

BEAUFORTIA

INSTITUTE OF TAXONOMIC ZOOLOGY (ZOOLOGICAL MUSEUM)
UNIVERSITY OF AMSTERDAM

Vol. 32 no. 4

September 17, 1982

THE TAXONOMY AND BIOGEOGRAPHY OF THE *NASUTA* GROUP OF THE GENUS *BAETURIA* STÅL, 1866 (HOMOPTERA, TIBICINIDAE)

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ABSTRACT

The name *nasuta* group is proposed here for eight New Guinean species of the genus *Baeturia* Stål, 1866, for which a monophyletic origin is made plausible. Seven of these species are redescribed, and one, *B. intermedia*, is described as new. Distribution maps and a key to the males are presented. The *nasuta* group is mainly distributed in the mountain ranges of Central and SE New Guinea, which formed probably a part of the historic Inner Melanesian Arc. The one exception, *B. parva*, is restricted to the lower mountain ranges and lowlands of Northern New Guinea and New Britain, an alleged part of the Outer Melanesian Arc.

INTRODUCTION

The present study is prompted by Duffels' publications (1977; in prep.) on the taxonomy and historic biogeography of the Cicadoidea of Sulawesi, New Guinea and the SW Pacific, which suggest that island arcs were important routes of dispersal for some groups of cicadas since the middle of the Miocene.

The genus *Baeturia* Stål, 1866 seemed most suitable to test this idea since it is widely distributed in Japan, the Ryukyu islands, the Moluccas, New Guinea, Queensland, Solomon Islands and Samoa (Metcalf, 1963). The genus is not recorded from Fiji, but has been found on Rotuma, a small island 500 km N of the Fijis, as proved by material from this island in the collection of the British Museum (Nat. Hist.), London. Recently, Boulard (1979) added four new *Baeturia*-species from the

New Hebrides, each restricted to one island.

According to Metcalf (1963) the genus contained 10 species in 1955. Since then Blöte (1960) added 27 new species from New Guinea and Boulard (1979) described four new species from the New Hebrides. In spite of the large number of species described, the taxonomy of the genus is poorly known and revisionary work is required as a basis for historic biogeography.

In this paper a taxonomic revision is presented for a group of New Guinean *Baeturia*'s recognized by Blöte (1960). Based upon this revision speculations on the historic biogeography of the group are made.

METHODS

In the Leiden Museum, I found that Blöte had neglected to label the individual specimens of the

Baeturia species upon which his 1960 publication was based. All specimens of the same species were arranged in the collection under labels bearing the species names. Holo- allo- and paratypes were indicated as such by orange coloured type labels only. For clearness sake I have provided all specimens with both, Blöte's as well as my own identification label.

All specimens examined have been measured, as far as the undamaged state allowed. The measurements, ranges, averages and standard deviations are given with the descriptions.

The distributions of all species are mapped in figs. 42-44 with the aid of geographical sources mentioned by Duffels (1977) and some additional geographical information from Boeseman (1963) and Van Deusen (1964).

The altitudinal ranges of the species, as far as indicated on the labels, are summarized in table I.

Table I: The altitudinal range of the species of the *nasuta* group.

<i>nasuta</i>		1176 - 2500 m
<i>mamillata</i>		1043 - 1500 m
<i>arabuensis</i>		1260 - 1780 m
<i>parva</i>		10 - 500 m
<i>marmorata</i>		800 - 1050 m
<i>bipuncta</i>		800 - 1200 m (2100 m)
<i>laminifer</i>	(360 m)	1043 - 1470 m
<i>intermedia</i>		1980 m

PHYLOGENY

Phylogeny of the *nasuta* group

The New Guinean *Baeturia* species centred around *Baeturia nasuta* Blöte, 1960 form one of the four, unnamed, groups of New Guinean *Baeturia* recognized by Blöte (1960).

My revision of *B. nasuta* and relatives reveals that these species are separated from other *Baeturia* by two synapomorphic characters, expressing also the monophyly of the group: the narrow, triangularly protruding postclypeus which is ventrally distinctly angularly swollen, and the four ridges on the tymbals. The name *nasuta* group is proposed here for the group of species concerned.

Since the monophyly of a group is highly essential for any biogeographical conclusions regarding this group, it is necessary here to make

plausible the synapomorphy of the above named characters.

The triangular, ventrally swollen postclypeus was recognized by Blöte as characteristic for the species here revised. He divided the New Guinean *Baeturia* species in four "sections" according to the width of the postclypeus in dorsal view. The group revised here was simply the section with the narrowest postclypeus. Though Blöte mentioned the ventral swelling, he did not stress the importance of this character.

The peculiar shape of the postclypeus in the *nasuta* group is regarded here as a synapomorphy characterizing the group. The postclypeus is triangular in dorsal view, its anterior part is angularly swollen in lateral view. The anterior and ventral surfaces have a deep median furrow, which is most distinct at the ventral swelling. Many species of the presumably closely related Prasiini have a postclypeus as narrow as in the *nasuta* group, but they definitely lack the ventral swelling. Study of a wide range of *Baeturia* species demonstrated that the postclypeus of *Baeturia* other than the *nasuta* group is nearly always wider dorsally and if swollen, not angularly so and not distinctly furrowed.

As to the four ridges on the tymbals, another synapomorphy of the *nasuta* group, I have found that all species of *Baeturia* examined, except those of the *nasuta* group, have seven or eight ridges on their tymbals. In the Prasiini we find species with 7 up to 22 ridges. If we consider a number of ridges up to 7 or 8 as primitive for *Baeturia*, since it is the most widely spread character, the four ridges as found in the *nasuta* group surely form an apomorphic character.

Phylogeny within the *nasuta* group

On close examination of the eight species of the *nasuta* group it appeared that differences between the species of this group are so slight and so small in number that I am not able to present a cladogram for the group. However, some remarks on the in-group phylogeny can be made. Six species, *B. arabuensis*, *B. bipunctata*, *B. intermedia*, *B. laminifer*, *B. mamillata* and *B. nasuta* form a monophyletic group on account of the existence of

a dorsal protrusion on the clasper which is regarded as synapomorphous. *B. laminifer* and *B. bipunctata* of this group are presumed to form a monophyletic group on account of the following synapomorphies: the apical position of the dorsal protrusion of the clasper, the bi-topped epimeral triangle and the medial lengthening of the male operculum. The high lateral side of the right-angled crest of the operculum might be a synapomorphous character for *B. marmorata* and *B. parva*, the other two members of the *nasuta* group.

BIOGEOGRAPHY

The historic biogeography of the New Guinean flora and fauna is extremely complicated by the complex palaeogeography of this island.

In an excellent review of the geological literature Holloway (1979) explained that New Guinea is built up out of parts of two island arcs: the Inner and Outer Melanesian Arc. These arcs were wide apart until the Middle Miocene (Packham, 1973) and were pushed together by the northward movement of the Australian plate. In present-day New Guinea the inner arc is recognized in the mountain ranges of central New Guinea and probably Huon peninsula, and perhaps the arc continued in SE New Guinea and adjacent islands. The supposed outer arc runs from the Vogelkop and the mountain ranges along the northern coast of New Guinea, possibly with exception of Huon peninsula, and continues over New Britain, Solomon Islands, New Hebrides and Fiji to Samoa.

The present distribution and the phylogeny of the *nasuta* group can be explained by a historic island arc dispersal. All species, but one, of this group are restricted to the mountain ranges of central New Guinea, which are supposed to be parts of the historic Inner Melanesian Arc. The one exception, *Baeturia parva*, which inhabits the northern coastal mountain ranges and lowlands of New Guinea, and is also recorded from New Britain, represents an Outer Arc distribution. *B. parva* is a lowland species, occurring up to 500 m, which might have developed out of an ancestral form of the *nasuta* group from Central New Guinea, after the approach of the Inner- and

Outer Melanesian Arcs and the formation of New Guinea. The fact that *B. parva* does not form the sister taxon of the *nasuta* group minus *B. parva* is in accordance with this historic explanation.

TAXONOMY

Description of the *nasuta* group

The males of the *nasuta* group are very alike. All but one, have a very strikingly coloured abdomen; a darkened mediodorsal band, almost transparent sides with bright red stripes bordering the posterior margins of the segms 3-6 and a row of lateroventral black spots. The males of *B. marmorata* do not show the transparent sides and red stripes. The females of this group are very similar to the females of other closely related *Baeturia*'s: dull ochraceous, brown speckled and in most species slightly larger than the males.

Head: Ochraceous, in most species brown speckled. There is a deep furrow between the lateral ocelli. The lateral ocelli are close together, the distance between the eye and lateral ocellus being about 1.5 times as long as the distance between the lateral ocelli. The postclypeus is very narrow, protrudes triangularly and is ventrally distinctly swollen, its greatest width being not more than about 1.3 times as wide as the vertex lobe.

Tymbal organs: The tymbals have four sclerotized transverse ridges running from dorsal to ventral; most species have three distinct short intercalary ridges.

Opercula: The male opercula, having basically the same shape in all species, consist of a right-angled proximal part and a shell-shaped distal part. The proximal part is very uniform. The distal part is variably in shape, rather short, more or less erect in most species, and medially bent around the base of the meracanthus, so that the meracanthus extends over the operculum. In one species only the posterior margin of the operculum reaches beyond the anterior margin of the abd. sternite 2. The female operculum is somewhat shorter than the conspecific male operculum.

Abdomen: Male abdomen ochraceous; mediodorsal line slightly darkened; the sides of segms 4-6 are hardly pigmented, almost transparent;

posterior margins of segms. 3-6 orange to light-red. Ventrally of the transparent sides each of the segms. 3-8 has one black spot, forming a row of spots alongside. The female abdomen is brown speckled all over. The row of black spots, here of the segms. 3-7, and the red posterior margins, here on the segms. 3-8, are in most specimens vague but distinguishable, surely not so striking as in the males. There is no darkened mediodorsal line.

Male genitalia: The caudal dorsal beak is truncate at its apex in most species and obtusely pointed in *nasuta*. The caudal dorsal beak is acutely pointed in most *Baeturia* species not belonging to the *nasuta* group. The basal lobes of the pygofer bear very blunt to conical protuberances which may protrude hindwards. In lateral view the clasper is broad at its base and in all but one species curved downwards towards its apex. Six species have a protrusion at the dorsal margin of the clasper, where the clasper curves downwards. The aedeagus is S-curved and pointed at its apex.

Female genitalia: The caudal dorsal beak is truncate or sharply pointed. The internal female genitalia have not been studied.

The species of the *nasuta* group are redescribed, since their original descriptions, mainly based upon the male genitalia, were insufficient to name unidentified males with some certainty. One species belonging to the group is described as new. New characters of taxonomic value were found in male opercula, caudal dorsal beak and colouration of the wing. More attention is given now to the identification of the females.

