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FINAL INSTAR CATERPILLAR AND METAMORPHOSIS OF *THOSEA VETUSTA* (WALKER, 1862) IN SINGAPORE (LEPIDOPTERA: LIMACODIDAE)

Tzi Ming Leong[1]* and **Vilma D'Rozario**[2]
[1]*Central Nature Reserve, National Parks Board, 601 Island Club Road, Singapore 578775, Republic of Singapore*
[2]*National Institute of Education, Nanyang Technological University, 1 Nanyang Walk, Singapore 637616, Republic of Singapore*
(**Corresponding author*: leong_tzi_ming@nparks.gov.sg, banjarana@gmail.com)

INTRODUCTION

In Singapore, the limacodid genus *Thosea* Walker, 1855 is represented by at least two species. The first is *Thosea mediostrigata* Hering, 1933 as reported by Cock et al. (1987: 44–45; Pl. 20 — moth 3, male specimen from Singapore). The second is *Thosea vetusta* (Walker, 1862), an account of its final instar larva and cocoon being hereby provided. This species has a Southeast Asian distribution, occurring in Peninsular Malaysia, Sumatra, Java, Borneo, Sulawesi (Cock et al., 1987).

OBSERVATIONS

While conducting a faunal survey at the Bukit Timah Nature Reserve on the night of 25 Sep.2010, a final instar larva of *Thosea vetusta* was encountered (ca. 2235 hours). It was situated at eye-level and attached to the underside of a leaf of *Bhesa paniculata* (family Celastraceae), slowly feeding with its head shrouded and protected by a membranous hood (Fig. 1). The larva was an overall apple green, with striking mid-dorsal patterns consisting of an interrupted yellow, longitudinal band outlined with blue (Figs. 2, 3). The central pattern was most eye-catching, as there were additional highlights of bright orange, coinciding with a prominent elevation most notable when viewed from the side (Fig. 2).

In typical limacodid fashion, the larva exhibited rows of sub-dorsal and lateral scoli. The sub-dorsal scoli consisted of short spines radiating outwards, while the lateral scoli were more elongated, conical and elaborate. Preliminary determination of the larval identity was by comparison with published illustrations of this species (Holloway, 1986: Pl. 9–4, Cock et al., 1987: Pl. 25–6). The dimensions of the larva were measured as follows — body length: 31 mm; body width: 21 mm (including lateral scoli), 11 mm (excluding lateral scoli); body height: 6 mm.

Fig. 1. Anterior view of the final instar larva of *Thosea vetusta*, feeding at eye-level on the leaf of *Bhesa paniculata* (Celastraceae) at the Bukit Timah Nature Reserve on the night of 25 Sep.2010 (ca. 2235 hours). Its head was concealed beneath a membranous hood.

Fig. 2. Lateral view of final instar larva (head towards right). Note prominent raised ridge in the centre of the mid-dorsum, attractively coloured blue, orange and yellow.

Fig. 3. Dorsal view of larva (head towards right). Dimensions measured include body length: 31 mm; body width: 21 mm (including lateral scoli), 11 mm (excluding lateral scoli); body height: 6 mm.

