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New Aganainae from Indonesia (Lepidoptera, Noctuoidea, Noctuidae)

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Abstract

This article features two new species in the Aganainae subfamily: *Asota buruensis* **sp. nov.** and *Asota sulamangoliensis* **sp. nov.** Both originate from the Indonesian isles of Buru and Sula Mangoli. The article sets out with some observations on the higher classification of the Aganainae subfamily and the *Asota* genus. The description of these new species contains images of the genitalia as well as comparisons with species bearing great resemblances.

Zusammenfassung

Im vorliegenden Artikel werden zwei neue Arten der Unterfamilie Aganainae beschrieben: *Asota buruensis* **sp. nov.** and *Asota sulamangoliensis* **sp. nov.** Beide stammen von den indonesischen Inseln Buru und Sula Mangoli. Der Artikel setzt sich auch mit der höheren Klassifikation der Unterfamilie Aganainae und der Gattung *Asota*

auseinander. Die Beschreibung dieser neuen Arten enthält Bilder der Genitalien ebenso wie Vergleiche mit den ähnlichen Arten.

Ringkasan

Sedang dalam proses menyediakan suatu revisi subfamili Aganainae di seluruh dunia, dua spesies ditemukan di British Museum of Natural History di London, yang sampai sekarang ini belum diletakan. Sambil mendeskripsi kedua spesies di sini, sejumlah catatan awal menyangkut klasifikasi yang lebih. Ngengat tersebut dimasukkan dalam genus *Asota*. Dua spesies ngengat termasuk dalam subfamili Aganainae dibuat deskripsinya. Kedua spesies tersebut berasal dari Pulau Buru dan Sula Mangoli, bagian dari Kepulauan Maluku, Indonesia. Ngengat maupun alat kelaminnya dibuat deskripsinya. Distribusi ngengat tersebut di luar Pulau Buru dan Sula Mangoli tidak diketahui. Sebagai suatu introduksi karakteristik subfamili Aganainae, kedua. Ngengat tersebut dimasukkan dalam genus *Asota*.

Introduction

In process of making a revision of the Aganainae, two undescribed species of *Asota* were found in the collection of The Natural History Museum in London. In describing them here, some introductory remarks on the higher classification are presented as well.

List of abbreviations: BMNH = British Museum of Natural History (Natural History Museum), London; MWM = Museum Witt, Munich; RMNH = Naturalis (Nationaal Natuurhistorisch Museum) (formerly Rijksmuseum voor Natuurlijke Historie), Leyden, The Netherlands; ZSM = Zoologische Staatssammlung, Munich.

The characteristics of the subfamily Aganainae

According to JORDAN (1896) it was BOISDUVAL (1832) who introduced the name *Aganais* (Aganaïdes) first in his "Voyage de l'Astrolabe" from which HERRICH-SCHÄFFER derived the name Aganaidae for describing the subfamily (SNELLEN, 1888).

HERRICH-SCHÄFFER (1850-1858) made a „Synopsis familiarum Lepidopterorum". In his table on page 12 under the serial number 31 he wrote:

"Die Trennung der Arctioidea von den Lithosinen u. Syntomoiden ist nur eine künstliche und nicht besser zu rechtfertigen als jene der Liparinen. Will man trennen, so müssen auch die Agaristinen u. Aganaiden als eigene Gruppen aufgestellt werden. Da die Nycteolinen ausfallen werden, so setze ich jene Formen an den Anfang, welche sich den Noctuinen am natürlichsten anschließen und jene an das Ende, welche den Microlepidopteren am ähnlichsten sind.

Palpi adscendentes prominuli, articulo tertio longo filiformi [=Palpen weit aufsteigend, ihr Endglied lang fadenförmig.] …"

Translation: “The separation of the Arctioidea from the Lithosinae and Syntomoidea is but an artificial one and not easier to justify than of the Liparinae. If you want this separation then the Agaristinae and the Aganaidae should be arranged as a group of their own. Given that the Nycteolinae would be excluded, I put that group at the beginning so that the Noctuinae follow naturally and at the end those which are most similar to Microlepidoptera.

