Proceedings of the Academy of Natural Sciences of Philadelphia 140(2):281-334, 1988

Bark Crickets of the Western Pacific Region (Gryllidae: Pteroplistinae)

DANIEL OTTE
Academy of Natural Sciences, Philadelphia, Pennsylvania 19103

ABSTRACT.—The subfamily Pteroplistinae (Gryllidae) is expanded to include members of the subfamily Landrevinae of Gorochov. The subfamily, which is restricted to southeast Asia and the western Pacific region as far as Fiji, is now comprised of two tribes (Pteroplistini and Landrevini), 29 genera and 73 species. Here 13 new genera and 31 new species are described. Evidence is given of a close relationship between the subfamilies Pteroplistinae and Oecanthinae. [Biogeography, crickets, Gryllidae, Landrevinae, Oecanthinae, new genera, new species, Pteroplistinae, western Pacific].

The present paper concerns a subfamily of large, mainly forest inhabiting crickets whose relationship to other groups has been problemmatical. The group is distributed over a large area from India to the western Pacific region and now contains 73 species distributed among two tribes and 29 genera. A chance examination of a male of *Pteroplistus* (type genus of the subfamily Pteroplistinae) in the Bishop Museum (Honolulu) has lead to some quite surprising discoveries concerning the relationships among several groups of crickets. The first is that the subfamily Pteroplistinae, which previously included only the genus *Pteroplistus* must be expanded to include the Landrevinae (Gorochov 1982) or Landrevini (Otte & Alexander 1983). The subfamily as here construed comprises two tribes—Pteroplistini, with *Pteroplistus* as the only member, and the much larger Landrevini, which contains the remaining genera. Previous to Gorochov (1982) the Landrevini were placed under the tribe Gryllomorphini, in the subfamily Gryllinae (Chopard 1967). Gorochov (1982) correctly observed that the Landrevini were quite distinct from the other Gryllomorphini and, indeed, were not even members of the subfamily Gryllinae. The more surprising discovery is that this group seems to be related most closely to the Oecanthinae and Podoscirtinae. The evidence for this is presented below.

I first became familiar with bark crickets in Australia, where R. D. Alexander and I collected two species in the Queensland rain forest. Subsequently we have found a number of new species in various collections and have collected additional species in Fiji and Palau. Of the 28 genera and 73 species discussed in this paper, 13 genera and 31 species are new. Because the vast majority of species do not fly, their dispersal through Indomalaysia and the western Pacific region is of special interest.

I believe hundreds of additional species probably exist in nature—first, because all of the species have been taken at only one or a few geographically restricted areas, usually in forests; second, because it is in forests that flightless species of crickets tend to diversify

Comparison of past classification schemes with that presented here

Present scheme	Gorochov 1982-1984	Chopard 1967	Saussure 1877
Pteroplistinae	Gryllomorphinae	Gryllomorphini	Gryllomorphites
Pteroplistini	Gryllomorphini	*Landreva*	*Landreva*
Pteroplistus	*Gryllomorpha*	*Duolandrevus*	*Odontogryllus*
Tribe Landrevini	Petaloptelini	*Endolandrevus*	*Gryllomorphus*
Landreva	*Petaloptila*	*Paralandrevus*	
Hemilandreva	*Discoptila*	*Drelanvus*	
Duolandrevus	*Glandulosa*	*Gryllapterus*	
Endolandrevus	*Acroneuroptila*	*Hemilandreva*	
Mjobergella	*Hymenoptila*	*Copholandrevus*	
Apiotarsoides	Landrevinae	*Lasiogryllus*	
Copholandrevus	*Landreva*	*Mjobergella*	
Odontogryllodes	*Hemilandreva*	*Oreolandreva*	
Jorama	*Duolandrevus*	*Microlandreva*	
Ajorama	*Endolandrevus*	*Odontogryllus*	
Avdrenia	*Paralandrevus*	*Odondogryllodes*	
Ginidra	*Mjobergella*	*Hymenoptila*	
Neova	*Drelanvus*	*Discoptila*	
Eleva	*Lasiogryllus*	*Petaloptila*	
Jareta	*Gryllapterus*	*Acroneuroptila*	
Fijina	*Oreolandreva*	*Gryllomorpha*	
Sigeva	*Microlandreva*		
Papava	*Odontogryllus*		
Ahldreva	*Odontogryllodes*		
Paralandrevus	*Copholandrevus*		
Drelanvus			
Gryllapterus			
Liogryllus			
Oreolandreva			
Microlandreva			

most dramatically. This paper represents, therefore, only an introduction to this previously largely unrecognized group. It is written now in the belief that once the group is described and its preliminary relationships discussed, more attention will be focussed on it.

SUBFAMILY PTEROPLISTINAE

HISTORY

Prior to the present analysis the subfamily was comprised of a single genus (*Pteroplistus*) and five species, all from southeast Asia. Recognition that other taxa are related to *Pteroplistus* and should be included under Pteroplisinae has come in several steps. 1) Chopard (1967), following the scheme of Saussure (1877), united under the tribe Gryllomorphini (subfamily Gryllinae) those genera which resembled field crickets (Gryllinae) and which possessed small spines above the spurs on the hind tibiae. 2) Gorochov (1982) removed certain of Chopard's genera and placed them in a new subfamily, Landrevinae. 3) Inde-

pendently (Otte and Alexander 1983) also separated out these genera, but placed them in a new tribe Landrevini, under Gryllinae. They also placed, probably mistakenly, the genus *Gryllitara* under Gryllinae. These main classification schemes are outlined below. 4) Now, following a comparison of 21 genera, and especially an examination of *Pteroplistus*, the new classification is put forward and shown in the left column of Table 1. This latter scheme differs from that of Gorochov mainly in that his Landrevinae is now treated as a tribe under the subfamily Pteroplistinae.

RELATIONSHIP TO OTHER SUBFAMILIES

During recent work on African Oecanthinae I found that in all species of Oecanthinae the proximal end of the stridulatory file begins with a prominent knob. I recalled that all pteroplistine males I had examined (at least those which retain a stridulum) also possess this feature and that no other crickets seem to possess it. A metanotal gland is also present in both subfamilies (as it is in Podoscirinae and Eneopterinae). Pteroplistinae and Oecanthinae also share the following features: each group has prognathous members (the Oecanthinae are exclusively prognathous); spines *and* spurs on the hind tibiae; without a long arching spermatophore tube mold; epiphallus strongly bilobed; scape of the antennae broad, much broader than the interantennal space.

Whether oecanthines and pteroplistines share an ancestry exclusive of the Podoscirtinae and Eneopterinae remains to be studied by a comparison of all four groups. It is clear, however, that bark crickets are derived from the Podoscirine-Eneopterine-Oecanthine stock and are not related to Gryllinae as previously thought (see also Gorochov 1982).

LIST OF ALL KNOWN SPECIES

Species in bold type were examined or illustrated in this study

PTEROPLISTINAE
Landrevini

Landreva Walker
- **clara** Walker (Type) Fig. 5A
- **angustifrons** Chopard Figs 5B, 21
- *insignis* Walker
- *subaptera* Chopard
- *ebneri* Chopard
- *zola* Fernando
- *kuveni* Fernando
- *talus* Fernando
- *hemiptera* Bolívar
- *semialata* Chopard

Duolandrevus Kirby

Ishigaki Group
- **ishigaki** n. sp.
- **major** n. sp.
- **hongkongae** n. sp.
- **coulonianus** (Saussure)
- **palauensis** n. sp.
- **coriaceus** Shiraki Figs 20J, 23

Karnyi Group
- **pendleburyi** n. sp.
- **rufus** Chopard
- **karnyi** n. sp.

Gingoogus Group
- **gingoogus** n. sp.
- **balabacus** n. sp.
- **luzonensis** n. sp.

Unknown relationship
- *brachypterus* de Haan (Type)
- *semialatus* Chopard
- *mjöbergi* Chopard

Repapa new genus
- **sapagaya** n. sp.
- **tenompokae** n. sp.
- **brevipes** (Chopard) (from *Duolandrevus*)

Solepa new genus
- **variegata** n. sp.

Neova new genus
- **bodemensis** n. sp.

Eleva new genus
- **wairahu** n. sp.

Jorama new genus
palawanensis n. sp.
isarogensis n. sp.
curtipennis Chopard
Ajorama new genus
balatukanis n. sp.
Bejorama new genus
intermedia Chopard
Sutepia new genus
thailandica n. sp.
Jareta new genus
sedlaceki n. sp.
Endolandrevus Saussure
Rostratus Group
rostratus (Saussure)
bomberi n. sp.
manokwari n. sp.
Unknown relationship
brevipes n. sp.
ritsemae (Saussure)
tomentosus Chopard
pubescens Chopard
Mjöbergella Chopard
macrocephala Chopard
warra Otte and Alexander
Fijina new genus
savu n. sp.
viti n. sp.
Avdrenia new genus
ajax n. sp.
fordi n. sp.
mailaita n. sp.
Ginidra new genus
wauensis n. sp.
Kotama
maai n. sp.
Copholandrevus Chopard
australicus Chopard
brevicauda Chopard
Odontogryllodes Chopard
brevicauda Chopard
latus Chopard
Papava
aiyurae n. sp.
Apiotarsoides Chopard
semialatus Chopard
Ahldreva
nondugli n. sp.
Sigeva new genus
gressitti n. sp.
Hemilandreva Chopard
lamellipennis Chopard Fig. 5C
Paralandrevus Saussure
hector Saussure
Liogryllus Chopard
albipalpus Chopard
Drelanvus Chopard
robustus Chopard
Gryllapterus Bolívar
tomentotus Bolívar
Oreolandreva Chopard
brevipennis Chopard
Microlandreva Chopard
notabilis Chopard
Pteroplistus Saussure
dilinensis n. sp.
acinacerus Saussure
platyxiphus de Haan
platycleis Bolívar
perakensis Chopard
similis Chopard

MUSEUMS

ANN ARBOR—University of Michigan Museum of Zoology, Ann Arbor, Michigan
BERLIN—Museum für Naturkunde, Humboldt Universität, East Berlin
BRUSSELS—Institut Royal des Sciences Naturelles de Belguique, Brussels
COLOMBO—Department of Entomology, National Museum of Sri Lanka
EBERSWALDE-FINOW—Institut für Pflanzenschutzforschung der Akademie der Landwirtschfswissenschaften der DDR, Abt. Taxonomie der Insekten, Eberswalde-Finow
HONOLULU—Bishop Museum, Honolulu, Hawaii
LEIDEN—Rijksmuseum van Natuurlijke Historie, Leiden
LONDON—British Museum (Natural History), London
NEUCHATEL—Musee d'Histoire Naturelles, Neuchâtel, Switzerland
PHILADELPHIA—Academy of Natural Sciences, Philadelphia, Pennsylvania
SINGAPORE— Raffles Museum, Singapore
VIENNA—Naturhistorisches Musem, Vienna

FORMATION OF NAMES

The following new genus names are arbitrary combinations of letters which fulfill the requirement of being short and euphonious in Latin; none, to my knowledge, "suggest a bizarre, comical, or otherwise objectionable meaning:" *Jorama, Ajorama, Bejorama, Avdrenia, Eleva, Jareta, Repapa, Solepa, Neova, Ginidra, Sigeva, Papava* and *Kotama*. The following new genus names are based on geographical localities (see type localities of type species): *Sutepia, Fijina* and *Ahldreva*. Most new species names are derived directly from geographic localities; several are named after collectors.

Subfamily PTEROPLISTINAE

Biology

There are virtually no notes in the literature on the biology of the Pteroplitines. Presently, biological information is based on only four species.

1. *Mjöbergella warra:* Otte and Alexander (1983: 76)noted that this species was usually found in dead standing trees or fallen logs, rarely under bark on woulded living trees. Both sexes and several juvenile stages were taken from tunnels and crevices under bark. There is little doubt that tunnels are made by crickets, at least in some cases. At Whyalla Plains, males and females were found in blind tunnels a few inches deep in a downed tree. Tunnel entrances were easily located because in all cases bark had been chewed away in a circle several inches in diameter around them. A female in a burrow with her head at a tunnel entrance for several minutes suddenly reversed position, defecated, and kicked the pellet off her ovipositor and out the tunnel entrance with the hind leg then reversed again. Disturbance by us using the antennae of a hand-held male, caused her first to approach the entrance then to reverse position and to kick with her hind legs. She was finally extricated by sawing off the limb while holding a thumb over the hole, then drowning her in alcohol and extricating her body with forceps. In dense colonies it is best to search for these cricket by stripping bark off dead trees and tearing open rotten logs. Males in Queensland sang only at night, and apparently always from near tunnel entrances or crevices under bark.

2. *Fijina savu:* This species was first heard in a rainforest along a ridge on Vanua Levu (Fiji). The species was finally discovered in a rotting log about a foot off the ground. Other males seemed to be singing from similar locations.

3. *Fijina viti:* This species was found in a dense tangle of brush along a steep bank in a road cut in a rainforest area.

4. *Duolandrevus palauensis:* One population of this species was found on a living tree in a mangrove tidal swamp on Babelthuap Island. The singing male was singing in a crotch of a tree about eight feet about the water. Several more males were found in a mangrove forest on the neighboring Pelelieu Island and in an adjacent dry forest. All males seemed to be singing from living trees and all from a few feet to ten feet about the surface.

5. *Duolandrevus major:* Steve Montgomery (field notes) found numbers of this species running up and down tree trunks and branches in a wooded area in the Bonin Islands.

6. *Neova bodemensis* was found on Ifalik Island (Micronesia) in coconut debris along the shoreline (label data).

Most of the large robust crickets of this group inhabit forest undergrowth and are especially adapted to living in or under bark. *Pteroplistus,* which appears by the length of the hindwings to be capable of flight, may live more in the foliage of trees. The members of two genera (*Ahldreva* and *Apiotarsoides*) are elongate and have very short hind tibiae which would appear to adapt them to living in hollow twigs and stems much like the similarly-shaped Hawaiian *Prognathogryllus* do.

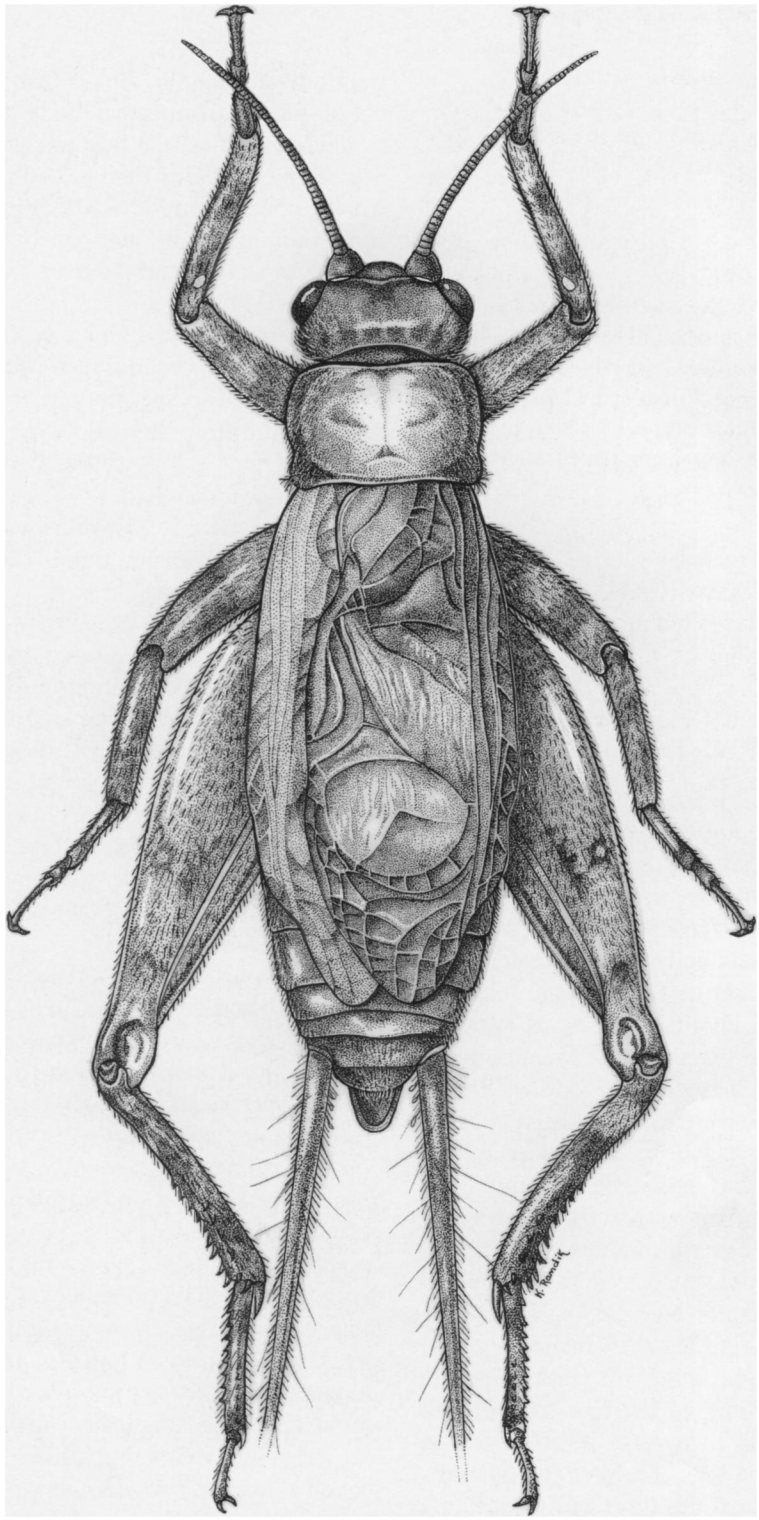


FIG. 1. *Pteroplistus dilinhensis* n. sp. holotype male.

Recognition of subfamily

Scape of antennae about as wide as forehead (rostrum), which is very narrow (head 4 to 6 times as wide as rostrum); head rather square in dorsal view; forehead angulate in lateral view; median ocellus located on dorsum of head; dorsum of head flattened. Pronotum variable in shape, sometimes wider anteriorly than posteriorly; lateral lobes with a distinctly slanted lower margin, lowest at anterior end; pronotal margins with small bristles on leading margin. Metanotum in most species with a large, shallow, dorsal depression containing bristles. Male forewings variable, usually with stridulum, but some genera without; forewings in singing species with short apical area (except Pteroplistinae). Cu_2 vein (stridulum) with a distinct bend between the two major bends; file with a small, raised cluster of teeth at apex of minor bend. Left wing often above right one. Hindwings absent in all species but *Pteroplistus*. Legs: foretibiae in non-mute forms usually with small inner and outer tympanal openings, occasionally with only inner openings. Mute species without tympana. Number of apical spurs on front and middle tibiae: 3/3 in Landrevini, 2/2 in Pteroplistinae (3/4 in Gryllinae). Hind tibiae with short spines above subapical spurs; with 2 - 4 subapical spurs on inner and outer margins. Male genitalia elongate, epiphallus strongly bilobate (sometimes with one or two smaller median lobes). Arched STM (spermatophore tube mold) absent—a short groove leads from spermatophore sac *posteriorly* into the epiphallus. Ectoparameres not extending beyond epiphallus. Virga wide, with thin lateral flanges.

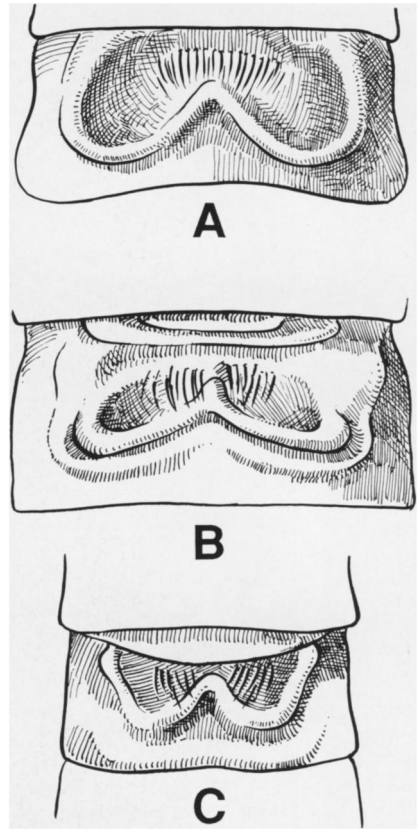
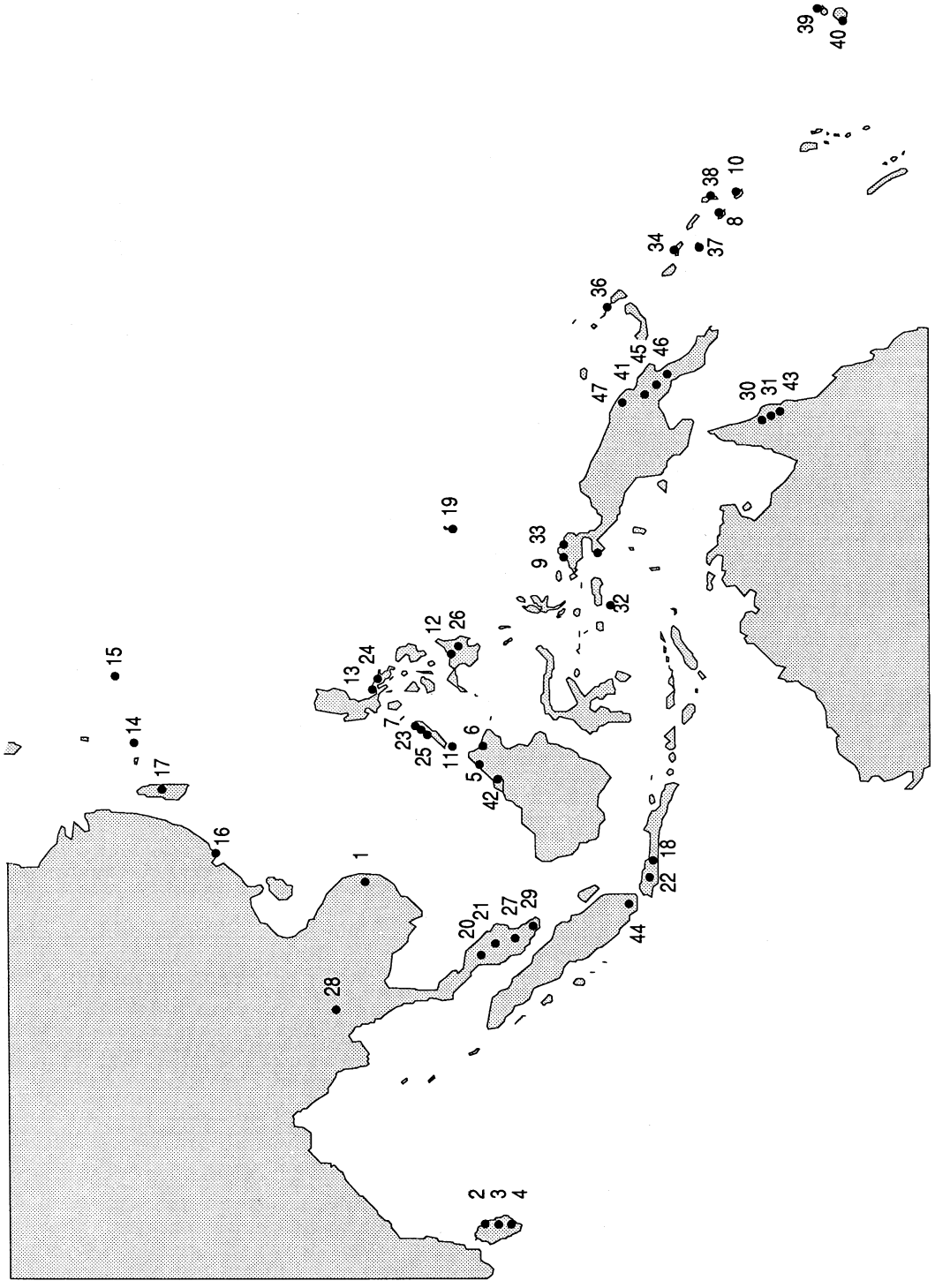


FIG. 2. Metanotal pits in **A**, *Kotama maai*; **B**, *Papava aiyurae*; **C**, *Ahldreva nondugli*.

