



Sogana from the Greater Sunda (Hemiptera: Fulgoromorpha: Tropiduchidae)

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Abstract

A new species of *Sogana* Matsumura, 1914, *S. floreni* n. sp., is described from Borneo, Sabah (Malaysia). The species is compared with *S. robustocarina* Liang & Wang, 2008 and *S. stimulata* Melichar, 1914, and an addendum to the key to the species of *Sogana* by Liang & Wang (2008) is given to place the new species. Male genitalia and habitus are illustrated, biological data are provided. A distribution map is given for the 3 species of *Sogana* known from the Greater Sunda.

Keywords: Fulgoroidea, Auchenorrhyncha, canopy fogging

Introduction

The identification of recent material in the collections of RBINS, collected by canopy fogging in Borneo (Sabah, Malaysia) by Dr Andreas Floren (University Würzburg, Germany), has led to the discovery of a new species of *Sogana* Matsumura, 1914, *S. floreni* n. sp.

In their review of *Sogana* Matsumura, Liang & Wang (2008) recognized seven species and illustrated all except *S. stimulata* Melichar, 1914. The genus is widely distributed in SE Asia, with only two species to date recorded in the Greater Sunda: *S. robustocarina* Liang & Wang, 2008 (Borneo) and *S. stimulata* Melichar, 1914 (Mentawai, Sumatra). The present paper describes *S. floreni* n. sp. and compares it to *S. robustocarina* and *S. stimulata*. An addendum to the key of Liang & Wang (2008) is given to place *S. floreni*. *S. stimulata* is illustrated for the first time.

The genus was placed by Fennah (1982) in the tribe Isporisini Fennah, 1982.

Material and methods

The genitalia are extracted after boiling the abdomen for about one hour in a 10% solution of potassium hydroxide (KOH) at about 100°C. The pygofer is separated from the abdomen and the phallic complex dissected for examination. The whole is then placed in glycerin for conservation. Wings have also been mounted. They have been glued with transparent nail varnish.

The genitalia as well as other characters useful for identification are figured. A distribution map produced by the software *CFP 2.0* (Barbier & Rasmont, 2000) and photos of habitus are also provided.

The following acronyms are used for the measurements (taken as in Constant, 2004): BF, breadth of the frons; BT, breadth of the thorax; BTg, breadth of the tegmina; BV, breadth of the vertex; LF, length of the frons; LM, length of the mesonotum; LP, length of the pronotum; LT, total length; LTg, length of the tegmina; LV, length of the vertex.

Acronyms used for the collections (Curators in parentheses):

RBINS Royal Belgian Institute of Natural Sciences, Brussels, Belgium (P. Grootaert)
MMBC Moravske Museum, Brno, Czech Republic (I. Malenovsky)

Taxonomy

Family Tropiduchidae

Tribe Isporisini

Genus *Sogana* Matsumura, 1914

Insertion in the key to the species of *Sogana* by Liang & Wang (2008)

6. Vertex with lateral areas weakly depressed (Fig. 1B), sublateral carinae strongly curved outwards, almost approaching to lateral margin; fore wings without nebula apically *S. stimulata* Melichar
- Vertex with lateral areas flat (Fig. 1G), sublateral carinae nearly straight; fore wings with brownish nebula apically 7.
7. Vertex less elongate (LV/BV = 1.11); aedeagus with right distal process thin, without teeth, right proximal process slightly sinuate and with apex projecting ventrally..... *S. robustocarina* Liang & Wang
- Vertex more elongate (LV/BV = 1.24); aedeagus with right distal process strong, broad, with teeth on dorsal margin; right proximal process strongly sinuate and with apex projecting dorsally..... *S. floreni* n. sp.

Sogana floreni n.sp.

(Figs 1F–K, 2, 3)

Etymology. Dedicated to Dr Andreas Floren who collected the new species in Borneo.

