NATURE IN SINGAPORE 2010 **3**: 167–170
Date of Publication: 26 August 2010

FINAL INSTAR CATERPILLAR AND METAMORPHOSIS OF *ECTROPIS BHURMITRA* (WALKER, 1860) IN SINGAPORE (LEPIDOPTERA: GEOMETRIDAE: ENNOMINAE)

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INTRODUCTION

The geometrid genus *Ectropis* Hübner belongs to the tribe Boarmiini and is represented by approximately 100 species around the world (Holloway, 1993; Sato, 2007). In Borneo, four species have been documented (Holloway, 1993). For Indonesia, eight species are known (Sato, 2007). For Singapore, just one species—*Ectropis bhurmitra* (Walker, 1860) has been identified thus far. This species has a broad Asian-Pacific distribution, having been recorded from Sri Lanka (type locality), India, Taiwan, the Philippines, Thailand, Peninsular Malaysia, Borneo, Sumatra, Java, Sulawesi, Buru, New Guinea, and the Solomon Islands (Sato, 2007). The final instar larva is hereby described, based on a Singapore specimen reared to metamorphosis.

OBSERVATIONS

On the afternoon of 8 Jan.2010 (ca.1430 hrs), a final instar geometrid larva was found actively feeding on the young, tender leaves of a *Terminalia catappa* (family Combretaceae) sapling at Hindhede Nature Park, Bukit Timah. It was then collected to be reared for confirmation of its identity. The larva had a total length of 32 mm, with an overall coffee brown colour (Figs. 1–3). On its flanks, there was a double lateral black band above the pale spiracular zone (Fig. 1). On its dorsum, there was a continuous, grey-brown mid-dorsal band, interspersed with both pale and dark flecks (Fig. 2). On its underside, a mid-ventral band was also noticeable, becoming increasingly paler towards the posterior (Fig. 3).

Fig. 1. Lateral view of final instar caterpillar of *Ectropis bhurmitra* (head towards right), first encountered at Hindhede Nature Park, Bukit Timah on 8 Jan.2010. It was feeding on the young leaves of its hostplant *Terminalia catappa* (Combretaceae). When not feeding, it extended its body outwards and bore a striking resemblance to a brown twig.

Fig. 2. Dorsal view of final instar caterpillar (as in Fig. 1). Its total length is 32 mm.

Fig. 3. Ventral view of final instar caterpillar (as in Figs. 1, 2). Note silken thread produced from its labium.

On the night of 9 Jan.2010, the larva began to exhibit pre-pupal symptoms. It had ceased feeding and was contracting its body and releasing fluids from within at the same time. However, there was no attempt to weave a silken cocoon onto adjacent leaves or around itself. By the night of 10 Jan.2010, pupation was already complete. The pupa, measuring 15 × 5 mm, was a dark caramel colour (Fig. 4). Its cremaster was tipped with a pair of sharp spines. In the afternoon of 18 Jan.2010, a well-formed adult moth emerged and was determined to be a female *Ectropis bhurmitra* (Fig. 5). It was comparable to previously published illustrations for this species (e.g., Holloway, 1993: Pl. 14—moth 25; Sato, 2007: 206—Fig. 1). Among the Bornean species, *Ectropis longiscapia* Prout, 1926, would be most closely allied to *Ectropis bhurmitra*. However, there is distinct altitudinal separation between the two, with *Ectropis longiscapia* inhabiting the upper montane forest, whereas *Ectropis bhurmitra* resides in lowland forests (Holloway, 1993).