Palpi adscendentes prominuli, articula tertio longo filiformi [= Palps strongly ascending, the last joint long and filiform.]…”

SNELLEN (1888) made a revision of the Aganainae and paid attention to the different descriptions of that subfamily. He found the description of BOISDUVAL (1833) to be the most appropriate:

“Tête médiocre; yeux saillant; antennes ordinairement un peu pectinées dans les mâles; palpes longs, ascendante, leur dernier article très-long, nu, grêle, comprimé latéralement; trompe longue; corselet velu, ponctué sur les épaulettes; abdomen cylindrique, ponctué de noir, un peu plus long que les ailes inférieures; ailes oblongues, les supérieures ponctuées à leur base, soit en dessus, soit en dessous; pattes très longues”

Translation: Head medium-sized; eyes prominent; antennae usually a little bit comb shaped in the males; palps long, ascending, their last joint very long, naked, thin, compressed laterally, proboscis long; thorax roughly haired, dotted on the patagia; abdomen cylindrical black dotted, a little bit longer than the hind wings; wings elongated, the fore wings with dots at the base, on the upper side as well as on the under side; legs very long.

SNELLEN does not agree with “corselet velu” in this description; the scaling of the thorax is smoothly not roughly haired.

He also cited the characteristics of the Aganainae (*Hypsa*) described by WALKER (1854):

“Allied to the Noctuina. Body rather *slender*, nearly *linear*. Palpi ascending, a *little* longer than the head; second joint nearly thrice the length of the first; third linear, *long*, much more slender than the second. Antennae *slender*, *setaceous*. Fore tibiae of the male *dentated* beneath. Hind tibiae armed with four long spurs”

The terms in italics are more or less incorrect according to SNELLEN, but he did not suggest what they should be instead.

The moths which are mentioned here meet the above characteristics of the Aganainae.

Areole: Another characteristic very often found in the Aganainae is the extra cell (areole) near the discal cell. With the exception of the genus *Agape*, all genera of the Aganainae have that areole and it is found in all species dealt with so far.

Gland: It was JORDAN (in ROTHSCHILD & JORDAN, 1896) who found the "mouth of a gland", as he called it, on the metathorax of all Aganainae.

He writes (l. c., page 206): "The thorax of *Asota* and all other *Aganaidae* inclusive of *Agape* SNELLEN, 1888[1], bears just in front of the hinder edge of the mesoscutum in the middle line a rounded impression often filled up with a brownish matter”. This impression is the mouth of a gland which I have not yet found in other moths.

[1] According to WATSON, FLETCHER & NYE (1980: 5), it ought to be *Agape* FELDER, 1874 (*in* FELDER, FELDER & ROGENHOFER, 1864-1875) instead of *Agape* SNELLEN, 1888.

The author looked at all the genera of this family and they all have a mark on the metathorax which as Jordan says "has never been found" in other Noctuidae. It could be an autapomorphic characteristic but this observation needs more investigation. In any case all the animals treated here have that characteristic mark on the metathorax in both sexes.

The author also investigated the genera in the Lymantriidae and Arctiidae, ("quadrifine Noctuidae clade" sensu LAFONTAINE & FIBIGER, 2006). None of them had that "mouth of a gland".

Diagnosis of the genus *Asota* HÜBNER, [1819]

According to JORDAN (*in* ROTHSCHILD & JORDAN, 1896: 203) the characteristics of the genus *Asota* are:

"Fold in front of the cavity on fore wing with one enlarged carinate scale; hind wing above with an elongate spot of thick scales just behind costal nervure in the middle of the wing; the last but one joint of the antennae shorter than the last but two, and at the utmost as long as broad, mostly shorter; third joint of palpi seldom little shorter, mostly as long as or longer than the second."

