

A NEW GENUS OF SCUTTLE FLY (DIPTERA: PHORIDAE) FROM MALAYSIA

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ABSTRACT

Imparphora gen. nov., a new genus of scuttle fly is described from Malaysia. The *Imparphora pahangensis* sp. nov. is the type species of the new genus. A total of six mature females species and a male were collected from baited traps along UKM's Trail at Fraser's Hill Research Centre, Pahang. These findings expand the species diversity of scuttle flies in Malaysia especially in the highland forest. The comparisons with the nearest genera were explained herein.

Key words: Taxonomy, Diptera, Phoridae, new genus, new species, Fraser's Hill, Malaysia.

ABSTRAK

Imparphora gen. nov., genus baharu lalat mencalai dari Malaysia diperihalkan. *Imparphora pahangensis*, sp. nov. ialah spesies tip untuk genus baharu ini. Sebanyak enam spesies lalat dewasa betina dan satu jantan disampel daripada perangkap umpan di sepanjang Denai UKM di Pusat Penyelidikan Bukit Fraser, Pahang. Penemuan ini mengembangkan lagi maklumat kepelbagaian spesies lalat ini di Malaysia, khususnya di hutan tanah tinggi. Perbandingan dengan beberapa genus terdekat juga turut diuraikan.

Kata kunci: Taksonomi, Diptera, Phoridae, genus baharu, spesies baharu, Bukit Fraser, Malaysia

INTRODUCTION

Scuttle flies (Diptera: Phoridae) are a group of small flies with a broad spectrum of habitats and ecologies. Information on scuttle flies in Malaysia is still scarce although several species have been discovered from various environments in Malaysian lowland with unique and sexually dimorphic characteristics (Disney & Fayle 2008; Disney et al. 2009; Maruyama et al. 2008; Zuha & Disney 2017). The findings of new scuttle fly species of Malaysian

highland forest, were only limited to descriptions by Borgmeier (1966 & 1967), based on *Megaselia* species collected from Cameron Highlands, Pahang. To study the species diversity of scuttle flies in a Malaysian highland forest, a survey was carried out. In the current research, RMZ collected six females and a male from Fraser's Hill, Pahang, which failed to key out in the key to genera (Disney 1994). RHLD then concluded these represent a new genus, which we describe below.

MATERIALS AND METHODS

During an expedition to Universiti Kebangsaan Malaysia (UKM) Fraser's Hill Research Centre on 9-11 February 2018, a survey on local Phoridae was conducted. On 10 February 2018, a total of 10 baited traps consisting decomposed cow's liver in plastic vials were placed along approximately 70m UKM's Trail (3.728°N, 101.711°E and 969.5-988.5m above sea level). Traps were checked on the next day and specimens were preserved in 70% by RMZ. HD slide mounted them in Berlese Fluid (Disney 2001).

TAXONOMY

Imparphora gen. nov. (Figs 1-18)

Type species: *Imparphora pahangensis* sp. nov.

Diagnosis. Postpedicels longer than broad. Supra-antennal bristles, antials and anterolateral bristles situated close to the eye margins and situated vertically one below the other. Mesopleuron bare. Scutellum with an anterior pair of small hairs and a posterior pair of bristles. Male hypopygium with a very long slender anal tube and robust bristles at tip of proctiger, the hypandrial lobes are vestigial. The tibial spurs are reduced to small bristles except on the mid tibia of the male. Front tarsi with posterodorsal hair palisades on all five segments. A dorsal hair palisade on mid tibia in male only and on hind tibiae on both sexes. Hind tibia with posterodorsal bristles. Wing with subcosta ending well before vein 1, vein 3 is unforked, with section 1 about twice as long as 2, and costal index less than 0.4. Costal cilia only about 0.04 mm long.

Etymology. *Impar*, meaning odd plus *Phora*, the type genus of the family.