Identification of Tribes

	LANDREVINI	PTEROPLISTINI
Forewing length/ pronotal length	0.3 - 3.0	3.0-4.0
Hindwing	absent	present
Ovipositor	dorsoven compressed	laterally compressed
Auditory tympana inner/outer	i/o, i/- or -/-	i/-
No. apical spurs on front/middle tibiae	3/3	2/2
No. subapical spurs on hind tibiae inner/outer	4/4	1-2/2-3


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
36
37
38
39
40
41
42
43
44
45
46
47

Tribe LANDREVINI

Recognition of tribe.— See table above.

Distribution.— India to Fiji.

Biology.— These crickets are called bark crickets because they usually inhabit dead tree trunks and rotting wood where they may be found under bark. The elongated bodies and very short hind tibiae suggest that some genera live in hollowed out tubes in dead branches and twigs.

Duolandrevus Clade

This clade (Fig.) comprises the genera *Duolandrevus, Repapa, Solepa, Neova,* and *Eleva.* It is most closely related to the Jorama clade from the same region.

DUOLANDREVUS Kirby

Type species: *brachypterus* De Haan. The types of this species (2 males, 1 female) are not in the Brussells or Leiden museums and are presumed to be lost. At present the genus is defined by illustrations of *D. coulonianus* provided by Gorochov (1982).

Ishigaki Group

Male epiphallus with three terminal projections (side view). Face with a major ridge at lower inner margin of eyes. Head wider than pronotum.

Duolandrevus ishigaki n. sp.

Holotype.— Male. Ryuku Islands, Ishigaki Island, xi - xii 1952 (G. E. Bohart). HONOLULU.

Figs 4, 6 20. Table 1. Differs from the similar *major* as follows: epiphallic lobes wider at distal end (side view); forewings with 6 harp veins and many more cells in the mirror area; body color considerably darker; hind femora much thicker. Abdomen without a median dark band and two adjacent pale bands. As in *major,* head of males wider than prontoum and pronotum widest at anterior end.

Male.— A large, dark brown to blackish cricket with fine pubescence. Pronotum: blackish with gray pubescence. Abdomen blackish with gray pubescence on sides. Forewings: dorsum gold-brown, translucent; mirror incomplete. Front and middle legs uniform reddish brown. Hindlegs uniform reddish brown.

Female.— Similar in color and size to males, but head only slightly wider than

OPPOSITE PAGE

FIG. 3. Distribution of Pteroplistinae treated in this work.

1, *Pteroplistus dilinhensis*
2, *Landreva angustifrons*
3, *Landreva clara*
4, *Hemilandreva lamellipennis*
5, *Repapa tenompokae*
6, *Repapa sapagaya*
7, *Repapa brevipes*
8, *Solepa variegata*
9, *Neova bodemensis;*
10, *Eleva wairahu*
11, *Duolandrevus balabacus*
12, *Duolandrevus gingoogus*
13, *Duolandrevus luzonensis*
14, *Duolandrevus ishigaki*
15, *Duolandrevus major*
16, *Duolandrevus hongkongae*
17, *Duolandrevus coriaceus*
18, *Duolandrevus coulonianus*
19, *Duolandrevus palauensis*
20, *Duolandrevus pendleburyi*
21, *Duolandrevus rufus*
22, *Duolandrevus karnyi*
23, *Jorama palawanensis*
24, *Jorama isarogensis*
25, *Jorama curtipennis*
26, *Ajorama balatukanis*
27, *Bejorama intermedia*
28, *Sutepia thailandica*
29, *Jareta sedlaceki*
30, *Mjöbergella warra*
31, *Mjöbergella macrocephala*
32, *Endolandrevus rostratus*
33, *Endolandrevus manokwari*
34, *Endolandrevus brevipes*
35, *Endolandrevus bomberi*
36, *Avdrenia ajax*
37, *Avdrenia fordi*
38, *Avdrenia malaita*
39, *Fijina savu*
40, *Fijinaviti*
41, *Ginidra wauensis*
42, *Kotama maai*
43, *Copholandrevus australicus*
44, *Odontogryllodes brevicauda*
45, *Papava aiyurae*
46, *Apiotarsoides semialatus*
47, *Ahldreva nondugli*
48, *Sigeva gressitti*

TABLE 1. Comparison of males of Pteroplistinae. BL, body length. FL, femur length. HW, greatest head width. RW, rostral width. GPW, greatest pronotal width. FWL, forewing length. PL, pronotal length. TL, hind tibia length. FL, hind femur length Condition of tympana: inner/outer (i, small inner; I, large inner; o, small outer; O, large outer; -, inner or outer absent). HM, hologype male; PM, paratype male; HF, holotype female; PF, paratype female.

	Number file teeth	BL	FL	HW/ RW	HW/ GPW	FWL/ PL	TL/ FL	Condition of tympana	Hind tibial spurs inner/outer	Mirror	Median ocellus
Duolandrevus ishigaki											
HM	65+	28	18.5	4.8	1.2	1.9	0.72	i/o	4+4,5/4+6	incomplete	large
Duolandrevus major											
n=4	42-53	23-30	16+	4.8	1.3	2.2	0.67	i/o	4+4-6/4+5-7	incomplete	large
Duolandrevus honkongae											
HM	54	19	11.5	4.1	1.1	1.8	0.7	i/o	4+5/4+0	obsolete	large
Duolandrevus pendleburyi											
HM	77	21.5	14.7	5	1	2.4	0.65	i/o	4+6/4+5	incomplete	large
Duolandrevus rufus											
HM	46	22	15	4.5	1	2.8	0.69	i/o	4+6/4+8	complete	large
Duolandrevus karnyi											
HM	56	16	11	5.1	1.1	2.9	0.65	i/o	4+5/4+4	complete	large
Duolandrevus balabacus											
HM	75	16.5	??	4.8	0.96	2.3		i/o	-	complete	large
Duolandrevus gingoogus											
HM	78	20	14	4.9	0.95	2.2	0.67	i/o	4+6/4+7	complete	small
Duolandrevus luzonensis											
HM	80	21	13	5	1.1	2.5	0.69	i/o	4+5/4+5	complete	large
Duolandrevus palauensis											
n=4	117-130	20-22	12-13	5.3-5.9	0.99-1.00	2.6-2.8	0.64-0.70	i/-	4+4-6/4+6-7	complete	small
Sutepia thailandica											
HM	100	31	19	4.4	1.1	2.9	0.68	i/o	4+4/4+5	complete	large

Jorama palawanensis											
HM	49	22	15.5	5.7	0.94	1.8	0.66	i/o	4+7/4+9	obsolete	large
Jorama isarogensis											
n=4	37-48	21-27	16.0-20	5.3-5.6	0.96-1.0	2.0-2.3	0.67-0.7	i/o	4,5+4,5/4,5+7-9	obsolete	large
Jorama curtipennis											
HM	31	25	15			1.82	0.67	i/o	4+5/4+8	obsolete	large
Ajorama balatucanus											
HM	64	13.5	8.5	4.6	0.9	2.2	0.69	i/-	4+5,6/4+7	incomplete	large
Bejorama intermedius											
HM	56	16.6	9.8	4.5	0.98	2.3	0.65	i/o	4+4/4+7	incomplete	large
Endolandrevus rostratus											
HM	106	21.5	15.5	6.2	0.93	2.5	-	i/-	4+5/4+8	complete	large
Endolandrevus bomberi											
HM	48	19	13.3	4.8	1	2.8	0.69	i/-	4+4,5/4+5	obsolete	large
Endolandrevus manokwari											
HM	123	26	17.2	6.4	1	3.1	0.72	i/-	4+7/4+8	complete	large
Endolandrevus brevipes											
HM	64	16	8.7	5.4	1.1	2.2	-	i/-	4+4/4+6	complete	small
Repapa sapagaya											
HM	99	14	-	5.7	0.92	2.4	-	i/o	-	obsolete	samll
Repapa tenompokae											
HM	49	16	10	4.8	1.1	2.5	0.65	i/o	4+1/4+6	obsolete	small
Repapa brevipes											
HM	105	15	9			2.5	0.67	i/o	4+1,2/4+6,7	incomplete	
Solepa variegata											
HM	116	18	11.1	5.8	1	1.5	0.59	i/o	4+1/4+2,4	obsolete	small
Avdrenia ajax											
HM	85	25	17	5.4	0.95	2.3	0.62	i/o	4+3,4/4+3,4	obsolete	small
Avdrenia fordi											
HM	88	29	19	5.5	0.96	2.2	0.64	i/o	4+4/4+5	obsolete	small
Avdrenia malaita											
HM	106	26	16	5.7	0.99	2.3	0.64	i/o	4+3/4+3	obsolete	small
Ginidra wauensis											
HM	77	19		6.5	1	1.5	-	i/-	-	obsolete	small

Table 1 continued

	file teeth	BL	FL	HW/ RW	HW/ GPW	FWL/ PL	TL/ FL	tympana	tibial spurs inner/outer	Mirror	
Eleva wairahu											
HM	0	11.5	7	4.4	1	0.9	0.58	-/-	3+4/4+6	obsolete	absent
Neova bodemensis											
HM	65	19	12	5	1.1	2.8	0.67	i/o	4+6/4+7	complete	large
PM	61	17	-	4.4	1.1	2.4	-	i/o	-	complete	
PM	62	18	11.5	4.2	1	2.9	0.61	i/o	4+7/4+5	complete	
PM	64	18	11	4.5	1.1	2.7	0.66	i/o	4+4,5/4+6,7	complete	
Jareta sedlaceki											
HM	52	23	15	6	0.95	2.3		-/o	4+7/4+9	incomplete	large
Fijina savu											
HM	88	21	16	5.8	0.97	2.4	0.63	i/o	4+4/4+5	obsolete	small
Fijina viti											
HM	86	25	15			2.06	0.53	i/-	4+3/4+4	obsolete	small
Sigeva gressitti											
HM		17.5	12.2	6	1.1	0.3	0.58	-/-	4+3/4+3	-	small
Kotama maai											
HM		15.5	9.5	4.5	1	0.8	0.56	-/-	4+2/4+3	-	small
Papava aiyurae											
HM		19	13	5.4	1	0.6	0.65	-/-	4+3/4+3	-	absent
Ahldreva nondugli											
HM		24	14.5	4.9	1.1	0.7	0.47	-/-	4+2/4+2	-	absent
Apiotarsoides semialatus											
HM		27	17	6.4	1	1.3	0.4	-/-	4+2/5+2	obsolete	absent
Odontogryllodes brevicauda											
HM		14	8.2	4.5	0.98	0.8	0.57	-/-	4+3/4+4	-	absent
Pteroplistus dilinhensis											
HM	-	14.8	8.8	5.8	0.94	4	0.58	I/-	1+7/2+12	complete	absent

Table 2. Comparison of Pteroplistinae females (see Table 1 for abbreviations).

	BL	FL	FWL/ PL	TL/ FL	OL/ FL	Condition of tympana	tibial spurs + inner/outer
Ajorama balatucanus							
PF	14.5	8.2	1.04		1.13	i/o	
Duolandrevus ishigaki							
PF	30	20		0.71	1.1	i/o	4+7/4+7
Duolandrevus major							
PF					0.59-0.7?	i/o	
Duolandrevus gingoogus							
PF	21	14	0.76	0.7	1.03	i/o	
Neova bodemensis							
PF	19	13.5	0.5		1.11	i/o	
PF	20	13	0.66				
Apiotarsoides semialatus							
PF	28	16	1.29	0.44	1.1	-/-	3+3/4+3
PF	28	17.2	1.29	0.38	1.04	-/-	
Pteroplistus dilinhensis							
PF	14	11	3.3		0.64	i/-	2+19/3+30

pronotum and dorsum of head with faint longitudinal stripes.

Specimens.— Holotype male HONOLULU. Paratype: Same data as holotype, 1 female, HONOLULU.

Duolandrevus major n. sp.

Holotype.— Male. Bonin Islands (Ogasawara Islands), Hahajima Island, Chibusayama trail, 19-21 vii 1980 (S. L. Montgomery). PHILADELPHIA.

Figs 6, 20. Table 1. Differs from the similar *ishigaki* as follows: epiphallus with narrower lateral process (side view); forewing with fewer cells in mirror area, and harp with 9 veins; hind femora narrower; body color more pale—pronotum and head orange instead of black. Much larger than *hongkongae*.

Male.— Size large; color reddish brown with yellowish legs, black on face and on lateral field of forewings. Head distinctly broader than pronotum. Pronotum: lateral lobes much darker than disc. Abdomen: dorsum patterned with pale reddish brown and dark brown, and with a median row of dark marks; dark along lateral margins. Venter of abdomen yellowish brown.

Female.— Similar to males in color and in having a broad head.

Specimens.— Holotype male HONOLULU. Paratypes: Same data as holotype, 5 males, 8 females, PHILADELPHIA.

Duolandrevus hongkongae n. sp.

Holotype.— Male. Hong Kong N. T., Tai Po Kai Forestry Station, 17 vii 1964 (W. J. Voss). HONOLULU.

Figs 6, 20. Table1. Differs from the somewhat similar *ishigaki* and *major* as follows: distal end of epiphallic lobes much narrower

(in side view) and with distal projections nearer to one another; forewing with 5 harp veins; much smaller in size (see Table 2); head not wider than pronotum, pronotum with parallel sides.

Male.— Medium sized, dark brown with reddish brown legs. Head: dorsum reddish brown; face and cheeks dark brown to blackish. Pronotum: dorsum with convex margins; anterior and posterior widths nearly equal. Forewings: Mirror obsolete, right wing above left. Hindwings absent.

Specimens.— Holotype male HONOLULU.

Duolandrevus palauensis n. sp.

Holotype.—Male. Palau (Belau), Pelelieu Island, 19-26 Feb 1986 (Alexander, Otte and Flinn) PHILADELPHIA.

Figs 7, 22. Table 1. Differs from other members of the group in the shape of the male epiphallus and in wing venation.

Male.—Size medium to large; color mostly rusty-red, but with dark forewings. Head: dorsium rusty-red, but rostrum dark brown; face dark brown on frons; patterned with light and dark on clypeus and labrum. Pronotum: dorsum rusty colored; lateral lobes very dark brown but with a pale spot in the lower anterior quarter. Forewings dark brown, with a well-developed mirror. Abdomen: dorsum mottled with a median dark area bordered on either side by a lighter area and, near the margins with dark markings; venter uniformly rusty-red. Fore- and midlegs: outer faces of femora rusty colored but marbled with dark brown markings. Hind femur: rusty-colored and with a dorsal row of dark markings.

Female.—Unknown.

Specimens.—Holotype male PHILADELPHIA. Paratypes: Same data as holotype, 2M, PHILADELPHIA. Palau, Babelthuap Island, near Aimeliik, mangroves 19-26 Feb. 1986 (Alexander, Otte and Flinn) 1M, PHILADELPHIA.

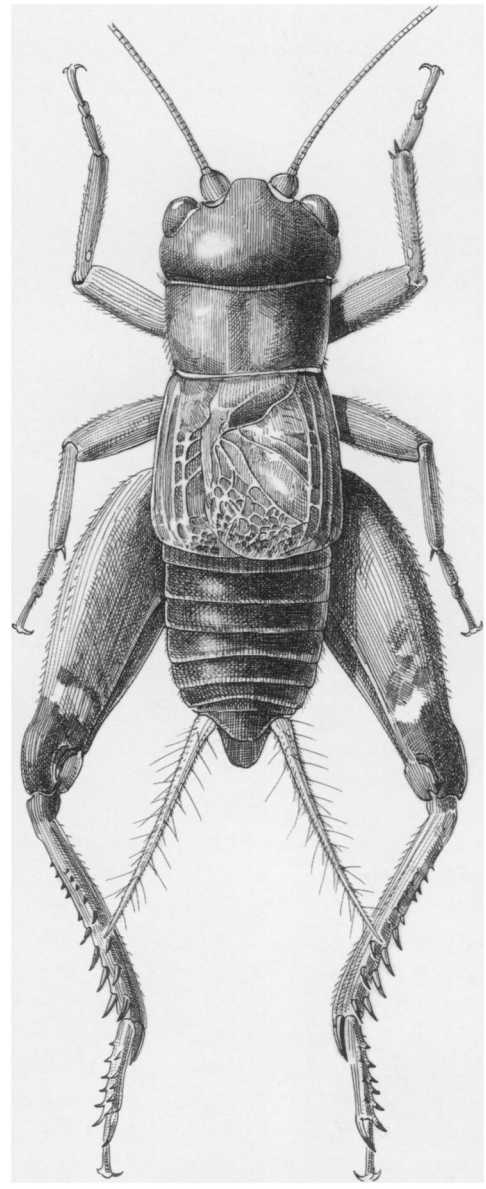


FIG. 4. *Duolandrevus ishigaki* holotype male

Karnyi Group

Distinguished from other groups by the male genitalia. Dorsum of head without pale stripes. Head as wide as pronotum. Dorsum of abdomen hairy (groups above may have fine pubescence). Mirror incomplete or com-

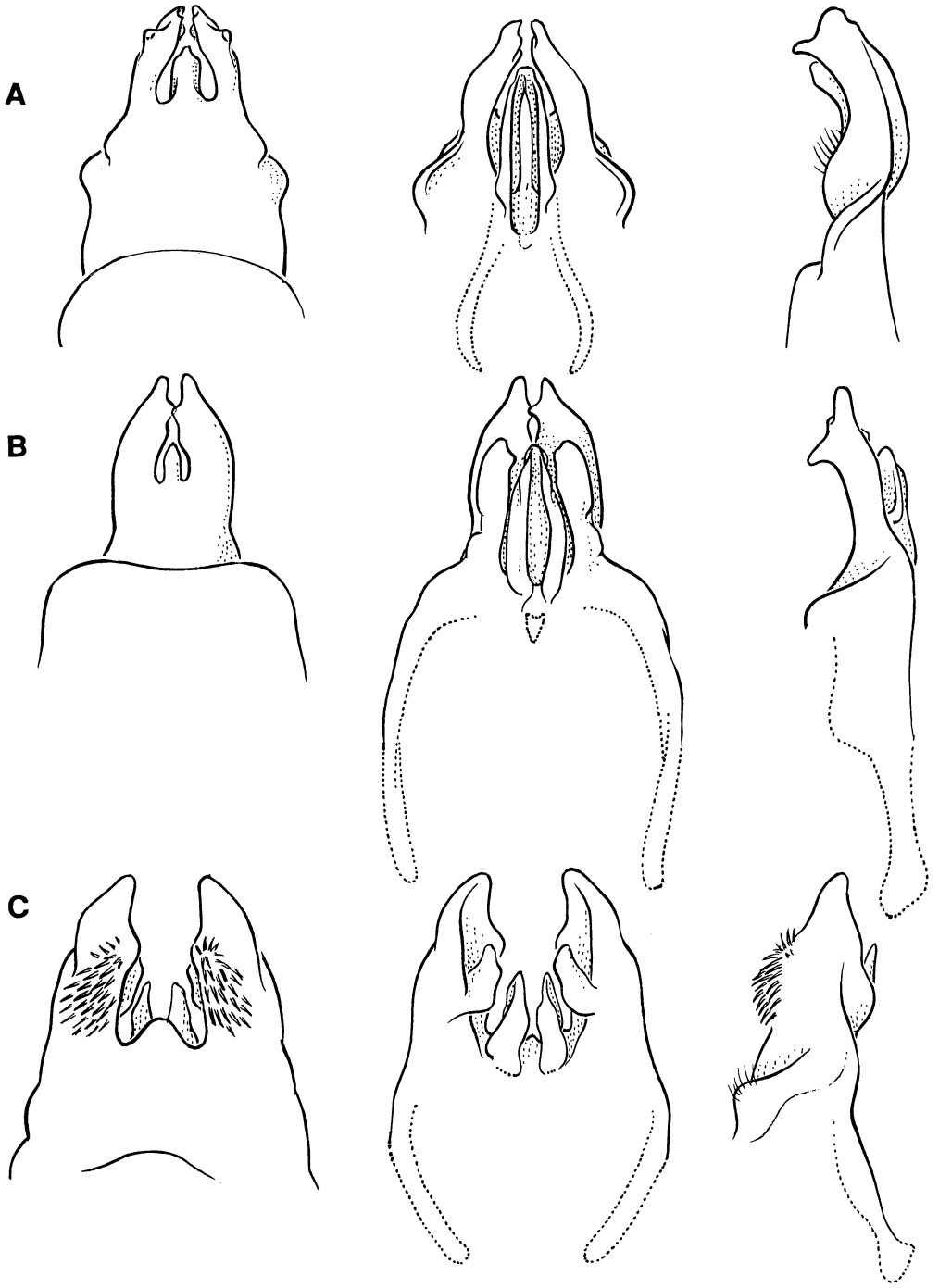


FIG. 5. Male genitalia: dorsal, ventral and lateral views. **A**, *Landreva clara*; **B**, *Landreva angustifrons* holotype; **C**, *Hemilandrevus lamellipennis* holotype.

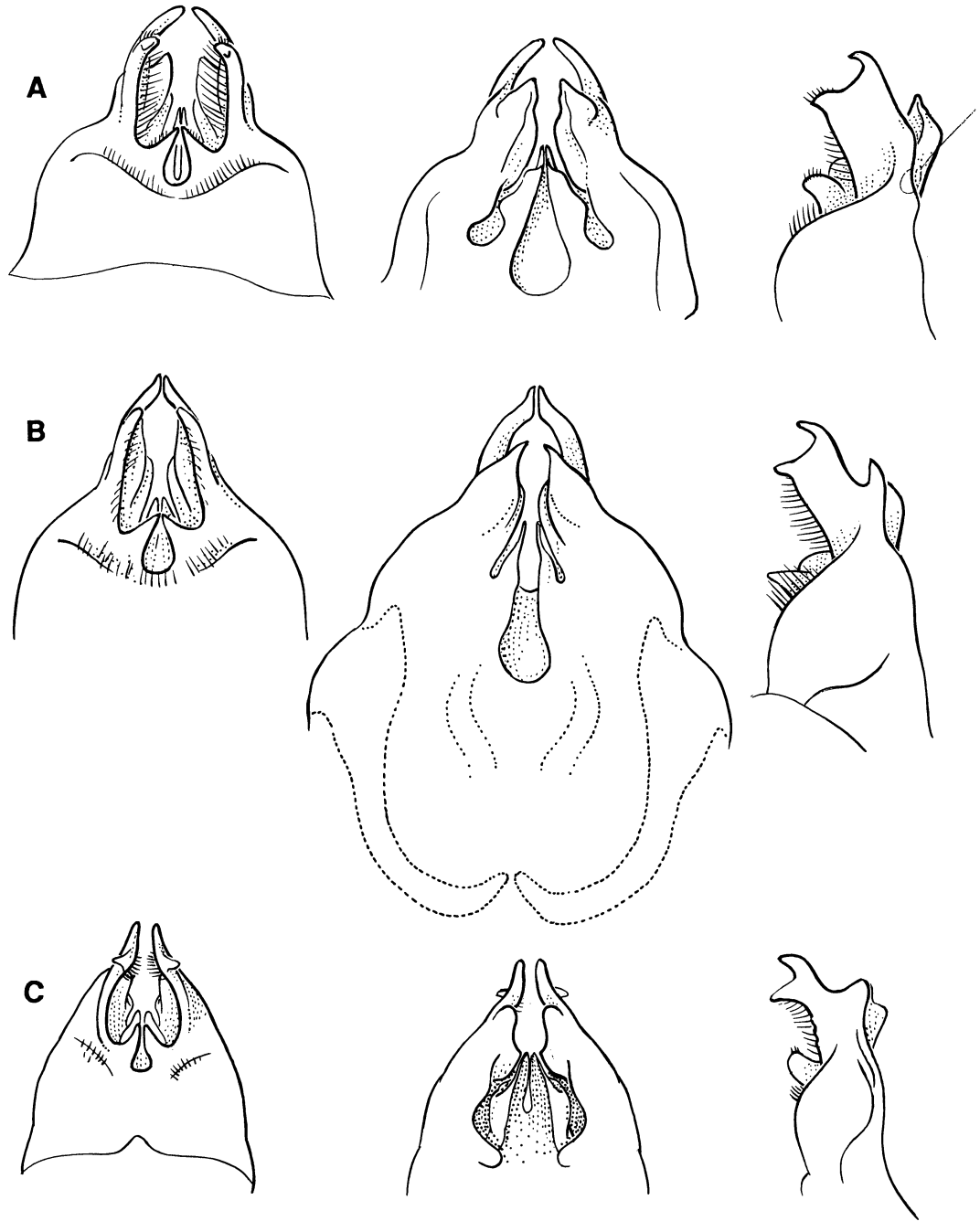


FIG. 6. Male genitalia: dorsal, ventral and lateral views. **A**, *Duolandrevus ishigaki* holotype; **B**, *Duolandrevus major* holotype; **C**, *Duolandrevus hongkongae* holotype.