The moths described below have the typical fold and cavity of *Asota*, but the characteristics mentioned of the antennae are different. The last but one joint of the antennae is not shorter than the last but two, but on the contrary just a bit longer than broad. The third joint of the palpi is longer than the second.

Asota buruensis sp. n. (Pl. 1, figs 1, 2)

The collection of the British Museum contains two specimens of the new Aganainae. They originate from Buru and were captured in 1922 by C., F. and J. PRATT, professional collectors.

There were no examples of this unknown species located in the entomological departments of the collections of the museums in Amsterdam, Berlin, Dresden, Jayapura (Papua, Indonesia), Leiden, Munich (ZSM and MWM) and Wageningen.

The new species was not mentioned in Fauna Buruensis in the report of the Boeroe expedition (TOXOPEUS 1922, VAN EECKE 1926 and 1929) and also ROTHSCHILD (1915) did not mention it in his paper about the islands of Ceram, Buru, Bali and Miso'ol.

Material. Holotype ♂: Indonesia, Buru, Gamoe Mrapat, Central West of Buru, 5000 ft (= 1524 m), 03-04-1922, C., F., & J. Pratt. (BMNH). Paratype ♀: Indonesia, Buru, Gamoe Mrapat, Central West of Buru, 5000 ft (= 1524 m), 03-04-1922, C., F., & J. Pratt. (BMNH).

Etymology**:** The species is named after the Island of Buru, where it was found.

Description: The wingspan of male and female is 65-70 mm. Length of the forewing is 32 mm.

The ground colour of the wings of the moths, in both sexes is yellowish / ochreous. The forewings more dark yellowish / ochreous; the hindwing light yellowish / ochreous. The base of the forewing has the same yellowish / ochreous colour as the hindwing and has 5

black dots. In the upper side of the forewing at the lower end of the discal cell is a vague white spot. The underside of the forewing and the hindwing has the same yellowish / ochreous colour, with the exception of the apex of the forewing, which is dark over one third of the area of the wing. Each wing has a dark spot in the middle of the underside near the costa. The spot on the forewing is larger than the spot of the of the hindwing. The thorax and the abdomen have the same yellowish / ochreous colour, the thorax a little bit darker than the abdomen. On the metathorax is a gland opening. On the anterior part of the patagia is a small black spot. The antennae are filiform and brown. The first joint of the palps has a yellowish / ochreous colour, with a black spot at the end. The last two joints of the palps are black on the upper side and the sides are whitish. The legs are whitish and have a dark stripe on the femur. They bear four spurs, two long ones and two short ones.

Male genitalia (pl. 2, fig. 1 and 1 B)[2]: Valva narrow at base, widening ventrally in middle. Sacculus short, less than half length of valva, ending in an acute, upcurved processus. Aedeagus with a fork shaped cornutus on the vesica. The cucullus of the valva is relatively short compared with *A. egens*.

Female genitalia: Ovipositor short, ductus bursae tube-like with constant width. Corpus bursae oval apically with a lateral appendix. Ductus seminalis originating of apex of corpus near entrance of ductus bursae.

Distribution: The species is only known from the island of Buru in Indonesia.

Relationship: At first sight the specimen looks somewhat like a species of the genus *Agape* FELDER, 1874 according to the colour, but the new species has an areole in the forewing, which is not the case in *Agape*. In *Asota* it is more similar to *Asota egens* (WALKER, 1854) but in *A. egens* the forewing veins tend to be picked out paler and the hindwing has extensive greyish clouding though this is variable. *Agape* species are more robust and have more extensive orange spotting on a yellow forewing and the abdomen is differently marked.

It is also outside the general variability of *Asota egens* (WALKER, 1854), the shape of the forewing is more elongated, the colour is more yellowish and the discal mark is paler.