The species of the *nasuta* group are separated mainly on account of the shape of the clasper and its dorsal protrusion, the caudal dorsal beak, the basal lobe of the pygofer, and the operculum.

Key to the males

In the following lines a key to the males of the *nasuta* group is presented. Though most females can be identified with some certainty the features of distinction are too vague and too small in number to allow the construction of a key to the females. The argumentation for the specific allocation of the females can be read from the descriptions of the species.

- 1a. Dorsal protrusion on clasper very distinct (figs. 10, 13, 29 and 34) 2
- b. Dorsal protrusion on clasper weakly developed or absent (figs. 4, 19, 24, 40) 5
- 2a. Basal lobe of the pygofer strongly distally protruding; the part of the clasper distally of the dorsal protrusion is more than twice as long as the base of the dorsal protrusion (figs. 10, 13) 3
- b. Basal lobe of the pygofer hardly distally protruding; the part of the clasper distally of the dorsal protrusion is about as long as the base of the dorsal protrusion (figs. 29, 34) 4
- 3a. Dorsal protrusion of the clasper triangularly shaped; caudal dorsal beak slender, and either truncate or rounded apically; basal lobe of the pygofer pointed at its apex; abd. segm. 1 as long as abd. segm. 2 mediodorsally; the posterior margin of the operculum reaches beyond the anterior margin of abd. segm. 2 *arabuensis*
- b. Dorsal protrusion of the clasper finger-shaped; caudal dorsal beak broad and truncate at its apex; basal lobe of the pygofer rounded apically; abd. segm. 1 shorter than abd. segm. 2 mediodorsally; the posterior margin of the operculum does not reach beyond the anterior margin of abd. segm. 2 *mamillata*
- 4a. Dorsal protrusion of the clasper hump-shaped, triangularly rounded; body colour red-brown; abdomen strongly dilated, especially ventrally *bipunctata*
- b. Dorsal protrusion of the clasper square laminiform; body colour pale-yellowish; abdomen not dilated *laminifer*
- 5a. Abd. tergite 1 visible in dorsal view; clasper directed downwards; operculum adjacent to the body (figs. 4, 19, 40) 6
- b. Abd. tergite 1 invisible in dorsal view; clasper directed upwards; the operculum is very erect; its distal part stands almost right-angled upon its proximal part; basal lobe pygofer hardly protruding distally and broadly rounded at its apex *marmorata*
- 6a. Abd. segm. 1 mediodorsally shorter than abd. segm. 2 7
- b. Abd. segm. 1 as long as abd. segm. 2 medio-

dorsally; caudal dorsal beak truncate at its apex; basal lobe of the pygofer distinctly protruding distally and pointed at its apex *intermedia*

- 7a. Caudal dorsal beak pointed at its apex; dorsal protrusion on the clasper weakly developed; postclypeus and vertex bear long hairs, tegmina and wings slightly darkened . . . *nasuta*
- b. Caudal dorsal beak truncate at its apex; there is no dorsal protrusion on the clasper; postclypeus and vertex almost hairless; the veins of tegmina and wings have alternating light and dark bands *parva*

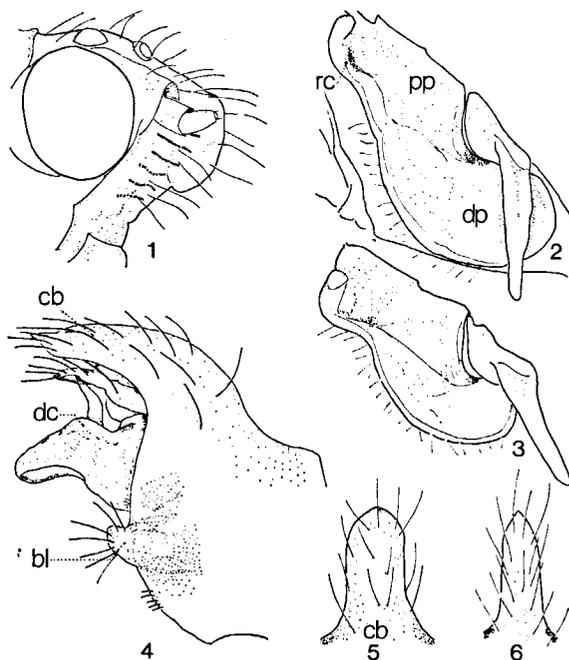
Baeturia nasuta Blöte, 1960

(Figs. 1-6, 42, 45-46)

Baeturia nasuta Blöte, 1960: 61; 63 figs. 1-2.

Material examined: IRIAN: NEW GUINEA (W): Araboebivak, 20.x.1939, KNAG [Koninklijk Nederlands Aardrijkskundig Genootschap], 1 ♂, RML, same data but 1 & 16.XI.1939, 2 ♀, *Baeturia arabuensis* det. H. C. Blöte, 1960; Baliem Camp, 1750 m, L. J. Toxopeus, 1 ♂ paratype, RML, same data but 14.xi.1938, 1 ♂, 3.xii.1938, 1 ♂ paratype, 1600 m, 24.xi., 4.xii & 5.xii.1938, 3 ♀ paratypes; Enarotali, Wissellakes, 12.vii.1952, W. J. Roosdorp, 1 ♂, RML, same data but 1938, Adang Roushdy, 1 ♀; Ibele Camp, 2250 m, 20.xi.1938, L. J. Toxopeus, 1 ♂ holotype, RML, same data but 27.xi.1938, 1 ♂ paratype, 19 & 26.xi.1938, 2 ♀ paratypes; Mist Camp, 1800 m, 10.i.1939, L. J. Toxopeus, 1 ♀, RML; Paniai, Wissellakes, 1750 m, vii-ix, 1939, KNAG, 4 ♂ 14 ♀, RML; Top Camp, 2100 m, 8.i.1939, L. J. Toxopeus, 1 ♀, RML, same data but 22.i. & 1.ii.1939, 2 ♀. PAPUA NEW GUINEA: NEW GUINEA (NE): Budemu, Finisterre Mts., Madang district, 4000 ft, 30.x-15.xi.1964, M. E. Bacchus, 1 ♀, BM; Edie Creek, Wau, Morobe district, 7000 ft, 17.x.1964, M. E. Bacchus, 1 ♂, BM; Gang Creek Camp, Mt. Rawlinson, Morobe district, 4500 ft, 30.vi.1964, H. M. van Deusen, 1 ♀, AMNH; Kaindi on Meari Creek, Wau, 2050 m, 25.v.1959, L. J. Brass, 2 ♂, AMNH, same data but 12.v.1959, 1 ♀; Karaweri, 30 km SSO Chuave, 15.ii.1973, K. W. Ströder, 1 ♂, RML, Kimi Creek Camp, Mt. Michael, 1980 m, 29.vii.

1959, 1 ♀ AMNH; Mekino, 30 km SSW Lufa, 2.iii.1973, K. W. Ströder, 1 ♂, RML; Pila, 16 km SE Chuave, Chimba district, 9.ii.1973, K. W. Ströder, 1 ♂, RML; Saiko, Bubu river, Upper Waria river, 5500-6000 ft, ix-x.1939, F. Shaw Mayer, 1 ♂ 7 ♀, BM; Mt. Tafa, 8500 ft, iii.1934, L. E. Cheesman, 2 ♂ 3 ♀, BM. NEW GUINEA (SE): Mt. Daymann, Maneau Range, 2230 m, 4.vii.1953, Geoffry M. Tate, 1 ♂, AMNH.



Figs. 1-6. *Baeturia nasuta* Blöte, 1960: 1, male head in lateral view, paratype from Baliem Camp; 2, male operculum in ventral view, Paniai; 3, female operculum in ventral view, from Paniai; 4, male genitalia in lateral view, Paniai; 5, male caudal dorsal beak in dorsal view, Paniai; 6, female caudal dorsal beak in dorsal view, Paniai. Lettering: bl = basal lobe; dc = dorsal protrusion of the clasper; dp = distal part of the operculum; cb = caudal dorsal beak; pp = proximal part of the operculum; rc = right-angled crest.

Both males and females of this species can be easily recognised by the darkened wings and tegmina, and the long, narrow 8th apical area of the tegmina. The body of the males is light ochraceous, of the females more reddish.

Description

Head (fig. 1): Ochraceous, lightly brown speckled, mainly on the vertex lobes. Postclypeus dorsally

very narrow and triangularly protruding: greatest width of postclypeus as wide as the vertex lobe. The postclypeus in the female can be even more protruding than in the male. Postclypeus and vertex bearing many long hairs, which are as long as or longer than the postclypeus in dorsal view. In lateral view the postclypeus is angularly rounded, distinctly swollen ventrodistally and concavely curved inward ventroproximally.

Pronotum: Less hairy than the head; the longest hairs are most densely set at the lateral margins and in a medial band. This medial band, which is fairly conspicuous by a very dense, brown speckling, is strongly dilated towards the anterior and posterior pronotum margins: in two male and some female specimens the ground colour of this band, as well as that of the pronotum collar, is darker and slightly reddish. In most specimens the anterior and posterior pronotal margins are reddish.

Mesonotum: Some specimens have two small black spots in front of the cruciform elevation. In other specimens these spots may be unrecognizable in the brown speckling, extending all over the mesonotum.

Tegmina and wings: Hyaline, but very lightly brown suffused. On close examination, slightly darker brown blots, alternating with small clear parts are found close upon the veins. This colouring, though very vague, is clearest visible in the female. The tegmina are rather slender: 8th apical area in the male 3.5 to 4.7 times and in the females 2.4 to 4.3 times as long as broad.

Legs: The dark marks show a tendency to form rings on the femora and stripes on the tibiae; the tarsi are usually slightly darker than the femora and tibiae.

Tymbal organs: Tymbals with four sclerotized transverse ridges running across the whole tymbal and three short intercalary ridges, which are sometimes hardly visible; with the naked eye, these intercalary ridges seems to form a band running across the tymbals.

Opercula: The male operculum (fig. 2) is oval, slightly erect, so that a distinct gap exists between the posterior operculum margin and the tymbal organ as well as the 2nd abd. sternite. The posterior margin of the operculum is inflected, most

distinctly halfway along this margin. Due to this inflection the inner surface of the operculum itself is only partly visible. The weak crest along the posterior margin turns into a distinct, right-angled lateral crest, bordering a flat area at the lateral side of the operculum; the medial margin of the operculum is broadly rounded. The female operculum (fig. 3), though shorter than that of the male, has basically the same shape. The crest at the lateral side is in some specimens more like that of *mamillata*. The operculum is medially pointed towards the base. The crest along the posterior margin is very distinct.