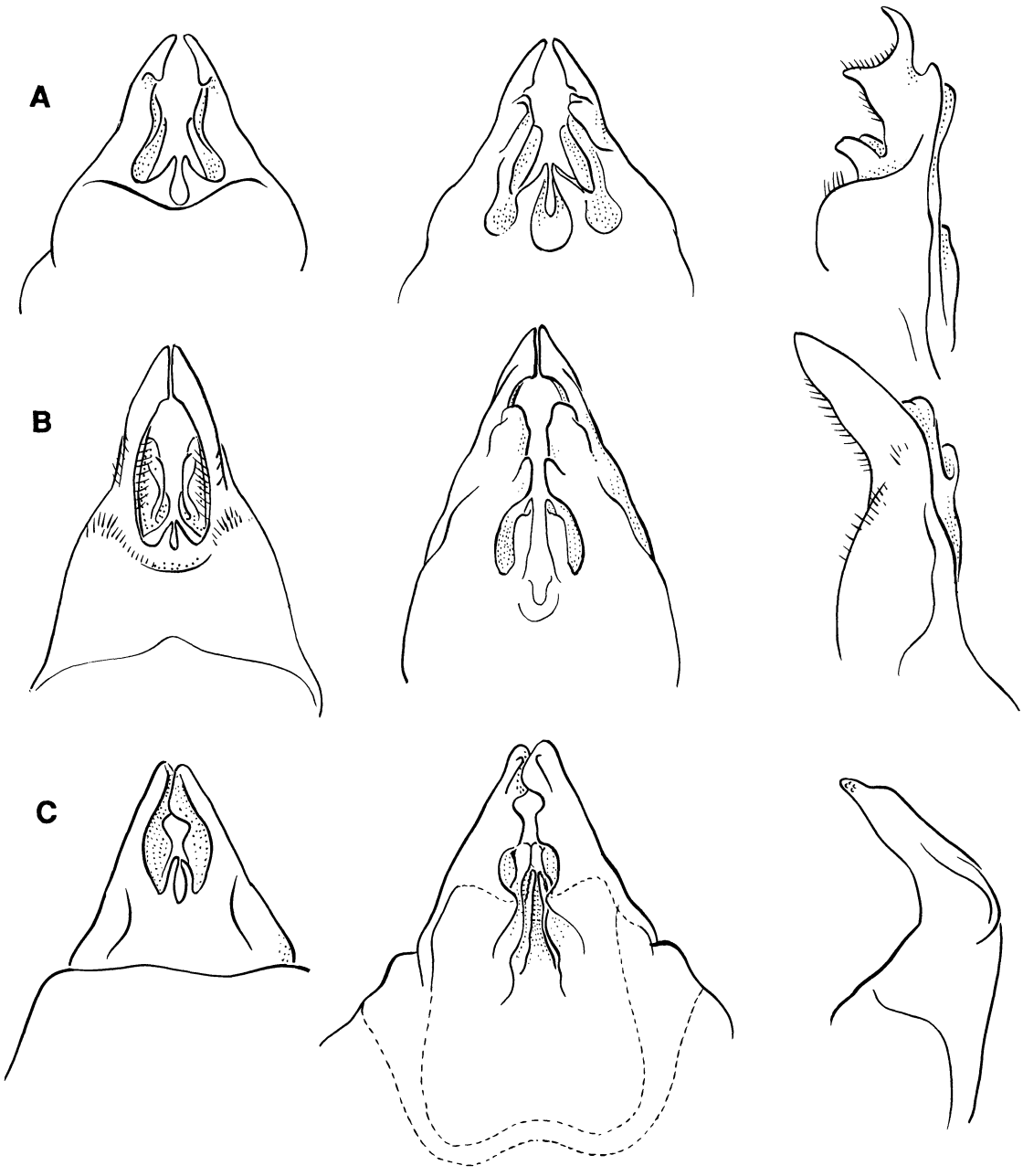


FIG. 7. Male genitalia: dorsal, ventral and lateral views. **A**, *Duolandrevus coulonianus*, from Gorochov; **B**, *Sutepia thailandica* holotype; **C**, *Duolandrevus palauensis* holotype.

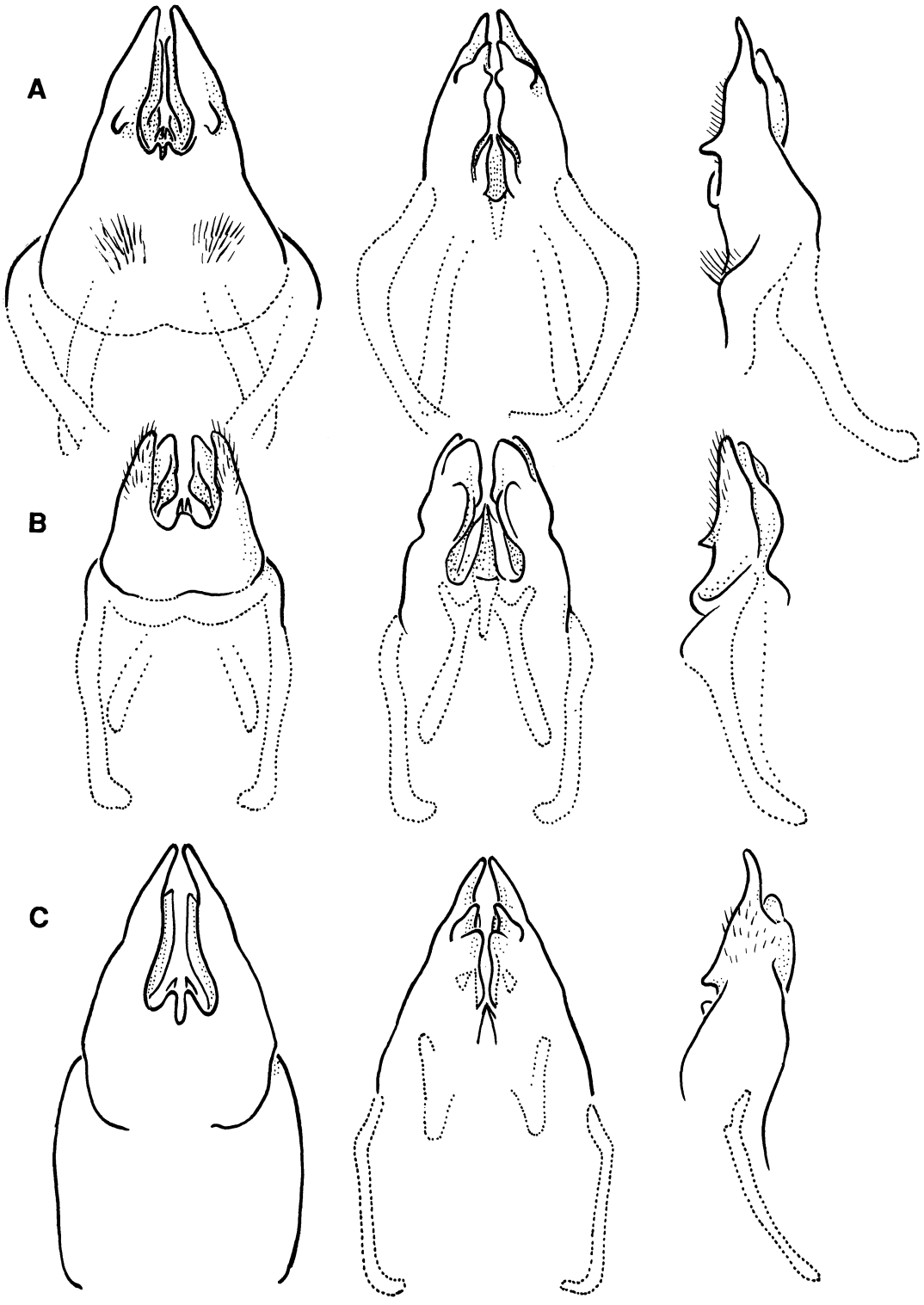


FIG. 8. Male genitalia: dorsal, ventral and lateral views. **A**, *Duolandrevus pendleburyi* holotype; **B**, *Duolandrevus karnyi* holotype; **C**, *Duolandrevus rufus*, Chopard determined specimen.

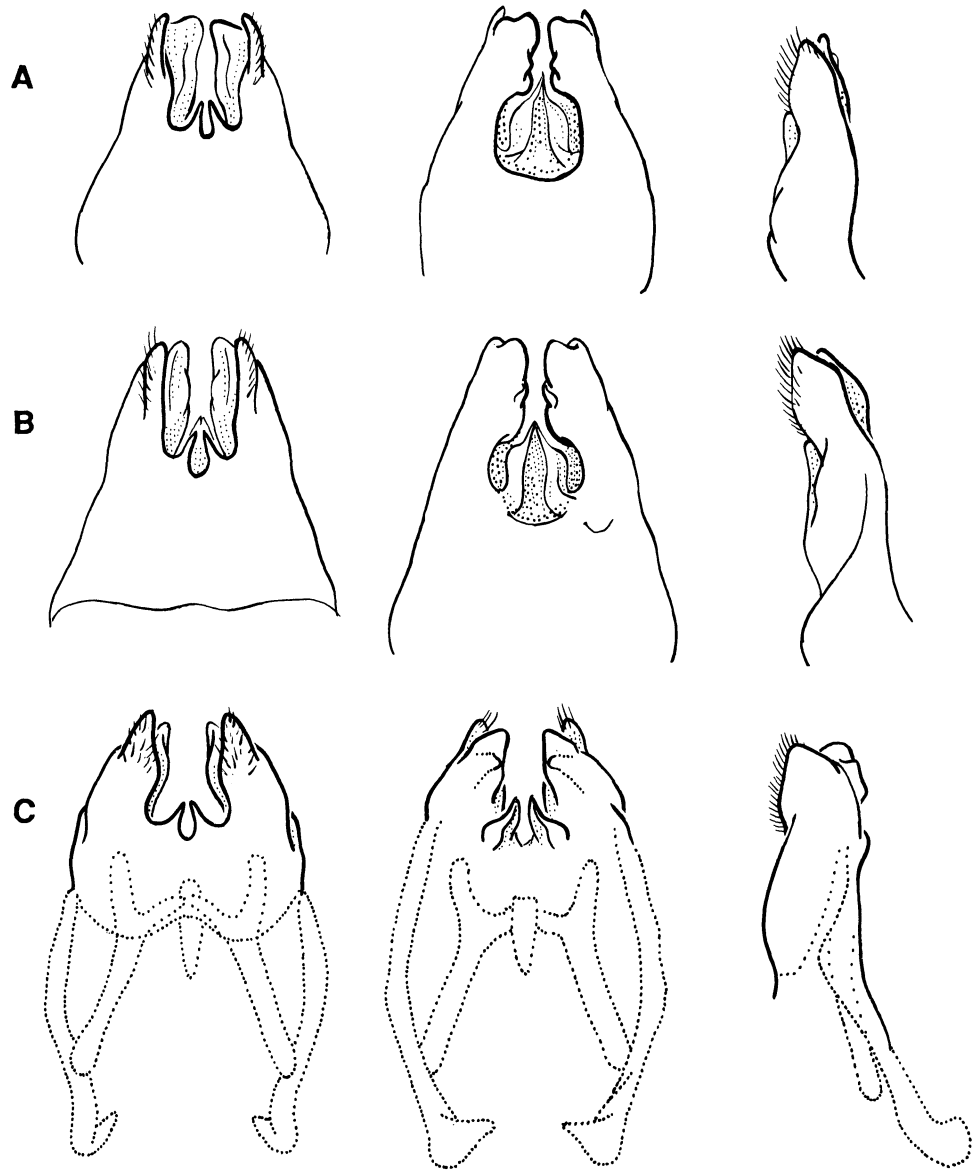


FIG. 9. Male genitalia: dorsal, ventral and lateral views. **A**, *Duolandrevus balabacus* holotype; **B**, *Duolandrevus gingoogus* holotype; **C**, *Duolandrevus luzonensis* holotype.

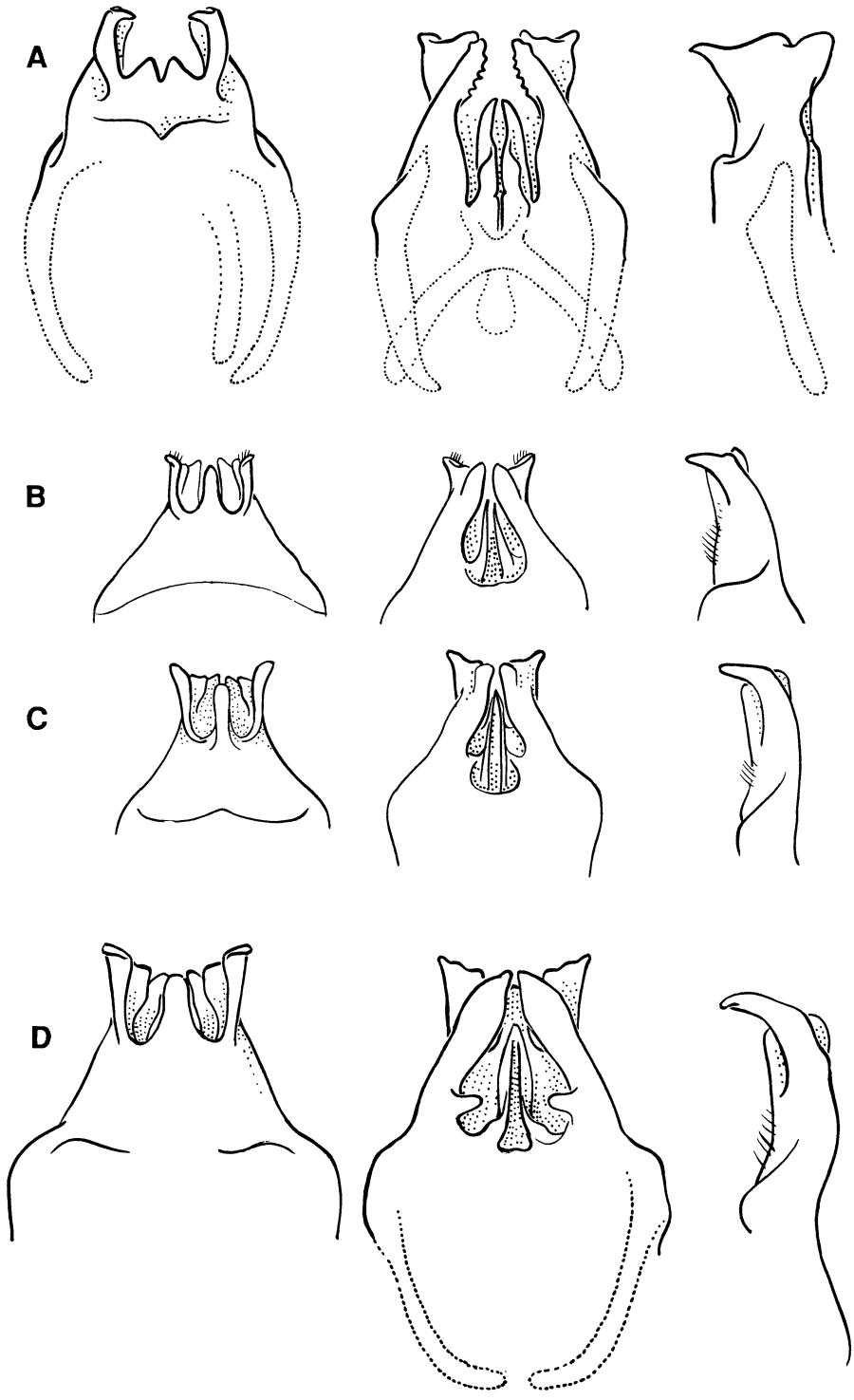


FIG. 10. Male genitalia: dorsal, ventral, and lateral views. **A**, *Solepa variegata* holotype; **B**, *Repapa sapagaya* holotype; **C**, *Repapa tenompokae* holotype; **D**, *Repapa brevipennis* holotype.

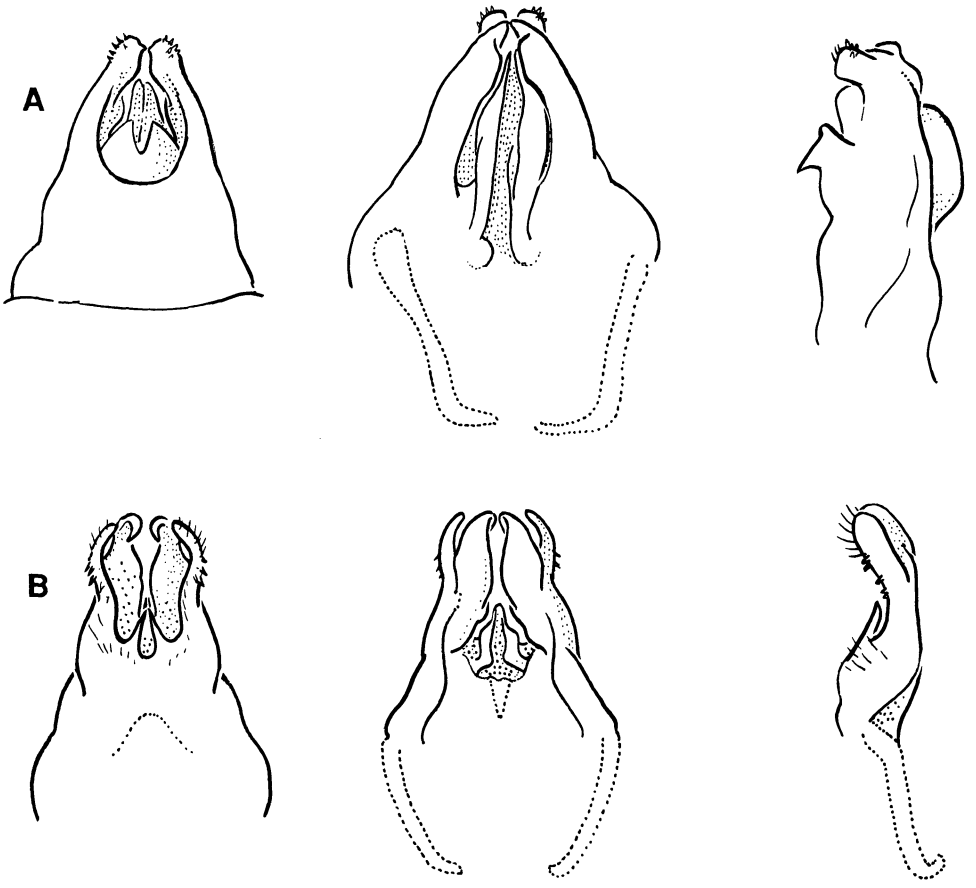


FIG. 11. Male genitalia: dorsal, ventral and lateral views. A, *Ajorama balatukanis* holotype; B, *Bejorama intermedia* holotype.

plete. Forewing length more than 2.4 times as long as pronotum.

Doulandrevus pendleburyi n. sp.

Holotype.—Male.Malaysia, Pahang, Cameron's Highlands, No. 4 Camp., 4800 feet, 17 x 1923 (H. M. Pendlebury). PARIS.

Figs. 8, 20. Table 2. Differs from other two members of group in the shape of the male epiphallus, and in having an incomplete mirror and a dark brown pronotal disk.

Male.— Size medium to large; color dark reddish brown with rusty colored legs; head and forewings smooth and shiny; pronotum covered with dense pubensence. Head: Dorsum dark reddish brown, unbanded; median ocellus much smaller than lateral ones; face nearly black, but orange on clypeus and labrum; cheeks dark brown, darkest below eyes. Pronotum dark reddish brown, covered with pubescence, especially dense on latteral lobes. Forewings: dorsum dark brown, smooth, blackish in basal area and darker again in apical area; lateral field blackish. Abdomen: dor-

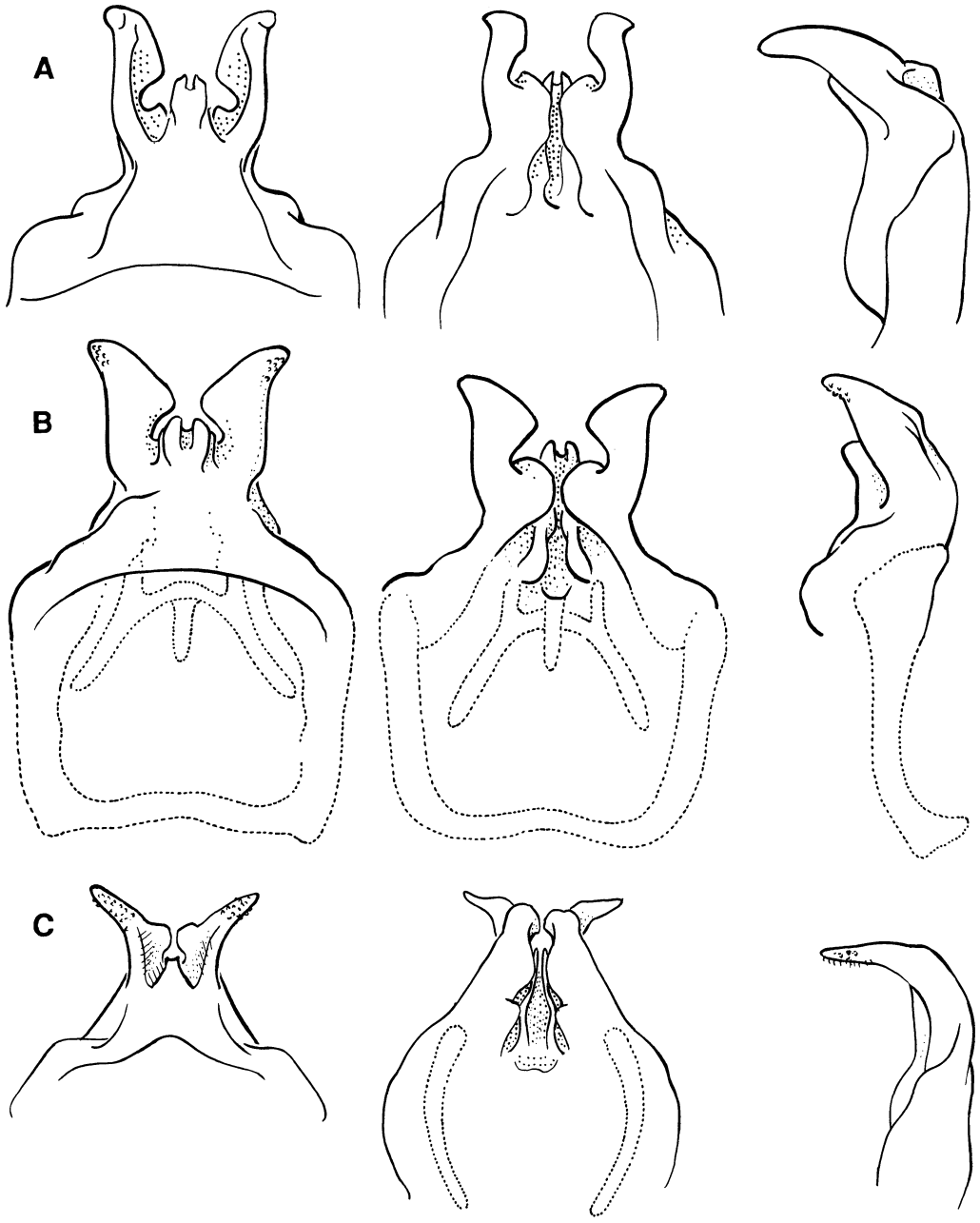


FIG. 12. Male genitalia: dorsal, ventral, and lateral views. **A**, *Endolandrevus manokwari* holotype; **B**, *Endolandrevus rostratus* lectotype; **C**, *Endolandrevus bomberi* holotype.

