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## TEN SPECIES ADDED TO THE GENUS *AEDEASTRIA* DE BOER, 1990, WITH THE DESCRIPTION OF EIGHT NEW SPECIES AND NOTES ON THE TAXONOMY AND BIOGEOGRAPHY (HOMOPTERA, TIBICINIDAE)

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### ABSTRACT

A new concept is proposed for the cicad genus *Aedeastria* De Boer, 1990, so that ten species can be added, bringing the total number of species to twelve. Of these ten species added to the genus, two (*A. latifrons* (Blöte) and *A. digitata* (Blöte)) are re-described and transferred from *Baeturia* Stål, while eight species (*A. bullata*, *A. cheesmanae*, *A. dilobata*, *A. hastulata*, *A. kaiensis*, *A. moluccensis*, *A. obiensis*, and *A. waigeuensis*) are described as new. A key to the males of *Aedeastria* is presented. *Aedeastria* belongs to a group of Australian and New Guinean genera, defined earlier as the "*Baeturia* and related genera complex" and is very closely related to the genus *Thaumastopsaltria* Kirkaldy of that complex. Though no cladogram is presented, the distribution of several characters, and their probable phylogenetic significance, is discussed. *Aedeastria* is widely distributed in New Guinea and some adjacent islands, and has two species in northern Maluku. The genus appears to be concentrated in western New Guinea, especially the high number of endemic species on the various islands around Cendrawasih is remarkable.

### INTRODUCTION

The genus *Aedeastria* was erected for two species (*A. cobrops* and *A. sepia*) with a very remarkable aedeagus, showing a vague pattern of concentric ridges (De Boer, 1990). Further study of the New

Guinean Tibicinidae reveals, that ten species share an apparently apomorphic pronotal character with the two species of *Aedeastria*. It becomes necessary to adjust the concept of *Aedeas-*

*tria*, to accommodate these ten species into a monophyletic taxon, since no synapomorphic character could be found to segregate these species, excluding the two previously known *Aedeastria* species. The monophyly of *Aedeastria* is now based upon a single pronotal character, but the distribution of several other characters, apparently unique within the genus, are in accordance with its supposed monophyly.

Eight species added to *Aedeastria* are described here for the first time and two species, transferred from *Baeturia*, are redescribed; for the description of *A. cobrops* and *A. sepi* the reader is referred to a previous publication (De Boer, 1990). The sections, on phylogeny and biogeography, and the key to the males, deal with all species of the genus. *Aedeastria* belongs to a supposedly monophyletic group of genera, the "*Baeturia* and related genera complex" defined earlier (De Boer, 1990). The present publication forms part of a phylogenetic and area-cladistic study of that complex.

## MATERIAL AND METHODS

The material examined for this study comes from the following institutions:

BMNH	Natural History Museum (formerly: British Museum (Natural History)), London
BPBM	Bernice P. Bishop Museum, Honolulu
IZW	Polska Akademia Nauk, Instytut Zoologii, Warszawa
MSNG	Museo Civico di Storia Naturale "G. Doria", Genova
Moul	Personal collection Mr M.S. Moulds, Greenwich, Australia
MZB	Museum Zoologicum Bogoriense, Bogor
MVM	Museum of Victoria, Melbourne
MZS	Musée Zoologique de l' Université et de la Ville, Strassbourg
NCSSU	North Carolina State University Insect Collection, Raleigh
RMNH	Nationaal Natuurhistorisch Museum (formerly: Rijksmuseum van Natuurlijke Historie), Leiden
SMD	Staatliches Museum für Tierkunde, Dresden
SMF	Natur Museum und Forschungs Institut "Senckenberg", Frankfurt am Main
ZMA	Instituut voor Taxonomische Zoölogie (Zoölogisch Museum), Amsterdam

The following geographical sources have been used: Atlas van tropisch Nederland (1938), The Times Atlas of the World (1968) and the "List of New Guinea localities" published by the Bishop Museum (1966).

After overnight softening, male genitalia were examined by pulling out the pygofer with a sharp needle inserted between pygofer and 8th abdominal segment. The aedeagus was pulled out at the same time, by inserting the needle between the claspers. For all specimens body length and tegmen length were measured; other measurements are based on a maximum of ten specimens.

## PHYLOGENY

### The Monophyly of *Aedeastria*.

The monophyly of *Aedeastria* is based upon a pronotal character; the pronotal collar bends sharply down at the anterior margins of its amplified lateral lobes and forms a distinctly inflated ridge along these margins. This ridge, which does not continue to the anterolateral corner of the pronotum but ends at the anterior end of pronotal collar, is regarded synapomorphic for the species of *Aedeastria*. A similarly inflated ridge, but forming an almost continuous and straight edge from the lateral corner of the pronotal collar to the anterolateral corner of the pronotum, is found in three species of *Gymnolympna* Stål, 1861, in *Cystosoma* Westwood, 1842, *Cystopsaltria* Goding & Froggatt, 1904, and in *Baeturia humilis* Blöte, 1960 and *B. viridicata* Distant, 1897. The latter two species are supposed to be closely related to *Thaumastopsaltria* Kirkaldy (cf. De Boer, 1992) and *Aedeastria*. The taxonomic position of *Cystosoma* and *Cystopsaltria* is not yet clear, but they might form the sister group of *Aedeastria*, *Thaumastopsaltria*, and a group including *B. humilis* and *B. viridicata*.

### The Phylogenetic position of *Aedeastria*

*Aedeastria* belongs to the "*Baeturia* and related genera complex", a supposedly monophyletic group containing several New Guinean and Aus-

tralian genera and some undescribed New Guinean species groups (De Boer, 1990). An S-shaped aedeagus with winged lateral crests is regarded apomorphic for that complex. In a first attempt to reveal some of the intergeneric relationships of this complex, a subdivision was made based on male operculum size. In *Baeturia*, *Gymnotympana*, *Scottotympana* De Boer, 1991, and *Venustria* Goding & Froggatt, 1904, the medial margin of the operculum lies mesiad of the meracanthus. While in *Aedeastria*, *Thaumastopsaltria*, a presumed monophyletic group containing *Chlorocysta* Westwood, 1851, *Glaucoptsaltria* Goding & Froggatt, 1904, and *Owra* Ashton, 1912, a presumed monophyletic group containing *Cystosoma* and *Cystopsaltria* and the undescribed New Guinean species groups alluded to above, the medial margin of operculum lies generally lateral to the meracanthus (De Boer, 1991; 1992). Since the sister group of the "Baeturia and related genera complex" is not known with certainty, it is not clear which of these character states is apomorphic. In the Prasiini, a possible sister group, the medial margin of operculum lies lateral to the meracanthus.

*Aedeastria* shares a somewhat wrinkled head and pronotum, a fairly distinct medial pronotal fissure, and a very narrow border along the hind margin of the tegmen with *Cystosoma*, *Cystopsaltria*, *Thaumastopsaltria* and the species group including *B. humilis* and *B. viridicata*. In other genera of the complex the surface of head and pronotum is much more smooth and the border along the hind margin of tegmen generally broader, but such wrinkled surfaces and narrow borders also occur in the Prasiini, a possible sister group of the complex.

*Aedeastria*, *Thaumastopsaltria*, and the species group including *B. humilis* and *B. viridicata* share a very similar angular male operculum, and generally very distinct diverging fissures in the vertex. The shape of male operculum is possibly synapomorphic for these three groups. Furthermore, *Aedeastria* and *Thaumastopsaltria* share fairly long ovipositor sheaths, reaching beyond the apex of the caudodorsal beak, but in *Thaumastopsaltria* these are even longer than in *Aedeastria*. It is very probable that *Aedeastria* is the sister group of

*Thaumastopsaltria*, and the undescribed species group together.

#### In-group relationships

I will discuss some characters here, that are shared by several species of *Aedeastria*. When appropriate, the possible apomorphy of these characters is discussed in relation to character distributions in related genera. These characters might contribute to an intended phylogenetic reconstruction of *Aedeastria* and the "Baeturia and related genera complex" as a whole.

#### Tymbals

*A. dilobata*, *A. hastulata*, and *A. obiensis* have 5 tymbal ridges; *A. bullata*, *A. kaiensis*, *A. latifrons*, *A. obiensis*, and *A. waigeuensis*, have 6; *A. cheesmanae*, *A. cobrops* and *A. digitata* have 7 and *A. sepia* has 9 tymbal ridges. The number of tymbal ridges is very variable in related genera, and the character is considered of very limited phylogenetic value. The species of *Thaumastopsaltria*, the nearest related genus, generally have 6 tymbal ridges.

#### Shape of the 8th sternite

The 8th sternite of all species except *A. cobrops*, *A. digitata*, *A. sepia* and *A. obiensis* is more or less W-shaped; medially incised at its distal margin. This incision is strongest in *A. latifrons* and *A. waigeuensis* (figs 14, 34), weakest in *A. moluccensis* (fig. 60) and quite distinct in the remaining species. The distal margin of the 8th sternite is often concave in related genera, but the distinct medial incision is unique for the species of *Aedeastria*.

#### Shape of pygofer

The pygofer of the species of *Aedeastria* is generally strongly rounded, with almost globularly curved lateral lobes. In *A. cobrops*, *A. sepia* and *A. waigeuensis*, the lateral lobe of pygofer recurves near its distal margin, forming a distinct fold parallel to the distal margin.

*A. digitata*, *A. dilobata* and *A. bullata* have a distinct caudodorsal beak on the pygofer. In *A. cobrops* and *A. sepia* this beak is absent, while the remaining species share a very broad and short caudodorsal beak. Such short and broad beaks

only occur in *Aedeastria*, the absence of a beak is regarded synapomorphic for *A. cobrops* and *A. sepia*.

The ventral part of the pygofer opening is very long and slender, with almost parallel margins in *A. cobrops*, *A. waigeuensis* and two specimens of *A. cheesmanae* (fig. 28). *A. obiensis* also has a slender pygofer opening which is, however, differently shaped; caused by a gradually incurving pygofer lobe (fig. 66).

#### Shape of clasper

*A. bullata*, *A. hastulata*, *A. moluccensis*, *A. dilobata*, and *A. waigeuensis* share a strongly down-curved, hook-shaped and sharply pointed clasper. The claspers of these species diverge strongly towards their apices. The claspers of *A. obiensis* are also sharply pointed, but more straight and directed posteriad, with the apical parts almost parallel. The clasper of *A. hastulata* is very peculiar, with a long and spine-shaped ventral protrusion (fig. 80), and somewhat resembles the claspers of *Thaumastopsaltria lanceola* de Boer and *T. sicula* De Boer (De Boer, 1992). Hook-shaped claspers frequently occur in related genera but are generally less sharply pointed.

*A. cheesmanae*, *A. cobrops*, *A. digitata*, *A. kaiensis*, *A. latifrons*, and *A. sepia*, have parallel and posteriorly directed claspers, though the claspers diverge close to their apices in *A. cheesmanae*, *A. cobrops*, and *A. sepia*. The clasper apex is distinctly bicuspidate in *A. cheesmanae*, *A. cobrops*, *A. digitata*, *A. kaiensis*, and *A. sepia*, and generally broadly rounded, though sometimes weakly bicuspidate in *A. latifrons*. The clasper of *A. digitata* somewhat deviates, ending in two thorn-shaped protrusions, connected by a serrate margin. One specimen of *A. sepia* from Maccluer gulf, Cendrawasih, has a very narrow, bluntly pointed clasper apex (De Boer, 1990). The bicuspidate clasper apex must probably be regarded synapomorphic for these 6 species.

*A. hastulata* and *A. sepia* have an angularly inflated protuberance at the dorsal corner of the clasper, which supports the aedeagus. Similar protuberances are found in *Gymnotympana* and *Scottotympana*. The claspers of *A. cheesmanae*, *A. waigeuensis*, *A. kaiensis* and *A. moluccensis* form a dis-

tinct and angular dorsal crest, bending around the aedeagus; such dorsal crests are found in several related genera.

*A. bullata* and *A. dilobata* share a very broad clasper (in lateral view), which possibly indicates a close relationship between these species.

#### Shape of aedeagus

*A. cobrops* and *A. sepia* share a very large and strongly inflated aedeagus, with a weak pattern of concentric ridges on the ventral and lateral sides. These characters are synapomorphic for these two species.

*A. bullata*, *A. digitata*, and *A. dilobata* share a pair of very distinct dorsal crests on the aedeagus, *A. latifrons* has very weak dorsal crests, and *A. cheesmanae*, *A. hastulata*, and *A. kaiensis* share a single dorsal crest. Such dorsal crests are found in several related genera, the paired dorsal crests are very common in *Thaumastopsaltria*.

*A. cheesmanae*, *A. digitata*, *A. hastulata*, *A. kaiensis*, *A. latifrons*, *A. moluccensis*, and *A. waigeuensis* share a distinct subapical lobe on the aedeagus. This lobe is often continuous with the lateral crests, similar lobes are found in several genera of the "*Baeturia* and related genera complex". The shield-shaped crest around the aedeagus apex of *A. cobrops* might be homologous with this protuberance (see De Boer, 1990).

#### BIOGEOGRAPHY

*Aedeastria* is distributed over New Guinea and north Maluku (figs 1, 2), with a high concentration of endemic species in Cendrawasih (=the Vogelkop peninsula) and the islands of western New Guinea: *A. waigeuensis* is endemic on Waigeu, *A. cheesmanae* on Waigeu and Misoöl, *A. kaiensis* on the Kai Islands, *A. obiensis* on Obi and *A. cobrops* on Cendrawasih. *A. sepia*, which is known from three localities (Cendrawasih, Roon Island in the Geelvink Baai, and the Torricelli mountains), may represent three separate species (De Boer, 1990), which would add two more endemics to the Vogelkop area.