Material examined. Holotype ♂: [Coll I.R.Sc.N.B., Malaysia, Sabah (Borneo), Poring, 28.iii.1998, prim. Forest, night fogging 1, B4, *Barringtonia scortechinii* (Barringtoniaceae) Leg. Andreas Floren, code Basc82, I.G.: 31.494] (RBINS) coordinates: 5°59'N 116°14'E.

Paratypes: 1 ♀: same data as holotype; 1 ♂: [Coll I.R.Sc.N.B., Malaysia, Sabah (Borneo), Poring, 29.iii.1998, prim. Forest, night fogging 1, B10, *Aporosa lagenocarpa* (Euphorbiaceae) (flowering), Leg. Andreas Floren, code Apla88, I.G.: 31.494] (RBINS); 1 ♂: [Coll I.R.Sc.N.B., Malaysia, Sabah (Borneo), Poring, 28.iii.1998, prim. Forest, night fogging 1, B6, *Aporosa maingayi* (Euphorbiaceae), Leg. Andreas Floren, code Apma84, I.G.: 31.494] (RBINS); 3 ♀: [Coll I.R.Sc.N.B., Malaysia, Sabah (Borneo), Poring, 27.iii.1998, prim. Forest, night fogging 1, B3, *Barringtonia scortechinii* (Barringtoniaceae), Leg. Andreas Floren, code Basc81, I.G.: 31.494] (RBINS); 3 ♀: [Coll I.R.Sc.N.B., Malaysia, Sabah (Borneo), Poring, 7.xi.1996, prim. Forest, day fogging 7, M F7, *Aglaia* cf. *macrophyllum* (Meliaceae), Leg. Andreas Floren, code Agra66, I.G.: 31.494] (RBINS); 1 ♂: [Coll I.R.Sc.N.B., Malaysia, Sabah (Borneo), Poring, 29.iii.1998, prim. Forest, night fogging 1, B11, *Ficus leptogramma* (Moraceae) Leg. Andreas Floren, code File89, I.G.: 31.494] (RBINS).

Other material examined. 1 ♀ juvenile: [Coll I.R.Sc.N.B., Malaysia, Sabah (Borneo), Poring Hot Springs, 6°03.467'N 116°42.205'E, 19.ix.2006, prim. Forest, day fogging 1, B28, Leg. Andreas Floren, I.G.: 31.494] (RBINS).

Description. LT: ♂: 9.6 mm.

Head: vertex (Fig. 1G) elongate with apex rounded in dorsal view, lateral areas depressed between median carina and laterodiscal, obsolete carinae; median carina broader and medially excavated on basal half; vertex yellow-brown with lateral depressed areas black except small basal patch; apex black-brown; frons concave in lateral view (Fig. 1H); median carina extending to apex of clypeus (Fig. 1I); frons pale yellow-brown with 6

incomplete transverse red bands; gena pale yellow-brown with black line at antero-dorsal angle; clypeus pale yellow-brown; labium reaching hind coxae; ratio LV/BV = 1.24; LF/BF = 1.75.

Thorax: (Fig. 1G) pronotum with anterior and posterior margins emarginate; median carina grooved longitudinally; deeply impressed point on side of median carina; discal carinae curved; pale yellow-brown, darker, getting nearly black medio-anteriorly; mesonotum with median and discal carinae joining anteriorly; tegulae pale yellow-brown.

