.....*dilaticeps*
- 4(2). Pronotum with posterior half almost black laterally..... 5
 Pronotum without conspicuous black areas, more or less unicolorous..... 6
- 5(4). Last connexival segment and seventh dorsal segments very narrow, not at all reflexed in male. Eighth segment simply acutely pointed in male. Without reddish tinge on upper surface of body. Mesopleuron unicolorous. Head behind eyes with usually black tubercles, one of them strongly produced laterally, and reaching lateral margin of eyes, with white oblique stripes on scutellum. Length of body 2.21-2.26 mm.....*acutus*
 Last connexival segment and seventh dorsal segments normal and slightly reflexed in male. Eighth ventral segment with distinct apical margin, acutely pointed at postero-lateral angle in male. Head behind eyes concolorous with the rest of head surface. Postocular spine not as conspicuous as in preceding species. Mesopleuron black along anterior margin. Scutellum without white oblique band. Length of body 2.25 mm. in male, 2.37 mm. in female.....*micronesicus*
- 6(4). Double rows of tubercles on connexival segments clearly separated from each other. Connexivum very strongly reflexed in female. Length of body 2.47 mm. in female.....*saipanensis*
 Double rows of tubercles on connexival segments contiguous. Connexivum slightly, or not, reflexed in female..... 7
- 7(6). Yellowish brown, head at base and pronotum infuscated. Scutellum with narrow, white, oblique stripe. Four tubercles on anterior half of lateral margin clearly separated from each other, the first one smallest, directed anteriorly. Second antennal segment distinctly longer than third. Length of body 2.47 mm. in female.....*infuscatus*
 Pale yellowish brown, oblique stripe on scutellum much wider and ill defined. Four tubercles on anterior half of pronotum subcontiguous. Second antennal segment subequal to third. Length of body 2.34 mm. in female*trukensis*

3. *Calisius longicornis* Matsuda and Usinger, n. sp. (fig. 1, *b*).

Large species, elongate oval, with long antennae. Head a little longer than wide across eyes (39 : 34.5), anterior process reaching middle of third antennal segment, lateral margin coarsely granulated, with at least three irregular projections. Apical margin distinctly notched at middle, clypeal region longitudinally elevated. Antenniferous tubercles acutely pointed, the lateral margins feebly rounded, slightly surpassing apex of first antennal segment. Eyes directed latero-posteriorly. Lateral margins immediately behind eyes with a few small denticles, then with two much bigger tubercles placed obliquely, the first of these acute at tip, reaching middle of eyes. Upper surface rather sparsely granulated; on either side of clypeal region with a longitudinal series of tubercles; on either side of longitudinal axis of head in posterior half with two longitudinal subparallel series of tubercles; also with tubercles along postocular lateral margin. Antennae slender and long, a little longer than head (39 : 35); relative length of first to fourth segments 6 : 7.5 : 13.5 : 12; second segment arising a little inside of middle of apical margin of first segment, slightly constricted at base on inner margin; third segment slender, gradually thickened anteriorly; fourth segment fusiform, apical one-third densely white pubescent. Rostrum not reaching base of head. Head beneath sparsely coarsely granulated.

Pronotum about three-fourths as long in middle as head (30 : 39), the anterior lobe about five-sevenths as wide as posterior lobe (49 : 69), collar with a pair of distinct

granules. Anterior margin behind collar slightly concave; antero-lateral angles produced laterally; apex rectangular; lateral margins behind antero-lateral angles strongly produced laterally and slightly forward; lateral margins of posterior lobe with six prominences; posterior margin bisinuate; upper surface transversely depressed at middle, with the usual four longitudinal series of granules placed equidistant from each other at base, and a series of transverse conspicuous granules along lateral margin in posterior half.

Scutellum two and one-half times as long as pronotum (75 : 30), gradually narrowed posteriorly, the apical margin broadly rounded. Disc strongly triangularly elevated at middle of base with four basal tubercles, median longitudinal carina sparsely granulated. Meso- and metasterna finely punctured except on median yellow spot. Pleural region of pro- and mesothorax granulated. Prosternum about as long as mesosternum, metasternum about one and one-half times as long as mesosternum at middle; metathoracic pleural region finely punctured. Dorsally exposed metathoracic region granulated at sides. Connexivum finely granulated. First connexival segment with subtriangular mass of pale fuscous granules along anterior margin. Each connexival segment with a double row of tubercles, three pairs to each segment, of which the anterior two are always black. Sixth segment densely granulated, transverse, trapezoidal in shape, the lateral margin oblique and straight, divergent posteriorly. Legs finely granulated. Claws with white arolia. Abdomen beneath finely punctured throughout.

Spiracles on the first to fifth abdominal segments placed ventrally, closer to anterior margin, spiracle of sixth segment on a prominent tubercle, visible from above; spiracle of seventh segment on postero-lateral angle of lateral lobe.

Female: Sixth ventral segment with median bilobed portion feebly bisinuate on posterior margin; each median lobe of seventh segment ventrally acutely pointed and with a mass of fine pale granules on apical region. Lateral lobe with apical margin substraight, feebly notched at middle, sensibly extending beyond apex of median lobe. Genital segment tapering in basal half.

Coloration: Pale fuscous to cinnamomeous or nearly black in general. Head above and basal three antennal segments pale fuscous, fourth antennal segment cinnamomeous except in apical region which is white pubescent. Eyes cinnamomeous. Pronotum fuscous, the lateral margins of anterior lobe darker. Connexivum with first, fifth and sixth segments black, other segments pale fuscous. Sixth dorsal segment pale fuscous. Scutellum on and behind basal elevation almost black, with whitish area located obliquely behind middle. Body beneath cinnamomeous to almost black except on pale yellow spots located on center of meso- and metasterna and on first to fifth ventral segments.

Length of body: 4.0-4.3 mm.

Holotype, female (US 63473), Mt. Kupriso [Kupwurisio], Ponape, north slope, about 300-400 m. alt., beating vegetation, Mar. 11, 1948, Dybas. Paratype, female, same data as for holotype.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

This species runs to *C. antennalis* Horváth in Horváth's key (1913, Mus. Nat. Hungarici, Ann. 11: 624) but may be distinguished by its much larger body, by the fourth antennal segment being shorter than third, by the anterior process being strongly notched at the apical and lateral margins, and by the wider head.

4. *Calisius tinianensis* Matsuda and Usinger, n. sp. (fig. 4, *c, m*).

Head a little longer than wide across eyes (21 : 18.5); anterior process lobately produced on apical margin, slightly notched at middle; lateral margin granulated; antenniferous tubercles with lateral margins slightly rounded. Antennae about one and one-third times as long as head; relative length of first to fourth segments 3.5 : 3.8 : 3 : 5.5; fourth segment with apex silvery pubescent. Postocular lateral margin with a small tubercle

Abdomen moderately widened at middle, a little more than one and one-sixth as wide as greatest width of pronotum (33.5 : 28.5). The usual triangular mass of tubercles along anterior margin of first connexival segment pale. The usual double row of tubercles on lateral margin of each connexival segment composed of three tubercles, the median tubercles always black except on first segment, where the first two tubercles are almost black. All spiracles placed ventrally, closer to anterior margin of each segment, the sixth on lateral margin near anterior margin, seventh terminal.

Male: Sixth dorsal segment transverse, trapezoidal, densely granulated, elevated and dark longitudinally at middle. Sixth ventral segment with basal margin substraight at middle, slightly sinuate, a little longer at middle than at sides. Seventh segment with basal margin rounded, apical lateral angle produced posteriorly. Genital segment with apical margin distinctly extending beyond apex of seventh segment.

Female: Sixth dorsal segment trapezoidal, basal margin slightly convex, lateral margin slightly sinuate, about one and two-fifths times as wide at posterior margin as long at middle, coarsely granulated, with a transverse row of larger tubercles along posterior margin and a small black marking along posterior margin at middle. Sixth ventral segment with posterior margin running obliquely upward laterally, feebly sinuate on either side of middle. Seventh segment about five-ninths as long at middle as preceding segment at middle; median lobes with lateral margin feebly sinuate, lateral lobe composed of two projections, each acutely rounded; spiracle placed at tip of outer projection. Genital segment tapering apically, lateral margins straight.

Coloration: Variegated white, yellowish brown, and fuscous, the head above unicolorous, white with reddish tinge, eyes cinnamomeous. Antennae yellowish brown except apical region of last segment, which is fuscous and densely white pubescent. Rostrum with last segment totally nearly black. Pronotum on anterior half white, with reddish tinge; posterior half fuscous; fuscous coloration especially pronounced between sublateral and lateral carinae, this fuscous region extending downward onto posterior half of propleuron and mesopleuron along anterior margin. Scutellum with basal elevated region fuscous, fuscous oblique stripes running obliquely and roundly downward as far as posterior margin of second connexival segment, another rhomboidal fuscous marking spreading on either side of longitudinal axis in posterior half, this marking sometimes confluent laterally with anterior narrow marking. Acetabular region fuscous, legs with femora fuscous except the apical one-sixth yellowish brown. Connexivum white with reddish tinge, the area surrounding black tubercle on lateral margin brown. Ventrites with yellowish tinge medially, white with reddish tinge laterally.

Length of body: male, 2.25 mm.; female, 2.37 mm.

Holotype, male (US 63475), Peleliu I., Palau, east coast, Jan. 25, 1948, Dybas. Allotype, female, same data as for holotype.

PALAU. BABELTHUAP: Ngaremeskang, one male, 25 m., Dec. 20, 1952, Gressitt. PELELIU: West coast, one male, Jan. 27, 1948, Dybas, July 29, 1945, Hagen.

DISTRIBUTION: Western Caroline Is. (Palau).

The specimen from Babelthuap has a more yellowish tinge instead of a reddish tinge. This species might be *C. araklai* Esaki and Matsuda, but it is apparently smaller. Specimens of *C. araklai* are not available for direct comparison at this time.

8. *Calisius saipanensis* Matsuda and Usinger, n. sp. (fig. 4, d, j).

Head about as long as wide (19.5 : 20). Anterior process with apical margin lacking lobate projection, slightly incised at middle; lateral margin irregularly granulated, almost parallel-sided. Upper surface granulated. Antenniferous tubercles with lateral

margins slightly rounded. Antennae a little shorter than head (16.3 : 19.5); relative length of first to fourth segments 3 : 4 : 3.3 : 6.3.

Pronotum a little over twice as wide as long (34.5 : 16). Anterior-most tubercle on lateral margin thick, much thicker than second, third, and fourth tubercles, small. Posterior angle broadly rounded and with a mass of obsolete tubercles.

Scutellum about two and two-thirds times as long as pronotum; basal margin with four tubercles, the median pair smaller than those on extremity, one of the median pair closer to the one on extremity, which is connected by an oblique series of granules to lateral margin; lateral margin feebly sinuate; apical margin broadly rounded; upper surface shallowly punctured throughout.

Apex of costal margin of hemelytra granulated; reaching middle of fourth connexival segment. Prosternum with posterior margin feebly sinuate. Mesosternum flattened and laevigate. Posterior margin straight. Metasternum about one and one-eighth times as long as mesosternum. Metapleuron with an oblique series of conspicuous tubercles. Connexivum strongly reflexed; double rows of tubercles on lateral margins clearly separated; anterior two on both upper and lower rows of tubercles, darker. Spiracles placed ventrally, closer to anterior margin than to posterior margin, except those on seventh segment, the first tubercle of upper row, and the last tubercle apically.

Female: Sixth ventral segment with basal margin straight at middle, then rectilinear, running obliquely laterad. Seventh ventral segment with median bilobed portion bisinuate on posterior margin. Seventh dorsal segment with both basal and apical margins straight, widened apically, about twice as wide on apical margin as long at middle, with a distinct tubercle on posterior angle. Exposed eighth segment with three tubercles, the outermost one most conspicuous. Genital segment tapering apically.

Coloration: Yellowish brown in general coloration. Eyes black, basal half of pronotum darker; basal elevation of scutellum fuscous. Scutellum with oblique straight white stripe running from median longitudinal carina to lateral margin, fuscous along anterior margin of this oblique white stripe and behind as far as apical margin; second connexival segment mostly dark fuscous; sixth segment in basal half and along posterior margin at middle dark fuscous. Last rostral segment almost black. Legs with femora infuscated except near extremity.

Length of body: female, 2.47 mm.

Holotype, female (CM), Saipan I., Kalabera area, Feb. 16, 1945, Dybas.

DISTRIBUTION: Southern Mariana Is. (Saipan).

This new species may be separated from *C. tinianensis* by the absence of the lobate protuberance of the anterior projection and by the thicker and obtuse anterior-most tubercle on the lateral margin of the pronotum.

9. *Calisius infuscatus* Matsuda and Usinger, n. sp. (fig. 4, f, k).

Head a little longer than wide (21 : 18.5). Anterior process with apical and lateral margins granulated. Lateral margin of antenniferous tubercles slightly divergent anteriorly, the usual mass of tubercles on vertex obliterated. Postocular lateral tubercles reaching or distinctly surpassing lateral margins of eyes. Antennae less than three-fourths as long as head; relative length of first to fourth segments 2.5 : 3.6 : 3.6, apex of fourth segment white pubescent.

Pronotum a little over twice as wide as long (32 : 15); anterior-most spine on lateral margin smallest among the four spines on anterior half of pronotum, directed anteriorly, the rest rounded at apex; posterior margin broadly rounded, feebly sinuate with a small tubercle near posterior angle. Tubercles on upper surface more or less obliterated.

Scutellum about three and two-thirds times as long as pronotum; the lateral margins sinuate at middle. Mesosternum and metasternum with posterior margins feebly sinuate.

Metasternum a little longer than mesosternum (12 : 9); posterior margin straight. Metaepimeron with lateral tubercles obsolete. Connexivum not reflexed in female. Upper and lower rows of tubercles on each segment pressed against each other. Spiracles placed ventrally, remote from lateral margin, close to anterior margin of each segment except those on last two segments laterally.

Female: Seventh dorsal segment with basal margin straight; lateral margin feebly sinuate; posterior margin slightly rounded. Median bilobed portion of seventh ventral segment straight on either side of middle on posterior margin. Lateral lobes of eighth segment with three projecting tubercles, of which middle one distinctly surpasses apex of lateral tubercle. Ninth segment tapering apically, with a pair of distinct tubercles near extremity.

Coloration: Yellowish brown in general coloration; head behind eyes, upper surface of pronotum except for basal angle, basal elevation of scutellum along anterior margin of white oblique stripe, and totally behind oblique white stripe except for posterior angles,

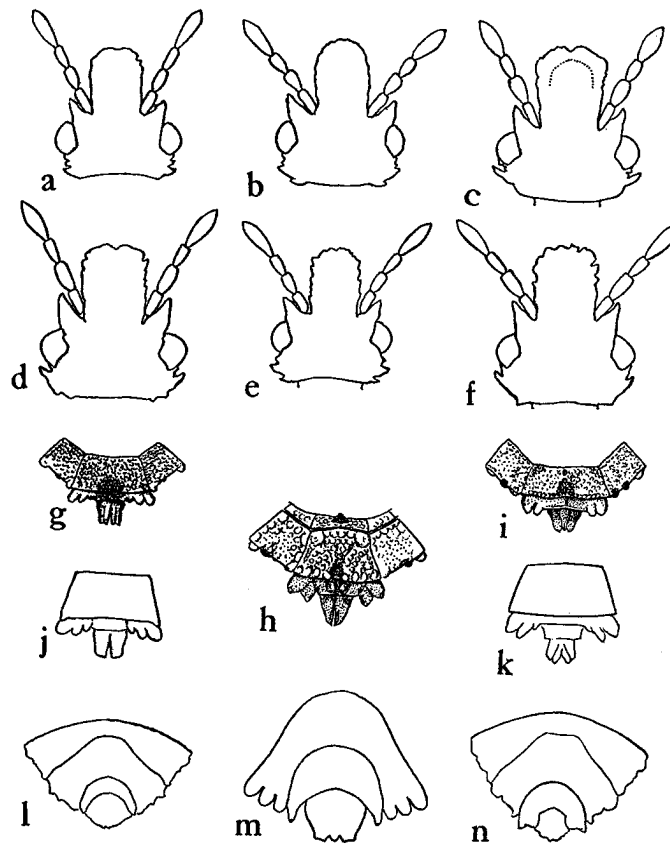


FIGURE 4.—*Calisius* species. a-f, heads: a, *C. trukensis*; b, *C. micronesicus*; c, *C. tinianensis*; d, *C. saipanensis*; e, *C. acutus*; f, *C. infuscatus*. g-k, terminal female abdominal segments (dorsal view): g, *C. acutus*; h, *C. micronesicus*; i, *C. trukensis*; j, *C. saipanensis*; k, *C. infuscatus*. l-n, terminal male abdominal segments (ventral view): l, *C. acutus*; m, *C. tinianensis*; n, *C. micronesicus*.

infuscated. Eyes cinnamomeous. Head beneath infuscated; the last rostral segment almost black; thoracic sterna dark brown; pleural region and femora except near extremity almost black. Abdomen brown.

