

New species of *Gunungiella* (Trichoptera: Philopotamidae) from Sabah, East Malaysia

J. Huisman

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Seven new species of *Gunungiella* are described from around Gunung Kinabalu (Sabah).

Jolanda Huisman, Department of Entomology, University of Minnesota, St. Paul, MN 55108, U.S.A.

Introduction

Gunungiella, a peculiar genus of Philopotamidae, was first described by Ulmer in 1913. From 1913 until 1968 only six species were added to the literature, two from India, and one each from Java, Pakistan, Philippines, and Sri Lanka. In 1968 Schmid described 34 new species (33 from India, and one from China), and he thus raised the number of species in the genus to 40. Schmid (1968) mentioned that eleven of his species descriptions were based on single males, and that he had only covered a fraction of the known distribution area of the genus. He stated that many more species would be discovered, as more of the region was explored. The relatively low diversity of the genus in Indonesia and Malaysia (*G. reducta* from Java) can be partially explained by the fact that the southeast Asian archipelago has been grossly undercollected. In this paper seven new species are described, four based on only one male. So, given a bit more time, undisturbed by logging, these regions will certainly yield more species. Unfortunately it is easier to get permits and funding for logging than for collecting and conservation.

The author made caddisfly collecting trips while spending June 1986-May 1987 in Sabah, Sarawak, and Brunei and subsequent collecting trips since then, during which time some 200 sites were visited. Habitats from which collections were made ranged from lowland to montane (50-3300 m) primary forest types. *Gunungiella* species (31 males) were found at eleven sites, all around Gunung Kinabalu in Sabah, and ranging in altitude from 500-1750 m. In addition, 44 female specimens were collected in the same area, but they could not be associated with the males, since the species found have overlapping habitats. They are presented here only to illustrate the two female morphotypes occurring in this area.

Collections were made with light traps and the specimens were preserved in 70% alcohol. Genitalia were cleared in 10% KOH solution, examined, and illustrated using standard trichopterological practices. Terminology for male genitalia follows that of Schmid (1968) and female genitalia that of Schmid (1989). A list of all described *Gunungiella* species is given in table 1. Material of the species described in the present paper is deposited in the National Museum of Natural History, Leiden, The Netherlands (RMNH), and in the collection of the author housed at the University of Minnesota Insect Collection, St. Paul, Minnesota, U.S.A. (JH).

Systematics

Genus *Gunungiella* Ulmer

Gunungiella Ulmer, 1913: 82. Type species: *Gunungiella reducta* Ulmer, 1913: 84, fig. 4.

For a generic description the reader is referred to the descriptions given by Ross (1956: 46-48) and Schmid (1968: 898-903).

Gunungiella paruh spec. nov.

(fig. 1A-F)

Material.— Holotype, ♂ (RMNH), Kinabalu National Park, near sungai Silau Silau, 06°00'N 116°32'E, 1500 m, 12.v.1987, J. Huisman.

Male.— Antennae brown, broken. Anterior wing length 4.5 mm. Genitalia as in fig. 1. Segment VIII heavily setose, tergum VIII extended posteriorly, edge of apex irregular with slight notch mesally. Segment IX with four pairs of dorsolateral processes; in lateral view the dorsal most pair are broad from base to apex, enveloping a second pair, which are slightly longer, more slender, apex obtuse, with one dark brown triangular subapical sclerite, and some apical papillae; basally, on mesal surface of broad processes a third pair of slender, short processes; a fourth pair of processes branches basally off the broad processes as short, broad hairy lobes in lateral view; in dorsal view however, they are slender processes (see figs 1A, B). Segment X subequal to IX, entire; base broad and sclerotised, tapering to slender and membranous distal half, apex rounded; in lateral view apex slightly bent ventrally, with two apical peg like setae. Phallus oval basally, distal $\frac{2}{3}$ tubular, two pairs of brown stout nail shaped spines. Inferior appendages with first segment roughly rectangular, broadest at mid length, from there onwards with long setae; in ventral view, with v-shaped apicomeral indentation; second segment of inferior appendages irregularly elongate, broad at base, constricted at $\frac{1}{3}$ length, and parallel sided for remaining $\frac{2}{3}$; in ventral view, mesal surface with approximately 16 long orange brown blunt setae, some 17 brown short stump peglike setae on the lateral surface, apically with four long brown sharp setae.

Female and immatures.— Unknown.

Remarks.— The general structure of the genitalia of this species resembles those of the three new species *G. berduri*, *G. lekuk*, and *G. anthea*, in having segment VIII very setose and not very modified, segment IX being well sclerotised with two to four pairs of processes, and the shape of the inferior appendages, with the first segment being rectangular with apex broadly rounded and the second segment being elongate with three groups of setae which have basically the same arrangement. *Gunungiella paruh* spec. nov. is easy to distinguish from the others by the shape of segment VIII, the number of dorsolateral processes of segment IX, the apical placement of the two peg-like setae on segment X, the shape and number of sclerites in the phallus, and the number and placement of setae on the second segment of the inferior appendages.

Etymology.— Malay - *paruh* - beak, for the lateral view of the apex of sternite X.

