



A new species of bee-mimicking clearwing moth (Lepidoptera: Sesiidae) from Thailand, with description and video of its behaviour



Marta Agnieszka Skowron Volponi^{a,*}, Paolo Volponi^b

^a Department of Molecular Biology, Faculty of Biology, University of Gdansk, Wita Stwosza 59, 80-308 Gdansk, Poland

^b ClearWing Foundation for Biodiversity, ul. Podczaszyńskiego 11/15 m 23A, 01-866 Warsaw, Poland

ARTICLE INFO

Keywords:

Aschistophleps argentifasciata
Clearwing moth
Mimicry
Semi-evergreen rainforest
Sesiidae
Thailand

ABSTRACT

Unique footage of flight and mud-puddling behaviour of a new species of clearwing moth (Lepidoptera: Sesiidae) was filmed in its habitat in Thailand. *Aschistophleps argentifasciata*, morphologically resembling a bee, imitates its model also in the way it flies. This behavioural mimicry, as well as mud-puddling, filmed both in real-time and slow motion (500/1000 frames per second), are shown in a supplementary video and described herein. A morphological description of the new species, including male genitalia, mimicry features, differential diagnosis from closely related species and information on the habitat, time and conditions of occurrence are provided. This is the first video of the genus *Aschistophleps* ever published and this species is the first country record of *Aschistophleps* for Thailand.

Introduction

Members of the family Sesiidae are a classic example of Batesian mimicry (Robinson et al., 1994). A new species of bee-mimicking clearwing moth, *Aschistophleps argentifasciata* (Fig. 1–4), has been discovered in Thailand, being also the first record of the genus in this country. The genus *Aschistophleps* is characterised by the presence of two tufts of hair-like scales on the hind legs and elongated scales on fore and mid legs (Hampson, 1892), which together give it a “hairy” bee-like appearance. It has been recently observed that morphological mimicry in clearwing moths can be complemented by behavioural aspects, such as imitating the flight trajectory of bees and wasps (Skowron et al., 2015; Skowron Volponi and Volponi, 2017a) or sounds made by the mimicry models (Skowron Volponi and Volponi, 2017b). *A. argentifasciata* was observed and filmed flying in a bee-like manner in its natural habitat whilst mud-puddling (Supplementary Video 1). Many different hymenopterans were seen in the same area, including similar sized and shaped bees. The new species was seen several days in a row in the same area, but always only one or two individuals were present. This indicates that they do not occur in large numbers, in contrast to numerous bees flying in that location. In Batesian mimicry, being rare in comparison with the model(s) is advantageous for the mimic, because it increases the chances of not being disguised by the predator (Matthews and Matthews, 2010). This publication includes a description of mud-puddling and mimicry behaviour and a detailed video showing this sesiid in its natural habitat (where the species occurs

without being lured by sex pheromones), a morphological description, mimicry features, differential diagnosis from closely related species, habitat, time and conditions of occurrence.

Materials & methods

The study sites were in the natural habitat of the new species in two locations in Phetchaburi Province, Thailand. The type specimens were collected on the bank of Phetchaburi river (GPS coordinates: 12°53'7.74"N 99°39'28.83"E). The sesiid's behaviour was filmed using Olympus STYLUS TG-3 Tough, Sony RX10 II and Sony α7R II cameras. Slow-motion videos were filmed in 500 and 1000 fps with the Sony RX10 II. Using an electronic thermo hygrometre placed in the shade, temperature and air humidity were measured. The type specimens were collected without the use of synthetic sex attractants. Morphological details were studied with a Leica M80 stereomicroscope and photographed using a Leica M205A. Wingspan, body and antenna length were measured on a computer screen from photographs of mounted specimens taken next to a scale. Genitalia were prepared in the following steps: 1) maceration of the abdomen in boiling 10% KOH for app. 1 min 2) genitalia dissection in 10% ethanol 3) dehydrating by passing through 30%, 60% and 100% ethanol and 4) mounting in Euparal.

* Corresponding author.

E-mail address: marta.skowron@phdstud.ug.edu.pl (M.A. Skowron Volponi).

<https://doi.org/10.1016/j.aspen.2017.12.007>

Received 13 July 2017; Received in revised form 16 October 2017; Accepted 28 December 2017

Available online 29 December 2017

1226-8615/ © 2018 Korean Society of Applied Entomology and Taiwan Entomological Society. Published by Elsevier B.V. All rights reserved.