Two species, *A. moluccensis* and *A. hastulata*, appear more or less widely distributed in northern

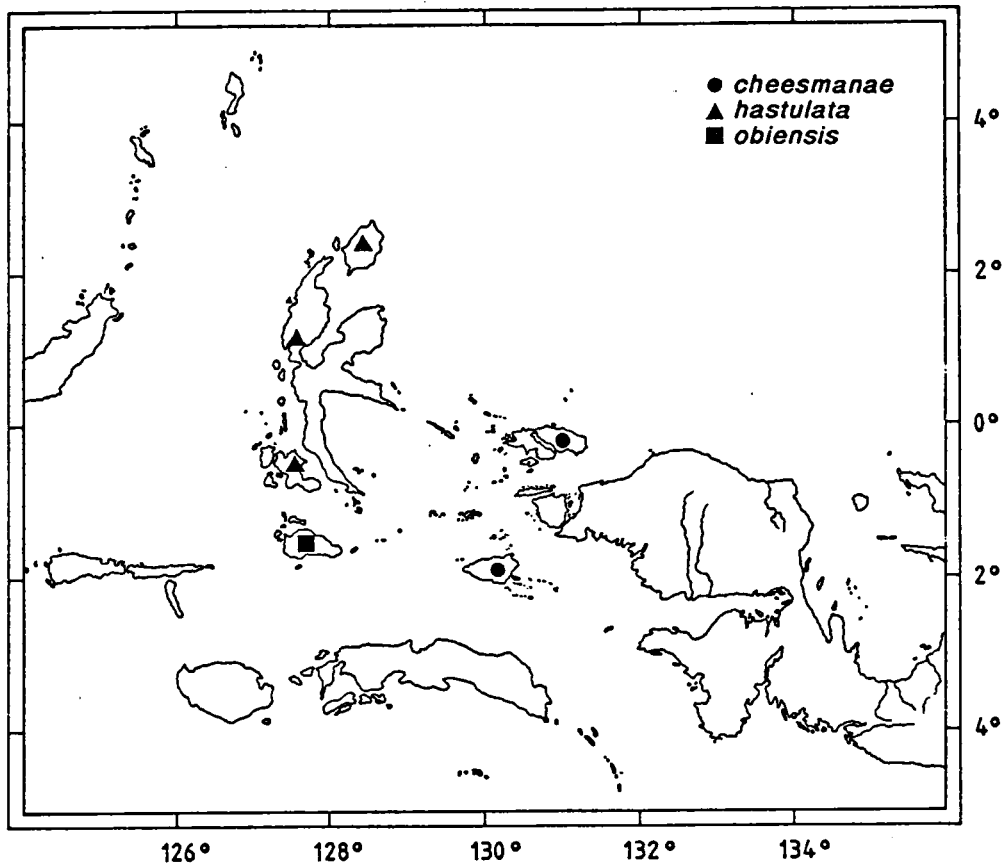


Fig. 1. Localities of *Aedeastria cheesmanae*, *A. hastulata*, and *A. obiensis*.

Maluku, *A. digitata* is endemic in northern Irian Jaya, and *A. latifrons* is widely distributed in north and south New Guinea, including the Aru Islands. Only *A. bullata* and *A. dilobata*, two possible sister species, are presumably endemics of Papua New Guinea, the first in the Torricelli mountains, the second on the Papuan peninsula. The distribution of *A. latifrons* is especially interesting, since it is one of the very few cicada species, that is distributed north and south of the central mountain ranges of New Guinea. A similar distribution is only known from *Baeturia flava* Goding & Froggatt, 1904, but that species also occurs in Queensland (Moulds, 1990; De Boer, unpublished).

A similar distribution, with many endemics in and around Cendrawasih, is known from two other genera of cicadas: *Rhadinopyga* Duffels, 1985, and *Arfaka* Distant, 1905 (De Jong, un-

published), but these genera are less widely distributed in other parts of New Guinea (Duffels, 1985; 1986; Duffels & De Boer, 1990).

Historical biogeography aims to find general patterns of distribution. Comparable patterns are supposed to be the result of one and the same vicariant event. The distributions and sister group relations of *Aedeastria* and *Rhadinopyga* indicate a vicariant pattern between the Papuan peninsula (either including parts of Maluku or Misool) and the Vogelkop with adjacent islands.

*Rhadinopyga* is regarded as the sister group of *Diceropyga* Stål, 1870 (Duffels, 1985). The *Diceropyga* distribution is very similar to that of *Thaumastopsaltria*, which is the possible sister group of *Aedeastria* (De Boer, 1992). *Diceropyga* and *Thaumastopsaltria* seem to be centred in the Papuan peninsula, but their distribution area includes

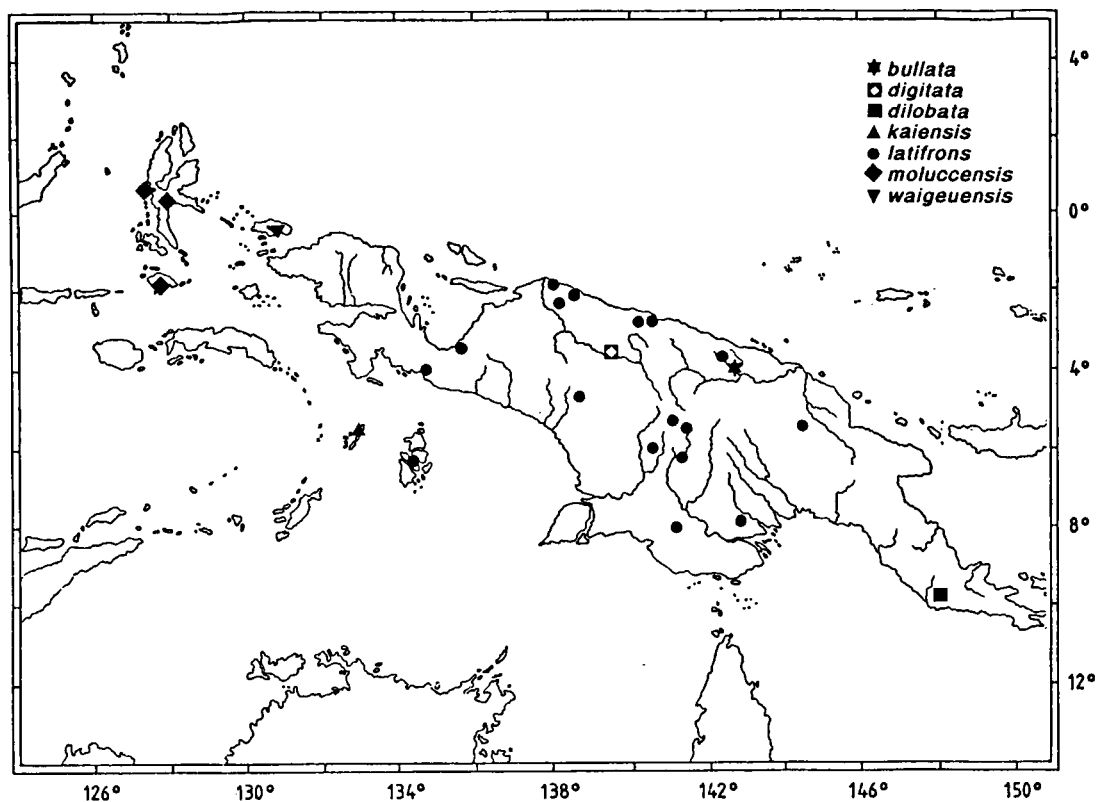


Fig. 2. Localities of *Aedeastia bullata*, *A. digitata*, *A. dilobata*, *A. kaiensis*, *A. latifrons*, *A. moluccensis*, and *A. waigeuensis*.

northern New Guinea, the Bismarck Archipelago and Solomon Islands, southern New Guinea and northern Queensland. Both are absent on Cendrawasih, but re-appear west of Cendrawasih: *Diceropyga* in Maluku, *Thaumastopsaltria* on Waigeu and Misool.

Geological evidence for a direct historical relation between any of the parts of the Vogelkop area and the Papuan peninsula has not been found yet. The greater part of Cendrawasih is of continental origin and was formed after the collision in Late Miocene of two previously joined microcontinents (the Kemum formation, which forms the greater part of northern Vogelkop, and the Misool terrane, including the Onin and Kumaua peninsulas of southern Vogelkop), that had earlier rifted from the Australian plate: Misool from central Papua New Guinea, and Kemum possibly from as far east as northern Queensland (Pigram & Panggabean, 1984). Though these microcontinents come from near

the present position of the Papuan peninsula, their rifting occurred (Aptian for Kemum and Late Lias for Misool, which is about 172 and 135 million years ago respectively) long before the terranes of the Papuan peninsula arrived there and accreted to the Australian continent in Middle or Late Miocene, about 15 million years ago (Pigram & Panggabean, 1984; Pigram & Davies, 1987). The northern parts of Cendrawasih, however, (the Arfak and Tosem mountains) and the islands of Waigeu and Halmahera, originate from an oceanic island arc system, which also included northern New Guinea, the Papuan peninsula, Bismarck Archipelago and Solomon Islands (Hamilton, 1979; Holloway, 1984; Pigram & Davies, 1987; Rangin et al., 1990; Daly et al., 1991). These terranes originate from far eastward, and a historical proximity between the Papuan peninsula terranes and Halmahera might have existed.

The genus *Arfaka* indicates quite different re-

lations for the Vogelkop area. *Arfaka* belongs to the Prasiini and is supposed to form a monophyletic group with *Jacatra* Distant, 1905, *Lembeja* Distant, 1892, and *Prasia* Stål, 1863 (De Jong, 1985). Though several species of *Lembeja* are distributed in New Guinea and northern Queensland (De Jong & Duffels, 1981; De Jong, 1982), most species of the Prasiini are found in Sulawesi, radiating to the lesser Sunda islands, Jawa, northern Borneo and the Philippines (Metcalf, 1963; De Jong, 1985; 1986; 1987) and the nearest relatives of *Arfaka* are presumably to be found on Sulawesi.

## TAXONOMY

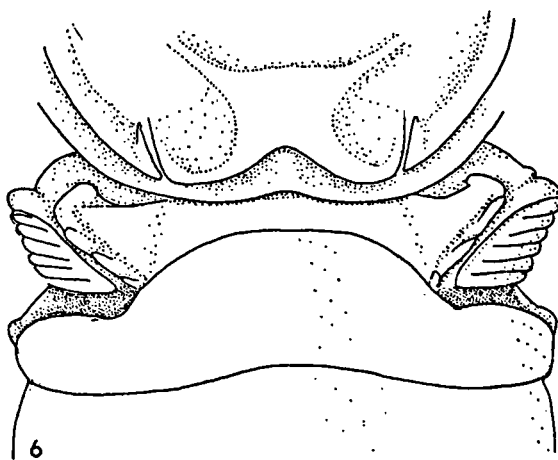
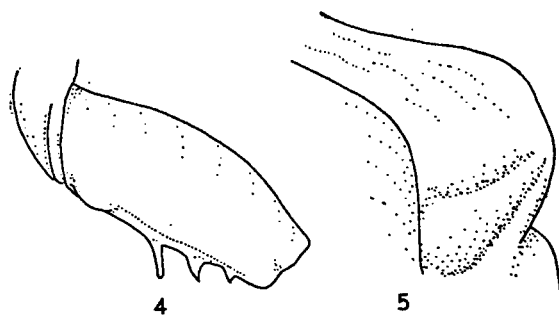
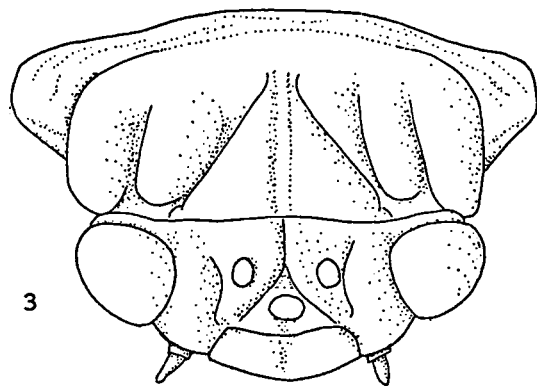
### *Adeastria* De Boer, 1990

*Adeastria* De Boer, 1990: 63-72; De Boer, 1991: 2; De Boer, 1992: 19.

Type species: *A. cobrops*

## DESCRIPTION

Body ochraceous to reddish brown, sometimes tinged with green, but without special colour markings. Fresh material of these reddish brown cicadas probably entirely olive green. Females generally slightly larger than males. Tegmina in males and females distinctly longer (1.1-1.4 x) than body length. Head (fig. 3) broad and short, 2.5-2.8 x as wide as long, but narrower than anterior part of pronotum, with a broad, angular, and weakly protruding postclypeus. Anterior margin of postclypeus generally forming an obtuse angle medially (almost straight in *A. dilobata* and *A. kaiensis*), and generally continuous with anterior margins of vertex lobes, but distinctly protruding beyond vertex lobes in *A. moluccensis* and the paratypes of *A. hastulata*. Postclypeus not swollen in lateral view, anterior margin straight, or slightly concave. Sides of postclypeus with several shallow furrows, ending in short rows of short parallel ridges, that form a narrow band along the lorum. Vertex generally practically bald, without setae, 1.8-2.2 x as broad as long, and



Figs. 3-6. *Adeastria latifrons* Blöte, 1960: 3, head in dorsal view, holotype; 4, fore femur, holotype; 5, detail lateral corner of pronotal collar, Hollandia; 6, first and second tergite, holotype

1.3-1.9 x as broad as postclypeus, with a distinct medial fissure and diverging fissures between ocelli. Diverging fissures almost obsolete, however, in *A. bullata*, *A. digitata* and *A. dilobata*. Ocelli small and fairly wide apart. Distance between lateral

ocelli generally longer (0.9-1.4 x) than distance between lateral ocellus and eye, and distinctly longer (1.4-2.6 x) than width of frontal ocellus. The latter ratio distinctly larger (2.8-3.5 x) in *A. moluccensis*. Pronotum with fairly distinct medial furrow (fig. 3). Pronotal collar abruptly bent down at anterior margins of its amplified lateral parts, and distinctly inflated along that margin (fig. 5), less distinctly so in *A. digitata*. Fore femur (fig. 4) with row of three fairly short erect spines, diminishing in length towards tibia, most proximal spine, however, strongly bent in *A. digitata* and the holotype of *A. hastulata*. Most proximal spine generally longer than distance to middle spine. Tegmina and wings hyaline, veins ochraceous. Tegmina with 8 fairly long and slender apical areas, a very slender costal area, and generally a very narrow hyaline border along hind margin. This border tends to broaden towards apex of tegmen. *A. moluccensis* has a distinctly broader hyaline border along the hind margin of tegmen. Wings with 6 apical areas and distinct hyaline border along hind margin. Tymbal with 5-9, but most species with 6, parallel sclerotized ridges. Male operculum not covering tymbal cavity in ventral view, often leaving folded membrane partly visible. Distal part of male operculum angularly oblong and fairly short, generally longer than basal part, but shorter than meracanthus. Lateral margin of distal part making an obtuse, or almost right, angle with the distinct crest around the distolateral corner of basal part. Operculum not extending medially of meracanthus; its medial margin not reaching to meracanthus. Female operculum very similarly shaped as that of male, but shorter. Male abdomen very delicate and weakly inflated. Tergite 1 very short and broad (fig. 6) middorsal part sometimes completely hidden under metanotum. Anterior margin of 2nd tergite weakly concave, almost straight, medially. Medial part of 2nd tergite a little less than twice as long as lateral parts, lateral parts weakly inflated anteriorly, and adjacent to most distal tymbal ridge. Ventral part of 2nd tergite straight between auditory capsule and 2nd sternite, with distinct crest along tymbal cavity (fig. 13). Sternites 1 and 2 adjacent, or almost adjacent. Auditory capsules inflated and protrud-

ing laterad, generally just visible in dorsal view. Sternite 8 often W-shaped; medially incised at hind margin. Female abdomen shorter and more robust than that of male. Ovipositor sheaths reaching beyond apex of caudodorsal beak (fig. 15). Female caudodorsal beak broad, triangle-shaped, and rounded at apex. Male pygofer laterally often globularly rounded, generally with very short and erect caudodorsal beak. Pygofer of *A. cobrops* and *A. sepia* without beak; of *A. digitata*, *A. dilobata* and *A. bullata* with fairly long beak, extending over anal valves. Caudodorsal beak broad and rounded, in *A. dilobata* pointed, at apex. Clasper, either hook-shaped, slightly diverging and curving down to pointed apex, or parallel and more directed posteriad and then often bicuspidate at weakly outwards curved apex. Basal parts of clasper fused to a more or less continuous, though sometimes inconspicuous, collar around base of anal valves. Aedeagus upright between claspers, weakly S-curved with slender lateral crests and sometimes dorsal and / or ventral crests. The lateral crests often curve upwards and fuse near aedeagus apex, where they form a small subapical lobe. Aedeagus of *A. cobrops* and *A. sepia* strongly swollen, and striate; with pattern of concentric ridges on lateral and ventral sides. Aedeagus apex ending at round pore, or dorsoventrally incised, and then ending in two small and rounded lateral lobes.