Habitat.— Vegetation: wet submontane oak forest. River at the type locality 5 m

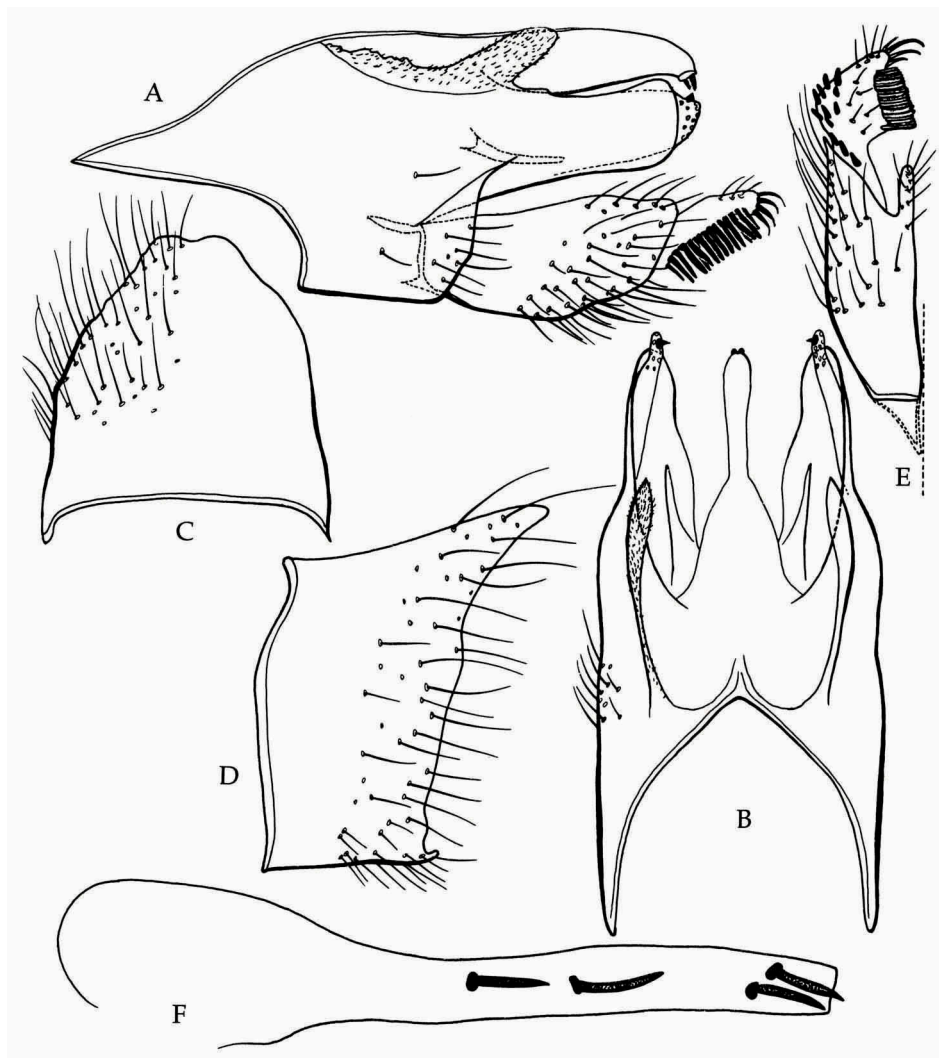


Fig. 1. *Gunungiella paruh* spec. nov. ♂, genitalia. A, lateral view; B, dorsal view abdominal segment IX and X; C, dorsal view abdominal segment VIII; D, lateral view abdominal segment VIII; E, ventral view inferior appendage; F, lateral view phallus.

wide, bottom with mossy boulders, pebbles and leaf litter, steep banks. Water clear, temperature 18°C, and a pH of 6.5 at the date of collection.

***Gunungiella berduri* spec. nov.**
(fig. 2A-F)

Material.— Holotype, ♂ (RMNH), 12 km NNE Ranau, Poring Hot Springs, sungai Kepungit, 06°03'N 116°42'E, 550 m, 24.1.1987, J. Huisman.

Male.— Antennae pale yellow, 1.5 mm. Anterior wing length 3 mm. Genitalia as

in fig. 2. Segment VIII heavily setose, tergum VIII extended posteriorly, apex truncate; in lateral view with shallow dorsolateral indentation. Segment IX with two pairs of slender dorsolateral processes and a broad ventrolateral lobe; in lateral view dorsal most pair covered with short setae, second ventral most pair glabrous, tapering to very sharp, long apex; the broad ventrolateral lobe reaches to $\frac{1}{3}$ the length of the first segment of the inferior appendages. Segment X slightly longer than IX, entire, in dorsal view with rounded apex, with very slight mesal notch; with two subapical stout short peglike setae. Phallus bulbous basally, distal $\frac{2}{3}$ tubular with eight brown, stout, nail-shaped spines. Inferior appendages with first segment roughly rectangular, long setae from base to apex, apex broadly rounded; in ventral view a v-shaped apicommesal indentation; second segment of inferior appendages irregularly elongate; in ventral view with about 14 short thick peglike setae laterally, mesally with a diagonal row of ten large dark brown setae, apically with eight lighter long sharp setae.

Female and immatures.— Unknown.

Remarks.— This new species resembles the new species *G. paruh*, *G. lekuk*, and *G. anthea* in the general shape of the male genitalia as discussed under *G. paruh* spec.

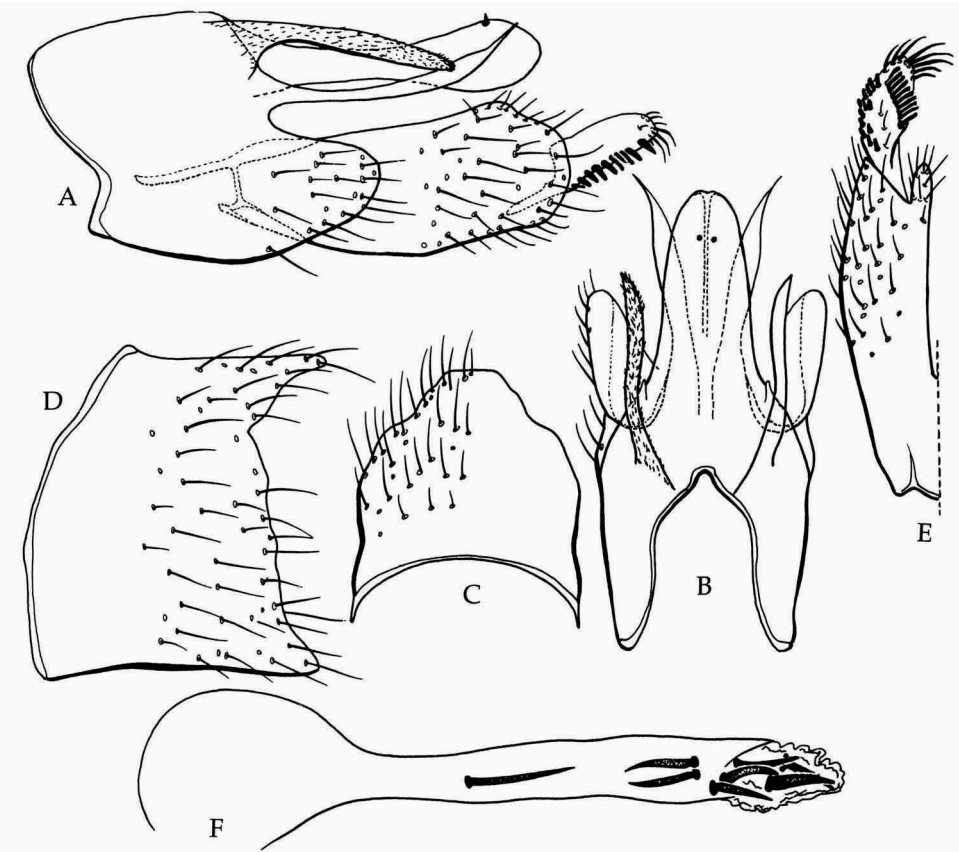


Fig. 2. *Gunungiella berduri* spec. nov. ♂ genitalia. A, lateral view; B, dorsal view abdominal segment IX and X; C, dorsal view abdominal segment VIII; D, lateral view abdominal segment VIII; E, ventral view inferior appendage; F, lateral view phallus.

nov. *Gunungiella berduri* is most similar to *G. lekuk*, based on the unmodified shape of segment VIII, abdominal segment IX having two pairs of dorsolateral processes and a broad ventrolateral lobe, and finally the shape of the inferior appendages. It differs from all species in Sabah in having eight large spines in the phallus.

