

**FINAL INSTAR LARVA AND METAMORPHOSIS OF THE MOTH
EUPTEROTE NAESSIGI HOLLOWAY, 1987 IN SINGAPORE
(LEPIDOPTERA: EUPTEROTIDAE: EUPTEROTINAE)**

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INTRODUCTION

The most recent revision of the family Eupterotidae proposed an assignment of its members into five groups, namely: (1) a basal ‘*Ganisa*–group’, (2) Janinae, (3) Striphnopteryginae, (4) Eupterotinae, and (5) Panacelinae (Oberprieler et al., 2003). Within the Eupterotinae in Singapore, the genus *Eupterote* Hübner is represented by three species, namely *Eupterote asclepiades* (C. Felder & R. Felder, 1874), *Eupterote naessigi* Holloway, 1987, and *Eupterote niassana* (Rothschild, 1917). Locally, the larva of *Eupterote niassana* has been previously encountered and successfully reared (Leong, 2008). Here, the diagnostic final instar larva and metamorphosis of *Eupterote naessigi* is described from an encounter in the Central Catchment Nature Reserve (CCNR), Singapore. This species was first described based on type specimens from Borneo (Brunei and Sarawak) and its known geographic distribution includes Sumatra, Peninsular Malaysia, and Borneo (Holloway, 1987). It was named for a prolific German lepidopterist, Wolfgang A. Nässig, who is based at the Forschungsinstitut Senckenberg, Frankfurt (J. D. Holloway, pers. comm.).



Fig. 1. Lateral view of final instar larva of *Eupterote naessigi* feeding on its hostplant, *Bridelia tomentosa* (Euphorbiaceae), encountered at Bukit Kallang on the night of 5 Aug. 2009 (ca. 2215 hours).



Fig. 2. Dorsal view of final instar larva (as in Fig. 1). Its body length was 80 mm.