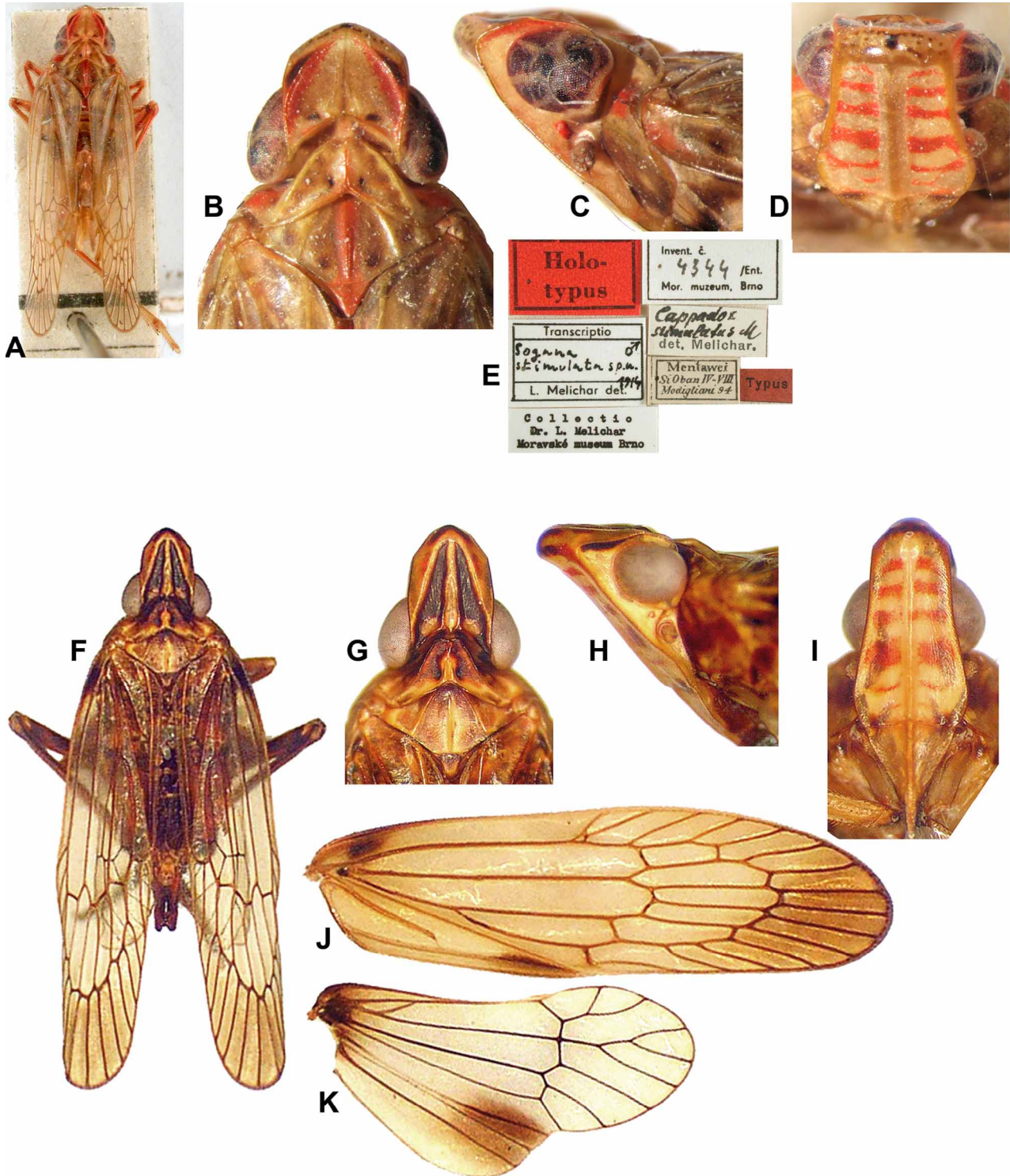


FIGURE 1. *Sogana*. A–E, *S. stimulata*, holotype (photo by I. Malenovsky, MMBC). A, habitus, dorsal view (LT = 9 mm). B, vertex and thorax, dorsal view. C, head, left lateral view. D, frons, sagittal view. E, labels. F–K, *S. floreni*. F, habitus, dorsal view (LT = 9.6 mm). G, vertex and thorax, dorsal view. H, head, left lateral view. I, frons, normal view. J, right tegmen, dorsal view. K, right hind wing, dorsal view.

