The Australasian Genus Scotocyma Turner (Lepidoptera: Geometridae: Larentiinae)

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Introduction
The Larentiinae, a large subfamily of the looper moth family Geometridae, has a worldwide distribution, with the highest species diversity in temperate regions [1]. The larentiine genus Scotocyma is atypical for the subfamily in this respect because it occurs mainly in tropical and subtropical regions. The genus contains medium-sized, rather uniformly brownish-coloured moths. The male and female genitalia have the best diagnostic characters for precise species identification. Nevertheless, in most species the genitalia have not been studied so far, which revealed the need to a critical revision of the genus. A revision of the genus Scotocyma has been done recently [4, 5].

The results are as follows:
• Keys to species and distribution maps were provided;
• A phyllogenetic analysis was performed to test the monophyly of the genus;
• Distribution patterns of the species were examined;
• A biogeographic discussion was included;
• The tribal position of the genus was clarified. Some results of this study are presented here.

Nomenclature of the genitalia

<table>
<thead>
<tr>
<th>Species</th>
<th>Male</th>
<th>Female</th>
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<tbody>
<tr>
<td>S. sumatrensis</td>
<td>1 - male genitalia, amura; 2 - oenotus; 3 - female genitalia.</td>
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<tr>
<th>Structures</th>
<th>Male</th>
<th>Female</th>
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<tr>
<td>a - antrum; c - cecum; ca - calcar; cb - corpus bursae; cs - comb-like structures; cos - costa valvae; d - diverticulum; db - ductus bursae; hsm - head-shaped membrane; lta - lateral tegmental arm; ps - papillae anales; ph - patches of hair; ps - patch of sclerotisation; s - signum; t - tegumen; u - uncus; elv - elytra; vinc - vinculum.</td>
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Diagnosis

• Male genitalia. Uncus simple or broadened distally; valvae narrowed medially, with comb-like structures or their rudiments; calcar present; acdegus thick and short.
• Female genitalia. Antrum large, sclerotised, broadened distally, folded; corpus bursae membranous, with patches of sclerotisation on its ventral and dorsal sides, with large diverticulum; ductus seminalis inserted ventrally on corpus bursae; signum present.

The Australasian Genus Scotocyma is widespread in the Australasian region from Papua New Guinea in the west, to Samoa Islands in the east, including the north and central-eastern Australia and New Caledonia, Borneo, Sulawesi, and Sumatra.

Habitat
The species of the genus Scotocyma occur mainly in the subtropical and tropical primary forest at moderate to rather high elevations of 340-1800 m. The Scotocyma species seem to be rare, since few specimens were obtained in most areas, even where collecting has been strategic and intensive.

Distribution

The genus Scotocyma is widely distributed in the Australasian region from Papua New Guinea in the west, to Samoa Islands in the east, including the north and central-eastern Australia and New Caledonia, Borneo, Sulawesi, and Sumatra.

Results

The phylogenetic analysis was performed using PAUP* version 4b10 [6]. Bremer support values were calculated with AutoDecay version 4.0 [2] and PAUP*. The figure below (strict consensus tree) was prepared using MacClade version 3.07 [3].

Outgroups

Two species of the genus Visiana s.l., namely V. sordidata (Moore), the type species of the genus, and “V.” excentrata (Gueneé) were chosen as outgroup taxa for the phylogenetic analysis because they are presumably closely related to the species of the genus Scotocyma.

References