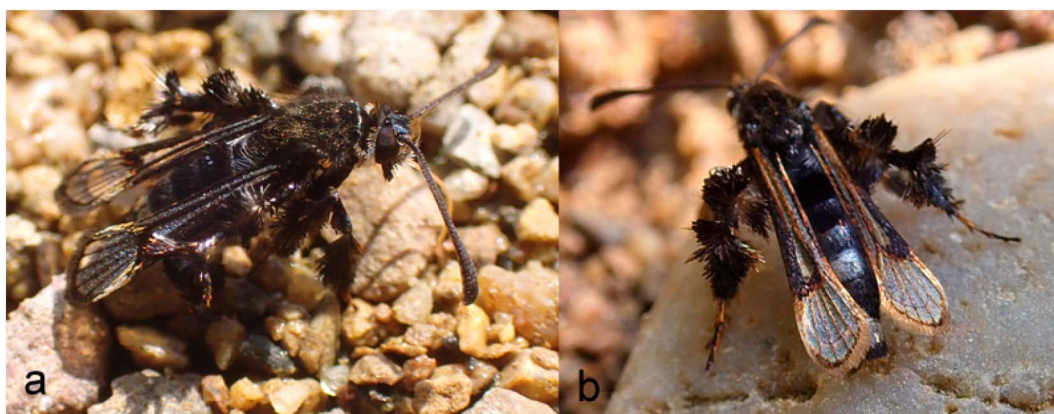


Fig. 1. *Aschistophleps argentifasciata* mud-puddling on moist pebbles. This species varies in the colouration of forewing scales and cilia. a) black forewing cilia, veins and margins with white and creamy yellow scales on discal spot extending to coastal and anal margins and b) orange scales around anterior transparent area and on margins, light brown cilia. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)



Fig. 2. ♂ Holotype of *Aschistophleps argentifasciata*.

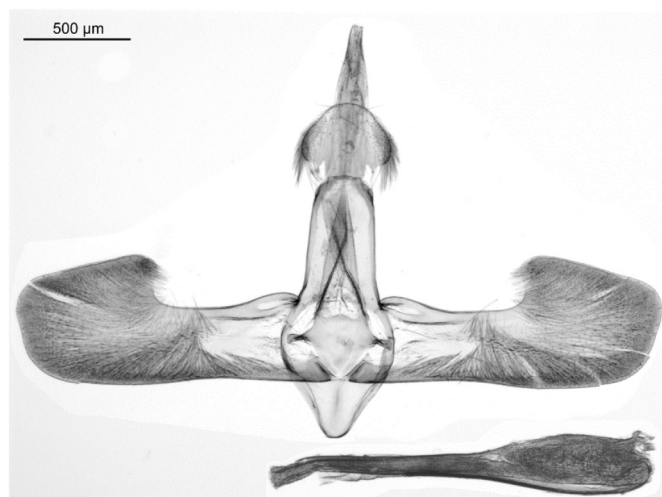


Fig. 3. Male genitalia of *Aschistophleps argentifasciata*.

Results

Aschistophleps argentifasciata sp. novum

ZooBank ID: urn:lsid:zoobank.org:pub:036E86BD-5392-4CCE-8345-BFFD99692F36.

Types

Holotype ♂, pinned (Fig. 2). Original labels: “Thailand: Phetchaburi, 11 II 2017, Skowron Volponi M.A.” “Holotype, *Aschistophleps argentifasciata* sp. n., des. Skowron Volponi and Volponi, 2017a”. Deposited in the Natural History Museum in London.

Paratype ♂, pinned. Original labels: “Thailand: Phetchaburi, 06 II 2017, Skowron Volponi M.A.” “Paratype, *Aschistophleps argentifasciata* sp. n., des. Skowron Volponi M.A. 2017”. Abdomen utilised for genitalia dissection. Private collection of Marta Skowron Volponi.

Morphological description

Wingspan: 12–14.5 mm; body length: 6.5–8 mm; antenna length: 3.5–4 mm.

Antenna: strongly clavate, black dorsally, yellow with some black scales ventrally, several larger black and white scales at base, needle-like seta at apex.

Head: frons smooth-scaled with several white setae, grey with white thin stripes on lateral margins; vertex with elongated scales, black with blue sheen; labial palpi long and upturned with elongated scales black basally and white medially on ventral side, creamy yellow apically (Fig. 1a, Supplementary Video 1 time code [TC] 00:49–00:56); proboscis long, orange; pericephalic hairs white ventrally and creamy yellow to orange with several black hairs dorsally; compound eyes brown; ocelli black.

Thorax: covered with white hair-like scales on background of smooth black scales with metallic sheen, faint, dashed orange line running longitudinally on mesothorax medially (Fig. 1a); patagia white; patch of white scales laterally; long white and black hairs at wing insertion.

Abdomen: tergites 1–3 and 6–7 black; tergite 4 black with slight silver sheen; tergites 5 and 8, as well as posterior margin of 4th and 7th tergite, black with intense silver sheen in sunlight (Supplementary Video 1 TC 00:22–00:23, 01:19–01:22); sternite 1 black; sternite 2 black with several creamy yellow scales on distal margin; sternites 3–6 black with white stripe on distal margins; sternites 7–8 black; anal tuft small, black.

Legs: fore and mid femur smooth-scaled, grey; fore and mid tibia and 1st tarsomere tufted with hair-like scales: mixture of black with metallic sheen, white and creamy yellow to orange (Supplementary Video 1 TC 00:49–00:56); fore and mid tarsomeres 1 and 5 black, 2–4 creamy yellow to orange proximally, black distally; hind femur smooth-scaled, black with silver sheen; hind tibia with two tufts of hair-like scales separated by smooth (black dorsally and white ventrally) scales medially (Fig. 1): tufts black with metallic sheen, band of white scales on proximal tuft, some creamy yellow to orange scales ventrally on tufts and spurs, distal tuft extending to 1st tarsomere; tarsomeres black with

Download English Version:

<https://daneshyari.com/en/article/8883111>

Download Persian Version:

<https://daneshyari.com/article/8883111>

[Daneshyari.com](https://daneshyari.com)