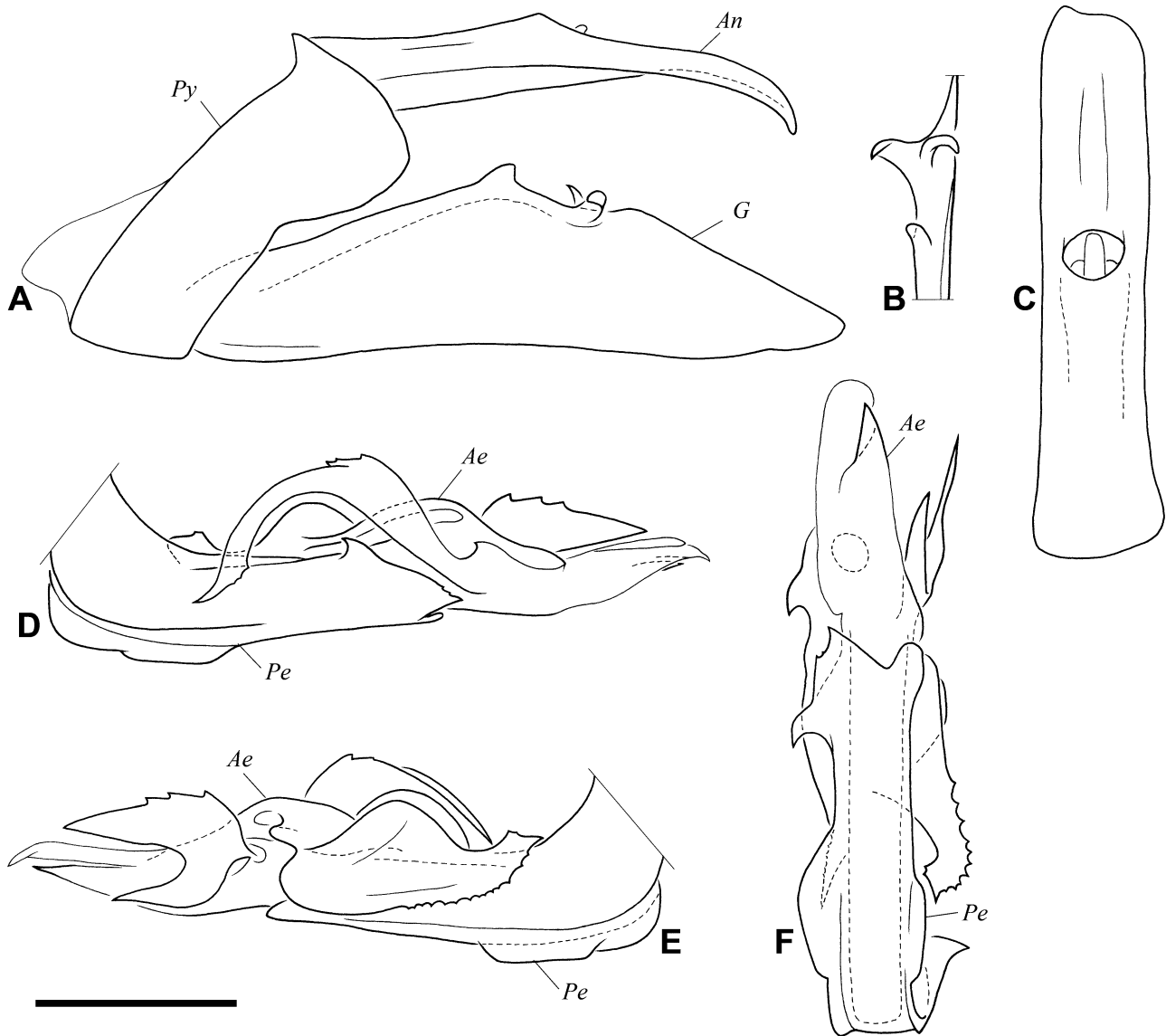


FIGURE 2. *Sogana floreni*, male genitalia. A, pygofer, anal tube and gonostyli, left lateral view. B, processi of dorsal margin of right gonostylus, dorsal view. C, anal tube, dorsal view. D, phallic complex, left lateral view. E, phallic complex, ventral view. F, phallic complex, right lateral view. *An*: anal tube; *Ae*: aedeagus; *G*: gonostyli; *Pe*: periandrium; *Py*: pygofer. Scale 1 mm.