***Asota sulamangoliensis* sp. n.** (Pl. 1, figs 4, 5)

In the collection of the British Museum is another unknown Aganainae specimen. For a long time the author was puzzled, because there are two other Aganainae which look very much like the moth from the Sula island: Sula Mangoli. Although the Sula islands are politically Maluku they are biogeographically much closer to Sulawesi.

Asota brunnescens (NIEUWENHUIS, 1948**)** and the moth from Sula Mangoli are very similar although the discal mark on the hindwing is narrower and the pale zone at the base of the forewing resembles more that of *Asota darsania* (DRUCE, 1894) from Halmahera. Besides that there is a difference in the male genitalia – described further on –. This lead to the conclusion that the moth of Sula Mangoli is a new species.

[2] Male genitalia seem to be very similar in all Aganainae.

Material. Holotype ♂: Indonesia, Sula Mangoli (Maluku Islands), Nov. '07 (W. Doherty), genital preparation in British Museum (fecit R. de Vos). Paratype ♀: Indonesia, Sula Mangoli (Maluku islands), Nov. '07 (W. Doherty), genital preparation in British Museum (fecit R. de Vos)

Etymology: The name refers to the Indonesian island of Sula Mangoli of the Maluku islands.

Distribution: Indonesia, island Sula Mangoli.

Description of the male: Wingspan: 53 mm, length of forewing: 25 mm.

The dark brown forewings and yellow hindwings with a broad brown border are the most striking characteristics as are seen also in *A. brunnescens* (NIEUWENHUIS, 1948**)**, but there is a difference in the yellow part of the wing close to the body. This part is larger with four dots on the base. The one near the costa is elongated and yellowish, vaguely enclosed. On the border between the yellow part and the brown part of the wing is a small black line just in the middle. The underside is brown, with a faint yellow stripe in the middle of the wing near the base, mottled with brown scales. In the middle of that faint stripe is a dark brown spot. The upper side is yellow with a broad brown border. The border undulates at vein 4. In the middle of the disc is a brown crescent shaped spot. This spot is narrower than in *Asota brunnescens* (NIEUWENHUIS, 1948) and the pale zone at the base of the forewing resembles more that of *Asota darsania* (DRUCE, 1894) from Halmahera. The thorax is yellow, with a brown spot in the middle near the mesoscutum. The mesoscutum has the impression mentioned in the beginning of this article. Two brown spots on the patagia. The antennae of the male are covered with hairs on both sides. The palps are porrect, the second joint is brown with yellow on the underside. the third is thin and dull brown. The legs are yellow, mottled with dull brown scales.

Female: The antennae are filiform and the forewings are a little bit broader, but other than that there is no difference in appearance in comparison with the male.

Male genitalia (pl. 2, fig. 3 and 3 B): The valve is not round, but oblique and sloping. The sacculus is short, 1/3 length of valva, ending in an upcurved processus. The angle of sacculus and processus is more or less 120 degrees. The aedeagus long and thick and the cornutus on the vesica is long and unequally bifid. The vesica itself is ovate.

Female genitalia (pl. 2, fig. 4): Ductus bursae broader towards ostium. Corpus bursae elongate oval, wider towards ductus. Origin of ductus seminalis not traced.

In comparison the male genitalia of *Asota brunnescens* (NIEUWENHUIS, 1948) (pl. 2, fig. 2 and 2 B): The valvae of *A. brunnescens* are much broader and relatively longer distal to the saccular process. The field with cornuti on the aedeagus is smaller and does not have a sharp border on both sides. The vesica is two times volume of that of the new species and more irregular in shape. Two cornuti equal in length to the longer in the new species

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Plate 1

1. *Asota buruensis* sp. n. ♂. Holotypus. Indonesia: Buru, "23. 22, Gamoe 'Mrapat, Central West Buru, 5000 ft., 3-4 '22, C., F. & J. PRATT;. JOICEY Bequest Brit. Mus 1934-120." BMNH London.