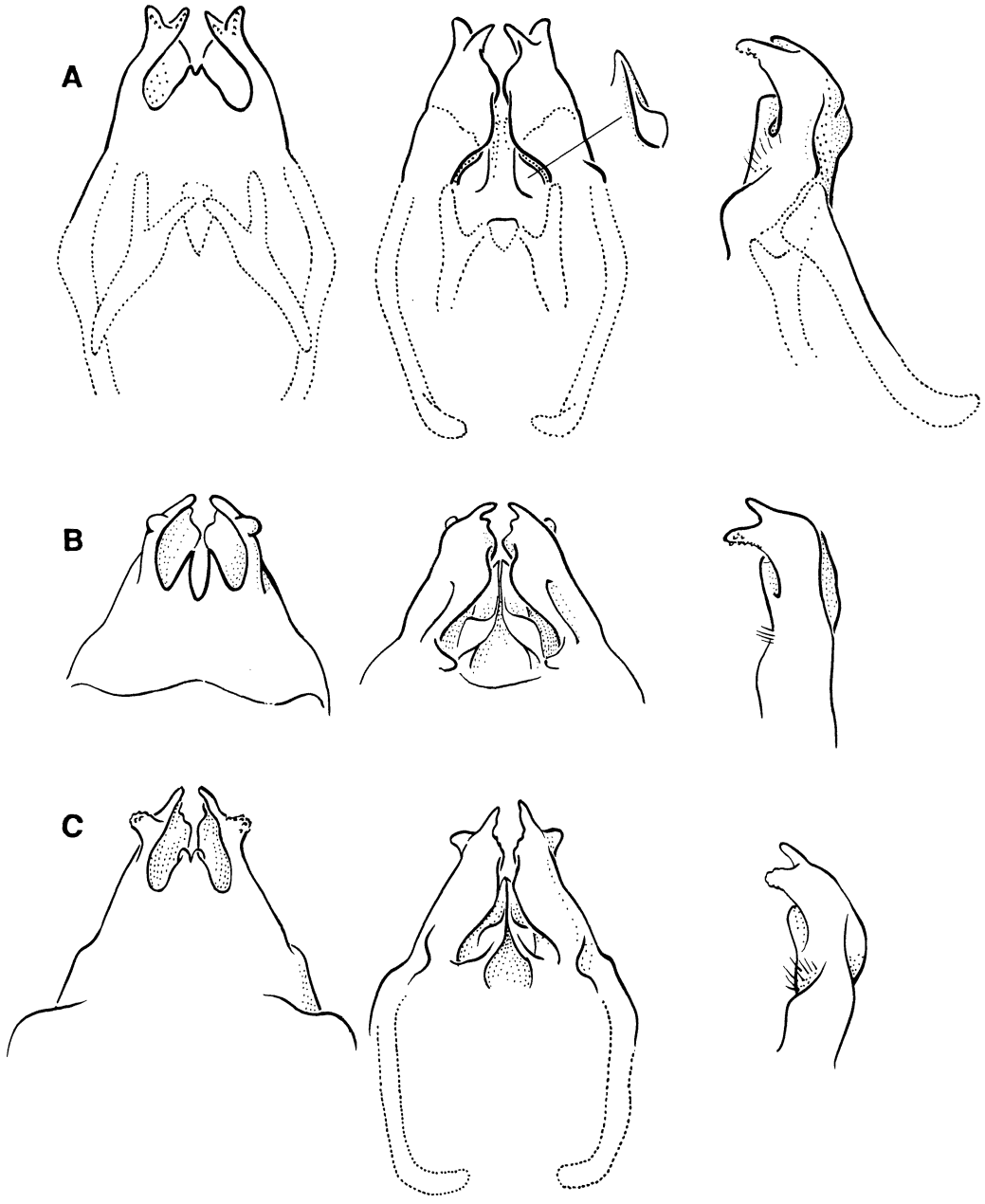


FIG. 13. Male genitalia: dorsal, ventral and lateral views. **A**, *Jorama isarogensis* holotype; **B**, *Jorama palawanensis* holotype; **C**, *Jorama curtipennis* holotype.

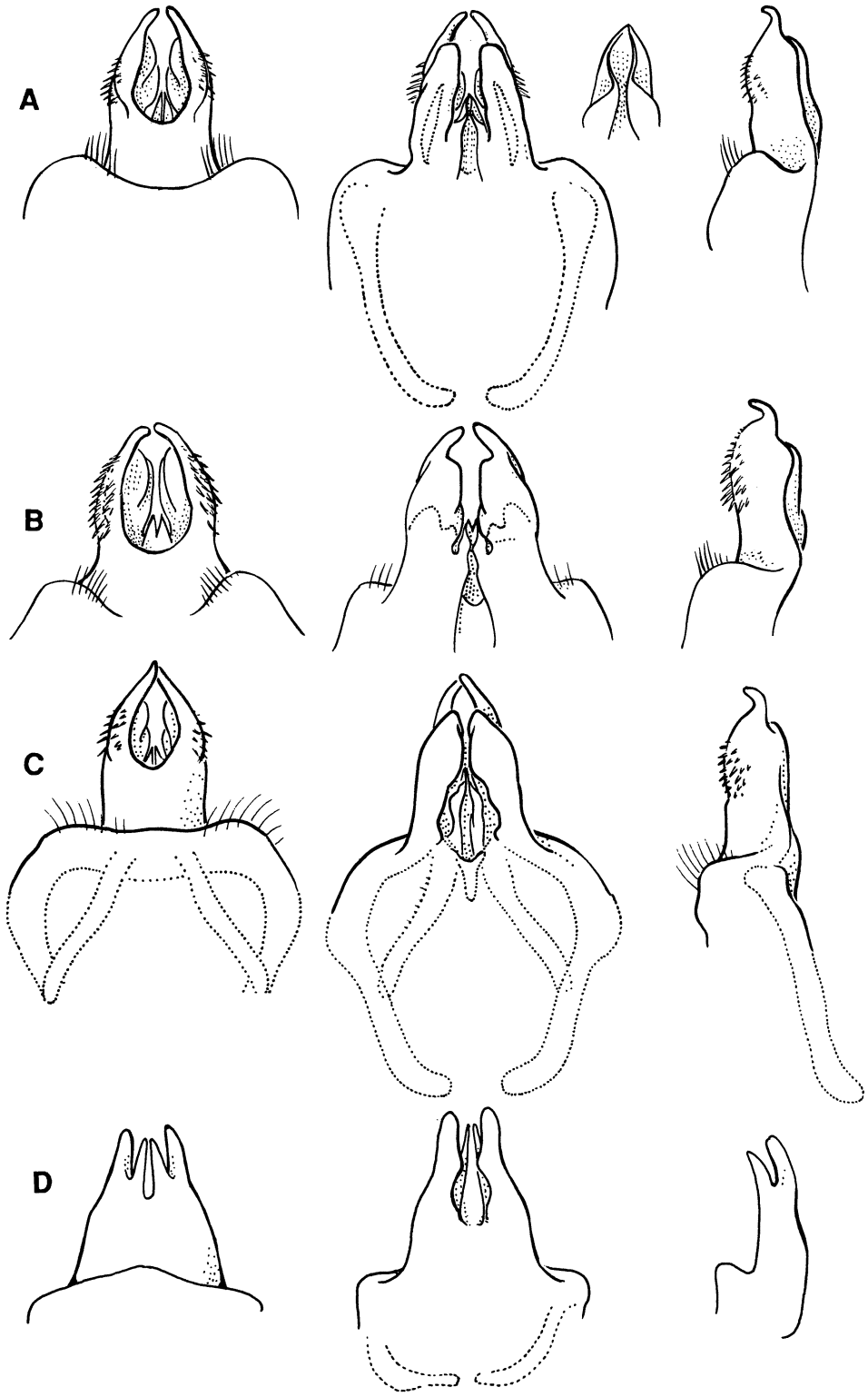


FIG. 14. Male genitalia: dorsal, ventral, and lateral views. **A**, *Avdrenia ajax* holotype; **B**, *Avdrenia fordi* holotype; **C**, *Avdrenia malaita* holotype; **D**, *Eleva wairahu* holotype.

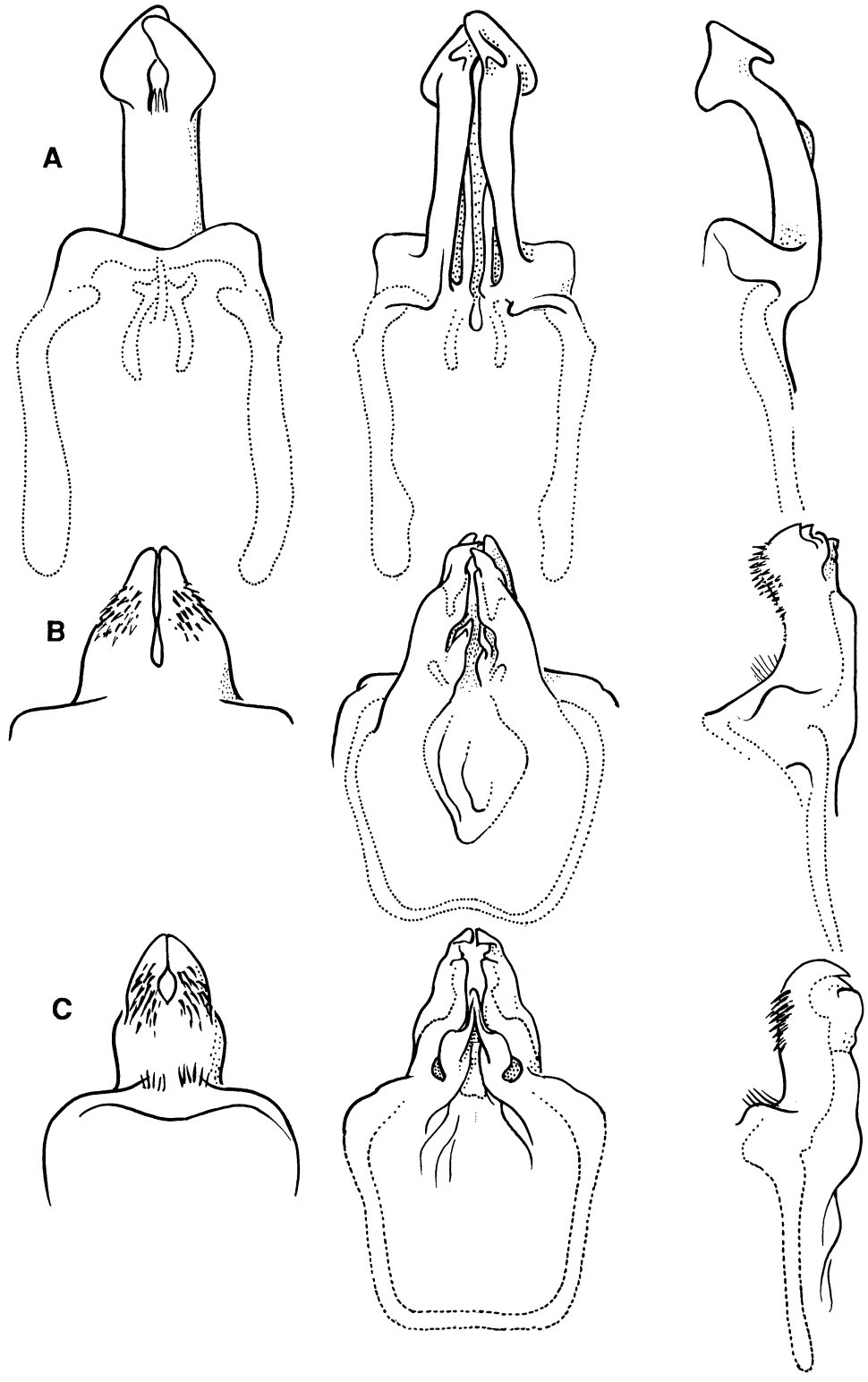


FIG. 15. Male genitalia: dorsal, ventral, and lateral views. **A**, *Jareta peraki* holotype; **B**, *Fijina savu* holotype; **C**, *Fijina viti* holotype.

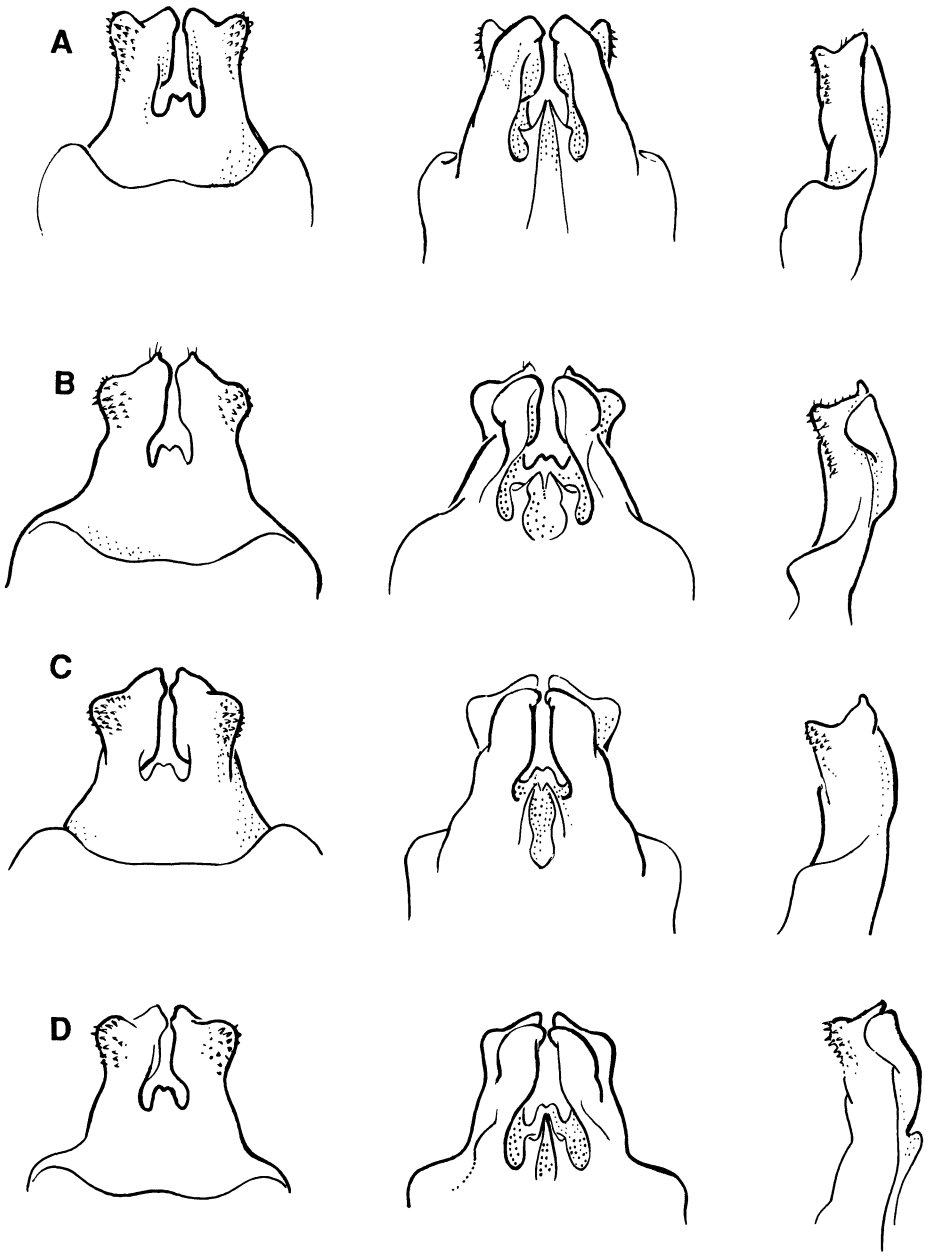


FIG. 16. *Neova bodemensis* male genitalia: dorsal, ventral, and lateral views. **A**, holotype; **B**, Ifalik Atoll; **C**, Wangaroi, New Britain; **D**, Northwest New Guinea.

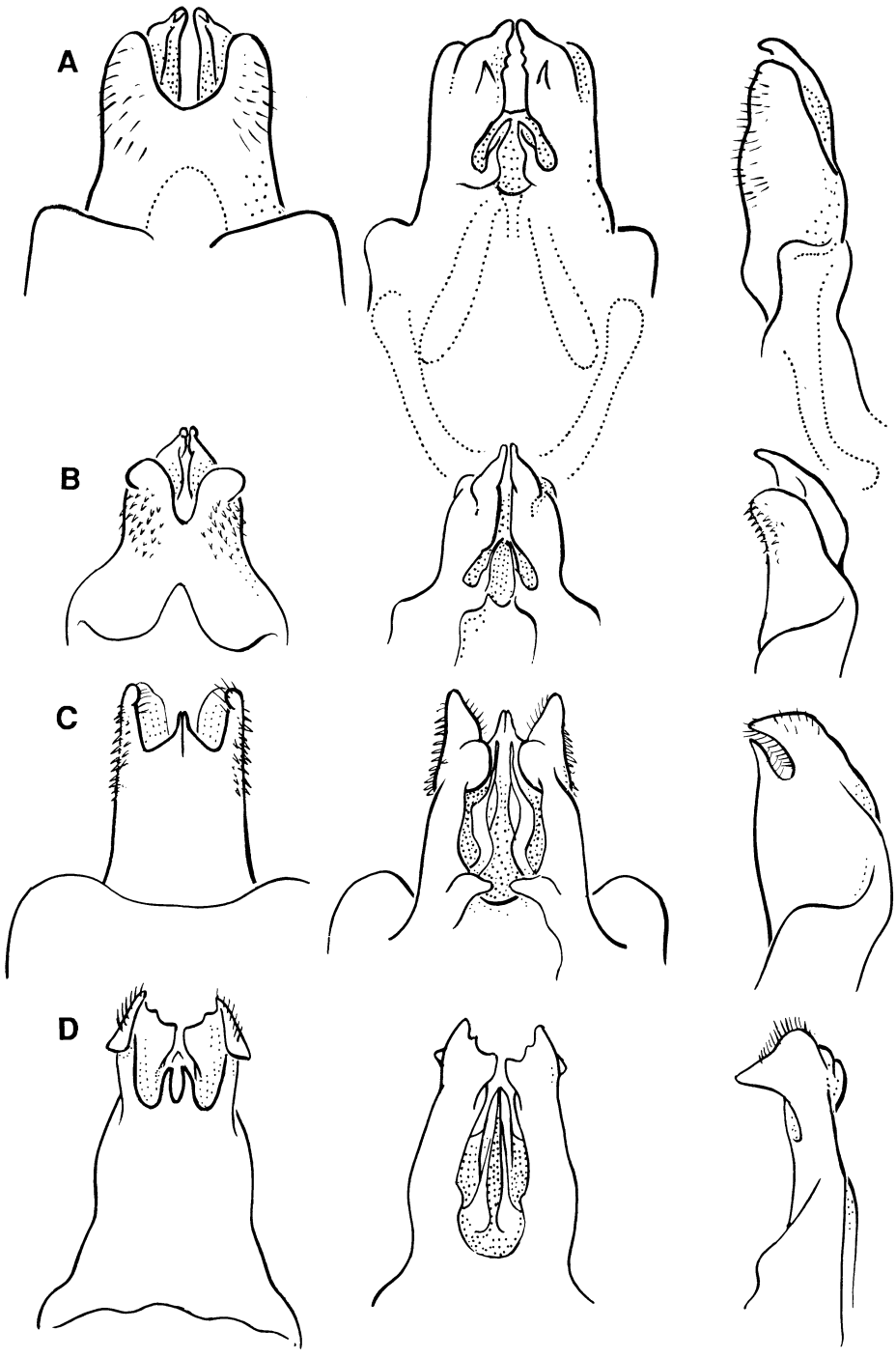


FIG. 17. Male genitalia: dorsal, ventral and lateral views. **A**, *Ginidra wauensis* holotype; **B**, *Sigeva gressitti* holotype; **C**, *Papava aiyurae* holotype; **D**, *Kotama maai* holotype.

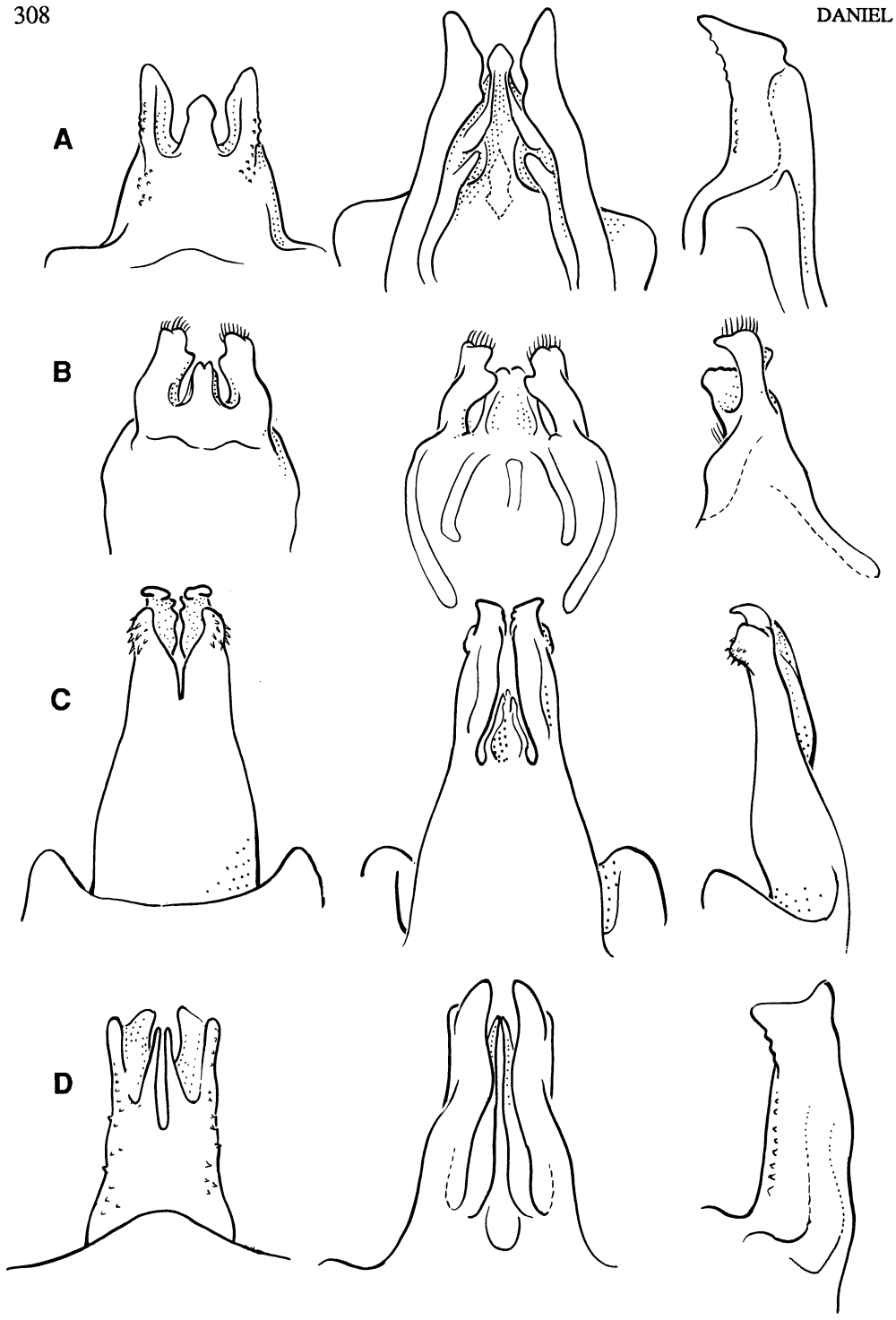


FIG. 18. Male genitalia: dorsal, ventral, and lateral views: A, *Mjöbergella warra* holotype; B, *Odontogryllodes brevicauda* holotype. C *Ahldreva nondugli* holotype; D, *Copholandrevus australicus* holotype.

