

Contribution to the knowledge of Sulawesi's tiger moths. Description of a new genus and species

(Lepidoptera: Erebidae: Arctiinae)

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A new genus and species of Erebidae, Arctiinae from Sulawesi is described. The genus *Axelarctia* gen. nov. belongs to Arctiini and is eventually a sister genus of *Defreinarctia* Dubatolov & Kishida, 2005. The species *Axelarctia emblematica* sp. nov. is so far the only species belonging to the new genus.

Eine neue Gattung und Art der Erebidae, Arctiinae aus Sulawesi wird beschrieben. Die Gattung *Axelarctia* gen. nov. gehört zu den Arctiini und ist möglicherweise eine Schwestergattung von *Defreinarctia* Dubatolov & Kishida, 2005. Die Art *Axelarctia emblematica* sp. nov. ist bisher die einzige Art der neuen Gattung.

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Introduction

The present species from Sulawesi, Indonesia is very characteristic and could be recognized as undescribed quite easily. However, its systematic position within Arctiinae, Arctiini remained enigmatic and could be determined only after a careful study. A new genus must be described of which so far only this single species in the Wallacean region is known. However, it seems possible that other species will be discovered or assigned to the present genus, most likely in the eastern parts of the Oriental (=Sino-Indian) region or the western parts of the Australian region (= Australasian Realm), especially in the Wallacean territory. The species is widely different from other tiger moths in several superficial characters. Therefore, we looked for a reasonable genus by studying many comparative papers, predominantly those treating the Asian genera of Arctiini (Koda 1987, 1988, Dubatolov 2003, 2004a, b, Dubatolov & Kishida 2005, Dubatolov et al. 2007, Schmidt 2009, De Vos 2011), but found no genus to place our species. Therefore, we decided to describe a new one.

Description

Axelarctia Speidel & Černý gen. nov.

Type species: *Axelarctia emblematica* Černý & Speidel sp. nov. here designated.

Antennae of male bi (double)-pectinated. Eyes naked. Labial palpi straight, about twice as long as diameter of eyes. Proboscis extraordinarily thin, hardly visible between labial palpi when rolled, questionably functional. Tibial spurs 0-2-4, of medium length. Retinaculum distinct, bar-shaped elongate. Frenulum of male simple, clamped between retinaculum and wing membrane of forewing-underside.

Wing venation (Fig. 1). Forewing without accessory cell, R2 originates from the stem of R3+4, R5 absent. M2, M3 and CuA 1 from lower angle of discoidal cell. In these characters, the venation of the forewings (especially absence of R5) differs from all other Arctiini as indicated by Sotavalta (1964).

Genitalia. Tegumen large, with 2 lateral lobes and hypertrophied acrotergite. Specialized uncus. See

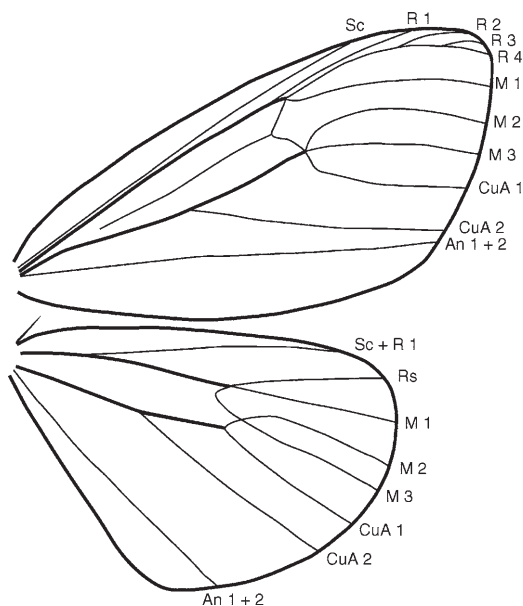


Fig. 1. Wing venation of *Axelarctia emblematica*.

also under the description of the species for more details.

Etymology. Named in honour of Dr Axel Hausmann, in recognition of his merits during his career as an entomologist in the Zoological State Collection, Munich and to celebrate his retirement this year (2026). May he have still many years of research without bureaucratic burdens!

Discussion of relationships to other genera

The most similar genitalia seem to be those of *Defreinarctia* Dubatolov & Kishida, 2005. In *Defreinarctia*, the 9th acrotergite is also well developed, though much less than in *Axelarctia*, but uncus is not modified. However, there are similar lateral lobes of the tegumen, but *Defreinarctia* has distinct carinal plates in the aedeagus and is more similar to *Spilosoma* in this respect. The venation of *Defreinarctia* also agrees with *Spilosoma*, R5 is present (Dubatolov & Kishida 2005).