Abdomen: Male abdomen with a reddish brown to almost black mediodorsal line. The sides of the segms. 4-6 are hardly pigmented and almost transparent. In weakly pigmented specimens these lateral areas give the impression of old damp paper. Segm. 1 is distinctly shorter than segm. 2 mediodorsally. The female abdomen is reddish ochraceous, densely brown speckled. The posterior margins of the segm. 3-6 are dark brown or reddish in the female, more orange tinged in the male. The lateroventral row of black spots is very distinct in male and female.

Male genitalia (figs. 4-5): The caudal dorsal beak is distinctly pointed at its apex, reversed gutter shaped and about as long as the clasper. The basal lobes of the pygofer bear an apically rounded protuberance which is hardly distally protruded and bent slightly upwards. The clasper is described in lateral view. The apical part of the clasper is curved downwards. The dorsal protrusion is weakly developed; proximal part of the dorsal margin concave next to the protrusion and convexly outcurved at the base, distal part of the dorsal margin nearly a straight line to the strongly convex apex. A weakly developed furrow runs parallel to the dorsal margin from the base to halfway the length of the clasper.

Female genitalia (fig. 6): The caudal dorsal beak is sharper pointed than in the male, more slender and about as long as the valvae.

Measurements: Length of body: ♂ 15.3-18.1 mm (16.7 ± 0.9), ♀ 15.9-21.9 mm (18.6 ± 1.6); length of tegminum: ♂ 20.2-22.9 mm (21.2 ± 0.9), ♀ 24.1-31.3 mm (26.8 ± 1.9); length of pronotum: ♂ 2.07-2.25 mm (2.15 ± 0.05), ♀

2.36-2.96 mm (2.62 ± 0.16); width of pronotum: ♂ 4.74-5.40 mm (5.10 ± 0.21), ♀ 5.25-7.14 mm (6.25 ± 0.45); width of head: ♂ 3.16-3.44 mm (3.29 ± 0.10), ♀ 3.56-4.36 mm (3.92 ± 0.20).

One male from Baliem Camp is much darker coloured than the males described above. The head, the medial band of the pronotum, the mesonotum and the pigmented parts of the abdomen are dark castaneous to almost black; the sides of the pronotum are ochraceous and bear on either side two black stripes. The mesonotum shows two paramedian converging yellow lines running from the anterior margin to the centre of the mesonotum. These lines are very faint in some other specimens of this species. Although the specimen from Baliem Camp is somewhat different in colour, it certainly belongs to *B. nasuta*.

The specimens from the Chimbu district: Karaweri, Mekino and Pila are very pale and distinguish themselves by a very strongly W-shaped posterior margin of the 8th abd. sternite.

Baeturia mamillata Blöte, 1960

(Figs. 7-12, 43, 47)

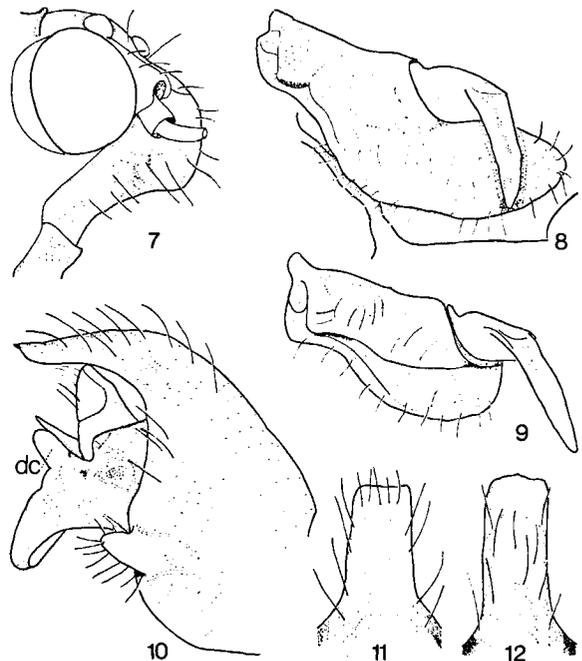
Baeturia mamillata Blöte, 1960: 64, 65, figs. 5-6.

Material examined: IRIAN: NEW GUINEA (W): Araboebivak, x.1939, KNAG, 4 ♀ *Baeturia arabuensis* det. H. C. Blöte, 1960, RML; Bivak 39A, Star Range, 1500 m, l.vii. 1959, Neth. New Guinea Exp., 1 ♀, RML; Ok Tenma, Star Range, 1500 m, 19.v.1959, Neth. New Guinea Exp., 1 ♀, RML; Sibil, Star Range, 1260 m, iv-vi.1959, Neth. New Guinea Exp., 6 ♂ 18 ♀, RML, same data but R. T. Simon Thomas, 1 ♂. PAPUA NEW GUINEA: NEW GUINEA (NE): Budemu, Finisterre Mts., 4000 ft, 15-24.x. 1964, M. E. Bacchus, 7 ♂ 3 ♀, BM; Damanti, Finisterre Mts., 3500 ft, 2-11.x.1964, M. E. Bacchus, 1 ♂, BM; Masba Creek Camp, Huon Peninsula, Morobe district, 7.xii.1964, H. M. Van Deusen, 1 ♂, AMNH; Moro, Finisterre Mts., 30.x-15.xi.1964, M. E. Bacchus, 2 ♂ 1 ♀, BM. NEW GUINEA (SE): Mondo, 5000 ft, 1.ii.1934, L. E. Cheesman, 12 ♂ 13 ♀ holo- and paratypes, BM, same data but 2 ♀ paratypes *Baeturia lamifera* det. H. C. Blöte, 1960.

The males of this species are very similar to *B. nasuta* in general aspect, but somewhat lighter and more greenish coloured. The females are very robust and red-brown coloured. The female abdomen is very short and stout. The 8th apical area of the tegminum is very broad and short in males and females.

Description

Head (fig. 7): Ochraceous to olive green; speckled as in *B. nasuta*. Postclypeus broader, more rounded dorsally than in *B. nasuta*, and with a dint in the dorsal surface. The postclypeus is 1.2-1.5 times as wide as the vertex lobe. Postclypeus and vertex bear less hairs than in *B. nasuta*; some male specimens nearly hairless. The female head is red-brown or greyish coloured and densely set with short hairs on postclypeus and vertex. Postclypeus in lateral view distinctly swollen, but more rounded than in *B. nasuta*, missing the ventroproximal concave incurvation.



Figs. 7-12. *Baeturia mamillata* Blöte, 1960: 7, male head in lateral view, Sibil; 8, male operculum in ventral view, Sibil; 9, female operculum in ventral view, Sibil; 10, male genitalia in lateral view, Ok Tenma; 11, male caudal dorsal beak in dorsal view, Ok Tenma; 12, female caudal dorsal beak in dorsal view, Sibil. Lettering as in figs. 1-6.

Pronotum: Ochraceous and almost hairless, with exception of some long hairs at the lateral margins. Pattern of brown speckling as in *B. nasuta*, but the medial band is not differently coloured as in this species. The pronotum collar is slightly darkened or reddish in most specimens.

Mesonotum: Greyish brown. Nearly all specimens have two black spots in front of the cruciform elevation, which is olive-green in the males and red in the females. The lateral sides of the female mesonotum are also red coloured.

Tegmina and wings: Hyaline, more robust than in *B. nasuta*; the 8th apical area of the tegminum is 2.4-2.7 times as long as broad.

Legs: Ochraceous, light brown speckled. The tibiae and tarsi are slightly darker, more reddish than the femora.

Tymbal organs: The ridges and intercalary ridges are light-brown and distinct.

Opercula: Male operculum (fig. 8) as in *B. nasuta*, but more erect. The inflection of the posterior margin is less distinct. The gap between the posterior margin of the operculum and the tymbal organ as well as the 2nd abd. sternites shows the inner surface of the operculum as well as the tymbal cavity. The lateral part of the right-angled crest differs from that of *B. nasuta* in forming a slope down to a hole rather than a flat area. The medial margin of the operculum is more pointed than in *B. nasuta*. The female operculum (fig. 9) is very erect: the semicircular distal part stands with an almost right angle on the proximal part. A crest runs along the lateral half of the posterior margin. The opercula of the females from Araboebivak are longer.

Abdomen: The male abdomen is very similar to that of *B. nasuta*. The transparent sides of the abd. segms. 4-6 are light-brown stained in a lateral band. Segm. 1 is distinctly shorter than segm. 2 mediodorsally and olive-green coloured. Female abdomen red-brown and densely brown speckled, the posterior margins of the segms. 3-6 are red. The female abdomen is shorter than in other species: body length : abd. length = 1.68-1.97 (1.78 ± 0.09) (in *B. arabuensis*: 1.63-1.77 (1.69 ± 0.04)).

Male genitalia (figs. 10-11): The caudal dorsal beak is truncate at the apex and reaches to only

midlength the clasper. The basal lobes of the pygofer bear conical protuberances, that protrude hindwards and are rounded apically. The clasper is described in lateral view: its apical part is strongly curved downwards; dorsal protrusion is finger-shaped; proximal part of the dorsal margin strongly concave next to the protrusion and convexly outcurved at the base; distal part of the dorsal margin convex next to the protrusion and than nearly straight to the strongly convex apex.

Female genitalia (fig. 12): The caudal dorsal beak is truncate and about as long as the valvae.

Measurements: Length of body: ♂ 14.3-17.8 mm (16.0 ± 0.9), ♀ 15.4-19.8 mm (17.5 ± 1.2); length of tegminum: ♂ 18.0-22.2 mm (20.0 ± 1.1), ♀ 22.1-29.2 mm (25.3 ± 1.8); length of pronotum: ♂ 2.08-2.48 mm (2.28 ± 0.12), ♀ 2.40-3.08 mm (2.78 ± 0.18); width of pronotum: ♂ 4.55-5.81 mm (5.29 ± 0.36), ♀ 5.60-7.14 mm (6.48 ± 0.36); width of head: ♂ 3.28-3.80 mm (3.57 ± 0.16), ♀ 3.80-4.64 mm (4.25 ± 0.19).