## KEY TO THE MALES

- 1a Clasper sharply pointed at apex .....2
- 1b Clasper bicuspidate, or sometimes bluntly rounded at apex.....7
- 2a Pygofer with distinct triangular caudodorsal beak. Aedeagus with pair of distinct dorsal crests (figs. 92, 103) .....3
- 2b Pygofer with short and blunt caudodorsal beak. Aedeagus with single dorsal crest.....4
- 3a Pygofer lobe with two protuberances; one long and posteriorly directed, the other bluntly rounded and laterad (fig. 96). Clasper laminiform. Tymbal with 5 ridges .....*A. dilobata*
- 3b Pygofer lobe with one bluntly rounded and lateral protuberance (fig. 87). Clasper globularly swollen at dorso-distal corner (fig. 89). Tymbal with 6 ridges.... *A. bullata*
- 4a Clasper forming a bluntly rounded dorsal corner



- around aedeagus (figs 71, 80). Tymbal with more than 5 ridges.....5
- 4b Clasper forming an angular square-shaped dorsal crest around aedeagus (figs 49, 57). Tymbal with 5 ridges .....6
- 5a Apical part of clasper lobate, recurving towards interior of pygofer (fig. 66). Dorsal part of clasper smoothly rounded, not protruding. Aedeagus with narrow dorsal crest. Pygofer lobe with bluntly rounded protuberance. Ventral part of pygofer lobe incurved; ventral part of pygofer opening narrow, U-shaped (fig. 66) ...*A. obiensis*
- 5b Apical part of clasper with spine-shaped, weakly curved ventromedial protuberance. Dorsal part of clasper angularly protruding. Aedeagus with broad dorsal crest. Pygofer lobe with broad laminiform and outcurving protuberance. Ventral part of pygofer lobe not incurved; ventral part of pygofer opening broad, V-shaped.....9
- 6a Clasper hook-shaped, strongly curved down (fig. 49). Body length 16-19 mm .....*A. cheesmanae*
- 6b Clasper directed hindwards, only curved down near apex (fig. 57). Body length 12.6 mm ..... *A. moluccensis*
- 7a Basal part of aedeagus strongly swollen, with a concentric pattern of weak ventral ridges. Pygofer without caudodorsal beak.....8
- 7b Basal part of aedeagus slender, without pattern of ventral ridges. Pygofer with distinct, but generally caudodorsal beak.....9
- 8a Tymbal with 7 ridges. Aedeagus with broad shield-shaped crest around apex .....*A. cobrops*
- 8b Tymbal with 9 ridges. Aedeagus without crest around apex .....*A. sepia*
- 9a Aedeagus somewhat directed posteriad, passing between claspers some distance away from anal valves (fig. 6). Claspers fused, or adjacent, between aedeagus and base of anal valves. Claspers do not form a crest around aedeagus. Apical part of clasper broad in lateral view .....10
- 9b Aedeagus erect, almost adjacent to anal valves (figs 18, 30). Claspers not fused between aedeagus and base of anal valves. Claspers form an angular dorsal crest around aedeagus. Apical part of clasper slender in lateral view.....11
- 10a Caudodorsal beak short. Pygofer lobe with lobate lateral protrusion. Sternite 8 W-shaped; strongly incised at distal margin (fig. 14). Claspers fused between aedeagus and base of anal valves. Apical part of clasper broad and lobate, with large and rounded ventral hollow (fig. 10). Aedeagus with long, slender lateral crests and weak dorsal ridges (fig. 11).....*A. latifrons*
- 10b Caudodorsal beak quite long. Pygofer lobe with finger-shaped, posteriorly directed, protrusion (fig. 37). Sternite 8 not W-shaped; not incised at distal margin. Claspers not fused between aedeagus and base of anal valves. Clasper dorsoventrally flattened near apex, ending in two thorn-shaped protrusions, connected by a serrate margin (fig. 40). Aedeagus with short, broad lat-

- eral crests and distinct dorsal ridges (fig. 42) .....*A. digitata*
- 11a Clasper strongly curved down towards apex, hooked around margin of 9th sternite (fig. 29). Aedeagus elongate between subapical lobe and apex (fig. 32). Lateral lobe of pygofer with bluntly rounded protuberance .....*A. waigeuensis*
- 11b Clasper straight. Aedeagus not elongate between subapical lobe and apex (fig. 25). Lateral lobe of pygofer with laminiform, out-curving protuberance....*A. kaiensis*

## DESCRIPTION OF THE SPECIES.

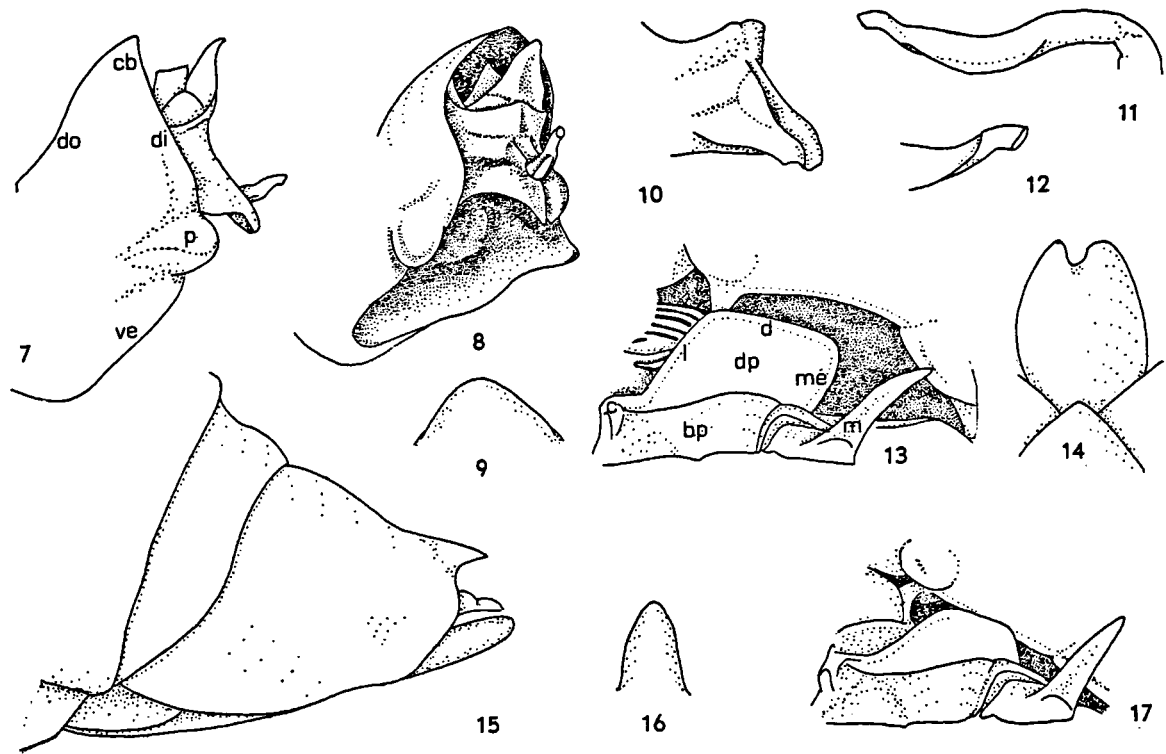
### *Aedeastria latifrons* (Blöte, 1960) n. comb. (Figs. 2-17)

*Baeturia famulus* Myers (nec Distant), 1928: fig. 18.

*Baeturia latifrons* Blöte, 1960: 78, fig. 42; Duffels & Van der Laan, 1985: 253.

Material examined: IRIAN: NEW GUINEA (W): Alkmaar, Lorentz R., 9.xi.1909, 2♀, SMD; Bodem, 11 km SE Oerbefareh, 100 m, 7-17.vii.1959, T.C. Maa, 2♂, 1♀, BPBM; same data 1♂, ZMA; Bodem, Sarmi area, 10.vii.1959, T.C. Maa, 1♂, 2♀, BPBM; same data 1♀, ZMA; Digul, New Guinea Exp. 1904-05, 1♀, SMD; Eramboe, 80 km ex Merauke, 9.i.1960, T.C. Maa, 1♂, BPBM; Etna baai, 1904-05, Dr. Koch, 3♂, 1♀, SMD; Etna baai, New Guinea Exp. 1904-05, 1♂, 1♀, SMD; Hollandia, 18.xi.1945, H. Hoogstraal, 2♂, NCSU; Ifar, xii.1957, G. den Hoed, ♂ holotype *Baeturia latifrons*, RMNH; Kawakich, Star Range [Kawakit S Katem, see v. Royen, 1959], 25 m, 11.ix.1959, New Guinea Exp., 1♂, RMNH; Kiunga, Fly River, 26-30.vii.1957, 1♂, BPBM; Mamberamo, Alb. bivak, W. Docters v Leeuwen NN Guinea Exp. 1926, 1♂, MZB; Nabire, S Geelvink Bay, 2-9.vii.1962, J.L. Gressitt & J. Sedlacek, 1♂, BPBM; Pionier bivak, i.1928, W.C. v Heurn, 1♀, MZB; Sabron, Cyclops Mts., Camp 2, 2000 ft, vii.1936, L.E. Cheesman, 1♂, BMNH; ARU I.: Aru Islands, 14.ii.1911, Elgner, 1♀, BMNH; Aru eilanden, Elgner, 1♂, BMNH; Isole Aru, O. Beccari, 1873, 1♂, MSNG; Kobroor, Papagula, 30.iv.1980, H. Merton, 1♂, SMF; Manoembai, x.1929, Snellius Exp., 1♂, RMNH; PAPUA: NEW GUINEA (NE): Baiyer riv., 1150 m, 18.x.1958, J.L. Gressitt, 1♂, 1♀, BPBM; Eliptamin Valley, 1200-1350 m, 1-15.ix.1959, 1♂, BPBM; Mokai vill., Torricelli Mts., 750 m, 1-23.i.1959, W.W. Brandt, 2♂, BPBM; NEW GUINEA (SE): Balimo, 9 m, 7.viii.1964, H. Clissold, 1♂, BPBM; Tabubil, Western Province, 5° 15' S 141° 13' E, 6.vii.1991, R.B. Lachlan, 1♂, Moul; same data but 24.x.1991, 1♂; 5.xi.1991, 1♂, Moul. Also belonging to this species but without locality label: 1♂, NCSU.

*A. latifrons* is easily recognized by its short, round-



Figs. 7-17. *Aedeastria latifrons* Blöte, 1960: 7, pygofer in lateral view, Bodem; 8, pygofer from aslant, holotype; 9, male caudodorsal beak in dorsal view, holotype; 10, clasper, holotype; 11, aedeagus in lateral view; 12, detail aedeagus apex; 13, male operculum, holotype; 14, 8th sternite, holotype; 15, female genital segment in lateral view, Aru; 16, female caudodorsal beak in dorsal view, Aru; 17, female operculum, Aru. Lettering: bp = basal part of operculum; c = crest around distolateral corner of basal part of operculum; cb = caudodorsal beak; d = distal margin of operculum; di = distal margin of pygofer; do = dorsal margin of pygofer; dp = distal part of operculum; l = lateral margin of operculum; m = meracanthus; me = medial margin of operculum; p = protuberance on lateral lobe of pygofer; ve = ventral margin of pygofer.

ed and posteriorly directed claspers, that gradually merge to a smooth, ring-shaped collar around the base of anal valves (fig. 10).

#### DESCRIPTION

Body light brown to olive green. Females on average larger than males. Male abdomen 1.0-1.4 x as long as head and thorax, of female 1.1-1.4 x. Tegmina of males and females 1.2-1.3 x as long as body length.

Tymbal organs: Five parallel transverse sclerotized ridges spanning the tymbal from dorsal to ventral margin, a 6th ridge almost reaching ventral margin and sometimes a 7th, most proximal, ridge reaching to half the tymbal width. Six or seven intercalary ridges are clearly visible.

Opercula: Male operculum (fig. 13) not covering tymbal cavity in ventral view. Distal part of operculum angular, oblong and longer than basal part. Distal part adjacent to body. Lateral margin long and straight, making a distinct and slightly obtuse angle with crest of basal part. Distal and medial margins straight. Distolateral and distomedial corners rounded. Distinct crest along margins of operculum. Gap between operculum and abdomen generally quite narrow; folded membrane not visible in ventral view. Meracanthus reaching beyond operculum, but not reaching margin of abdomen. Female operculum (fig. 17) smaller than that of male, with the distal part generally shorter than basal part, and oblong or trapezoid-shaped. Lateral margin as in male making a distinct and obtuse angle with crest of basal part. Distolateral corner angularly

rounded. Distal margin straight, making a right or obtuse angle with short medial margin.

Abdomen: Male abdomen slightly inflated, unmarked. Auditory capsules weakly developed, weakly protruding and hardly visible in dorsal view. Sternites 1 and 2 generally adjacent. Sternite 8 (fig. 14) bicuspidate; deeply incised at distal margin. Female abdomen reddish-ochraceous or green. Female caudodorsal beak in dorsal view (fig. 16) triangular, rounded or sharply pointed at apex.

Male genitalia: Pygofer in lateral view as in fig. 7. Dorsal margin of pygofer concave to base, convexly bent into short and rounded caudodorsal beak. Distal margin concave to apex of beak and convex to lateral protuberance. Caudodorsal beak in dorsal view (fig. 9) broadly rounded, hardly protruding. Lateral lobe of pygofer curving mesiad towards end of distal margin, forming a large bluntly rounded, strongly outcurving and slightly swollen protuberance. These protuberances are longer than in most other species of *Aedeastria*. Ventral margin of pygofer straight. Ventral part of pygofer opening broad V-shaped; with ventral margins weakly converging to base of pygofer (fig. 8). Claspers (fig. 10) very short and straight, directed posteriad, almost triangular in lateral view and parallel to apices. Dorsal parts of claspers fuse, though often leaving a weak medial furrow proximally of aedeagus, and merge into a broad and slightly upwards curving ring-shaped clasper base, forming a continuous collar around base of anal valves. Apical part of clasper with large, but shallow ventral hollow. Clasper often weakly bicuspidate at apex. Aedeagus (fig. 11) passing between claspers at about half the clasper length, slightly upcurved at half-length, but recurving close to apex, with distinct lateral crests and a pair of weakly developed dorsal ridges. The lateral crests bend upwards at distal ends and fuse to a weakly developed collar at apical bending point of aedeagus (fig. 12), this subapical protuberance is not visible in all specimens. Aedeagus pore round.