Etymology.— Malay - *berduri* - thorny, for the many stout spines in the phallus.

Habitat.— Vegetation: hilly area with Dipterocarpaceae forest, with abundant bamboo. River at type locality was 5 m wide, bottom with boulders, pebbles and leaf litter, steep banks. Water clear, temperature 22°C, and a pH of 6.5 at date of collection.

***Gunungiella lekuk* spec. nov.**
(fig. 3A-F)

Material.— Holotype, ♂ (RMNH), Kinabalu National Park, confluence sungai Liwagu and sungai Silau Silau, 06°00'N 116°33'E, 1450 m, 10.i.1987, J. Huisman.

Male.— Antennae brown, 3 mm. Anterior wing length 4.5 mm. Genitalia as in fig. 3. Segment VIII heavily setose, tergum VIII extending far posteriorly; in lateral view with shallow lateral indentation. Segment IX with two pairs of dorsolateral processes and a broad ventrolateral lobe; in lateral view, dorsal most pair with fine setae, tapering to acute apex; second, ventral most pair more slender glabrous, having a long sharply tapering upturned apex; ventrolateral broad lobe reaching halfway the length of the first segment of inferior appendages. Segment X longer than IX, entire; in dorsal view with rounded apex with slight median notch, middorsal with two short stout triangular setae at $\frac{1}{3}$ from apex (fig. 3B); in lateral view tapering from base until $\frac{2}{3}$ from apex, sharply constricted to a neck-shape, widening again at $\frac{1}{3}$ from the apex, then tapering to blunt apex. Phallus bulbous basally, distal $\frac{2}{3}$ widening towards membranous apex, lightly sclerotised tubular, with two pairs of brown spines, one about half length of the other. Inferior appendages with first segment roughly rectangular, distal half with many long setae, apex broadly rounded; in ventral view with v-shaped apicomeres indentation; second segment of inferior appendages irregularly elongate, in ventral view with about 12 brown short thick peglike setae, mesally with some eight brown straight setae in diagonal row, subapically with some nine short brown setae, apically ten long sharp light brown setae.

Female and immatures.— Unknown.

Remarks.— This species fits in the same group of species mentioned under *G. paruh* spec. nov. and it resembles *G. berduri* spec. nov. most of all. *Gunungiella lekuk* can easily be separated from *G. berduri* because of the number of spines in the phallus, the indentation in segment X, and the setation of the second segment of the inferior appendages.

Etymology.— Malay - *lekuk* - indentation, for the shape of segment X in lateral view.

Habitat.— Vegetation: wet submontane oak forest. River at type locality 10 m wide, bottom with big boulders, pebbles and leaf litter, steep banks. Water clear, temperature 16°C, and a pH of 6.5 at date of collection.

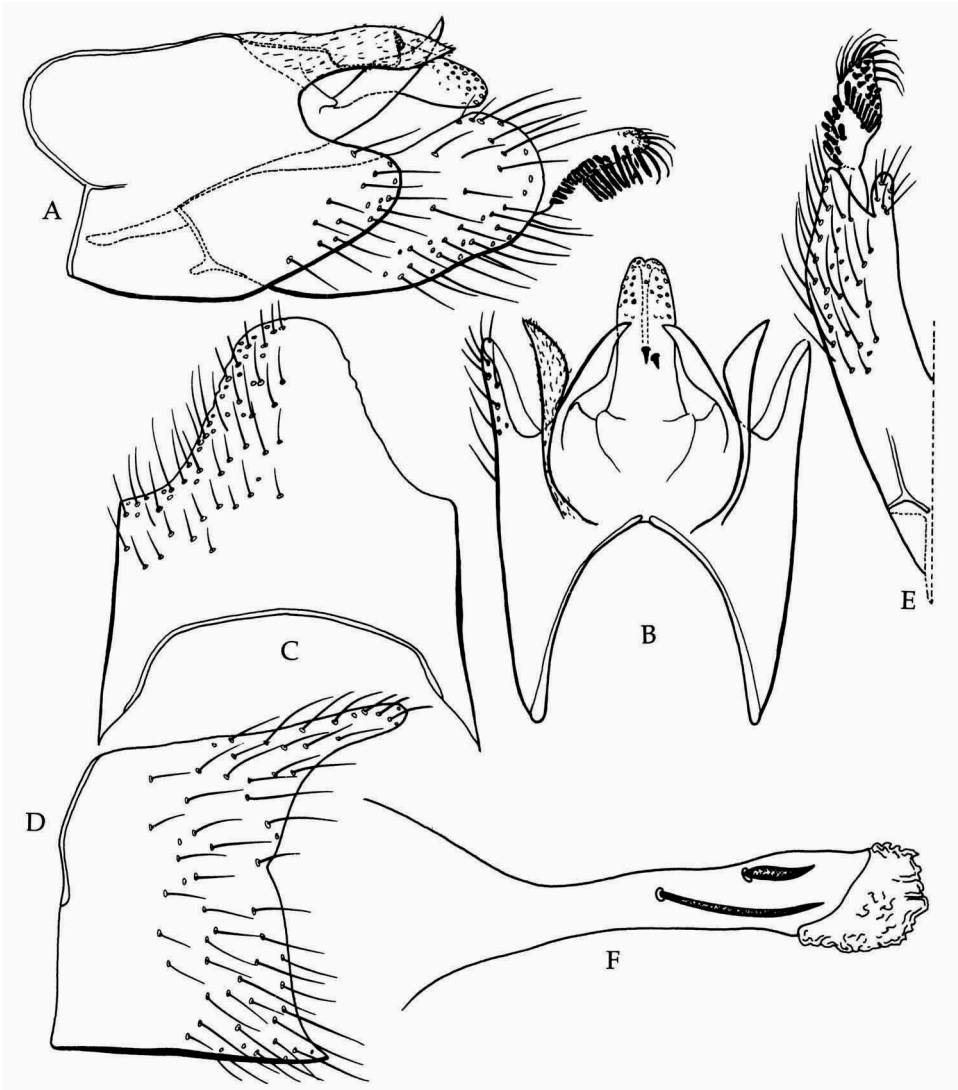


Fig. 3. *Gunungiella lekuk* spec. nov. ♂ genitalia. A, lateral view; B, dorsal view abdominal segment IX and X; C, dorsal view abdominal segment VIII; D, lateral view abdominal segment VIII; E, ventral view inferior appendage; F, lateral view phallus.