***Baeturia arabuensis* Blöte, 1960**

(Figs. 13-18, 44, 48)

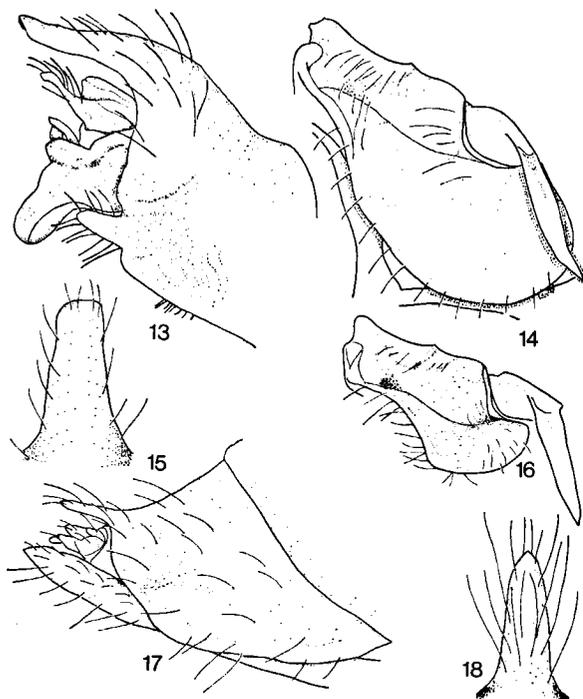
Baeturia arabuensis Blöte, 1960: 63, 64 fig.

Material examined: IRIAN: NEW GUINEA (W): Araboebivak, 6-12.X.1939, KNAG, 5 ♂ holo- and paratypes, RML; Enarotali, Wissellakes, 1750 m, 7.I.1955, L. D. Brongersma, 1 ♂, RML; Sibil, Star Range, 1260 m, iv-vi.1959, Neth, New Guinea Exp. 9 ♂, 27 ♀, *Baeturia mamillata* det. H. C. Blöte, 1960, RML.

The males of this species can easily be recognised by their slightly dilated abdomen. Their colour is pale ochraceous as in *B. mamillata*. The females are greyish coloured. Both males and females have a grey medial band running across the mesonotum.

Description

Head: Ochraceous, lightly brown speckled. The postclypeus resembles that of *B. mamillata* in shape, but is less protruding. Short hairs cover the postclypeus and vertex.



Figs. 13-18. *Baeturia arabuensis* Blöte, 1960: 13, male genitalia in lateral view, paratype from Araboebivak; 14, male operculum in ventral view, paratype from Araboebivak; 15, male caudal dorsal beak in dorsal view, Sibil; 16-18 females from Sibil: 16, operculum in ventral view; 17, genitalia in lateral view; 18, caudal dorsal beak in dorsal view.

Pronotum: Lighter coloured than the mesonotum and head. Speckled as in *B. mamillata*.

Mesonotum: Greyish coloured. Most specimens have two black spots in front of the cruciform elevation. The grey-brown speckling forms a medial band, connecting the medial band of the pronotum with the cruciform elevation (which is less speckled in most specimens) and two lateral bands running from the cruciform elevation towards the basis of the tegminum.

Tegmina and wings: The shape of the tegmina is intermediate between that of *B. nasuta* and *B. mamillata*; 8th apical area 2.6-3.0 times as long as broad.

Legs: Ochraceous, femora sometimes lightly speckled; tibiae slightly darker, more reddish and light brown speckled.

Tymbal organs: The ridges and intercalary ridges on the tymbals are light-brown coloured.

Opercula: The male operculum (fig. 14) is very

long and adjacent to the body, so that the inner surface of the operculum and the tymbal cavity are not visible. The strongly convex posterior margin of the operculum reaches beyond the anterior margin of abd. segm. 2. The lateral part of the right-angled lateral crest is shorter than in the foregoing species. There is a weak crest along the posterior margin, the medial margin is truncate and almost a straight line. The female operculum (fig. 16) is very different from that of the male. The operculum is very erect; its triangular distal part stands almost right-angled on its proximal part. The posterior margin of the operculum is convex next to the meracanthus, right-angled half-way and concavely curved more laterally. A distinct crest runs along the posterior margin. Right-angled lateral crest as in *B. mamillata* male.

Abdomen: The male abdomen is slightly dilated. The mediadorsal band, lateroventral row of black spots and red posterior margins of the segms. 3-6 are very conspicuous. Pigmentation of the transparent sides of the segms. 4-6 as in *B. mamillata*. Ventral side of the abdomen unspotted. The female abdomen is grey-brown in most, red-brown in some specimens. There is no distinct medial line. The posterior margins of the segms. 3-6 are red.

Male genitalia (figs. 13 & 15): The caudal dorsal beak is slender, about as long as the clasper and either truncate or rounded at the apex. The basal lobe of the pygofer bears an apically sharply pointed, conical protuberance which is bent slightly upwards and directed strongly backwards. The clasper is very like that of *B. mamillata*, though the dorsal protrusion differs in being triangularly rounded.

Female genitalia (figs. 17-18): The caudal dorsal beak is pointed at its apex and shorter than the valvae.

Measurements: Length of body: ♂ 16.0-22.1 mm (18.7 ± 1.4), ♀ 15.2-19.3 mm (17.8 ± 0.9); length of tegminum: ♂ 19.9-26.8 mm (22.6 ± 1.5), ♀ 23.2-27.4 mm (25.7 ± 1.9); length of pronotum: ♂ 2.24-3.61 mm (2.46 ± 0.28), ♀ 2.48-3.04 mm (2.77 ± 0.12); width of pronotum: ♂ 4.86-6.42 mm (5.55 ± 0.36), ♀ 5.60-6.58 mm (6.15 ± 0.27); width of head: ♂ 3.36-4.00 mm (3.55 ± 0.17), ♀ 3.60-4.63 mm (3.97 ± 0.16).

Baeturia parva Blöte, 1960

(Figs. 19-23, 42, 49)

Baeturia parva Blöte, 1960: 65-67, figs. 9-10.

Material examined: BISMARCK ARCHIPELAGO: NEW BRITAIN: Puktas, Baining Mts., 22.xi.1957, J. Smart, 1 ♀, BM. IRIAN: NEW GUINEA (W): Ajamaroe, 3.iii.1953, L. D. Brongersma, 1 ♀, RML, same data but 30.v.1952, L. D. Brongersma and W. J. Roosdorp, 1 ♀; Djidmaoe, 13.vi.1952, L. D. Brongersma and W. J. Roosdorp, 1 ♀, RML; Dojo, iv.1958, G. den Hoed, 1 ♂ paratype, ZMA; Fakfak, 10.iv.1952, L. D. Brongersma, 1 ♀, RML; Hollandia, i.1937, W. Stüber, 1 ♂, BM, same data but Humboldt bay, iv.1936, L. E. Cheesman, 1 ♀, BM; 10-60 m, 8.x.1954, L. D. Brongersma, 1 ♂ holotype, 9.x., 16.x. & 26.xi.1954, 3 ♀ paratypes, 21.xi. & 22.xi.1952, 2 ♂ paratypes, 17.xi. 1954, L. D. Brongersma and L. B. Holthuis, 1 ♀ paratype, all RML; ii.1958, G. den Hoed 1 ♂ paratype, ZMA; Humboldt bay, Bewani Mts., vii.1937, W. Stüber, 1 ♂ 1 ♀, BM, same data but Pukusam district, vi.1937, 1 ♂; Ifar, xii.1957, G. den Hoed, 1 ♀ paratype, ZMA; Joka on Sentani lake, 21.x.1954, M. Boeseman and L. B. Holthuis, 1 ♀, RML; Secru, MacCluer Bay, viii.1898, K. Schädler, 1 ♀, RML; Torecella Mts. [Torricelli Mts.], between Afua & Chinapelli, Akimbo Riv. Sea Falls, 1700 ft, 1939, G. P. Moore, 1 ♂ 1 ♀, BM. PAPUA — NEW GUINEA: NEW GUINEA (NE): Friedrichwilhelmshafen, Fruhstorfer, 1 ♀, RML; Maprik, 28.x.1957, J. Smart, 1 ♀, BM.

B. parva is the smallest species of the *nasuta* group. Furthermore this species can be recognized by the band-pattern on the veins of wings and tegmina, in males and females.

Description

Head: Red-brown to greyish brown, slightly dark speckled. Postclypeus in dorsal view resembling that of *B. mamillata*, provided with the same denticles. The postclypeus and vertex have sparse short hairs in the male, but are hairier in the female. Postclypeus in lateral view less swollen than in the foregoing species and rounded as in *B. mamillata*.

Pronotum: As in *B. nasuta*. The ground colour of the medial band is slightly reddish. The pronotum is almost hairless in the male and bears some short hairs in the female.

Mesonotum: Greyish coloured. All specimens have two black spots in front of the cruciform elevation.

Legs: Ochraceous, sometimes lightly speckled. Femora of the females are lightly brown speckled. The tibiae and tarsi are slightly darker, more reddish, coloured.

Tegmina and wings: The veins of tegmina and wings have alternating light and dark bands. The shape of the tegminum as in *B. arabuensis*; 8th apical area 2.7 to 3.0 times as long as broad.

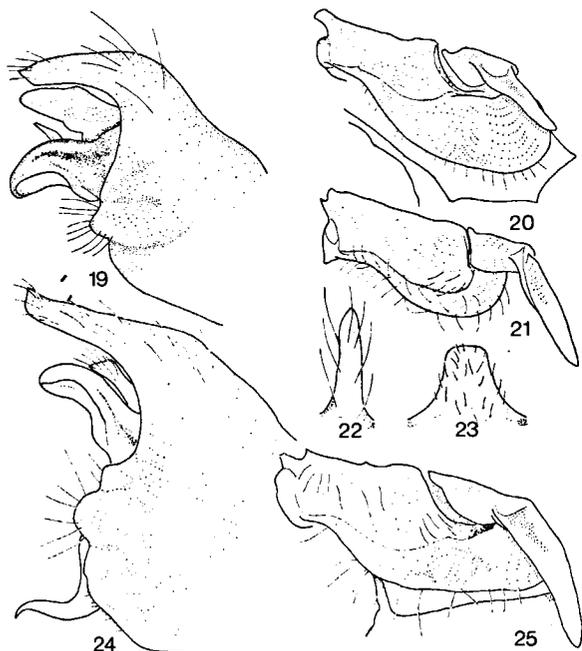
Tymbal organs: The ridges on the tymbals are very light-brown to greyish. Intercalary ridges are recognizable in one of the specimens only.

Opercula: The male operculum (fig. 20) is very short and adjacent to the body, leaving only a narrow gap between posterior margin of the operculum and tymbal organ as well as 2nd abd. sternite, obstructing any glance of the tymbal cavity and the inner surface of the operculum. The right-angled crest at the lateral edge of the operculum is very distinct, especially its lateral part, which is higher than its distal part. The medial margin of the operculum is broadly rounded, and slightly upcurved. There is no crest along the posterior margin. The female operculum (fig. 21) is very erect, its distal part stands almost right-angled upon its proximal part. The crest round to lateral edge shows the same characteristics as in the male, and turns into a weak crest along the posterior margin.

Abdomen: Male abdomen ochraceous, weakly brown speckled dorsally only. Mediodorsal line vague. The lateroventral black spots are very distinct, since the ground colour is very light. The sides of the segms. 3-6 are pigmented as in *B. mamillata*. Segm. 1 is distinctly shorter than segm. 2 mediodorsally. Female abdomen ochraceous, densely brown speckled all over; posterior margins of the segms. 3-6 red-brown.