Length of body: 2.47 mm.

Holotype, female (CM), Guam I., Pati Pt., June 4, 1945, Dybas.

DISTRIBUTION: Southern Mariana Is. (Guam).

This species is clearly separable from *C. dilaticeps* Usinger, which occurs on the same island, by the absence of a lamellate apical margin of the anterior process of the head, by the darker coloration, by the subcontiguous double row of tubercles on the lateral margin of the connexivum and by other characters. Also, this species differs from *C. saipanensis* in its reflexed connexivum and in the inconspicuous anterior-most tubercle on the lateral margin of the pronotum.

10. *Calisius trukensis* Matsuda and Usinger, n. sp. (fig. 4, a, i).

Head a little longer than wide (18 : 17). Anterior process barely, or not, reaching apex of first antennal segment. Apical margin sensibly notched at middle. Lateral margins with obscure projections in anterior half, the upper surface densely granulated. Antenniferous tubercles acute at tip. Postocular lateral margins with two anterior inconspicuous tubercles behind eyes, a rather conspicuous one at posterior angle of head, but not reaching lateral margin of eyes. The usual median longitudinal rows of tubercles divergent anteriorly, starting from middle of posterior margin of head, with fine tubercles along inner margins of eyes and coarse tubercles behind eyes fuscous. Antennae a little shorter than head (15.5 : 18), the relative length of first to fourth segments 3.0 : 3.0 : 3.0 : 6.5. Rostral groove subparallel except near apex, slightly convergent, densely granulated on either side of groove.

Pronotum about as long as head, a little less than twice as wide as long (30 : 16.5). Lateral margins with three tubercles in anterior half including one at antero-lateral angle which is most conspicuous and produced laterally, lateral margins in posterior half broadly rounded, posterior margin feebly rounded and carinate. Posterior angles subrectangular, not produced posteriorly, anterior margin with collar. Median longitudinal row of tubercles straight, median carinae slightly convergent anteriorly, a pair of two conspicuous tubercles behind collar placed on imaginary straight line from median row of tubercles, sublateral carinae slightly curved inwardly, lateral margin in posterior half elevated.

Scutellum a little less than two and one-half times as long as pronotum (40.5 : 16.5), distinctly narrowing to behind middle, then briefly dilated at apical fourth, beyond which it narrows roundly to apex. Basal elevation with three pairs of tubercles laterally, two pairs spread over posterior margin of pronotum, median pair placed first behind posterior margin of pronotum. Upper surface with round shallow punctures throughout. Metanotum slightly exposed laterally, tubercles on metapleuron invisible from above. Prosternum obscurely granulated. Meso- and metasterna mostly translucent, the granulation very much obliterated. Thoracic pleura densely granulated throughout. Scent glands placed transversely behind mesothoracic acetabular elevations (probably along the posterior margin of mesothoracic epimeron). Legs with femora granulated.

Abdomen slightly widened at middle, just a little wider than pronotum (32 : 30). Connexivum strongly reflexed laterally, the usual double rows of tubercles on lateral margins located close to each other, the median tubercles of the three on each segment a little darker. Ventrites convex and granulated except for the translucent middle and with an opaque area on each segment. Spiracles placed ventrally, closer to anterior margin than to posterior margin, except the sixth spiracle laterally and the seventh one terminally.

Female: Sixth dorsal abdominal segment trapezoidal. Lateral margin straight, posterior margin at middle with a mass of black tubercles. Sixth ventral segment with median bilobed portion twice as long as preceding segment at middle, posterior margin straight and oblique. Seventh ventral segment with posterior margin slightly rounded, lateral lobe produced posteriorly, straight, apical margin feebly notched. Genital segment tapering apically, dark fuscous, apex feebly notched.

Coloration: Body predominantly pale yellowish brown, variegated with fuscous areas and white. Head pale yellowish brown, anterior process infuscated. Eyes ferrugineous. Pronotum on anterior lobe white except for yellowish brown tubercles, posterior lobe yellowish brown, basal elevation of scutellum fuscous, somewhat purplish. Disc predominantly white on either side of yellowish-brown longitudinal carina behind basal elevation. Obscurely spread laterally as far as middle of lateral margin, fuscous, but without well-pronounced rhomboidal marking in apical one third. Connexivum yellowish brown, body beneath whitish. Legs yellowish brown with femora and claws mostly fuscous. Last rostral segment black, penultimate one dark brown.

Length of body: female, 2.34 mm.

Holotype, female (US 63476), south valley, Mt. Tonaachau, Wena (Moen) I., Apr. 4, 1949, Potts.

DISTRIBUTION: Eastern Caroline Is. (Truk).

This new species is similar to *C. infuscatus* but is distinguishable from it in the following points: The general coloration is pale yellowish brown and the markings are not so well pronounced; the relative length and shape of the antennal segments are different; the laterally exposed metanotum is not conspicuous; the width of the abdomen in relation to the pronotum is considerably less; the double rows of tubercles on the connexival lateral margins are more nearly contiguous; the connexivum is much more reflexed; the seventh dorsal abdominal segment is more transverse; and the granulation is less pronounced.

11. *Calisius araklai* Esaki and Matsuda.

Calisius araklai Esaki and Matsuda, 1951, Mushi 22(13): 84-85.

DISTRIBUTION: Described from Babelthuap Island in the Palau Islands.

The unique type specimen was not available to us during the preparation of this paper. Hence it has not been possible to include it in the key.

SUBFAMILY MEZIRINAE

This is the largest and most diverse group of Aradidae. It was treated as a separate family, Dysodiidae, by Reuter (1912, Öfv. Finska Vet.-Soc., Förh. 54(A): 33), but this position cannot be defended unless all other subfamilies are raised. In the Mezirinae the rostrum arises from an enclosed atrium through an opening that is usually slitlike in form but occasionally is open anteriorly or posteriorly. The first dorsal abdominal scent gland opening is very large and is displaced posteriorly. Two tribes are recognized (Usinger, 1951, Eighth Int. Congr. Ent., Proc., 174-179).

TRIBE CARVENTINI

Metathoracic scent gland openings inconspicuous, not extending as channels to lateral margins. Body more or less coated with an incrustation that forms regular patterns and appears as a part of the integument.

Genus *Lissocoris*, new genus

Apterous and largely glabrous. Elongate, strongly attenuated anteriorly in anterior half, with incrustation on surface. Eyes small. Postocular lateral margin lacking a process. Antenniferous tubercles well developed and thick at base. Rostrum arising from apex of anterior process of head, which is roundly open. Rostral groove wide, neck region long. Antennae long, first segment thick, second segment short, third segment long and slender, fourth segment fusiform. Pronotum with a well-developed collar region, with a deep longitudinal depression at middle. Mesonotum without wing pads, lacking ordinary triangular scutellum, partitioned into three lobes, the median lobe elongate, more or less rhomboidal in shape. Metanotum and first and second abdominal tergites fused at middle. Meso- and metanota and first and second dorsal segments laterally well defined, distinct from the long first visible connexival segment. Pro-, meso-, and metasterna very distinct from each other because of transverse grooves. Metasternum and first and second abdominal sterna fused. Scent gland openings invisible. Legs long, the anterior tibiae each with a short spine near extremity. Claws with weakly developed arolia. First connexival segment very elongate, triangular, reaching almost to anterior end of mesonotum. Second to fifth exposed tergal segments glabrous, the sublateral parts of tergal markings very strongly impressed, located close to median longitudinal elevated axis; three elevated areas on longitudinal axis subequally distant from each other and subcontinuous. Spiracles placed laterally.

Type of genus: *Lissocoris spinipes* Matsuda and Usinger.

This new genus is related to the genus *Zimmermania* Usinger (1948, Hawaiian Ent. Soc., Proc. 13(2):261-264) but it can be separated by its apterous instead of micropterous condition, the distinct anterior process, the tripartitioned mesonotum, and the very different shape of the tergal markings.

12. *Lissocoris spinipes* Matsuda and Usinger, n. sp. (fig. 5, a).

Head a little longer than wide across the eyes (50 : 42). Anterior process gradually attenuated anteriorly and directed slightly downward, not reaching basal half of first antennal segment. Antenniferous tubercles thickened at base, apex acutely pointed, lateral margin feebly rounded, densely clothed with short yellow erect hairs. Eyes small, located behind middle of lateral margins of head, postocular lateral margins feebly rounded, neck region subparallel at sides. Upper surface behind clypeus longitudinally elevated and clothed with short yellow hairs. Antennae about two and one-half times as long as head (122 : 50), relative length of antennal segments 39 : 22 : 39 : 22; first segment very thick, thicker than anterior process, coated with short bristles; second segment short and narrow, slightly and gradually thickened anteriorly, apical margin truncate; third segment most slender, finely granulated; fourth segment thickened anteriorly, thickest near apex, densely clothed with short white hairs and sparsely clothed with long pilosity in the apical area. Rostrum arising from apex of head, short, not reaching anterior margins of eyes.

Pronotum with a well-developed collar, lateral margins of collar strongly convergent posteriorly, antero-lateral angle obtuse, angulately produced anteriorly, lateral margins slightly diverging posteriorly, well-elevated prothoracic pleuron visible on either side of lateral margin, posterior margin straight on either side of middle, where it is

slightly produced posteriorly, upper surface glabrous, very strongly and widely depressed in apical half behind collar, then narrowly depressed as far as posterior margin, raised on either side of median depression laterally, irregularly sculptured. Mesonotum cuneiform, median lobe strongly elevated, elongate rhomboidal in shape, in front of anterior angle and on either side of lateral angle of rhomboidal lobe with a deep pit, lateral piece on either side of median lobe strongly obliquely corrugated, strongly inclined posteriorly. Metanotal region elevated posteriorly, glabrous. Legs long, with short hairs throughout, anterior tibiae each with three fine bristle-like spines subapically, of which the middle one is shorter than the others, claws with fine whitish membranous arolia. Pro-, meso-, and metasterna well defined from each other by transverse grooves, glabrous, obscurely longitudinally rugose, pleural region strongly obliquely sculptured.

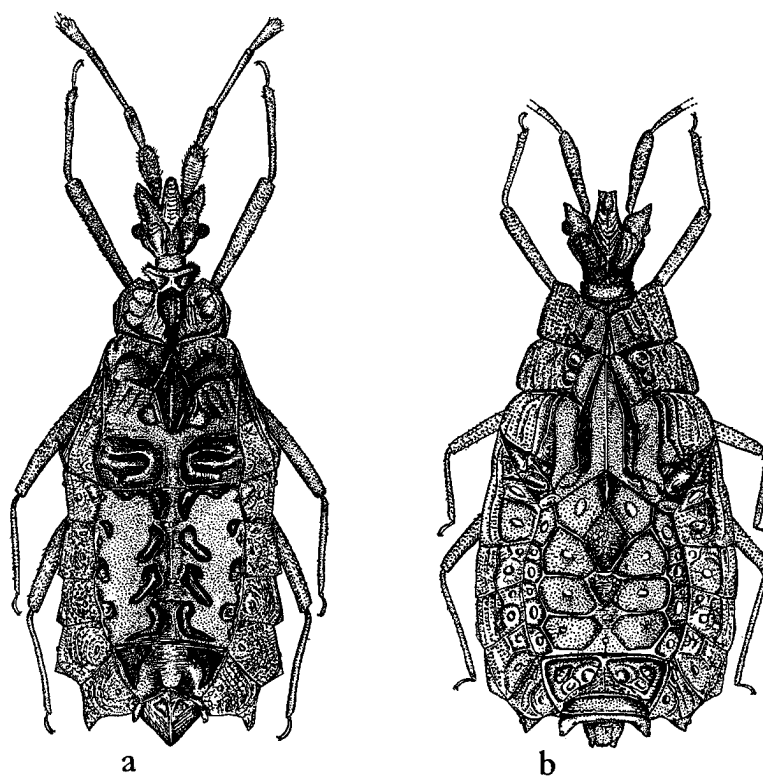


FIGURE 5.—a, *Lissocoris spinipes*, male, holotype. b, *Trigonaptera glabra*, female, holotype.

Abdomen subparallel in male, relative width at posterior angle of visible first to sixth segments 57 : 50 : 55 : 58 : 56 : 39, posterior angles at visible third, fourth and fifth connexival segments acute (this results from an incrustation on short hairs near posterior angle), upper surface finely punctured and irregularly rugose. First visible connexival segment narrowed posteriorly, visible third to sixth segments widened posteriorly. First and second tergal segments completely fused with metanotum, glabrous in middle behind scutellum, with C-shaped deep sculpture on either side of middle, posterior margin carinate and straight. Tergal plates as figured, median longitudinal axis well elevated,

three elevations associated with reduced scent glands, sixth dorsal segment with basal margin subrectilinear, the posterior margin obtuse, angulately emarginated, lateral margin rounded, upper surface strongly elevated posteriorly, along lateral margin deeply subtriangularly depressed. All spiracles placed laterally.

Male: Visible seventh segment small, rounded at apex. Genital segment strongly directed downward, lateral margin straight, apex acute, longitudinally carinate in middle, obliquely carinate on either side of middle.

Coloration: Dark, reddish brown, legs and rostrum paler, head and genital segment darker.

Length of body: 4.5-4.7 mm.

Holotype, male (BISHOP 2556), Truk, Tol (Ton) I., Mt. Unibot, alt. 390 m., Feb. 4, 1953, J. L. Gressitt. Paratype, male, Tol I., Mt. Unibot, taken in Berlese funnel, Jan. 2, 1953, Gressitt. A nymph that presumably pertains to this species was taken at the same locality May 24, 1946, by Townes.

DISTRIBUTION: Eastern Caroline Is. (Truk).

Genus *Trigonaptera*, new genus

Elongate obovate, head with anterior process moderately developed, the genae surpassing clypeus. Eyes small, located in front of middle of lateral margin, without post-ocular spine. Rostrum arising slightly behind apex of clypeus. Rostral groove wide. Antennae with first segment long, second segment short and thin, remaining segments broken off.

Pronotum with distinct ringlike collar, narrower than mesothorax, latero-anterior angle produced. Mesonotum and metanotum completely fused in middle, forming a flat, elongate pentagonal plate. Mesosternum almost as long as metasternum. Mesothoracic acetabular cleft distinct, without visible scent gland. Metasternum well defined posteriorly from visible first ventral abdominal segment. Legs long. Femur substraight, without conspicuous thickening, claws with arolia. Posterior margin of second tergal abdominal segment deeply emarginated, thus forming a pentagonal tergal plate within connexivum. Usual visible first connexival segment fused with succeeding segment, thus visible first connexival segment really represents first three segments, reaching anteriorly to posterior angles of metanotum.

Tergal plates pentagonal with three median longitudinal elevations associated with scent glands subcontinuous. Pattern of plates as figured. Spiracles with first two placed on first visible connexival segment, first spiracle placed fairly remote from lateral margin, second, third, and fourth ventral, close to lateral margin, fifth to seventh on lateral margin.

Type of genus: *Trigonaptera glabra* Matsuda and Usinger.

This new genus is remarkable in having a pentagonal tergal plate, and in the fusion of the first three connexival segments. It is similar to *Lissocoris* Matsuda and Usinger in its fused median part of meso- and metanota, but it is distinguishable from it by the pentagonal tergal plate, by the different localization of spiracles, and by the metasternum being well defined from the ventral abdominal segments.

13. *Trigonaptera glabra* Matsuda and Usinger, n. sp. (fig. 5, b).

Body obovate. Apterous. Head a little longer than wide across eyes (38 : 35); anterior process with genae slightly surpassing clypeus, forming a shallow notch in front of clypeus, reaching basal fourth of first antennal segment. Clypeus longitudinally carinate

at middle, obliquely rugose on either side. Antenniferous tubercles thick, inner margins slightly sinuate, apex small and acutely pointed. Eyes located at apical third of lateral margins, small, the lateral margins of head slightly dilated just behind eyes, then convergent posteriorly. Upper surface in posterior half with strongly elevated areas, along lateral margins, obliquely rugose.

Antennae finely granulated; first segment long, its inner margin slightly constricted a little in front of base, then slightly thickened anteriorly, slightly narrowed near apex, apex acutely rounded; second segment less than half as long as first segment, thin, slightly thickened anteriorly, apex subtruncate; third and fourth segments missing. Rostrum arising from a wide slit in atrium slightly behind apex of clypeus. Apex extending much beyond posterior margin of eyes. Rostral groove wide, not reaching apex, elevated behind groove.