The genitalia of *Orhantarctia* Dubatolov & Kishida, 2005 are also similar; they share the large tegumen with *Axelarctia*, but do not have the dorso-lateral lobes and are provided with *Spilosoma*-like carinal plates in the aedeagus which are lacking in *Axelarctia*.

Spilosoma Curtis, 1825 as currently defined is probably poly- or paraphyletic, one may doubt the need of the long list of recently described genera in *Spilosoma* s.l., like *Tamilarctia*, *Defreinarctia*, and *Orhantarctia* as de Vos & Suhartawan (2011) state,

and, indeed, the description and separation of these genera may create the superfluous need for separating many more genera from *Spilosoma*.

The cytochrome c oxidase 1 barcoding in BOLD systems indicates agreements of *Axelarctia* and *Spilosoma* s.l. No robust phylogenetic conclusions are possible by the analysis of this comparatively small mitochondrial gene; the relationship of *Axelarctia* with the *Spilosoma* group must still be corroborated by other characters. Moreover, the generic complex of *Spilosoma* is not sufficiently resolved at present though monophyletic entities can certainly already be recognized within *Spilosoma* s.l. The recognition of these monophyletic groups is urgently needed for the subdivision of this huge complex, independent of whether they are designated as genera, subgenera, or species groups. Surely, *Axelarctia* widely diverges from other genera of the complex by the morphology of the forewing-venation and the male genitalia. The complex of genera around *Spilosoma* is sometimes united in a subtribe called Spilosomina Seitz, 1910.

The analysis of the partial mitochondrial cytochrome c oxidase subunit I (COI 5' barcode region; sample IDs BC ZSM Lep 66323-66324, NCBI accession numbers: PZ451309-PZ451310) gene did not reveal a closer match with any species contained in BOLD systems (Ratnasingham et al. 2024). The nearest neighbour taxon was an unidentified Arctiinae (BOLD: ABX3049), with a distance of 6.67 %.

Spilosoma owgarra (Bethune-Baker, 1908) is also found to be similar in the DNA barcode (6.85 % difference). It belongs to the *dinawa* group of species of *Spilosoma* (De Vos & Suhartawan 2011) including *Spilosoma adriani* De Vos & Suhartawan, 2011, *S. alberti* (Rothschild, 1914), *S. biagi* (Bethune-Baker, 1908), *S. dinawa* (Bethune-Baker, 1904), *S. kebea* (Bethune-Baker, 1904), *S. owgarra* (Bethune-Baker, 1908), *S. rubribasis* (Joicey & Talbot, 1916), *S. vulgaris* De Vos & Suhartawan, 2011, and *S. wildi* De Vos, 2013. These species don't present the specialised characters of *Axelarctia* and show some resemblance to *Orhantarctia* in habitus and the presence of the carinal plate in the aedeagus.

The following principal characters are indicated for the possibly related genus *Defreinarctia*: Antennae short, not longer than $\frac{1}{3}$ of forewing length. In male, they are serrate on the anterior and pectinate on the posterior side. Eyes large, hemispherical and naked. Palpi straight, twice as long as dense hairs on frons. Proboscis not reduced, as long as the head width. Vein R2 of forewings stalked with R3-5. Veins Rs and M1 on hindwing arising from a single point (Dubatolov & Kishida 2005).

The following main characters are given for *Orhantarctia*: Antennae long, apparently $1\frac{1}{2}$ of the forewing length, bipectinate in males, pectination

