

# INSECTS OF MICRONESIA

## Homoptera: Cicadidae

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Distant (1882) reported a remarkable cicada, *Arcystasia godeffroyi* Distant, from Ponape, and (1892) recorded a cicada from Ruk Island (Truk) as *Melampusalta rosacea* Distant (a New Caledonian species), and later (1905) described a new species from Bonin Islands, *Diceropyga boninensis*. Matsumura (1905) reported a Bonin cicada, *Cosmopsaltria ogasawarensis*, as new, but it was found to be the same as Distant's species (Kato, 1932). Kato (1928) added another species, *Meimuna bonininsulana* Kato, to the fauna of Bonin Islands. No cicadas other than the two mentioned above have been reported from those islands. From Micronesia, Matsumura (1927) described two new cicadas, *Hamza uchiyamae* and *Parasemia uchiyamae*, but the latter was thought identical with Distant's *M. rosacea* for some time. Kato gave notes and illustrations on these known cicadas of Micronesia (Carolines) from 1927 to 1941 but did not add much to the knowledge of that fauna. Esaki reported three times on the Micronesian Cicadidae (1936, 1939 and 1947) based upon material collected mainly by himself, Yasumatsu and Yoshimura and also by inhabitants of the islands. Four new species were described and added to the Micronesian fauna. By the last report, the Micronesian cicadas totalled seven species in five genera, not including those of Bonin Islands. Biological observations on most species were recorded. As the third report was written in Japanese except for the description of new species, some abstracts of biological notes may be cited in the present report.

### ZOOGEOGRAPHY

The cicada fauna of Micronesia is poor and consists only of nine endemic species in six genera, of which one genus is endemic. The pattern of distribu-

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Table 1. Distribution of Micronesian Cicadidae

	MICRONESIAN ISLAND GROUPS								
	Carolines								OTHER LOCALITIES
	Bonin	Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	
Tibicininae									
1. <i>Arcystasia godeffroyi</i>							×		
2. <i>Melampsalta uchiyamae</i>						×	×		
3. <i>M. yasumatsui</i>						×			
4. <i>M. yapensis</i>				×					
Cicadinae									
5. <i>Hamza uchiyamae</i>			×						
6. <i>Meimuna boninensis</i>	×								
7. <i>M. bonininsulana</i>	×								
8. <i>Diceropyga kusaiensis</i>								×	
9. <i>Purana carolettae</i>			×						

tion, however, is interesting and it is worthy to note that cicadas are spread over the Bonin Islands (northernmost part of Micronesia), and Caroline Islands (southwestern part of Micronesia), but not over Mariana Islands, between Bonin and Caroline Islands, and Marshall Islands, eastern part of Micronesia. This suggests a fauna having its source in more western and southern continental islands or continents, and that winds and sea currents are more effective in distributing them. Elements of the Micronesian Cicadidae fauna may be divided into two groups in terms of geographical origin; one group is found in the Carolines and the other in the Bonins. The former group may be subdivided into two from their sources of origin.

Group 1. Elements comprising Cicadidae of Caroline Islands.

Subgroup 1. Australo-Melanesian or Melanesian elements: In this category species of *Melampsalta* Amyot and *Arcystasia* Distant may be included, with all of the four species endemic to the Carolines. Although the genus *Melampsalta* is almost worldwide, it is richest in species in Australia. One of the two species in Truk is related to the Australian *mackinlayi* Distant and, the other to the New Caledonian *rosacea* Distant. As a species of Yap is somewhat different from the two above-mentioned species, it is uncertain whether the Yap species originated from the Australian Region through New Guinea, or the Oriental Region through the Philippines. The genus *Arcystasia* is endemic to Ponape but the resemblance of its genitalic structure to that in Melamp-

saltini may suggest that the genus may have differentiated from an ancestral form of the Melampsaltini or its relatives in the Australian Region.

Subgroup 2. Malayan elements: In this category, respective species of *Hamza* Distant and *Purana* Distant in Palau, and a species of *Diceropyga* Stål in Kusaie, may be included. The genus *Hamza* is restricted in distribution (Buru, Amboina and Palau) and contains only two species. The genus *Purana* is spread over the Oriental and Malayan Regions but the species of Palau is thought to resemble the Malayan *albiguttata* (Walker). Although a route through Philippines to Palau may be also possible, it is not certain. The genus *Diceropyga* is principally distributed over the Malayan and Melanesian Regions (*vide* Distant's Cat. Hom., 1906), but the genus may be presumed heterogeneous and not homogeneous. At the present time, it is preferable to consider the species of Kusaie more directly Melanesian and indirectly Malayan.

Group 2. Elements comprising the Cicadidae fauna of the Bonin Islands: Only one genus and two species are known in the Bonins, and both are endemic. The genus *Meimuna* Distant is obviously of Oriental origin and spreads into the east coast of continental China and Korea as well as into Taiwan, Ryukyus and Japan. The most closely related species is *kuroiwai* Matsumura in Okinawa and not *opalifera* (Walker) in Japan. Therefore, the Cicadidae fauna of the Bonin Islands may be directly supplied from Ryukyus and indirectly from the Oriental Region.

Preliminary study of male genitalia for comparison with Micronesian cicadas:

Sing-Pruthi (1925) showed that the structure of the aedeagus and basal plates differentiates in two directions, and assumed that the type of Tibicininae is more advanced than that of Cicadinae, and that other accompanying structures are demonstrative of lower taxa. The genitalic structure of Cicadidae also exhibits good characters for separating genera and species, as well as higher taxa, as in the other groups of Hemiptera. Results of a study on male genitalic structure of Micronesian, Japanese and some Oriental cicadas<sup>4</sup> indicate the above and, in particular, that the structure of tenth abdominal segment may serve for classifying various ranks of taxa in the Cicadidae.

A supposed generalized structure of tenth abdominal segment of Cicadidae consists of two pairs of downward lateral lobes from the tergite, anteroventral and posteroventral lobes (the former homologous with Myers' copulatory hooks in *Melampsalta*, the latter with Sing-Pruthi's posteroventral lobe).

4. Material Studied: All species in Micronesia, *Leptopsalta*, *Huechys*, *Mogannia* (1 sp.), *Nipponosemia*, *Platypleura* (2 spp.), *Gaeana*, *Graoptsaltria*, *Meimuna*, (2 spp.), *Oncotympana*, *Euterpnosia*, *Terpnosia*, *Tanna* (2 spp.), *Rihana*, *Tibicen* (2 spp.), *Cryptotympana* (2 spp.).

Anteroventral lobes are developed to embrace the middle part of aedeagus by their inner portions, and differentiate in two directions, one towards enlargement and high sclerotization (Mogannini and Tibicininae) and the other towards reduction through subdivision of two portions (Cicadinae, except for Mogannini). The two portions are outer sclerotized lateral processes and inner, basal, weakly sclerotized or membranous folds, the latter meeting along mid-line to form a short canal above and which hold the aedeagus. The outer lateral processes have a tendency towards reduction in size or fusion to base of each side of posteroventral lobe and finally, disappearance. The posteroventral lobes have progressively fused together and sclerotized in most of the Cicadidae, but in the Mogannini they have reduced. The fused lobe remains small in size and not strongly sclerotized in the Tibicininae, but it is enlarged and sclerotized towards the Tibicenini in the Cicadinae, though it retains bilobed nature or shows secondary division in the Dundubini.

Presumed differentiations in the male cicadid genitalia: The aedeagus is not enlarged but differentiated into a theca with a lobed apex and exposed vesica, the latter is sclerotized and cylindrical (Tibicininae), or it is enlarged, but the vesica remained broadly membranous and retracted when not in use (Cicadinae). In another sequence, the anteroventral lobes of tenth abdominal segment are developed to strong hooks but correlatively posteroventral lobes remained small in size (Tibicininae) or reduced (Mogannini), and in another direction, the former lobes divided into lateral processes and inner folds, or reduced to mere membranous folds, which are in advanced groups, attached in front of the posteroventral lobe, this lobe enlarging and hardening form an uncus (Cicadinae excepting Mogannini).

#### Classification of exuviae:

Inadequate knowledge of the structure of cicadid exuviae and nymphs prevent us from achieving adequate classification based upon them. Up to the present, the antennae and anterior femur have been mainly used for description, though other characters, of course, also have not been ignored. The structure of the frontoclypeus, antennae, trace of venation on wing pads, anterior femur, apical spines of hind tibiae and rudiments of genitalia, as well as of chaetotaxy, show good characters for classifying exuviae. Shape of anterior tibia is also useful in separating species. Mud-covered exuviae of *Platypleura* are very distinct and this may be correlated with the chaetotaxy, and the shape of exuviae is also characteristic in this genus or perhaps in the genus group. Comparative observation of the exuviae of Japanese and a few Oriental cicadas<sup>5</sup>, though they are very poor, with those of Micronesian ones, indicates that the exuviae may also, to some extent, be classified as in the

5. Material used: 6 species in 5 genera of Micronesian cicadas, *Leptopsalta*, *Huechys*, *Platypleura*, *Graoptosaltria*, *Meimuna* (2 spp.), *Oncotympana*, *Euterpnosia*, *Terpnosia*, *Tanna*, *Tibicen* (2 spp.), *Cryptotympana*.

adults. A preliminary treatment of the exuviae may be seen in the following key.

