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Illustrated larval key to lepidopteran pests of rice in Malaysia

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Here we provide an illustrated key to lepidopteran larvae that occur as pests on rice (*Oryza*) in Malaysia. We are unaware of a published key for this region for this vital commercial crop, and hence provide one based on easily observable features that could be useful for identification, early detection, and pest management by specialists and non-specialists alike (see discussion in Mukerji & Singh 1951, Sri *et al.* 2010, Timm *et al.* 2007, Tillmon *et al.* 2000, Wagener *et al.* 2004).

Larvae were sampled by hand from seven paddy fields in Peninsular Malaysia: Kg. Padang Malau, Beseri, Perlis (N6.33° E100. 13°), Pokok Sena, Kota Setar, Kedah (N6.9° E100.32°), Kg. Parit Rawi, Seberang Perak (N4.8° E100.53°), Parit 7B, Seberang Perak (N4.4° E101.5°), and Parit Hj. Kassim, Bagan Serai (N5.1° E100.32°) in Perak, Kg. Mampas, Terachi, Negeri Sembilan (N2.44° E102.9°) and Kg. Jelapang, Setiu, Terengganu (N5.25° E102.50°). All larvae were reared individually in 7.5 x 7.5 cm plastic containers in the laboratory, and taxonomic identification was based on Stehr (1987), Passoa (1991) and Victor *et al.* (2004). Photographs were taken using QuickPHOTO MICRO 2.3 on an Olympus' E330-ADU1X camera attached to Olympus' SZX10 microscope and edited with software Photoscape Version 3.6.3. Key construction follows Goulet & Huber (1993).

Definitions and terminology for last instar larval characters in the key are as follows: *Adfrontal suture*, *epicranial suture* = grooves in the “face” of the larva; *Epicranial notch/vertical triangle* = area where the epicranial suture reaches the edge of the head capsule; *Prothoracic (T1) shield* = darkened plate on top of the first thoracic segment; *Seta (plural: setae)* = hair-like projections from the skin (sometimes called spines, bristles); *Primary setae* = microscopic/proprioceptor setae; *Secondary setae* = long ortactile setae that can scattered over the cuticle, or as dense tufts or hair pencils; *Pinaculum (plural: pinacula)* = small, flat, hardened area of skin from which one or more setae arise; *Chalaza (plural: chalazae)* = pinacula that are distinctly elevated, cone-shaped and bear a single seta; *Tuberculate base* = tubercle base that bears seta/ setae; *Anal comb* = also called anal fork, used for flipping frass; *Prolegs* = paired ventral muscular outgrowths of the body wall; *Crochets* = small hooks arranged in rows or circles around the edge of the planta.

Larvae of nine species in four lepidopteran families were found during our sampling: *Melanitis leda* (L.) (Nymphalidae); *Parnara guttata* Bremer & Grey, *Pelopidas mathias* (Fabr.) (Hesperiidae); *Cnaphalocrocis medinalis* (Guenee), *Marasmia patnalis* Bradley (Pyralidae); *Spodoptera mauritia* (Bdv.), *Spodoptera* sp., *Mythimna venalba* (Moore), *Mythimna loreyi* (Duponchel) (Noctuidae).

Illustrated key

- 1a. T1 constricted giving appearance of a ‘neck’.
 - b. Body with numerous secondary setae arising from chalazae on each segment.....2
- 1’aa. T1 not constricted.
 - bb. Body without secondary setae 3