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RECORD OF THE BAGWORM MOTH, *MAHASENA CORBETTI* TAMS IN SINGAPORE (LEPIDOPTERA: PSYCHIDAE)

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INTRODUCTION

The bagworm moth genus, *Mahasena* Moore, is represented by 11 species within the Oriental region, with two occurring in Southeast Asia, namely, *Mahasena corbetti* Tams and *Mahasena andamana* Moore (Robinson et al., 1994). The type species for the genus is *Mahasena andamana*, and is known only from the Andaman Islands (Robinson et al., 1994; Pitkin & Jenkins, 2004). The other species, *Mahasena corbetti*, has a more widespread distribution and has been recorded from Thailand, Peninsular Malaysia, Sumatra, Java, Borneo (Brunei, Sabah), Solomon Islands, and Samoa (Robinson et al., 1994). Its occurrence in Singapore is verified by successful attempts at rearing its larvae to metamorphosis.

Fig. 1. An adult male bagworm moth, *Mahasena corbetti* (ZRC.LEP.357b, body length = 11 mm, arrowed) freshly eclosed from its pupa (P) on 19 Sep.2011. Its caterpillar had been previously feeding on the leaves of *Thaumatococcus daniellii* (Marantaceae) at Kent Vale, National University of Singapore.

OBSERVATIONS

On 18 Jul.2011, two bagworm moth caterpillars were observed to be feeding on the leaves of the exotic plant, miracle berry (*Thaumatococcus daniellii*, family Marantaceae), grown in a pot on the 12th storey balcony of an apartment at Kent Vale, National University of Singapore. They were subsequently brought to our attention and reared in captivity. The caterpillars had concealed themselves within larval cases that consisted of overlapping, thin strips of leaves excised from their hostplant. During the day, they rarely emerged from their larval cases, and preferred to feed at night instead. Towards the end of Jul.2011, they stopped feeding and sealed the entrances to their larval cases, which were secured to the underside of the leaf, dangling from a short stalk of silk.

On 15 Sep.2011, the first moth had eclosed from its pupa. The pupal case had become extruded from the bottom end of the cocoon in a head-down position. On 19 Sep.2011, the second moth eclosed in similar fashion and initially climbed upwards and clung onto its larval case to allow its wings to extend and stiffen (Fig. 1). Its dark brown pupal case measured 15 × 4 mm and its posterior-most segments were securely attached to the bottom aperture of its cocoon (Fig. 2). Upon closer inspection of the larval case, the moulted head capsules of its prior caterpillar phase were seen to be attached to the upper portion, just beneath the supporting silk stalk (Fig. 3). The larger head capsule (width 2.5 mm) may have belonged to the final instar caterpillar, while the smaller head capsule (width 1.2 mm) may have belonged to the penultimate instar caterpillar.

The male moths possessed antennae that were distinctly bipectinate (Fig. 4), and this character was best observed from the frontal perspective. Their wings were a dark chocolate brown, while the thorax was a lighter chestnut brown (Fig. 5). Along the posterior segments of its abdomen, the flanks were adorned with prominent and symmetrical tufts of hair pointing outwards and backwards (Fig. 6). In the male moth specimen which had eclosed earlier on 15 Sep.2011, its abdomen proved to be rather extensible and telescopic. At full extension of its abdomen, its body length was measured to be 20 mm. Both moths were subsequently preserved as voucher specimens at the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research (RMBR), National University of Singapore, and catalogued as ZRC.LEP.357a (eclosed: 15 Sep.2011; pupa: 14 × 4 mm; body length: 20 mm, with abdomen extended; forewing: 10 mm) and ZRC.LEP.357b (eclosed: 19 Sep.2011; pupa: 15 × 4 mm; body length: 11 mm; forewing: 9 mm).

Fig. 2. Lateral close-up of the vacated pupal case (15 × 4 mm) in a head-down position, with its posterior abdominal segments still attached to the bottom aperture of the cocoon (as in Fig. 1).

Fig. 3. Two moulted head capsules of the caterpillar were deliberately attached to the upper portion of the larval case. The larger capsule (L) had a width of 2.5 mm and possibly belonged to the final instar caterpillar, while the smaller capsule (S) had a width of 1.2 mm and possibly belonged to the penultimate instar caterpillar.

Fig. 4. Frontal close-up of the eclosed male bagworm moth (ZRC.LEP.357b, body length: 11 mm, as in Fig. 1). Note its bipectinate antennae.

Fig. 5. Dorsal view of male bagworm moth (ZRC.LEP.357b, body length: 11 mm, forewing: 9 mm), with wings fully extended.

Fig. 6. Dorsal close-up of abdominal segments of male bagworm moth (ZRC.LEP.357b), to view the characteristic arrangement of hairs.

The identity of the eclosed bagworm moths as *Mahasena corbetti* was confirmed by Thomas Sobczyk. Previously published illustrations of *Mahasena corbetti* have appeared in Kamarudin et al. (1994: Fig. 1—forewing; Fig. 5—hindwing; Fig. 9—electron micrograph of forewing upperside scales; Fig. 13—adult male moth; Figs. 17, 21—genitalia; Fig. 25—pupal case of female; Fig. 29—pupal case of male), as well as Robinson et al. (1994: pl. 1, Fig. 16—adult male moth). The morphology of our male moth specimens agree well with those previously illustrated.

In Malaysia, this species of bagworm moth has been regarded as an agricultural pest, as their larvae feed on the leaves of oil palm, *Elaeis guineensis* (Sankaran & Syed, 1972; Kamarudin et al., 1994). Attempts have been made to seek out potential entomological candidates as biological control agents. In the oil palm plantations of Peninsular Malaysia, 11 species of hymenopterous parasitoids were recorded to target *Mahasena corbetti* as their hosts (Kamarudin et al., 1996). In similar plantations in Sabah (East Malaysia, Borneo), six species of hymenopterous parasitoids (including braconids, ichneumonids, and eulophids) and five species of dipterous parasitoids (all tachinids) were found to be associated with *Mahasena corbetti* (Sankaran & Syed, 1972). In addition, a clerid beetle, *Callimerus bellus* was found to be a natural predator of larval *Mahasena corbetti*.

The list of documented larval hostplants for *Mahasena corbetti* includes 36 genera in 20 families (Kamarudin et al., 1994; Robinson et al., 2011). Within this list of plants, there appears to be a pronounced preference for legumes (family Fabaceae with eight genera recorded) and palms (family Arecaceae with eight genera recorded). The present record of *Thaumatococcus* (Marantaceae) contributes an additional genus (and family) to the larval hostplant list.

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