KEY TO SUBFAMILIES, TRIBES AND GENERA OF MICRONESIAN  
CICADIDAE (BASED ON ADULTS)

1. Tymbal covers absent; aedeagus small, with theca trilobed and vesica sclerotized and exposed; 10th abdominal segment armed with a pair of strong hooks in front of small posteroventral lobe (Tibicininae).....2  
 Tymbal covers present; aedeagus large, with theca not lobed and vesica extensive, 10th abdominal segment with posteroventral lobe large and stout, forming an uncus (except for Mogannini) (Cicadinae).....3
2. Eyes not projecting beyond the anterior angles of pronotum; bases of veins M and Cu<sub>1</sub> closed but not united to form a common stalk (Parnisini); apical 1/2 of venation reticulate; tegmina as well as wings with a little more than 10 apical cells; opercula large, with their inner margins closed to each other; abdomen more or less inflated, with 1st abdominal tergite in male much longer than the 2nd; aedeagus widened towards apex in lateral view.....**Arcystasia**  
 Eyes scarcely projecting beyond anterior angles of pronotum; bases of M and Cu<sub>1</sub> united to form a common stalk; veins not reticulate; abdomen not inflated (Melampsaltini); Tegmina and wings respectively with 8 and 6 apical cells; opercula small, with their inner margins well separated from each other; aedeagus narrowed towards apex .....**Melampsalta**
3. Lateral margins of pronotum as well as costal margin of tegmina dilated (common to Platypleurini); tymbal covers interiorly incomplete; aedeagus very large; 10th abdominal segment with a pair of lateral processes and a deeply, broadly excavated posteroventral lobe (Hamzini).....**Hamza**  
 Lateral margins of pronotum and costal margin of tegmina not dilated, tymbal cover complete (at least interiorly complete).....4
4. Lateral margins of pronotum distinctly angulate or toothed; opercula usually long and with inner margins closed to each other; 10th abdominal segment with inner folds partially sclerotized and distinct, and with posteroventral lobe (uncus) bilobed (Dundubini) .....5  
 Lateral margins of pronotum not toothed; opercula short; lateral processes of 10th abdominal segment distinct or reduced, and inner folds reduced to membranous; posteroventral lobe well developed, with apex shortly or obscurely bifurcate (Cicadini); head with eyes as wide as base of mesonotum; 3rd and 4th abdominal segments in ♂ with distinct tubercles of same size; aedeagus rather short, with the basal 1/2 thick and straight; lateral processes of 10th abdominal segment absent .....**Purana**
5. Caudal apices of lateral walls of pygophore not produced to dentiform; aedeagus long, tubular and narrowed towards apex; inner folds of 10th abdominal segment not hooked.....**Meimuna**  
 Caudal apices of lateral walls of pygophore produced to dentiform; aedeagus not tubular on apical 1/2 where it possesses sclerotized dilations or processes; inner folds of 10th abdominal segment forming strong hooks posteroventrally...**Diceropyga**

KEY TO SUBFAMILIES TRIBES AND GENERA OF MICRONESIAN  
CICADIDAE (BASED ON EXUVIAE)<sup>†</sup>

1. Hind tibiae provided with three apical spines (Tibicininae); 7th abdominal tergite distinctly longer than preceding or next tergite, with hind margin concavely sinuate in middle; ♂ 10th abdominal segment produced anteroventrally and bifurcate at apex (*Arcystasia* and *Melampsaltini*).....2  
Hind tibiae provided with 4 or 5 apical spines (Cicadinae).....3
2. Fore wing pads with traces of reticulate venation and of a little more than 10 apical cells .....**Arcystasia**  
Fore wing pads with traces of common stalk of veins M and Cu<sub>1</sub> and of 8 apical cells (*Melampsaltini*); hind wing pads with trace of 6 apical cells.....**Melampsalta**
3. Second to 7th abdominal sternites except sides with a transverse row of setigerous tubercles and the 8th with several rows of similar tubercles; intermediate tooth of anterior femora small, not larger than the last tooth of comb and well separated from the latter (common to *Platyleurini*); exuvia rather elongate, a little more than 2 × as long as wide, shining, not thickly covered with mud; abdominal tergites sparsely covered with hairs (*Hamzini*).....**Hamza**  
Second to 7th abdominal sternites furnished with several transverse rows of setae.....4
4. Fourth antennal segment as thick as 5th, antennae almost filiform on from 3rd to apical segment; base of 10th abdominal segment in ♂ bilobed or provided with a pair of tubercles or elevations (*Dundubini*).....5  
Fourth antennal segment thicker than remainder to apex; base of 10th abdominal segment in ♂ not bilobed nor tuberculated on sides (*Cicadini*); antennal segments narrowed towards apical segment; 10th abdominal segment in ♂ with a small median impression near base but not bilobed.....**Purana**
5. Grayish, somewhat brownish and rather opaque; 8th antennal segment a little shorter than the 7th; base of 10th abdominal segment in ♂ bilobed by median sulcus...**Meimuna**  
Head and thorax pale brown and hyaline but abdomen grayish brown and sub-opaque; 8th antennal segment distinctly longer than the 7th; base of 10th abdominal segment in ♂ furnished with a nipple-shaped elevation on each side.....**Diceropyga**

SUBFAMILY TIBICININAE Distant

Tibicininae Distant, 1905, Ann. Mag. Nat. Hist. ser., 7, 15: 304.

TRIBE PARNISINI Distant<sup>6</sup>

Parnisaria Distant, 1905, Ann. Mag. Nat. Hist., Ser., 7, 16: 203. (as division)

Genus **Arcystasia** Distant

*Arcystasia* Distant, 1882, Proc. Zool. Soc. London: 133. (type: *A. godeffroyi* Distant).

This genus is endemic to Ponape. Although *Arcystasia* was placed next to *Acrilla* Stål (= *Thaumastopsaltria* Kirkaldy) when it was established, Distant (1905) placed *Thaumastopsaltria* in the *Chlorocystaria* Distant and *Arcystasia* in the *Parnisaria*; the latter seems heterogenous. Kato (1932) transferred

6. Kato (1956) placed the *Parnisaria* in the *Tibicinini* Distant without detailed explanation.

this genus into the Melampsaltini Distant from the Parnisaria by the resemblance of basal parts of veins M and  $Cu_1$ . But the genus may be separated from the Melampsaltini by the characters seen in the key. *Arcystasia* may be considered to warrant its own tribe, but it is preferable for it to remain in Distant's tribe until more related genera are studied.

**1. *Arcystasia godeffroyi* Distant (figs. 1 and 2)**

*Arcystasia godeffroyi* Distant, 1882, Proc. Zool. Soc. London: 133, tab. 7, fig. 1, 1a, 1b, ♂.—

Esaki, 1947, Mushi 17 (7): 36, tab. 1, fig. 5, ♂. (colored)

*Arcystasia godeffroyi*: Kato, 1933, Three colour ill. ins. Japan 3: tab. 38, fig. 10, ♀ (colored)

Size: Body length ♂, 22.5–26.0 mm., ♀, 21.0–25.0 mm.; tegminal length ♂, 25.0–29.0 mm., ♀, 28.5–34.0 mm.

Color in life: Mesonotum and bases of tymbal covers dark green, this green hue becoming discolored as time passes; mesonotum on anterior margin with a pair of brown median striae, in front of cruciform elevation with a pair of blackish brown spots and exteriorly to the latter with a pair of distinct, blackish brown, longitudinal fasciae which are irregularly interrupted by several narrow lines; most parts of abdominal dorsum dark brown and not reddish

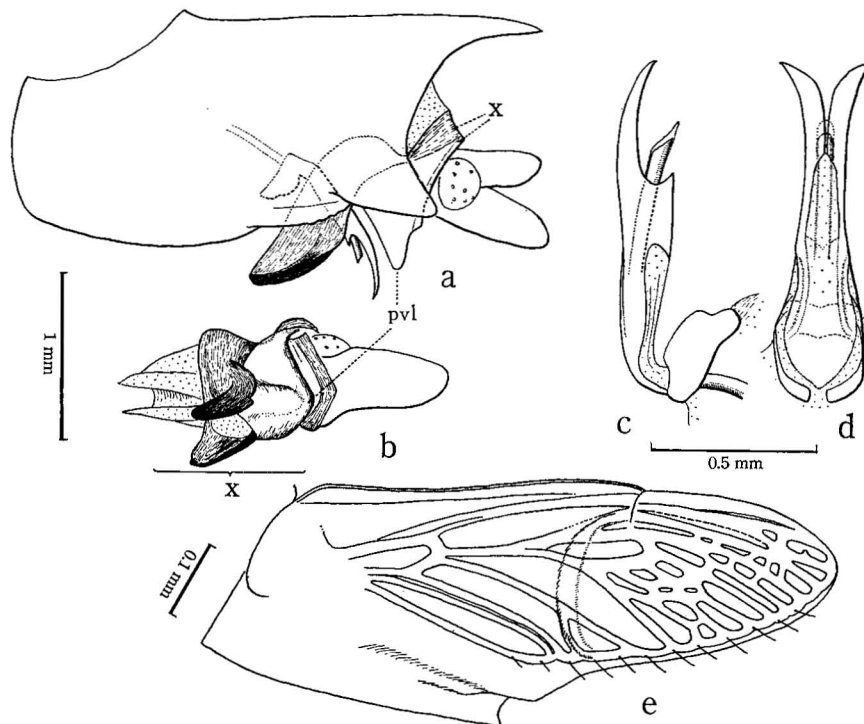


FIGURE 1. *Arcystasia godeffroyi*, ♂: a, genital segments, lateral view; b, 10th and 11th abdominal segments, obliquely ventral view; c, and d, aedeagus, lateral and dorsal views, respectively; e, right fore wing pad of exuviae.  
pvl = posteroventral lobe; X = 10th abdominal segment.