Measurements: Body length ♂: 14.1-17.3 mm (x 16.0 mm ± 1.1), ♀: 16.0-20.2 mm (x 18.0 mm ± 1.3); tegmen length ♂: 18.3-25.4 mm (x 20.4 mm ± 1.9), ♀: 20.7-24.7 mm (x 22.5 mm ± 1.2);

head length ♂: 1.1-1.6 mm (x 1.3 mm), ♀: 1.3-1.6 mm (x 1.5 mm); pronotum length ♂: 1.7-2.3 mm (x 2.0 mm), ♀: 2.0-2.5 mm (x 2.3 mm); mesonotum length ♂: 3.1-4.0 mm (x 3.6 mm), ♀: 3.6-4.6 mm (x 4.1 mm); head width ♂: 3.2-4.4 mm (x 3.8 mm), ♀: 3.9-4.7 mm (x 4.4 mm); width of pronotal collar ♂: 4.2-5.8 mm (x 5.1 mm), ♀: 5.5-6.6 mm (x 6.0 mm).

Distribution (fig. 2): *A. latifrons* is widely distributed over New Guinea, with exception of Cendrawasih, northern Papua New Guinea and the Papuan peninsula. *A. latifrons* is one of the few cicada species that occurs in, and on both sides, north and south, of the central mountain ranges of New Guinea.

### ***Aedeastria kaiensis* n.sp.**

(Figs. 2, 18-28)

Holotype: The holotype comes from the Kai Islands, Irian Jaya, and bears the following labels: "H.C. Siebers / Kei Eil. 1922 / G. Daab (print) 99 (written)", ♂, MZB. Paratype: KAI ISLANDS: Key, Toeal, 1 ♀, MZS.

*A. kaiensis* is closely related to *A. latifrons*, the species can be recognized by its very slender, and dorsally flattened clasper, with sharply bicuspidate apex. Only one male and one female are available.

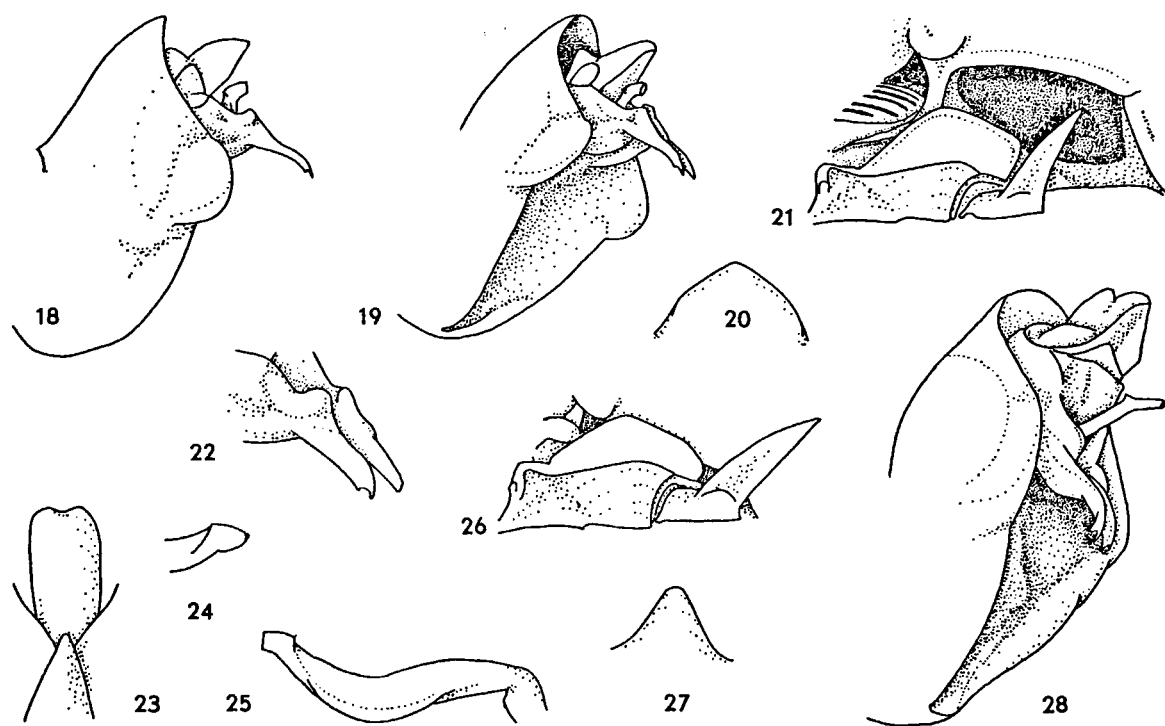
### DESCRIPTION

*A. kaiensis* is a small ochraceous brown species without any special colour markings. Female larger than male. Abdomen of male and female 1.4 x as long as head and thorax. Tegmina of male and female 1.2 x as long as body length.

Legs: Most proximal spine of fore femur shorter than distance to middle spine.

Tymbal organs: Five parallel transverse sclerotized ridges spanning the tymbal from dorsal to ventral margin. A 6th, most proximal, ridge almost reaches ventral tymbal margin. Intercalary ridges can hardly be discerned.

Operculum: Male operculum (fig. 21) very small, not covering tymbal cavity in ventral view. Basal part of operculum weakly vaulted, and with distinct crest around distolateral corner. Distal



Figs. 18-28. 18-27: *Aedeastria kaiensis* n. sp.: 18, pygofer in lateral view; 19, pygofer from aslant; 20, male caudodorsal beak in dorsal view; 21, male operculum; 22, clasper; 23, 8th sternite; 24, detail aedeagus apex; 25, aedeagus in lateral view; 26, female operculum; 27, female caudodorsal beak in dorsal view. 28: *Aedeastria waigeuensis* n. sp., pygofer from aslant.

part of operculum angular, oblong-shaped and slightly longer than basal part, bent adjacent to body. Lateral margin in ventral view long and straight, making a distinct and obtuse angle with crest of basal part. Distal margin straight making an almost right angle with straight medial margin. Distolateral corner rounded. Distinct crest along margins of operculum. A wide gap between operculum and abdomen; folded membrane partly visible in ventral view. Meracanthus not reaching margin of abdomen. Female operculum (fig. 26) shorter than that of male. Distal part of operculum somewhat trapezoid-shaped. Lateral margin slightly convex and making an almost right angle with crest of basal part. Distolateral corner angularly rounded. Distal margin straight, making an obtuse angle with short medial margin.

Abdomen: Ochraceous, segmental hind margins slightly darkened. Male abdomen slender, hardly inflated. Auditory capsules weakly developed, hardly protruding and just visible in dorsal

view. Sternites 1 and 2 not adjacent. Sternite 8 (fig. 23) weakly bicuspidate, only slightly incised at distal margin. Female abdomen slender. Female caudodorsal beak in dorsal view (fig. 27) broad triangular, bluntly rounded at apex.

Male genitalia: Pygofer in lateral view as in fig. 18. Dorsal margin of pygofer convex, continuously rounded with short and broad caudodorsal beak. Distal margin straight, concavely bent into margin of beak and angularly bent outwards into lateral protuberance. Caudodorsal beak in dorsal view (fig. 20) broadly triangular, bluntly rounded at apex and hardly protruding. Lateral lobe of pygofer strongly curved inwards towards end of distal margin, and sharply bending outwards at end of that margin, forming a broad, angular and laminiform protuberance. Ventral margin of pygofer convex towards base. Ventral margins converging, but parallel and adjacent near base of pygofer opening (fig. 19). Claspers (fig. 22) straight, parallel and directed posteriad. Clasper base not forming a collar around base of anal

valves. Apical part of clasper very slender in lateral view, dorsally flattened, ventrally slightly hollow, and sharply bicuspidate at apex. Clasper forming a weakly protruding rectangular and inwards curved dorsal corner, supporting aedeagus in upright position. Aedeagus (fig. 25) strongly upcurved at half-length and slightly recurving near apex, with distinct lateral crests and a weakly developed dorsal crest. Lateral crests curve upwards at distal ends and fuse to a very small, hardly protruding, subapical collar at bending point of aedeagus (fig. 24). [Apex of aedeagus damaged].

Measurements: Body length ♂: 14.4 mm, ♀: 15.8 mm; tegmen length ♂: 17.4 mm, ♀: 18.5 mm; head length ♂: 1.0 mm, ♀: 1.3 mm; pronotum length ♂: 1.8 mm, ♀: 1.9 mm; mesonotum length ♂: 3.2 mm, ♀: 3.4 mm; head width ♂: 3.1 mm, ♀: 3.9 mm; width of pronotal collar ♂: 4.4 mm, ♀: 5.0 mm.

Distribution (fig. 2): This species is only known from the Kai Islands, southwest New Guinea.

***Aedeastria waigeuensis* n. sp.**  
(Figs. 2, 28-36)

Holotype: The holotype comes from Waigeu Island, Irian Jaya, and bears the following labels: "N. DUTCH NEW GUINEA: / Waigeu. Camp Nok. / 2,500 ft. iv.1938. / L.E. Cheesman. / B.M. 1938-593.", ♂, BMNH; Paratype: same data as holotype, 1♂, BMNH.

Remark: A series of females from the same locality as the types of *A. waigeuensis*, and apparently all belonging to the same species, either belong to this species or to *A. cheesmanae* described below. A description of these females is given with the description of *A. cheesmanae*.

*A. waigeuensis* is slightly larger than *A. latifrons*, and easily recognized by the long and slender claspers, curving around the deeply incised hind margin of the 8th sternite (fig. 29).

DESCRIPTION

Body ochraceous to grey-brown, tinged with green. Abdomen 1.4-1.5 x as long as head and

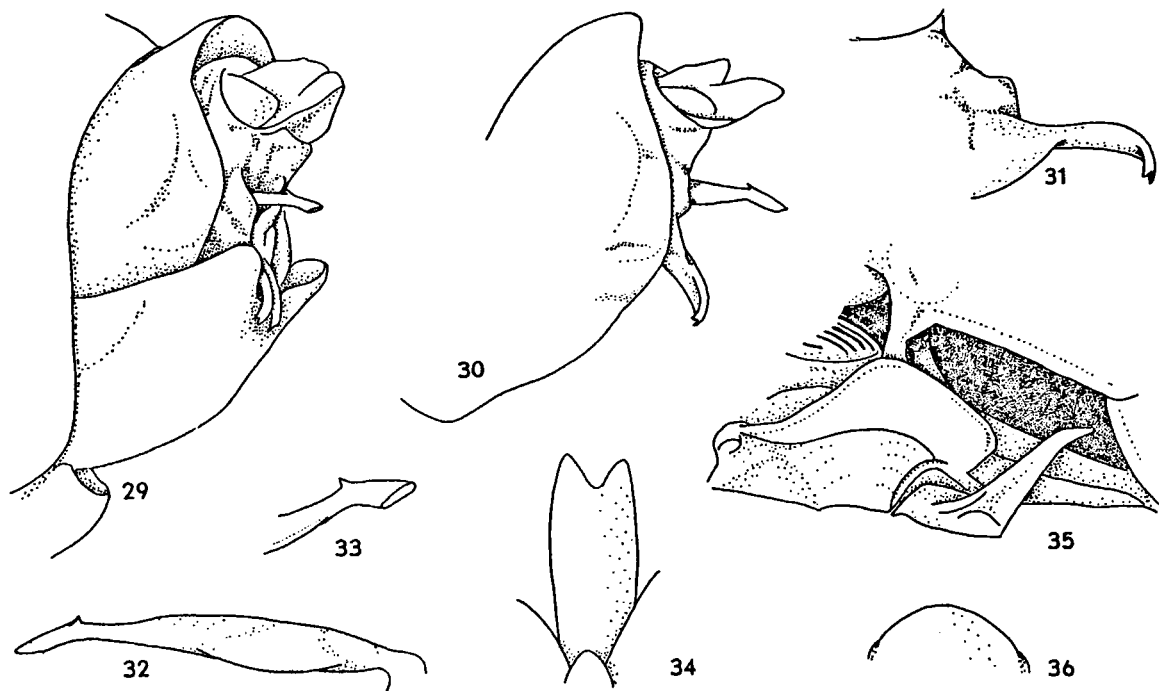
thorax. Tegmina 1.2 x as long as body length.

Tymbal organs: Five parallel transverse sclerotized ridges spanning the tymbal from dorsal to ventral margin. A 6th, most proximal, ridge almost reaches ventral tymbal margin. Intercalary ridges can hardly be discerned.

Operculum (fig. 35): Basal part of operculum strongly vaulted. Lateral part of crest around distolateral corner very short, shorter than in both foregoing species, and higher than distal part of that crest. Distal part of operculum angular, oblong-shaped and slightly shorter than basal part. Distal part bent adjacent to body. Lateral margin in ventral view long and straight, making a distinct and obtuse angle with crest of basal part. Distal and medial margins straight. Distolateral and distomedial corners rounded. A distinct crest runs along all margins of operculum. A wide gap between operculum and abdomen; folded membrane partly visible in ventral view. Meracanthus reaching beyond operculum, but not reaching margin of abdomen.

Abdomen: Stout and slightly inflated, greyish brown, with reddish segmental hind margins and a row of vaguely darkened lateroventral spots on segments 3-7. Auditory capsules weakly developed, hardly protruding and hardly visible in dorsal view. Sternites 1 and 2 almost adjacent. Sternite 8 (fig. 34) bicuspidate, deeply incised at distal margin.

Genitalia: Pygofer in lateral view as in fig. 30. Dorsal margin of pygofer convex, continuously rounded with short and broad caudodorsal beak. Distal margin straight, concavely bent into margin of beak, and angularly bent outwards into lateral protuberance. Caudodorsal beak in dorsal view (fig. 36) broadly rounded, hardly protruding. Lateral lobe of pygofer globularly rounded, abruptly curving outwards towards end of distal margin, and forming a broad, but only slightly swollen, protuberance. Ventral margin of pygofer weakly convex, but concave towards base of pygofer. Ventral part of pygofer opening elongate and very slender; with ventral margins close together (fig. 28). Claspers (fig. 31) long, slender and parallel, directed posteriad, but slightly curved down to their bifurcate apices. The claspers curve around the edge of the 8th sternite, at



Figs. 29-36. *Aedeastria waigeuensis* n. sp.: 29, pygofer from aslant, when retracted; 30, pygofer in lateral view; 31, clasper; 32, aedeagus in lateral view; 33, detail aedeagus apex; 34, 8th sternite; 35, operculum; 36, caudodorsal beak.

the deep incision in its hind margin (fig. 29). Apical part of clasper without distinct hollow, though slightly incurved at the bifurcation. Clasper with broad and angular dorsal protrusion at base. This protrusion bends inwards around aedeagus and supports aedeagus in upright position. Claspers at base fused to a broad, ring-shaped collar around base of anal valves. Aedeagus (fig. 32) with weak dorsal ridge and short lateral crests, slightly S-curved, but angularly bending into straight and slender apical part, and forming a sharp, tooth-shaped, subapical protrusion at its bending point (fig. 33). Aedeagus elongate distally of this protrusion. The lateral crests of aedeagus seem not to be connected to the subapical protrusion (as is the case in most other species of the genus).