Remarks: In the key to world genera (Disney 1994) the male runs to couplets 129 and 130. Its hypopygium clearly differs from *Cremersia* Schmitz, whose anal tube is only about as long as the epandrium and is broader than usual. It differs from *Melaloncha* Brues, whose costal index is about half the wing length and whose anal tube is only about 1.5 times as long as the epandrium and has numerous (at least 50) short hairs and no differentiated hairs at tip of proctiger. *Apocephalus* Coquillett likewise has a longer costa, in addition it has a pair of frontal bristles close to median line, its variable anal tube is sometimes almost as long but not so slender. In the key to females it runs to couplet 178 to *Apocephalus* and *Pseudacteon* Coquillett. The ovipositor sheath resembles that of *Apocephalus*, but the wing and frontal bristles exclude it. The wing closely resembles that of *Pseudacteon* but the latter's ovipositor sheath is short.

***Imparphora pahangensis* sp. nov.** (Figs 1-18)

Specimens Examined: Holotype male, Malaysia, Pahang, Fraser's Hill, 3.728°N, 101.711°E, 11. II. 2018, baited trap, Raja Muhammad Zuha (University of Cambridge Museum of Zoology, 41-55). Paratypes: 2 females as holotype, similar locality.

Description. Male. Head as Fig. 2 and frons as Fig. 3. Side of thorax as Fig. 4. Front leg as Fig. 5. Mid femur and tibia as Fig. 6. Hind leg as Fig. 7. Hypopygium as Figs 8 & 9. Wing as female (Fig. 1) but 1.45 mm long, costal index 0.33, costal ratios 2.58: 1, costal cilia 0.05 mm long, outermost axillary bristle being 0.10 mm long. Haltere as female (Fig. 1).

Female. Whole fly as Fig. 1. Postpedicels, palps and proboscis as Fig. 10. Frons as Fig. 11. Side of thorax as Fig. 12. Abdomen as Fig. 13. Wing as Figs 17 & 18, being 1.24 mm long. Costal index 0.35, costal ratios 2.24: 1. Costal cilia 0.04 mm long. With 3 axillary bristles, the outermost being 0.07 mm long. No hair at base of vein 3. Haltere (Fig. 1) with pale stem and brown knob.

Etymology. Named after the type locality Pahang, a state located at East-coast of Peninsular Malaysia.

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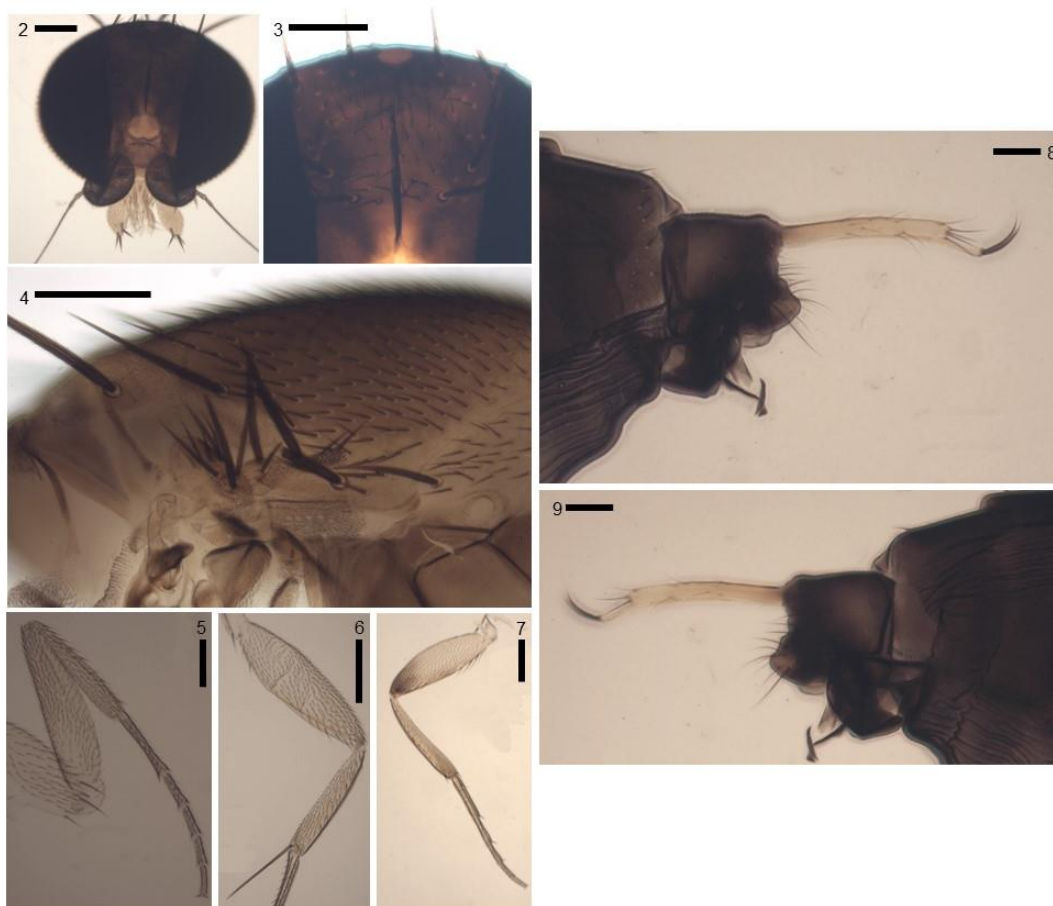
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REFERENCES