2. *Asota buruensis* sp. n. ♀. Paratypus. Indonesia: Buru "23. 22, Gamoe 'Mrapat, Central West Buru, 5000 ft., 3-4 '22, C., F. & J. PRATT;. JOICEY Bequest Brit. Mus 1934-120." BMNH London.

3. *Asota darsania* (DRUCE, 1894) ♂. Indonesia: Halmahera. BMNH London.

4. *Asota sulamangoliensis* sp. n. ♂. Holotypus. Indonesia: Sula Mangoli, Nov. 97. [=1897], (W. DOHERTY). ROTHSCHILD Bequest B.M. 1939-1. BMNH London.

5. *Asota sulamangoliensis* sp. n. ♀. Paratypus. Indonesia: Sula Mangoli, Nov. 97. [=1897], (W. DOHERTY). ROTHSCHILD Bequest B.M. 1939-1. BMNH London.

6. *Asota brunnescens* (NIEUWENHUIS, 1948). ♂. Holotypus. Indonesia: Sambiut. RMNH Leiden.

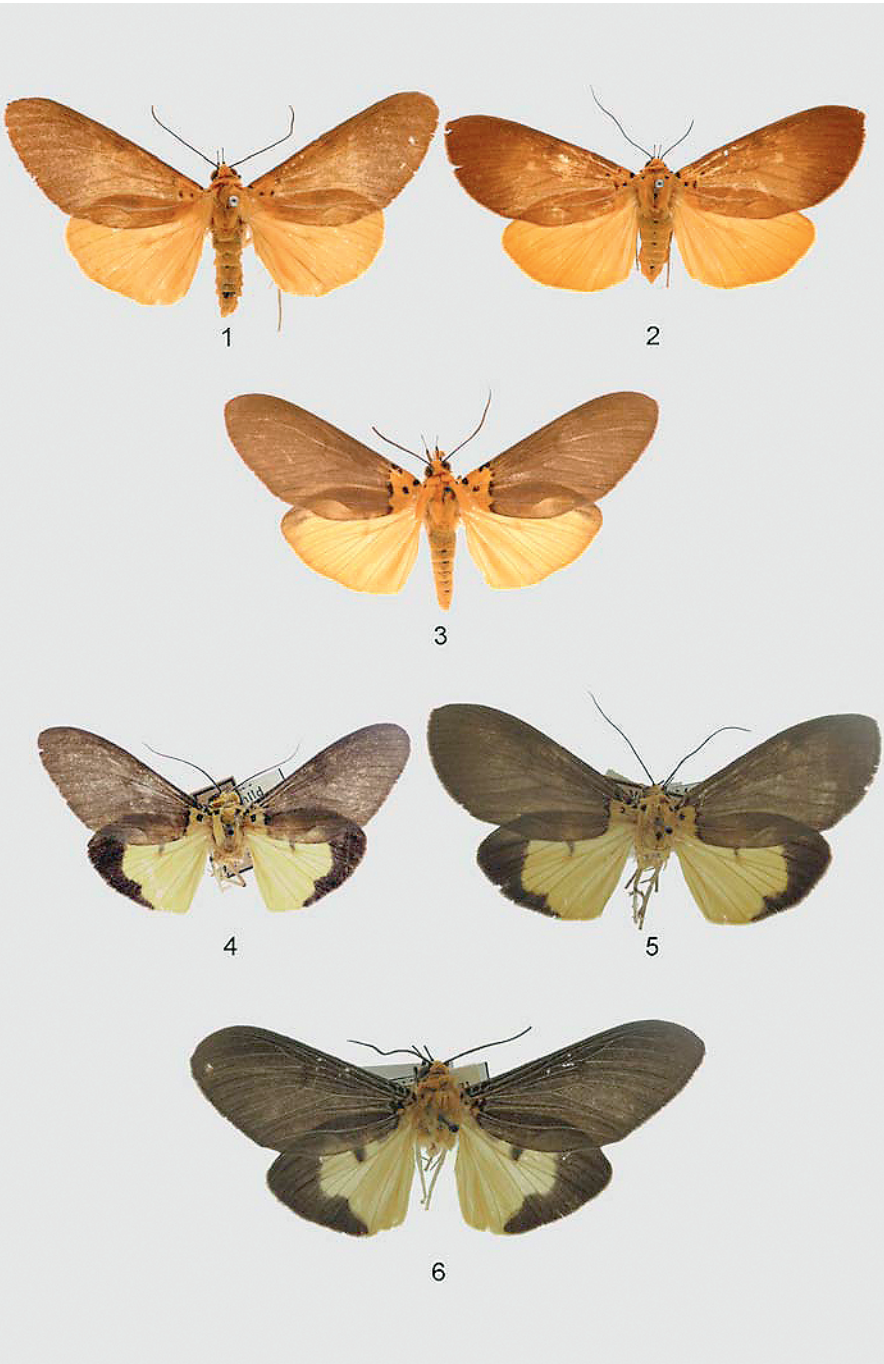
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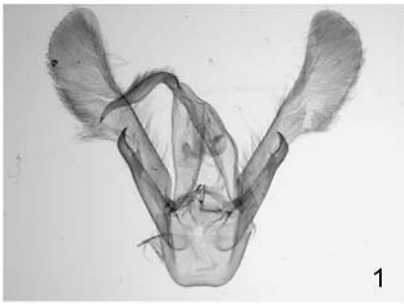
Plate 2