Measurements: Body length: 19.1 & 19.4 mm; tegmen length: 22.4 & 23.0 mm; head length: 1.6 mm both; pronotum length: 2.8 & 2.9 mm; mesonotum length: 4.1 & 4.6 mm; head width: 4.3 & 4.4 mm; width of pronotal collar: 5.7 & 6.2 mm.

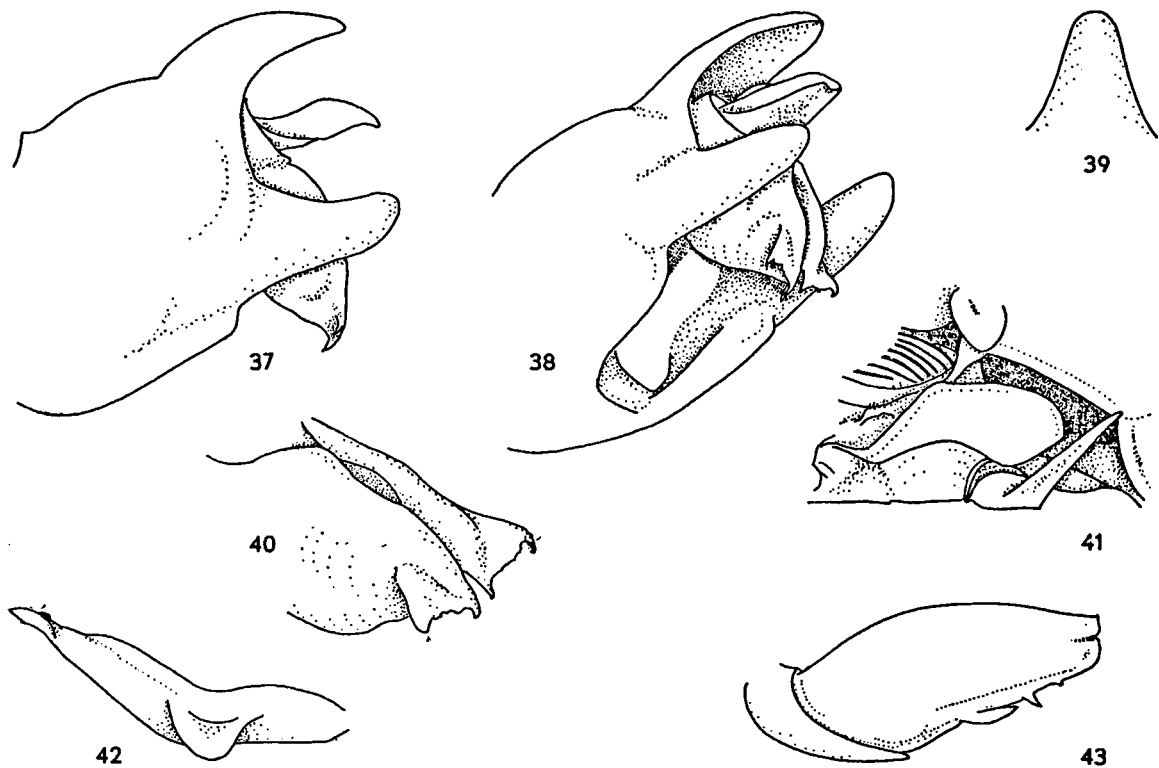
Distribution (fig. 2): *A. waigeuensis* is probably endemic to Waigeu Island.

***Aedeastria digitata* (Blöte, 1960) n. comb.**  
(Figs. 2, 37-43)

*Baeturia digitata* Blöte, 1960: 71, 78, figs. 38-39; Duffels & van der Laan, 1985: 252.

Material: IRIAN: NEW GUINEA (W): Rattan Camp, 1200 m, ii.1939, L.J. Toxopeus Neth. Ind.-American New Guinea Exped., ♂ holotype *Baeturia digitata*, 1♂ paratype, RMNH; same data but iii.1939, 1♀ allotype, RMNH.

In his description, Blöte mentions three males and one female. Two males and the female were found in the RMNH, the third male is in the AMNH, but was not available for study. It is rather uncertain, whether the allocation of *A. digitata* to *Aedeastria* is correct. The species shares the supposedly apomorphic swollen edge on the lateral part of the pronotum collar, but this ridge is less well developed than in the other species of *Aedeastria*. Furthermore, contrary to *Aedeastria*, the



Figs. 37-43. *Aedeastria digitata* Blöte, 1960: 37, pygofer in lateral view; 38, pygofer from aslant; 39, caudodorsal beak in dorsal view; 40, claspers; 41, male operculum; 42, aedeagus in lateral view; 43, male fore femur.

diverging fissures on the vertex are almost obsolete, and the proximal femoral spine is strongly bent in *A. digitata*. The latter character also occurs in the holotype of *A. hastulata*, and is common in several related genera (e.g. *Thaumastopsaltria*, *Cystosoma*, and *Cystopsaltria*). The shapes of pygofer and claspers of *A. digitata* differ strongly from all other New Guinean cicada species, and do not suggest a definite relation to any of the genera. However, the broad and serrate clasper apex is presumed to be homologous with the bicuspidate clasper apex as found in many of the species of *Aedeastria*, while the shape of opercula and tegminal characters do not oppose its inclusion in that genus.

*A. digitata* is easily recognized by its peculiar pygofer, with large curved caudodorsal beak, concave distal margin, and conical, posteriorly directed, protuberances. A somewhat similar pygofer was found in some species of the *Baeturia viridis* group (De Boer, 1992). The single female

known is incomplete and differs from the males by an erect femoral spine, and quite possibly this specimen may not belong to this species.

#### DESCRIPTION

Body reddish brown. Male abdomen 1.6-1.7 x as long as head and thorax. Tegmina of males 1.2 x as long as body length. Abdomen of female missing, but the specimen has a more robust head and thorax, and longer tegmina.

Head: Vertex quite smooth, with some short setae; diverging fissures almost obsolete in males, but more distinct in the female.

Legs: Femur with row of three spines, diminishing in length towards tibia. The most proximal spine is strongly bent and adjacent to femur in the males (fig. 43), with its apex almost reaching the base of middle spine, and erect in the female.

Tymbal organs: Six parallel transverse sclero-

tized ridges spanning the tymbal from dorsal to ventral margin. A 7th, most proximal ridge almost reaching ventral margin. Six short intercalary ridges are only vaguely visible.

**Opercula:** Male operculum (fig. 41). Basal part of operculum strongly vaulted. Lateral part of crest around distolateral corner fairly short and distinctly higher than distal part of that crest. Distal part of operculum angular, oblong-shaped and longer than basal part, curved towards body. Lateral margin long and straight, making a distinct and obtuse angle with crest of basal part. Distal margin almost straight, but convex to distomedial corner and forming an obtuse angle with lateral and medial margins. Medial margin straight. A weak crest along margins of operculum. Gap between operculum and abdomen narrow; folded membrane hardly visible in ventral view. Meracanthus just reaching margin of abdomen. Female operculum shorter than in male. Distal part of operculum oblong. Lateral margin straight, making a distinct and obtuse angle with crest of basal part. Distolateral corner angularly rounded. Distal margin long and straight, making an almost right angle with short and straight medial margin.

**Male abdomen:** Slender and weakly inflated, with lateroventral row of dark spots on segments 3-7. Segmental hind margins reddish brown in holotype, ochraceous in paratype. Auditory capsules globularly swollen, and just visible in dorsal view. Sternites 1 and 2 adjacent. Sternite 8 not bicuspidate; distal margin straight. [Female abdomen missing].

**Male genitalia:** Pygofer in lateral view (fig. 37) of very peculiar shape. Dorsal margin of pygofer convex, making a distinct angle with stout and strongly bent caudodorsal beak. Distal margin weakly concave, almost continuously curved from apex of caudodorsal beak into conical protuberance on lateral lobe of pygofer. Caudodorsal beak in dorsal view (fig. 39) very long, triangle-shaped and bluntly rounded at apex. Lateral lobe of pygofer strongly curving inwards towards end of distal margin, forming a broad and swollen, conically shaped and distinctly posteriorly directed protuberance. Ventral part of pygofer lobe forming an angular corner just under this protu-

berance. Ventral margin of pygofer straight. Ventral part of pygofer opening broad, U-shaped (fig. 38). Claspers (fig. 40) somewhat inflated, closely together at base, leaving a very narrow opening for anal valves, weakly curving down, and parallel to apices, though curving outward at half-length, around aedeagus. Dorsal parts of claspers adjacent between aedeagus and anal valves. Clasper distinctly widening and dorsoventrally flattened towards apex, forming short and sharply pointed, thorn-shaped lateral and medial protrusions, connected by a serrate distal margin. Aedeagus (fig. 42) strongly upcurved at half-length, but weakly recurving near apex, with short and broad lateral crests at basal curvature, a pair of distinct dorsal ridges, and a pair of very small subapical lobes at the apical bending point. Aedeagus pore round.

**Measurements:** Body length ♂: 16.1 & 17.8 mm; tegmen length ♂: 20.0 & 20.8 mm, ♀: 21.5 mm; pronotum length ♂: 1.2 & 1.3 mm, ♀: 1.5 mm; mesonotum length ♂: 3.4 & 3.7 mm, ♀: 3.8 mm; head length ♂: 1.2 & 1.3 mm, ♀: 1.5 mm; head width ♂: 3.4 mm both, ♀: 3.6 mm; width of pronotal collar ♂: 4.5 & 4.8 mm, ♀: 4.7 mm.

**Distribution** (fig. 2): *A. digitata* is known from only one locality in central Irian Jaya.

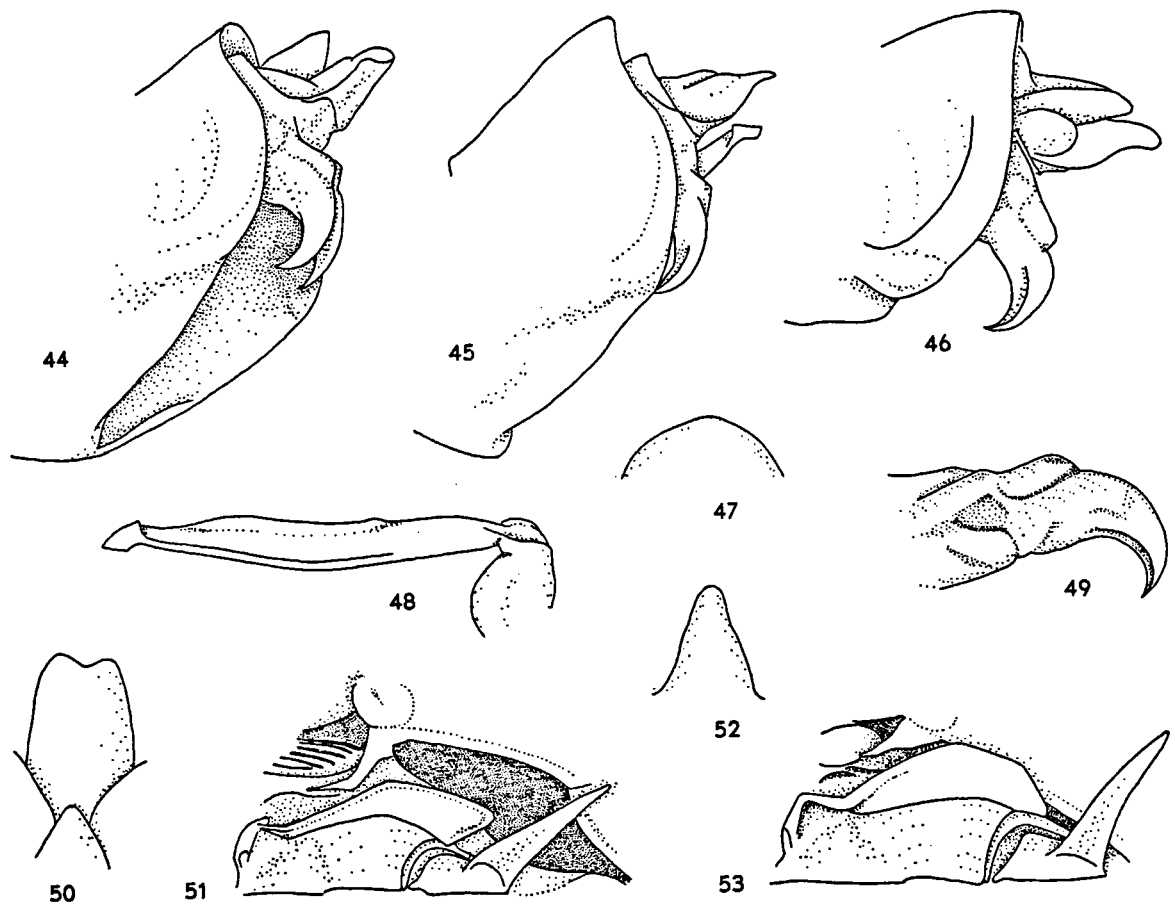
### ***Aedeastria cheesmanae* n.sp.**

(Figs. 1, 44-53)

**Holotype:** The holotype comes from Waigeu Island, Irian Jaya, and bears the following labels: "N. DUTCH NEW GUINEA: / Waigeu. Camp Nok. / 2,500 ft. v.1938. / L.E. Cheesman. / B.M. 1938-593.", ♂, BMNH; Paratypes: same data as holotype, 1♂, BMNH; same data 1♂, ZMA; same data but iv.1938, 3♂, BMNH; Other material: MISOÖL: Misoöl id (W), 0-75 m, 8.ix-20.x.1948, M.A. Lieftinck, 1♂, 1♀, MZB; WAIGEU: Waigeu, Camp Nok, 2,500 ft., iv.1938, L.E. Cheesman, 8♀, BMNH; same data but v.1938, 5♀, BMNH; same data 1♀, ZMA.

**Remark:** The female specimens from Waigeu might also belong, or partly belong, to *A. waigeuensis* described above. Since no differentiation, however, could be made between these females and the female from Misool, which presumably belongs to *A. cheesmanae*, the Waigeu females are attributed to this species.





Figs. 44-53. *Aedeastria cheesmanae* n. sp.: 44, pygofer from aslant; 45, pygofer in lateral view, Waigeu; 46, pygofer in lateral view, Misool; 47, male caudodorsal beak in dorsal view; 48, aedeagus in lateral view; 49, clasper; 50, 8th sternite; 51, male operculum; 52, female caudodorsal beak in dorsal view; 53, female operculum.

*A. cheesmanae* has a very similar pygofer as *A. waigeuensis* but has very different, hook-shaped and sharply pointed, claspers and in that respect closely resembles *A. moluccensis*, described next.