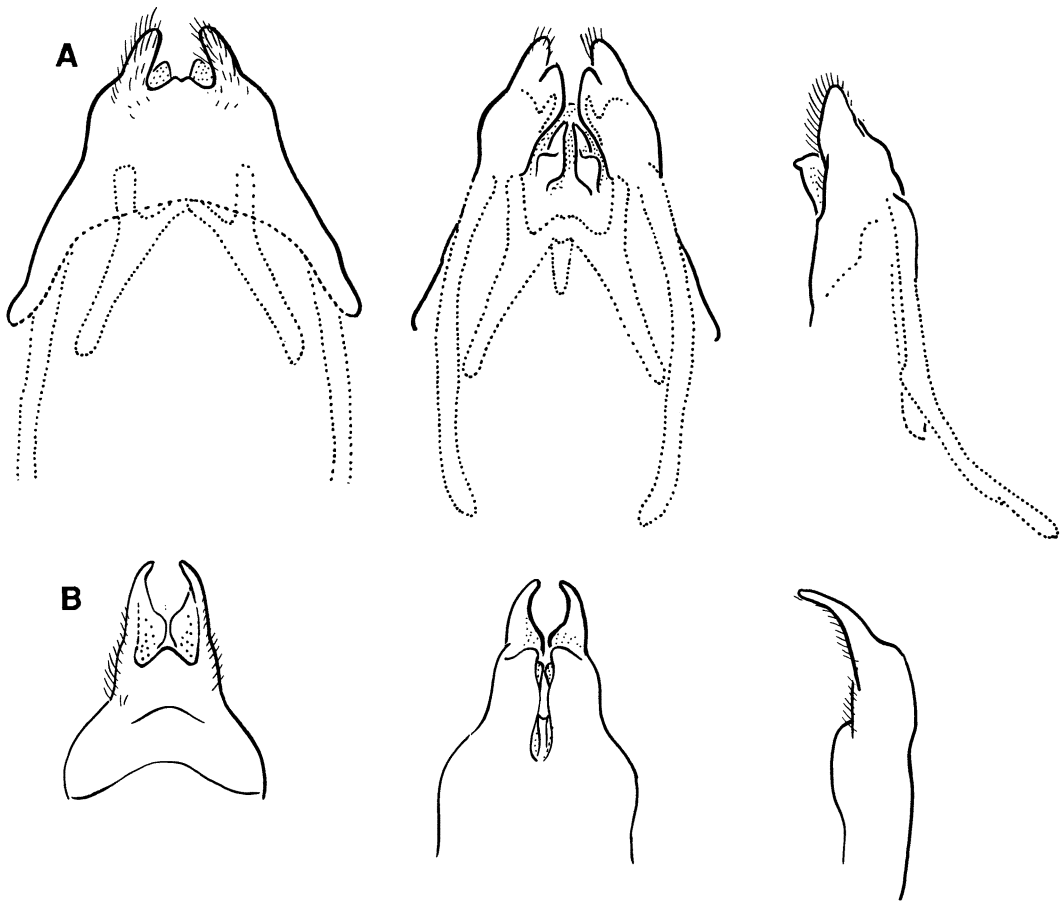


FIG. 19. Male genitalia: dorsal, ventral, and lateral views. **A**, *Apiotarsoides semialatus*; **B**, *Pteroplistus dilinhensis* holotype.

sum brown with a median row of dark spots; sides of tergites blackish. Legs rusty red.

Specimens.— Holotype male PARIS.

Duolandrevus rufus Chopard

Duolandrevus rufus Chopard 1931: 131. Holotype male. Malaysia, Perak, Batang Padang, Jor camp, 1800 feet, 30 v 1923 (H. M. Pendlebury) BRUSSELS. Type examined.

Figs 8, 20. Table 1. Differs from other members of this group as follows: Mirror complete (incomplete in *pendleburyi*); body length more than 20 mm (*karnyi* less than 20 mm); lateral lobes hairy (not hairy in *karnyi*); dorsum of abdomen orange brown (dark brown in *karnyi*).

Male.— Size medium to large; color pale reddish brown to orange. Head: Dorsum smooth, orange brown; face and cheeks orange-brown. Pronotum: dorsum mostly smooth, darker in color than head; lateral lobes with dense pubescence. Forewings smooth, lighter than pronotum; lateral field

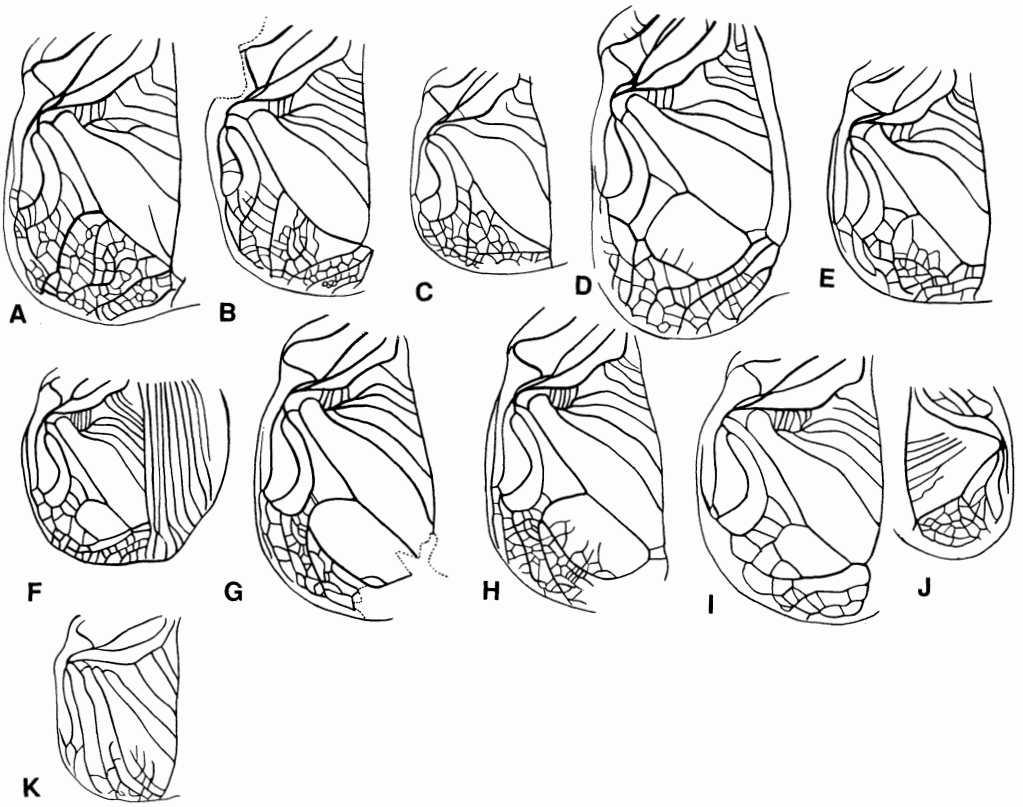


FIG. 20. Male forewings. **A**, *Duolandrevus ishigaki* holotype; **B**, *Duolandrevus* major holotype; **C**, *Duolandrevus hongkongae* holotype; **D**, *Sutepia thailandica* holotype; **E**, *Duolandrevus pendleburyi* holotype; **F**, *Duolandrevus karnyi* holotype; **G**, *Duolandrevus rufus*, Chopard determined; **H**, *Duolandrevus rufus* holotype; **I**, *Duolandrevus gingoogus* holotype; **J**, *Duolandrevus coriaceus*, from Shiraki; **K**, *Ginidra wauensis* holotype.

reddish. Abdomen: brown, very pubescent. Legs orange colored.

Specimens.— Holotype male BRUSSELS.

Duolandrevus karnyi n. sp.

Holotype.—Male. Indonesia, Java, Tjibodas [Cibodas], 20 viii 1930 (Karny). PHILADELPHIA.

Figs 8, 20. Table 1. Distinguished from other members of this group as follows: male epiphallic lobes more blunt and hairy; small central process not bifurcate; mirror complete but small (incomplete in *pendleburyi*, large in *rufus*); body length less than 20 mm (*rufus* more than 20 mm); lateral lobes not hairy (hairy in *rufus*); dorsum of abdomen dark brown (orange brown in *rufus*).

Male.— Head and pronotum rusty red, legs orange, forewings dark brown. Head: dorsum reddish brown or rusty colored. Head, pronotum and wings shiny, abdomen hairy on dorsum. Pronotum: dorsum and lateral lobes same color as head. Abdomen: dorsum very hairy, rusty-brown in color, nearly black along

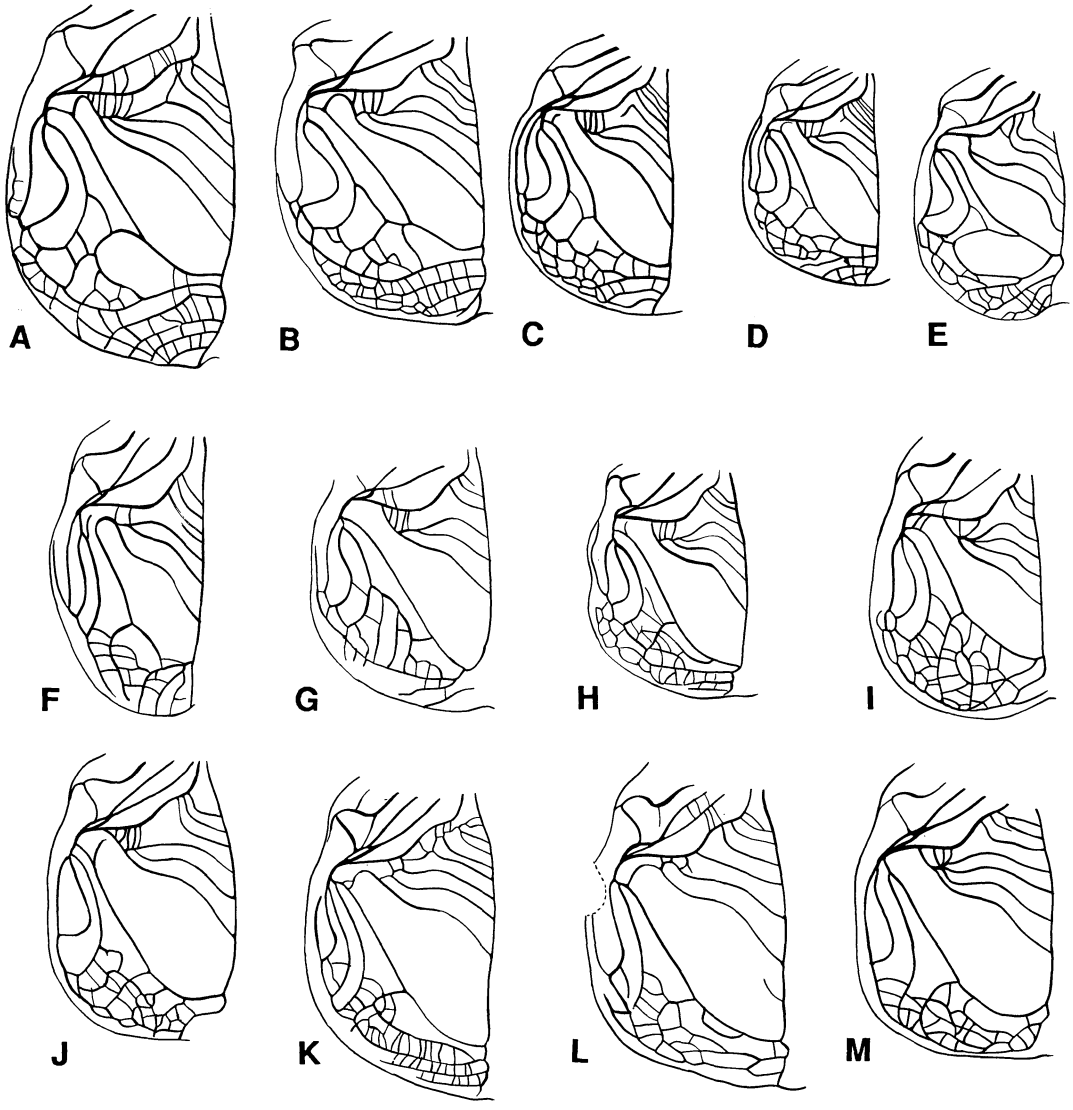


FIG. 21. Male forewings. **A**, *Duolandrevus luzonensis* holotype; **B**, *Duolandrevus balabacus* holotype; **C**, *Bejorama intermedia*; **D**, *Bejorama intermedia* holotype; **E**, *Landreva angustifrons* holotype; **F**, *Ajorama balatukanis* holotype; **G**, *Repapa sapagaya* holotype; **H**, *Repapa tenompokae* holotype; **I**, *Repapa brevipes* holotype; **J**, *Jorama palawanensis* holotype; **K**, *Jorama isarogensis* from Camarines; **L**, *Jorama isarogensis*; **M**, *Jorama curtipennis* holotype.

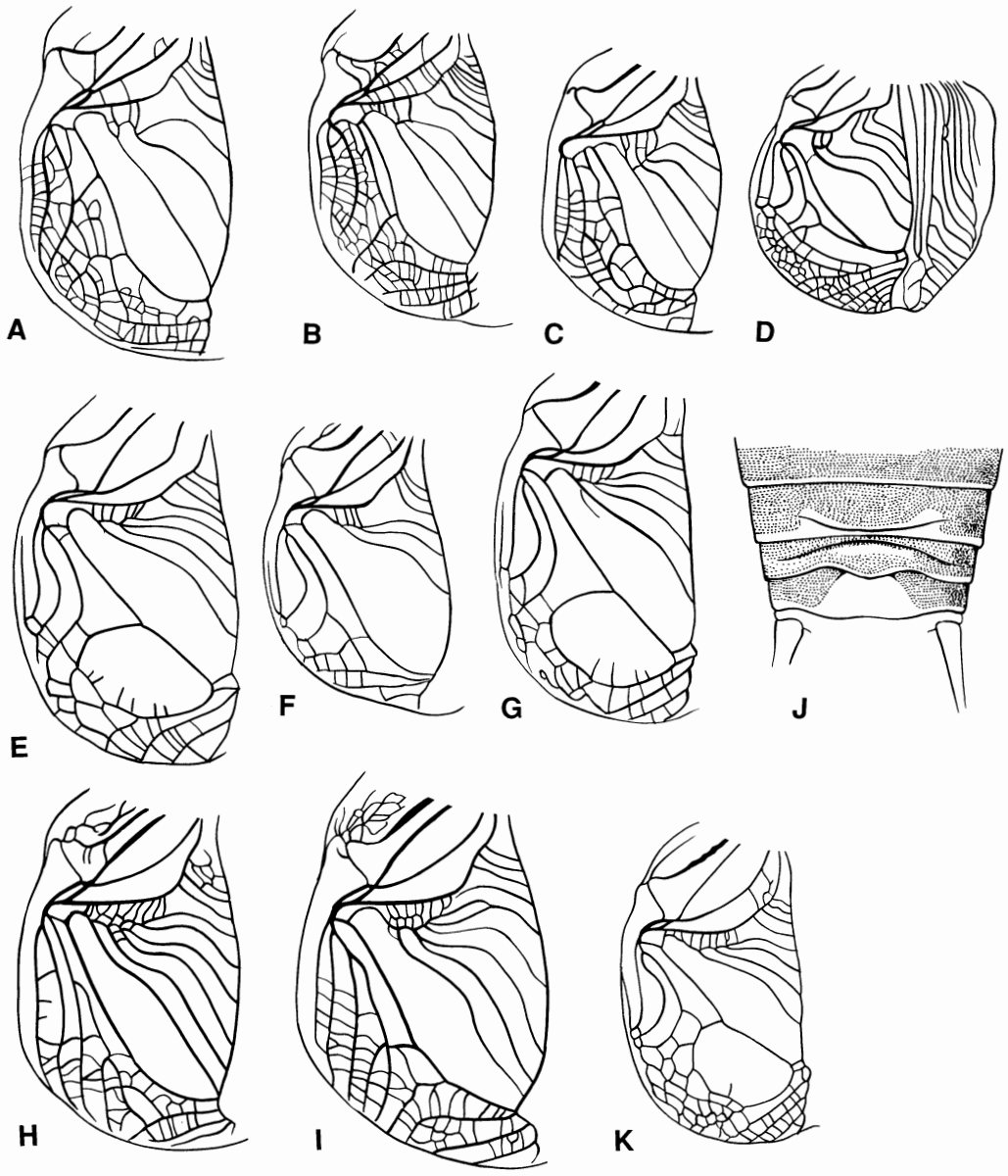


FIG. 22. Male forewings (except J). **A**, *Avdrenia ajax* holotype; **B**, *Avdrenia fordi* holotype; **C**, *Avdrenia malaita* holotype; **D**, *Jareta sedlaceki* holotype; **E**, *Endolandrevus rostratus* lectotype; **F**, *Endolandrevus bomberi* holotype; **G**, *Endolandrevus manokwari* holotype; **H**, *Fijina viti* holotype; **I**, *Fijina savu* holotype; **K**, *Duolandrevus palauensis* holotype; **J**, *Fijina viti* holotype male, dorsal terminal tergites.

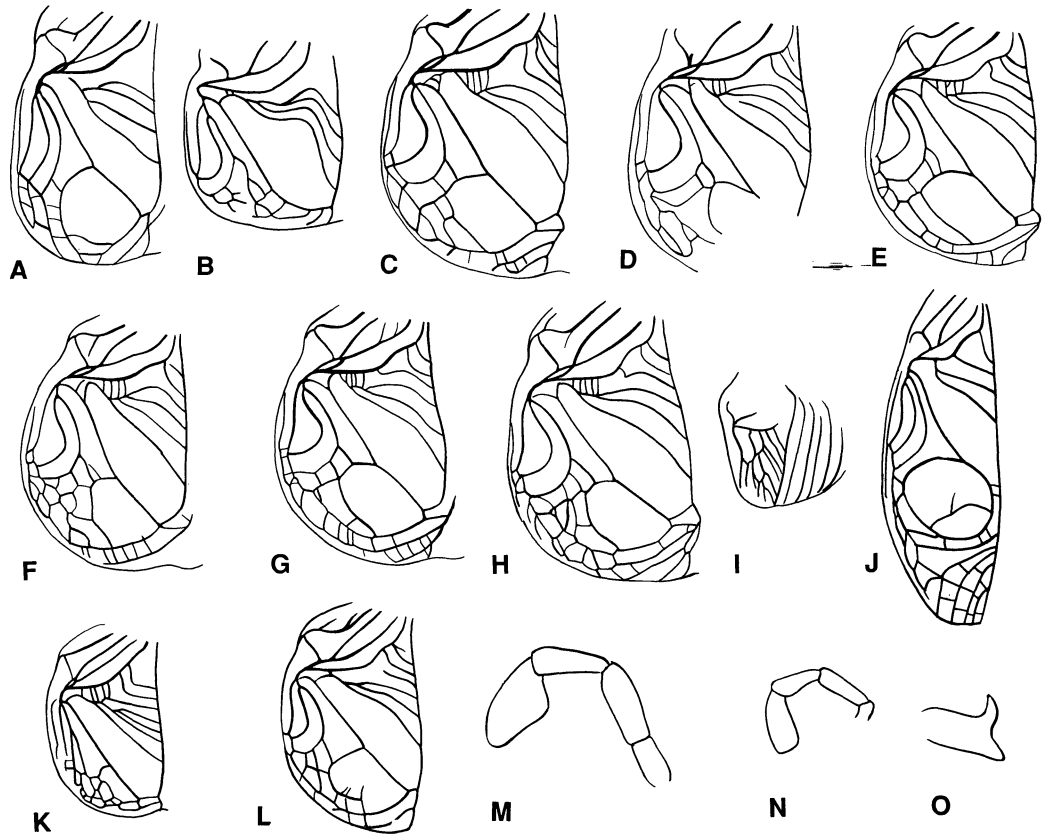


FIG. 23. Male forewings (except M-O). **A**, *Endolandrevus brevipes*; **B**, *Solepa variegata* holotype; **C**, *Neova bodemensis* holotype; **D**, *Neova bodemensis* from Ifalik Island; **E**, *Neova* bodemensis from Cyclops Mts.; **F**, *Neova bodemensis* from Upper Wangaroi, New Britain; **G**, *Neova bodemensis* Irian Jaya; **H**, *Neova bodemensis* from near Waris, Irian Jaya; **I**, *Kotama maai* holotype; **J**, *Pteroplistus dilinhensis* holotype; **K**, *Mjöbergella macrocephala* holotype; **L**, *Mjöbergella warra* holotype male. **M**, *Papava aijurae* labial palp; **N**, *Sigeva gressitti* labial palp; **O**, *Duolandrevus coriaceus*, terminal projection of male genitalia (lateral view) after Shiraki.

midline; venter reddish brown. Legs all uniformly reddish.

Specimens.— Holotype male PHILADELPHIA.

Gingoogus Group

Distinguished from all other groups by the male genitalia. Mirror complete but small. Dorsum of abdomen dark brown. Head narrower than pronotum. Abdomen and legs not patterned with light and dark.

Duolandrevus balabacus n. sp.

Holotype.— Male. Philippines, Balabac Island, 10 km S of Balabac, 25 ivory-colored 1962 (M. Thompson). HONOLULU.

Figs 9, 21. Table 1. Differs from the similar *gingoogus* as follows: smaller (see Table 2); epiphallus noticeably shorter; apical area of forewings with many more cells; mirror less distinct. Lateral pronotal lobes and dorsum of abdomen hairy (unlike *luzonensis*). The hind legs of *balabacus* are lost and cannot be compared.

Male.— Size medium to small; color dark brown, with reddish brown legs (hind legs lost). Sides of pronotum, legs, and abdomen pubescent. Forewings dark reddish brown on dorsal and lateral fields. Front and middle legs reddish brown.

Specimens.— Holotype male HONOLULU.

Duolandrevus gingoogus n. sp.

Holotype.—Male. Philippines, Mindanao, Misamis Oriental, Mt. Pomalithi, 21 km west of Gingoog City. 800-1000 m, 11 x 1965 (H. M. Torrevillas). HONOLULU.