Male genitalia (figs. 19 and 23): The caudal dorsal beak of the paratypes are truncate at its apex and very short, reaching to halfway the clasper; caudal dorsal beak of the holotype is

distinctly longer and more slender. The basal lobes of the pygofer bear a laterally rounded, not really distally protruding protuberance. The clasper is described in lateral view: it is slender; its apical part is curved downwards; there is no dorsal protrusion; the dorsal margin is concave at one fourth of its length and convexly curved towards the apex.



Figs. 19-25. 19-23: *Baeturia parva* Blöte, 1960: 19, male genitalia in lateral view, paratype from Hollandia; 20, male operculum in ventral view, paratype from Hollandia; 21, female operculum in ventral view, Fakfak; 22, female caudal dorsal beak in dorsal view, Fakfak; 23, male caudal dorsal beak in dorsal view, Hollandia. 24-25: *Baeturia marmorata* Blöte, 1960, male paratype from Rattan Camp: 24, genitalia in lateral view; 25, operculum in ventral view.

Female genitalia (fig. 22): The caudal dorsal beak is slender and sharply pointed, about as long as the valvae.

Measurements: Length of body: ♂ 12.2-16.6 mm (14.5 ± 1.2), ♀ 12.8-16.2 mm (14.3 ± 1.0); length of tegminum: ♂ 14.4-18.0 mm (16.2 ± 1.2), ♀ 15.9-19.7 mm (18.0 ± 1.1); length of pronotum: ♂ 1.72-2.04 mm (1.85 ± 0.12), ♀ 1.80-2.40 mm (2.12 ± 0.17); width of pronotum: ♂ 3.80-4.25 mm (4.06 ± 0.18), ♀ 4.25-5.25 mm (4.76 ± 0.29); width of head: ♂ 2.84-3.28 mm (3.09 ± 0.19), ♀ 3.16-3.76 mm (3.49 ± 0.19).

The two specimens from Torricelli Mts. are darker coloured; the veins of tegmina and wings, the legs, and the abdomen are red to redbrown coloured. The specific colour pattern on the veins is not visible, possibly due to the red colouring within the veins.

Baeturia marmorata Blöte, 1960

(Figs. 24-28, 50)

Baeturia marmorata Blöte, 1960: 67 figs. 11-12.

Material examined: IRIAN: NEW GUINEA (W): Araucaria Camp, 800 m, 29.iii.1939, L. J. Toxopeus, ♂ holotype, RML, same data but 10.iii.1939, 1 ♀ allotype, 11 & 26.iii.1939, 2 ♀; Rattan Camp, 1050 m, ii.1939, L. J. Toxopeus, 1 ♂ paratype, RML.

Of this species only two males and three females are known to me. The males of this species differ from the foregoing species in colour. Head and thorax are not ochraceous and brown speckled, but dark-brown and striped. The male abdomen does not have the transparent sides and the orange coloured posterior margins of the segments manifest in the other species of the *nasuta* group. In spite of these differences in colour, *B. marmorata* is regarded a member of the *nasuta* group on account of the narrow postclypeus, the four ridges on the tymbals and the downwards curved, broad-based claspers. The female allotype that obviously belongs to this species, has almost the same colour pattern in head and thorax as the male holotype. The two other females are darker coloured, but show the vestiges of a grey triangle on the mesonotum, characteristic for this species.

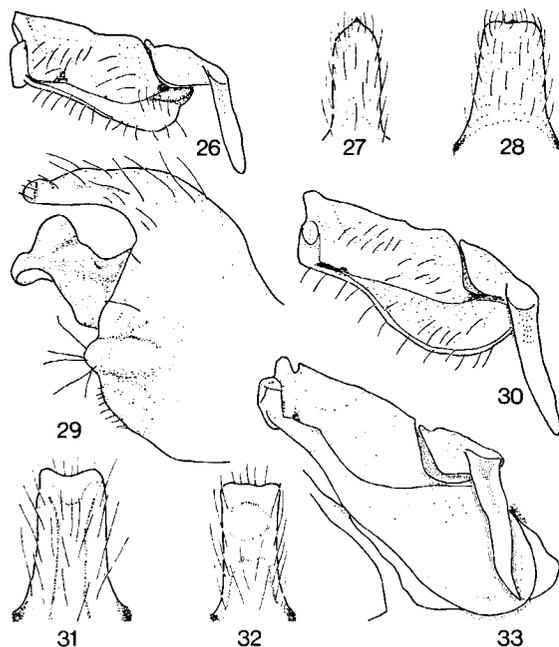
Description

Head: Greyish-brown, with a dark blot on the vertex lobes, between the eyes and lateral ocelli. Postclypeus as in *B. mamillata*.

Pronotum: In the holotype the margins and mediodorsal line are ochraceous, the remaining parts are darkened with brown stripes, which radiate from the eyes towards the posterior margin. In the male paratype the anterior and posterior margins are darkened, the medial band is darkened anteriorly and close to the posterior margin. The lateral margins and medial band are

provided with long hairs in both male specimens. The female pronotum is ochraceous and hardly brown speckled.

Mesonotum: Dark-brown with a medial, lighter coloured triangular area attached to the ochraceous cruciform elevation and two black spots in front of this elevation. The sides of the mesonotum are darkly stained.



Figs. 26-33. 26-28. *Baeturia marmorata* Blöte, 1960: 26, female operculum in ventral view, paratype from Araucaria Camp; 27, female caudal dorsal beak in dorsal view, paratype from Araucaria Camp; 28, male caudal dorsal beak in dorsal view, paratype from Rattan Camp. 29-33. *Baeturia bipunctata* Blöte, 1960 from Rattan Camp: 29, male genitalia in lateral view; 30, female operculum in ventral view; 31, male caudal dorsal beak in dorsal view; 32, female caudal dorsal beak in dorsal view; 33, male operculum in ventral view.

Tegmina and wings: Hyaline, shaped as in *B. mamillata*. The 8th apical area of the tegminum is 2.5-2.7 times as long as broad; in two female specimens probably belonging to this species the 8th apical area is 3.2 times as long as broad.

Legs: Ochraceous, hardly speckled or un-speckled. The tibiae and tarsi are slightly darker coloured than the femora.

Tymbal organs: The ridges and intercalary ridges are pale-brown to greyish coloured as in *B. parva* and hardly distinguishable.

Opercula: The male operculum (fig. 15) is very erect, the distal part stands almost right-angled upon the proximal part, so that the tymbal cavity as well as the inner surface of the operculum are visible. Right-angled lateral crest as in *B. parva*. Posterior margin convex, without a crest; medial margin truncate. Female operculum (fig. 26) as in *B. mamillata*, with a crest along the posterior margin.

Abdomen: Abdomen of the holotype ochraceous, un-speckled; of the male paratype light-brown and lightly speckled. The mediadorsal line is somewhat darkened; posterior margins of abd. segms. 3-6 ochraceous. Many short hairs give the abdomen a silvery aspect. Row of lateroventral black spots less distinct than in the foregoing species. Tergite 1 is not visible. Female abdomen ochraceous, but uniformly dark-stained laterally.

Male genitalia (figs. 24 & 28): The caudal dorsal beak is ochraceous coloured, stout and truncate at its apex, but bears a short, sharp point midlength its apical margin. The protuberances of the basal lobes of the pygofer are very blunt and hardly directed backwards. The posterior margin of the pygofer makes an almost right angle dorsally, and less distinct, ventrally of the protuberances. Clasper as in *B. parva*, but pointed upwards instead of curved downwards. A torsi in the clasper makes that the ventral side of the clasper is rotated to a more lateral position towards the apex.

Female genitalia (fig. 27): The caudal dorsal beak is pointed at the apex and longer than the valvae.

Measurements: Length of body: ♂ 15.1, 17.1 mm, ♀ 18.1, 18.1, 21.4 mm; length of tegminum: ♂ 20.7 mm, ♀ 23.7, 26.4, 28.6 mm; length of pronotum: ♂ 2.34, 2.70 mm; ♀ 2.75, 2.75, 3.10 mm; width of pronotum: ♂ 5.39, 6.23 mm, ♀ 5.85, 6.30, 7.05 mm; width of head: ♂ 3.85 mm, ♀ 4.30, 4.45, 5.05 mm.

***Baeturia bipunctata* Blöte, 1960**

(Figs. 29-33, 44, 51)

Baeturia bipunctata Blöte, 1960: 64, fig. 4.

Material examined: IRIAN: NEW GUINEA (W): Araucaria Camp, 800 m, 3-16.iii.

1939, L. J. Toxopeus, 9 ♀, RML: Rattan Camp, 1200 m, ii.1939, L. J. Toxopeus, 1 ♂ holotype, 1 ♀, RML; Top Camp, 2100 m, 19.ii.1939, L. J. Toxopeus, 1 ♀, RML.

The male holotype is the largest male specimen in the *nasuta* group, its body is reddish-brown and hardly speckled. The abdomen differs from that of the foregoing species in being strongly dilated, especially ventrally, like in *Baeturia guttulinervis* Blöte, 1960 and *Baeturia rufula* Blöte, 1960. The shape of the claspers, the four ridges on the tymbals and the narrow, protruding postclypeus, however provide the arguments for placing *B. bipunctata* in the *nasuta* group. The females that presumably belong to this species are very much like the females of *B. marmorata* in general aspect: the thorax is hardly speckled and the posterior half of the mesonotum is lighter, more greyish coloured than the anterior half. However, the light colouring is not restricted to a triangle as in *marmorata*. The main difference between the females of both species is found in the caudal dorsal beak being truncate in *B. bipunctata* and pointed in *marmorata*. A drawback for coupling these females with the male of *B. bipunctata* is the fact that all females are smaller than the males and the difference in 8th apical areas of males and females.

Description

Head: Reddish brown, with some sparse dark blots on the vertex lobes, mainly near the lateral ocelli. The postclypeus, like that of *B. mamillata*, is strongly rounded at the anterior margin. Vertex and postclypeus, covered with hairs which are as long as in *B. nasuta*, but less densely set.

Pronotum: Of the same colour as the head. The brown speckling forms a medial band as in *B. nasuta*; in the male, a black spot is found on either side of the narrowest part of this band. Medial band and pronotum collar slightly reddish. Long hairs are most densely set at the lateral margins and in the medial band.

Mesonotum: The proximal half of the mesonotum is olive-green, the distal half reddish. Brown marks tend to form stripes from the anterior margin of the mesonotum to half-way along

the mesonotum. The reddish distal half has no dark marks except the two black spots in front of the cruciform elevation.