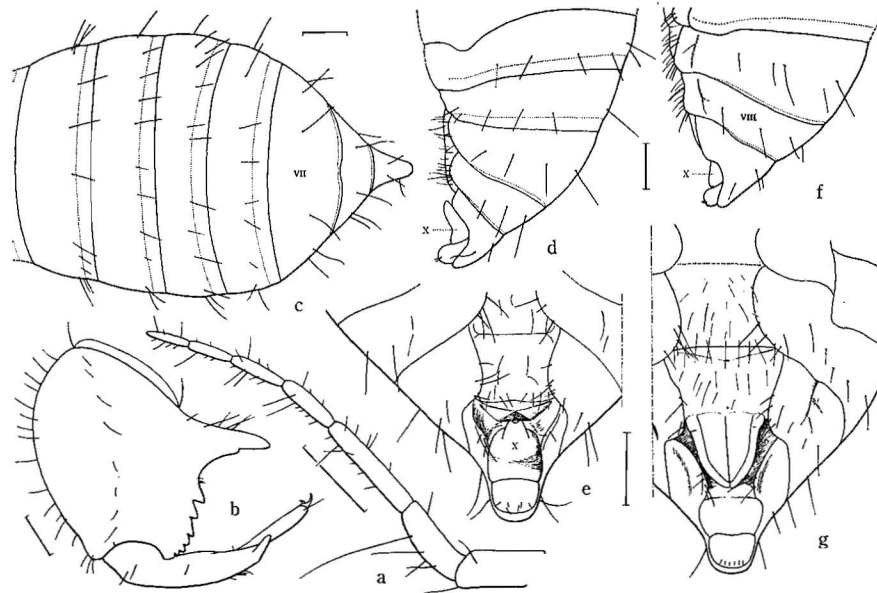


FIGURE 2. *Arcystasia godeffroyi*, ♂ and ♀ exuviae: a, left antenna, ♂; b, left anterior leg, ♂; c, d and e, apical abdominal segments, ♂, dorsal, lateral and ventral view, respectively; f and g, the same, ♀, lateral and ventral views, respectively. Scale: 1.0 mm. VII, VIII and X = 7th, 8th and 10th abdominal segments.

as shown in Kato's color figure (1933). Tegmina hyaline but slightly tinged with brown. (Esaki, 1947)

Male genitalia: Pygophore (fig. 1a) rather broad, with dorsal hind apex acutely produced and with ventrolateral margins not deeply incised near posterior corners where they are moderately produced posteriorly.

Aedeagus (fig. 1a. c & d) small; theca trilobed at apex and widened towards apex in side view, with paired dorsal lobes long, broad and divergent apically, and the unpaired ventral lobe very short; vesica tubular, sclerotized and exposed. Tenth abdominal segment (fig. 1a & b) with a pair of well sclerotized broad hooks which embrace the aedeagus between both the bases and are obtuse at apices, and with a posteroventral lobe which is small, broadly rounded at apex and less highly sclerotized.

Exuviae: ♂ 20 mm., ♀ 21–24 mm. in length. Somewhat shining, pale brown to pale yellowish brown and subhyaline. Rather elongate, about 3 × as long as wide. Frontoclypeus roundly swollen on upper part but straight on lower part in side view, provided with scattered erect setae but many extraordinarily long ones at apex; frontoclypeus about 1.5 × as long as clypeus (2.6: 1.7 in mm.). Antennae (fig. 2a) rather long (ca. 5 mm.), narrowed towards apex, 7-segmented; 2nd segment furnished with a very long seta; 3rd the longest; relative lengths of antennal segments I to VII, 1.00: .95: 1.21: .73: .60: .52: .48 (in mm.). Wing pads with trace of reticulate venation; fore wing pads (fig. 1e) with trace of 11 to 13 or a little more apical cells and furnished with 10 setae along trace of marginal vein. Anterior femora (fig. 2b) very thick, with intermediate tooth a little larger than the last tooth of comb and close to the latter and with posterior tooth thick, obtuse at apex and accompanied by a low subtooth; anterior



tibiae slightly curved, gradually narrowed from middle and with an obtuse apex; hind pairs of tibiae provided with 3 apical spines. Abdominal tergites (fig. 2c, d & f), except for the 9th, respectively furnished with a transverse row of several setae; 7th tergite about  $2 \times$  as long as 8th, with hind margin concavely sinuate in middle, 9th tergite rather short, only little surpassing apex of 11th segment. Abdominal sternites (fig. e & g) provided with scattered erect setae. Male 8th sternite of abdomen with hind margin slightly sinuate; 9th sternite subdivided into short anteromedian area, low triangular anterolateral areas, and low triangular posterior area which is bipartite by median line and elevated in each part; 10th abdominal segment with a broad anteroventral projection which is bifurcate at tip; 11th segment projected postero-ventrally. Female 8th abdominal sternite (fig. 2g) with rudiment of ovipositor about  $1/2$  as long as sternite; 9th sternite only represented by rudiment of ovipositor sheath in ventral view; 10th abdominal segment small, about  $2/3$  as long as wide.

DISTRIBUTION: Caroline Is. (Ponape).

PONAPE: 1 ♀, light trap and 1 ♀ exuvia, alt. 70–80 m., SE Nanponmal, Jan. 7, 1953, Pac. Sci. Bd., Gressitt; 1 ♂, Nanpil, Nett Dist., Feb. 27, 1948, Pac. Sci. Bd., Dybas; 1 ♀, Mt. Nanalaud, alt. ca. 1,000–2,000 ft., Mar. 18, 1948, Pac. Sci. Bd., Dybas, crown of short-stem of *Pandanus*; 4 ♂ and 2 exuviae, Mt. Tamatamansakir, 1,400 ft., Jan.–Sept. 1950, Adams; 2 ♂, 3 ♀, same locality, Jan. 17 & 19, 1953, light trap, Pac. Sci. Bd., Gressitt; 1 ♂, Tolotom, SE Ponape, Jun.–Sept. 1950, Adams; 2 ♂, Ponape, Oct. 2, 1950, Langford.

This cicada occurs abundantly on Ponape I. and sings in chorus for about twenty minutes at dusk. The songs are loud and characteristic, in chorus rather noisy, and audible from afar. This species is found with difficulty in its resting habit, mainly on leaves but rarely on trunks or branches of trees, and therefore it is difficult to catch the cicada in a tall forest that has high crowns. The native name is “tenter” in Ponape Island. (Esaki, 1947)

#### TRIBE MELAMPSALTINI Distant

Melampsaltaria Distant, 1905, Ann. Mag. Nat. Hist. (7) Ser., **16**: 269. (as division)

#### Genus *Melampsalta* Amyot

*Melampsalta* Amyot, 1847, Ann. Soc. Ent. France, Ser. 2, 5: 155. (type: *Cicada musiva* Germar)

#### KEY TO MICRONESIAN SPECIES OF *Melampsalta*

1. Frontoclypeus not longitudinally sulcate; hooks of ♂ 10th abdominal segment not thickened basally.....2
- Frontoclypeus longitudinally sulcate; hooks of ♂ 10th abdominal segment distinctly thickened basally.....**4. yapensis**
2. Body longer than 19 mm., entirely green in color, without markings, often fading to yellowish on abdomen; dorsal apical lobes of theca long and divergent; hooks of ♂ 10th abdominal segment broad at base.....**2. uchiyamae**
- Body shorter than 19 mm., grayish green with dark brown markings and brownish

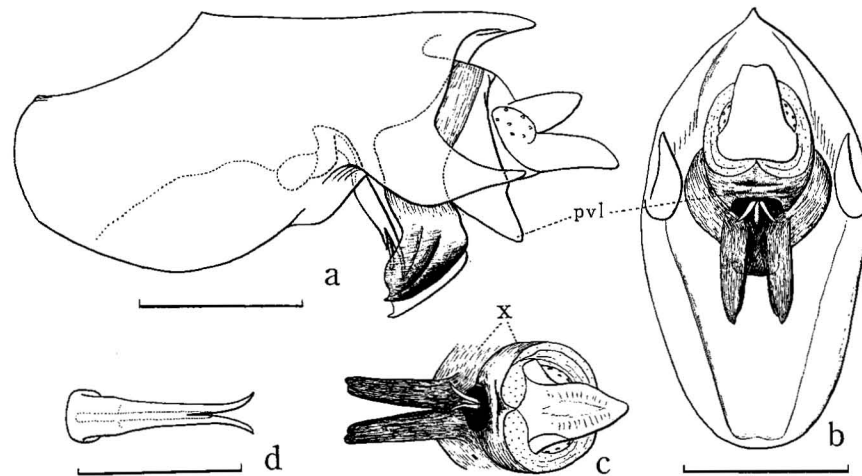


FIGURE 3. *Melampsalta uchiyamae*, ♂: a, genital segments, lateral view; b, the same, caudal, slightly ventral, view; c, the same, dried specimen, somewhat more magnified than others; d, aedeagus, dorsal view. Scale: 1.0 mm. Abbreviations as in the preceding explanations.

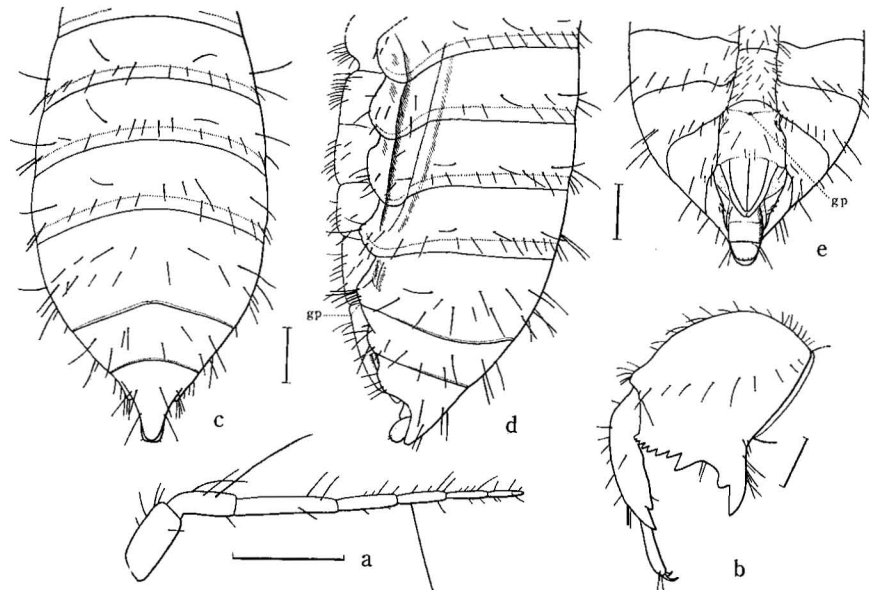


FIGURE 4. *Melampsalta uchiyamae*, ♀ exuviae: a, left antenna; b, left anterior leg; c, d and e, abdomen, excepting basal segments, dorsal, lateral and ventral views, respectively. Scale: 1.0 mm. gp = genital opening.

on abdomen, green area fading to brownish in dried specimens; dorsal apical lobes of theca short and subparallel; hooks of ♂ 10th abdominal segment narrow at base...