Figs 9, 20. Table 1. Distinguished from the very similar *balabacus* as follows: epiphallus noticeably longer; apical area of forewings with many fewer cells; mirror distinct, though small.

Male.— Medium in size, dark reddish brown with orange legs. Sides of body and legs noticeably pubescent. Head and dorsum dark reddish brown, unbanded. Legs uniform brown.

Females: The only female presumed to belong to this species is from near the type locality. Similar to male in size and color.

Specimens.— Holotype male HONOLULU.
Paratypes: Misamis Oriental, Dinawihan Gingoog, 26 km E Gingoog City, 100-300 m, 30 viii 1965 (Torrevillas) 1 female HONOLULU. Misamis Oriental, Mt. Balatukan, 15 km SW Gingoog, 1000-2000 m, 27-30 iv 1960 (Torrevillas) 1 female HONOLULU.

Duolandrevus luzonensis n. sp.

Holotype.—Male. Philippines, S O. Luzon. PHILADELPHIA.

Figs 9, 21. Table 1. Differs from *gingoogus* and *balabacus* as follows: epiphallic lobes wider (in side view) lateral lobes and dorsum of abdomen smooth, shiny (not hairy). Head wider than pronotum.

Male.— Size large, color dark reddish brown head and pronotum; shiny. Head: dorsum dark red brown, shiny; median ocellus much smaller than large lateral ocelli; face and cheeks shiny, dark red-brown. Pronotum uniformly dark red-brown and shiny. Forewings shiny red-brown; lateral field darker than dorsum. Hindwings absent. Abdomen shiny, dark red brown. Legs all uniformly orange. Hindtibiae dark brown, orange between spurs.

Specimens.— Holotype male PHILADELPHIA.

REPAPA new genus

Type species: *R. sapagaya* n. sp.

Distinguished from all other genera by the male genitalia and the following set of characters: tympana present on both inner and outer faces; forewing length less than 2.5 times as long as pronotum; body length 16 mm or less; forewing without a mirror.

Repapa sapagaya n. sp.

Holotype.— Male. Borneo (British North), Sandakan Bay (SW), Sapagaya lumber camp, 2 - 20 m, 9 xi 1957 (Gressitt). HONOLULU.

Figs 10, 21. Table 1. Differs from other members of the genus by the male genitalia. Most similar to *tenompokae*, but mirror larger, with fewer harp veins, file with over 90 teeth; head narrower than pronotum.

Male.— Size small, color dark reddish brown with orange-brown legs. Abdomen: dark brown. Forewings: dark gray-brown, partly horny. Hindlegs lost.

Females not known.

Specimens.—Holotype male HONOLULU.

Repapa tenompokae n. sp.

Holotype.— Male. British North Borneo, 1460 m, 30 miles east of Jesselton, [Kota Kinabalu] 17-21 x 1958 (T. C. Maa). HONOLULU.

Figs 10 21. Table 2. Differs from all other genera by the male genitalia. Very similar to *sapagaya*, but with more harp veins, and with

a less developed mirror; file with fewer than 60 teeth; head wider than pronotum.

Male.— Size small, color dark red brown with orange legs, dark horny forewings. Head not banded. Abdomen: dark brown. Forewings: dark reddish brown, not translucent. Front and middle legs: uniform orange-brown. hindfemora orange-brown, becoming dark brown on dorsum, dark area with a lighter patch.

Specimens.— Holotype male HONOLULU.

Repapa brevipes (Chopard)

Duolandrevus brevipes Chopard 1937: 138. Holotype male, N. Palawan, Binaluan, Nov - Dec 1913 (G. Boettcher). EBERSWALDE-FINOW. Type examined.

Notes on Holotype.—Table 1.

SOLEPA new genus

Type species: *Solepa variegata* n. sp.

Differs from all other genera in the shape of the male genitalia. Also has the following combination of characters: Pronotum, abdomen, and legs variegated pale and dark brown; dorsum of head with six pale longitudinal stripes; forewings short, about 1.5 times as long as pronotum; mirror obsolete.

See also *S. variegata.*

Solepa variegata n. sp.

Holotype.— Male.Solomon Islands, Guadalcanal, Popamanasin, 5000 feet, 15 x 1965, No. 18826 (P. Greenslade). LONDON.

Figs 10, 23. Table 1. Variegated pronotum and abdomen. Forewings very short. File without a bunch of raised teeth. Genitalia as figured.

Male.— Head: dorsum with 6 dark brown longitudinal bands on vertex and occiput; face with a wide pale gray brown band descending center of frons, bordered by black along the antennal sockets; upper half of clypeus dark brown, lower half and labrum pale brown; dark brown to black below antennae; cheeks pale brown below eyes and posterior to lower half of eyes, dark brown above middle of eyes. Pronotum: dorsum marked as figured; lateral lobes pale brown in lower half, dark brown to black in upper half; lower margin dark brown. Forewings: dorsal field brown, darker in apical area; lateral field dark brown. Abdomen: dorsum pale brown, with a median row of black marks (one per segment) but last tergite largely black; venter pale brown, subgenital plate dark brown to black. Legs all pale brown. Hindfemora with large black area before the knees and proximal to that an irregular dark mark on upper face; hindtibiae brown, blackish between the spurs.

Specimens.— Holotype male LONDON.

ELEVA new genus

Type species: *E. wairahu* n. sp.

Distinguished from all other genera by the male genitalia (Fig. 14); forewings without a stridulum; forelegs without tympana; forewings shorter than pronotum; head about 7 times as wide as rostrum.

Eleva wairahu n. sp

Holotype.— Male. Solomon Islands, San Cristobal, Wairahu River, 100 m, 9-15 v 1964. HONOLULU.

Male.— Fig. 14. Table 1. Size small, color dark brown with yellow-brown legs. Forewings about as long as pronotum, without a stridulum. Forelegs without tympana. Pronotal disk patterned yellow-brown and dark brown. Abdomen: pale brown with dark markings along median line and lateran margins. Forewings: very short, blackish, slightly overlapping medially.

Specimens.— Holotype male HONOLULU.

NEOVA new genus

Type species: *N. bodemensis* n. sp.

Differs from other genera by the male genitalia; also with a large pale area on forehead adjacent and anterior to median ocellus; tympana present on both inner and outer faces; mirror complete.

Neova bodemensis n. sp.

Holotype.— Male. New Guinea (Netherlands), Bodem, 100 m, 11 km southeast of Oeberfaren, 7-17 vii 1959 (T. C. Maa). Honolulu.

Figs 16, 23. Table 1.

Male.— Size medium; color dark brown with orange-brown legs; pubescent head and legs. Head: dorsum with stripes 1 and 2, forehead pale anterior to median ocellus. Abdomen: dorsum patterned with light and dark brown. Forewings: gray-brown, translucent. Right wing above left. All femora orange-brown.

Female: Similar in color and size to male.

Specimens.— Holotype male HONOLULU. *Paratypes:* Micronesia, Ifalik Island, Ifalik atoll, 7 ii 1953 (J. W. Beardsley) 1 male, HONOLULU. New Britain, Gazelle Peninsula, Upper Warangoi, Illugi, 230 m, 8-11 xii 1962 (J. Sedlacek). 1 male, HONOLULU. New Guinea (Northwest), Ifar, Cyclops Mountains, 450-500 m, 9 ix 1962 (J. Sedlacek). 1 male, HONOLULU. New Guinea (Neth.) Waris, S of Hollandia, 450-500 m, 1-7 viii 1959 (T. C. Maa). 1 male, 1 female, HONOLULU.

Jorama Clade

This group of genera includes *Jorama, Ajorama, Bejorama, Sutepia* and *Jareta.* It is most closely related to the Duolandrevus Clade (Figs 30, 32).

JORAMA new genus

Type species: *J. palawanensis* n. sp.

Epiphallus with two closely spaced terminal projections; upper one with short spurs. Mirror obsolete. Forewings less than 2.3 times as long aspronotum. Head more than 5.0 times as wide as rostrum. Dorsum of abdomen with longitudinal dark and pale bands. Dorsum of head with longitudinal pale bands. Face without a major ridge at lower inner margin of the eye. Head narrower than pronotum.

Jorama palawanensis n. sp.

Holotype.— Male. Philippines, Palawan, 3 km northeast of Tinabog, 10 v 1962 (H. Holtman). HONOLULU.

Figs 13, 21. Table 1. Differs from other members of the genus as follows: epiphallic lobes different in shape (see Fig. 12) central lobe more deeply incised; smaller (see Table 1); distal end of forewing rounded (similar to *curtipennis*; more obliquely truncated in *isarogensis*). Lateral pronotal lobes pubescent; inner face of hind femora without dark marks

Male.— Size medium; color dark brown with yellowish brown legs. Head: dorsum with 6 pale stripes and with pale areas posterior to each lateral ocellus and anterior to median ocellus; face with an inverted Y-shaped pale area on forehead. Abdomen: dorsum patterned pale and dark brown; venter dark brown. Forewings gray-brown, translucent. Front and middle femora yellowish-brown. Hind femora yellowish brown, becoming dark about the knees.

Specimens.— Holotype male HONOLULU.

Jorama isarogensis n. sp.

Holotype.— Male. Philippines, Camarines Sur, Mt. Isarog, 750-850 m, 20 ivory-colored 1963 (H. M. Torrevillas). HONOLULU.

Figs 13, 21. Table 1. Differs from other members of the genus as follows: Very similar to *palawanensis,* but central lobe not

deeply incised as in *palawanensis*; larger than *palawanensis*, smaller than *curtipennis*; distal end of forewings oblique (rounded in both *curtipennis* and *palawanensis*).

Male.— Medium in size, dark brown in color, blackish on inner and outer faces of femora and tibiae. Tympana on inner and outer faces, small, nearly equal in size. Head: dorsum with four longitudinal pale stripes; face and cheeks black. Pronotum: dorsum with undulating surface, pubescent in depressions; lateral lobes black with some gray pubescence. Abdomen: dorsum patterned brown and blackish. Forewings: dorsum brown; lateral field dark brown to black; left wing above right. Front and middle legs: pale brown on dorsum, becoming black distally, especially dark on inner and outer faces; tibiae dark brown to black, smooth on upper face, pubescent on lower face. Hind legs: outer face with oblique blackish stripes; dorsum pale brown; knee area blackish.

Female.— Very similar to males in color and size.

Specimens.— Holotype male HONOLULU. Paratypes: Philippines: same data as holotype, 3M 3F, HONOLULU. Misamis Oriental, 15 km W of Gingoog, 1 female, Honolulu. Camarines Sur, Mt. Iriga, 500-600 m, 14 iv 1962, 1 female, HONOLULU. Negros Island, Masaling, ii and iii (Alcala). PHILADELPHIA.

Jorama curtipennis (Chopard) n. comb.

Duolandrevus curtipennis Chopard 1937. Arb. üb. morph. u. taxon. Ent. 4/2: 139. Holotype male, N. Palawan, Binaluan, Nov - Dec 1913 (G. Boettcher). EBERSWALDE-FINOW.

Differs from other members of genus as follows: male epiphallus without deeply incised median lobe (unlike *palawanensis*); forewing rounded along posterior margin (oblique in *isarogensis*).

Notes on Holotype.— Figs 13, 21. Table 1. Body color dark reddish brown, shiny; femora orange. Head: dorsum with four pale longitudianl stripes, one behind inner margin of eyes most distinct; face dark with inverted Y-shaped pale marking on frons; cheeks dark brlwn but with an ivory area below lower anterior margin of eyes. Pronotum: dorsum dark reddish brown, shiny; lateral lobes dark browh, with small pale spot in lower anterior corner. Forewings: dorsal field dark brown; lateral field dark brown to black. Hindwings: none. Abdomen: dorsum dark brown, somewhat pubescent, darker at distal end; venter dark brown. Legs all orange brown, hind femora become blackish on knees.

AJORAMA new genus

Type species: *Ajorama balatukani* n. sp.

Differs from all other genera in the male genitalia. Also with the following combination of characters: body length less than 15 mm; lacking an outer tympanum; head narrower than pronotum; mirror incomplete; forewing ca. 2.2 times as long aspronotum.

Ajorama balatukanis n. sp.

Holotype.— Male. Philippines, Misamis Oriental, Mt. Balatukan, 15 km southwest of Gingoog, 1000 - 2000 m, 27-30 iv 1960 (H. M. Torrevillas). HONOLULU.

Male.— Figs 11, 21. Table 1. Size small; color dark brown with pale brown legs; head, pronotum, legs, and abdomen pubescent. With inner tympanum only. Head: face dark brown down to and including clypeus; labrum pale brown; dorsum dark reddish brown, with a round pale area posterior to each lateral ocellus; face dark brown on frons, pale brown on clypeus and labrum; cheeks pale brown. Pronotum: dorsum dark brown; lower portion of lateral lobes pale brown. Abdomen dark reddish brown. Forewings: dorsal field pale brown, becoming blackish in apical area. Outer auditory tympanum absent. Legs pale

brown, but hind femora with two dark bands in distal half on upper and inner faces. Male genitalia as figured.

Specimens.—Holotype male HONOLULU. Paratype: male, Philippines, Ifugao Prov., Liwo, 8 km E of Mayoyao, 1000-1300 m, 30-31 v 1967 (Torrevillas). HONOLULU.

BEJORAMA new genus

Type species: *B. intermedius* Chopard.

Distinguished from *Jorama* and *Ajorama* as follows: male genitalia as in Fig. 11; head width less than 5.0 times rostral width (greater than 5.0 in *Jorama*); mirror absent (a small mirror present in *Ajorama*). Dorsum of abdomen hairy, lateral lobes of pronotum not very hairy.

Bejorama intermedia (Chopard) n. comb.

Duolandrevus intermedius Chopard 1969: 148. Holotype male, Malaya, Perak, Gunong Kladang. PARIS. New combination. Type not examined.

Figs 11, 21. Table 1. Color dark reddish brown, legs orange, body mostly shiny. The type was not examined. The illustrations are of the male from Kuala Lumpur.

Specimens.— Malaysia, Kuala Lumpur, Gombak Valley, 1 male, PARIS.

SUTEPIA new genus

Type species: *Sutepia thailandica* n. sp.

Lateral epiphallic lobes each with a single process; the two lobes closely juxtaposed at distal end. Male forewing with a well-developed mirror and with ten harp veins.

Sutepia thailandica n. sp.

Holotype.— Male. Thailand, Doi Suthep, 29-31 iii 1958 (T. C. Maa). HONOLULU.

Male.— Figs 7, 20. Table 1. Size large; color dark brown, but head and pronotum blackish. Head: wider than pronotum, dorsum blackish, face and cheeks blackish; face with prominent ridge and several serrations beneath each eye. Pronotum: dorsum wider at anterior end, blackish with gray pubescence; lateral lobes blackish with dense pubescence. Abdomen blackish with gray pubescence on sides. Forewings gray brown, translucent on dorsum; dark brown to black on lateral field; mirror complete, without dividing veins; left wing above. Hindwings absent. Front and middle legs dark reddish brown. Hind femur uniform reddish brown, darker on knees.

Specimens.— Holotype male HONOLULU.

JARETA new genus

Type species: *D. sedlaceki* n. sp.

Distinguished from all other genera by the male genitalia; with only an outer tympanum; mirror incomplete; head about 6 times as wide as rostrum.

Jareta sedlaceki n. sp.

Holotype.— Male. Indonesia? The label is difficult to read, appears to be Perai [=Erai] of Indonesia, but is perhaps Perak of Malaya. VIENNA.

Figs 15, 22, 24. Table 1. Male genitalia as in Fig. 16. Foretibiae with only a large outer tympanum.

Male.— Size medium to large; color dark reddish brown; with some pubescence mainly on legs, but also on lateral lobes. Head brwon face dark brown. Pronotum: orange and dark brown on dorsum, lateral lobes blackish in upper 2/3 pale brown below. Forewings brown, blackish in apical and basal areas. Abdeomen: dorsum brown, dark reddish brown in last 5 tergites. with some median

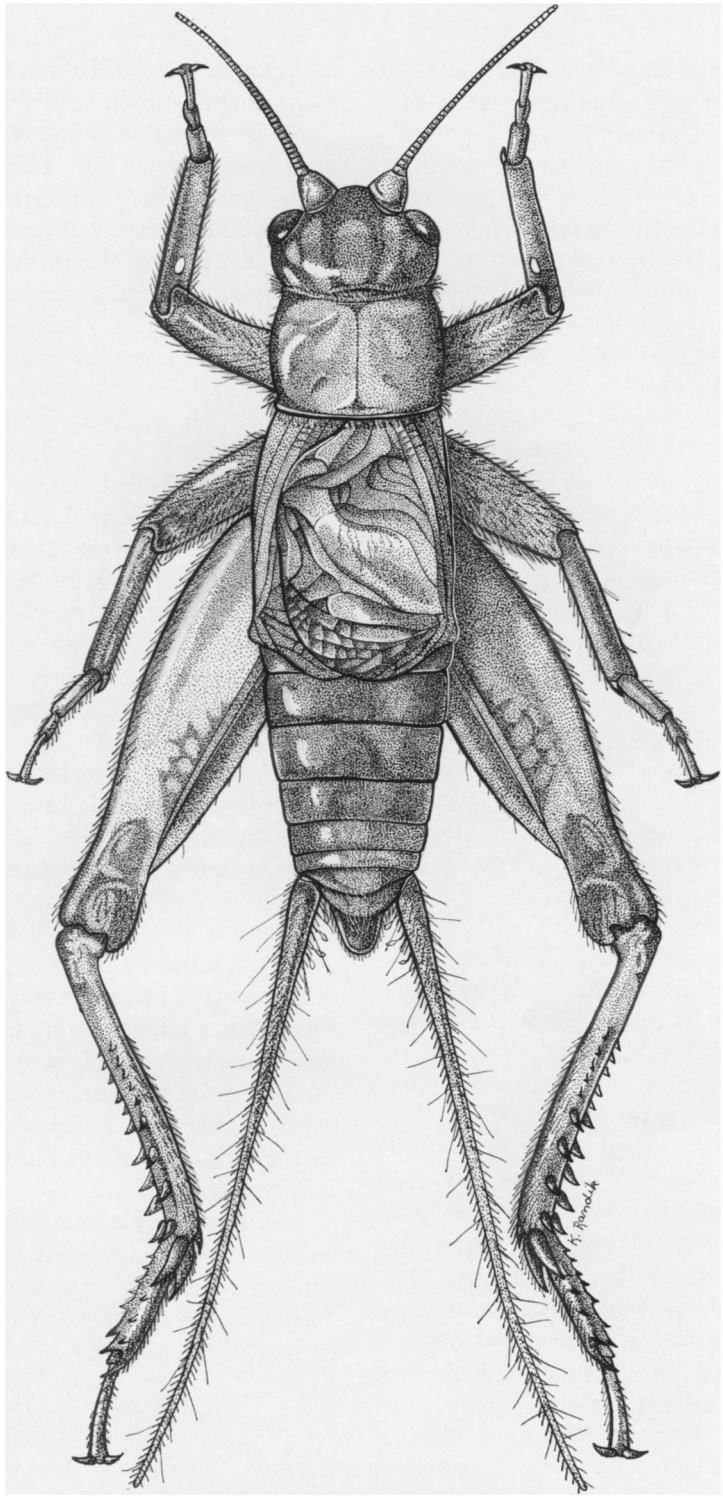


FIG. 24. *Jareta sedlaceki* holotype male.

pubbesnce but mostly shiny. Legs orange brown.

Specimens.— Holotype male VIENNA.

Endolandrevus Clade

This group contains four genera from the central and eastern portion of the range of the subfamily: *Endolandrevus*, *Mjobergella*, *Avdrenia* and *Fijina*. It is most closely related to the clade which includes both *Duolandrevus* and *Jorama* clades.

ENDOLANDREVUS Saussure

Type species: *E. rostratus* Saussure.

Distinguished from the similar *Repapa* as follows: male genitalia as in Fig. 12; tympana present only on inner face; forewing length more than 2.5 times the pronotal length; dorsum of head with dark brown and reddish longitudinal stripes on vertex. Hind femora dark brown at distal end. *E. ritsemae*, *E. tomentosus*, and *E. pubescens* were not examined.

Rostratus Group

Endolandrevus rostratus Saussure

Landrevus/Endolandrevus rostratus Saussure 1877: 274. Lectotype male, designated by Gorochov, Amboine, Type No. 5454, VIENNA. *Endolandrevus*, Kirby 1906: 50. Type examined.

Notes on Lectotype.— Figs 12, 22. Table 1. Size large; shiny, smooth; color of head and pronotum brown to dark brown at distal end, black just before the knees and black on the knee crescents. Abdomen brown, shiny.

Endolandrevus bomberi n. sp.

Holotype.— Male. New Guinea (Netherlands), Vogelkop, Bomberi, 700-900 m, 9 vi 1959 (J. L. Gressitt). HONOLULU.

Figs 12, 22. Table 1. Differs from other members of the group by the male genitalia. Most similar to *manokwari*, but much smaller and without a mirror.

Male.— Size medium; color dark brown with orange brown legs. Head unstriped, dark brown, shiny. Forewings opaque on dorsum, black on lateral field. Femora orange brown, tibiae dark brown.

Specimens.— Holotype male Honolulu.

Endolandrevus manokwari n. sp.

Holotype.— Male. New Guinea (Netherland), Vogelkop, Kebar Valley, west of Manokwari, 550 m, 4-31 i 1962, under dead bark (L. W. Quate). HONOLULU.

Figs 12, 22. Table 1. Differs from other members of the group by the male genitalia; forewing length about three times as long as prontoum.

Male.— Size large; color dark brown, with pale brown legs but with dark maculations near distal ends of all femora. Head: dorsum with three pale stripes; outer two stripes joining at posterior margin of eyes; rostrum light brown and blackish. Pronotum: dorsum faintly patterned with light and dark brown; lateral lobes blackish, with ivory area in lower anterior part. Abdomen: dorsum brown with a median row of black spots, blackish on sides, venter dark brown. Forewings: dorsum gray-brown translucent, sides blackish. Right wing above left. Front and middle femora yellow-brown, somewhat spotted on dorsum, becoming dark brown on inner and outer faces towards periphery. Hindfemora brown, with dark brown spots on dorsum, becoming dark brown distally.

Specimens.— Holotype male HONOLULU.

INCERTAE SEDIS

Genitalia of *E. brevipes* are poorly preserved and could not be figured for proper comparison. It is likely, from the distribution that this is not an *Endolandrevus*, but we leave it in its

original genus until other males can be studied. As in Rostratus Group mirror complete and tympanum on inner face only.

Endolandrevus brevipes n. sp.

Holotype.—Male. Solomon Islands, Choiseul Island, Kitipi River, 80 m, 13 iii 1964. Honolulu.

Fig. 23. Table 1. Distinguished from other species by the male genitalia.

Male.— Size medium to small; color dark brown; pubescent. Head: dorsum dark brown, pale stripes 1 and 2 faint. All femora yellow brown.

Specimens.— Holotype male Honolulu.

AVDRENIA new genus

Type species: *Avdrenia ajax* n. sp.

Genitalia as figured. Large (BL more than 25 mm), smooth, shiny. Head narrower than pronotum. Tibiae with both inner and outer openings. Head width more than 5 times rostral width. Mirror obsolete. Forewings with numerous crossveins between the chords.

Avdrenia ajax n. sp.

Holotype.— Male. Solomon Islands, Kolombangarae, Pepel, 0-30 m, 3 v 1964 (Shanahan). HONOLULU.

Figs 14, 22, 25. Table 1. Differs from other members of the genus as follows: forewing with 7 harp veins (*fordi* with 11 *malaita* with 9) chordal area with fewer cells (similar to *malaita)*, and apical area relatively shorter; body smaller and with relatively longer forewings (Table 2) and somewhat different male epiphallus shape.