1. *Asota buruensis* sp. n. ♂. Genital capsule.
1 B. *Asota buruensis* sp. n. ♂. Aedeagus.
2. *Asota brunnescens* (NIEUWENHUIS, 1948). ♂. Genital capsule.
2 B. *Asota brunnescens* (NIEUWENHUIS, 1948). ♂. Aedeagus.
3. *Asota sulamangoliensis* sp. n. ♂. Genital capsule.
3 B. *Asota sulamangoliensis* sp. n. ♂. Aedeagus.
4. *Asota sulamangoliensis* sp. n. ♀ genitalia.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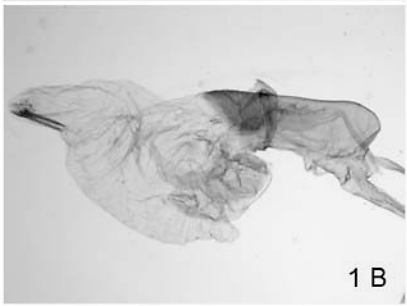
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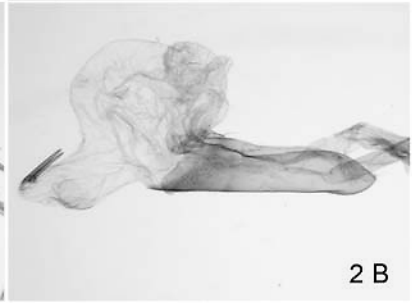
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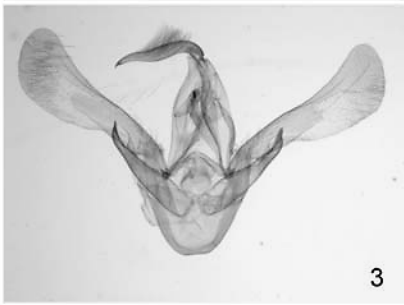
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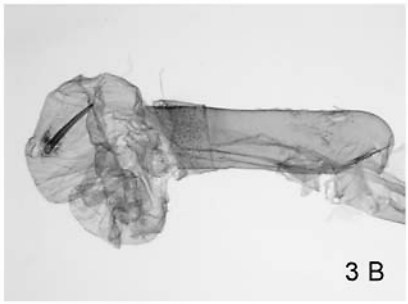
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