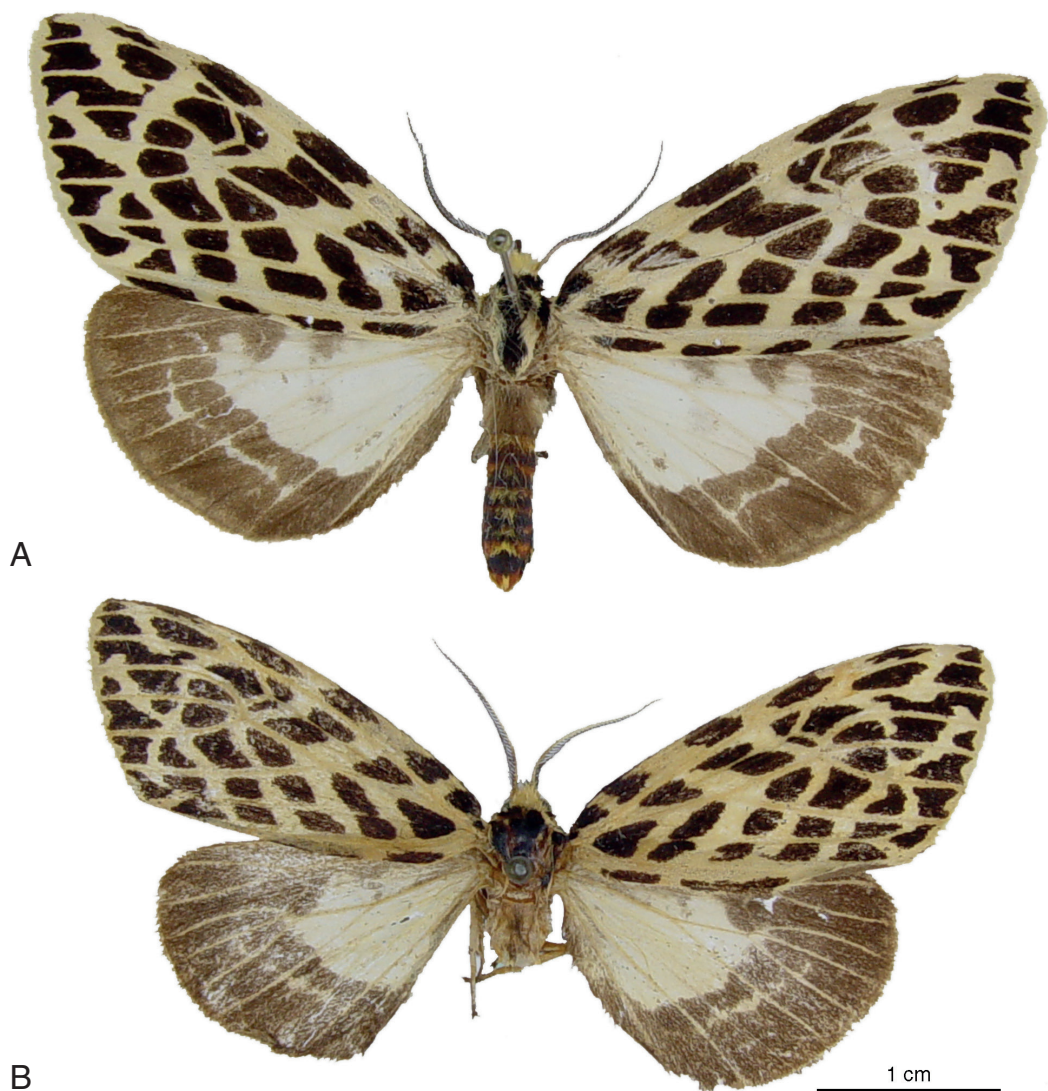


Fig. 2. Males (paratypes) of *Axelarctia emblematica* (photo Igor Kostjuk). **A.** S. Celebes (Sulawesi), Puncak, Palopo, 2°55' S 120°05' E, i.1997, 900–1300 m, leg. local collectors, BC ZSM Lep 66323, Bavarian State Collection of Zoology, Munich. **B.** C. Sulawesi, Puncak Dingin/ Palu, 8.–10.v.1985, BC ZSM 66325, Genitalpräparat Heterocera Nr. 11.119, Museum Witt München, Bavarian State Collection of Zoology, Munich.

gradually decreasing towards apex. Eyes large, strongly convex, ovoid and naked. Palpi stout, slightly longer than the dense hairs on frons, with apical segment slightly bent downwards. Proboscis not reduced, as long as the head width. Vein R2 on forewings stalked with R3–5. Veins Rs and M1 on hindwing arising from a single point (Dubatolov & Kishida 2005).

So far, we could only find a single species to belong in the new genus.

Axelarctia emblematica Černý & Speidel sp. nov.
Figs 2,3

Holotype: ♂ Indonesien, Sulawesi (S), Puncak, Palopo, 900–1300 m, v.1998, leg. local collectors, Slide AV9614 ♂ A. Volynkin, BC ZSM Lep 66324, Bavarian State Collection of Zoology, Munich, Germany.