Male.— Size large; color uniformly reddish brown; shiny. Head about as wide as pronotum; reddish brown. Pronotum with parallel sides. Forewings: dorsal field only slighly ligher than lateral field; left wing above right.

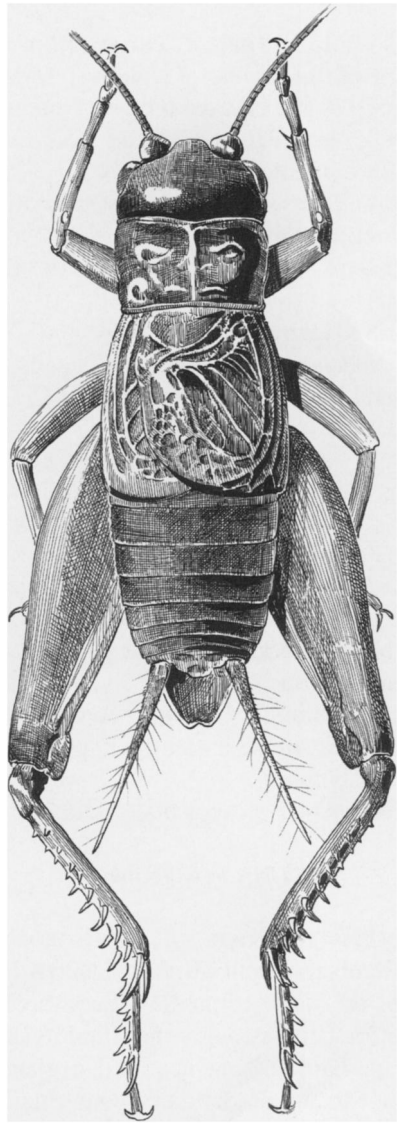


FIG. 25. *Avdrenia ajax* holotype male.

Specimens.— Holotype male HONOLULU.

Avdrenia fordi n. sp.

Holotype.—Male. New Ireland (SW) "Camp Bishop" 15 km up Kait River, 125 m, 7 vii 1956 (E. J. Ford Fr.) HONOLULU.

Figs. 14, 15B. Table 1. Differs from other members of the genus as follows: forewing the 11 harp veins; chordal area with numerous small cells; larger than *ajax* and *malaita*; and with different male epiphallus.

Male.— Size large, smooth, shiny; color entirely reddish brown.

Specimens.— Holotype male HONOLULU.

Avdrenia malaita n. sp.

Holotype.— Male. Solomon Islands, Malaita Island, Kwailasi, 25 v 1955, BM 157-201, 3128 (E. S. Brown) LONDON.

Figs 14, 22. Table 1. Differs from *fordi* and *ajax* as follows: lateral lobes of epiphallus relatively shorter than in fordi; forewing with an extra parallel vein between oblique vein and chordal vein.

Male.— Size large, head and pronotum nearly black; smooth and shiny. Forewings shiny; mirror obsolete. Legs brown, shiny; hindfemora orange brown, becoming dark brown at apex; tibiae dark brown, blackish between the spines.

Specimens.— Holotype male LONDON.

FIJINA new genus

Type species: *F. savu* n. sp.

Distinguished from all other genera in the shape of the male epiphallus. Last three tergites before cerci strongly modified in central region, perhaps having acquired a glandular function. Metanotal gland obsolete. File without a small bump at the proximal end. Genitalia as figured; mirror obsolete; with both inner and outer tympana.

Fijina savu n. sp.

Holotype.— Male. Fiju, Vanua Levu, Labasa-Savusavu road, near mountain crest, rainforest, 23 ii 1965 (Alexander, Otte and Rice, F1). PHILADELPHIA.

Figs 15, 22. Table 1. Differs from *F. viti* in the shape of the epiphallus, and in possessing an outer tympanum.

Male.— Size large, shiny but somewhat pubescent on abdomen and pronotum; dark brown to black on head and pronotum; yellowish front and middle legs, orange hindlegs. Hindfemora becoming dark brown at distal end.

Rain forest; found in rotting bark on the forest floor.

Specimens.— Holotype male PHILADELPHIA.

Fijina viti n. sp.

Holotype.— Male. Fiji, Viti Levu, mountain forest east of Nadi, near top of plateau, March 1984 (R.D. Alexander). ANN ARBOR.

Figs 15, 22. Table 1. Differes from *F. savu* in the shape of the epiphallus and in lacking an outer tympanum.

Male.— Very similar to *F. savu*, but body color ligher brown, and hind femora with faint brown oblique stripes on outer face.

The only male was found in thick brushy vegetation on a steep bank above the road through remnants of a rain forest.

Specimens.— Holotype male ANN ARBOR.

Ginidra Clade

GINIDRA new genus

Type species: *G. wauensis* n. sp.

Differs from all other genera in having the following combination of characters: Male genitalia as in Fig. 17; chords on forewing modified, nearly parallel but diverging posteriorly; tympanum on inner face only; forewing length about 1.5 times the pronotal length.

Ginidra wauensis n. sp.

Holotype.—Male. New Guinea (Northeast), Morobe District, Wau, 1100 m, 22 x 1961 (J. Sedlacek). HONOLULU.

For diagnosis see genus above.

Male.— Fig. 23. Table 2. Size medium; color pale reddish brown. Head: dorsum pale reddish brown, without dorsal stripes. Pronotum: dorsum reddish brown, lateral lobes pale along lower margin. Forewings: dorsal field brown, lateral field pale. Front and middle legs pale brown. Hindlegs lost.

Specimens.— Holotype male HONOLULU.

KOTAMA new genus

Type species: *K. maai* n. sp.

Distinguished from other genera by the shape of the male epiphallus. Forewings shorter than pronotum, with a rudimentary file, but veins strongly modified from the usual wings which bear stridulatory files. Differs from *Papava* in the male genitalia and in possessing a rudimentary file on the forewing.

Kotama maai n. sp.

Holotype.— Male. British North Borneo, Tenompok, 1460 m, 30 miles east of Jesselton [Kota Kinabalu], 26-31 i 1959 (T. C. Maa). HONOLULU.

Male.— Figs 2, 17, 23. Table 1. Size small; head and pronotum reddish brown, abdomen dark brown, legs yellow brown. Not noticeably pubescent as in other two species. Forewings slightly shorter than pronotum; with a small stridulatory file which bears small irregulary spaced teeth. Probably the file is no longer functional as suggested by the complete absence of auditory tympana.

Specimens.— Holotype male HONOLULU.

ODONTOGRYLLODES Chopard

Type species: *O. brevicauda*

Odontogryllodes brevicauda Chopard

Odontogryllodes brevicauda Chopard 1969: 154.
Holotype male, Sumatra, Lampongs. PARIS. Type examined.

Small, somewhat elongate, reddish brown; pronotum appearing longer than wide; forewings squared off along posterior margins, shorter than pronotum, without a stridulum, and with parallel veins; legs yellow brown. Genitalia as in Fig. 21.

SIGEVA new genus

Type species: *Sigeva gressitti* n. sp.

Distinguished from all other genera in the shape of the male epiphallus (Fig. 23). Similar to *Copholandrevus* but forewings separated by a large gap; head width more than 5.5 times rostral width.

Sigeva gressitti n. sp.

Holotype.— Male. New Guinea, Mt. Suckling, 200 m, 16 vii 1972 (J. L. Gressitt). HONOLULU.

Figs 17, 23. Table 1. See genus above for diagnosis.

Male.— Size medium; color yellow-brown becoming blackish at end of abdomen. Head width more than 5.5 times rostral width. Forewings: very short, not overlapping medially. Body very pubescent.

Specimens.— Holotype male HONOLULU.

PAPAVA new genus

Type species: *Papava aiyurae* n. sp.

Distinguished from all other genera in the shape of the male epiphallus. Similar to *Ahldreva,* but hind tibiae are more than half the length of the hind femora. Differs from *Kotama* in lacking a rudimentary stridulatory file on the forewing. Forewings short but overlapping medially.

Papava aiyurae n. sp.

Holotype.— Male. New Guinea (NE), East Highlands, Aiyura, 1900 m, 9 i 1968 (J. L. Gressitt). HONOLULU.

Figs 2, 17, 23, 26. Table 1. See generic di-

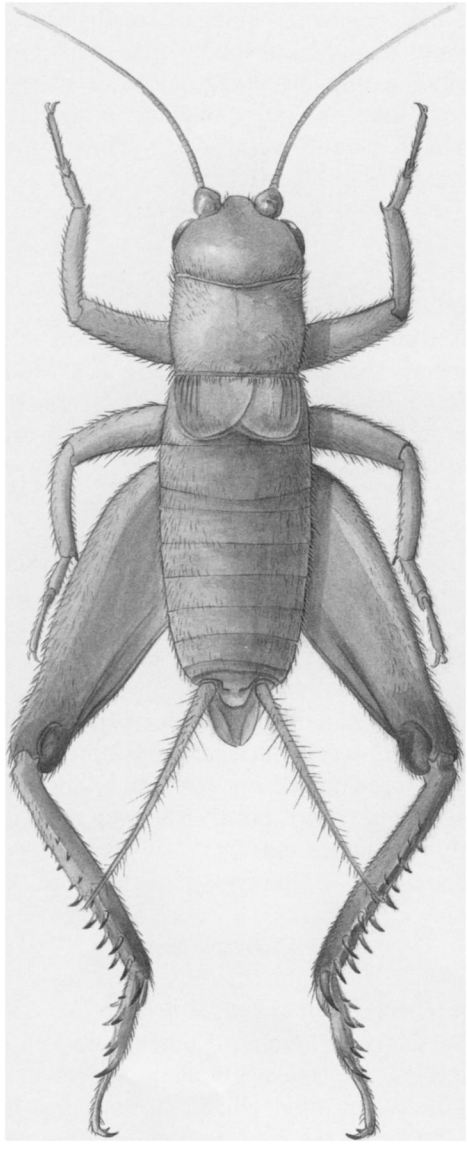


FIG. 26. *Papava aiyurae* holotype male.

agnosis above.

Male.— Size medium; color yellow-brown; pubescent. Forewings short but overlapping medially. Dorsum of head with faint stripes 1, 2 and 3. Palpi very short.

Specimens.— Holotype male HONOLULU.

AHLDREVA new genus

Type species: *A. nondugli* n. sp.

Distinguished from other genera in the male genitalia, in having enlarged jaws, and in having hind tibiae less than half the length of the hind femora. Forewings without a stridulum, and with parallel veins. Distinctly prognathous.

Ahldreva nondugli n. sp.

Holotype.— Male. New Guinea (NE), Ahl Valley, Nondugl, 1750 m, 8 vii 1955 (J. L. Gressitt). HONOLULU.

Male.— Figs 2, 18, 27. Table 1. Size medium to large, color reddish brown, legs yellow-brown; smooth, shiny; jaws elongate; hind tibiae very short. Abdomen smooth shiny, reddish brown. Forewings: dark brown with yellowish veins.

Specimens.— Holotype male HONOLULU.

APIOTARSOIDES Chopard

Type species: *Apiotarsoides semialatus* Chopard.

Hind tibiae very short, shorter than than hind basitarsus (in this respect is very similar to *Ahldreva*). Differs from *Papava* in lacking large depressions beneath the forewings. Similar in having short hind tibiae. Elongate. forewings with parallel veins and without a stridulum. Tympana absent. Hind tibiae very short, shorter than hind basitarsus.

Apiotarsoides semialatus Chopard

Apiotarsoides semialatus Chopard 1931: 6. Types: 1 male, 1 female, Iles Kei: Toeal (H. -C. Siebers). PARIS. Type not examined.

The following notes taken from specimens collected at Simbang, Huon Gulf, New Guinea. These specimens agree closely with the description and illustrations provided by Chopard 1931.

Male.— Figs 19, 28. Table 1. Body covered with a fine pubescense; male genitalia as figured. Size large, elongate; color medium brown, covered with a very fine pubescence. Head: dorsum pale orange brown; medium ocellus obsolete; face and cheeks pale brown. Pronotum: dorsum dark brown, but appearing more pale because covered with dense short, silvery pubescence; lateral lobes ivory-colored in lower half, dark brown in upper half. Forewings: dorsal field reddish brown, lighter along lateral margins; lateral field pale brown, but reddish brown between top two veins. Hindwings absent. Abdomen pale brown, pubescent. Front and middle legs: color pale brown; femora very wide. Hindlegs: femur pale brown, becoming red brown at distal end; tibiae reddish brown.

Specimens.— Kei Island, Toeal (H. -C. Siebers) 1 male, 1 female, LONDON. New Guinea, Simbang, Huon Gulf, 1899 (Biro) 2 males, 2 females, LONDON.

PTEROPLISTINI

PTEROPLISTUS Saussure

Pteroplistus dilinhensis n. sp.

Holotype.— Male. Viet Nam, 40 km north of Dilinh (Djiring), 540 m, 26 ivory-colored 1960 (R. E. Leech). PHILADELPHIA.

Male.— Figs 1, 19, 23. Table 1. Size medium to small; color gray-brown with black on forehead, lateral lobes, and lateral bases of forewings. Head: dorsum with 6 dark brown bands on occiput, vertex pale brown. with large black area post to interocellar suture; median ocellus missing; face very short; cheeks blackish. Pronotum: dorsum pale gray brown; lateral lobes black, pale in lower front corner. Forewings: dorsal field brown, veins lighter than membrane; lateral field blackish in first third; Sc with 6 branches. Hindwings extend one half pronotal length beyond forewings. Abdomen: dorsum dark brown, venter dark brown to black. Forelegs: femora pale brown; tibiae with two broad dark bands. Middlelegs lost. Hindfemora: pale brown with black patch before the knees, and proximal to these (at two-thirds point) an irregular black marking in upper and inner face; tibiae with three dark bands, these darkest between the spines. Male genitalia as in Fig. 19.

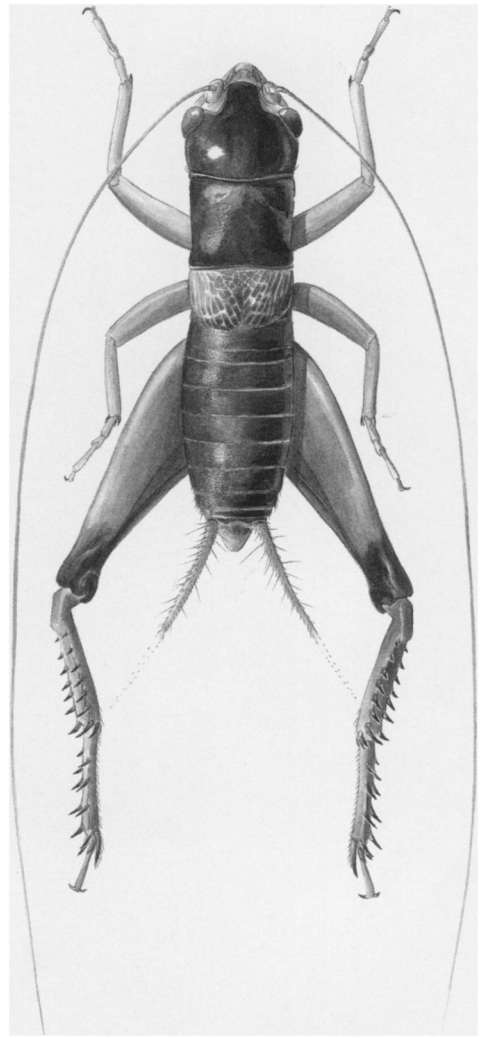


FIG. 27. *Ahldreva nondugli* holotype male.

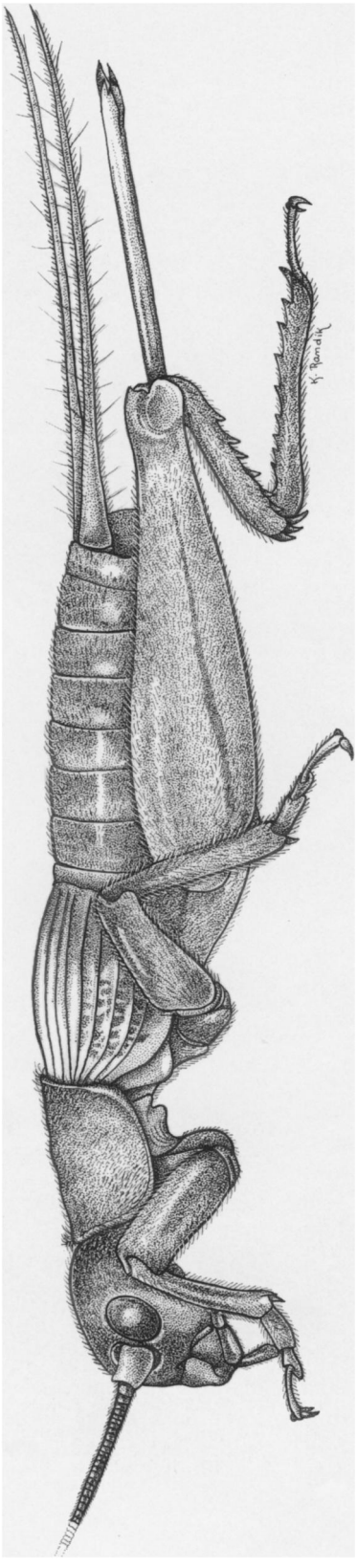


FIG. 28. *Apiotarsoides semialatus* female.

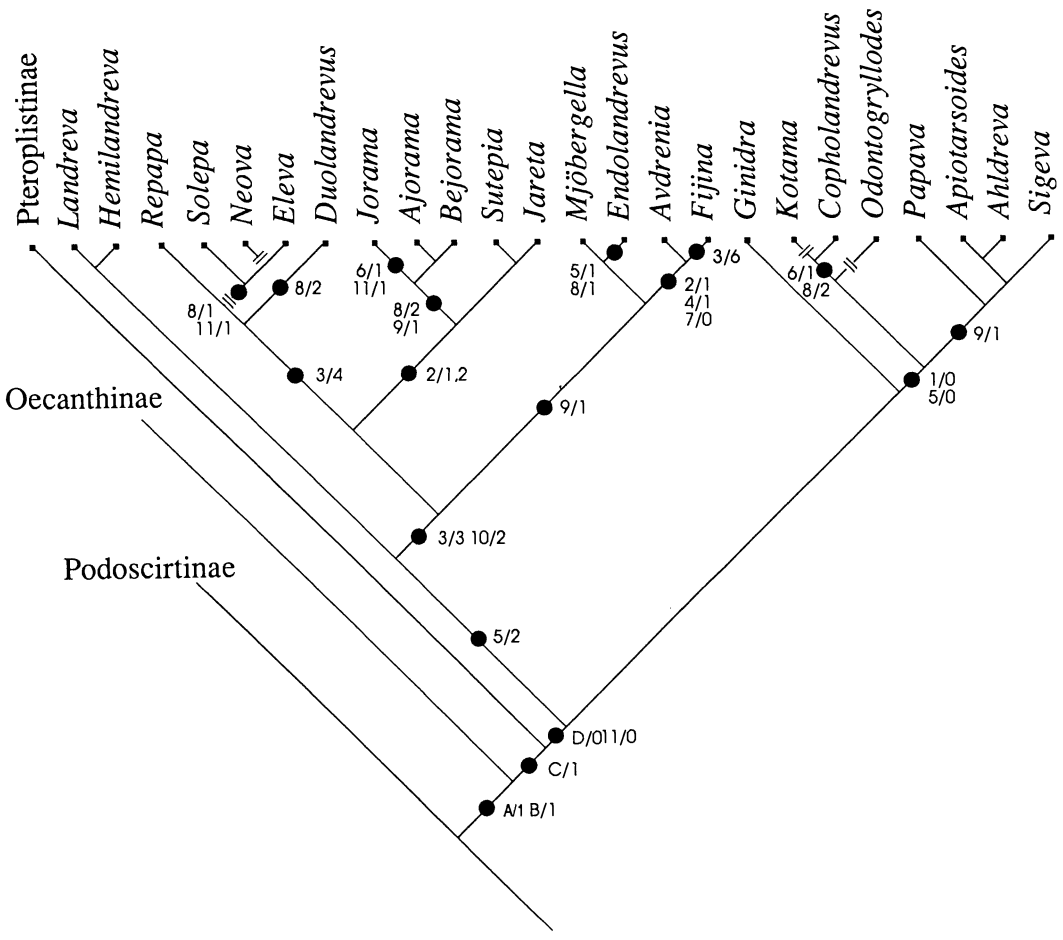


FIG. 29. Cladogram showing relationships among the various groups or species treated here. A key to characters and character states is given in Table 3.

DISTRIBUTION AND EVOLUTION

The distribution of Pteroplistinae is centered around Indo-Malaysia and the western Pacific. Several species, not examined in this study and perhaps not belonging to the subfamily are recorded from the Seychelles Islands (*Gryllapterus*) and Africa(*Oreolandreva*) (Chopard 1967).

The subfamily has spread into the Pacific as far as the Bonin Islands in the north, and eastwards along the outer Melanesian Arc from New Guinae through the Solomons to Fiji. No species were found in careful collecting in New Caledonia or in Efate,Vanuatu.

The only known flying members of the group (*Pteroplistus*) are from India, Viet Nam and Malaysia. Migragion of the group eastwards into the Pacific was mainly by flightless forms. The propensity for members of this group to be associated with rotting wood suggests that movement to the east was by floatation, perhaps most likely as eggs deposited in vegetation carried down rivers and

TABLE 3. List of characters and character states used to construct cladograms (Figs 29 and 30). Character states in italics are presumed on the basis of out-group comparison to be derived.