Tegmina: (Figs 1F,J) elongate, subhyaline, pale yellow-brown with darker apical area and infuscate patches near base along costal margin, and at apex of clavus; veins slightly infuscate; veins at apical cells darker; 14–15 apical cells; 5 subapical cells; ratio LTg/BTg = 3.36.

Hind wings: (Fig. 1K) hyaline with veins black; infuscate patches basally and at middle of sutural margin, at emargination; sutural margin strongly emarginate.

Legs: piceous; femora III with longitudinal black line; tibiae III with 3 lateral and 6 apical spines; first hind tarsomere with 6 apical spines.

Male genitalia: pygofer narrow with dorsal half broader; posterior margin strongly sinuate in lateral view (Fig. 2A); anal tube elongate and narrow, slightly curved postero-ventrad; in dorsal view, right half of apex projecting postero-ventrad (Fig. 2C); gonostyli elongate with ventral margin concave and apex roundly pointed in lateral view (Fig. 2A); dorsal margin with one digitiform process and two hooks at middle (Figs 2A, B); aedeagus with 3 strong processes: one on left side, projecting anteriorly, strongly curved, with hook dorsally near its base and teeth on dorsal margin and at apex of ventral margin (Fig. 2D); distal one on right

side furcate, with dorsal part more developed and showing teeth on dorsal margin (Fig. 2E); proximal one on right side large, with ventral margin showing teeth and dorsal margin strongly sinuate, apex projecting dorsad (Fig. 2E); perianthium with ante-apical dorsal hook on left side and apical margin emarginate ventrally, pointed on left side and digitiform on right side (Figs. 2D–F).

Biology. All twelve known specimens have been collected by canopy fogging, including eight collected during the night by that technique. This could indicate nocturnal habits for the species. Specimens were collected from the following species of tree: *Barringtonia scortechinii* King (Barringtoniaceae) (5 specimens), *Aporosa lagenocarpa* Airy Shaw (Euphorbiaceae) (1), *Aporosa maingayi* Hook.f.(Euphorbiaceae) (1), *Aglaia* cf. *macrophyllum* (Meliaceae) (3), *Ficus leptogramma* Corner (Moraceae) (1). According to those data the species seems polyphagous but only direct observations could confirm that it does not live on some species of epiphytes or vines.

Note. the species is very close to *S. robustocarina* Liang & Wang, 2008. The two species can be reliably separated by the shape of the male genitalia, especially the processes of the aedeagus as in the key couplet above.

Sogana robustocarina Liang & Wang, 2008

(Fig. 3)

Sogana robustocarina Liang & Wang, 2008: 40.

Geographical data (Liang & Wang, 2008). Malaysia, Sabah (Borneo) Kalabakan (coordinates: 4°25'N 117°29'E); Keningau (erroneously spelled “Keningan” in Liang & Wang, 2008) (coordinates: 5°20'N 116°10'E).