***Gunungiella anthea* spec. nov.**
(fig. 4A-F)

Material.— Holotype, ♂ (RMNH), Kinabalu National Park, sungai Tibabar, 06°02'N 116°33'E, 1750 m, 2.x.1986, J. Huisman. Paratypes: 6 ♂♂ (RMNH), same data; 2 ♂♂ (JH), same locality, 11.viii.1986, J. Huisman; 3 ♂♂ (RMNH), Kinabalu National Park, Liwagu, 06°01'N 116°33'E, 1650 m, 30.ix.1986, J. Huisman; 3 ♂♂ (RMNH), same locality, 18.xi.1986, J. Huisman.

Male.— Antennae pale yellow, 4 mm. Anterior wing length 4.5-5 mm. Genitalia as in fig. 4. Segment VIII heavily setose, tergum VIII extended far posteriorly, apex

with mesal excision and irregular edge, in lateral view strongly indented laterally. Segment IX with two pairs of long dorsolateral processes, outer pair flattened, broad basally, acute apically, covered with many short setae, enveloping the inner pair, which are longer, tubular, narrow mesally, widening to broader apex with brush of ten long, thick, dark brown subapical setae. Segment X much shorter than IX, simple, tubular; apex obtuse, with mesal notch. Phallus bulbous basally, distal $\frac{3}{4}$ tubular; mesally with two small internal spines, subapically with two large brown, subequal thorn shaped spines. Inferior appendages with first segment roughly rectangular, covered with long slender setae, lobelike extended apicodorsally; mesal surface with

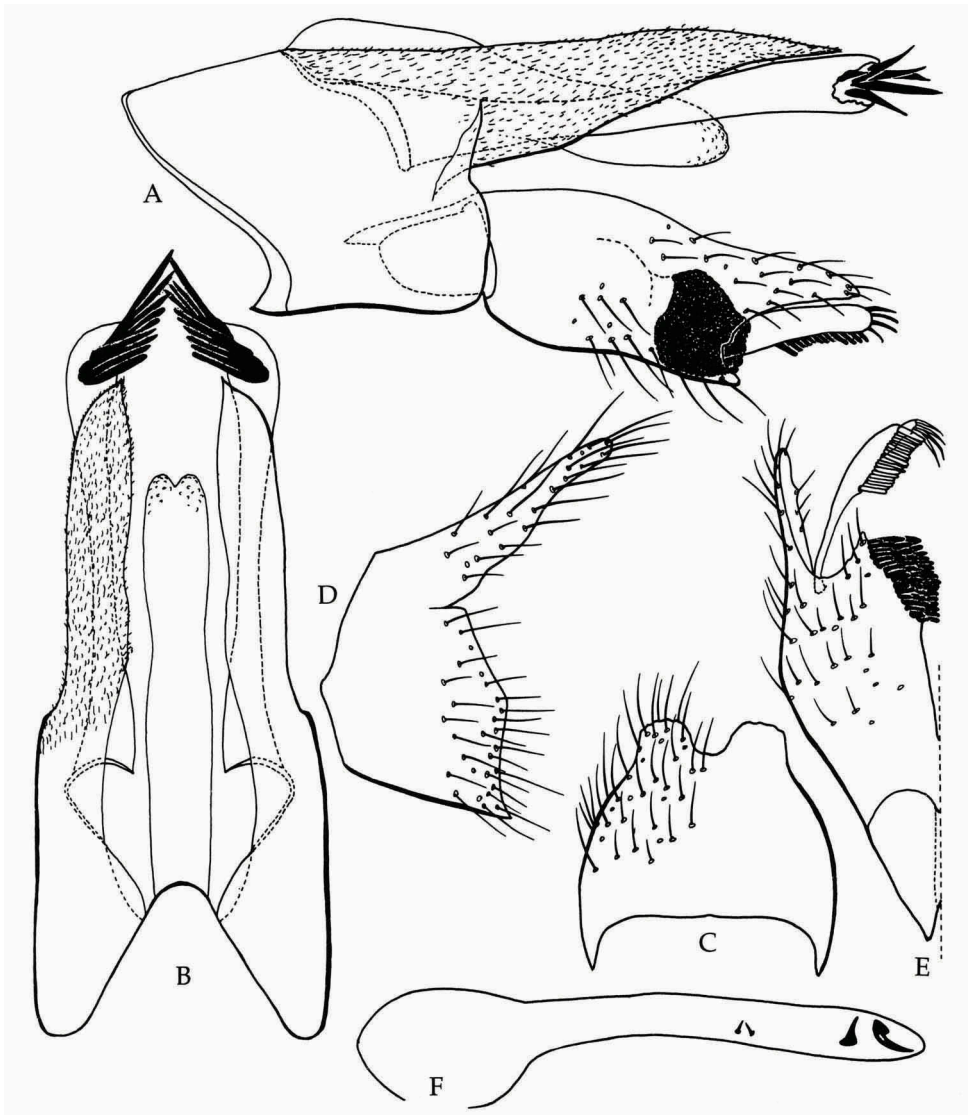


Fig. 4. *Gunungiella anthea* spec. nov. ♂ genitalia. A, lateral view; B, dorsal view abdominal segment IX and X; C, dorsal view abdominal segment VIII; D, lateral view abdominal segment VIII; E, ventral view inferior appendage; F, lateral view phallus.

many rows of black short thick setae, in ventral view with u-shaped apicomesal indentation; second segment of inferior appendages in ventral view with slender basal half, apical half broader with mesal row of 20 orange-brown short, thick setae, apex with about four long thick, light brown setae.

Female and immatures.— Unknown.

Remarks.— This new species also fits in the above mentioned group of species, but it is quite distinct from its congeners. The main differences are in the shape of segment VIII, being more extended posteriorly, and in lateral view having a more pronounced indentation; in having the second pair of dorsolateral processes of segment IX with apical brushes of setae, in missing the broad ventrolateral lobe of segment IX, in the shape of both the first and the second segments of the inferior appendages, and the rows of setae on the first segment of the inferior appendages.

Etymology.— *Anthea* - named after my very dear friend Anthea Lamb-Phillipps.

Habitat.— Vegetation wet submontane oak forest. The Tibabar is a braided shallow stream 4 m wide, bottom with pebbles and leaf litter, banks steep. Water clear, temperature 15°C, and a pH of 6 at the date of collection. The Liwagu at the locality of collection is 10 m wide, fast flowing, deep, bottom with boulders and pebbles. Water clear, temperature 16°C, and a pH of 6.5 at the time of collection.

***Gunungiella tanduk* spec. nov.**

(fig. 5A-F)

Material.— Holotype, ♂ (RMNH), Kinabalu National Park, sungai Tibabar, 06°02'N, 116°33'E, 1750 m, 11.viii.1986, J. Huisman. Paratypes: 1 ♂ (RMNH), same locality, 2.x.1986, J. Huisman.