#### DESCRIPTION

Body light brown or greenish. Females distinctly larger than males, but some of the females might belong to the slightly larger *A. waigeuensis*. Male abdomen 1.2-1.4 x as long as head and thorax, of females 1.1-1.4 x. Tegmina of males 1.1-1.4 x as long as body length, of females 1.2-1.3 x.

Legs: Most proximal spine of fore femur generally shorter than distance to middle spine.

Tymbal organs: Six parallel transverse sclerotized ridges spanning the tymbal from dorsal to ventral margin. A 7th, most proximal ridge reaching to about half the tymbal width. Six short intercalary ridges are only vaguely visible.

Opercula: Male operculum (fig. 51). Basal part of operculum strongly vaulted. Lateral part of crest around distolateral corner long and slender, distinctly higher than distal part of that crest. Distal part of operculum angular, oblong-shaped and shorter than basal part. Distal part erect, not curved towards body. Lateral margin long and straight, making a distinct and obtuse angle with crest of basal part. Distal and medial margins straight. Distolateral corner angular or rounded. Distomedial corner subrectangular. A distinct

crest along margins of operculum. Gap between operculum and abdomen narrower than in *A. waigeuensis*; folded membrane partly visible in ventral view. Meracanthus reaching beyond margin of abdomen. Female operculum (fig. 53). Distal part of operculum trapezoid-shaped. Lateral margin, as in male, making a distinct and obtuse angle with crest of basal part, but slightly convex. Distolateral corner angularly rounded. Distal margin short and straight, making an obtuse angle with medial margin.

Abdomen: Male abdomen slender, hardly inflated, and greyish brown, with ochraceous, or slightly red tinged, segmental hind margins. Some specimens with a row of vaguely darkened lateroventral spots on segments 3-7. Auditory capsules weakly developed, hardly protruding and hardly visible in dorsal view. Sternites 1 and 2 adjacent. Sternite 8 (fig. 50) in most specimens slightly bicuspidate. Female abdomen reddish-ochraceous or green. Female caudodorsal beak in dorsal view (fig. 52) triangular, and narrowly rounded at apex.

Male genitalia: Pygofer in lateral view (fig. 45) closely resembling that of *A. waigeuensis*. Dorsal margin of pygofer convex, continuously rounded with short and broad caudodorsal beak. Distal margin straight, concavely bent into margin of caudodorsal beak and angularly bent outwards into laterad curved protuberance. Caudodorsal beak in dorsal view (fig. 47) angularly rounded, hardly protruding. Lateral lobe of pygofer globularly rounded, abruptly curving outwards towards end of distal margin, forming a broad, outwards bent and weakly swollen protuberance. Ventral margin of pygofer weakly convex, but concave towards pygofer base. Ventral part of pygofer opening elongate and very slender; ventral margins close together (fig. 44). Claspers diverging towards apices. Clasper (fig. 49) with downwards curved, hook-shaped and sharply pointed apical part. There is a considerable variation in length of the proximal part of clasper: in some specimens the clasper hook reaches well beyond the margin of pygofer (fig. 46), in others, the clasper is more retracted (fig. 45). Apical part of clasper with distinct, but slender hollow. Clasper with broad and angular dorsal protrusion at base.

This protrusion bends inwards around aedeagus and supports aedeagus in upright position. Claspers at base fused to broad, ring-shaped collar around base of anal valves. Aedeagus (fig. 48) slightly upcurved, but angularly bent down and abruptly narrowing to short apical part, just proximal to bending point. Aedeagus with very slender lateral crests and distinct dorsal crest. The lateral crests curve up, and fuse at distal ends, to form a small subapical collar at apical bending point of aedeagus. Aedeagus pore round.

Measurements: Body length ♂: 16.1-19.0 mm (x 17.3 mm ± 1.1), ♀: 19.3-22.3 mm (x 20.3 mm ± 0.7); tegmen length ♂: 19.5-22.4 mm (x 21.0 mm ± 0.9), ♀: 23.4-27.2 mm (x 24.9 mm ± 0.9); head length ♂: 1.4-1.7 mm (x 1.5 mm), ♀: 1.5-1.7 mm (x 1.6 mm); pronotum length ♂: 1.9-2.2 mm (x 2.1 mm), ♀: 2.3-2.7 mm (x 2.5 mm); mesonotum length ♂: 3.7-4.4 mm (x 4.0 mm), ♀: 4.5-5.1 mm (x 4.8 mm); head width ♂: 3.8-4.2 mm (x 4.0 mm), ♀: 4.4-5.0 mm (x 4.7 mm); width of pronotal collar ♂: 5.0-5.7 mm (x 5.4 mm), ♀: 6.1-7.0 mm (x 6.4 mm).

Distribution (fig. 1): *A. cheesmanae* is recorded from the islands of Waigeu and Misool.

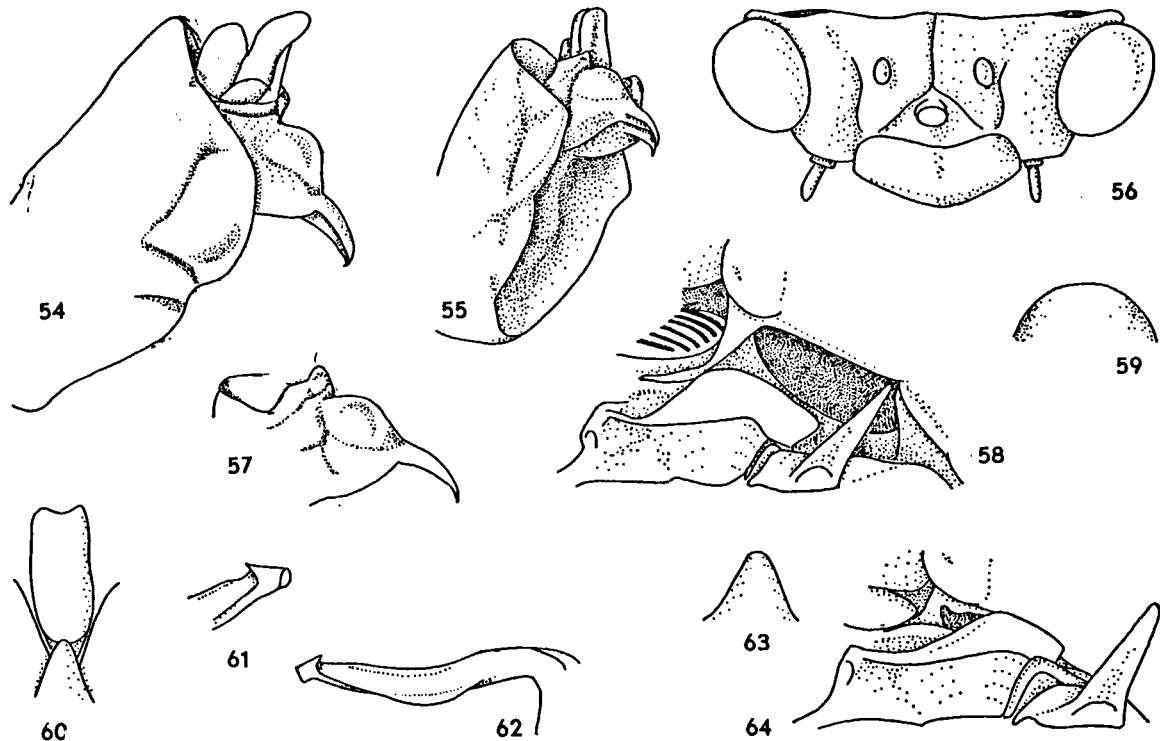
Etymology: This species is named in honour of Miss L.E. Cheesman, who collected the type series, besides many other specimens on which the current study of the "*Baeturia* and related genera complex" is based.

### ***Aedeastria moluccensis* n. sp.**

(Figs. 2, 54-64)

Holotype: The holotype comes from Obi Island, Irian Jaya, and bears the following labels: "Lai Wui Obi / 15.ix.1953" (written) ♂, MZB. Paratypes: OBI ISLAND: Obi, Doherty, ex coll. Fruhstorfer, 1 ♀, BMNH; Kali Telaga, 31.x.1953, 1 ♀, MZB; Obi, Waterstradt, 1 ♀, IZW; Other material: HALMAHERA: Mumar river, 200-300 m, 27.ix.1951, 1 ♀, MZB; TERNATE: Ternate, Forsten, 1 ♀, RMNH.

*A. moluccensis* is closely related to *A. cheesmanae*, sharing a very similar clasper. *A. moluccensis* is distinctly smaller, however, and can be recognized by the large and angularly rounded dorsal protrusion at the base of clasper. The male holotype and female paratypes all come from Obi island.



Figs. 54-64. *Aedeastria moluccensis* n. sp.: 54, pygofer in lateral view; 55, pygofer from aslant; 56, head in dorsal view; 57, clasper; 58, male operculum; 59, male caudodorsal beak in dorsal view; 60, 8th sternite; 61, detail aedeagus apex; 62, aedeagus in lateral view; 63, female caudodorsal beak in dorsal view; 64, female operculum.

Two females of about the same size, from Halmahera and Ternate presumably belong to this species, though the female from Halmahera differs slightly in the shape of its postclypeus.

#### DESCRIPTION

Body ochraceous brown, without any colour markings. Females larger than male. Abdomen of male 1.5 x as long as head and thorax, of females 1.3 x. Male tegmen 1.1 x as long as body length, of females 1.3 x.

Head: Ochraceous, with traces of green on vertex lobes. Vertex with some short red-brown setae. Postclypeus angularly, and distinctly, protruding beyond vertex lobes; its anterior margin angularly bending back at lateral corners, forming almost right angles with anterior margins of vertex lobes (fig. 56), though almost continuous with vertex lobes in the female from Halmahera.

Tegmina: With distinct hyaline border along

hind margin.

Tymbal organ: Six weakly sclerotized ridges spanning the tymbal from dorsal to ventral margin and a 7th, most proximal, ridge spanning half the tymbal width. Intercalary ridges can not be recognized.

Opercula: Male operculum (fig. 58). Basal part of operculum strongly vaulted. Lateral part of crest around distolateral corner long and slender, distinctly higher than distal part of that crest. Distal part of operculum shorter than basal part and oblong-shaped. Lateral margin straight, making a distinct and obtuse angle with crest of basal part, and an obtuse angle with distal margin. Distal margin straight, making a right angle with short and straight medial margin. A wide gap between operculum and abdomen; folded membrane partly visible in ventral view. Mera-canthus almost reaching margin of abdomen. Female operculum (fig. 64) shorter than that of male. Lateral margin of distal part more gradually curving into distal part of crest around later-

al corner. Distal margin weakly convex, forming an almost right angle with short medial margin.

Abdomen: Unicolorous ochraceous or greenish tinged. First tergite of male very short, middorsal part almost completely hidden under metanotum. Auditory capsules weakly inflated, just visible in dorsal view. Sternite 1 and 2 almost adjacent. Sternite 8 (fig. 60) elongate, its distal margin slightly concave medially. Female caudodorsal beak in dorsal view (fig. 63) broadly triangular and rounded at apex.

Male genitalia: Pygofer in lateral view as in fig. 54. Dorsal margin short and straight, concave at base of short and stout caudodorsal beak. Distal margin straight, making a very slight angle with margin of beak. Ventral margin weakly convex, but weakly concave towards base of pygofer. Caudodorsal beak in dorsal view (fig. 59) very short and broadly rounded. Lateral lobe of pygofer curving inwards towards end of distal margin, but abruptly bending outwards at end of that margin, forming a broad and angular, lamini-form protuberance. Ventral margins of pygofer almost parallel and fairly wide apart (fig. 55). Claspers (fig. 57) long and parallel, directed posteriorly. Clasper with broad and angular dorsal protrusion at base. This protrusion bends inwards around aedeagus and supports aedeagus in upright position. Apical part of clasper very slender and straight towards base, but strongly curved downwards, close to sharply pointed apex. Apical part with very distinct, long and slender, sharply edged clasper hollow. Claspers fused at base, but not forming a distinct collar around base of anal valves. Aedeagus (fig. 62) almost straight, slightly bent upwards at half its length and angularly, though slightly, bent down near apex. Apical part very short. Aedeagus with slender but distinct lateral crests and a very weak, but sharply edged dorsal crest. The lateral crests curve upwards at distal ends and fuse to a small and sharply pointed protuberance at apical bending point of aedeagus (fig. 61). Apex of aedeagus slightly incised ventrally; aedeagus pore almost oval.

Measurements: Body length ♂: 12.6 mm, ♀: 13.5-16.6 mm (x 15.3 mm ± 1.2); tegmen length ♂: 14.0 mm, ♀: 17.2-20.3 mm (x 18.4 mm); head

length ♂: 1.1 mm, ♀: 1.2-1.6 mm (x 1.4 mm); pronotum length ♂: 1.5 mm, ♀: 1.7-2.2 mm (x 2.0 mm); mesonotum length ♂: 2.7 mm, ♀: 3.0-3.6 mm (x 3.4 mm); head width ♂: 2.7 mm, ♀: 3.3-4.0 mm (x 3.6 mm); width of pronotal collar ♂: 3.7 mm, ♀: 4.1-5.1 mm (x 4.8 mm).

Distribution (fig. 2): *A. moluccensis* is known from Obi Island, females from Halmahera and Ternate probably belong to the species.

Remark: The female from the BMNH is badly preserved, tegmina and wings are incomplete and the abdomen is partly consumed.

### ***Aedeastria obiensis* n. sp.**

(Figs. 1, 65-74)

Holotype: The holotype comes from Obi Island, Irian Jaya, and bears the following labels: "Telaga / Obi 11-8-1953" (written) ♂, MZB. Paratypes: same data as holotype but 6.viii.1953, 1♀; 7.viii.1953, 2♀; 31.viii.1953, 1♀, all MZB; Obi lake, 180 m, 29.viii.1953, 1♀, MZB; Salawaku river, 17.vii.1953, 1♂, MZB.