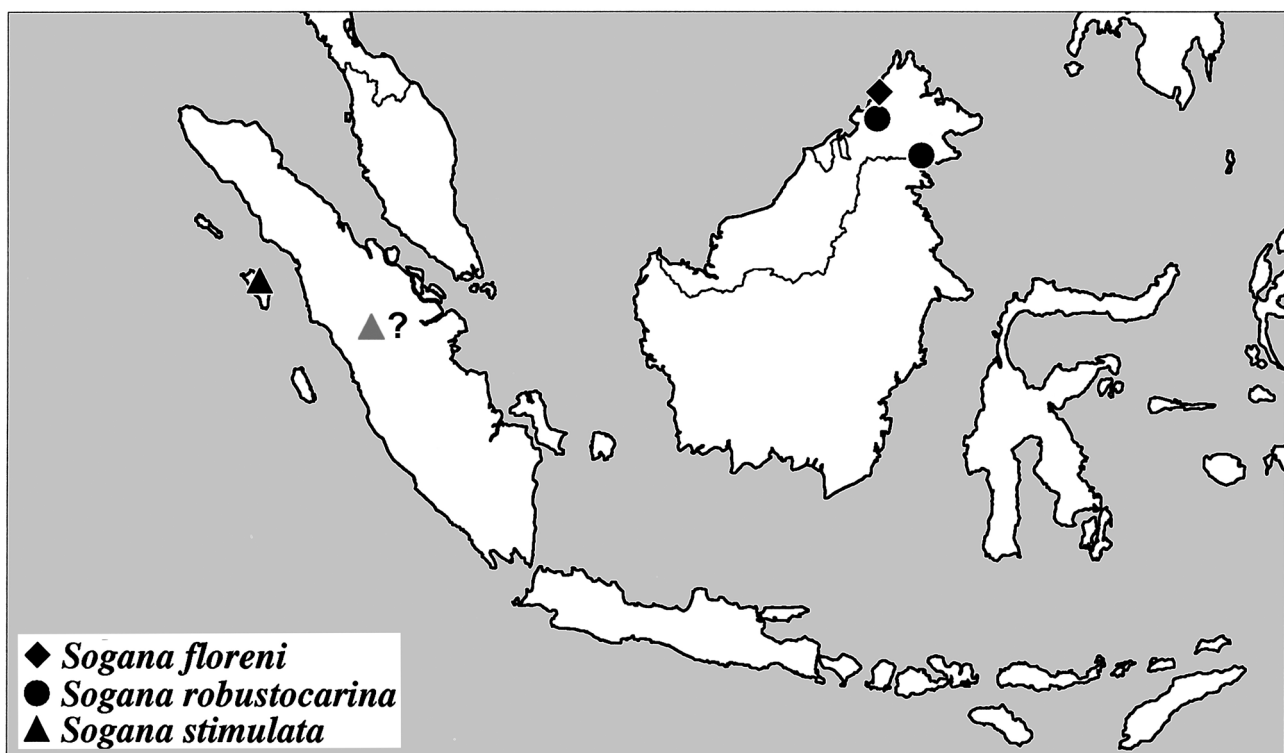


FIGURE 3. Distribution of the species of *Sogana* in the Greater Sunda.

***Sogana stimulata* Melichar, 1914**

(Figs 1 A–E, 3)

Sogana stimulata Melichar, 1914: 115; Metcalf, 1954: 132; Wilson & Malenovsky, 2007: 145; Liang & Wang, 2008: 41.

Geographical data (Wilson & Malenovsky, 2007): Indonesia, Mentawai Islands: Si Oban (coordinates: 2°11'S 99°43'E); “Sumatra”.

Note. the specimen recorded from Sumatra is a female. Additional material from Sumatra is necessary in order to confirm the presence of the species on the island.

Discussion

This discovery of a new species of *Sogana* in Borneo, from a place close to the *loci typici* of *S. robustocarina*, makes it obvious that other unknown species are awaiting discovery.

The number of specimens available for *S. floreni* n.sp. is high, compared to the other species of the genus (see Liang & Wang, 2008). All those specimens have been collected by canopy fogging which could indicate that species of *Sogana* are living high in the trees, which would make them rarely collected.

Extensive use of canopy fogging within the distribution range of the genus would probably provide interesting data for this genus and additional new species.

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