Pronotum, including collar, a little less than twice as wide at base as long at middle (55 : 29), collar glabrous, anterior margin slightly concave behind collar, antero-lateral angle slightly produced forward, reaching anterior margin of collar, lateral margins widened posteriorly, posterior angle obtusely angulate, posterior margin obliquely subrectilinear on either side of middle, upper surface with rather wide longitudinal groove at middle, glabrous on either side of groove, granulated on lateral half. Mesonotum at base over one and one-third times as wide as pronotum at base (75 : 55); lateral margins broadly rounded at apical angles, posterior margin strongly concave on either side of middle, completely fused with metanotum at middle, forming an elongate, laevigate, lancet-form plate which reaches down to anterior margin of second abdominal segment. Deeply depressed on either side along this median lobe, laevigate on inner half, granulated and longitudinally sculptured on outer half of both meso- and metanota. Thoracic sterna highly polished. Prosternum with a cross-shaped elevation between coxal bases, not well defined posteriorly from mesosternum. Mesosternum almost as long as metasternum, center of meso- and metasterna with a round opaque spot. Metathoracic acetabular cleft distinct. Metasternum with posterior margin bisinuate between legs, well defined from abdominal segment, scent glands invisible. Legs simple, claws with weakly developed arolia.

Area of first and second dorsal abdominal segments with posterior margin strongly angulately emarginate, irregularly elevated and sculptured. Relative width at posterior margin of first to fourth visible connexival segments 104 : 106 : 96 : 78. Tergal plate pentagonal (anterior margin strongly angulately produced anteriorly), longitudinally sulcate just behind middle of anterior margin, median longitudinal rows of elevated area subcontinuous, anterior-most one granulate, largest, second and third becoming successively smaller, laevigate, with round, reduced scent glands located on them. Sublateral row of tergal markings large, more or less pentagonal, third and fourth transverse, well defined from each other by narrow carinae, also from lateral row of tergal pattern, each marking with feebly elevated tubercles on center, finely granulated along margin. Sixth segment with basal margin subrectilinear, lateral margin slightly rounded, posterior margin straight, strongly elevated transversely at apical one-third, upper surface strongly depressed along lateral margin, with three feebly elevated tubercles on either side of middle where it is elevated and granulated. Connexival segments with the usual visible first segment fused with the usual second segment, thus first visible segment represents three true segments in this species. First visible segment with three tubercles along inner margin, lateral third longitudinally carinate, second to fifth visible connexival segments as long as wide, posterior margins oblique, outer margins always longer than inner margins, lateral third granulated, well defined from inner laevigate area, where a pair of tubercles is always present, posterior one of which is always larger.

Female: Fifth visible segment (true seventh) with posterior angle strongly acutely produced posteriorly. First spiracles fairly remote from lateral margin, second on first visible segment, close to lateral margin, still apparently on ventral side, third and sixth very close to lateral margin, fifth, sixth, and seventh lateral. On ventral surface of abdomen eight segments are visible. Sixth ventral segment with median bilobed portion feebly sinuate on either side of middle, a little wider at posterior margin than long at middle, upper surface obliquely strongly rugose, about two and one-half times as long as genital segment at middle. Seventh segment with lateral margin rounded, apex acute,

slightly surpassing apex of prominent preceding segment. Genital segment with apex feebly notched, distinctly surpassing apex of preceding segment.

Length of body: 3.7 mm.

Holotype, female (US 63477) Koror I., Nov. 26, 1947, Dybas, in old palm log.

DISTRIBUTION: Western Caroline Is. (Palau).

This genus differs from *Lissocoris* in many characters and, most conspicuously, in the pentagonal dorsal plate area of the abdomen and in the absence of subapical spines on the fore tibiae.

TRIBE MEZIRINI

Metathoracic scent gland openings conspicuous, extending as channels or evaporating areas to lateral margins. Body granular or pubescent and sometimes encrusted with debris but not coated with a regularly patterned material as in the Carventini.

Genus *Artabanellus*, new genus

Micropterous. Head about as long as wide. Postocular lateral margins convergent posteriorly, lacking spines. Eyes small. Antennae with first segment thick and long, second small, third most slender and long, fourth shorter than third. Rostrum arising from anteriorly opened atrium. Rostral groove wide. Lateral margins of pronotum with projections, inner pair of callosities on upper surface strongly raised. Mesothoracic scutellum transverse and large, strongly longitudinally raised at middle. Metanotum occupying either side of mesothoracic scutellum, the posterior margin subrectilinear, with strongly reduced or vestigial wings located behind posterior angles of pronotum on either side of basal angles of scutellum. Fused first and second dorsal abdominal segments divided into two parts by pentagonal succeeding tergal plates within connexivum. Mesosternum short. Acetabular cleft distinct in metathorax. Metathoracic scent gland openings laterally behind mesothoracic epimeron. Metasternum well defined from fused first and second ventral abdominal segments. Legs simple, claws with arolia. Tergal plate pentagonal in shape, anterior margin produced in the middle with ill-defined elongate quadrangular cell behind scutellum. Three median longitudinal rows of tubercles well separated from each other. Spiracles ventral except for last two, which are lateral. Posterior margin of visible second and fifth ventral abdominal segments well elevated and well defined from each other.

Type species: *Artabanellus infuscatus* Matsuda and Usinger.

Artabanellus is somewhat suggestive of *Artabanus*, but the latter has the rostral atrium slitlike and has a well-developed stridulatory mechanism.

14. *Artabanellus infuscatus* Matsuda and Usinger, n. sp. (fig. 6, a).

Head slightly longer than wide (56 : 53); anterior process with genae extending beyond apex of clypeus, fused together at apex, feebly notched in the holotype, a little thicker than first antennal segment, sides converging anteriorly, reaching basal three-fourths of first antennal segment. Antenniferous tubercles blunt at apex, postocular lateral margin rectilinear, converging posteriorly from middle of posterior margins of eyes. Upper surface totally clothed with short, wrinkled dark hairs except on subtriangular area along post-ocular lateral margins where it is obscurely transversely rugose, well elevated behind anterior process. Antennae about one and two-thirds times as long as

head (94 : 56); relative length of first to fourth segments 27 : 15 : 32 : 20; first segment thickest, stout, basal area narrowed, apex narrowly rounded; second segment thickened anteriorly, apex subtruncate; third segment slender, gradually thickened anteriorly; fourth segment fusiform, strongly thickened at apical third, clothed with long pilosity apically. Rostrum reaching base of head, rostral groove wide, strongly transversely rugose on either side of groove.

Pronotum asymmetrical in holotype. Right half with antero-lateral angle forming a prominent lobe which is produced antero-laterally, apical margin of lobe subrectilinear, lateral margin with a small projection directed laterally in front of middle, behind the projection subrectilinearly divergent posteriorly. Anterior margin behind head straight; left half with a poorly developed antero-lateral projection (probably the right half is normal); posterior margin slightly concave on either side of middle. Upper surface with inner pair of callosities strongly raised, and encircled by a carina which is continuous laterally with carina encircling outer pair of callosities; behind inner pair of callosities

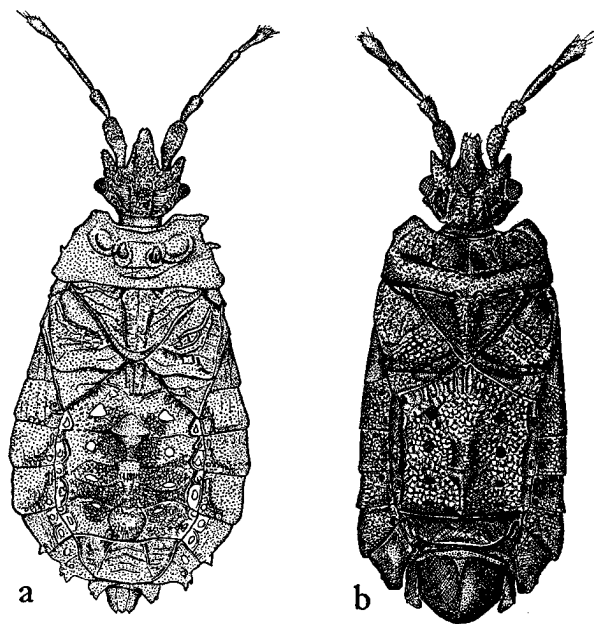


FIGURE 6.—a, *Ariabanellus infuscatus*, female, holotype. b, *Mastigocoris angulatus*, male, holotype.

with a few transverse rugosities. Prosternum slightly elevated longitudinally. Meso- and metathoracic sterna shallowly depressed in middle, obscurely longitudinally rugose at sides. Mesothoracic pleural region strongly transversely rugose, metathoracic sternum twice as long as mesothoracic sternum. Meso- and metathoracic legs with femora and tibiae finely granulated. Claws with fine, short, silvery arolia. Scutellum a little longer than pronotum (38 : 33), over one and one-half times as wide as long (68 : 38), very strongly, widely, and longitudinally elevated in middle, obliquely irregularly sculptured at sides. Hemelytra micropterous, visible just behind posterior angle of pronotum, metanotum irregularly sculptured, posterior margin straight, extending beyond apex of scutellum.

Abdomen oval in shape, relative width at posterior angles of visible first to fifth connexival segments 57 : 62 : 61 : 56 : 40. Each connexival segment from visible first

to fourth slightly rounded and produced laterally near posterior angle, fifth and sixth segments with an acute projection near posterior angle directed posteriorly; two tubercles longitudinally placed along inner margins of second to fifth connexival segments, obscurely longitudinally rugose in outer half, posterior margin of fifth visible dorsal segment feebly sinuate on either side of middle, exposed dorsum roundly punctured throughout, with three well-raised laevigate tubercles placed longitudinally in middle, middle one smallest, all tubercles sparsely clothed with yellow hairs, a row of four laevigate spots placed laterad to median row of tubercles on each visible second, third, fourth, and fifth segmental region, also two small flattened laevigate tubercles placed along lateral margins of second to fifth visible dorsal segments. Sixth dorsal segment with apical margin feebly produced posteriorly, shallowly but widely depressed and irregularly transversely rugose in middle, slightly raised longitudinally and sparsely clothed with short yellow hairs on either side of median depression and again inclined laterally, lateral margin slightly rounded. Spiracles placed ventrally except the last two, which are laterally located. First spiracles placed close to inner margin of connexival segment, then progressively located more laterally in succeeding segments, posterior margin of visible second, third, and fourth ventral segments straight, with a laevigate, inverted triangular spot in middle of posterior margin of visible second to fifth segments, a round flattened tubercle placed longitudinally midway between longitudinal axis and lateral margin of ventrites. Fifth segment with posterior margin broadly concave, sixth segment with median bilobed portion widely opened and ovipositor exposed. Genital segment (visible eighth) extending well beyond apex of seventh visible segment, which is strongly uplifted, probably because of exposure of ovipositor in holotype.

Coloration: Brown to dark reddish brown, partly almost black. Antennae brown, fourth segment very much infuscated. Upper surface of head coated with dark yellow hairs, dark reddish brown in ground color, head beneath dark reddish brown except rostrum, which is paler. Pronotum dark reddish brown, along posterior margin brown, but in middle dark reddish brown. Scutellum and hemelytra almost black except median elevated area paler, posterior half of first visible segment and all of second segment brown, succeeding segments dark reddish brown except that posterior angles are paler; lateral projections near posterior angle of visible fifth and sixth connexival segments brown, dorsum dark reddish brown. Body beneath dark reddish brown. Legs brown.

Length of body: 4.6 mm.

Holotype, one female (US 63478), Peleliu I., east coast, Jan. 29, 1948, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

Genus *Mastigocoris*, new genus

Brachypterous. Head about as long as wide. Antennae with second segment smallest; third linear; fourth fusiform. Anterior process with genae not conspicuously extending beyond apex of anterior process. Antenniferous tubercles not conspicuous. Postocular lateral margins without conspicuous spines. Atrium widely opened. Rostral groove wide. Pronotum rather short; collar distinct; antero-lateral angles slightly produced; posterior margin rounded; upper surface with distinct transverse groove; median and lateral callosities distinct. Scutellum triangular in shape, with distinct median longitudinal elevation. Reduced hemelytra reaching middle of metanotum. First dorsal abdominal segment traceable, interrupted in middle; posterior margin of second tergal segment oblique, confluent behind scutellum; third to sixth tergal segments coarsely punctured with distinct longitudinal carinae that separate lateral tergal markings; third to sixth segments indicated by laevigate tubercles; median longitudinal elevation located in fourth to sixth segment area; posterior margin of sixth tergal segment feebly sinuate. Legs rather short; claws with fine arolia. Scent gland openings rather short, but distinct, located laterally. Each

ventral segment well marked and separated by oblique anterior margin of each segment. All spiracles placed ventrally rather close to lateral margins except for last two, which are on lateral margin. Male genital segment large.

Type species: *Mastigocoris angulatus*, new species.

This new genus has the open rostral atrium of *Artabanellus*, but it differs in many other characters, the most conspicuous of which is the brachypterous rather than micropterous condition of the hemelytra.

15. *Mastigocoris angulatus* Matsuda and Usinger, n. sp. (fig. 6, b).

Head about as long as wide (26 : 26.5); anterior process with apical margin shallowly, roundly excavated, slightly extending beyond middle of first antennal segment; clypeus sparsely, finely granulated; antenniferous tubercles finely granulated, the lateral margins parallel-sided, apex subacute; postocular lateral margins feebly sinuate, acutely pointed, just behind eyes; upper surface behind clypeus elevated, granulated, and with a longitudinal sulcus, laterally well defined by longitudinal groove. Antennae over one and one-half times as long as head (42.5 : 26.5), finely sparsely granulated throughout; relative length of first to fourth segments 11 : 7.5 : 12.5 : 11.5; first segment curved laterad in apical two-thirds; second segment strongly thickened anteriorly; third segment laevigate and narrow at base, then gradually thickened anteriorly, apex truncate; fourth segment fusiform, with long white pilosity in apical one-third. Atrium widely opened. Rostral groove with lateral margins finely granulated, slightly narrowed posteriorly. Rostrum slightly extending beyond posterior margin of head.

Pronotum a little over two and one-half times as wide as long in middle (44 : 17); collar strongly carinate; antero-lateral angles produced anteriorly, subrectangular, lateral margins slightly divergent posteriorly, feebly sinuate behind antero-lateral angles; posterior margin feebly sinuate near posterior angle; upper surface distinctly transversely depressed at basal one-third; anterior lobe with wide median longitudinal depression that separates obscurely elevated median callosities; posterior lobe coarsely granulated.

Scutellum about as long as pronotum (18 : 17); lateral margin feebly rounded; basal margin with a pair of round tubercles at middle; upper surface longitudinally elevated and irregularly rugose in middle, inclined laterally, sublaevigate and obscurely rugose on either side of middle. Reduced hemelytra with outer margins oblique and sinuate; surface finely granulated. Metanotum behind hemelytra coarsely punctured; prosternum with posterior margin rounded. Mesosternum with posterior margin sinuate; surface laevigate and shallowly depressed. Metasternum with posterior margin straight, a little less than twice as long as mesosternum; surface laevigate and shallowly depressed. Scent gland openings human liplike, disposed obliquely. Femora dilated at middle, sparsely clothed with short stiff hairs. Anterior tibiae with spurs on inside of extremity. Claws with white fine arolia that reach extremity of claws.

Abdomen feebly dilated posteriorly at second connexival segment, then subparallel-sided; relative width at posterior angles of second to sixth connexival segments 17 : 17.2 : 16.5 : 17.5 : 16.2; posterior margin of second connexival segment oblique and rounded; lateral margins of fifth segment feebly sinuate; posterior angles slightly produced; lateral margins of sixth segment rounded; posterior angles roundly produced; seventh connexival segment with lateral margins feebly sinuate; posterior angles broadly rounded; lateral margins of first tergal segment on either side of scutellum rounded; second tergal segment with posterior margin convergent anteriorly behind scutellum dividing into two transverse subtriangular areas; third to sixth tergal segments continuous; upper surface coarsely punctured; each segment indicated by the presence of four laevigate depressed markings; lateral rows of markings inclined laterally, well separated by longitudinal carina; posterior margin feebly rounded; seventh tergal segment subvertically elevated posteriorly. Each ventral abdominal segment well separated from the others with distinct laevigate area in middle. Spiracles placed ventrally, closer to lateral margins than to anterior or posterior margins except for last two on lateral margin.

Male: Seventh ventral segment about two and one-half times as long as preceding segment; basal margin broadly rounded; sensibly sinuate at middle; apical margin slightly rounded. Eighth segment with lateral margins parallel-sided, abruptly narrowed near apex. Genital segment a little wider than long on dorsal side; large apical margin broadly rounded.