- Borgmeier, T. 1966. Studies on Indo-Australian phorid flies, based mainly on material of the Museum of Comparative Zoology and the United States National Museum (Diptera, Phoridae). *Studia Entomologica, Petropolis* 9: 129-348.
- Borgmeier, T. 1967. Studies on Indo-Australian phorid flies, based mainly on material of the Museum of Comparative Zoology and the United States National Museum (Diptera, Phoridae). Part II. *Studia Entomologica Petropolis* 10: 81-276.
- Disney, R.H.L. 1994. *Scuttle Flies: The Phoridae*. London: Chapman & Hall.
- Disney, R.H.L. 2001. The preservation of small Diptera. *Entomologist's Monthly Magazine* 137: 155-159.
- Disney, R.H.L. & Fayle, T.M. 2008. A new species of scuttle fly (Diptera: Phoridae) parasitizing an ant (Hymenoptera: Formicidae) in Borneo. *Sociobiology* 51(2): 327-332.
- Disney, R.H.L., Neoh, K.B. & Lee, C.W. 2009. A new species of scuttle fly (Diptera: Phoridae) parasitizing a termite (Isoptera: Termitidae) in Malaysia. *Sociobiology* 54(1): 89-94.
- Maruyama, M., Disney, R.H.L. & Hashim, R. 2008. Three new species of legless, wingless scuttle flies (Diptera: Phoridae) associated with army ants (Hymenoptera: Formicidae) in Malaysia. *Sociobiology* 52(3): 485-496.
- Zuha, R.M. & Disney, R.H.L. 2017. Records of *Woodiphora* Schmitz (Diptera: Phoridae) from animal carcasses in Bangi, Malaysia. *Serangga* 22(1): 161-177.



Fig. 1 *Imparphora pahangensis* sp. nov. female. (Bar=500 μ m).



Figs 2-9 *Imparphora pahangensis* sp. nov. male. 2, head; 3, frons; 4, side of thorax; 5, front leg; 6; mid femur and tibia; 7, hind leg; 8-9, hypopygium. (Bar=100µm).



Figs 10-18 *Imparphora pahangensis* sp. nov. female. 10, postpedicels to proboscis; 11, frons; 20, side of thorax; 13, abdomen; 14, front leg; 15, middle femur to basitarsus; 16, hind femur and tibia; 17, wing; 18, basal half of wing. (Bar=100 μ m).