Tegmina and wings: Veins, especially the costal veins of the tegmina, red-brown coloured. The 8th apical area of the tegminum is in the male 3.8 times, and in the female 2.5 to 3.1 times as long as broad.

Legs: Reddish-brown, without dark markings.

Tymbals organs: The light-brown ridges on the tymbals turn reddish dorsally. There are no distinct intercalary ridges.

Opercula: The male operculum (fig. 33) is very erect, so that the tymbal cavity and the inner surface of the operculum are visible. Right-angled lateral crest of the operculum as in *B. nasuta*. The medial part of the operculum is an almost semicircular flat area, with a crest along its medial margin. Female operculum (fig. 30) as in *B. mamillata*, but less erect. There is a crest along the posterior margin.

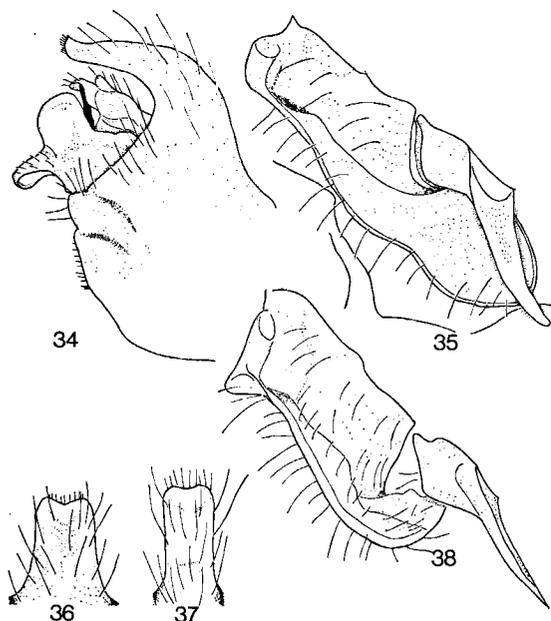
Abdomen: Male abdomen strongly dilated laterally as well as ventrally; in dorsal view it is not unlike the abdomen of *B. arabuensis*, but in lateral view it is quite different because of its ventral dilation. The black spots on the abd. segms. 2-7 are situated at half the height of the lateral sides, because of the ventral dilation. Sides of abd. segms. 4-6 transparent and hardly pigmented, ventrally as well as dorsally of the black spots. Mediodorsal line reddish and hardly spotted. Segm. 1 shorter than segm. 2 mediodorsally. The female abdomen is ochraceous and laterally densely brown speckled or stained. The mediodorsal line, narrow bands dorsally and ventrally of the latero-ventral rows of black spots on the abd. segms. 2-8, and the posterior margins of the abd. segms. 2-8 are unspeckled.

Male genitalia (fig. 29 and 31): The caudal dorsal beak is truncate, slightly bi-topped at the apex. The basal lobes of the pygofer are truncate and protrude hardly backwards. Pygofer dark castaneous. The clasper is described in lateral view: it is globous at the base and strongly curved downwards towards the apex; the dorsal protrusion is broadly rounded and humpshaped situated at two-thirds the length of the clasper; proximal part of dorsal margin convex next to the pro-

trusion and concave at its base, distal part of dorsal margin convex towards the apex.

Female genitalia (fig. 32): The caudal dorsal beak is reddish coloured, truncate at its apex and as long as the valvae.

Measurements: Length of body: ♂ 22.8 mm, ♀ 18.5-21.0 mm (19.8 ± 0.9); length of tegminum: ♂ 24.9 mm, ♀ 26.0-29.1 mm (27.4 ± 0.9); length of pronotum: ♂ 2.85 mm, ♀ 2.70-3.30 mm (2.97 ± 0.18); width of pronotum: ♂ 6.50 mm, ♀ 6.08-7.60 mm (6.81 ± 0.41); width of head: ♂ 4.05 mm, ♀ 4.25-4.90 mm (4.59 ± 0.19).



Figs. 34-38. *Baeturia laminifer* Blöte, 1960: 34, male genitalia in lateral view, Kokoda; 35, male operculum in ventral view, Damanti; 36, male caudal dorsal beak in dorsal view, Damanti; 37, female caudal dorsal beak in dorsal view, Ekeikei; 38, female operculum in ventral view, from Ekeikei.

Baeturia laminifer Blöte, 1960

(Figs. 34-38, 44, 52)

Baeturia laminifer Blöte, 1960: 65 figs. 7-8.

MATERIAL EXAMINED: PAPUA NEW GUINEA: NEW GUINEA (NE): Damanti, Finisterre Mts., Madang district, 3550 ft, 2-11. x.1964, M. E. Bacchus, 5 ♂ and 4 ♀, BM. NEW GUINEA (SE): Ekeikei, ix.1903, Pratt, 2 ♀, BM; Kokoda, 1200 ft, xii.1933, L. E. Cheesman,

1 ♂, BM; Mafulu, [probably Mafufu] 4000 ft, i.1934, L. E. Cheesman, 1 ♂ holotype, BM; Mondo, 5000 ft, ii.1934, L. E. Cheesman, 1 ♂ paratype.

The males of this species are very pale-yellowish. The females are more greyish and have a grey-speckled lateral band across their abdomen. The females are recognised as belonging to this species mainly because of the shape of the caudal dorsal beak, which is the same as in the male.

Description

Head: Pale-greyish, slightly brown stained, mainly on the vertex lobes. The postclypeus and vertex bear some short hairs, but are almost hairless in some specimens. Postclypeus as in *B. mamillata*.

Pronotum: Coloured as the head; in some specimens brown stained, mainly along the fissures. In some specimens the anterior half of the medial band is lightly speckled, but in most specimens the medial band and the pronotum collar are un-speckled; in the males from Kokoda and Mondo and in some females the medial band is speckled upon a reddish groundcolour. Long hairs are set at the lateral margin.

Mesonotum: Greyish, brown stained medio proximally and lightly speckled laterally. Two brown spots are situated in front of the ochraceous, un-speckled cruciform elevation.

Tegmina and wings: Hyaline. The veins are pale-yellowish coloured. The 8th apical area of the tegminum is in the males 3.0-3.5 times, and in the females 2.5-4.1 times as long as broad.

Legs: Light ochraceous and un-speckled.

Tymbal organs: The ridges and intercalary ridges on the tymbals are light greyish coloured and hardly visible.

Opercula: The male operculum (fig. 35) is very short, but broad and stands very erect. The right-angled lateral crest as in *B. nasuta*. The operculum forms medially a narrow rounded flat area as in *B. bipunctata*. The posterior margin has a dip: the margin is convex to width of the operculum, concave and convex again to the medial apex of the operculum. There is a crest along the posterior margin. Female operculum (fig. 38) as in *B. mamillata*.

Abdomen: Male abdomen pale-yellowish. The lateroventral black spots on the abd. segms. 3-8 are very distinct. The sides of the segms. 3-6 are transparent and bear a row of more or less triangular grey pigmented stains, that have their basal line at the posterior, and their top at the anterior margins. Blots of the same shape form the vague mediodorsal line. The posterior margins of the segms. 2-8 are ochraceous in specimens from Damanti and red in other specimens. Segm. 1 is very short mediodorsally. Female abdomen ochraceous; the brown speckling forms a mediodorsal and two lateral bands on the abdomen. The posterior margins of the segms. 2-8 are either ochraceous and unspckled or red. The lateroventral row of black spots is very distinct.

Male genitalia (figs. 34 and 36): Caudal dorsal beak bi-topped as the *B. bipunctata* male. The basal lobes of the pygofer bear apically rounded, upwardly curved, protuberances as in *B. nasuta*. Clasper as in *B. bipunctata*, but dorsal protrusion square laminiform.

Female genitalia (fig. 37): Caudal dorsal beak as in the male and shorter than the valvae.

Measurements: Length of body: ♂ 16.0-18.4 mm (17.3 ± 0.9), ♂ 15.1-18.7 mm ($17.1 \pm$

1.4); length of tegminum: ♂ 19.8-22.0 mm (21.0 ± 0.6), ♀ 20.1-25.5 mm (23.1 ± 1.7); length of pronotum: ♂ 3.60-3.96 mm (3.76 ± 0.11), ♀ 3.88-4.40 mm (4.18 ± 0.41); width of pronotum: ♂ 5.25-5.53 mm (5.45 ± 0.18), ♀ 5.76-6.58 mm (6.14 ± 0.30); width of head: ♂ 2.32-2.48 mm (2.40 ± 0.05), ♀ 2.40-2.96 mm (2.65 ± 0.20).

Remark: Two female paratypes from Mondo have been identified as specimens of *B. mamillata* Blöte, 1960.

Baeturia intermedia n. sp.

(Figs. 39-41, 43, 53)

Material examined: PAPUA NEW GUINEA: No. 9, Kimi Creek Camp, NE slopes Mt. Michael, 1980 m, viii.29.1959 / Eastern Highland District, L. J. Brass, coll. / sixth Archbold Exped. to Papua New Guinea, ♂ holotype, AMNH.

This species, known from one male specimen only, seems intermediate between *B. nasuta* and *B. arabuensis*. The specimen is reddish-ochraceous coloured and densely brown speckled. It can readily be recognised by the slightly dilated abdomen, as in *B. arabuensis*, and by the slightly darkened tegmina and wings, as in *B. nasuta*.

Description

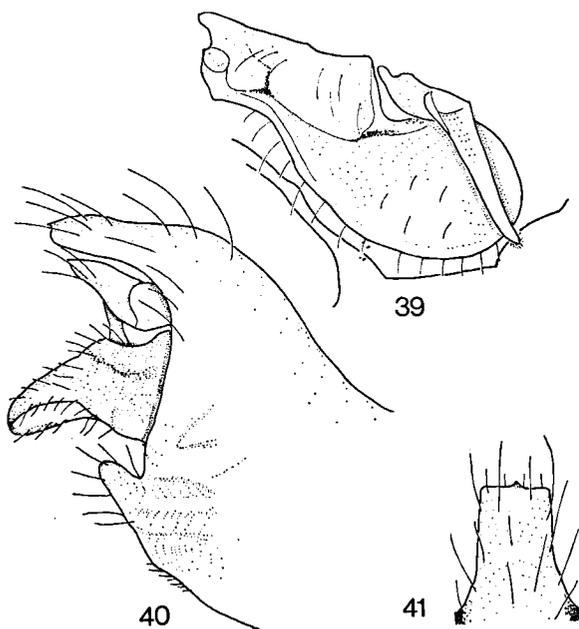
Head: Ochraceous, light-brown speckled all over. Long hairs on vertex and postclypeus as long as in *B. nasuta*. Postclypeus in dorsal view wider than the vertex lobe and broadly rounded at the anterior margin. In lateral view the postclypeus resembles that of *B. nasuta*, but it is more rounded.