.....3. yasumatsui

## 2. *Melampsalta uchiyamae* (Matsumura) (figs. 3 and 4)

*Parasemia uchiyamae* Matsumura, 1927, *Insecta Matsumurana* 2: 56, tab. 2, fig. 13.

*Melampsalta rosacea*: Kato, 1933, Three colour ill. ins. Japan 3: tab. 38, fig. 4, ♂ (colored).

*Melampsalta uchiyamae*: Esaki, 1947, *Mushi* 17 (7): 31, tab. 1, fig. 6, ♂ (colored).

Size: Body length ♂, 19.0–23.5 mm., ♀, 23.0–29.0 mm.; tegminal length ♂, 23.0–28.0 mm., ♀, 29.5–32.0 mm.

Color: In life uniformly bright green, without markings, but in dry specimens fading to yellowish, in particular, often to dirty yellow on abdomen. (Esaki, 1947) One of the 2 specimens from Ponape appearing in general coloration, similar to *M. yapensis* but cruciform elevation greenish and apex of head and some veins of tegmina having trace of green; several blackish, small, irregular spots on pro- and mesonota, and broad blackish brown median fascia on 1st abdominal tergite unusual. Another specimen from Ponape normal in color.

Male genitalia: Pygophore (fig. 3a & b) oval, widest behind middle, with dorsal hind apex pointed; ventrolateral margins deeply incised near posterior corners where they are distinctly and acutely produced posteriorly. Aedeagus (fig. 3a & d) small, narrowed towards apex; theca trilobed, with dorsal pair long, narrow and divergent apically and ventral one short; vesica tubular, sclerotized and exposed. Tenth abdominal segment (fig. 3a–c) with a pair of well sclerotized broad hooks which are acutely pointed at apex and slightly divergent at rest, and with a small, somewhat membranous posteroventral lobe.

Exuviae (♀): Length 17.5 mm., a little shining, pale yellowish brown and subhyaline. Somewhat elongate, about 3 × as long as wide. Frontoclypeus roundly swollen on upper part, straight on lower part in side view, furnished with several long setae on upper surface, much longer setae at apex and shorter, slenderer ones elsewhere; frontoclypeus nearly 2 × as long as clypeus (2.3: 1.25 in mm.). Antennae (fig. 4a) moderately long (ca. 4 mm.) and 7-segmented; the 1st segment distinctly thick but from 2nd to apical segment the thickness gradually diminished; 2nd and 5th segments each provided with an extraordinarily long seta, the 3rd much longer than any other segment; relative lengths of antennal segments from I to VII, .72: .65: .93: .57: .43: .39: .34 (in mm.). Wing pads with trace of venation indicating that of adult; fore wing pads furnished with 15 setae along trace of marginal vein. Anterior femora (fig. 4b) very thick, with intermediate tooth distinctly larger than last tooth of comb and close to latter and with posterior tooth nearly straight, angulated at apex and possessing distinct subtooth; anterior tibiae nearly straight except basal portion, with inner margin sinuate and with subapical tooth; hind tibiae provided with 3 apical spines. Abdominal tergites (fig. 4c & d) excepting the 9th furnished with 2 transverse rows of setae; 7th tergite about 1.5 × as long as 8th, with hind margin concavely sinuate in middle; 9th tergite ending in round apex and reaching tip of 11th abdominal segment. Abdominal sternites provided with scattered erect setae. Eighth sternite (fig. 4e) large, with rudiment of ovipositor which is a little shorter than 1/2 length of sternite; 10th abdominal segment about as long as wide and very little elevated; 11th abdominal segment short in ventral view and somewhat produced postero-ventrally.

DISTRIBUTION: Caroline Is. (Truk and Ponape).

TRUK: MOEN I.: 10 ♂ and 1 ♀ exuvia, Civ. Ad. Area, Feb. 12–Apr. 27, 1949, Potts, one of the ♂, Mar. 7, at light and the exuvia, Mar. 3, ex green ginger; 1 ♂, S. Valley, Mt. Tonaachau, Apr. 24, 1949, Potts. DUBLON I.:

5 ♂, Dec 21 & 22, 1935 and Jan. 1936, Z. Ono. 2 Tol.: ♂. Netutu, Apr. 9, 1949, Potts. TRUK Is.: 3 ♂, Dec. 20 & 22, 1935, Ono.

PONAPE (new record): 2 ♂, Oct. 2, 1950, D. B. Langford.

Those islands where this cicada was collected are Natsujima (=Toloas), Harujima, Akijima, Suiyoto, Mokuyoto, and Kinyoto. It is possible that this species occurs in all the forested islands of Truk where trees are growing. (Esaki, 1947) It is interesting that two male specimens were newly taken from Ponape, about 700 kilometers from Truk.

This cicada is abundant on palm and other forests and commences to sing in low, brief, characteristic tone and in chorus which begins precisely and continues for 20 to 30 minutes from sunset. Curiously, during its singing period, hand-clapping attracts the cicada to man, and therefore one can easily catch 30 insects within thirty minutes. Only males are caught by this method, and females do not show any response, and rarely come to light. Other than singing time no male is attracted by hand clapping, with one exceptional observation (midnight of Aug. 1, 1939, on Toloas) where hand clapping led the cicadas to sing here and there but did not attract them. The native name in Truk is "morokot" or "soremei," and for its nymph "nisson" (according to K. Yasumatsu). The cicada has long been known by the natives to be attracted by hand clapping, and their children amused themselves by employing the method to catch the cicadas. (Esaki, 1947)

### 3. *Melampsalta yasumatsui* Esaki (fig. 5)

*Melampsalta yasumatsui* Esaki, 1947, Mushi **17** (7): 35, 1 textfig.

Size: Body length ♂, 11.5–19 mm., ♀, 15.5–15.7 mm.; tegminal length ♂, 15.5–25.0 mm., ♀, 20.6–21.0 mm.

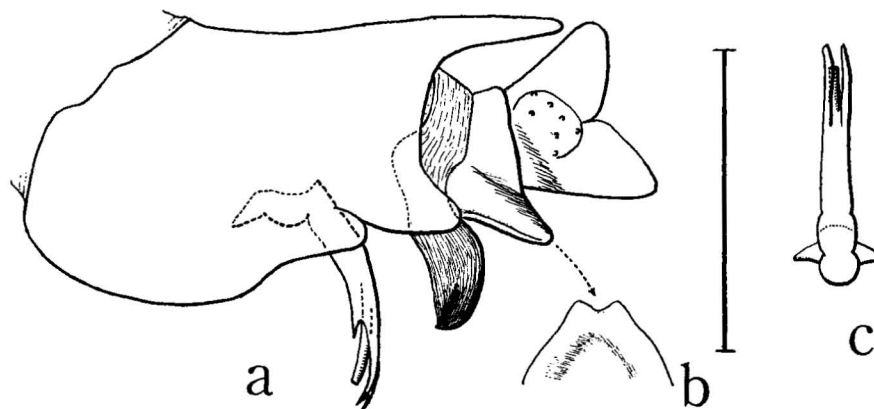


FIGURE 5. *Melampsalta yasumatsui*, ♂: a, genital segments, lateral view; b, apex of postero-ventral lobe; c, aedeagus, dorsal view. Scale: 1.0 mm.

Male genitalia: Pygophore (fig. 5a) rather short, with dorsal hind margin well produced to form angulate apex and posterolateral processes obtuse at apices. Aedeagus (fig. 5a & c) similar to that of the preceding species but theca shorter, and its dorsal pair of lobes originated separately and nearly parallel to each other. Tenth abdominal segment (fig. 5a) with a pair of rather slender hooks, which are slightly narrowed basally, and with a small, obscurely bilobed posteroventral lobe (fig. 5b).

DISTRIBUTION: Caroline Is. (Truk).

TRUK: MOEN I.: 1 ♂, 1 ♀, Civ. Ad. Area, Mar. 15 & Apr. 27, 1949, Potts; 1 ♂, 5 ♀, Mt. Teroken, Dec. 28, 1952, light trap, alt. 80 m., Gressitt; 1 ♀, Dec. 1952, Beardsley, at light, M-4818. Tol I.: 1 ♂, Dec. 30, 1952, light trap, alt. 200 m., Gressitt; 1 ♂, 1 ♀, Mt. Unibot, Jan. 3, 1953, light trap, alt. 200 m. and 390 m., J. L. Gressitt.

#### 4. *Melampsalta yapensis* Esaki (figs. 6 and 7)

*Melampsalta yapensis* Esaki, 1947, Mushi **17** (7): 35, tab. 1, fig. 4, ♂. (colored)

Size: Body length ♂, 19.5–21.0 mm., ♀, 20.7 mm.; tegminal length ♂, 26.0–28.0 mm., ♀, 28.3 mm.

Male genitalia: Pygophore (fig. 6a & b) similar to that of preceding species. Aedeagus (fig. 6a & c) like that of *M. uchiyamae* but less narrowed towards apex and with paired dorsal lobes of theca slightly shorter. Tenth abdominal segment (fig. 6a & b) with a pair of stout hooks which are thick basally, thin on apical 1/2 and close to each other at rest, and with a small, apically rounded posteroventral lobe.

Exuviae (♀): Head lost, length presumably a little more than 20 mm. Brownish, slightly shining and subopaque. Fore wing pads similar to that of *M. uchiyamae* but with 17 marks of setal punctures along trace of marginal vein. Anterior femora (fig. 7a & b) very thick, with intermediate tooth a little larger than last tooth of comb and with very stout posterior tooth which is blunt at apex and possesses a low obscure subtooth; anterior tibiae curved in claw, with an obscure subapical tooth; intermediate tibiae with 4 apical spines and posterior tibiae with 3 apical spines and 1 vestigial. First to 6th abdominal tergites (fig. 7c & d) furnished with

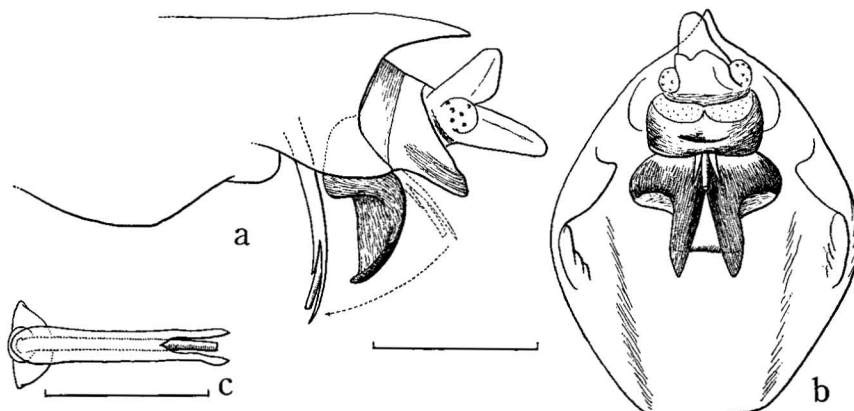


FIGURE 6. *Melampsalta yapensis*, ♂: a, genital segments, base of pygophore omitted, lateral view; b, the same, caudal, slightly ventral, view; c, aedeagus, dorsal view. Scale: 1.0 mm.