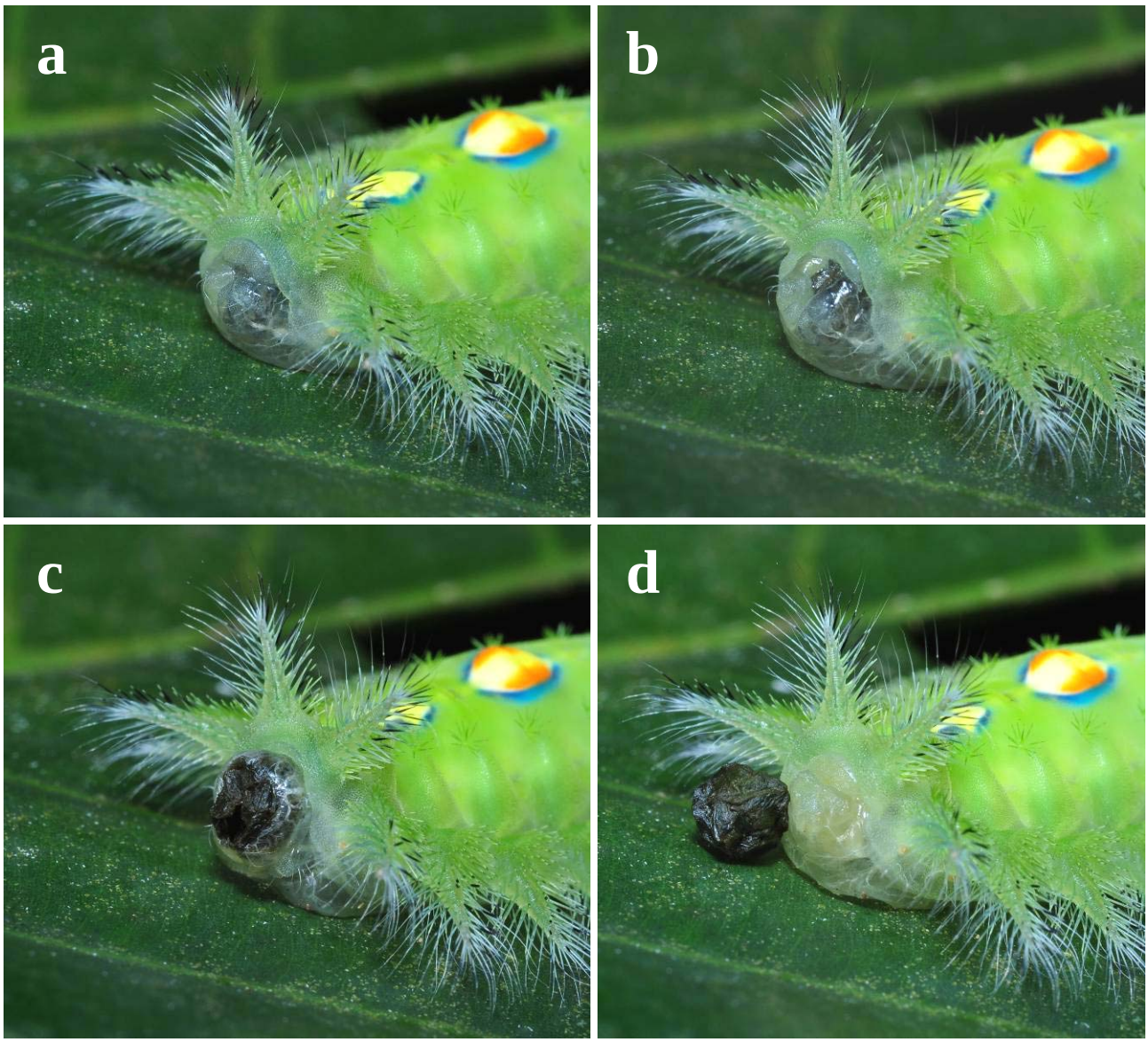

Fig. 4. Posterior close-up of larva, depicting defaecation sequence: (a) raising of lateral scoli at A9, (b) initial dilation of anal opening, (c) extrusion of faecal pellet, (d) expulsion of faecal pellet.

Fig. 5. The cocoon (14 × 11 mm) was fully formed by the night of 2 Oct.2010. It was loosely anchored onto the leaf surface via fine silken threads.

When reared in captivity, this larva demonstrated a healthy appetite for the leaves of *Bhesa paniculata*, with a steady and systematic pace of consumption. Consequently, this was accompanied by the regular discharge of faecal pellets (Fig. 4). Shortly before the defaecation process, the posterior-most pair of lateral scoli (at the 9th abdominal segment — A9) would be elevated, followed by the dilation of the anal aperture as the faecal pellet is gradually pushed out and discharged. On 1 Oct.2010, the larva discontinued its feeding and remained motionless. By the night of 2 Oct.2010, pupation had been complete as the smooth, elliptical cocoon was attached onto the leaf surface via fine silk threads (Fig. 5). The cocoon measured 14 × 11 mm.

On the evening of 25 Oct.2010 (ca. 1800 hours), the well-formed adult moth eventually emerged from its cocoon (Figs. 6, 7). It was confirmed to be a female of the species, its wing patterns and colouration agreeing with prior illustrations (Holloway, 1986: Pl. 7 — moth 18, Cock et al., 1987: Pl. 20 — moth 23, Pl. 33 — moth 2). The moth was preserved as a voucher specimen at the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research (RMBR), National University of Singapore. It was catalogued as ZRC.LEP.331 (body length: 19 mm, forewing length: 18 mm). The corresponding cocoon and pupa were preserved as well (Fig. 8). The post-eclosion cocoon demonstrated the characteristic hemispherical cap which opened up to provide exit of the moth. The antennal sheath was unfused with the pupa.