Coloration: Predominantly ferrugineous red. Antennae, legs, and rostrum yellowish brown; eyes golden yellow.

Length of body: 3.5 mm. in male.

Holotype, male (CM), Saipan I., Papago area, under bark, Jan. 27, 1945, Dybas.

DISTRIBUTION: Southern Mariana Is. (Saipan).

Genus *Artabanus* Stål

Artabanus Stål, 1865, Hemipt. Africana 3:31 (type: *A. geniculatus* Stål).

Head and body not strongly lobulate or spined laterally, the anterior process of head cleft at apex. Body surface with short, appressed, inconspicuous hairs. Ventral surface of third visible abdominal segment with a prominent, sinuate, longitudinal, knife-like ridge on either side, anterior margin of segment extending halfway through second segment. Several additional ridges are seen mesad of main ridge but these are much shorter. Hind tibiae bent at middle, apical half with inner (upper) face file-like opposite abdominal ridges, thus forming a stridulatory mechanism. Nymph with the same type of hind tibia but with abdomen strikingly different, with an elevated patch of very short, fine ridges laterally in region of second and third visible segments.

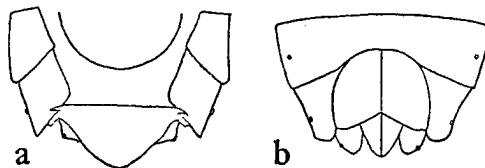


FIGURE 7.—a, *Artabanus lativentris*, terminal male abdominal segments (dorsal view). b, *Pictinus productus*, terminal female abdominal segments (ventral view).

16. *Artabanus lativentris* Esaki and Matsuda (fig. 7, a).

Artabanus lativentris Esaki and Matsuda, 1951, Mushi 22(13):79-80.

Male: Abdomen slightly narrowed posteriorly, relative width of first to sixth visible segments at posterior angle 81 : 77 : 77 : 75 : 70 : 56. Sixth visible dorsal segment transversely carinate, ending as an uplifted spine at each extremity, sixth connexival segment acutely pointed. Seventh visible segment small, reaching apex of sixth segment. Genital segment large, transverse, apical margin rather narrowly rounded.

DISTRIBUTION: Caroline Is.

PALAU. BABELTHUAP: One female, Ngiwal, Oct. 16, 1951, Gressitt.

KOROR: One male, Dec. 14, 1952, Beardsley.

PONAPE. Colonia, Feb. 2, 1936, Ono; one male and two females, Mt. Nanalaut, Mar. 7, 1936, Ono.

Genus *Neuroctenus* Fieber

Neuroctenus Fieber, 1860, Europäische Hemipt., 34 (type: *N. brasiliensis* Mayr).

Mezira-like but with a transverse carina at base of third, fourth, and fifth visible abdominal ventrites. Hind margin of fifth visible segment in female bisinuate.

Neuroctenus is worldwide in distribution, occurring in the tropical and temperate regions of both the Old and the New Worlds. It is widespread in the western Pacific and in the Melanesian islands but is not known from southeastern Polynesia or from Samoa and Fiji.

KEY TO MICRONESIAN SPECIES OF NEUROCTENUS

1. Rostrum short, not reaching posterior margin of head. Anterior process scarcely notched on apical margin. Mesosternum with posterior margin broadly emarginated. Posterior margin of fifth visible ventral segment of male roundly produced anteriorly on either side of median straight portion. Body very much flattened, abdomen strongly dilated posteriorly..... 2
Rostrum reaching or extending beyond posterior margin of head. Anterior process distinctly emarginate at tip. Mesosternum with posterior margin straight, posterior margin of fifth visible ventral segment of male simple. Body more thickened. Abdomen slightly or moderately dilated posteriorly.... 3
- 2(1). First antennal segment slightly surpassing apex of anterior process. Antenniferous tubercles slender and acute, directed slightly laterad, postocular tubercles acute. Body dark reddish brown with purplish tinge; more elongate, length of body 5.4 mm. in male.....**abdominalis**
First antennal segment not surpassing apex of anterior process. Antenniferous tubercles thick, postocular tubercle obtuse. Body totally black with golden eyes; less elongate, length of body 4.95-5.1 mm. in female, 4.8 mm. in male**angulatus**
- 3(1). Anterior process attenuated apically, without distinct notch. Membrane short, just reaching middle of fifth visible dorsal abdominal segment in female, just reaching posterior margin of fifth segment in male. Coloration variegated black, reddish brown and yellowish brown. Length of body 4.6 mm. in male, 4.9 mm. in female.....**variegatus**
Anterior process with a distinct notch at apex. Membrane longer. Coloration simpler 4
- 4(3). Sixth spiracle close to lateral margin, but distinctly ventral. Length of body 5.1 mm. in male, 5.6 mm. in female.....**pacificus**
Sixth spiracle distinctly lateral..... 5
- 5(4). Anterior angles of pronotum slightly produced anteriorly, postocular tubercles slightly surpassing eyes, acute at tip.....**palauensis**
Anterior angles of pronotum never produced anteriorly, postocular tubercles not surpassing eyes..... 6
- 6(5). Fusco-ferrugineous species. Postocular spines obsolete, forming a subrectangular angle at posterior angle of head; anterior angle of pronotum slightly reflexed but not forming a distinct lobe. Length of body 4.8 mm. in male**obsoletus**
Predominantly black species. Postocular spines small but acute, located fairly remotely behind eyes. Anterior angle of pronotum forming a small reflexed lobe of dark reddish-brown color.....**lobatus**

17. *Neuroctenus abdominalis* Matsuda and Usinger, n. sp. (figs. 9, b; 10, a).

Head as long as wide across eyes. Anterior process dilated anteriorly, apex broadly rounded. Antenniferous spines acute, directed laterally. Postocular spines reaching or sensibly passing lateral margins of eyes, a little thicker than antenniferous spines. Antennae long, about one and two-thirds as long as head (17.3 : 10.5); relative length of first to fourth segments 4.0 : 4.0 : 4.8 : 4.5; first segment a little thicker than second, granulated on apical two-thirds, slightly surpassing apex of anterior process; second segment gradually thickened anteriorly, narrowed near apex, apex truncate, granulated throughout; third segment linear, gradually simply thickened anteriorly, much thinner than second, finely granulated throughout, apex truncate; fourth segment fusiform, sensibly thicker at apical one-third than third, apical half rather sparsely white pubescent; disc obscurely transversely rugose; intraocular foveae obscure, the rest finely granulated. Rostrum short, just reaching posterior margin of eyes. Rostral groove wide, attenuate posteriorly, transversely rugose on either side of groove.

Pronotum about two and two-thirds times as wide as long (19.8 : 7.5); collar roundly emarginate; anterior margin on either side of collar slightly sinuate, lateral margin armed with a series of tubercles, slightly sinuate before middle; posterior angles broadly rounded; posterior margin broadly sinuate; disc coarsely irregularly rugose, behind collar obscurely longitudinally impressed; depressed inside lateral margins behind middle, transversely rugose along posterior margin.

Scutellum subtriangular, a little shorter than wide at base (10 : 12.5), apex obtusely angulate, upper surface longitudinally finely rugose behind basal margin. Corium with apical margin ill defined from membrane in holotype, apex reaching apical one-third of second visible connexival segment. Membrane narrow, apex just reaching apical margin of fifth abdominal segment.

Collar on ventral side laevigate; prosternum longitudinally rugose. Mesosternum along apical margin laevigate and transversely rugose, mostly obliquely rugose except laevigate area in front of middle of posterior margin, which is broadly roundly emarginate. Metasternum with posterior margin broadly emarginate. Thoracic pleural regions granulated. Acetabular (coxal) cleft invisible in meso- and metathorax. Legs with femora coarsely granulated, thickened, claws with small arolia.

Abdomen dilated posteriorly, relative width at posterior angles of first to fifth connexival segments 23.5 : 25.5 : 27.5 : 26.5 : 21.0; posterior angles feebly produced. Lateral margins of all segments slightly rounded, visible third segment longest, fourth segment a little shorter than third. Spiracles on first to sixth visible segments placed ventrally, fairly remote from lateral margins and equidistant from both anterior and posterior margins. Seventh spiracle on lateral margin, close to posterior angle of sixth visible segment.

Male: Posterior margin of fifth visible ventral segment as in the following species, sixth segment about three times as long as fifth in the middle. Seventh visible segment with apical margin subrectilinear, acutely pointed at inner angle. Genital segment coarsely granulated, transverse, about twice as wide as long, apical margin broadly rounded.

Coloration: Unicolorous dark reddish brown with purplish tinge, apical area of last antennal segment and claws paler.

Length: 5.4 mm.

Holotype, male (US 63479), Ulimang, Babelthuap, Dec. 8, 1947, Dybas.
DISTRIBUTION: Western Caroline Is. (Palau).

This new species shares the following characteristics with *N. serrulatus* Stål from the Philippines, Java, and Ceylon: (1) rostrum short, (2) anterior process not or feebly bifurcate apically, (3) mesosternum broadly emarginated on posterior margin, (4) acetabular cleft on meso- and metathorax invisible, (5) scent glands placed more longitudinally than is usual, (6) posterior

margin of fifth ventral segment roundly produced anteriorly on either side of median substraight position, (7) body more flattened.

N. abdominalis can be separated from *N. serrulatus* by its smaller body; by the darker coloration; by the less pronounced serrulate condition on prothoracic, connexival, and tibial lateral margins; and by other characters.

18. *Neuroctenus angulatus* Matsuda and Usinger, n. sp. (figs. 9, *a*; 10, *b*, *e*).

Head a little wider across eyes than long (10.5 : 9.5); anterior process narrowed near apex, apical margin sensibly emarginated, transversely rugose on clypeal region which is well defined from genae; antenniferous tubercles subacute, lateral margins rounded. Antennae about one and one-third times as long as head (12.5 : 9.5), thick, finely but sparsely granulated; first segment not reaching apex of anterior process, thickest in the middle; second segment slightly thicker than third; fourth fusiform, apical portion white pubescent, as thick as third. Postocular tubercles blunt, barely reaching lateral margins of eyes; intraocular foveae without luster, the rest of surface finely and sparsely granulated. Rostral groove slightly attenuated posteriorly. Rostrum not reaching posterior margin of head, transversely rugose on either side of groove; this region again laterally defined by longitudinal carina which connects inner margin of antenniferous tubercles and posterior margin of head.

Pronotum shorter than head (7.5 : 9.5), more than two and one-half times as wide as long; collar roundly emarginated, narrow but distinct, with a series of tubercles; anterior margin on either side of collar slightly sinuate and directed slightly forward, lateral margin serrulate, sinuate before margin; posterior margin straight except in posterior angle, broadly roundly produced posteriorly; disc sparsely finely granulated, obscurely transversely depressed, especially so in front of posterior angle, along posterior margin transversely rugose.

Scutellum a little shorter than wide (10 : 11), lateral margins slightly rounded; apex obtusely rounded; disc with a rather obscure longitudinal elevation in posterior half, finely and sparsely granulated. Corium with apex acute, upper surface without granules. Membrane with apex narrowly rounded, reaching posterior margin of fifth visible abdominal segment in female, not reaching posterior margin of fifth visible abdominal segment in male. Prosternum longitudinally rugulose, mesosternum behind anterior margin in middle transversely rugose, on either side of middle obliquely finely rugose; posterior margin broadly roundly emarginated; metasternum finely longitudinally rugose on either side of middle; acetabular regions obliquely rugose; pleural regions finely granulated. Legs finely granulated, femora strongly dilated.

Abdomen strongly dilated in the anterior half; relative width at second to fifth visible segments 23 : 24.5 : 23.2 : 19 in male, 23 : 24.3 : 23.2 : 19 in female. Connexivum finely granulated along lateral margin; posterior angles feebly produced, sublateral longitudinal carina well elevated. All spiracles placed ventrally except last pair, which is lateral; first spiracle just behind metathoracic acetabular elevation, second to fifth spiracles inside longitudinal carina, sixth inside longitudinal carina but very close to it.

Male: Fifth visible ventral segment with posterior margin straight at middle, slightly roundly produced anteriorly on either side of median straight line, then obliquely running posteriorly, about one-third as long at middle as at lateral margin. Sixth ventral segment almost four times as long as preceding segment at middle. Seventh visible segment with apical margin broadly rounded, distinctly surpassing apical angle of sixth segment, but not reaching posterior margin of genital segment. Genital segment rather coarsely granulated, transverse, apical margin broadly rounded.

Female: Fifth visible ventral segment about five-sixths as long as succeeding segment at middle, posterior margin trisinate. Sixth visible segment with median bilobed portion obliquely rugose on the surface, bisinuate on posterior margin. Seventh visible segment narrowed apically, apical margin straight. Genital segment small, apical margin rounded, feebly surpassing apex of preceding segment.

Coloration: Body above black, body beneath black with reddish tinge in general. Eyes shining gold. Membrane dark castaneous brown except along corium, which is dirty white. Eyes beneath black, emarginated with gold. Rostrum, coxae, posterior margin of prothorax, and middle of ventrites reddish brown.

Holotype, female (CM), Guam, Pati Pt., beating vegetation, June 4, 1945, Dybas. Allotype, same data as for holotype. Paratypes: Two males, five females, same data as for holotype; one male, one female, Pt. Ritidian, Guam, at light, June 19, 1945, G. Bohart, Gressitt, and J. R. Stuntz.

DISTRIBUTION: Southern Mariana Is. (Guam).

This new species is similar to *N. serrulatus* Stål from the Philippines in its characteristic fifth visible ventral segment and the emarginated posterior margin of the mesosternum; but it may easily be distinguished from it by the different coloration, by the much smaller body, by the comparatively much thicker antennae, and by the almost unnoticeable notch on the apical margin of the anterior process. It differs from *N. abdominalis* as indicated in the key.

19. *Neuroctenus variegatus* Matsuda and Usinger, n. sp. (figs. 9, d; 10, f).

Head a little wider across eyes than long (10.7 : 9.5); upper surface evenly granulated throughout; anterior process near apex narrowed; apical margin narrowly feebly notched in the middle; antenniferous tubercles subacute, lateral margins slightly rounded; postocular tubercles short but acute, just reaching lateral margins of eyes. Antennae evenly granulated throughout except on basal area of first segment and apical half of fourth segment, about one and one-third times as long as head (13.2 : 10.0); relative length of first to fourth segments 3.2 : 3.0 : 3.5 : 3.5; first segment evidently not reaching apex of anterior process, thickened in apical half; second segment a little thinner than first, narrowed near apex, apex acute; third segment linear, gradually thickened anteriorly, apex truncate; fourth segment fusiform, thickest at apical one-third, sparsely white pubescent. Rostrum extending slightly beyond base of head, transversely rugose on either side of rostral groove.

Pronotum a little less than two and one-half times as wide as long (19.5 : 8); a little shorter in middle than head (8 : 9.5); collar feebly sinuate; anterior margin on either side of collar slightly sinuate; antero-lateral angles broadly rounded; lateral margins in front of middle slightly sinuate; posterior angles broadly rounded and slightly produced posteriorly; posterior margin broadly sinuate; upper surface evenly granulated throughout, transversely depressed behind middle, median callosities obsolescent, represented by curved elongate laevigate areas placed obliquely on either side of middle.

Scutellum a little longer than pronotum (9.5 : 8.0), about one and one-third times as wide as long; lateral margins well carinate, subparallel just in front of obtuse apex; upper surface evenly granulated, a little more densely granulated than on pronotum; median longitudinal axis obscurely elevated.

Corium with apex acutely pointed, apical margin straight except near apex of scutellum, rather strongly sinuate; upper surface sparsely granulated on lateral half. Membrane narrow and short, apex reaching posterior margin of fifth visible dorsal segment in male, reaching middle of fifth visible segment in female. Prosternum granulated, meso- and metasterna with opaque areas in front of middle of posterior margin, of which that on metasternum is much larger. Posterior margins of pro-, meso-, and metasterna straight, mesosternum about five-sixths as long as metasternum.

Abdomen slightly dilated posteriorly as far as middle; relative width at posterior angles of first to fifth visible connexival segments 21 : 21 : 21.5 : 20.7 : 15.5 in male, 22.3 : 23.0 : 23.0 : 21.5 : 16.5 in female. Posterior angle of each segment very slightly produced, finely granulated along lateral margin on all segments; first visible segment

elongate subtriangular, second shortest, inner margin angularly produced inwardly; third and fourth more than one and one-half times as long as wide, subequal to each other; fifth slightly widened posteriorly; area between membrane and connexival segments broad. Spiracles placed ventrally, fairly remote from lateral margins except the last two pairs which are placed laterally.