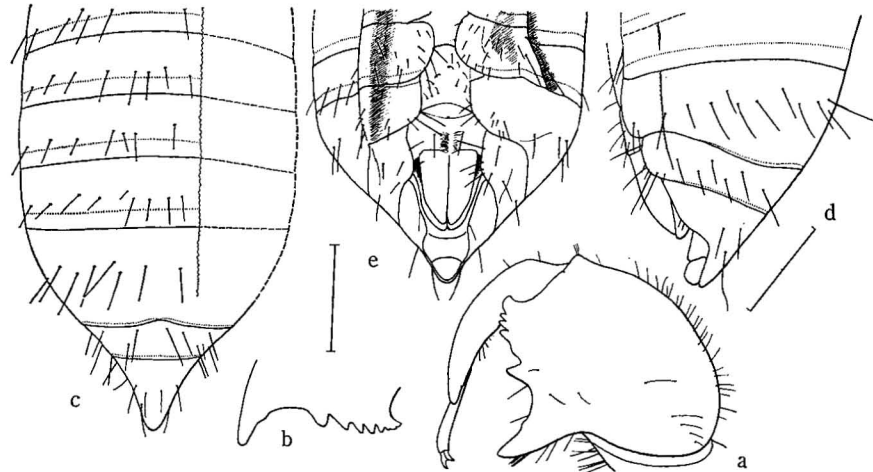


FIGURE 7. *Melampsalta yapensis*, ♀ exuviae: a, left anterior leg; b, femoral teeth of right anterior leg; c, d and e, apical abdominal segments, dorsal, lateral and ventral views, respectively. Scale: 2.0 mm.

a transverse row of setae, 7th and 8th tergites with 2 transverse rows of setae; median length of 7th tergite  $2 \times$  that of the 8th and with the hind margin concave in middle; 9th tergite rather long, reaching to tip of 11th abdominal segment. Female 8th abdominal sternite (fig. 7e) large, with rudiment of ovipositor that is relatively long and broad, and longer than  $1/2$  length of 8th sternite; 10th abdominal segment broad but not highly elevated; 11th abdominal segment small.

**DISTRIBUTION:** Caroline Is. (Yap).

**YAP:** YAP I.: 4 ♂, Hill behind Yaptown, 50 m., Nov. 29, 1952, Pac. Sci. Bd., Gressitt, 3 in light trap; 1 ♂, Mt. Matade, 95 m., Yap, Dec. 1, 1952, light trap, Gressitt; 1 ♀ exuvia, head lost and a part of thorax split off, Mt. Gillifits, 150 m., Nov. 29, 1952, Pac. Sci. Bd., Gressitt; 1 ♂, Colonia, Jul.–Aug. 1950, Goss; 1 ♀, Keng, Jul.–Aug. 1950, Goss; 2 ♂, Jul.–Aug. 1950, Goss; 1 ♀, Oct. 1952, Krauss. **E. RUMUNG I.:** 1 ♀, Jul.–Aug. 1950, Goss.

It is difficult to collect this cicada in Yap not only because of its much lower density than *M. uchiyamae* of Truk but also because it lives in tree tops. (Esaki, 1947)

#### SUBFAMILY CICADINAE Kato

Cicadinae Kato, 1932, Monograph of Cicadidae: 142. (Cicadinae Kato = Tibiceninae Van Duzee, 1916 (=Platypleurinae Handlirsch, 1925) + Cicadinae Van Duzee, 1915)

#### TRIBE HAMZINI Distant

Hamzaria Distant, 1905, Ann. Mag. Nat. Hist. Ser. 7, 15: 382. (as division)

Distant erected the *Hamzaria* for the genus *Hamza* mainly because of the widely exposed male tymbal. Later Kato (1932) transferred this genus to the Platypleurini because of the resemblance of body shape, especially the dilated sides of the pronotum. The genitalic structure of *Hamza*, however, does not show immediate relationship to that of *Platypleura*, and suggests that the former belongs to another group. The tymbal covers of *Hamza* are small but distinct from those of the Platypleurini and the deep sulcus which borders the tymbal covers from the abdominal tergite. Characters of the exuviae may also separate this genus from the Platypleurini (see the key of exuviae). The Hamzini may be a more primitive group.

#### Genus *Hamza* Distant

*Hamza* Distant, 1904, Trans. Ent. Soc. London: 674. (type: *Platypleura bouruensis* Distant).

#### 5. *Hamza uchiyamae* Matsumura (figs. 8 and 9)

*Hamza uchiyamae* Matsumura, 1927, Insecta Matsumurana 2: 47, tab. 2, fig. 3, ♂.—Esaki, 1947, Mushi 17 (7): 29, tab. 1, fig. 1, ♂. (colored)

*Hamza bouruensis* var. *uchiyamae*: Kato, 1933, Three colour ill. ins. Japan 3: tab. 36, fig. 3, ♂. (colored)

Size: Body length ♂, 17.5–22.0 mm., ♀, 20.5–22.0 mm.; tegminal length ♂, 22.7–28.0

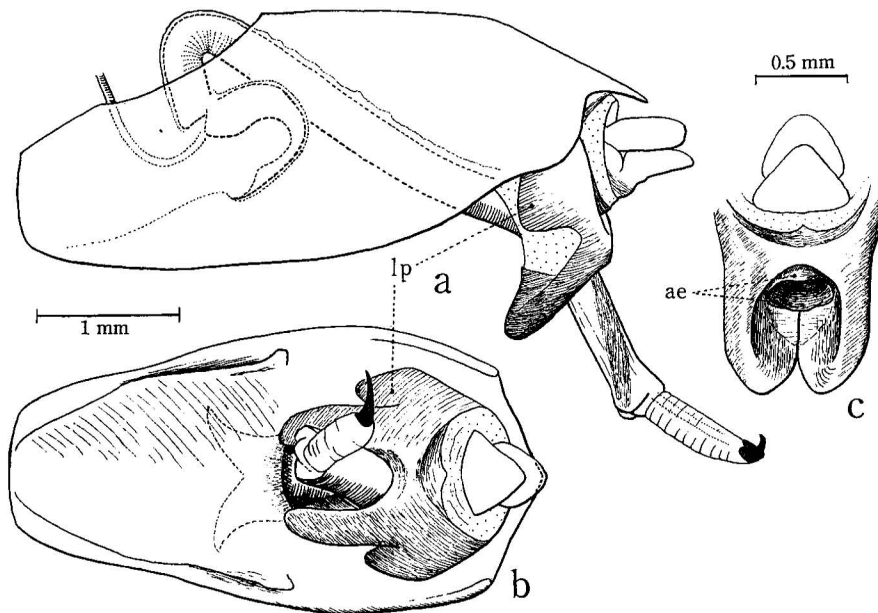


FIGURE 8. *Hamza uchiyamae*, ♂: a and b, genital segments, lateral and ventral views, respectively; c, 10th abdominal segment, dried specimen, posteroventral view. ae = tip of aedeagus; lp = lateral processes.

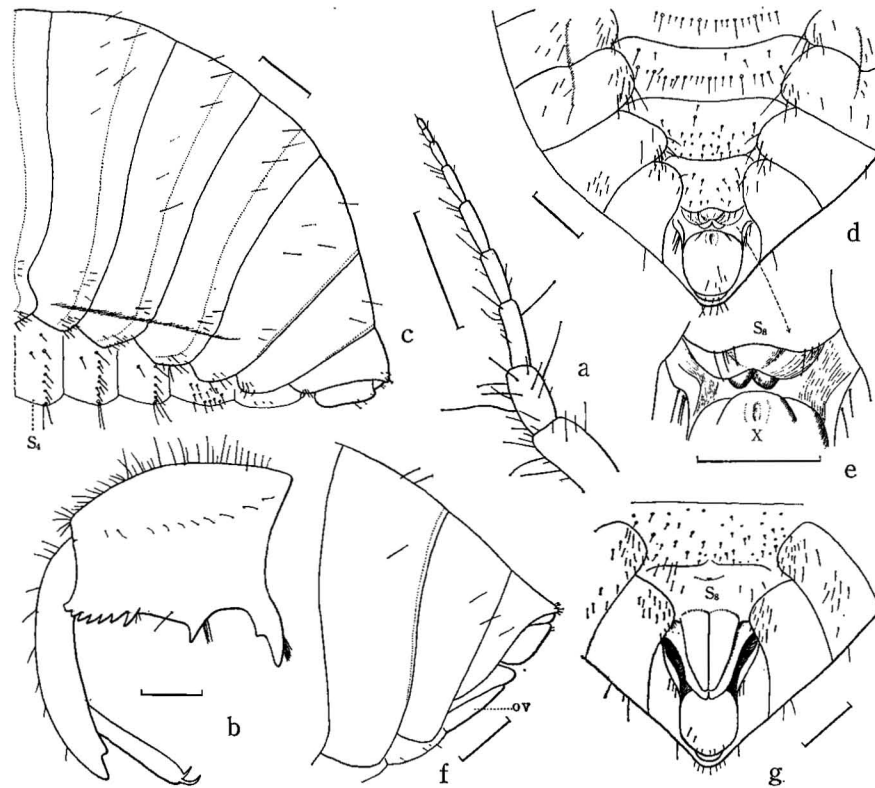


FIGURE 9. *Hamza uchiyamae*, ♂ and ♀ exuviae: a, left antenna, ♂; b, left anterior leg, ♂; c and d, apical abdominal segments, lateral and ventral views, respectively; e, 9th abdominal sternite and base of 10th abdominal segment, ♂, ventral view; f and g, apical abdominal segments, ♀, lateral and ventral views, respectively. Scale: 1.0 mm. ov = rudiment of ovipositor;  $S_4$  and  $S_8$  = 4th and 8th abdominal sternites.

mm., ♀, 28.5–30.0 mm.