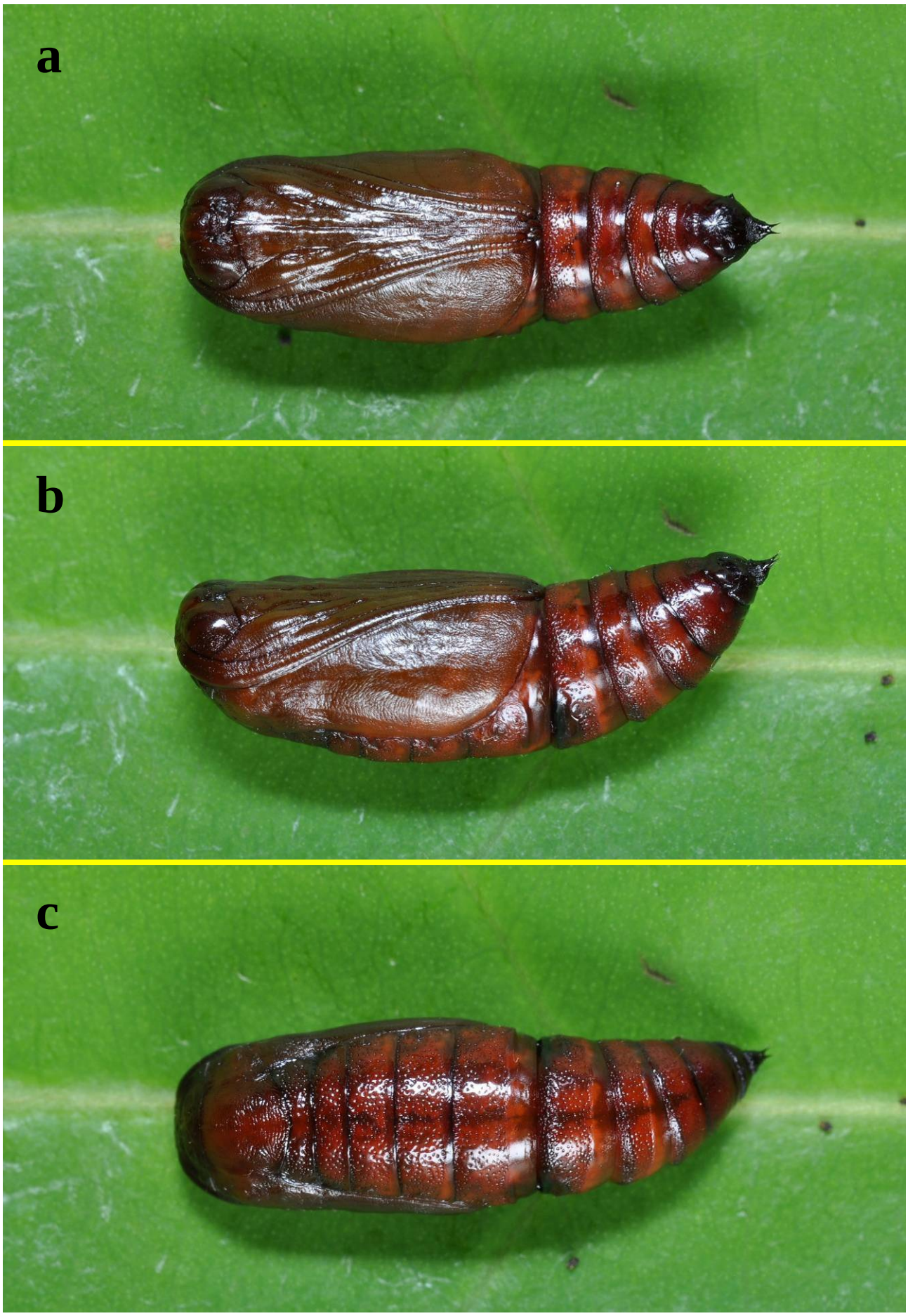

Fig. 4. Ventral (a), lateral (b), and dorsal (c) views of the pupa (15 by 5 mm). Pupation was complete by the night of 10 Jan.2010. Note pair of terminal spines on its cremaster.

Fig. 5. Newly emerged female moth (ZRC.LEP.278, body length: 15 mm, forewing length: 16 mm), eclosed in the afternoon of 18 Jan.2010.

The female specimen was preserved as a voucher specimen at the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research, National University of Singapore, with measurements of its body length (BL) and forewing length (FW) acquired. It was catalogued as ZRC.LEP.278 (BL: 15 mm, FW: 16 mm). In the ZRC Lepidopteran collection, a male *Ectropis bhurmitra* specimen from Singapore was previously deposited (ZRC.LEP.279, BL: 14 mm, FW: 16 mm), coll. Nature Reserves Survey, 28–29 May 1992, Nee Soon Swamp Forest. There is also a historical specimen of this species from Peninsular Malaysia (ZRC.LEP.280, male, BL: 13 mm, FW: 16 mm), coll. H. M. Pendlebury, 7 Sep.1924, at light, Kuala Lumpur, Selangor.

The caterpillars of this moth are known to be highly polyphagous. Throughout its geographical range, no less than 43 genera (in 29 families) have been cumulatively recorded as larval hostplants (Holloway, 1993; Robinson et al., 2010). In Sri Lanka, this moth has been previously regarded as an agricultural pest of tea (*Camellia sinensis*, Theaceae) plantations (Danthanarayana & Kathiravetpillai, 1969). In Europe, representative species of *Ectropis* have very variable larvae and are consistently twig mimics as well (South, 1961).

ACKNOWLEDGEMENTS

I wish to thank Kelvin K. P. Lim and Lua Hui Kheng for facilitating access to the ZRC Lepidopteran collection to examine the geometrid specimens. A proficient lepidopterist reviewer kindly responded with both speed and substance.

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