Male: Sixth visible connexival segment subquadrangular in shape, as long as wide, sixth dorsal segment behind membrane an inverted trapezoid in shape, lateral margins straight, basal margin a little less than three times as long as apical margin. Fifth visible ventral segment straight in the middle, then running obliquely and roundly laterad, about one-third as long at middle as sixth segment at middle. Sixth visible segment laevigate and lustrous on either side of median opaque longitudinal marking. Seventh visible segment rather small, apex subacute, eighth segment coarsely granulated, rather small, apical margin rounded.

Female: Sixth visible connexival segment subtriangular, sixth dorsal segment an inverted trapezoid, lateral margins rounded, sparsely granulated on surface, depressed along lateral margins and at middle. Fifth visible ventral segment with posterior margin trisinate, a little shorter than succeeding segment at middle; posterior margin of sixth visible segment in median bilobed portion bisinate. Seventh visible segment acute at apex, inner margin slightly sinuate, distinctly extending beyond apex of visible eighth segment. Eighth segment small, lobately producing on either side of middle where it is straight.

Coloration: Predominantly black with reddish brown and yellowish brown. Base of first and third antennal segments and apex of fourth antennal segment yellowish brown to reddish brown. Pronotum at basal angles and obscurely along posterior margin yellowish brown to reddish brown, inner half of corium and along the lateral margin of connexival segments reddish brown. Body beneath predominantly black, rostrum yellowish brown, coxae, apical area of femora, basal area of tibiae, and tarsi yellowish brown, posterior margin and median opaque elongate marking of each ventral segment reddish brown. Membrane dark fuscous except along apical margin of corium, which is luteous.

Length of body: male, 4.6 mm.; female, 4.9 mm.

Holotype, female (CM), Guam I., Pati Pt., June 4, 1945, Dybas. Allotype, male, Guam, Pati Pt., June 4, 1945, Dybas. Paratypes, 15 males, 14 females, same data as for holotype.

DISTRIBUTION: Southern Mariana Is. (Guam).

This new species resembles *N. pacificus* Usinger but may easily be distinguished by its smaller body, by the different coloration, by the shape of its anterior process, by the wider head, by the much larger opaque area on meso- and metasterna, by the shorter visible fifth ventral segment in the middle, and by other characters.

20. *Neuroctenus pacificus* Usinger (figs. 8; 9, *g*).

Neuroctenus pacificus Usinger, 1946, B. P. Bishop Mus., Bull. 189: 36-37.

DISTRIBUTION: Mariana and Caroline Is.

S. MARIANA IS. SAIPAN: One female, Nov. 3, 1944, E. Hagen. TINIAN: Two females, Mt. Lasso, northwest slope, Apr. 1, 1945, Dybas. ROTA: One female, Sabana, Oct. 20, 1945, Necker; two females, Ipan, Sept. 17, 1937, Oakley. GUAM: Pt. Oca, two males, Mar. 1945, R. Bohart, June 2, 1945, Dybas; Agana Airport, one female, Aug. 15, 1945, Dybas; Nimitz Beach, two

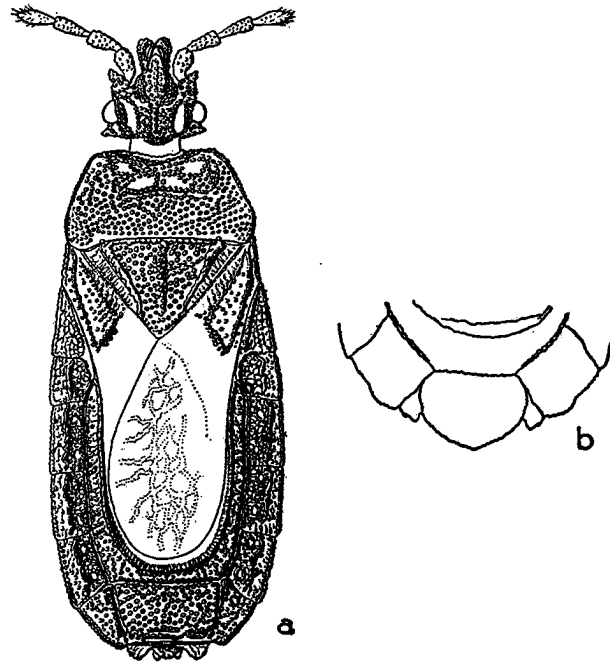


FIGURE 8.—*Neuroctenus pacificus*, female (from Usinger, Heteroptera of Guam).

females, Aug. 1952, Krauss; Asan Pt., female, Nov. 26, 1952, Gressitt; north-west of Talofoto, one male, July 2, 1946, Hosaka; Talofoto, one female, Apr. 28, 1946, Krauss.

PALAU. KOROR: Forty-three males, 46 females, Nov. 27, 1947, Dybas.

21. *Neuroctenus palauensis* Matsuda and Usinger, n. sp. (fig. 9, f).

Head as wide as long; anterior process gradually widened anteriorly; apex distinctly incised at middle; clypeus well defined both laterally and posteriorly, finely granulated above; antenniferous tubercles with lateral margins straight, feebly divergent anteriorly; postocular lateral margin small but acute, its posterior margin subrectilinear, slightly, roundly curved forward at apex; apex sensibly extending beyond lateral margins of eyes. Antennae about one and two-fifths times as long as head (43.5 : 31); relative length of first to fourth segments, 9 : 10 : 12 : 12.5, granulated throughout; first segment not reaching apex of anterior process; second segment slightly narrowed near apex; third segment simply thickened anteriorly, apex truncate; fourth segment fusiform, clothed with long pilosity in apical one-third. Upper surface of head granulated except for longitudinal depression along inner margins of eyes. Rostral groove with lateral margins carinate, sensibly narrowed apically. Rostrum reaching base of head, transversely rugose on either side of rostral groove.

Pronotum over twice as wide as long (18.5 : 8); a little shorter than head (8 : 10); antero-lateral angles broadly rounded; lateral margins obscurely granulated, strongly divergent posteriorly and sensibly sinuate in apical half, parallel in basal half; posterior margin broadly sinuate; upper surface uniformly, coarsely granulated, obscurely transversely rugose along posterior margins, obscurely shallowly depressed on either side of median longitudinal axis.

Scutellum a little longer than head (9 : 8), wider than long (12 : 9); lateral margins distinctly carinate, feebly sinuate at apical one-third, then strongly narrowed apically; apex obtusely angulate; upper surface with longitudinal axis obscurely elevated, sparsely granulated. Hemelytra with clavus obliquely rugose. Corium with outer margin rectilinear, apex subacute; upper surface obliquely rugose. Apex of membrane slightly extending beyond posterior margin of sixth abdominal segment. Legs with femora densely granulated, strongly thickened on outer margin at middle, tibiae sparsely granulated, claws with distinct arolia. Prosternum irregularly longitudinally rugose. Mesosternum as long as metasternum, with a pale reddish brown laevigate spot in front of middle of posterior margin; metasternum with posterior margin broadly sinuate, laevigate on longitudinal axis.

Relative width at posterior angles of second to sixth abdominal segments 21.7 : 22.5 : 23 : 22 : 18. Each connexival segment with lateral margins finely granulated; upper surface on inner half with a pair of laevigate tubercles obliquely disposed; posterior of each pair always more elongate than anterior; lateral margin of seventh segment obscurely sinuate at middle. Spiracles placed ventrally except for last two, which are on lateral margin, those on third, fourth, fifth, and sixth segments placed equidistantly from anterior, posterior, and lateral margins of each segment.

Male: Seventh ventral segment with basal margin straight at middle, twice as long as preceding segment at middle. Eighth segment small, subtriangular in shape. Genital segment on upper surface straight at basal margin, a little wider than long; apical margin broadly rounded.

Coloration: Ferruginous red in general coloration. Eyes golden yellow; membrane behind corium dark stramineous; claws and rostrum yellowish brown.

Length of body: 4.8 mm.

Holotype, male (US 63840), Koror, Palau Is., Nov. 27, 1947, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

This new species resembles *N. pacificus* Usinger, but may be distinguished by its apparently wider and shorter body and by the lateral position of the spiracles on the sixth segment.

22. *Neuroctenus obsoletus* Matsuda and Usinger, n. sp. (fig. 9, e).

Head a little wider than long (10 : 9.3), densely finely granulated; anterior process thick, dilated anteriorly; genae distinctly extending beyond apex of clypeus, forming a distinct notch in front of clypeus; anterior process distinctly surpassing apex of first antennal segment; antenniferous tubercles with lateral margins feebly rounded, apices subacute; postocular tubercles obsolete, forming a subrectangular angle behind eyes, never passing eyes; intraocular foveae narrow and deep, forming a sulcus. Antennae about one and one-half times as long as head (13.8 : 9.3), finely granulated throughout; relative length of first to fourth segments 3.5 : 3.0 : 3.3 : 4.0, similar in structure to *Neuroctenus pacificus*.

Pronotum about two and one-fifth times as wide as long (17.5 : 8), a little shorter than head (8 : 9.3); collar feebly sinuate; anterior margin on either side of collar straight, horizontal antero-lateral angle broadly rounded, lateral margins behind anterior angles feebly sinuate, posterior angles roundly produced posteriorly, posterior margin before scutellum straight; upper surface evenly finely granulated; posterior angles elevated, obscurely transversely depressed at middle; median longitudinal impression behind collar invisible, elongate opaque area placed obliquely on either side of middle before transverse depression.

Scutellum a little wider than long (11 : 8.5); apex obtusely angulate; lateral margins slightly sinuate; upper surface granulated; depression behind basal margin and median longitudinal elevation behind depression obscure. Corium in outer two-thirds sparsely granulated. Membrane with apex extending beyond posterior margin of visible fifth dorsal segment. Legs with femora and tibiae coarsely granulated. Abdomen gradually dilated posteriorly as far as middle of fourth connexival segment. Relative width at posterior

angles of first to fifth connexival segments 20 : 20.5 : 21 : 20.5 : 17.5; spiracles placed ventrally, fairly remote from lateral margins, sixth and last on lateral margin.

Male: Fifth visible segment with posterior margin straight at middle, then running obliquely roundly laterad, about half as long as sixth segment at middle. Seventh visible segment with apex acutely pointed. Slender genital segment about three-fourths as long as wide, finely and evenly granulated; apical margin broadly rounded.

Coloration: Almost entirely fusco-ferrugineous; membrane dirty white along apical margin of corium, the rest fuscous.

Length of body: male, 4.8 mm.

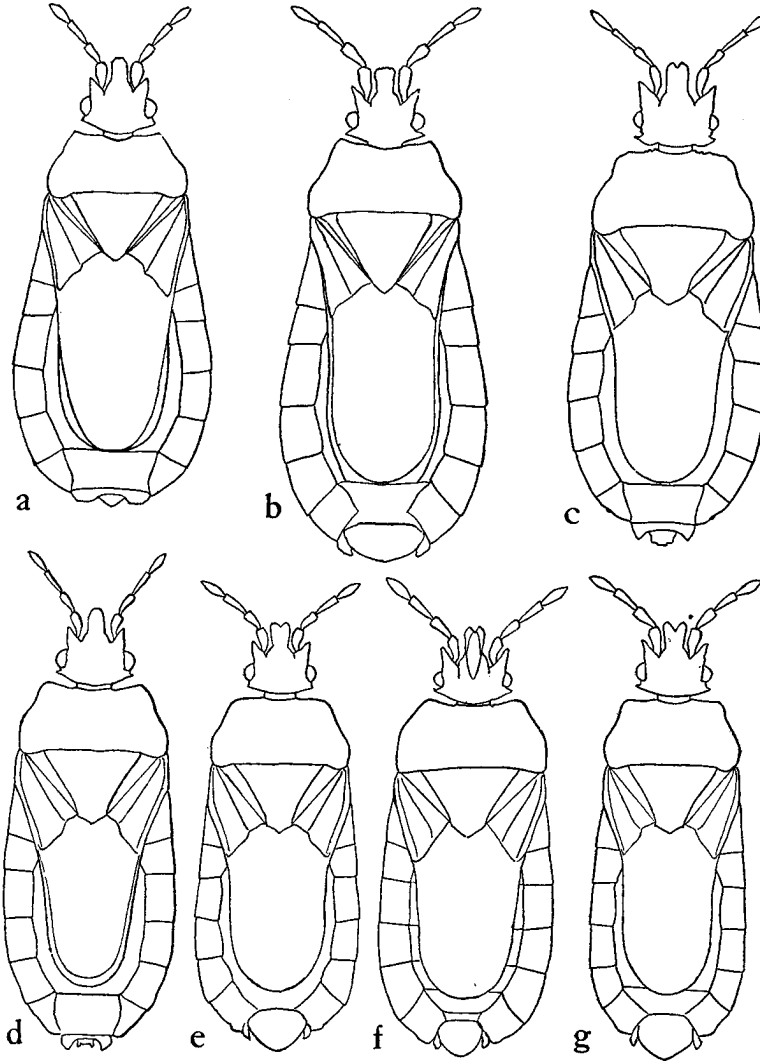


FIGURE 9.—*Neuroctenus* species, dorsal views: a, *N. angulatus*, female; b, *N. abdominalis*, male; c, *N. lobatus*, female; d, *N. variegatus*; e, *N. obsoletus*, male; f, *N. palauensis*, male; g, *N. pacificus*, male.

Holotype, male (US 63481), Yap I., July-Aug. 1950, R. J. Goss.

DISTRIBUTION: Western Caroline Is. (Yap).

This species is very similar to *N. pacificus* Usinger, but is separable in that the body is smaller, the postocular spine is obsolete, the abdomen is a little more strongly dilated, and the spiracle on the sixth visible segment is located laterally.

23. *Neuroctenus lobatus* Matsuda and Usinger, n. sp. (figs. 9, c; 10, c, d).

Head about as long as wide; anterior process moderately thickened anteriorly; apex rather deeply emarginated, slightly surpassing apex of first antennal segment; antenniferous tubercles acute, reaching middle of first antennal segment; postocular spine small, not or barely reaching lateral margins of eyes; interocular laevigate fovea larger than eyes. Antennae about one and one-third times as long as head (15.5 : 11.5), finely granulated throughout except for basal area of first segment and apical area of fourth segment; relative lengths of first to fourth segments 4.7 : 3.0 : 4.0 : 3.8; first segment thickest; third segment most slender, widened apically, apex truncate; fourth segment fusiform, sparsely pubescent. Rostral groove wide, slightly narrowed apically.

Pronotum over twice as wide as long at middle (21.5 : 9.5); anterior margin subhorizontal; antero-lateral angles subrectangular, slightly reflexed and reddish brown; lateral margins sinuate before middle; posterior angles broadly rounded; upper surface densely and equally granulated throughout; median pair of callosities rather small, laevigate and flattened, depressed on either side of callosity; lateral callosities obliterated.

Scutellum a little longer than pronotum (10.5 : 9.5), about one and one-third as wide as long (14 : 10.5), subtriangular; lateral margins sensibly sinuate behind middle; apex obtusely angulate; upper surface finely granulated; disc behind basal margin transversely depressed, sparsely longitudinally rugose; longitudinal axis feebly elevated. Corium with apex extending slightly beyond posterior margin of first connexival segment; membrane with apical margin broadly rounded, extending a little beyond posterior margin of fifth visible segment dorsally in male, not reaching posterior margin of fifth visible segment in female.

Thoracic sterna finely granulated except on longitudinal axis in basal half of mesosternum; in metasternum entirely laevigate; metasternum a little longer than mesosternum (6 : 5). Thoracic pleura densely granulated, coarser than on sternal region. Legs granulated on dorsal margins. Claws with arolia.

Abdomen a little less than one and one-fourth times as wide as pronotum (26.3 : 21.5), rather strongly dilated posteriorly in basal half, dilated almost the same degree in both sexes; relative width at posterior angles of first to fifth visible connexival segments 24.7 : 26.0 : 26.3 : 25.5 : 19 in female, 22.5 : 24.0 : 24.3 : 23.5 : 18.5 in male. Connexival segments finely granulated, longitudinal carina running a little outside of middle. First visible ventral segment well defined from metasternum. Spiracles on first to fifth segments placed ventrally, remote from lateral margins and equidistant from both anterior and posterior margins, the spiracles of sixth visible segment placed on lateral margins, those of seventh segment terminal.

Male: Sixth visible ventral segment about two and one-third times as long as fifth segment at middle. Seventh visible segment with genital lobe subacutely pointed, not reaching apex of genital segment, the latter with apical margin broadly rounded.