Color: Dorsal surface and tegmina grayish green; in particular, depth of dark brown markings variable from deep to light and size and depth of orange yellow markings on wings also, in some degree, changeable. Female easily distinguishable from ♂ by the paler coloration. (Esaki, 1947)

Male genitalia: Pygophore (fig. 8a & b), in ventral view, gradually widened towards behind middle, and with posterior margin broadly triangularly produced and ventrolateral margins not incised. Aedeagus (fig. 8a & b) very long and thick, strongly curved near base, with extensive vesica which has an apical sclerotized hook. Tenth abdominal segment (fig. 8a–c) with a distinct ventrolateral process on each side and with a short but broad postero-ventral lobe which is deeply and widely excavated.

Exuviae: Length 17–18 mm. (♂) and 20.5 mm. (♀), and about 2 × as long as wide. A little shiny, pale brown, opaque and more or less covered with mud but not thickly. Frontoclypeus roundly swollen, in side view, covered with a pair of tufts of very long erect setae at apex; clypeus about 2/3 as long as frontoclypeus. Antennae (fig. 9a) short and 9-segmented; 2 basal



segments much thickened and the following ones distinctly narrowed; relative lengths of antennal segments, .73: .58: .55: .45: .40: .35: .20: .12: .12. Fore wing pads covered with long setae along trace of veins and exposed part of hind wing pads also with long setae. Anterior femora (fig. 9b) rather thin, with intermediate tooth small and just at midway between the last tooth of comb and posterior tooth, the latter short, about 1/2 of femoral width; anterior tibiae with a distinct but obtuse subapical tooth; intermediate tibiae armed with 4 apical spines and posterior tibiae with 4 or 5 normal spines and 1 or 2 vestigial ones. Abdominal segments (fig. 9c & f) longest on the 7th; 2nd to 7th tergites furnished with 2 transverse rows of setae but rows obscure; abdominal sternites (fig. 9d & g) from 2nd to 6th, except sides, provided with a transverse row of setigerous tubercles; the 7th with a few rows of similar tubercles. Male 9th abdominal sternite (fig. 9d & e) subdivided into 3 parts, anteromedian and anterolateral areas, and posterior paired elevations (Lew's bow-shaped, median, posterior area, 1960); 10th abdominal segment somewhat semiglobular, with a basal round elevation which is shallowly, longitudinally impressed; 11th abdominal segment very small.

Female 8th sternite (fig. 9g) large, with rudiment of distinct ovipositor; 9th sternite represented by rudiment of ovipositor sheath in ventral view; 10th sternite simple, and a little narrower and less elevated than in ♂.

DISTRIBUTION: Caroline Is. (Palau).

PALAU: KAYANGEL: 7 ♂, and 4 ♀, Ngajangel, Dec. 15, 1952, light trap, Gressitt. BABELTHUAP: 4 ♂, 2 ♀, Ulimang, Dec. 11, 13 & 24, 1947, 2 ♂, Dec. 14 & 15, 1947, at light, Dybas; 1 ♂, Idep Uliman, Aug. 17, 1949, Kondo; 5 ♂, Ngiwal, Aug. 15 & Sept. 26, 1951, Gressitt; 1 ♀, Ngiwal, alt. 1 m., Dec. 16, 1952, light trap, Gressitt; 1 ♂, 1 ♀, Ngatpang, alt. 65 m., Dec. 6, 1952, light trap, Pac. Sci. Bd., Gressitt; 1 ♂, Dec. 22, 1947, Dybas. KOROR I.: 1 ♀, Ngarmid, Aug. 23–27, 1949, Mead; 1 ♀, SW Koror, alt. 25 m., Dec. 4, 1952, light trap, Gressitt; 2 ♂, Nov. 19, 1947 & Jan. 15, 1948, Dybas; 2 ♂, 2 ♀, Apr.–May, 1949, Langford, M 4419; 1 ♂, Nov. 1951, Gressitt. URUKTHAPEL: 1 ♂, Garamejo, Aug. 27, 1949, Mead; 2 ♂, 1 ♀, Aug. 12, 1949, Kondo. PELELIU: 1 ♂, E. coast, Feb. 8, 1 ♂, west coast, Feb. 2, 1948, Dybas; 1 ♀, near X-roads, 1 ♂, Apr. 23, 1936, Ono; 1 ♂, clubhouse, Apr. 24, 1936, Kondo; 1 ♂, Jul. 31, at light, Lot 2348, 1 ♂, Aug. 12, 1945, Dybas; 1 ♂, Aug. 12, 1945, at light, Hagen; 1 ♀, 1936, 1 ♂, no data, Ono. ANGAUR I.: 1 ♀, Apr. 16, 1936, Kondo. ALCOLON: 1 ♂, May 1, 1936, Ono. No island name: 2 ♂ and 1 ♀, Apr. 9, 1936, Ono; 1 ♂, Apr. 24, 1936, Otomo.

This cicada seems to be common in all of the Palau Islands and seems to occur all year round according to observations by Esaki and the inhabitants on the islands. This insect is named as "Cherelang" in Palau Islands. (Esaki, 1947)

#### TRIBE DUNDUBINI Distant

Dundubinaria Distant, 1905, Ann. Mag. Nat. Hist., Ser. 7, 15: 58. (as division)

Genus *Meimuna* Distant

*Meimuna* Distant, 1905, Ann. Mag. Nat. Hist. Ser. 7, 15: 67. (type: *Dundubia tripurasura* Distant).

KEY TO MICRONESIAN SPECIES OF *Meimuna*

1. Abdomen black, with hind margins of 2nd to 6th tergites and lateral markings on 3rd to 5th tergites yellowish; opercula long, with outer margins broadly concave at basal 1/2, inner margins arched and with apex rounded.....**6. boninensis**  
Abdomen dark brownish, obscurely brownish along hind margin of each segment; opercula scarcely concave near base of outer margins, with inner margins divergent posteriorly and very slightly, concavely sinuate near apex where it is subacutely pointed (from literature).....**7. bonininsulana**

**6. *Meimuna boninensis*** (Distant) (figs. 10 and 16)

*Diceropyga boninensis* Distant, 1905, Ann. Mag. Nat. Hist., Ser. 7, 15: 67; 1906, Syn. Cat. Hom. 1, Cicadidae: 64.—Matsumura, 1917, Trans. Sapporo Nat. Hist. Soc. 6 (3): 198.—Kato, 1925, Trans. Nat. Hist. Soc. Formosa 15: 22.—Esaki, 1930, Bull. Biogeogr. Soc. Japan 2: 214.

*Cosmopsaltria ogasawarenis* Matsumura, 1905, Trans. Sapporo Nat. Hist. Soc. 1: 29, tab. 1, fig. 1. (syn. by Kato, 1932)

*Meimuna ogasawarenis* Matsumura, 1917, Trans. Sapporo Nat. Hist. Soc. 6 (3): 199.—Kato, 1925, Trans. Nat. Hist. Soc. Formosa 15: 23.—Esaki, 1930, Bull. Biogeogr. Soc. Japan 2: 214.

*Meimuna boninensis*: Kato, 1932, Monogr. Cicadidae: 352, tab. 20, fig. 4, ♂; tab. 31, fig. L, ♂; 1933, Three colour ill. ins. Japan 3: tab. 17, fig. 1, ♂; 1938, Konchukai (Ent.

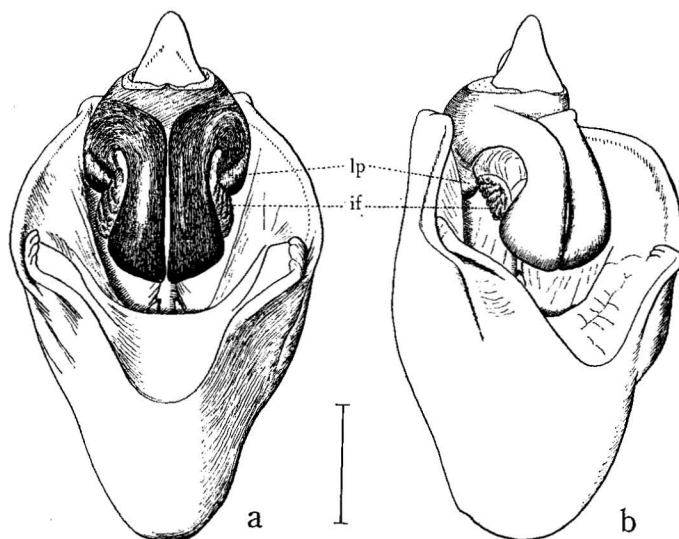


FIGURE 10. *Meimuna boninensis*, ♂: a and b, genital segments, ventral and ventrolateral views, respectively.

if = inner folds; lp = lateral processes, seen as low tubercles.

World) **6** (50): 311; 1956, Biol. Cicadas: 95.

Size: Body length ♂, 33.5 mm., ♀, 30.0 mm.; tegminal length ♂, 39.5 mm., ♀, 38.5 mm.

Color: Head and thorax black, with brownish yellow markings similar to those in other species of the genus. Abdomen black, with tymbal covers greenish yellow and hind margin of each segment narrowly brownish yellow; 3rd to 5th segments each with a brownish triangular spot in middle of hind margin and a brownish yellow rather oval marking on each side.