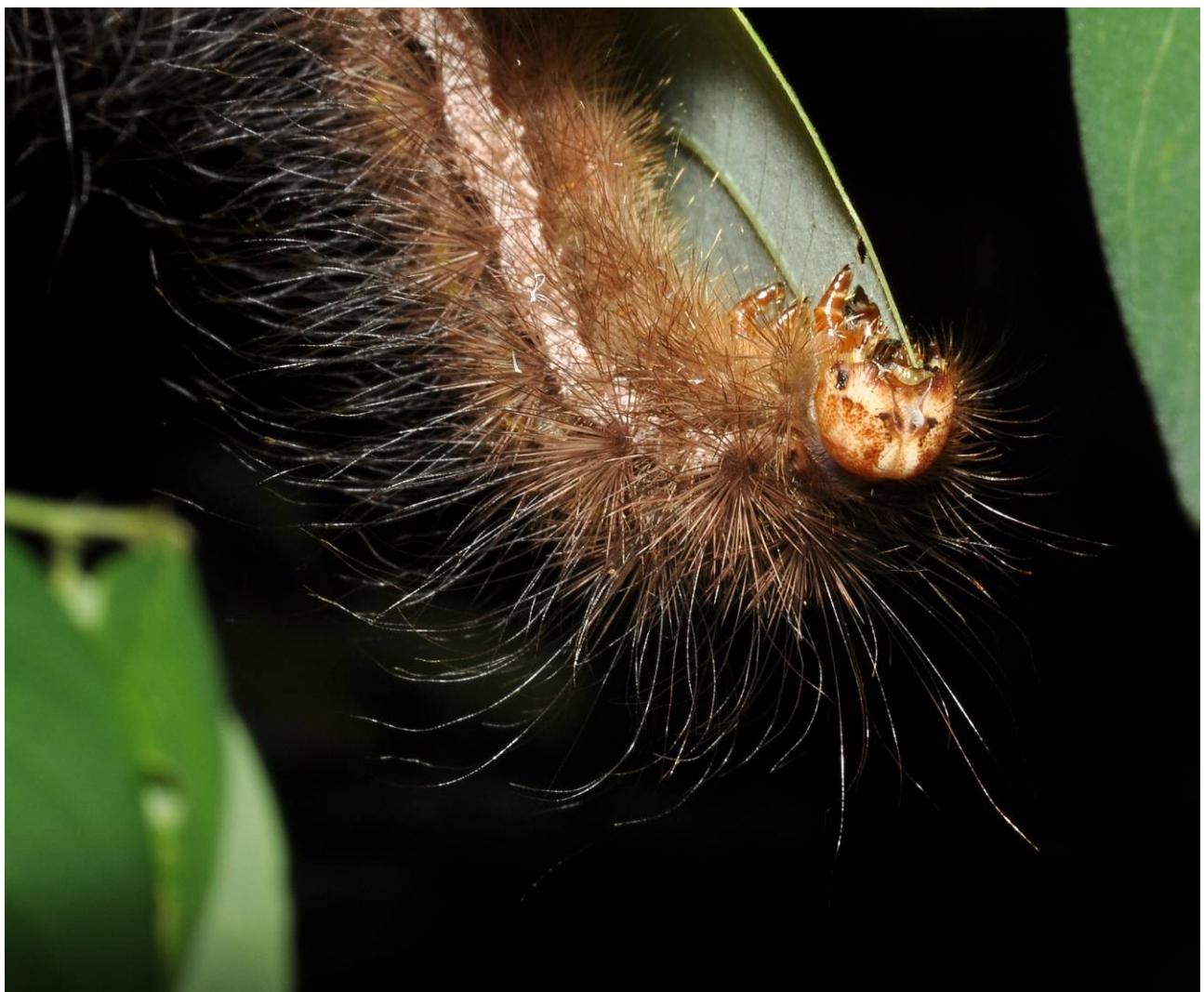


Fig. 3. Anterior close-up of final instar larva (as in Figs. 1, 2). Note dense arrangement of stiff, sharp-tipped spines and softer, longer setae radiating from its entire body.

OBSERVATIONS

On the night of 5 Aug.2009 (ca. 2215 hours), an unidentified final instar larva of a moth was encountered at Bukit Kallang, MacRitchie Reservoir forest (Fig. 1). It was actively feeding on the leaves of the local shrub, *Bridelia tomentosa* (family Euphorbiaceae), ca. 2 m above the forest floor. It had a body length of 80 mm. Its body was generally brown, with a pair of prominent longitudinal bands along the side of its thoracic and abdominal segments up to segment A9. These bands had undulating outlines and were pinkish white in colour, finely speckled with brown. Dorsally, each segment displayed a transverse black patch, centered with yellow (Fig. 2). Its head was cream coloured, with symmetrical dark brown patterns (Fig. 3). Throughout its body, there was an almost impenetrable armourment of stiff, radiating spines, interspersed with long, fine setae. This larva was then carefully reared in order to ascertain its identity upon completion of metamorphosis.

In captivity, the larva continued to feed consistently, but at a leisurely pace. On the morning of 3 Sep.2009, the larva began to enshroud itself with a loose network of leaves, held together with its own silk. In the following days, the cocoon was systematically reinforced with larval setae and spines. By 11 Sep.2009, pupation was eventually complete. The cocoon framework measured 50 by 30 mm. Thereafter, the cocoon was carefully dissected to examine and photograph the pupa therein (Fig. 4). The head and thoracic region was glossy black, while the abdominal segments were dark brown. There was a dense arrangement of short, brown hairs on the abdominal segments. The pupa measured 30 by 11 mm. The final larval instar exuvia was also retrieved from within the cocoon and preserved.

On the night of 7 Nov.2009, a male moth finally eclosed (Fig. 5), after an extended pupal period of almost two months. This moth was immediately identified to be *Eupterote naessigi*, as it clearly resembled earlier illustrations for this species (Holloway, 1987; Leong, 2008). A prominent pair of bipectinate antennae was present and its body and wings were an attractive golden yellow, with symmetrical brown markings on the fore- and hindwings. A combination of its wing shape, posture and colour patterns suggests a possible resemblance to a large, decaying leaf and might serve as a form of camouflage against a heterogeneous forest background. The intensity of yellow colouration on its underwing was of a lighter shade (Fig. 6).

Upon closer inspection, the underwing structures of the retinaculum and frenulum were observable in this male moth (Fig. 7). The moth was then preserved as a voucher specimen at the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research (RMBR), and catalogued as ZRC.LEP.252 (body length: 31 mm, forewing length: 52 mm). The corresponding empty pupa was also preserved and similarly catalogued (Fig. 8). By comparison, females of this species do not possess a retinaculum. In addition, females are also relatively larger, while their antennae have significantly shorter pectinations (additional specimens examined—ZRC.LEP.39, male, forewing length: 46 mm; ZRC.LEP.37, male, forewing length: 49 mm; ZRC.LEP.38, female, forewing length: 61 mm). In Brunei, the larva of *Eupterote naessigi* has been reared from *Cassia* (Fabaceae) (Holloway, 1987). However, neither detailed description nor illustration of the Bornean larva was provided.