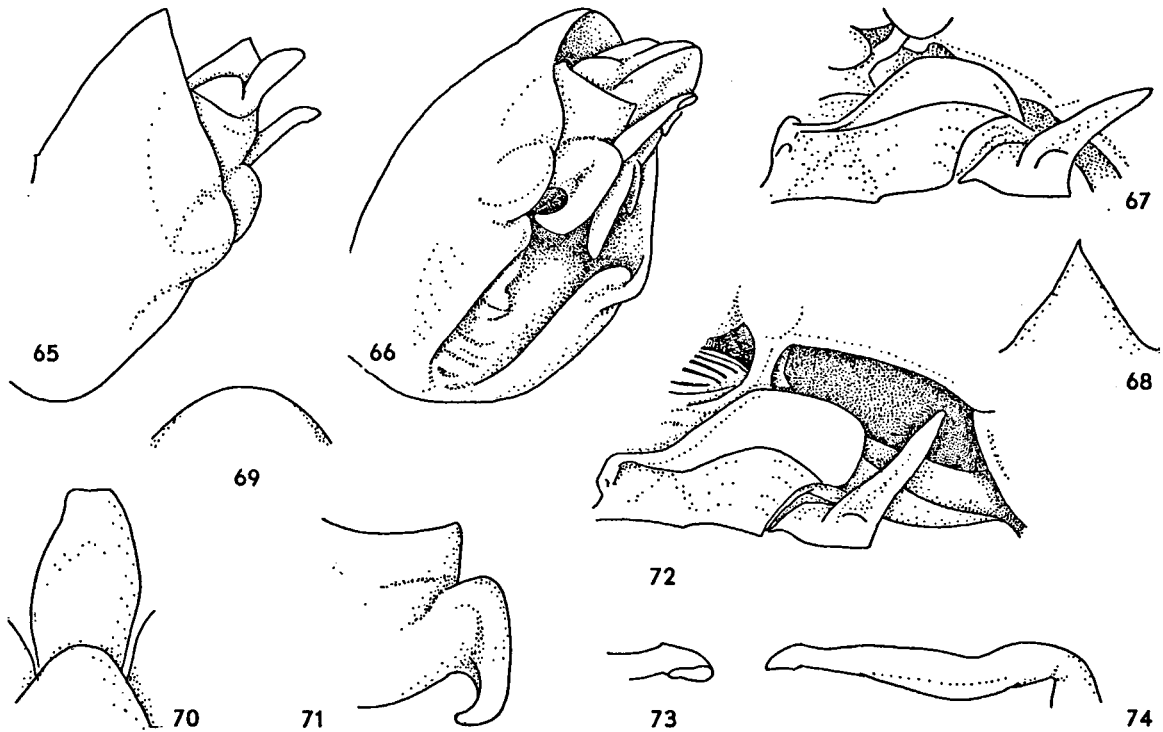
*A. obiensis* is distinctly larger than the foregoing species and can easily be recognized by its short and recurving claspers, and ventrally rounded pygofer, with incurving lateral lobes.

### DESCRIPTION

Body of males ochraceous, females more reddish brown, without any colour markings. Females larger than males. Abdomen of males 1.5-1.8 x as long as head and thorax, of females 1.2-1.4 x. Male tegmen 1.3 x as long as body length, of females 1.1-1.3 x.

Tymbal organ: Five weakly sclerotized ridges spanning the tymbal from dorsal to ventral margin and a 6th, most proximal, ridge spanning half the tymbal width.

Opercula: Male operculum (fig. 72). Basal part of operculum strongly vaulted. Lateral part of crest around distolateral corner long and slender, distinctly higher than distal part of that crest. Distal part of operculum shorter than basal part and oblong-shaped. Lateral margin straight, making a distinct and obtuse angle with crest of



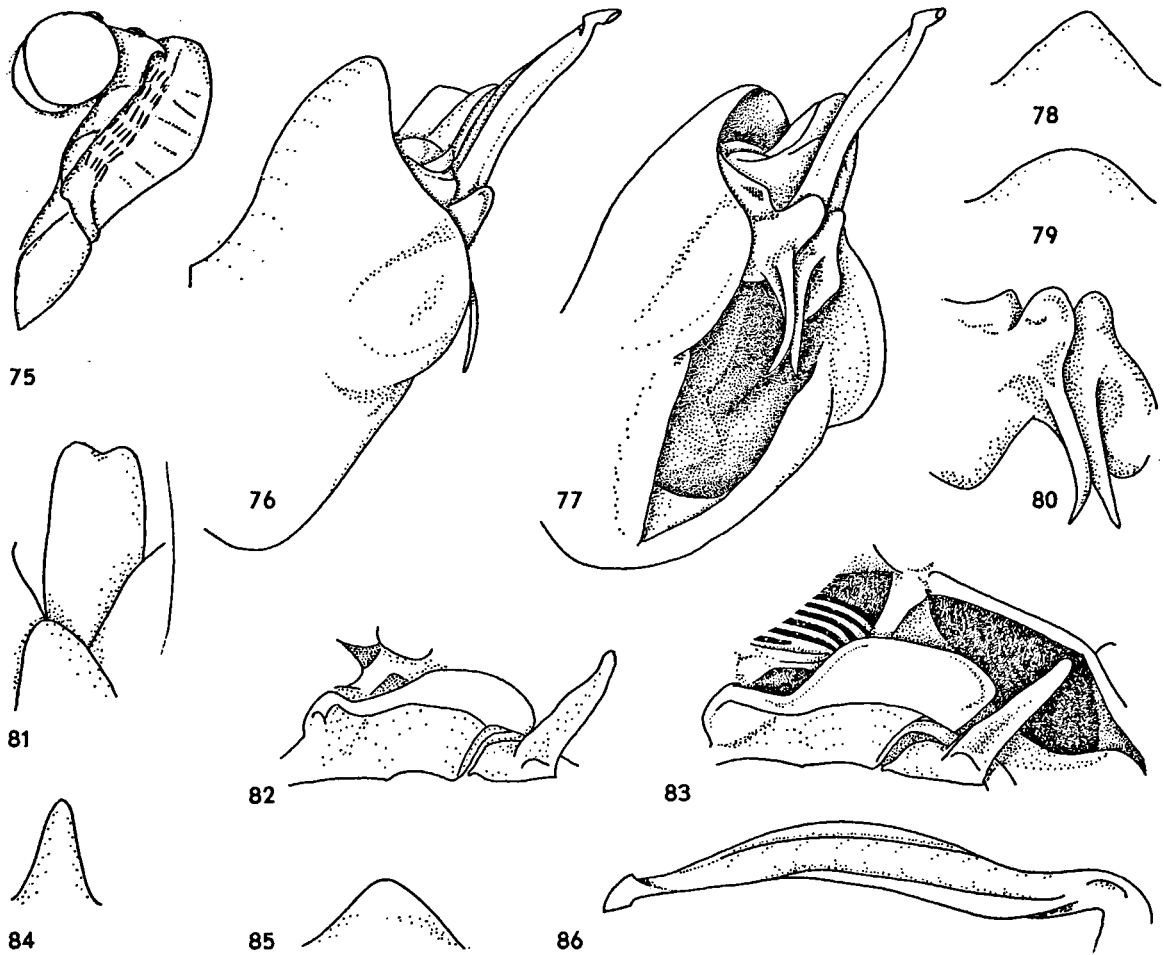
Figs. 65-74. *Aedeastria obiensis* n. sp.: 65, pygofer in lateral view; 66, pygofer from aslant; 67, female operculum; 68, female caudodorsal beak in dorsal view; 69, male caudodorsal beak in dorsal view; 70, 8th sternite; 71, clasper; 72, male operculum; 73, detail aedeagus apex; 74, aedeagus in lateral view.

basal part, and an obtuse angle with distal margin. Distal margin straight, making an almost right angle with short and straight medial margin. A wide gap between operculum and abdomen; folded membrane partly visible in ventral view. Meracanthus not reaching margin of abdomen. Female operculum (fig. 67) shorter than that of male. Distal part almost trapezoid-shaped; distal margin making an obtuse angle with lateral and medial margins.

Abdomen: Unicoloured ochraceous or red-brown. Auditory capsules globularly inflated, just visible in dorsal view. Sternites 1 and 2 not adjacent. Eighth sternite (fig. 70) truncate, not incised at distal margin. Female caudodorsal beak in dorsal view (fig. 68) broadly triangular, sharply pointed at apex.

Male genitalia: Pygofer in lateral view as in fig. 65. Dorsal margin weakly convex, continuous with very short caudodorsal beak. Distal margin almost continuously straight to apex of beak.

Ventral margin nearly straight. Caudodorsal beak in dorsal view (fig. 69) very short and broadly rounded. Lateral lobe of pygofer curving inwards towards end of distal margin, but abruptly bending outwards at end of that margin, forming a broad and angular, weakly swollen protuberance. Ventral part of pygofer rounded, curving inwards towards ventral margin; ventral part of pygofer opening fairly narrow, with margins close together (fig. 66). Claspers (fig. 71) very short, hook-shaped, diverging and strongly recurving into pygofer; apices pointed. Clasper dorsally broadly rounded and curved around aedeagus. Apical part of clasper with distinct, and sharply edged clasper hollow. Claspers fused at base, forming a broad collar around base of anal valves. Aedeagus (fig. 74) sinuous, slightly bent upwards at 1/3 its length and angularly, and slightly, bent down near apex. Apical part very slender. Aedeagus with slender but distinct lateral crests and a very weak dorsal crest. Aedeagus



Figs. 75-86. *Aedeastria hastulata* n. sp.: 75, postclypeus in lateral view, Bacan; 76, pygofer in lateral view; 77, pygofer from aslant; 78, male caudodorsal beak in dorsal view, holotype; 79, idem, Bacan; 80, claspers; 81, 8th sternite; 82, female operculum; 83, male operculum; 84, female caudodorsal beak in dorsal view, Makian; 85, idem, Morotai; 86, aedeagus in lateral view.

pore fairly broad and almost round (fig. 73).

Measurements: Body length ♂: 18.4 & 19.5 mm, ♀: 18.7-21.3 mm (x 19.8 mm ± 0.9); tegmen length ♂: 21.2 & 23.6 mm, ♀: 23.1-26.1 mm (x 24.2 mm ± 1.1); head length ♂: 1.1 & 1.5 mm, ♀: 1.7-2.0 mm (x 1.9 mm); pronotum length ♂: 2.2 & 2.3 mm, ♀: 2.5-2.8 mm (x 2.7 mm); mesonotum length ♂: 3.8 & 4.2 mm, ♀: 3.7-4.6 mm (x 4.3 mm); head width ♂: 4.2 & 4.4 mm, ♀: 4.4-5.2 mm (x 4.8 mm); width of pronotal collar ♂: 5.3 & 6.0 mm, ♀: 5.8-6.8 mm (x 6.4 mm).

Distribution (fig. 1): *A. obiensis* is probably endemic on Obi Island.

#### ***Aedeastria hastulata* n.sp.**

(Figs. 1, 75-86)

Holotype: The holotype comes from Morotai Island, northern Maluku, and bears the following labels: "Sangi en Talaud [print, crossed out] Morotai Goegoei [written] Erie 1926 [print]" ♂, MZB. Paratypes: BACAN: Batchian Doherty, 1♂, BMNH; Batchian 1♀ *Cephaloxys dilectus*, MVM; HALMAHERA: Halmahera, 1912-5, 1♂, SMD. Other material: MAKIAN: Makian, 14-26.ii.1903, Nieuw Guinea Exp. 1903, coll., Jacobi, 1♀, SMD; MOROTAI: Morotai, Bernstein, 1♀, RMNH; TERNATE: Ternate, 1894, Kükenthal, 1♀, SMF.

Three males are available, the male from Bacan

is severely damaged and consists of several loose parts pasted on a piece of cardboard. *A. hastulata* can be recognized by a sharp and slender medial protrusion on the clasper, not unlike that of several *Thaumastopsaltria* species (De Boer, 1992). Three females from north Maluku, of approximately the same size, presumably belong to this species, though the female from Morotai strongly deviates in size and shape of caudodorsal beak and possibly belongs to a separate species.

## DESCRIPTION

Body unicolorous light brown. Abdomen of males and females 1.2 x as long as head and thorax. Tegmina of males and females 1.3 x as long as body length.

**Head:** With considerable differences in shape of postclypeus. Postclypeus of holotype only slightly protruding in dorsal view; the convex anterior margin is continuous with anterior margins of vertex lobes. Postclypeus of paratypes distinctly protruding beyond vertex lobes, as in *A. moluccensis* (cf. fig. 56); anterior margin making a right angle with anterior margins of vertex lobes. Postclypeus of paratype from Bacan (fig. 75) angularly swollen in lateral view, very similar as in *Thaumastopsaltria*, but in other material, though rather robust, not angular in lateral view.

**Legs:** Fore femur with row of three spines, diminishing in length towards tibia. Most proximal spine in holotype strongly bent, adjacent to femur, but more erect in other material, and shorter than distance to middle spine.

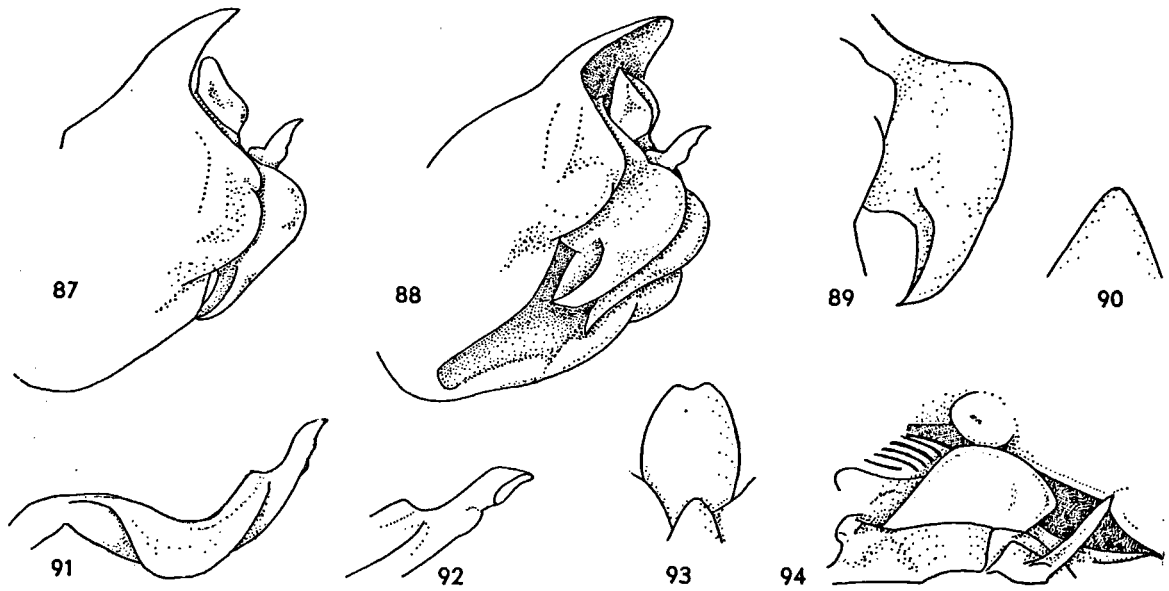
**Tymbal organs:** Four transverse sclerotized ridges spanning the tymbal from dorsal to ventral margin, and a 5th, most proximal, ridge only spanning about 3/4 of tymbal width. Intercalary ridges embedded in main ridges.

**Opercula:** Male operculum (fig. 83) partly covering tymbal cavity in ventral view. Basal part of operculum strongly vaulted. Distal part of operculum angular, oblong-shaped, with straight margins, about as long as basal part, and adjacent to body. Lateral margin long and straight, forming a distinct and slightly obtuse angle with crest of basal part. Distolateral corner broadly

rounded; distomedial corner narrowly rounded, almost pointed. Gap between operculum and abdomen fairly wide; folded membrane partly visible. Meracanthus reaching beyond operculum, but not reaching 2nd abdominal segment. Female operculum (fig. 82) much shorter than that of male. Distal part shorter than basal part. Lateral margin forming a distinct and obtuse angle with crest of basal part, angularly rounded into convex distal margin. Distomedial corner rounded or almost rectangular.