Male genitalia: Pygophore (fig. 10a & b) distinctly widened towards behind middle and with ventrolateral margins not incised; dorsal subapical area membranous and with a flat tail-like projection (corresponding to median dorsal spine) near center. Aedeagus<sup>7</sup> not seen. Tenth abdominal segment with a robust, longitudinally split posteroventral lobe and visible lateral lobes. Each anteroventral lobe differentiated into inner somewhat sclerotized fold and outer sclerotized, low tubercle, the latter contiguous to anterolateral base of the posteroventral lobe. Posteroventral lobe very large, a little narrowed in middle, rounded apically and deeply split along median line.

DISTRIBUTION: Bonin Is.

Bonin Is.: CHICHIJIMA: 1 ♂, Mt. Yoake—Mt. Chuo, Aug. 17, 1972, Setoya; 1 ♀, the same locality, Aug. 21, 1972, M. Iga. (These specimens were added to our collection through Dr. T. Shirôzu).

#### 7. *Meimuna bonininsulana* Kato

*Meimuna bonin-insulana* Kato, 1928, Trans. Nat. Hist. Soc. Formosa **18**: 30, tab. 1, figs.

1, 1a; 1932, Monogr. Cicadidae: 349, tab. 20, fig. 12, ♂; tab. 31, fig. D, ♂; 1933,

Three colour ill. ins. Japan **3**: tab. 14, fig. 1, ♂. (colored); 1938, Konchukai (Ent.

World) **6** (50): 311; 1956, Biol. Cicadas: 95.

DISTRIBUTION: Bonin Is. No specimens available.

### Genus *Diceropyga* Stål

*Diceropyga* Stål, 1870, Öfv. Vet.-Ak. Förh.: 708. (as subgenus of *Cosmopsaltria* Stål) (type:

*Tettigonia obtecta* Fabricius).

As the ♂ genitalia of *D. obtecta* (figured by Sing-Pruthi, 1925) is not the same as that of Micronesian *Diceropyga*, a revisional work based on male genitalia will be needed.

#### 8. *Diceropyga kusaiensis* (Esaki) (figs. 11, 12 and 13)

*Khimbya kusaiensis* Esaki, 1939, Tenthredo **2**: 231, tab. 4.

*Diceropyga kusaiensis*: Esaki, 1947, Mushi **17** (7): 31, tab. 1, fig. 3, ♂. (colored)

Size: Body length ♂, 20.0–23.0 mm.; tegminal length ♂, 28.0–33.0 mm.

Male genitalia: Pygophore (fig. 12a) strongly widened towards behind middle, with dorsal apical area broadly membranous and triangularly produced in middle and with ventrolateral margins not incised. Aedeagus (fig. 12a & d) long, well sclerotized, curved near base and middle, and with a pair of triangular dilations near apex and a small, narrow, curved subapical lobe on the right side. Tenth abdominal segment (fig. 12a–c) broadly membranous. Each anteroventral lobe weakly sclerotized and obscurely differentiated into outer, low elevation and inner fold, the latter highly sclerotized on apical part and forms an apical hook. Posteroventral lobe large, not strongly sclerotized, narrowed apically and with a tubercular

7. Aedeagus of *M. opaliera* long and slender, strongly curved near base and gradually narrowed towards apex.

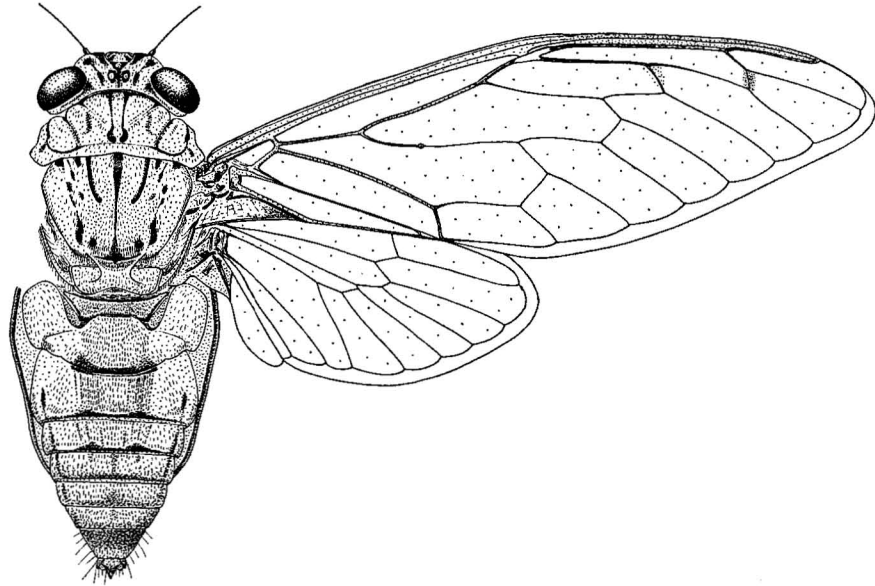


FIGURE 11. *Diceropyga kusaiensis*, ♂. (Dr. Y. Hirashima del.)

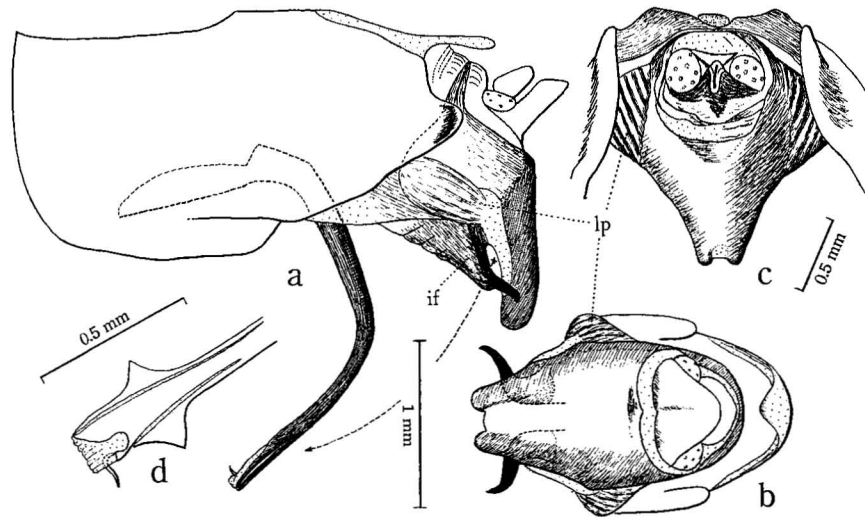


FIGURE 12. *Diceropyga kusaiensis*, ♂: a and b, genital segments, lateral and caudal views, respectively; c, the same with the latter, dried specimen; d, apex of aedeagus. Abbreviations as in fig. 10.

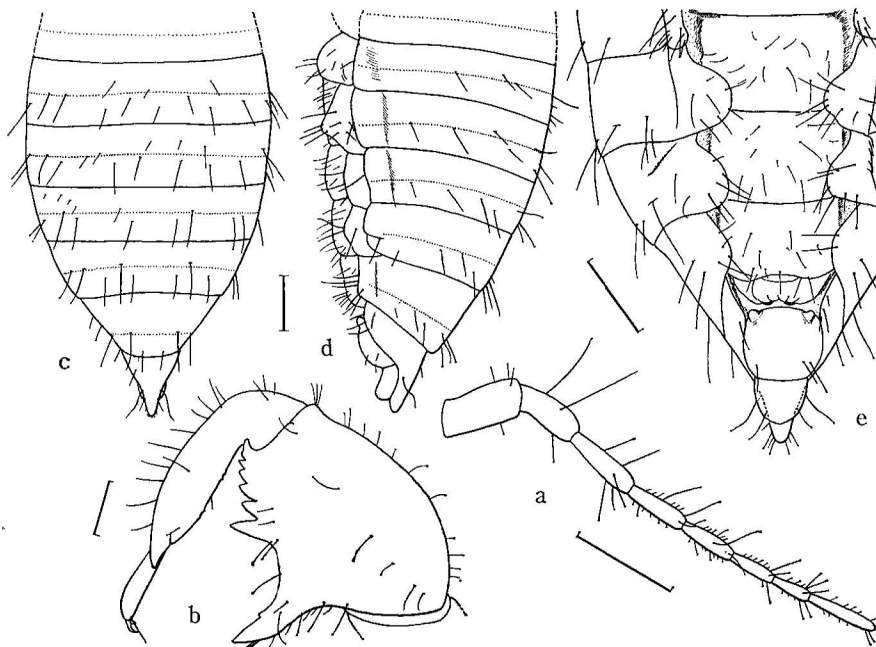


FIGURE 13. *Diceropyga kusaiensis*, ♂ exuvia: a, left antenna; b, left anterior leg; c, d and e, abdominal segments excepting basal ones, dorsal, lateral and ventral views, respectively. Scale: 1.0 mm.

projection on each side of the tip.

Exuviae (♂): Length 20 mm., somewhat elongate, about 2.5 × as long as wide. Slightly shining, pale brown and subopaque. Frontoclypeus roundly swollen in side view, provided with distinct erect setae as well as on clypeus, the setae on apical portion of frontoclypeus distinctly long; frontoclypeus 2 × as long as clypeus (2.8: 1.4 in mm.). Antennae (fig. 13a) moderately long (ca. 4.5 mm), rather narrow, and 8 segmented; 2nd segment provided with 3 long setae; 6 apical segments subequal in thickness, 8th segment much longer than the preceding; relative lengths of antennal segments, .80: .70: .70: .58: .50: .50: .40: .70. Wing pads without setae. Anterior femora (fig. 13b) thick, with the intermediate tooth distinctly larger than the last tooth of comb and closed to the latter, and with posterior tooth nearly straight and possessing a small subtooth; anterior tibiae almost straight with very slightly curved, claw-like apex; intermediate tibiae armed with 3 apical spines and posterior tibiae with 4 apical spines. Abdominal tergites (fig. 13c & d) provided with rather many setae; 7th tergite shorter than following; 9th tergite long and narrowed posteriorly, surpassing 11th abdominal segment, and with apex not curved upward. Abdominal sternites (fig. 13e) furnished with scattered erect setae.

Male 8th sternite (fig. 13e) with hind margin bisinuate; 9th sternite subdivided into 3 parts, short, obscurely bordered anteromedian area, large, swollen intermediate area and paired elevations closed behind preceding area; 10th abdominal segment somewhat rounded quadrate, with a nipple-shaped projection at each side of anteroventral portion; 11th abdominal segment slightly shorter than wide.