Paratypes: 1 ♂ C. Sulawesi, vic. Mamasa, 2°57' S 119°24' E; 2000 m, 17.–18.x.1995, leg. Gala, Collection Karel Černý; 1 ♂ S. Celebes (Sulawesi), Puncak, Palopo,

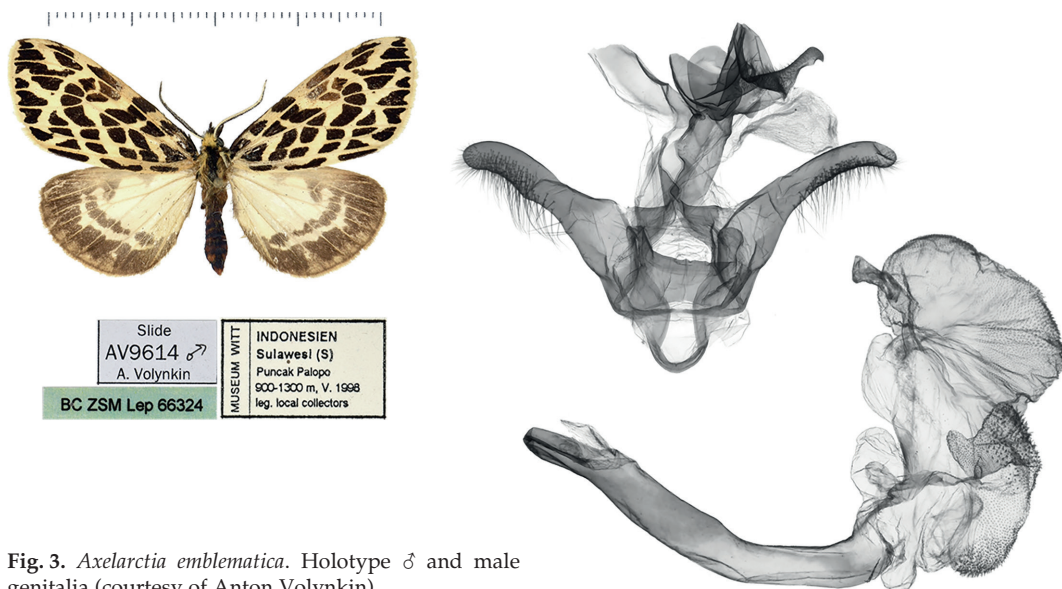


Fig. 3. *Axelarctia emblematica*. Holotype ♂ and male genitalia (courtesy of Anton Volynkin).

2°55' S 120°05' E, i.1997, 900–1300 m, leg. local collectors, BC ZSM Lep 66323; 1 ♂ C. Sulawesi, Puncak Dingin/ Palu, 8.–10.v.1985, BC ZSM 66325, Genitalpräparat Heterocera Nr. 11.119, Museum Witt München, Bavarian State Collection of Zoology, Munich, Germany.

Male. The head is black with cream white vertex, palpi black, the bipectinate antennae are black, flagellum dorsally cream white; patagia black, edged with cream white; thorax dorsally cream white, with a wide black band confluent with two black spots on the cream white tegulae; thorax ventrally pale brown, legs laterally cream white, medially pale brown; abdomen irregularly greyish brown.

The forewings are 27 mm long, cream white with plenty irregularly angular black spots which are arranged to transversal series. The fringes are cream white. The cream white ground colour of the underside is suffused with brown scales, the transversal series of spots are brown, blurred.

The hindwings are basally cream white with a greyish brown postmedian and a very wide greyish brown marginal band. The veins in the bands are cream white, the fringes greyish brown. The underside of the hindwings is purer in contrast.

Female. Unknown.

Male genitalia. (Slide Nr. AV9614 and MWN Nr. 11.119). The valva is approximately equal wide. Tegumen relatively large, with a pair of flat lateral lobes on its dorsal end. Moreover, the 9th acrotergite (see Koda 1987) is strongly developed, even larger than in other *Spilosomina*, bowl-shaped. The uncus

is strongly sclerotized, with highly modified basis and a terminal ventrad hook. The aedeagus (= phallus) is slightly bent, the vesica is multiple lobed, one of the basal lobes slightly scobinated, but without distinct carinal plate.

Flight period. Data are present from the months January, May, and October.

Similar species. No confusion is possible with any other known species.

Etymology. The markings on the forewing have the form of a mosaic-like emblem.

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