Male.— Antennae pale yellow, 4 mm. Anterior wing length 5.5 mm. Genitalia as in fig. 5. Segment VIII heavily setose, tergum VIII with deep v-shaped indentation mesally and pocket like structures subapicomesally. Segment IX long, simple, reduced, largely desclerotised, without processes. Segment X entire, apex rounded, two pairs of subapical dorsolateral brown spines, apical most pair angular, directed horizontally, basal most pair simple, short, straight. Phallus reduced basally, distal $\frac{3}{4}$ tubular, without spines. Inferior appendages with first segment broadly square, apical edge vertical and straight, apical corners slightly rounded; second segment broader than long, with some 40 stout short dark brown setae apically, and some 30 sharp brown setae on dorsal surface.

Female and immatures.— Unknown.

Remarks.— *Gunungiella tanduk* spec. nov. resembles the species from the *saptami* group as defined by Schmid (1968), especially *G. marginalis* Banks, 1939 from the Philippines. It differs from that species in the shape of tergite VIII, having two pairs of spines on segment X, not one as in *G. marginalis* and the other members of the *saptami* group, and the absence of spines in the phallus.

Etymology.— Malay - *tanduk* - antler, for the apical most pair of spines on segment X.

Habitat.— Vegetation: wet submontane oak forest. Type locality is a braided river 4 m wide, bottom with mossy boulders, pebbles and leaf litter, steep banks. Water clear, temperature 20°C, and a pH of 6 at date of collection.

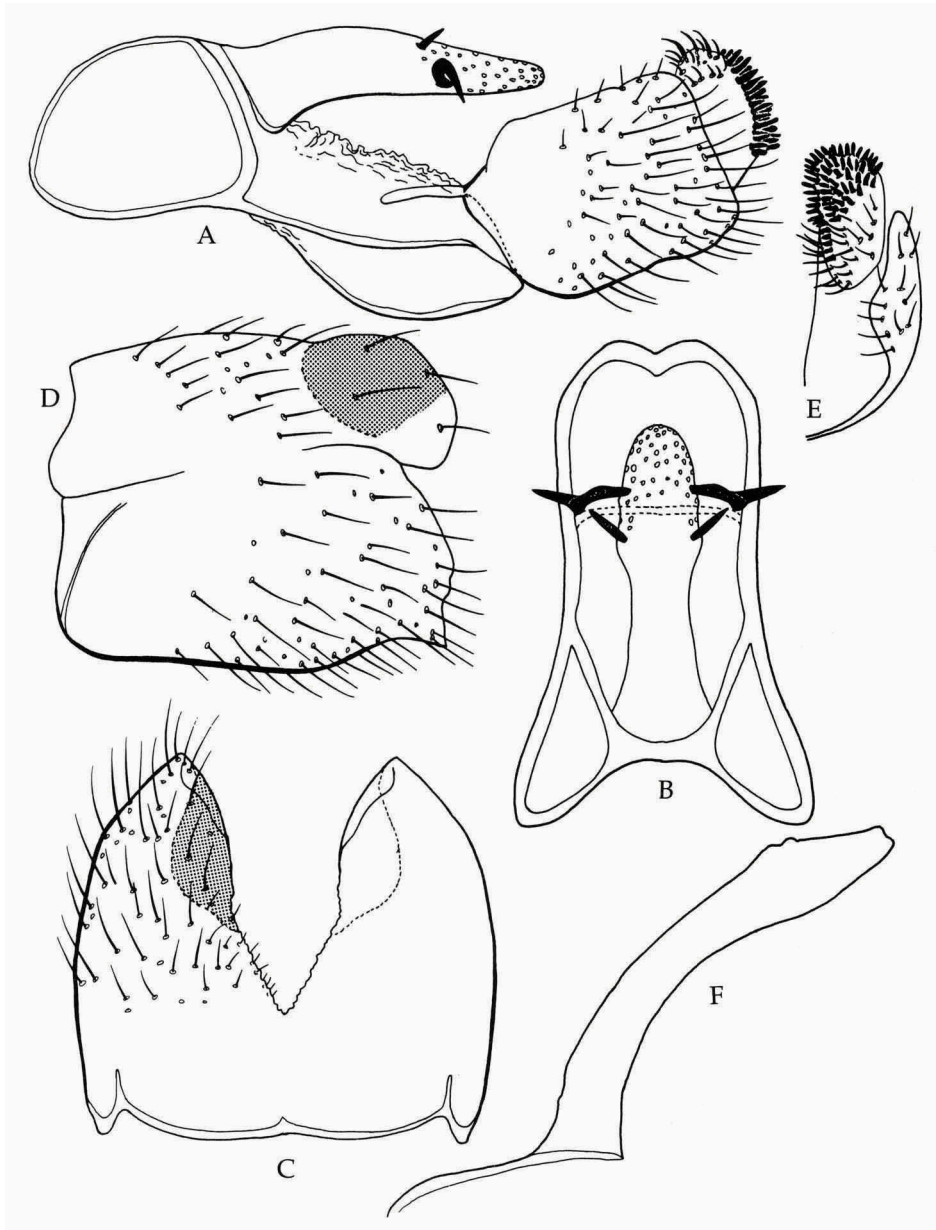


Fig. 5. *Gunungiella tanduk* spec. nov. ♂ genitalia. A, lateral view; B, dorsal view abdominal segment IX and X; C, dorsal view abdominal segment VIII; D, lateral view abdominal segment VIII; E, caudal view inferior appendage; F, lateral view phallus.

***Gunungiella parang* spec. nov.**
(fig. 6A-F)

Material.— Holotype, ♂ (RMNH), 12 km NNE Ranau, Poring Hot Springs, sungai Kepungit, 06°03'N 116°42'E, 550 m, 24.i.1987, J. Huisman. Paratypes: 4 ♂♂ (RMNH), same data, J. Huisman; 1 ♂ (RMNH),

Poring Hot Springs, Kepungit fall, 06°02'N 116°42'E, 625 m, 29.viii.1986, J. Huisman; 1 ♂ (RMNH), Poring Hot Springs, sungai Tananansad, 06°03'N 116°42'E, 560 m, 9.xii.1986, J. Huisman; 2 ♂♂ (JH), Poring Hot Springs, sungai Kipogoh, 06°03'N 116°42'E, 550 m, 25.i.1987, J. Huisman; 1 ♂ (RMNH), Poring Hot Springs, sungai Langanan, 06°04'N 116°42'E, 500 m, 2.ii.1987, J. Huisman.