DISTRIBUTION: Caroline Is. (Kusaie).

KUSAIE: 2 ♂, Mt. Matante, 580 m., Mar. 4, 1953, light trap, Clarke; 2 ♂, 1 ♂ exuvia, Hill 1010, 300 m., Apr. 13, 1953, J. F. G. Clarke; 2 ♂, Hill 541, 165 m., Mar. 19 & 27, 1953, light trap, Clarke; 1 ♂, Malem R., 90 m., Mar. 17, 1953, Clarke; one ♂, Wakap, 490 m., Apr. 27, 1953, Clarke; 2 ♂, Tafunsak, 1 m., Mar. 10, 1953, Clarke; 1 ♂, Mt. Fenkol, Ono.

The native name in Kusaie Island is "srisineku". (Esaki, 1947)

TRIBE CICADINI Van Duzee

Cicadini Van Duzee, 1916, Check List Hem.: 56.

Genus **Purana** Distant

*Purana* Distant, 1905, Ann. Mag. Nat. Hist., Ser. 7, 15: 60. (type: *Dundubia tigrina* Walker)

9. ***Purana carolettae*** Esaki (figs. 14 and 15)

*Purana carolettae* Esaki, 1936, Tenthredo 1: 3, figs. 1-2, tab. 1, fig. 2, ♂, fig. 3, ♀; 1947, Mushi 17; (7): 30, tab. 1, fig. 2, ♂ (colored)

Size: Body length ♂, 24.0-29.0 mm., ♀, 20.0-23.0 mm.; tegminal length ♂, 29.0-34.0 mm., ♀, 30.5-33.0 mm.

Male genitalia: Pygophore (fig. 14a & b) strongly widened towards behind middle, with dorsal apical area membranous and triangularly produced in middle (median dorsal spine), and with ventrolateral margins not incised. Aedeagus (fig. 14a & d) rather short, thick and straight in basal 1/2, and narrowed and curved apically. Tenth abdominal segment

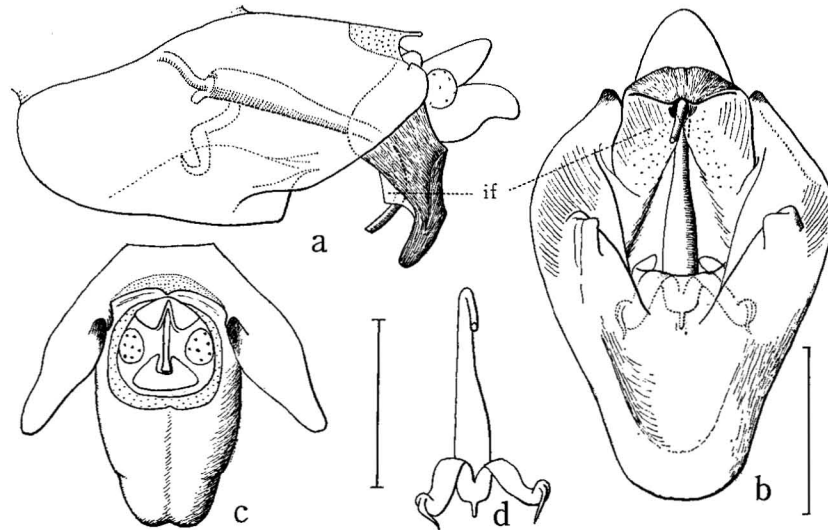


FIGURE 14. *Purana carolettae*, ♂: a, b and c, genital segments, lateral, ventral and caudal views, respectively; d, aedeagus, dorsal view. Scale: 1.0 mm.

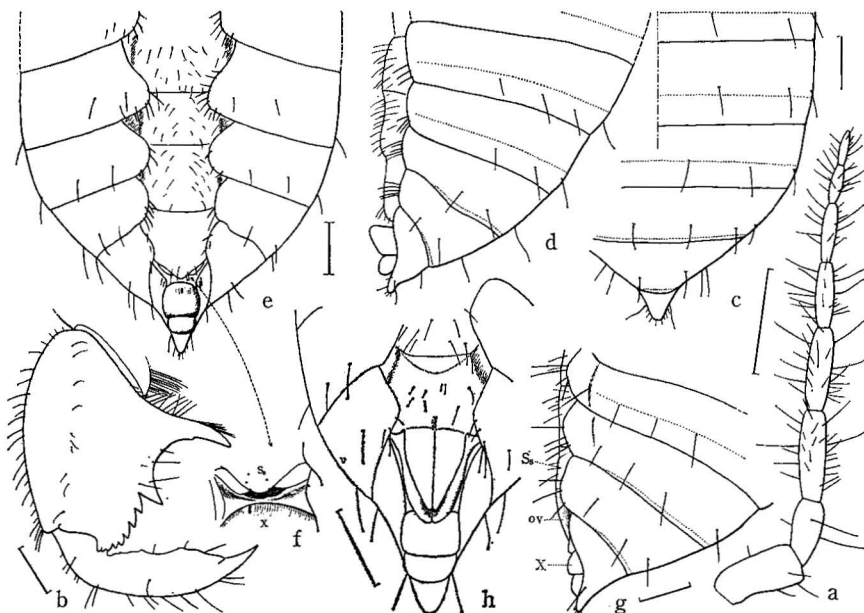


FIGURE 15. *Purana carolettae*, ♂ and ♀ exuviae: a, right antenna, ♂; b, left anterior leg, tarsus omitted, ♂; c, d and e, apical abdominal segments, ♂, dorsal, lateral and ventral views, respectively; f, 9th abdominal sternite with base of 10th abdominal segment, ♂; obliquely caudo-ventral view, g and h, apical abdominal segments, ♀, lateral and ventral views, respectively. Scale: 1.0 m. ov = rudiment of ovipositor.

(fig. 14a-c) with developed posteroventral lobe which is tapered towards a slightly bifurcate apex. Anteroventral lobes reduced to a pair of folds which hold apical portion of aedeagus together with inner wall of the posteroventral lobe.

Exuviae: Length ♂, ca. 23 mm., ♀, ca. 21 mm., a little over  $2.5 \times$  longer than wide. Somewhat shining, pale brownish yellow and subopaque. Frontoclypeus roundly swollen, covered with long erect setae, and slightly more than  $1.5 \times$  ( $3.1: 1.8$  in mm.) as long as clypeus. Antennae (fig. 15a) moderately long (ca. 4.5 mm.), gradually narrowed towards apex and 8-segmented; 6 apical segments with many erect setae; 3rd segment as thick as the 4th; relative lengths of antennal segments, .80: .69: .82: .81: .65: .55: .37: .35 (in mm.). Wing pads without setae. Anterior femora (fig. 15b) rather thick, with intermediate tooth distinctly larger than the last tooth of comb and close to the latter, and posterior tooth having a small tubercular subtooth; anterior tibiae broad, with apex claw-like and inner margin irregularly waved. Intermediate and posterior tibiae provided with 5 apical spines. Abdominal tergites (fig. 15c, d & g), excepting 9th, with a transverse row of several setae, and 6th-8th tergites subequal in median length; 9th tergite produced behind and apex somewhat upwardly curved. Abdominal sternites (fig. e & h) furnished with scattered erect setae. Male 8th sternite (fig. 15e) angularly produced behind; 9th sternite (fig. 15f) subdivided into 2 parts, anterolateral areas and posterior paired elevations, the latter of which is hardly visible ventrad, and with antero-median area reduced; 10th abdominal segment (fig. 15e & d) rather short, distinctly lifted downwards, with an obscure impression in middle of anteroventral area; 11th abdominal

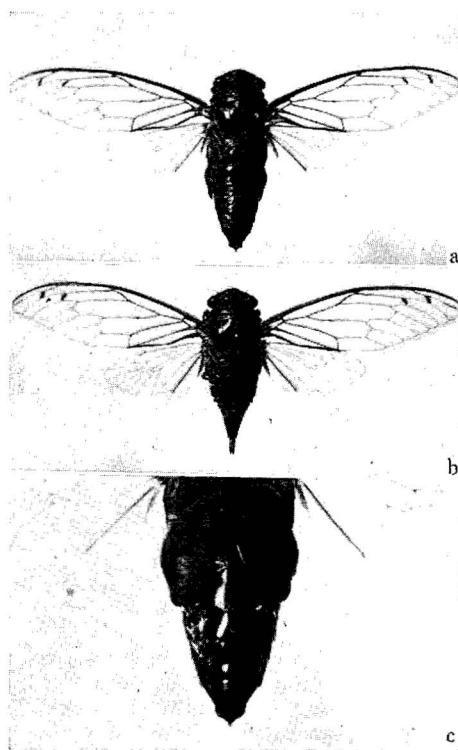


FIGURE 16. *Meimuna boninensis*: a, ♂; b, ♀; c, opercula and abdomen of ♂, ventral view.

segment about 1/2 as long as preceding segment. Female 8th sternite (fig. 15h) large, with rudiment of ovipositor about 1/2 length of sternite; 10th abdominal segment shorter than wide, less elevated than in ♂; 11th abdominal segment a little more than 1/2 length of the 10th.

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**PALAU:** BABELTHUAP: 1 ♀, Ngardmau, May 1, 1936, Ono; 1 ♂, Ngardok, Apr. 8, 1936, Ono; 2 ♂, Aimion, Ngeremlengui, Apr. 26, 1936, Ono; 1 ♀, E. Ngatpang, alt. 65 m., Dec. 8, 1952, Gressitt; 1 ♀, NW Auluptagel, alt. 25 m., Dec. 13, 1952, light trap, Gressitt; 3 ♂, 1 ♀, May 10 & Jun. 1, 1936, Ono. **KOROR:** 1 ♂, Feb. 15, 1948, Dybas; 1 ♂, 1 ♀, Apr.–May, 1949, Langford, M-4418. **AULUPTAGEL (AURAPSHEKARU):** 1 ♂, Sept. 1952, Pac. Sci. Bd. Ent. Surv. Micr., Krauss.