Female: Sixth visible connexival segment subtriangular in shape, sixth visible dorsal segment with basal margin rectilinear, lateral margins roundly narrowed apically; apical margin straight. Seventh visible segment with lateral lobes not reaching apex of genital segment; lateral margins rounded; apex subacute; median bilobed area of sixth visible ventral segment about one and one-third times as long as fifth segment at middle, apical margin bisinuate, longitudinally rugose on the surface.

Coloration: Black except for antero-lateral angles of pronotum. Along lateral margins of connexival segments sometimes reddish brown. Antennae a little paler, with reddish-

brown tinge, especially so on the basal part of third segment. Membrane black except along apical margin of corium dirty white. Body beneath concolorous with the body above.

Length of body: female, 5.1-5.4 mm.; male, 4.9 mm.

Holotype, female (US 63482), Koror I., Mar. 1954, J. W. Beardsley. Allotype, male, Koror, May 30, 1953, Beardsley. Paratypes: Two females, Koror, Apr. 1954, Beardsley; one female, Koror, under bark, June 10, 1953, Beardsley; one female, Koror, Feb. 1954, Beardsley.

DISTRIBUTION: Western Caroline Is. (Palau).

This species is very similar to *N. mayri* Stål, the only difference being the postocular spine, which is more acute, and the antero-lateral angles of the pronotum, which are a little more conspicuously reflexed.

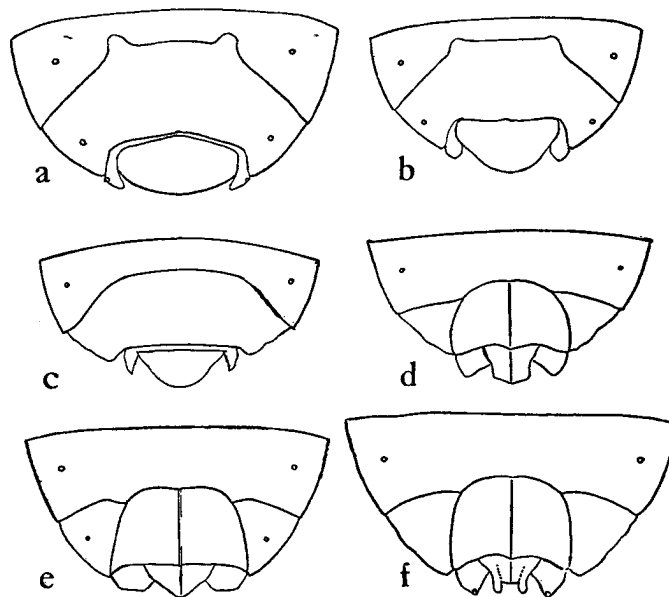


FIGURE 10.—*Neuroctenus* species, terminal abdominal segments (ventral view): a, *N. abdominalis*, male; b, *N. angulatus*, male; c, *N. lobatus*, male; d, *N. lobatus*, female; e, *N. angulatus*, female; f, *N. variegatus*, female.

Genus *Pictinus* Stål

Pictinus Stål, 1873, K. Sven. Vet.-Akad., Handl. 2(2): 145 (type: *P. cinctipes* Stål, neotropical).

As presently understood, this genus is characterized by its small, parallel-sided body form and by the tendency for the spiracles to lie close to or (first and last two pairs) on the lateral margins. The type species is from South America and has a distinctive type of stridulatory apparatus not seen in any

species from the Pacific. *Pictinus* in the widest sense becomes a virtually meaningless group but is used here pending a revised classification.

In the Pacific, small aradids of this type are known from many parts of southeastern Polynesia, Samoa, Fiji, Micronesia and from the Asiatic mainland. *P. pacificus* China, described from Samoa, was reported by Esaki and Matsuda (1951) from Yap Island; but the determination was doubtful and the specimen is not available for comparison so the species is not included in the following key.

Dybas noted that specimens of *Pictinus* were found in a decayed stump and under bark.

KEY TO MICRONESIAN SPECIES OF PICTINUS

1. First pair of spiracles placed on lateral margins of connexival segments. Antero-lateral angles of pronotum conspicuously produced anteriorly..... 2
 - First pair of spiracles placed ventrally. Antero-lateral angles of pronotum not conspicuously produced..... 3
- 2(1). Anterior process of head notched at apex. Antero-lateral angles of pronotum acutely produced. Membrane behind broadly pale at base, the apical two-thirds almost black. Relatively larger, the length of body 3.1-3.6 mm.....
 -**productus**
 - Anterior process of head conical at apex. Antero-lateral angles of pronotum obtusely angulate. Membrane almost totally black. Smaller, the length of body 3 mm.....**nigripennis**
- 3(1). Posterior margins of meso- and metasterna distinctly sinuate. Antero-lateral angles of pronotum distinctly lobately produced anteriorly. Ferruginous brown species. Length of body 2.8 mm. in female.....**acuminatus**
 - Posterior margins of meso- and metasterna straight or sensibly sinuate. Antero-lateral angles of pronotum not lobately produced, broadly rounded and feebly or slightly produced anteriorly..... 4
- 4(3). Head with a distinct small spine at posterior angle..... 5
 - Head without a distinct spine at posterior angle..... 6
- 5(4). Ferruginous brown species. Membrane long, reaching middle of sixth visible dorsal segment in female. Pronotum strongly depressed on upper surface. Length of body 2.6 mm. in female.....**longipennis**
 - Ferruginous red species. Membrane with apex not reaching apical margin of fifth visible dorsal abdominal segment. Pronotum with upper surface more convex. Length of body 2.75 mm. in female.....**affinis**
- 6(4). Third antennal segment distinctly longer than fourth..... 7
 - Third antennal segment equal to or only slightly longer than fourth..... 9
- 7(6). Eyes black. Length of body 3.3 mm. in male, and 3.4-3.7 mm. in female.....
 -**palauensis**
 - Eyes concolorous with rest of head. Smaller, 2.6-2.75 mm..... 8
- 8(7). Body densely granulated. Ferruginous red in coloration. Length of body 2.75 mm. in male.....**granulatus**
 - Body sparsely and finely granulated. Ferruginous brown in coloration. Length of body 2.6 mm.....**crassicornis**
- 9(6). Lateral margins of pronotum straight. Abdomen slightly dilated in male. Length 2.65 mm. in male.....**rectus**
 - Lateral margins of pronotum sinuate. Abdomen with sides subparallel in male. Length 2.2 mm. in male.....**minus**

24. *Pictinus productus* Matsuda and Usinger, n. sp. (figs. 7, *b*; 11, *f*).

Head about as long as wide (18 : 18.5); anterior process slightly thickened near apex; apex distinctly incised at middle, reaching middle of first antennal segment; antenniferous tubercles thick, lateral margins rounded, eyes obliquely placed; postocular lateral margins very much thickened, rounded, forming an obtuse angle at a little behind eyes, this angle reaching lateral margins of eyes; posterior margin of head straight. Antennae about one and five-sixths times as long as head (33 : 18); relative length of first to fourth segments 9.0 : 5.5 : 9.5 : 10.0; sparsely granulated throughout; first segment narrow at base, roundly thickened at middle on inner margin; second segment gradually thickened anteriorly, apex rounded; third segment linear, extreme apex slightly narrowed, apical margin subtruncate; fourth segment fusiform, apical area sparsely long white pubescent. Disc of head along eyes broadly opaque as far down as posterior margin of head, the rest sparsely granulated. Rostrum reaching posterior margin of head. Rostral groove subparallel, transversely rugose on either side of groove.

Pronotum half as long as wide (19 : 38), a little longer than head (19 : 18); collar slightly sinuate and granulate, anterior margin strongly produced, subparallel with postocular lateral margin, forming an acute anterior angle; lateral margins narrowed and reflexed anteriorly from subparallel basal one-fourth, slightly sinuate at middle, slightly more strongly narrowed anteriorly behind anterior angle; posterior margin subrectilinear in front of scutellum; posterior angle subrectangular and slightly elevated, slightly produced posteriorly. Disc granulated, especially in posterior half; callosities slightly elevated; median callosities separated by a longitudinal, shallow impression; lateral callosities obsolete, placed more anteriorly than median ones, separated by oblique impression; elongate laevigate area placed just behind extremities of collar or in front of antero-lateral corner of median callosities.

Scutellum a little shorter than wide (19 : 21); lateral margins well carinate, feebly rounded except near apex, subparallel; apex narrowly rounded; disc with a well-defined longitudinal carina which extends near apex, with several transverse rugosities which reach lateral margins on either side of longitudinal carina. Corium with apex acutely pointed, slightly extending beyond posterior margin of first visible connexival segment; apical margin sinuate; surface obliquely rugose throughout. Membrane with apex broadly rounded, almost reaching posterior margin of sixth visible dorsal abdominal segment in male, reaching posterior margin of fifth segment in female. Prosternum as long as mesosternum at middle, longitudinally widely depressed at middle, opaque. Mesosternum with posterior margin broadly but shallowly sinuate, anterior margin straight and strongly carinate, sparsely obscurely granulated. Metasternum over one and one-half times as long as mesosternum (18 : 11), more than three and one-half times as long as first visible ventral abdominal segment; posterior margin subparallel with anterior margin (or posterior margin of mesosternum). Propleuron granulated. Meso- and metapleura irregularly obliquely rugose, rather densely granulated behind propleura, sparsely granulated on metapleuron. Scent gland openings located at postero-lateral corners of mesothoracic epimera. Legs slender, femora finely granulated, with very short white hairs, slender and curved. Tibiae with very short hairs. Claws with curled fine arolia.

Abdomen parallel-sided; relative width at posterior angles of first to fifth connexival segments 40 : 40.5 : 41 : 40 : 34 in male, 41 : 42 : 42.5 : 41.5 : 35 in female. First visible connexival segment with posterior margin running obliquely upward, all segments elongate, subequal in length, slightly reflexed in both sexes, posterior angles feebly produced. Spiracles on first and sixth visible segments placed on lateral margins, the rest on ventral surface, fairly close to lateral margins, sixth invisible from above in female.

Male: Posterior margin of fifth visible segment broadly sinuate. Sixth visible connexival segment strongly dilated posteriorly. Sixth visible ventral segment about one and one-half times as long as preceding segment at middle. Seventh visible segment with lobate lateral margins slightly incised near apex, apex acutely rounded, slightly extending beyond apex of genital segment; genital segment subtriangular, apex acute, the lateral margins straight.

Female: Sixth ventral segment with median bilobed portion about one and three-fourths times as long as preceding segment at middle; lateral margins rounded; sixth connexival segment with lateral margins sinuate, apex broadly rounded. Seventh visible segment with apex rounded. Genital segment narrowly rounded apically, sensibly extending beyond apex of preceding segment.

Coloration: Ferruginous brown to ferruginous red, connexivum ferruginous brown, head, pronotum and scutellum darker. Membrane behind corium smoky white, gradually becoming darker, apical two-thirds ferruginous. Eyes gold. Body beneath paler, ferruginous brown.

Length of body: male, 3.1-3.3 mm; female, 3.4-3.6 mm.

Holotype, female (US 63483), Peleliu I., east coast, Mar. 26, 1948, Dybas. Allotype, male, same data as for holotype. Paratypes, four males, same data as for holotype.

DISTRIBUTION: Western Caroline Is. (Palau, Yap).

PALAU. BABELTHUAP: Eight males, eight females, Ulimang, beating dead branches, Dec. 10-16, 1947, Dybas, one male, wooded peak southwest of Ulimang, Dec. 16, 1947. ULEBSEHEL (Aurapushekaru): One male, beating dead branches, Jan. 14, 1948, Dybas.

YAP. YAP: One female, Mar. 8, 1949, Maehler.

This species resembles *P. pacificus* China from Samoa, but differs in the more acute anterior angles of the pronotum, in the incised anterior process of the head, and in the slightly different proportions of the antennal segments.

25. *Pictinus nigripennis* Matsuda and Usinger, n. sp. (fig. 11, *i*).

Head a little wider than long (18 : 16); anterior process conical, not bifid; clypeus extending well beyond genae, reaching a little beyond middle of first antennal segment; antenniferous tubercles thick, lateral margins broadly rounded, slightly reflexed, and granulated, dilated anteriorly, the apices obtuse; postocular lateral margins rounded, acuminate a little behind eyes; posterior margin slightly rounded. Antennae thick and rather short, about twice as long as head (31 : 16); relative length of first to fourth segments 9 : 6 : 8 : 8; first segment thickest, about twice as wide as clypeus, base narrow, strongly dilated, especially on inner margin; second segment small, dilated anteriorly, roundly narrowed behind apex; third segment a little thinner than second, gradually thickened anteriorly, apex truncate; fourth segment fusiform, apex long white pubescent. Disc of head with clypeus well elevated and posteriorly well defined. Elevation along inner margins of eyes oblong, about twice as large as eyes; a mass of granules intruding longitudinally at middle of anterior half; behind clypeus narrowly longitudinally elevated. Rostral groove very wide, occupying a third of under surface of head, obscurely transversely rugose on surface, finely sparsely granulated on either side of groove.

Pronotum a little more than twice as wide as long (35 : 16), as long as head (16 : 16); anterior margin behind neck broadly sinuate, anterior angles strongly produced, acuminate; lateral margins feebly sinuate at middle, broadly rounded near apex and narrowed apically; posterior angles subrectangular; posterior margin feebly sinuate; disc clearly transversely depressed at middle; anterior lobe deeply longitudinally impressed at middle; median callosities well separated from lateral callosities by oblique shallow depression; posterior lobe sparsely granulated, with a distinct transverse elevation a little in front of posterior margin, then inclined both anteriorly and posteriorly.

Scutellum a little longer than wide (17 : 15); lateral margins well carinate and slightly sinuate, rounded near base, and with apex ill defined; longitudinal carina well defined, reaching near apex; upper surface with several transverse rugosities, which reach lateral margins. Corium with veins well defined, but with lateral two evanescent near base;

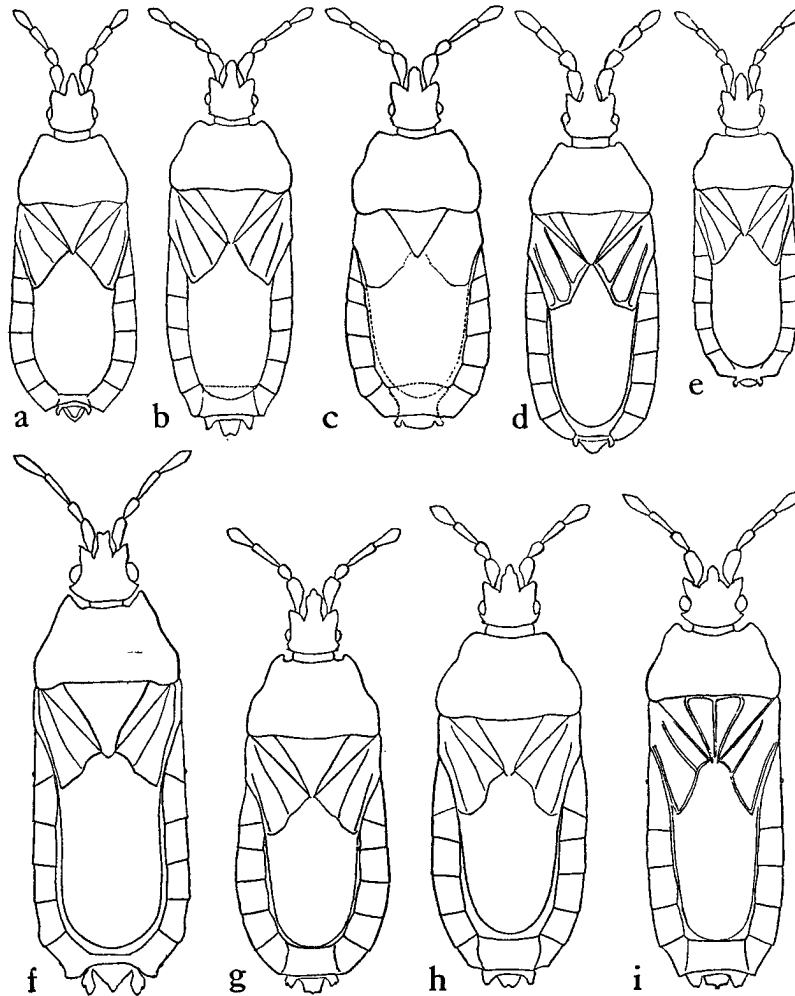


FIGURE 11.—*Pictinus* species, dorsal views: a, *P. rectus*, male; b, *P. longipennis*, female; c, *P. granulatus*, male; d, *P. crassicornis*, male; e, *P. minimus*, male; f, *P. productus*, male; g, *P. acuminatus*, female; h, *P. affinis*, female; i, *P. nigripennis*, female.

surface obliquely rugose; apex acute, reaching much closer to posterior margin of second visible connexival segment (the first visible and second visible segments are fused in this species) than to first spiracle. Membrane with apex broadly rounded, reaching posterior margin of fifth visible ventral segment. Relative lengths of pro-, meso-, and metasterna at middle 11 : 11 : 17; posterior margins of all sterna straight, each sternum with a shallow laevigate depression at middle along posterior margin, irregularly rugose on either side of middle on meso- and metasterna. Pleural regions obliquely rugose on three segments. Acetabular cleft distinct on metathorax. Scent gland openings widely exposed and located at postero-lateral corners of metepisterna.

and slightly produced; lateral margins reflexed in anterior half, slightly sinuate in front of middle; posterior angles subrectangular; posterior margin bisinuate; median impression separating median callosities rather wide; posterior lobe rather sparsely granulated, transversely elevated a little in front of posterior margin, inclined both anteriorly and posteriorly, slightly longitudinally depressed inside elevated lateral margin in posterior half.