Male.— Antennae pale yellow, 3.5 mm. Anterior wing length 3.5 mm. Genitalia as in fig. 6. Segment VIII setose, tergum VIII with deep rounded indentation reaching halfway through segment VIII, indentation excavated ventrally. Segment IX simple, almost completely desclerotised, without processes. Segment X entire, tapering to round apex. Phallus reduced basally, distal $\frac{3}{4}$ tubular, membranous apically, with two pairs of brown spines, first pair shaped like a bush knife, second pair thorn-shaped. Inferior appendages with first segment roughly square, apical edge vertical, apical corners rounded; second segment broader than long, with some 40 stout dark brown short setae and about ten longer, sharp setae on dorsal surface.

Female and immatures.— Unknown.

Remarks.— *Gunungiella parang* spec. nov. resembles *G. tanduk* and the species of the *saptami* group in the shape of modified segment VIII and the shape of the inferior appendages. It is easy to distinguish from them because of the shape of the indentation of tergum VIII, the reduced segment IX, the lack of sclerites on segment X, and

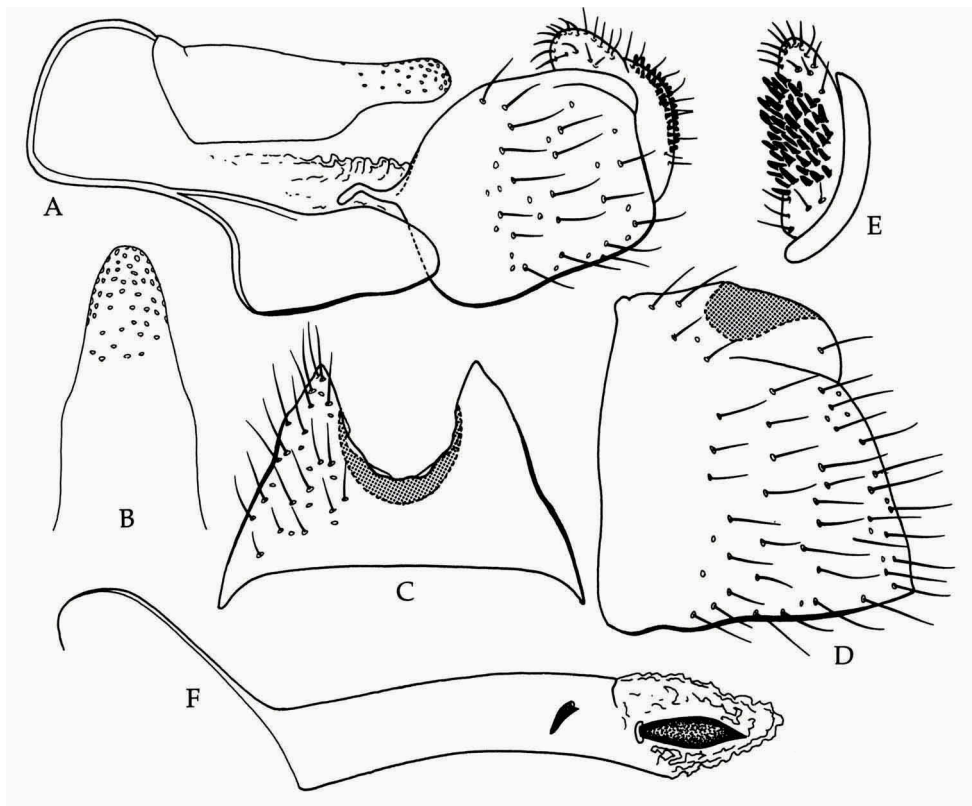


Fig. 6. *Gunungiella parang* spec. nov. ♂ genitalia. A, lateral view; B, dorsal view abdominal segment X; C, dorsal view abdominal segment VIII; D, lateral view abdominal segment VIII; E, caudal view inferior appendage; F, lateral view phallus.

the presence and unusual shape of the spines in the phallus.

Etymology.— Malay - *parang*- bush knife, for the subapical pair of spines in the phallus.

Habitat.— Vegetation: hilly area with Dipterocarpaceae forest, with abundant bamboo. Collections were made along streams from 1-15 m wide, bottom with mossy boulders, pebbles and leaf litter, steep banks. Water clear, temperature 22-24°C, and a pH of 6.5-7 on dates of collections.

***Gunungiella kakatua* spec. nov.**
(fig. 7A-F)

Material.— Holotype, ♂ (RMNH), 12 km NNE Ranau, Poring Hot Springs, sungai Kipogoh, 06°03'N 116°42'E, 550 m, 25.i.1987, J. Huisman.

Male.— Antennae pale yellow, 3.5 mm. Anterior wing length 4 mm. Genitalia as in fig. 7. Segment VIII setose, tergum VIII unmodified, with a straight, irregular apical edge. Segment IX simple, no processes, but dorsum IX a narrow bridge. Segment X lightly sclerotised, split entirely, apex obtuse, with pair of boomerang-shaped,

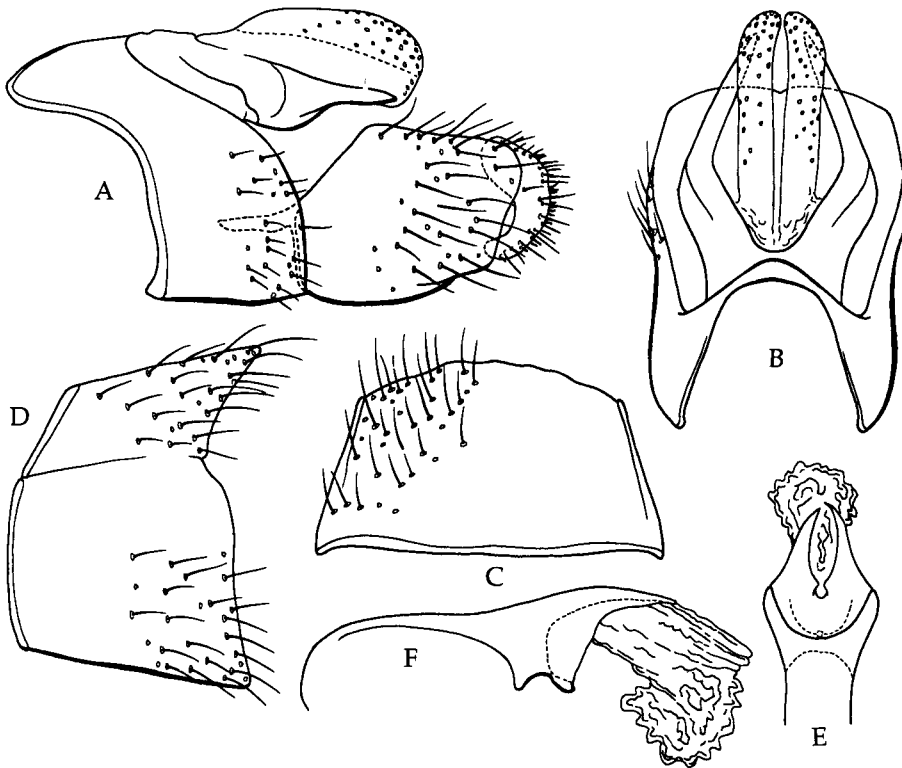


Fig. 7. *Gunungiella kakatua* spec. nov. ♂ genitalia. A, lateral view; B, dorsal view abdominal segment IX and X; C, dorsal view abdominal segment VIII; D, lateral view abdominal segment VIII; E, lateral view phallus; F, idem dorsal view.

basal processes. Phallus oval basally, distal half broad, in lateral view funnel shaped, in dorsal view with large brown pincer shaped sclerite (fig. 7E); apex with large membranous lobe. Inferior appendages with first segment roughly square, apical corners rounded; second segment of inferior appendages broader than long, with some 20 short dark brown setae, mainly on the mesal surface of the segment and many long thin setae all over surface.