A	Metanotal gland: 1, *present;* 0, absent
B	Stridulatory file: 1, *inner end with a protuberance;* 0, without
C	Stridulatory file: 1, with an extra bend (not S-shaped); 0, S-shaped
D	Hindwings; 1, present; 0, *absent*
1	Condition of stridulum: 0, *without*; 1, poorly developed; 2, well developed
2	Condition of mirror: 0, *absent*; 1, *obsolete*; 2, incomplete; 3, complete
3	Number of posterior harp veins (0, means none or cannot tell)
4	Middle chord cell: 1, *with cross veins*; 0, without cross cells
5	Auditory tympana: 0, *with neither;* 1, *with only inner;* 2, with inner and outer tympana
6	Genitalia, epiphallus (side view): 1, *with two terminal projections;* 0, with one terminal projection
7	Epiphallus: 1, with median process; 0, without median process
8	Epiphallus median process: 2, deeply bifurcate (w. two processes); 1, shallowly bifurcate; 0, without two processes
9	Epiphallus: 1, with spines; 0, without
10	Forehead: 1, rounded; 0, flattened
11	Pale stripes on back of head: 0, absent; 1, *present*
12	Distribution: 1 to 9 running from western India to Fiji
13	Distribution: 1-8 runnining NE to SW from Bonin islands
14	Head width: 1, head wider than pronotum; 0, head equal or narrower than pronotum
15	Head width: 0, 4-4.4 times rostral width; 1, 4.5-4.9 times rostral width; 2, 5.0-5.5 times; 3, 5.6-6.0; 4, 6.1 +
16	Forewing length: 0, 1 times or less than PL; 1, 1.1-1.9 times; 2, 2.0-2.9 times; 3, 3.0 + times
17	Hind tibial length: 0, 0.4 times or less than FL; 1, 0.41-0.49 times; 2, 0.50-0.59 times; 3, 0.60-0.69 times ; 4, 0.70 +
18	Median ocellus: 0, absent; 1, tiny; 2, large
19	Forehead smooth: 1, yes; 0, no
20	Pronotum smooth on top: 1, yes; 0, no
21	Abdomen smooth: 1, yes; 0, no

TABLE 4. Coding of characters and character states used to construct Figs 29 and 30. Key to code is given in Table 3.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Duolandrevus ishigaki	2	2	3	1	2	1	1	2	0	1	0	4	2	1	1	1	4	2	0	0	0
Duolandrevus major	2	2	4	1	2	1	1	2	0	0	1	5	1	1	1	2	3	2	1	1	0
Duolandrevus hongkongae	2	1	2	0	2	1	1	2	0	1	0	4	3	1	0	1	4	2	1	1	0
Duolandrevus coulonianus	?	?	?	?	?	1	1	2	0	?	?	?	?	?	?	?	?	?	?	?	?
Duolandrevus pendleburyi	2	2	3	0	2	1	1	1	0	1	0	4	6	0	2	2	3	2	1	0	0
Duolandrevus rufus	2	3	5	0	2	1	1	2	0	1	0	4	6	0	1	2	3	2	1	1	0
Duolandrevus karnyi	2	3	4	0	2	1	1	0	0	1	0	5	8	1	2	2	3	2	1	1	0
Duolandrevus balabacus	2	3	4	0	2	0	1	2	0	1	0	5	5	0	1	2	?	2	1	0	0
Duolandrevus gingoogus	2	3	4	0	2	0	1	2	0	1	0	5	4	0	1	2	3	1	1	1	0
Duolandrevus luzonensis	2	3	4	0	2	0	1	2	0	1	0	5	4	1	2	2	3	2	1	1	1
Duolandrevus coriaceus	2	2	6	0	2	?	?	?	0	?	?	?	?	?	?	?	?	?	?	?	?
Duolandrevus palauensis	2	3	4	0	1	1	1	2	1	1	1	6	4	0	3	2	3	1	1	0	0
Landreva angustifrons	2	3	2	0	2	1	1	0	0	1	0	2	8	?	?	?	?	2	0	0	0
Landreva clara	?	?	?	?	?	1	1	0	0	0	0	2	8	?	?	?	?	2	1	1	0
Hemilandreva lamillipennis	?	?	?	?	?	0	1	0	1	0	0	2	8	?	?	?	?	2	0	0	0
Sutepia thailandica	2	1	3	0	2	1	1	2	0	0	0	3	5	1	0	2	3	2	1	0	0
Jorama palawanensis	2	1	3	0	2	1	1	2	1	0	1	5	5	0	3	1	3	2	1	0	0
Jorama isarogensis	2	1	3	0	2	1	1	1	1	0	1	5	4	0	3	2	3	2	1	1	1
Jorama curtipennis	2	1	4	0	2	1	1	1	1	0	1	5	4	0	?	1	3	2	1	1	0
Ajorama balatukanus	2	2	3	0	1	0	1	2	1	1	0	5	4	0	1	2	3	2	1	0	0
Bejorama intermedius	2	2	3	0	2	0	1	2	1	1	0	4	7	0	1	2	3	2	1	1	1
Endolandrevus rostratus	2	3	4	0	1	0	1	1	1	0	1	6	6	0	4	2	?	2	1	1	1
Endolandrevus manokwari	2	3	4	0	1	0	1	1	0	0	1	6	5	0	4	3	4	2	1	1	0
Endolandrevus bomberi	2	2	3	0	1	0	1	1	1	1	0	6	5	0	1	2	3	2	1	0	0

Table 4 continued

Endolandrevus brevipes	2	3	4	0	1	?	?	?	0	1	0	6	5	1	2	?	?	1	0	0	0
Repapa sapagaya	2	3	3	0	2	0	1	0	0	5	0	5	5	0	3	2	?	1	1	0	0
Repapa tenompokae	2	3	4	0	2	0	1	0	0	1	0	5	5	1	1	2	3	1	0	0	0
Solepa variegata	2	1	4	0	2	0	1	1	0	1	1	8	5	0	3	1	2	1	1	1	0
Avdrenia ajax	2	1	3	1	2	0	0	0	1	1	0	8	5	0	2	2	3	1	1	1	1
Avdrenia fordi	2	1	3	1	2	0	0	0	1	1	0	8	4	0	2	2	3	1	1	1	1
Avdrenia malaita	2	1	4	1	2	0	0	0	1	1	0	8	5	0	3	2	3	1	1	1	1
Ginidra wauensis	2	1	2	0	1	0	0	0	0	0	0	7	5	0	4	1	?	1	0	0	0
Neova bodemensis	2	3	4	0	2	1	1	1	1	0	1	6	5	1	1	2	3	2	1	0	0
Eleva wirahu	0	1	0	0	0	0	1	1	0	0	1	8	5	0	1	0	2	0	1	1	0
Jareta sedlaceki	2	2	2	0	2	0	0	0	0	0	0	5	7	0	3	2	?	2	1	0	0
Fijina savu	2	1	6	1	2	0	0	0	1	1	0	9	5	0	3	2	3	1	1	1	0
Fijina viti	2	1	6	1	1	0	0	0	1	1	0	9	5	?	3	2	2	1	1	1	0
Sigeva gressitti	0	0	0	0	0	0	0	0	1	0	0	8	5	1	3	0	2	1	1	0	0
Kotama maai	1	0	0	0	0	1	1	2	0	1	0	5	5	0	1	0	2	1	1	1	0
Papava aiyurae	0	0	0	0	0	0	1	2	1	0	0	7	5	0	2	0	3	0	0	0	0
Ahldreva nondugli	0	0	0	0	0	0	0	0	1	1	0	7	5	1	1	0	1	0	1	1	1
Apiotarsoides semialatus	0	0	0	0	0	0	1	0	0	1	0	7	5	0	4	1	0	0	0	0	0
Odontogryllodes brevicauda	0	0	0	0	0	0	1	1	0	1	0	4	7	0	1	0	2	0	0	0	1
Pteroplistus dilinhensis	2	3	2	0	1	0	1	0	0	0	1	4	5	0	3	3	2	0	1	1	0
Mjobergella warra	2	3	3	0	2	0	1	0	1	?	?	7	6	1	?	?	3	?	?	?	?
Mjobergella macrocephala	2	2	5	0	2	?	?	?	1	?	?	7	6	0	?	?	3	?	?	?	?

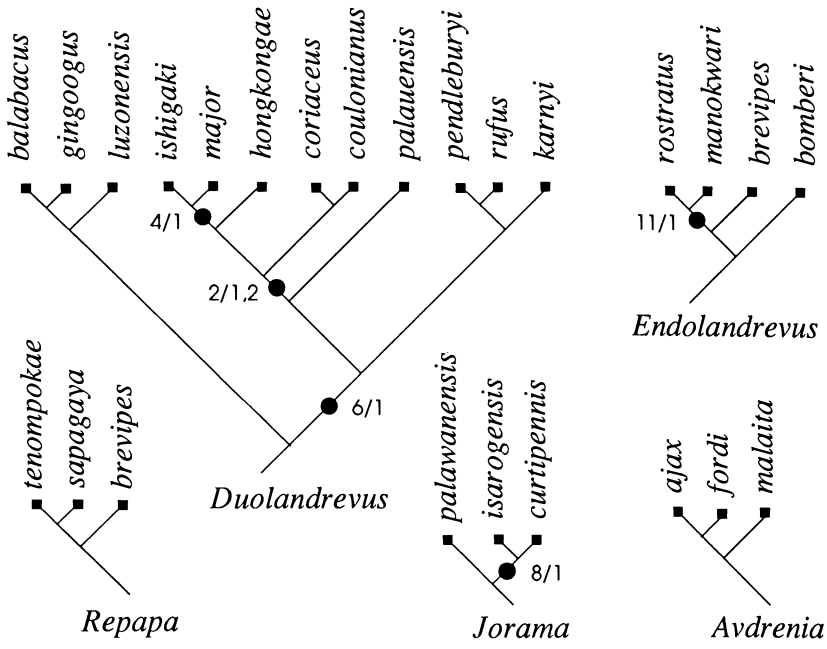


FIG. 30. Cladogram showing relationships among species in five genera. A key to characters and character states is given in Table 3.

transported by ocean currents. The movement of flightless species eastwards along the outher Melanesian Arc appears unlikely given the east to west flow of the South Equatorial Current through the region.

Relationships within the Subfamily

An assessment of relationships among genera and species of Pteroplistinae is based almost solely on a morphological analysis (23 of 25 characters). Two distribution 'characters' are also included (Table 3).

The cladograms given below were constructed using MacClade version 2.1 (Maddison and Madison 1987). The algorithm of MacClade finds all and only the most parsimonious assignments of character states that can be made to every node of the tree. Under this program alternative hypotheses under the same cladogram were explored by moving branches and rerooting clades. Although the capacity to weight characters exists I did not do so here. Cladograms were constructed under the assumption that any state of a character could change to any other state and each change was counted as one step (unordered transformation [Fitch Parsimony]).

In searching for the shortest trees I began with what seemed to be a fairly reasonable tree and used local branch swapping on the whole tree. Following this I examined character state distribution to see if other arrangements were suggested. The resulting cladogram is one of several with the same length. The differences between alternative trees with the same shorter length are minor—involving at most alternative swaps near the periphery. The resulting tree therefore should be treated as a rough first approximation of how taxa are related.

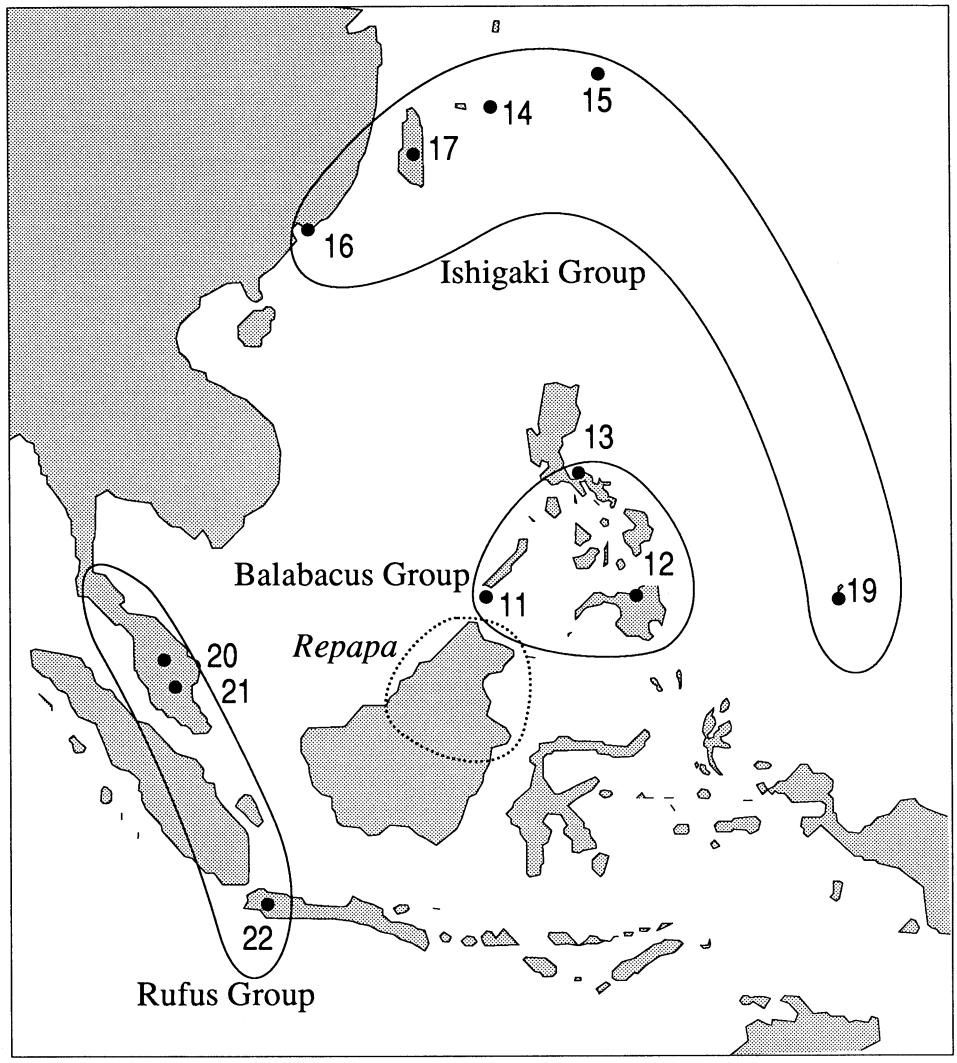


FIG. 31. Distributions of species belonging to three groups of *Duolandrevus* and the genus *Repapa*.

I was able to identify the presumed derived (apomorphic) states in only nine characters.

The resulting cladograms divides the Pteroplistinae into two clades: a large group (tribe Landrevini) and a much smaller group (tribe Pteroplistini). The Landrevini are divided into a larger group, all of which have the normal cricket acoustical transmitting and receiving apparatus, and a much smaller mute group of species mainly from Australia and New Guinea.

It is evident, even when geographic data is omitted from the analysis, that there is a close agreement between relationship and geographical proximity. Thus, it is seen that the clade that includes *Jorama* is geographically restricted to the western half of the distribu-

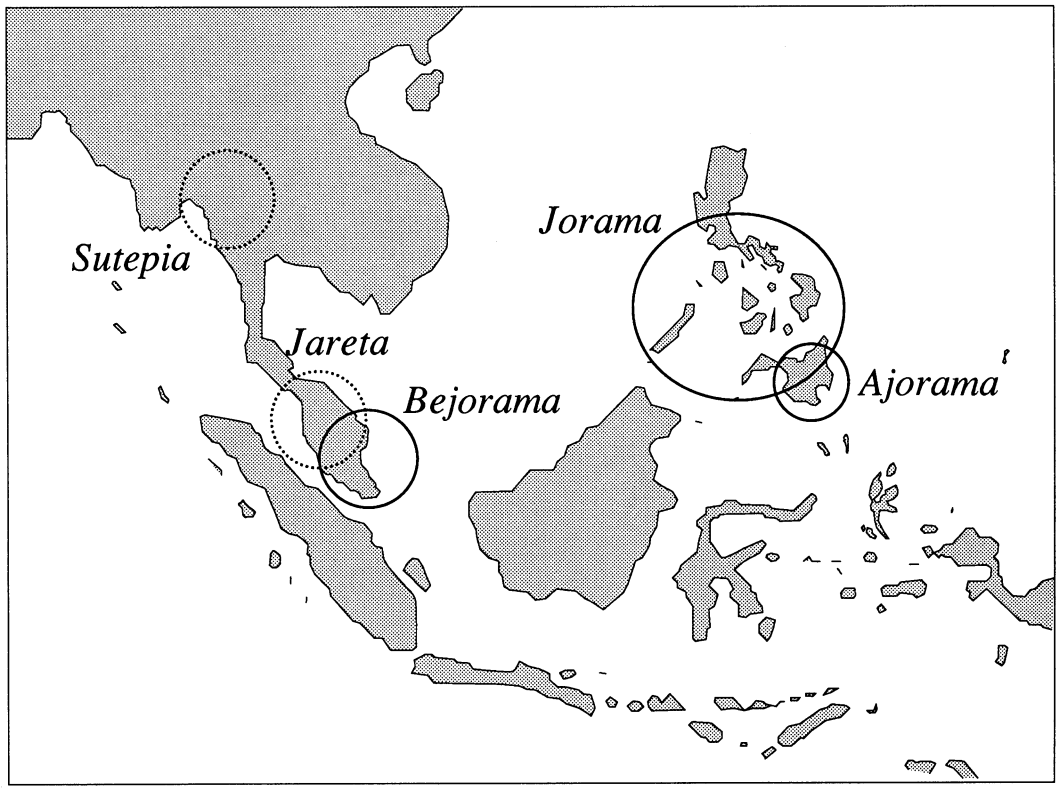


FIG. 32. Distribution of the Jorama Clade.

tional area while the clade that includes *Endolandrevus* is confined to the eastern half of the area. The members of different genera or of species groups are confined to more restricted geographic areas (*Avdrenia* to the Solomon Islands, *Fijina* to Fiji, etc.). These are not surprising findings, and are indeed expected. The only surprising distribution concerns the members of the Ishigaki group of *Duolandrevus*. The existing species suggest a movement of the group from the China coast eastwards to the Bonin Islands and then southwards to Palau. But given the sparseness of collecting throughout the region it is too early to conclude that the group is absent from a much wider region which includes the Philippines and Borneo.

ACKNOWLEDGMENTS

This research was supported in part by a National Science Foundation Grant (NSF 022264) to the University of Michigan. I am thankful to the Bishop Museum, Department of Entomology and especially to Gordon Nishida for his help and hospitality. Much of the initial work was completed at the Bishop Museum. I also thank the artists Tracy Pederson and Karen Randik for their excellent illustrations. Donald Azuma and James Newlin of the Entomology Departement helped me in many ways during this study. I also thank the various museums for sending material for study.

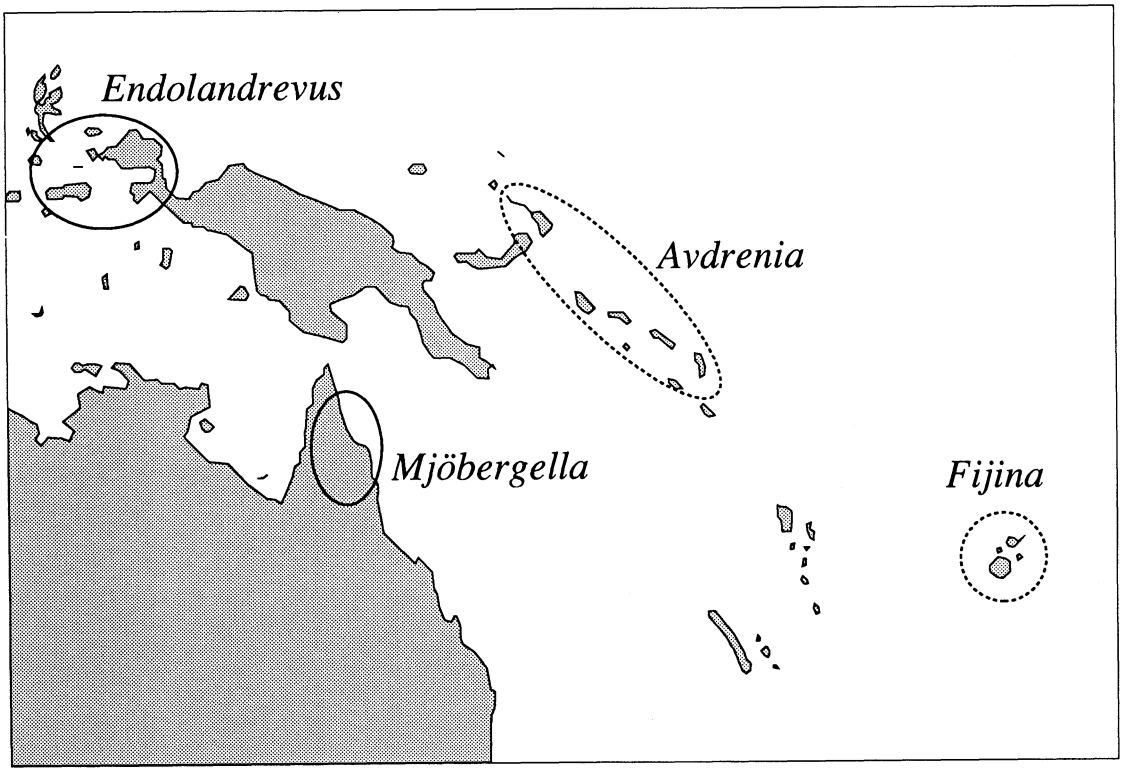


FIG. 33. Distribution of the Endolandrevus clade which is defined by character 9/1.

REFERENCES

Bolivar, I. 1899. Les Orthoptères de St. Joseph's College à Trichinopoly (Sud de l'Inde), 2me partie. Annales de la Société entomologique de France 68: 761-812.

Bolivar, I. 1912-13. Reports of the Percy Sladen Trust Expedition to the Indian Ocean in 1905 under the leadership of Mr. J. Stanley Gardner, M. A. Vol. 4, No. XVI. Orthoptera, Acrydiidae, Phasgonuridae, Gryllidae. Transactions of the Linnean Society of London, 15, Ser.2, Zoology: 263-292.

Chopard, L. 1925. The Gryllidae of Ceylon in the British Museum collection. Annals and magazine of Natural History (9th series), 89: 505-536.

Chopard, L. 1928. Revision of the Indian Gryllidae. Records of the Indian Museum 30(1): 1 - 36.

Chopard, L. 1930. The Gryllidae of Sarawak. The Sarawak Museum Journal 4(1) No. 12: 1-42.

Chopard, L. 1931. On the Gryllidae from the Malay Peninsula. Bulletin of the Raffles Museum, No. 6: 124-149.

Chopard, L. 1936. The Tridactylidae and Gryllidae of Ceylon. Ceylon Journal of Science. Spolia Zeylanica 20 (1): 9 - 87.

Chopard, L. 1937. Notes sur les Gryllies et Tridactylides du Deutsches Entomologisches Institute et descriptions d'especes nouvelles. Arbeiting über morphologische und taxonomische Entomologie aus Berlin-Dahlem 4(2): 136-152.

Chopard, L. 1945. Orthopteroides recueillis dans les montagnes du Cameroun par la Mission, Lepesme, Paulien, Vielliers. Revue francaise d'Entomologie XI, fasc.3: 156-178.

Chopard, L. 1958. Les Orthopteroides des Comores. Memoires de l'Institut scientifique de Madagascar, X, Series E, Entomologie: 3-40.

Chopard, L. 1967. Orthopterorum Catalogus, Pars 10, Gryllides. W. Junk.

Chopard, L. 1969. Orthopterorum Catalogus, Pars 12, Gryllides. W. Junk.

Chopard, L. 1969. The Fauna of India and adjacent countries. Orthoptera. Vol.2. Grylloidea. Zoological Survey of India, 421 pp.

Fernando, W. 1957. New species of insects from Ceylon (1). Ceylon Journal of Science, Biological Sciences, New series 1 (1): 7-18.

Fernando, W. 1957. New species of insects from Ceylon (2). Ceylon Journal of Science, Biological Sciences, New series 1 (1): 73-76.

Fernando, W. 1958. New species of insects from Ceylon (3). Ceylon Journal of Science, Biological Sciences, New series 1 (2): 85-93.

Gorochov, A. V. 1982. A new subfamily of crickets (Orthoptera, Gryllidae) from the Indo-Malay territory. Zhivotnoyj mir Vjetnama, Moscow, "Nauka": 147-151.

Gorochov, A. V. 1984. Faunistic and systematic notes on Gryllidae (Orthoptera) of the Crimea. Vestn. zool., 1984, No. 2.

Giglio-Tos, E. 1898. Viaggion del Dr. Enrico Festa nella Republica dell'Ecuador e regione vicine. IV. Ortotteri. Bolletino dei Musei di zoologia ed anatomia comparata della R. Universita di Torino 13: 1-108.

Haan, W. de. 1839-1844. Bijdragen to de Kennis de Orthoptera. Temminck, C. I. Verhandelingen over de natuurlijke Geschiedenis de nederlandsche oberseesche bezittingen, de Leden de Natuurkundige commissie in Indie en andere schrijvers. Zoologie.

Maddison, W. and D. Maddison. 1987. MacClade for the Macintosh. Museum of Comparative Zoology, Harvard University, Cambridge, MA

Otte, D. and R. D. Alexander. 1983. The Australian Crickets (Orthoptera: Gryllidae). Academy of Natural Sciences of Philadelphia Monograph No. 22: 1 - 477.

Saussure, H. de. 1877-1878. Melanges Orthopterologiques (5 fasc.). III. Gryllides. Memoires de la Societe de physique et d'histoire naturelle de Geneve 25(1): 1 - 352.

Shiraki, T. 1930. Orthoptera of the Japanese Em-