The previously documented larval hostplants for *Thosea vetusta* include eight genera, in seven families (Holloway, 1986; Cock et al., 1987; Robinson et al., 2010). The present record of *Bhesa* (Celastraceae) contributes an additional genus (and family) to the existing list.

Fig. 6. The female moth emerged on the evening of 25 Oct.2010 (ca. 1800 hours). Note prominent discal spot and contrasting shades of light versus dark brown on the forewing, clearly segregated by an oblique postmedial.

Fig. 7. Dorsal view of female moth (ZRC.LEP.331, body length: 19 mm, forewing length: 18 mm).

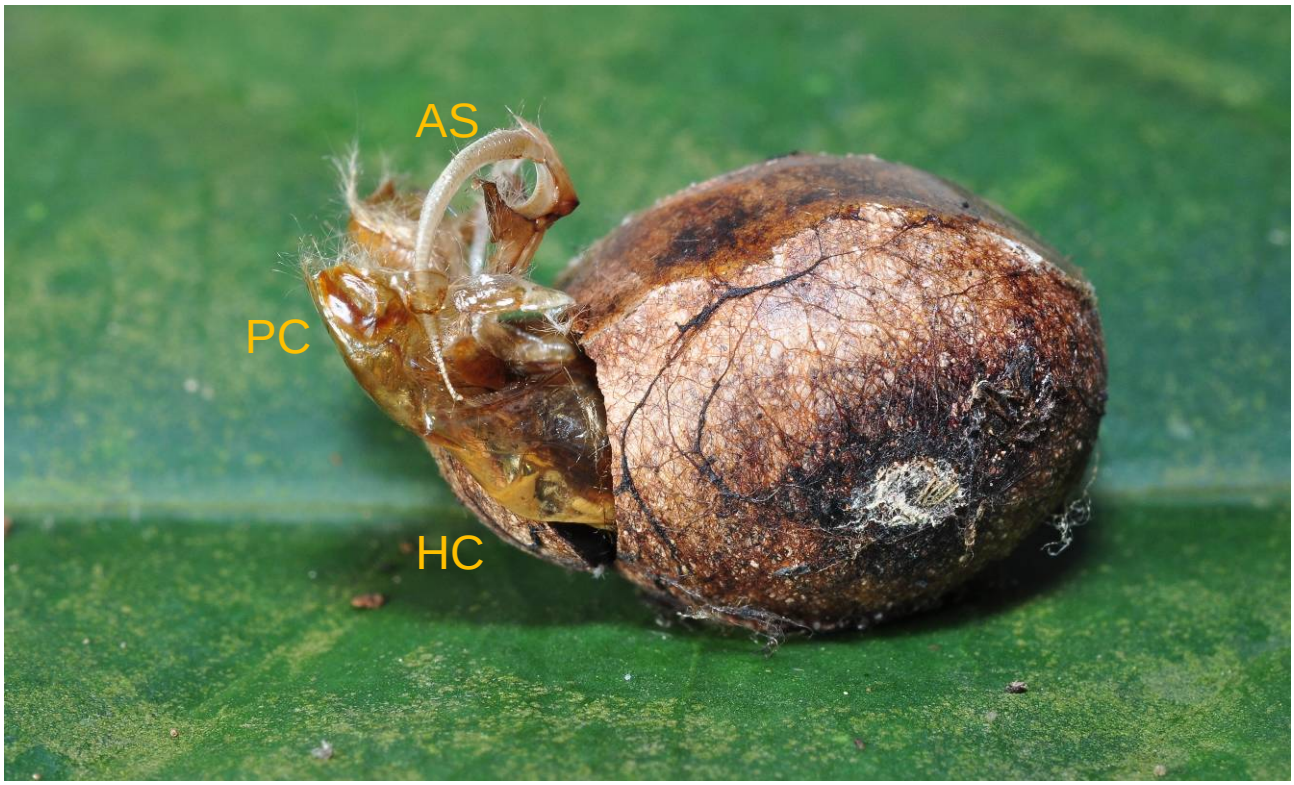

Fig. 8. Vacated cocoon, exhibiting typical limacodid eclosion aperture. At one end, a hemispherical cap (HC) was neatly excised to facilitate exit of the moth, leaving behind its pupal case (PC). The characteristic antennal sheath (AS) was not fused with the pupa.

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