**Abdomen:** Light brown and slightly inflated. A row of vaguely darkened lateroventral spots on segments 3-7. Auditory capsules weakly inflated, just visible in dorsal view. Sternites 1 and 2 not adjacent. Sternite 8 (fig. 81) bicuspidate; distinctly incised at distal margin. Female abdomen ochraceous, unmarked. Female caudodorsal beak narrow and triangular, bluntly pointed at apex (fig. 84), but very broad, short and rounded in female from Morotai (fig. 85).

**Male genitalia:** Pygofer in lateral view as in fig. 76. Proximal part of dorsal margin concave, distal part convex and continuous with broad and short caudodorsal beak. Distal margin straight or concave between beak and lateral lobe, concavely curved into margin of beak. Lateral lobe of pygofer curving outwards towards end of distal margin, forming a broad and laminiform protuberance, with rounded corners. Pygofer gradually curving inwards at ventral margin (fig. 77). Caudodorsal beak in dorsal view very short, rectangular in specimen from Bacan (fig. 78), in others rounded at apex (fig. 79). Clasper (fig. 80) very different from those of all foregoing species, with a globularly rounded, upwards directed distal protrusion, bending mesiad around aedeagus; and a sharply pointed, downwards directed ventromedial protrusion, very similar to those of *Thaumastopsaltria lanceola* and *T. sarissa* (De Boer, 1992). Aedeagus (fig. 86) slightly S-curved, but angularly bent down near apex. The lateral crests are broad at the proximal half, but very narrow along distal half of aedeagus, and bend upwards at their distal ends, forming a dorsal collar around apical part of aedeagus. Aedeagus with a thin, but very high, almost transparent dorsal crest. Aedeagus pore round.



Figs. 87-94. *Aedeastria bullata* n. sp.: 87, pygofer in lateral view; 88, pygofer from aslant; 89, clasper; 90, caudodorsal beak in dorsal view; 91, aedeagus in lateral view; 92, detail aedeagus apex; 93, 8th sternite; 94, operculum.

Measurements: Body length ♂: 17.4 & 19.8 mm, ♀: 17.4-18.5 mm; tegmen length ♂: 21.0 & 22.8 mm, ♀: 23.5-23.8 mm; head length ♂: 1.5-1.6 mm, ♀: 1.5-1.6 mm; pronotum length ♂: 1.7-2.2 mm, ♀: 2.2-2.4 mm; mesonotum length ♂: 3.9-4.1 mm, ♀: 3.8-4.4 mm; head width ♂: 3.5-4.0 mm, ♀: 4.2-4.3 mm; width of pronotal collar ♂: 4.9-5.4 mm, ♀: 5.9-6.0 mm.

Distribution (fig. 1): *A. hastulata* is a north Moluccan species, recorded from the islands of Bacan, Halmahera, Morotai, and Ternate.

Etymology: *Hastula* is the diminutive form of the word *hasta* (Lat.) meaning spear. The name refers to the spear-shaped ventromedial protrusion of the clasper.

***Aedeastria bullata* n. sp.**  
(Figs. 2, 87-94)

Holotype: The holotype comes from northern Papua New Guinea, and bears the following labels: "PNG: NEW GUINEA: NE: / Torricelli Mts Mokai Vill.; / 700 m, 16.31.xii.1958" (print); "W.W. Brandt, Coll. / BISHOP Museum" (print), ♂, BPBM.

Only one male is available, the species is easily

recognized by the hook-shaped and globularly swollen claspers, and its peculiar aedeagus with a pair of large, angular dorsal crests.

DESCRIPTION

Body ochraceous to castaneous brown. Abdomen 1.3 x as long as head and thorax. Tegmen 1.3 x as long as body length.

Tymbal organs: Five parallel transverse sclerotized ridges spanning the tymbal from dorsal to ventral margin and a 6th, most proximal, ridge almost reaching ventral margin. Intercalary ridges can hardly be discerned.

Operculum (fig. 94): Covering most of tymbal cavity in ventral view, reaching to margin of abdomen; folded membrane not visible. Basal part of operculum strongly vaulted. Lateral part of crest around distolateral corner long and slender, higher than distal part. Distal part of operculum angular, oblong and longer than basal part, adjacent to body. Lateral margin in ventral view long and straight, making a distinct and almost right angle with crest of basal part. Distal mar-



gin weakly convex, forming an almost right angle with straight medial margin. Distolateral corner rounded. Distinct crest along margins of operculum. Meracanthus reaching beyond operculum and beyond margin of abdomen.

Abdomen: Not inflated, unmarked. Auditory capsules weakly developed, hardly protruding and not visible in dorsal view. Sternites 1 and 2 adjacent. Sternite 8 (fig. 93) broad and rounded, and slightly bicuspidate; weakly incised at distal margin.

Genitalia: Pygofer in lateral view as in fig. 87. Dorsal margin of pygofer concave to base, convexly bent into long and rounded caudodorsal beak. Distal margin straight, forming an obtuse angle with margin of beak, but convex to distal end, forming a rounded corner just above lateral protuberance. Caudodorsal beak in dorsal view (fig. 90) broad triangular and rounded at apex. Lateral lobe of pygofer curving mesiad towards end of distal margin, and forming a large rounded, outcurving and slightly swollen protuberance. Ventral part of pygofer forming a broad angular corner just below this protuberance. Ventral margin of pygofer straight. Ventral part of pygofer opening bluntly V-shaped, ventral margins weakly converging to base of pygofer opening (fig. 88). Claspers (fig. 89) hook-shaped and almost parallel, slightly diverging towards sharply pointed apices. Clasper very stout in lateral view, dorsodistal corner of clasper globularly swollen. Apical part of clasper with large and sharply edged clasper hollow. Aedeagus (fig. 91) strongly upcurved at half-length, and slightly recurving to apex. Aedeagus with very broad rounded lateral crests, a pair of distinct dorsal crests and a small knobby protuberance just below its pore (fig. 92). The dorsal crests end abruptly, forming rectangular corners at their distal ends. Aedeagus pore fairly large, oval.

Measurements: Body length 14.4 mm; tegmen length 18.4 mm; head length 1.1 mm; pronotum length 1.7 mm; mesonotum length 3.4 mm; head width 3.2 mm; width of pronotal collar 4.3 mm.

Distribution (fig. 2): The only specimen known comes from the Torricelli Mountains in northern Papua New Guinea.

Etymology: The name *bullata* (Lat. *bullatus* = inflated) refers to the globularly swollen claspers.

### ***Aedeastria dilobata* n. sp.**

(Figs. 2, 95-104)

Holotype: The holotype comes from the Papuan peninsula, eastern New Guinea, and bears the following labels: "N. Guinea S.E. / Moroka, 1600 m. / LORIA vii-xi 93" (print); "Museo Civ. / Genova" (print), ♂, MSNG. Other material: PAPUA: NEW GUINEA (SE): Daradae, Javarere, Musgrove R., 1000 m, 4.x.1958, J.L. Gressitt, 1♀, BPBM.

Only one male is available, the specimen is of about the same size as *A. bullata*. *A. dilobata* is easily recognized by its unique pygofer-shape, with an extra pair of, long and slender, posteriorly directed protuberances, apart from the regular lateral protuberances. Though these protuberances give the species a totally different aspect relative to the species of all related genera, the angular oblong operculum and the shape of the lateral corner of pronotal collar place the species in *Aedeastria*. A female from the same area, and sharing the pronotal character, presumably belongs to his species.

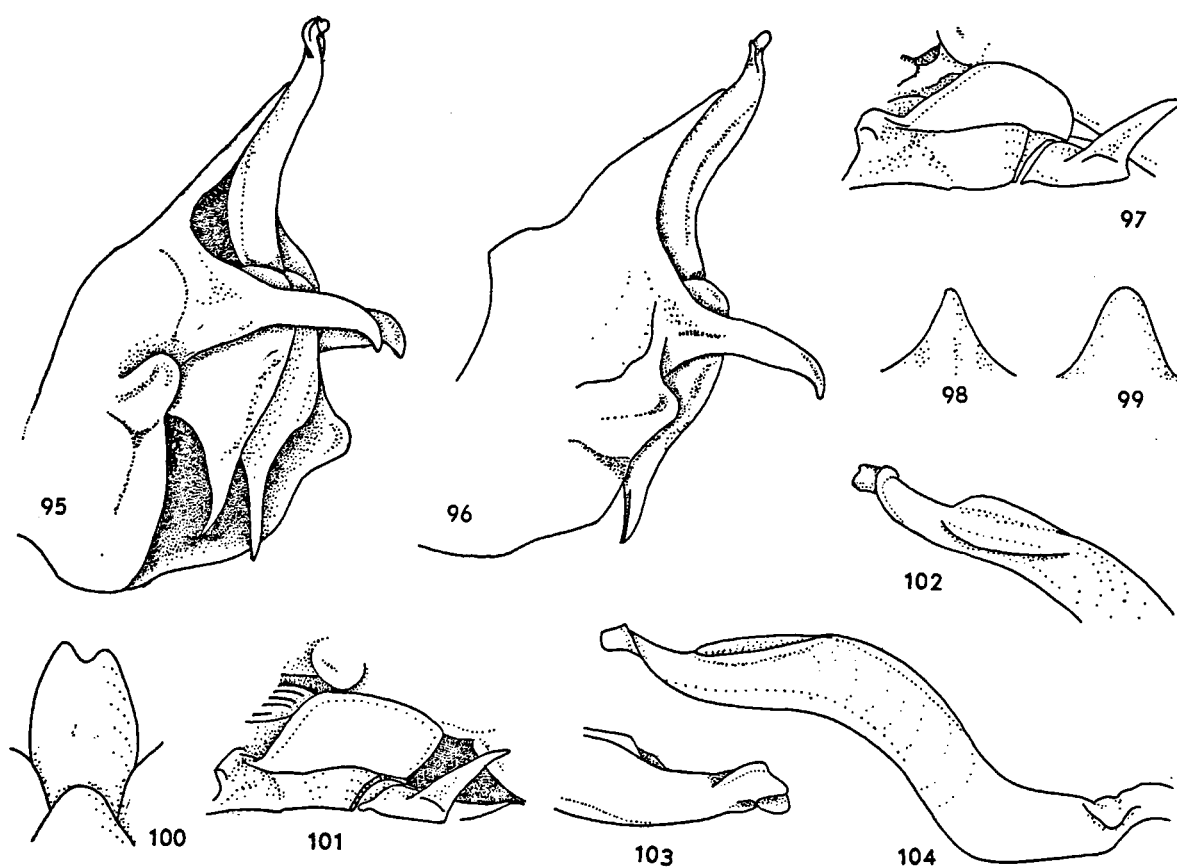
### DESCRIPTION

Body castaneous brown. Abdomen of male and female 1.2 x as long as head and thorax. Tegmen of male and female 1.3 x as long as body length.

Head: vertex with some short setae.

Tymbal organs: Four parallel transverse sclerotized ridges spanning the tymbal from dorsal to ventral margin, and a 5th, most proximal, ridge almost reaching ventral tymbal margin. Intercalary ridges can hardly be discerned.

Opercula: Male operculum (fig. 101) as in *A. bullata*, covering greater part of tymbal cavity in ventral view and reaching to margin of abdomen, folded membrane hardly visible in ventral view. Basal part of operculum strongly vaulted. Lateral part of crest around distolateral corner long and slender, higher than distal part. Distal part of operculum angular, oblong and about twice as long



Figs. 95-104. *Aedeastria dilobata* n. sp.: 95, pygofer from aslant; 96, pygofer in lateral view; 97, female operculum; 98, male caudodorsal beak in dorsal view; 99, female caudodorsal beak in dorsal view; 100, 8th sternite; 101, male operculum; 102, aedeagus from aslant; 103, detail aedeagus apex; 104, aedeagus in lateral view.

as basal part, adjacent to body. Lateral margin long and straight, making an almost right angle with crest of basal part. Distal and medial margins straight. Distolateral corner rounded; distomedial corner almost rectangular. Distinct crest along margins of operculum. Meracanthus reaching just beyond operculum, and beyond margin of abdomen. Female operculum (fig. 97) shorter than in male. Distal part of operculum somewhat trapezoid-shaped; distal margin forming a rounded and obtuse angle with lateral and medial margins. Lateral margin forming a distinct and obtuse angle with crest of basal part.

Abdomen: Male abdomen not inflated and unmarked. Auditory capsules weakly developed, but more swollen than in foregoing species; just visible in dorsal view. Sternites 1 and 2 adjacent. Sternite 8 (fig. 100) slightly bicuspidate, incised at distal margin. Female abdomen ochraceous

brown, more robust than that of male. Female caudodorsal beak (fig. 99) triangular, rounded at apex.

Male genitalia: Pygofer in lateral view as in fig. 96. Dorsal margin of pygofer almost straight, strongly and concavely bent at base of straight and erect caudodorsal beak. Distal margin straight, concavely bent into margin of caudodorsal beak and ending in a long and slender, posteriorly directed, protuberance at distal corner of pygofer. Lateral lobe of pygofer forming a large, bluntly rounded and distinctly swollen lateral protuberance, directly under this posteriorly directed protuberance. Caudodorsal beak fairly long as in *A. bullata*, in dorsal view (fig. 98) triangular, with concave margins, almost pointed at apex. Ventral margin of pygofer angularly bent at half-length and concave to base of pygofer. Ventral part of pygofer opening broad, V-shaped

(fig. 95); ventral margins strongly converging. Claspers (fig. 95) hook-shaped as in *A. bullata*, but much broader in lateral view and strongly diverging towards sharply pointed apices. Clasper almost laminiform, not swollen, but curving mesiad at dorsodistal corner and curving outwards into a small rounded lobe at half-length of distal margin. Apical part of clasper very slender, with slender and sharply edged clasper hollow. Aedeagus (fig. 104) very long and stout, passing between claspers, and recurving to adjacent to caudodorsal beak; its apex reaching just beyond apex of beak. Aedeagus very peculiarly bent in double S-curve, and laterally flattened; oval in cross section. Aedeagus with distinct dorsal and ventral crests, but without the lateral crests common to the "*Baeturia* and related genera complex". The dorsal crest ends distally in a pair of outcurving ridges, that form a disc-shaped and nearly flat area on the apical half of aedeagus (fig. 102). A distinct protuberance forms a collar around apical bending point of aedeagus, this protuberance is probably a remnant of the lateral crests. Aedeagus slightly incised at apex (fig. 103).

Measurements: Body length ♂: 14.0 mm, ♀: 16.5 mm; tegmen length ♂: 18.7 mm, ♀: 21.8 mm; head length ♂: 1.1 mm, ♀: 1.5 mm; pronotum length ♂: 1.7 mm, ♀: 2.1 mm; mesonotum length ♂: 3.4 mm, ♀: 3.8 mm; head width ♂: 3.3 mm, ♀: 4.1 mm; width of pronotal collar ♂: 3.8 mm, ♀: 5.8 mm.

Distribution (fig. 2): The male holotype comes from Moroka on the Papuan peninsula; a female from nearby Daradae probably belongs to this species.

Etymology: The name *dilobata* refers to the two lobate protuberances on the lateral lobe of pygof-er.

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