Pronotum: Ochraceous, brown speckled, most densely in a slightly darker coloured medial band, as in *B. nasuta*. Long hairs are most dense set on this medial band and towards the lateral margins. The anterior margin and the pronotum collar are reddish coloured.

Mesonotum: Reddish, brown speckled, with two black spots in front of the cruciform elevation.

Tegmina and wings: As in *B. nasuta*. The veins are probably red in the living animal since traces of bright red are found here. The 8th apical area of the tegminum is 3.4 times as long as broad.

Legs: Tibiae and tarsi slightly darker than the



Figs. 39-41. *Baeturia intermedia* n. sp.: 39, operculum in ventral view; 40, genitalia in lateral view; 41, caudal dorsal beak in dorsal view.

ochraceous femora. Brown marks tend to form rings on the tibiae.

Tymbal organs: Tymbals as in *B. nasuta*: the ridges and intercalary ridges are light-brown coloured and clearly visible.

Operculum: The operculum (fig. 39): as in *B. arabuensis*, but medial margin more broadly rounded.

Abdomen: Slightly dilated as in *B. arabuensis*. The mediodorsal line is red-brown. The abdomen is densely red-brown spotted all over. The transparent sides of the abd. segms. 3-6 are pigmented as in the pigmented specimens of *B. nasuta*. The ventral black spots are less distinct on the segms. 7 and 8. Segm. 1 is as long as segm. 2 mediodorsally.

Genitalia (figs. 40-41): The caudal dorsal beak is truncate at its apex, but medially pointed. Basal lobes of the pygofer as in *B. arabuensis*. The clasper mostly resembles that of *B. nasuta*, but the dorsal protrusion, though it is much smaller, reminds that of *B. arabuensis*.

Measurements: Length of body: 20.3 mm; length of tegminum: 23.7 mm; length of pronotum: 2.40 mm; width of pronotum: 5.65 mm; width of head: 3.68 mm.

ACKNOWLEDGEMENTS

For the loan of material I am most grateful to the following persons and institutions; the abbreviations mentioned are used in the lists of examined material:

AMNH American Museum Natural History, New York; Dr. R. T. Schuh, Dr. P. Wygodzinsky.

BM British Museum (natural history), London; Dr. W. J. Knight, Mr. M. D. Webb.

RML Rijksmuseum van Natuurlijke Historie, Leiden; Dr. P. H. van Doesburg.

ZMA Instituut voor Taxonomische Zoölogie (zoölogisch museum), Amsterdam.

I like to express my special gratitude to Dr. W. J. Knight and Mr. M. D. Webb, for their help and coöperation during my visit to the London museum, and to Dr. Hans Duffels, my tutor at Amsterdam University.

REFERENCES

- BLÖTE, H. C., 1958. On the history of the genus *Baeturia* Stål (Insecta, Homoptera, Cicadidae). Archs. néerl. Zool. 13, suppl. 1: 262-269, figs. 1-12.
- , 1960. The genus *Baeturia* Stål as represented in New Guinea (Homoptera, Cicadidae). Zool. Meded., Leiden 37: 61-80, figs. 1-46.
- BOESEMAN, M., 1963. Notes on the fishes of Western New Guinea I. Zool. Meded., Leiden 38: 221-242, figs. 1-10, plate vii-xvii.
- BOULARD, M., 1979d. Cigales nouvelles pour les Nouvelles-Hébrides (Homoptera, Cicadoidea). Anns. Soc. ent. Fr. (N.S.) 15: 101-108, figs. 1-12, figs. A-F.
- DUFFELS, J. P., 1977. A revision of the genus *Diceropyga* Stål, 1870. (Homoptera, Cicadidae). Monografieën ned. ent. Vereen. 8: 1-227, figs. 1-265.
- , in prep. Taxonomy, phylogeny and biogeography of the genus *Cosmopsaltria* Stål with remarks on the historic biogeography of the subtribe *Cosmopsaltriaria* (Homoptera, Cicadidae).
- HOLLOWAY, J. D., 1979. A survey of the Lepidoptera, biogeography and ecology of New Caledonia. Series entomologica 15: i-xii, 1-588, figs. 1-153, pls. 1-87.
- METCALF, Z. P., 1962. General catalogue of the Homoptera viii. A bibliography of the Cicadoidea (Homoptera, Auchenorrhyncha): i-iv, 1-229. (North Carolina State College, Raleigh, N. C.)
- , 1963. General catalogue of the Homoptera viii. Part 2. Tibicinidae: i-vi, 1-492. (North Carolina State College, Raleigh N. C.)
- PACKHAM, G. H., 1973. A speculative phanerozoic history of the southwest Pacific. — The western Pacific, island arcs, marginal seas, geochemistry (P. J. Coleman ed.): 369-388, figs. 1-9. (University of Western Australia Press, Nedlands, Western Australia).
- VAN DEUSEN, H. M., 1978. Results of the Archbold Expeditions. No. 101. Summary of the Seventh Archbold Expedition to New Guinea (1964). Am. Mus. Novit. 2660: 1-21, figs. 1-12.

Received: November 18, 1981

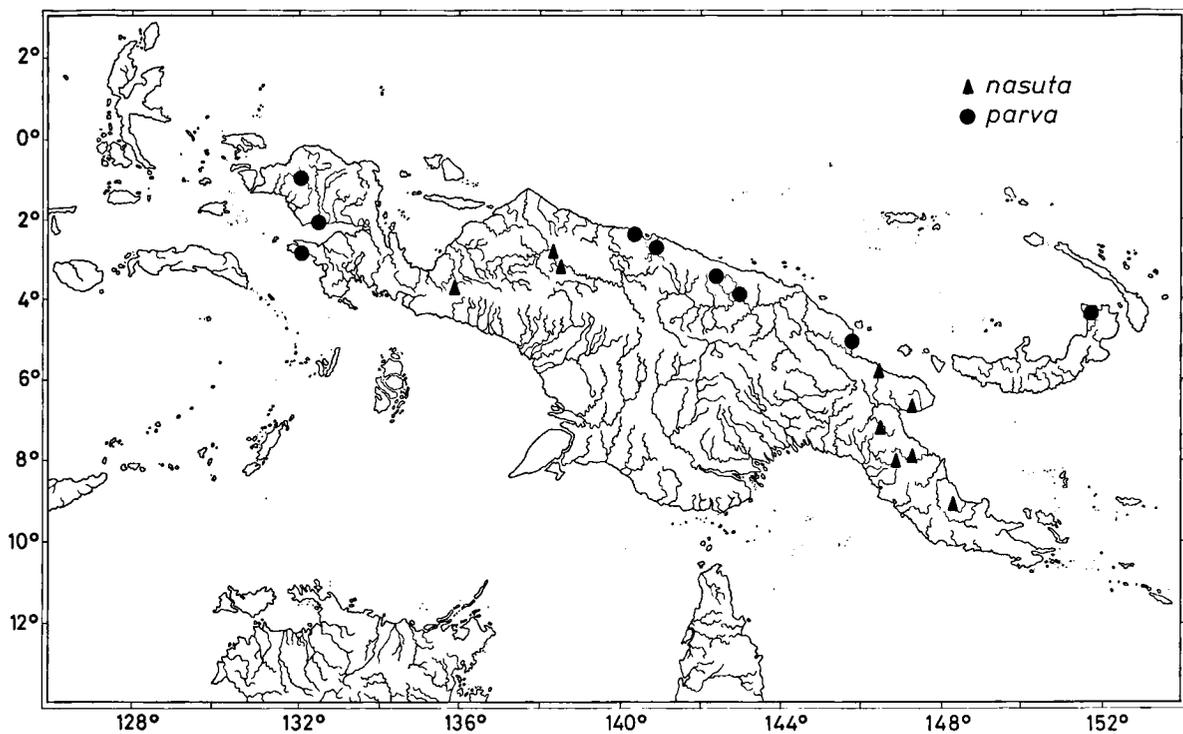


Fig. 42. Distribution of *Baeturia nasuta* and *B. parva*.

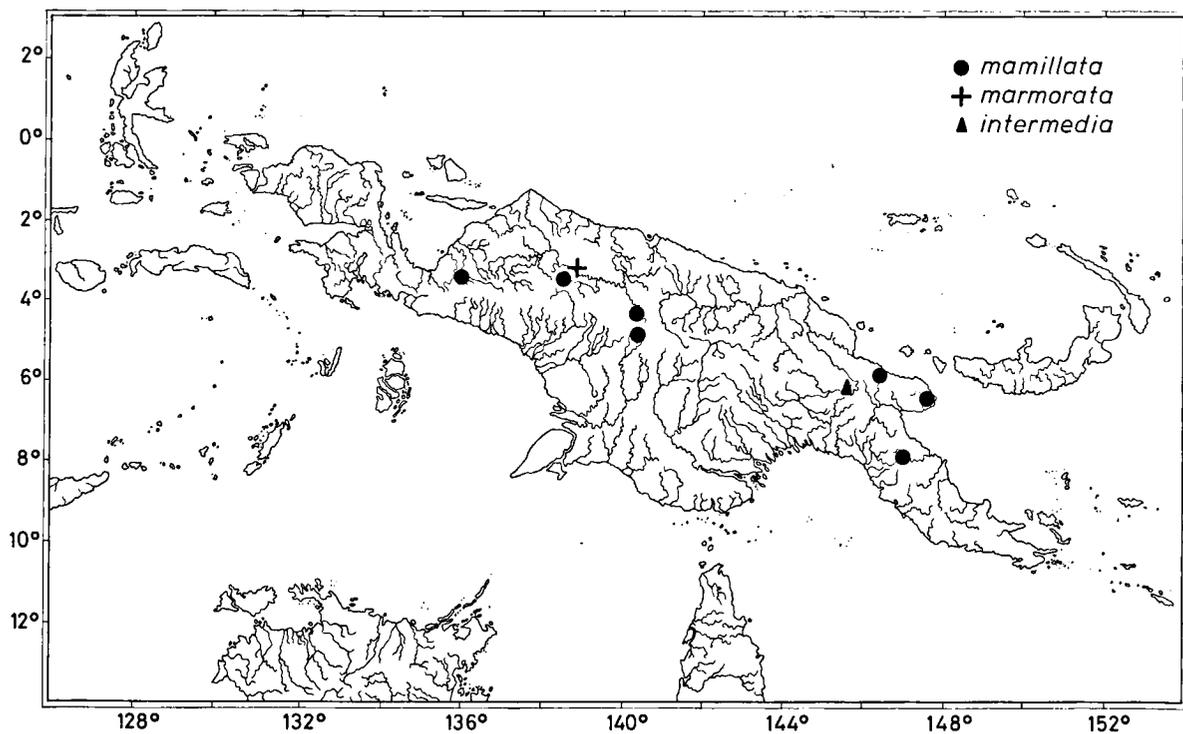


Fig. 43. Distribution of *Baeturia mamillata*, *B. marmorata* and *B. intermedia*.