Female and immatures.— Unknown.

Remarks.— This new species resembles *G. pantchami* Schmid, 1968, in having an unmodified segment VIII, the shape of segment IX, and the pair of dorsolateral processes on segment X. However, the divided segment X, the pincer shaped sclerite and funnel shape of the phallus, and the shape of the inferior appendages, easily distinguish *G. kakatua* from any known species in the genus.

Etymology.— Malay - *kakatua* - pincers, for the shape of the sclerite in the phallus.

Habitat.— Vegetation: hilly area with Dipterocarpaceae forest, with abundant bamboo. Stream at the type locality 1 m wide, bottom with pebbles and leaf litter, steep banks. Water clear, temperature 22°C, and a pH of 6.5 at date of collection.

Gunungiella spec. a (fig. 8A)

Material.— Kinabalu National Park: 2 ♀♀ (RMNH), sungai Tibabar, 06°02'N, 116°33'E, 1750 m, 2.x.1986, J. Huisman; 1 ♀ (RMNH), same locality, 12.i.1987, J. Huisman; 1 ♀ (RMNH), sungai Silau-Silau, 06°00'N 116°32'E, 1490 m, 27.iv.1987, J. Huisman; 1 ♀ (JH), sungai Liwagu, Silau-Silau trail, 06°00'N 116°33'E, 1470 m, 15.viii.1986, J. Huisman; 3 ♀♀ (RMNH), same locality, 22.i.1987, J. Huisman; 1 ♀ (RMNH), confluence sungai Liwagu, Silau-Silau, 06°00'N 116°33'E, 1450 m, 1.x.1986, J. Huisman; 2 ♀♀ (RMNH), Sabah, Bundu Tuhan, sungai Laidan, 05°58'N 116°31'E, 950 m, 23.i.1987, J. Huisman; 12 km NNE Ranau, Poring Hot Springs: 2 ♀♀ (JH), Staffquarters, 06°03'N 116°42'E, 550 m, 9.xi.1987, J. Huisman & R. de Jong; 1 ♀ (RMNH), sungai Tananansad, 06°03'N 116°42'E, 560 m, 3.xii.1986, J. Huisman; 1 ♀ (JH), sungai Kipogoh, 06°03'N 116°42'E, 550 m, 25.i.1987, J. Huisman; 3 ♀♀ (RMNH), Kepungit fall, 06°02'N 116°42'E, 625 m, 29.viii.1986, J. Huisman; 2 ♀♀ (JH), sungai Kepungit, 06°03'N 116°42'E, 550 m, 4.xii.1986, J. Huisman; 8 ♀♀ (RMNH), same locality, 24.i.1987, J. Huisman; 3 ♀♀ (RMNH), same locality, 480 m, 27.i.1987, J. Huisman; 2 ♀♀ (RMNH) sungai Montokungon, 06°02'N 116°42'E, 525 m, 30.i.1987, J. Huisman; 6 ♀♀, sungai Langanan, 06°04'N 116°42'E, 500 m, 2.ii.1987, J. Huisman.

Female.— Antennae yellow brown, 3.5 mm. Anterior wing length 4-4.5 mm. Genitalia as in fig. 8A, simple, long, slender. Segment VII slender, two times length of segment VI, slightly laterally compressed; ventrally setose; with ring of longer apical setae. Segment VIII very slender, retractable, with ring of apical setae; sternum VIII anteriorly with long slender apodemes. Segment XI short, lightly sclerotised, anteriorly with very long slender apodemes. Terminal segments X + XI membranous, with thin setae, bearing pair of terminal cerci.

Remarks.— The genitalia of these females resemble those of *Gunungiella ulmeri* Schmid (1949) in the general shape of the terminalia, being slender and long; they differ from it mainly in the absence of the lateral depression on segment VII.

Habitat.— Vegetation varies from Dipterocarpaceae forest in a hilly area with abundant bamboo (around 500 m altitude) to wet montane oak forest at 1750 m.

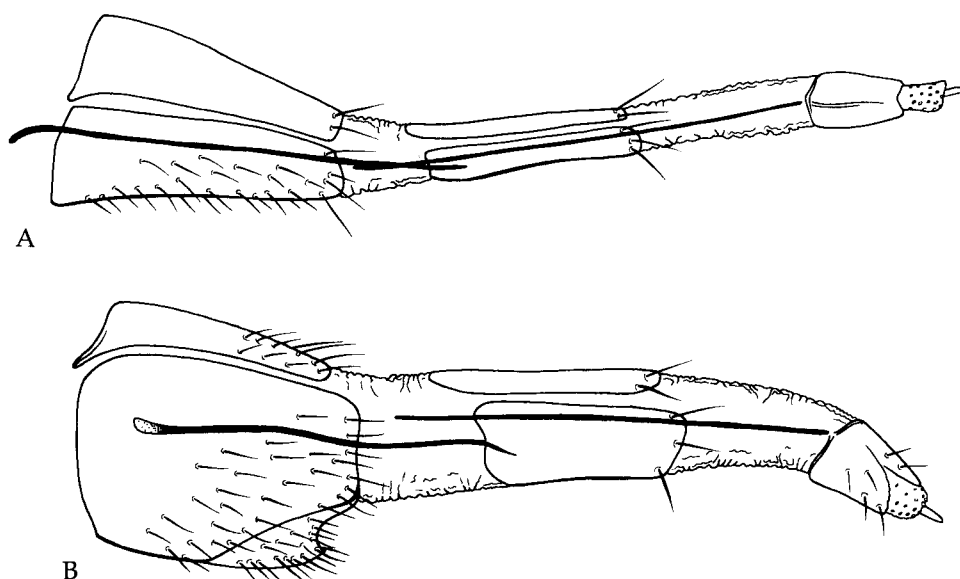


Fig. 8. *Gunungiella* spec. a, and b, ♀, genitalia in lateral view. A, spec. a; B, spec. b.