Scutellum wider than long (14 : 13); lateral margins straight, carinate, and granulated except near apex, briefly subparallel, apex acute; longitudinal carina finely granulated, not reaching apex; basal area transversely rugose and strongly elevated on either side of longitudinal carina; behind basal elevation obliquely rugose. Hemelytra with corium reflexed on costal margin in laterally exposed area in front of connexivum, apex reaching middle of second connexival segment, obtusely rounded; apical margin subrectilinear except near apex. Membrane with apex broadly rounded, reaching middle of sixth visible dorsal abdominal segment. Thoracic sterna glabrous; relative length of pro-, meso-, and metasterna at middle 8 : 10 : 12. Posterior margins of all segments straight. Pleural region mostly obscurely obliquely rugose, glabrous, granulated beneath pronotum. Scent glands very conspicuous, oblong in outline, located laterad of mesothoracic acetabula. Femora and tibiae sparsely clothed with short white hairs. Claws with arolia.

Abdomen feebly dilated at middle; relative width at posterior angles of first to fifth segments 32.5 : 33 : 33.3 : 31.3 : 26.5 in female. Abdomen strongly reflexed laterally, the posterior margin of first connexival segment oblique, indistinctly defined; ventrites strongly convex, the posterior half of each segment strongly elevated, pale brown and glabrous; anterior half irregularly rugose and dark reddish brown. Median laevigate fovea lacking except on first and fifth visible segments. All spiracles placed ventrally except those on seventh visible segment which are lateral.

Male: Sixth visible dorsal segment with anterior margin hidden beneath membrane, strongly depressed behind anterior margin, transversely carinate and elevated a little in front of posterior margin. Sixth connexival segment at posterior angles obtusely angulate, lateral margins slightly sinuate. Sixth segment with ventral median bilobed portion about one and one-half times as long as preceding segment at middle; lateral margins subparallel. Posterior margin bisinuate. Upper surface depressed on either side of middle, longitudinally rugose. Seventh visible segment subacute at tip, not reaching apex of genital segment. Genital segment tapering apically, apex incised at middle.

Coloration: Ferruginous brown. Eyes black. Membrane smoky black. Head beneath pale yellowish brown.

Length of body: female, 2.6 mm.

Holotype, male (BISHOP 2558), northern Ponape, southeast Nanpohnmal, cut native forest, light trap, alt. 70 m., Jan. 9, 1953, Gressitt.

DISTRIBUTION: Eastern Caroline Is. (Ponape).

This new species is characteristic in the conspicuous scent gland openings, in the long membrane, and in the convex and glabrous lateral margins of the ventral abdominal segments. All spiracles except the last are ventral.

28. *Pictinus affinis* Matsuda and Usinger, n. sp. (fig. 11, *h*).

Head about as long as wide (17 : 16.5); anterior process with apex conical; genae not reaching apex of head, extending slightly beyond middle of first antennal segment; antenniferous tubercles obtuse; lateral margins subrectilinear, subparallel; postocular lateral margin rounded, reaching lateral margins of eyes, with a small tubercle directed laterally at posterior angles of head; posterior margin feebly rounded; head above and behind tylus longitudinally elevated, transversely rugose and finely granulated; usual interocular laevigate area obliterated, instead, densely finely granulated and longitudinally elevated. Antennae incrassate, finely granulated throughout; first segment strongly incrassate, especially on inner margin in front of middle; second segment oval, apex rounded; third segment simply widened anteriorly on both margins; fourth segment strongly incrassate

behind apex, the apical area densely pubescent. Rostral groove parallel-sided, moderately wide, finely sparsely granulated on either side of groove. Neck region wide.

Pronotum convex, about one and two-thirds times as wide as long (37 : 22), about one and one-third times as long as head; anterior margin feebly emarginate; antero-lateral angles broadly rounded, feebly produced anteriorly in right side, not produced on left side in holotype; lateral margins rather strongly narrowed anteriorly, slightly sinuate before middle, finely granulated; disc distinctly transversely depressed, median longitudinal impression deep on either side of middle; callosities widely depressed; posterior lobe finely, rather sparsely granulated; usual transverse elevation in front of posterior margin not well marked.

Scutellum about two-thirds as long as pronotum (15 : 22), a little wider than long (18 : 15); lateral margins not very well defined, feebly sinuate, disc sparsely finely granulated, strongly transversely elevated in basal area; longitudinal carina not distinct, represented by a longitudinal series of fine granules. Corium with apex obtuse, slightly extending beyond posterior margin of first connexival segment, apical margin sinuate. Membrane with apex broadly rounded, not reaching posterior margin of fifth dorsal abdominal segment. Thoracic sterna laevigate; broadly, very shallowly depressed at middle on meso- and metasterna; depressed and longitudinally obscurely carinate on either side of depression on prosternum; relative length of three segments at middle, 10.5 : 11.0 : 14; posterior margins of meso- and metasterna very shallowly sinuate. Scent glands very conspicuous and large, widely opened, subtriangular in shape. Propleuron finely granulated. Claws with arolia.

Abdomen slightly dilated at middle; relative widths at posterior margins of first to fifth connexival segments 40 : 41 : 40.3 : 37.5 : 30. Posterior margin of first visible segment indistinct, oblique. Ventrites convex, each ventral segment with posterior margin laevigate, as in *P. longipennis*. Usual median opaque fovea shallowly impressed on posterior laevigate area. Spiracles ventral except on sixth segment where they are lateral and seventh where they are terminal.

Male: Sixth dorsal abdominal segment strongly depressed behind anterior margin, strongly elevated posteriorly; lateral margins rounded. Sixth connexival segment with lateral margins straight, posterior angles obtusely angulate; median portion of sixth ventral abdominal segment as in *P. longipennis*. Seventh visible segment with apex not reaching tip of genital segment, which is incised at middle.

Coloration: Ferruginous red throughout. Membrane mostly blackish. Posterior margins of ventral segments, rostrum, and legs, except femora, paler.

Length of body: female, 2.75 mm.

Holotype, female (US 63484), Koror I., old palm log, Nov. 26, 1947, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

29. *Pictinus palauensis* Esaki and Matsuda.

Pictinus palauensis Esaki and Matsuda, 1951, Mushi 22(13) : 82-83.

DISTRIBUTION: Palau. Described from Babelthuap.

PALAU. BABELTHUAP: Male, Ngaremeskang, 30 m. Dec. 21, 1952, Gressitt. KOROR: Two females, Nov. 24-26, 1947, Dybas. PELELIU: Two males, two females, east coast, in coconut axils, Aug. 2, 1945, Dybas.

30. *Pictinus granulatus* Matsuda and Usinger, n. sp. (fig. 11, c).

Head distinctly longer than wide (17 : 14.8); anterior process with apex conical, reaching middle of first antennal segment, densely granulated; antenniferous tubercles thick, lateral margins rounded, densely granulated; postocular lateral margins broadly rounded. Antennae about one and three-fourths times as long as head (30 : 17), densely

granulated throughout; relative length of first to fourth segments 9 : 5 : 9 : 7; first segment thickened anteriorly on inner margin, thickest at middle; second segment oval; third segment linear; fourth segment a little thinner than first. Upper surface of head densely granulated. Convex rostral groove subparallel, slightly sinuate near extremity, granulated on either side of groove.

Pronotum about one and three-fourths times as wide as long (33.5 : 19.5), a little longer than head (19.5 : 17.0); sinuate anterior lateral margin broadly rounded and feebly produced anteriorly; lateral margins granulated, distinctly sinuate in front of middle, posterior angles broadly rounded; posterior margin distinctly bisinuate. Upper surface densely granulated, median longitudinal impression on anterior lobe wide and continuous with posterior, thus presenting a wide depressed area at center of pronotal disc between median and lateral obliterated callosities. Callosities just behind collar with a pair of rather conspicuous tubercles.

Scutellum about one and one-third times as wide as long (17 : 12.5), lateral margins straight; basal area elevated, especially at middle. Corium with apex obtuse, reaching posterior margin of first visible segment. Membrane missing in holotype. Relative lengths of pro-, meso-, and metasterna at middle 7 : 11 : 13; prosternum longitudinally depressed at middle. Lustrous meso- and metasterna, glabrous, highly polished, shallowly depressed at center. Posterior margins of pro- and mesosterna feebly sinuate, and black with a round well-defined pit at middle of posterior margin of mesosternum. Scent glands opening laterad of mesothoracic acetabula. Pleural regions mostly granulated in pro- and mesothorax. Metapleuron mostly obscurely obliquely rugose. Legs with femora and tibiae densely granulated. Claws with arolia. Abdomen obovate; relative width at posterior angles of first to fifth connexival segments 37 : 38 : 38 : 35 : 29.5. Posterior angles of connexival segments feebly produced. Posterior margin of first connexival segment running obliquely upward laterally. Ventrites convex, laevigate lateral margin of each segment produced at middle. Spiracles placed ventrally, close to lateral margins except for the last pair which are terminal.

Male: Sixth visible ventral segment with the posterior margin straight except for middle which is broadly rounded and slightly produced posteriorly; sixth connexival segment with both lateral and posterior margins straight; seventh segment directed laterad, genital segment transverse, apical margin subrectilinear.

Coloration: Unicolorous, ferruginous, thoracic sterna ferruginous brown, lustrous. Length of body: 2.75 mm.

Holotype, male (US 63486), Dugor, Yap I., Berlese funnel collection, July-Aug. 1950, Goss.

DISTRIBUTION: Western Caroline Is. (Yap).

This species resembles *P. affinis* Matsuda and Usinger, but can be separated from it by the denser granulation, by the non-reflexed connexivum, by the much more flattened pronotum, and by the spiracles which are located much closer to the lateral margins.

31. *Pictinus crassicornis* Matsuda and Usinger, n. sp. (fig. 11, *d*).

Head, excluding neck, almost as long as wide (15.5 : 15.0); anterior process simply narrowed anteriorly; apex conical, slightly extending beyond middle of first antennal segment; clypeus sparsely, finely granulated, well defined both laterally and posteriorly; antenniferous tubercles obtuse at apex; lateral margin feebly rounded; postocular lateral margins without conspicuous spine or tubercle, sparsely granulated and feebly rounded. Antennae a little less than twice as long as head (27.3 : 15); relative lengths of first to fourth segments 8 : 3.8 : 8.5 : 7; all segments thick; first segment strongly incrassate on inner margin at middle; second segment rounded, a little longer than wide; third pedunculated at base, then gradually thickened anteriorly; fourth about as thick as third segment,

thick at base, apex clothed with long pilosity. Upper surface of head finely sparsely granulated throughout, distinctly elevated behind clypeus, with an elongate elevation along inner margins of eyes. Rostral groove with lateral margins feebly rounded and finely granulated. Rostrum reaching basal margin of head. Neck region well exposed.

Pronotum a little less than twice as wide as long (32 : 17); lateral margins finely granulated, widened posteriorly; basal one-third parallel-sided; antero-lateral angles roundly produced; posterior angles broadly rounded; posterior margin feebly bisinuate; upper surface of anterior lobe with a distinct median impression that separates finely granulated and well-elevated median callosities; posterior lobe finely granulated throughout, transversely elevated at basal one-fourth of pronotum, then inclined both anteriorly and posteriorly.

Scutellum a little wider than long (16.5 : 13); lateral margins distinctly carinate, subrectilinear, obscurely, longitudinally elevated at middle, with transverse fine carinae on either side of middle. Hemelytra with clavus well exposed, a distinct longitudinal carina at middle, obliquely rugose. Corium with apex reaching middle of third connexival segment; outer margin well carinate, obtusely angulate at outer one-third. Prosternum shallowly depressed at middle; posterior margin sinuate. Mesosternum about one and one-fourth times as long as prosternum; posterior margin feebly sinuate; upper surface laevigate, widely, shallowly depressed. Metasternum about one and one-fifth times as long as mesosternum; posterior margin slightly sinuate; upper surface shallowly depressed. Metathoracic scent gland openings oblong, located laterad of mesothoracic acetabular elevations. Anterior tibiae distinctly more slender than antennae, with obtuse tooth on inner margin at extremity.

Relative width of second to sixth abdominal segments at posterior angles 34.5 : 35.5 : 35 : 33.5 : 26 in male, 35.5 : 37 : 37.5 : 33.5 : 28 in female. Connexivum reflexed to the same degree in both sexes. Posterior angles scarcely produced; upper surface with a pair of markings longitudinally disposed along inner margin. Spiracles placed ventrally, close to lateral margin, equidistant from both anterior and posterior margins of each segment except for the last, which are at apex.

Male: Seventh ventral segment about one and one-third times as long as preceding segment. Eighth segment small, uplifted. Ninth segment with lateral margin sinuate, apex rounded.

Female: Seventh ventral segment with median bilobed portion a little more than twice as long as preceding segment, about one and two-fifths times as wide between posterior angles as long at middle; upper surface finely, longitudinally rugose, shallowly depressed on either side of middle. Eighth segment lobes directed slightly laterad; apices rounded, not extending beyond apex of ninth segment. Ninth segment with lateral margins feebly rounded; apex with a small cleft at middle.

Coloration: Ferruginous brown. Eyes concolorous with rest of head. Membrane infuscated. Rostrum yellowish brown.

Length of body: male, 2.60 mm.; female, 2.8 mm.

Holotype, female (CM), Saipan I., As Mahetog area, under board in woods, Jan. 19, 1945, Dybas. Allotype, male, in decayed stump, same data as for holotype, Jan. 20, 1945, Dybas. Paratypes, one male, one female, same data as for allotype.

DISTRIBUTION: Southern Mariana Is. (Saipan).

This species is similar to *P. acuminatus*, but may be distinguished by the anterior process of the head being without dilation near the apex, by the antennae being a little thicker, by the mesosternum being without a parallel short carina on either side extending to the anterior margin, by the posterior margin of the second ventral abdominal segment being ill defined, and by other characters.

32. *Pictinus rectus* Matsuda and Usinger, n. sp. (fig. 11, a).

Head distinctly longer than wide (16 : 13.2), anterior process with apex narrowly rounded; genae not reaching apex, slightly extending beyond middle of first antennal segment; antenniferous tubercles obtuse; lateral margins rounded; postocular lateral margins rounded, reaching lateral margins of eyes, without spine at posterior angle of head; posterior margin slightly rounded, represented by a transverse series of fine granules. Antennae one and one-half times as long as head (24 : 16), finely granulated; first segment thickened, especially on inner margin before middle; second segment oval; third segment simply thickened anteriorly, apex truncate; fourth fusiform, apex silvery pubescent. Upper surface of head finely granulated, usual interocular oblong area elevated and granulated. Rostral groove parallel, sparsely granulated on either side of groove. Neck region wide, irregularly rugulose.

Pronotum about one and three-fourths times as long as wide (28.5 : 16.5), a little longer than head (16.5 : 15.5); anterior margin behind neck represented by a series of fine tubercles; antero-lateral angles slightly produced anteriorly, subacute; lateral margins finely granulated, straight before basal one-third where they are subparallel; posterior margin feebly bisinuate; upper surface transversely depressed at middle; median longitudinal impression on anterior lobe wide; lateral callosities well separated from median callosities by a wide shallow depression; upper surface finely granulated, especially on posterior half.

Scutellum about one and one-third times as wide as long; lateral margins well carinate, slightly sinuate; upper surface behind base transversely elevated and rugose; median longitudinal carina ill defined. Corium with apex obtuse; apical margin feebly sinuate. Membrane reaching middle of sixth dorsal segment. Relative lengths of pro-, meso-, and metasterna 8.5 : 3.5 : 10. Prosternum longitudinally depressed. Meso- and metasterna without defined depression. Scent glands conspicuous, large, located lateral to mesothoracic acetabula. Legs with femora and tibiae sparsely finely granulated. Claws with arolia.