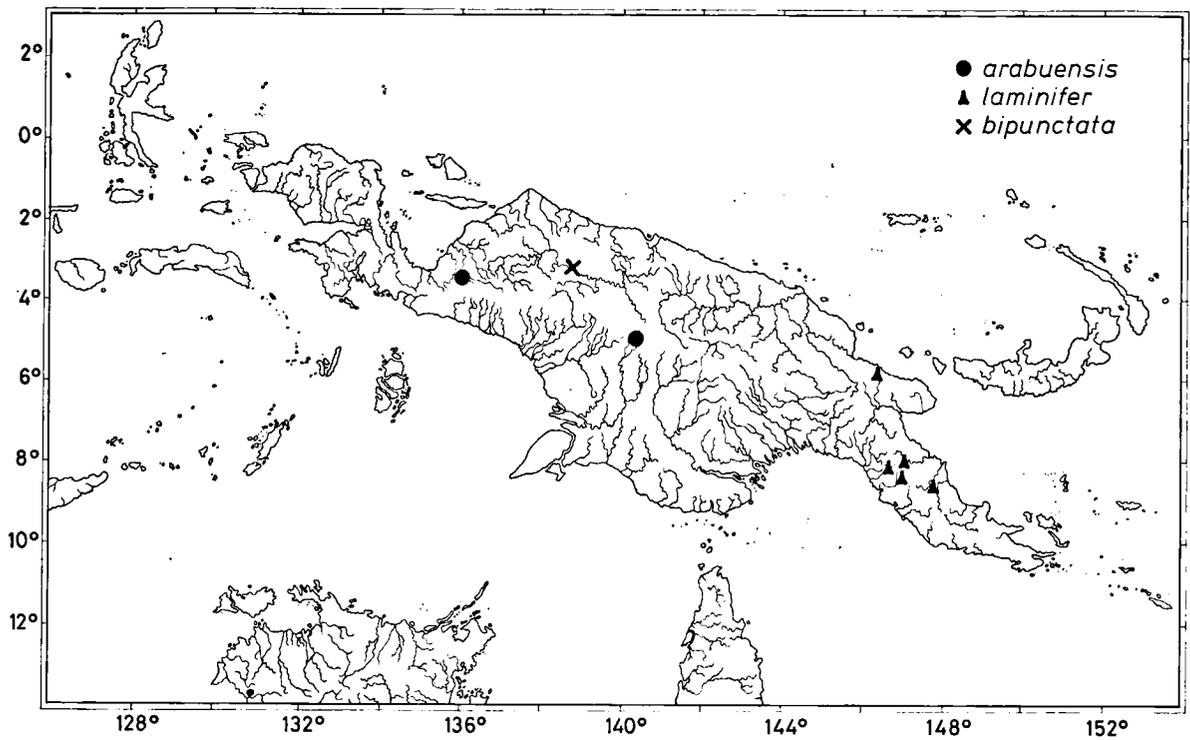
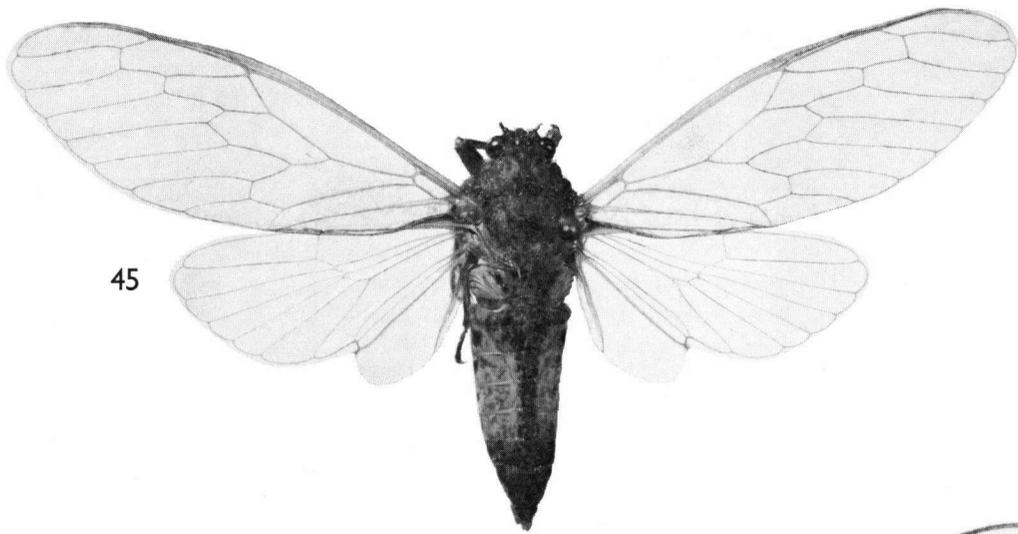
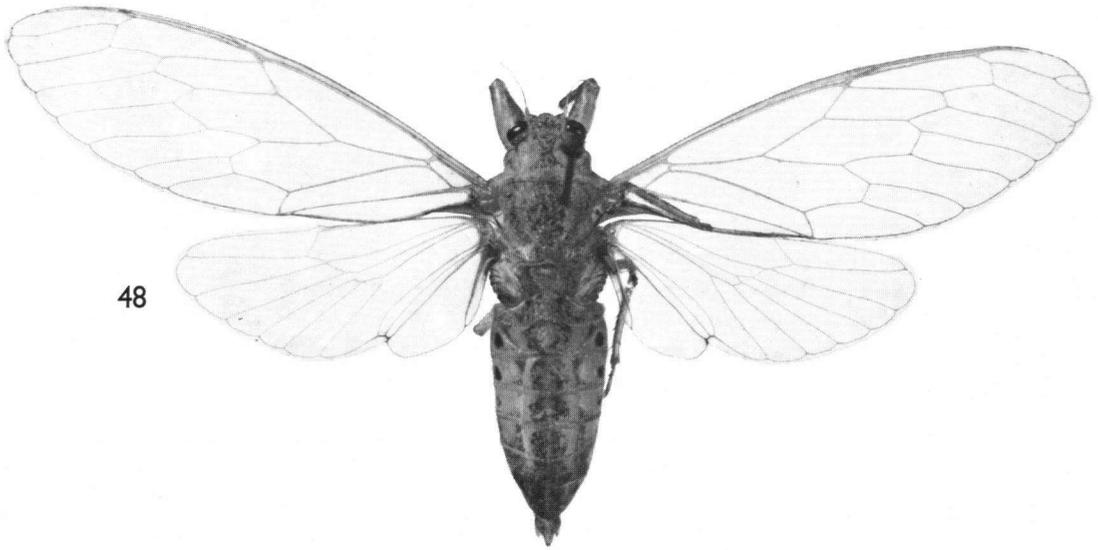


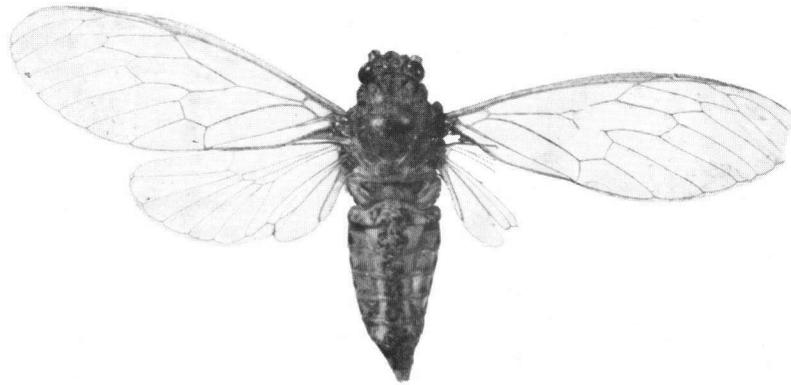
Fig. 44. Distribution of *Baeturia arabuensis*, *B. bipunctata* and *B. laminifer*.



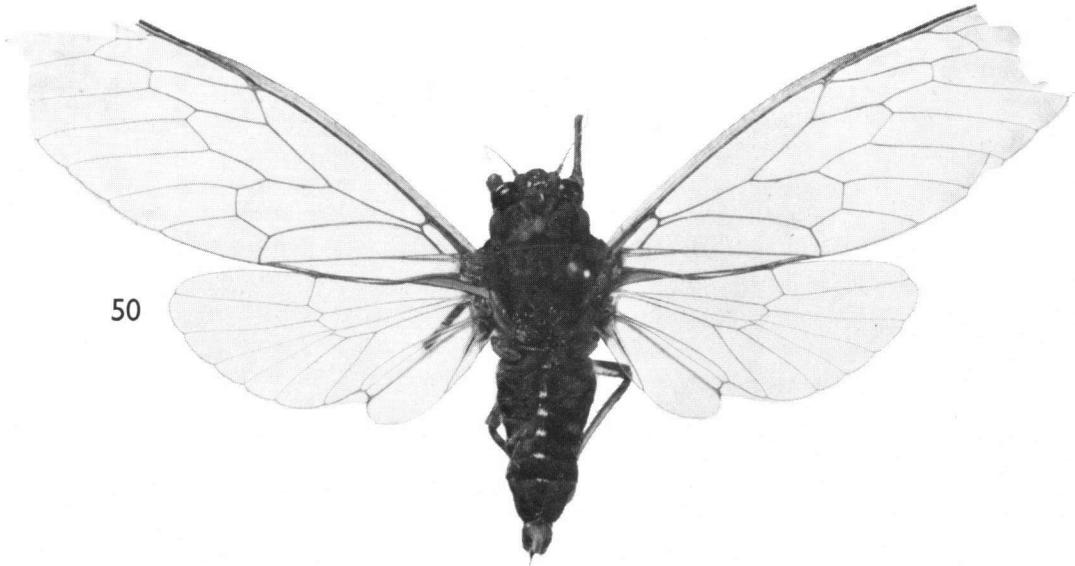
Figs. 45-46. *Baeturia nasuta*: 45, male paratype, Iebele Camp; 46, female, Paniai; Fig. 47. *Baeturia mamillata*: male, Sibil.



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Fig. 48. *Baeturia arabuensis*: male, Sibil; Fig. 49. *Baeturia parva*: male, paratype, Hollandia; Fig. 50. *Baeturia marmorata*: male paratype, Rattan Camp.



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Fig. 51. *Baeturia bipunctata*: male holotype; Fig. 52. *Baeturia laminifer*: male paratype, Mondo; Fig. 53. *Baeturia intermedia* n. sp.: male holotype.