ACKNOWLEDGEMENTS

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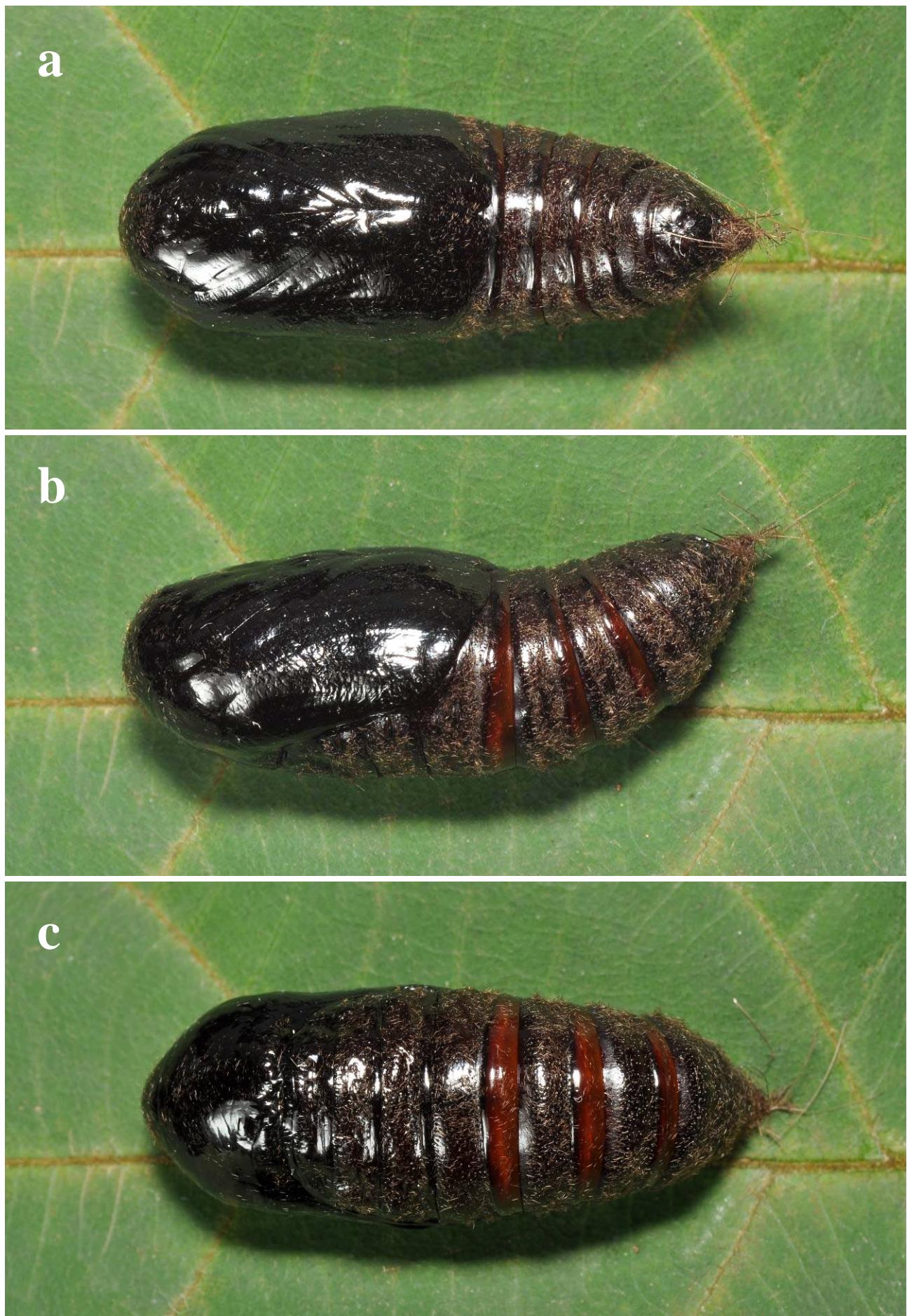


Fig. 4. Ventral (a), lateral (b), and dorsal (c) views of the pupa. The pupation process was completed on 11 Sep. 2009. The pupal dimensions were 30 by 11 mm.



Fig. 5. Dorsal view of male individual (ZRC.LEP.252, body length: 31 mm, forewing length: 52 mm), freshly eclosed on the night of 7 Nov. 2009.



Fig. 6. Ventral view of male individual (ZRC.LEP.252).



Fig. 7. Anterior-ventral close-up of the male individual (ZRC.LEP.252). Note the retinaculum (R) of the forewing, which catches onto the frenulum (F). Its antennae are clearly bipectinate.



Fig. 8. Vacated pupal case (ZRC.LEP.252).