Abdomen moderately dilated at middle; relative width at posterior angles of first to fifth connexival segments 31 : 32 : 32.5 : 31 : 24; connexivum slightly reflexed in male; ventrites convex; spiracles placed ventrally, fairly close to lateral margins except for last pairs.

Male: Sixth visible ventral segment about one and one-third times as long as preceding segment, with a prominent lustrous tubercle on longitudinal axis a little closer to posterior margin than to anterior margin. Seventh visible segment small, uplifted. Genital segment divided into a smaller upper lobe and a larger lower portion, separated from the latter by a depression. Apical margin of upper lobe acutely rounded; lateral margin of lower portion rounded; apex rounded.

Coloration: Unicolorous, ferruginous. Membrane translucent, slightly infuscated apically.

Length of body: male, 2.65 mm.

Holotype, male (US 63487), Yap I., Dugor, July-Aug. 1950, Goss.
DISTRIBUTION: Western Caroline Is. (Yap).

This species can be recognized from *P. productus*, *P. affinis*, and *P. acuminatus* by its smaller body and by the pronotum, which is evenly narrowed anteriorly.

33. *Pictinus minimus* Matsuda and Usinger, n. sp. (fig. 11, e).

Head distinctly longer than wide (15 : 11.5); anterior process with apex conical; long lateral margins slightly narrowed apically, reaching basal two-thirds of first antennal segment; obtuse lateral margins rounded. Eyes slightly exposed laterally, postocular lateral margins rounded, reaching lateral margins of eyes; posterior margins rounded. Antennae finely granulated, about one and two-thirds times as long as head (24.5 : 15); relative

length of first to fourth segments 7 : 4 : 7 : 6.5; first segment about as thick as anterior process, base narrow, thickened in apical half; second segment oval; third segment simply dilated apically, apex subtruncate; fourth segment fusiform, apex silvery pubescent. Upper surface of head finely sparsely granulated. Rostral groove subparallel except near apex slightly attenuated.

Neck region wide, irregularly rugulose. Pronotum about one and three-fourths times as wide as long (26 : 14.5); antero-lateral angle of pronotum broadly rounded and feebly produced anteriorly; lateral margins strongly sinuate before middle; posterior angles broadly rounded; posterior margin feebly bisinuate; upper surface finely granulated, especially on posterior lobe, transversely depressed at middle; median longitudinal depression wide.

Scutellum about one and one-half times as wide as long; lateral margins feebly sinuate behind base; upper surface transversely elevated and rugose behind base; median longitudinal carina obscure. Corium with apex obtuse; apical margin slightly sinuate; upper surface obscurely obliquely rugose. Membrane reaching middle of sixth visible dorsal segment. Relative length of pro-, meso-, and metasterna at middle 9 : 9 : 10. Prosternum laevigate, shallowly depressed longitudinally. Mesosternum laevigate, depressed, especially behind anterior margin. Metasternum flattened longitudinally at middle, but not depressed. Pleural region finely granulated. Scent glands conspicuous and large, located lateral to mesothoracic acetabula.

Abdomen subparallel at sides on anterior half; relative width at posterior angles of first to fifth connexival segments 27 : 28 : 28 : 26 : 22. Posterior angle of each connexival segment feebly produced. Ventrites convex; posterior margin of each segment high and laevigate, longitudinally laevigate and elevated at middle on either side of median elevation. Spiracles placed ventrally, close to lateral margin except those on seventh segment, which are terminal.

Male: Sixth visible connexival segment with lateral margins slightly sinuate; posterior angle obtusely angulate; posterior margin horizontal. Seventh visible segment small, uplifted, apex acute. Genital segment with apical margin broadly rounded.

Coloration: Unicolorous, ferruginous red. Body beneath paler, brownish. Eyes alternately golden and black according to different lights. Membrane pale yellow behind apical margin of corium, infuscated apically.

Length of body: male, 2.2 mm.

Holotype, male (US 63488), Koror I., Nov. 21, 1947, Dybas. Paratype, male, Koror, Limestone Ridge south of inlet, under bark, Jan. 21, 1948, Dybas.

DISTRIBUTION: Western Caroline Is. (Palau).

This new species is distinct from any others of this group because of its small body and its ventral segments, which are longitudinally elevated at the middle.

Genus *Chiastoplonia* China

Chiastoplonia China, 1930, *Insects of Samoa* 2(3):104 (type: *C. pygmaea* China).

Head very short with anterior process scarcely extending beyond bases of antennae. Rostral atrium open in front. Clavus and corium reduced, not exceeding level of apex of scutellum. Scutellum with carinae in form of a cross. Spiracles sublateral, those of first and second segments, at least, visible from above.

Chiastoplonia proves to be widely distributed through Polynesia and Micronesia.

KEY TO MICRONESIAN SPECIES OF CHIASTOPLONIA

1. Ferruginous red to black. Lateral margins of pronotum in posterior half evenly narrowed, then briefly subparallel in front of middle, again evenly narrowed anteriorly, thus forming an angle before the middle. Pronotum without a very prominent elevated area in front of middle of posterior margin. Length of body: 3.3 mm. in male, 3.4-3.7 mm. in female.....**ponapensis**
- Ferruginous brown in general coloration. Lateral margins of pronotum bisinuate, rounded instead of angulate. Disc of pronotum with a distinctly elevated area surrounded by a deep impression in front of middle of posterior margin. Length of body: 2.35-2.50 mm. in male, 2.6 mm. in female.....**pygmaea**

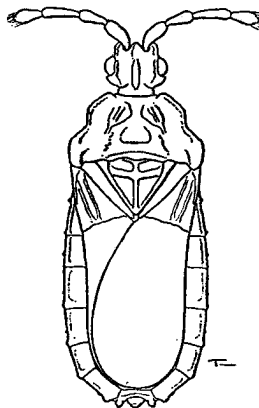


FIGURE 12.—*Chiastoplonia pygmaea*, male (from China, Heteroptera of Samoa).

34. ***Chiastoplonia pygmaea*** China (fig. 12).

Chiastoplonia pygmaea China, 1930, *Insects of Samoa* 2(3): 104-105.

—Esaki and Matsuda, 1951, *Mushi* 22(13): 80.

DISTRIBUTION: Caroline Is.; described from Samoa and subsequently reported by Esaki and Matsuda from Jaluit Atoll, Marshall Is.

PALAU. PELELIU: Eleven males, 11 females, east coast, Jan. 25, 1948, Dybas. ANGAUR: Two females, one male, Feb. 3-4, 1948, Dybas.

CAROLINE ATOLLS. NGULU: One male, seven females, Ngulu I., Oct. 3, 1952, Krauss.

PONAPE. One male, Matalanim Plantation, June-Sept. 1950, Adams.

35. ***Chiastoplonia ponapensis*** Esaki and Matsuda.

Chiastoplonia ponapensis Esaki and Matsuda, 1951, *Mushi* 22(13): 81-82.

DISTRIBUTION: Mariana and Caroline Is. Originally described from Ponape.

S. MARIANA IS. SAIPAN: One male, four females, Jan. 17, 1945, Hagen.

PALAU. PELELIU: One male, east coast, Jan. 25, 1948, Dybas.

CAROLINE ATOLLS. NGULU: Two males, one female, Ngulu I., Oct. 3, 1952, Krauss.

PONAPE. One female, Mt. Peipalap, June-Sept. 1950, Adams.

Genus **Mezira** Amyot and Serville

Mezira Amyot and Serville, 1843, Histoire des Insectes . . . Hemipt., 305 (type: *M. granulata* Amyot and Serville).

Brachyrynchus Laporte, 1832, Mag. Zool. 2 : 54 (type: *B. orientalis* Laporte).

This is a worldwide genus, difficult to characterize because of the diverse elements within it and the present lack of characters. The type species is from Cuba. Pacific species fall into two groups, one of which Stål (1865) separated as the subgenus *Arictus* (Hemipt. Africana, 3 : 31; type, *A. thoracoceras* Montrouzier) (includes *tagalica* and relatives from Micronesia) and the other on which Laporte's preoccupied name *Brachyrynchus* was based (type: *orientalis* Laporte=*membranaceus* Fabricius).

KEY TO MICRONESIAN SPECIES OF MEZIRA

1. Second and third antennal segments equal to each other in length. Antero-lateral angles of pronotum simply rounded. Surface without tubercles that form particular patterns.....**membranacea**
 Second antennal segment about half as long as third. Antero-lateral angles of pronotum lobately produced forward. Surface with a series of granules that form particular patterns..... 2
- 2(1). Sixth spiracle placed ventrally. Ferruginous red in ground color. Posterior angles of connexival segments moderately produced.....**nanamaraki**
 Sixth spiracle placed on lateral margins of connexivum..... 3
- 3(2). Antennae thick, the last segment about one-third as long as third. Ferruginous red predominantly.....**tagalica**
 Antennae slender, the last segment about half as long as third..... 4
- 4(3). Ground color ferruginous red. Posterior angles of connexival segments strongly acutely produced, especially in male. Antero-lateral angles of pronotum narrow and rather strongly produced anteriorly.....**angularis**
 Ground color black. Posterior angles of connexival segments not strongly produced. Antero-lateral angles of pronotum widely lobate.....**marianensis**

36. **Mezira membranacea** (Fabricius).

Acanthia membranacea Fabricius, 1798, Ent. Syst., Suppl., 526.

Aradus membranaceus Fabricius, 1803, Syst. Rhyngotorum, 118.

Mezira membranacea China, 1930, Insects of Samoa 2 (3) : 103.

Mezira micronesica Esaki and Matsuda, 1951, Mushi 22 (13) : 77-78. New synonym.

DISTRIBUTION: Orient, Micronesia, New Guinea.

BONIN IS. CHICHI JIMA: Hills east of Omura, June 1949, Mead.

S. MARIANA IS. TINIAN: Nov. 11, 1952, Beardsley. AGIGUAN: One female, May 29, 1952, Owen. GUAM: Thirty-five males, 33 females, 2 km. southeast of Asan, Oct. 31, 1947, Dybas.

PALAU. BABELTHUAP: Two males, Ulimang, Dec. 22, 1947, Dybas. KOROR: One male, two females, Nov. 21, 1947, Dybas. NGERGOI (Garakayo): Two females, Aug. 8, 1945, Hagen. PELELIU: Five males, six females, east coast, Jan. 27, 1948, Dybas. ANGAUR: One female, Dec. 1-2, 1951, Gressitt.

YAP. RUMUNG: Nine, July-Aug. 1950, Goss.

CAROLINE ATOLLS. ULITHI: One female, Potangeras I., Nov. 10, 1947, Dybas.

TRUK. TONOAS (Dublon): Twelve males, nine females, 1,200 ft., May 26, 1946, Townes. WENA (Moen): Four males, nine females, May 31, 1946, Townes.

PONAPE. One male, Agric. Exper. Sta., June-Sept., 1950, Adams.

KUSAIE. Seventeen specimens, Dec. 29, 1935, one male, one female, Jan. 26, 1936, Ono.

So many specimens of this species are available (about 400) that only token localities are given to represent the general distribution in Micronesia. It is widely distributed in the Oriental Region and Pacific area. The distribution and synonymy are summarized by China (1930). Since that time Esaki and Matsuda proposed a new name, *M. micronesica*, for small Micronesian specimens with more reddish body color and straight lateral margins of the sixth abdominal segment. Specimens of this type fall within the wide range of variation in our series. A few of the Bonin Island specimens have a conspicuous pale pattern on the membrane and therefore might be referred to the subspecies *albipennis* Fabricius [Kormilev, 1953, Naturf. Gesell. Basel, Verh. 64 (2): 339].

It is interesting that no specimens of this conspicuous species are known from Guam or other islands in the Marianas prior to 1947, though extensive and specialized collecting was done by Esaki, Swezey, Usinger, and others in the years before World War II.

37. *Mezira nanamaraki* Esaki and Matsuda.

Mezira nanamaraki Esaki and Matsuda, 1951, Mushi 22 (13): 73-75 (Ponape, Carolines).

DISTRIBUTION: Caroline Is.

PALAU. BABELTHUAP: One male, one female, Irrai (Airai), Jan. 20, 1948, Dybas. PELELIU: Three males, three females, east coast, July 31, and Aug. 5-13, 1945, Dybas.

PONAPE. One male, Jan. 12, 1953, Clarke. Nanwei (Nanue), June-Sept. 1950, Adams. Colonia, one female, Hydroelectric Plant, Aug. 13, 1946, Townes.

38. *Mezira tagalica* (Stål).

Brachyrhynchus tagalicus Stål, 1870, Öfv. K. Vet.-Akad., Förh. 27: 672. Length of body: male, 8.2 mm.

DISTRIBUTION: Philippines, New Guinea, Java, Indochina, Nias I., Burma, Caroline Is.

PALAU. PELELIU: Two males, two females, Aug. 5, 1945, and Jan. 24, 1948, Dybas.

YAP. YAP: Kolonia, one female, July-Aug. 1950, Goss.

We also have specimens from Mindoro, Luzon, and Cochin China. Micronesian individuals are considerably smaller than those seen in other regions.

39. *Mezira angularis* Esaki and Matsuda.

Mezira angularis Esaki and Matsuda, 1951, Mushi 22 (13): 75-77.

DISTRIBUTION: Caroline Is.

PALAU. BABELTHUAP: One female, eight males, Iwang, Dec. 18, 1953, Gressitt. NGERGOI (Garakayo): One female, on half dead breadfruit trunk, at night, Aug. 7, 1945, Dybas. PELELIU: Ten males, 10 females, Aug. 10, 1945, Dybas; eight males, five females, north central part, July 29 and Aug. 7-12, 1945, Dybas; four males, three females, east coast, Aug. 13, 1945, Dybas; one female, Ngasias (Asias), Apr. 23, 1936, Kondo.

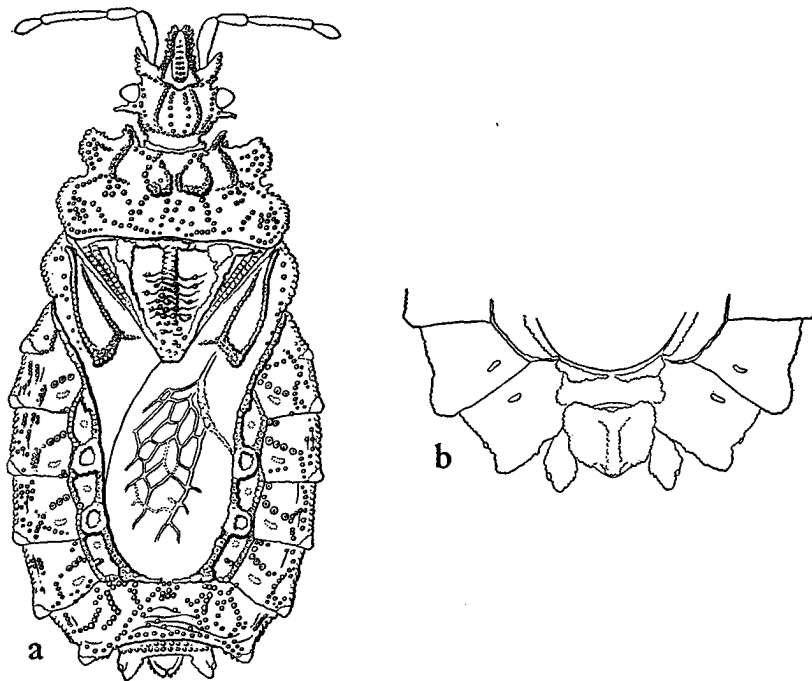


FIGURE 13.—*Mezira marianensis*: a, female; b, terminal abdominal segments (dorsal view) of male (from Usinger, Heteroptera of Guam).

40. *Mezira marianensis* Usinger (fig. 13, a, b).

Mezira marianensis Usinger, 1946, B. P. Bishop Mus., Bull. 189: 34, fig. 3 (Guam).—Esaki and Matsuda, 1951, *Mushi* 22 (13): 79 (Rota, Saipan).

DISTRIBUTION: Mariana Is.

S. MARIANA IS. SAIPAN: One female, Jan. 17, 1945, E. Hagen, one male, three females, Feb. 17 and Aug. 1945, Dybas. GUAM: One male, 2 km. southeast of Asan, Jan.-Apr. 1945, Baker, one male, one female, 1937, Oakley, three males, one female, under dead bark, Sept. 15, 1937, Oakley; two females, Fadang, June 3, 1945, Dybas; two males, Pati Pt., June 4, 1945, Dybas; Pt. Taguan, July 10, 1945, G. Bohart and Gressitt; one female, northern Guam, Apr. 29, 1946, Krauss.