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A new species of clearwing moth (Lepidoptera: Sesiidae: Osminiini) from Peninsular Malaysia, exhibiting bee-like morphology and behaviour

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Abstract

A new species of Sesiidae, tribe Osminiini from Peninsular Malaysia, *Heterosphecia pahangensis* Skowron, displaying numerous bee-mimicking features, is described. DNA barcodes showed significant differences with related taxa. However, the paucity of Sesiidae barcodes from Southeast Asia prevents meaningful taxonomic comparisons. The closest match out of published data on Sesiidae barcodes is *Heterosphecia bantanakai*, Arita & Gorbunov (2000a) from the tribe Osminiini, which has 9.98% sequence divergence from *Heterosphecia pahangensis*. Photographs of the moth in its natural habitat are shown. Behavioural aspects, such as mud-puddling and mode of flight, are described and presented in a video.

Key words: *Heterosphecia*, mimicry, new species, *pahangensis*, Malaysia

Supplementary data: link to video: <https://vimeo.com/136088402> password: pahangensis

Introduction

Representatives of the family Sesiidae are known for their excellent mimicry of wasps and bees (Robinson *et al.* 1994) which is widespread across different genera. For example, members of *Dasysphecia* are thought to be mimics of the genus *Bombus* (Kallies & Arita 2005) whereas *Podosesia syringae* is a wasp mimic (Webster 1897). The mimicking characteristics include partially hyaline, narrow wings, the presence of hair-like scales on the legs and other parts of the body, simple and often clavate antennae, and brightly coloured bands on the abdomen.

A new species of clearwing moth exhibiting bee-like morphology and behaviour was discovered in Peninsular Malaysia and is described here. DNA sequencing of the COI gene indicated that it belongs to the tribe Osminiini Duckworth and Eichlin (1977) and is closely related to *Heterosphecia* Le Cerf (1916), *Aschistophleps* Hampson (1892), and *Pyrophleps* Arita and Gorbunov (2000a). Morphological similarity to the mentioned genera confirms these results. Taking into consideration the work of Arita and Gorbunov (1995, 2000a, 2000b) and Kallies (2003) the new species is placed in the genus *Heterosphecia*. It is the eighth species belonging to this genus and first from Peninsular Malaysia.

Material and methods

Field observations involved temperature and humidity measurements, pheromone, honey and salt lure testing as well as advanced photographic documentation. Pheromone lures for the following species were tested: *Sesia apiformis*, *Paranthrene tabaniformis*, *Pennisetia hylaeiformis*, *Synanthedon tipuliformis*, *S. vespiformis*, *S. myopaeformis* (Pherobank, Wageningen, Netherlands). Each lure was placed at the type locality on a different day and observed from around 10 am to 5 pm, however they failed to attract any sesiids.