***Gunungiella* spec. b**
(fig. 8B)

Material.— Kinabalu National Park: 2 ♀♀ (RMNH), sungai Tibabar, 06°02'N, 116°33'E, 1750 m, 2.x.1986, J. Huisman; 1 ♀ (JH), sungai Liwagu, Silau-Silau trail, 06°00'N 116°33'E, 1470 m, 15.viii.1986, J. Huisman.

Female.— Antennae yellow brown, broken. Anterior wing length 4.5-5 mm. Genitalia as in fig. 8B. Segment VII equal or slightly longer than VI, setose especially ventrolaterally on posterior $\frac{3}{4}$; midventrally, sternum VII keel-shaped and setose. Segment VIII slender, with ring of apical setae; sternum VIII anteriorly with long, slender apodemes. Segment IX short, lightly sclerotised, with some thin setae; sternum IX anteriorly with very long, slender apodemes. Segment X + XI membranous, with thin setae, bearing pair of terminal cerci.

Remarks.— The general shape of the female terminalia resemble *G. ulmeri* and *G. spec. a*, in being long and slender; it differs from both in the shape of sternum VII.

Habitat.— Same as under *Gunungiella* spec. a.

Table 1. The species of *Gunungiella*, Ulmer.

Species	Reference	Distribution	Altitude (m)
<i>G. achtadachi</i>	Schmid 1968: 932-4, figs 42-44	India: Assam	1080
<i>G. achtami</i>	Schmid 1968: 922-3, figs 19, 20	India: Assam	150
<i>G. achtatrimchi</i>	Schmid 1968: 952, figs 84, 85	India: Assam	954
<i>G. achtavimchi</i>	Schmid 1968: 942, figs 60, 61	India: Madras	150-1540
<i>G. anthea</i> spec. nov	Huisman 1993: 80-2, fig. 4	Malaysia: Sabah	1650-1750

<i>G. berduri</i> spec. nov.	Huisman 1993: 77-9 fig. 2	Malaysia: Sabah	550
<i>G. bodhidarma</i>	Schmid 1960: 104-5, figs. 1, 11, 12	India, Pakistan	525-1385
<i>G. chodachi</i>	Schmid 1968: 931-2, figs. 38, 39	India: W Bengal	1200
<i>G. chotrimchi</i>	Schmid 1968: 950, figs. 77-80	India: Assam	675-955
<i>G. chovimchi</i>	Schmid 1968: 940, figs 3, 55-6, 94-5	India: Madras	245-925
<i>G. dachami</i>	Schmid 1968: 925-6, figs 23, 24	India: Kerala	925
<i>G. dvadachi</i>	Schmid 1968: 928, figs 27, 28	India: Mysore	460
<i>G. dvatrimchi</i>	Schmid 1968: 945-6, figs 69, 70	India: Kerala	925
<i>G. dvitiya</i>	Schmid 1968: 917-8, figs 9, 10	northern India	60-1080
<i>G. ekadachi</i>	Schmid 1968: 926, figs 25, 26	India: Kerala	150-275
<i>G. ekatrimchi</i>	Schmid 1968: 944-5, figs 66-68	India: Mysore	770
<i>G. ekavimchi</i>	Schmid 1968: 935-6, figs 2, 5, 50, 51, 91, 92	India: Assam, Mikir N Cachar	75-460
<i>G. kakatua</i> spec. nov.	Huisman 1993: 85-6, fig. 7	Malaysia: Sabah	550
<i>G. lekuk</i> spec. nov.	Huisman 1993: 79-80, fig. 3	Malaysia: Sabah	1450
<i>G. madakumbura</i>	Schmid 1958: 77-8, figs 1-4	Pakistan	
<i>G. marginalis</i>	Banks 1939: 142, Ross 1956: 47	Philippines	1230-1538
<i>G. navadachi</i>	Schmid 1968: 934, figs 45-47	India: Manipur	1630
<i>G. navami</i>	Schmid 1968: 924-5, figs 21, 22	India: Assam, Manipur	75-245 1385
<i>G. navavimchi</i>	Schmid 1968: 942-4, figs 62, 63	India: Mysore	140-1080
<i>G. nietneri</i>	Banks 1920: 362; Ross 1956: 47	Sri Lanka	
<i>G. pachtchima</i>	Schmid 1968: 952-3, figs 86-8, 98	India: Assam	955-2215
<i>G. pantchadachi</i>	Schmid 1968: 930-1, figs 34-7	India: Manipur	400-1445
<i>G. pantchami</i>	Schmid 1968: 920-2, figs 15, 16	India: Assam	90-1700
<i>G. pantchatrimchi</i>	Schmid 1968: 948-50, figs 75, 76	India: Assam	770
<i>G. parang</i> spec. nov.	Huisman 1993: 83-5, fig. 6	Malaysia: Sabah	500-625
<i>G. paruh</i> spec. nov.	Huisman 1993: 76-7, fig. 1	Malaysia: Sabah	1500
<i>G. prathama</i>	Schmid 1968: 914-6, figs 7, 8, 89, 90	northern India	215-1845
<i>G. reducta</i>	Ulmer 1913: 84, Ross 1956: 47	Java	
<i>G. saptadachi</i>	Schmid 1968: 932, figs 40, 41	China: Cho-kiang	
<i>G. saptami</i>	Schmid 1968: 922, figs 17, 18	India: Assam	615
<i>G. saptatrimchi</i>	Schmid 1968: 950-1, figs 81-3	India: Assam	1230
<i>G. saptavimchi</i>	Schmid 1968: 940-2, figs 57-9, 96	India: Madras	700-1230
<i>G. tanduk</i> spec. nov.	Huisman 1993: 82-3, fig. 5	Malaysia: Sabah	1750
<i>G. tchaturdachi</i>	Schmid 1968: 930, figs 32, 33	India: Manipur	1390
<i>G. tchaturti</i>	Schmid 1968: 920, figs 13, 14	India: Assam	1390
<i>G. tchaturtrimchi</i>	Schmid 1968: 946-8, figs 73, 74	India: Kerala	1540-2460
<i>G. tridachi</i>	Schmid 1968: 928, figs 29-31	India: Madras	615-1080
<i>G. tritiya</i>	Schmid 1968: 918-20, figs 11, 12	India: Manipur	770
<i>G. tritrimchi</i>	Schmid 1968: 946, figs 71, 72	India: Assam	
<i>G. trivimchi</i>	Schmid 1968: 936-40, figs 52-4	India: Assam	125
<i>G. vimchi</i>	Schmid 1968: 934-5, figs 48, 49, 93	India: Assam	1630-2245
<i>G. ulmeri</i>	Schmid 1949: 323, 1968: 944, figs 64, 65, 97	India, Ghats	

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