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THE BLOW FLIES FROM SARAWAK, EAST MALAYSIA (DIPTERA: CALLIPHORIDAE), WITH PRACTICAL KEYS AND A CHECKLIST

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ABSTRACT

The collection of Calliphoridae made by the first author during the surveys in Sarawak, East Malaysia in 2007 and 2008 is dealt with. A total of 20 genera and 40 species are listed. *Sumatria brevis* James, 1966 is newly recorded from Malaysia. Revised keys to the Malaysian species are provided to include the newly recorded one.

Keywords: blow flies, Calliphoridae, East Malaysia, keys, Sarawak

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INTRODUCTION

The present study is a partial result of the project entitled " Study on taxonomy and bionomics of two winged flies, Diptera in Sarawak, East Malaysia" and conducted with the coordination and cooperation with the Sarawak Museum in Kuching. It was initiated in 2005 when the Japanese team (Representative: Dr. I. Miyagi) collected and identified mosquitoes and flies for the Sarawak Museum collection and database. It was our sincere intention to assist the Sarawak Museum (Sarawak Government) in collecting and documenting the complete fauna and bionomics of two-winged flies in Sarawak over the years. The research was carried out in various habitats such as primary forests, farms, mangroves and beaches including some parts of National Parks from 2005 to 2008. The present study is the partial result of surveys made mainly in 2007 and 2008. We had already published the result of surveys in 2005 and 2006 (Kurahashi and Leh, 2007). The researchers obtained the necessary permits from the Director of Sarawak Forest Department to conduct research on Diptera (two-winged flies) for taxonomic studies.

During the field survey in our collaborated project, the first author tried to collect flies in different localities and various habitats in order to

make a good series of reference collections for the Sarawak Museum (Natural History Reference Collection), Kuching. The collected samples were mounted with insect pins in good order. All specimens were sorted into subfamilies. We have examined 20 genera and 40 species of Calliphoridae. Among 37 species, we found one species as a new record for Malaysia. New country records are marked with an asterisk (*). The previous keys (Kurahashi, 1997) to the Malaysian species are revised to include the newly recorded species (Chin *et al.*, 2008) and all species are rearranged by the modern systematics of subfamilies and new generic combinations (Fan, 1992; Rognes, 1997; Pape and Arnaud, 2001).

Identified specimens are mostly preserved in the Sarawak Museum (Natural History Reference Collection), Kuching. Some were shared and deposited in several museums such as the National Science Museum, Tokyo (NSMT); Bishop Museum, Honolulu (BPBM); Carnegie Museum Natural History, Pittsburgh (CMNH); British Museum Natural History, London (BMNH). Names of museum are indicated in ( ) in the list of species below.

Practical keys

Key to the subfamilies of Malaysian Calliphoridae

1. Stem vein of wing without setulae on dorsal side of basal section 2
– Stem vein of wing with distinct setulae on posterodorsal side of basal section 3

2. Anterior lappet of metathoracic spiracle with conspicuous backwardly directed tuft of long hairs; postscutellum forming definite convex swelling which is microrugose and sometimes shows slight trace of shallow median incision; female postabdomen non-telescopic, modified for deposition of grown larvae; large tachinid-like flies .... Subfamily AMENIINAE
– Anterior lappet of metathoracic spiracle bare or at most with a very few small inconspicuous hairs; postscutellum not at all convex or at most with rudimentary trace of swelling, not as above; female postabdomen forming telescopic ovipositor, but sometimes short in larviparous species for deposition of first instar larvae 4

3. Subalar knob with erect hairs; thoracic squama largely lobulate, subtruncate at apex, concave on outer margin, haired in parts of upper surface; upper occiput without glossy submarginal band ..... Subfamily CHRYSOMYINAE
– Subalar knob bare or without distinct hairs; thoracic squama usually tougue-like, narrowly rounded at apex, straight on outer margin, rarely lobulate in some species of *Isomyia*; bare glossy submarginal band on upper occiput extending almost entirely across its width ..... Subfamily RHINIINAE

4. Propleuron hairy 5
- Propleuron bare 7

5. Posterior part of suprasquamal ridge with posterior parasquamal tuft of black setulose erect hairs on small well-defined black sclerite ..... Subfamily LUCILIINAE
- Posterior parasquamal tuft absent 6

6. Supraspiracular convexity clothed with long, upstanding, fine hairs; anterior part of suprasquamal ridge bare; distance between right and left presutural *ac* rather large; mesothoracic spiracle rather large, sometimes swollen .... Subfamily PUMOSIINAE, *Phumosia* Robineau-Desvoidy
- Supraspiracular convexity bare or pubescent ..... Subfamily CALLIPHORINAE

7. Prosternum usually hairy except for bare in *Verticia;* thorax not clothed with golden curly hairs; eyes dichoptic in ♂ and ♀; body at least partly yellowish .... Subfamily BENGALIINAE
- Prosternum bare; thorax usually with golden curly hairs, if no curly hairs, head holoptic in ♂ and ♀ and body black in ♂ and ♀ 8

8. Thorax clothed with fine tawny-coloured crinkly hairs; presutural *ia* absent; body at least on part testaceous yellow; parafacial bare; *ac* 0-1+1-2 .... Subfamily POLLENIINAE *Dexopollenia* Townsend
- Thorax without crinkly hairs or with white hairs; presutural *ia* present; body variable in colour but usually thorax fuscous to black; parafacial setulose; *ac* 1-2+3 .... Subfamily MELANODEXIINAE

Subfamily AMENIINAE

Key to the tribes and genera of AMENIINAE

1. Head almost always with very large facial carina; propleuron and prosternum almost always haired; hind tibia with apical *pd;* outer *ph* situated mesad of *prs;* ventral surface of costa setulose between apices of subcostal (Sc) and first longitudinal (R1) veins .... Tribe **Ameniini,** *Silbomyia* Maquart
- Head without facial carina; propleuron bare: prostenum bare, sometimes hairy; hind tibia without apical *pv;* outer *ph* situated lateral of *prs;* ventral surface of costa bare between apices of veins Sc and R1 .... Tribe **Catapicephalini,** *Catapicephala* Macquart

Tribe **Ameniini**

Key to the species of *Silbomyia*

1. Frontal stripe 2.4-2.8 x as broad as width of parafrontal (Kurahashi, 1997: 10, Fig.1a); parafrontal and parafacial yellowish-white pollinose, with brilliant creamy white or silvery appearance in certain incidence of light ..... *S. asiatica* Crosskey
- Frontal stripe 1.4-1.7 x as broad as width of parafrontal (Kurahashi, 1997: 10, Fig.-1b), parafrontal correspondingly broad; anterior 1/2 of parafrontal and parafacial silvery white pollinose in ♂, entirely golden-yellow pollinose in ♀ ..... *S. metallica* Crosskey