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### NOTE

#### ***AQUILARIA MALACCENSIS* (MALVALES: THYMELAEACEAE): A NEW HOST PLANT RECORD FOR *DEUDORIX EPIJARBAS CINNABARUS* (LEPIDOPTERA: LYCAENIDAE) IN MALAYSIA**

Kah Hoo Lau & Su Ping Ong

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**AQUILARIA MALACCENSIS (MALVALES: THYMELAEACEAE): A NEW HOST PLANT RECORD FOR *DEUDORIX EPIJARBAS CINNABARUS* (LEPIDOPTERA: LYCAENIDAE) IN MALAYSIA**

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*Aquilaria malaccensis* Lam. (Thymelaeaceae), one of the most sought-after agarwood producing species, was recently lifted to Critically Endangered (Harvey-Brown 2018) from Vulnerable (Asian Regional Workshop 1998) under the global International Union for Conservation of Nature (IUCN) Red List. This catastrophe clearly indicates that this species is in dire need of urgent attention from plant conservationists, policy makers, and enforcers. This tree can be found as an under-story species in tropical forests. The species' natural range includes India, Myanmar, Sumatra, Peninsular Malaysia, Singapore, Borneo, and the Philippines (Tawan 2004). In 2017, close to 350,000kg of *A. malaccensis* derivatives and products were exported (and re-exported) from many countries including the non-range states (CITES Trade Database 2019). Essential oils derived from this tree species have been in high demand and are widely used in traditional medicines (Ding 1960; Nor Azah et al. 2008; Jayachandran et al. 2014), in the production of incense and perfumery in the Middle East (Barden et al. 2000; Chang et al. 2001). The lucrative international

trade for many years had ultimately driven the genus into the list of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix II in 2005. Species listed under Appendix II require an export permit and a re-export certificate before any international trade can take place. Consequently, a 'non-detriment findings' is needed to show that an export will not be detrimental to the survival of that species in the wild.

Phenological studies on wild *A. malaccensis* trees in Penang Island and Perak (Peninsular Malaysia) started since 2011 and collection of aborted flowers, fruit capsules and seeds were done using 10–20 square-framed nettings measuring 1m × 1m placed at four selected mature trees. Aborted fruits on the forest ground were randomly picked for inspection. Towards the end of the fruiting season on 23 May 2018 in Penang Island, several freshly aborted fruits were collected from the ground and upon dissection, one was seen infested with a living larva. The moth larva of *Pitama hermesalis* Walker was previously reported to infest *A. malaccensis* fruit (Ong & Lau 2016). Closer observation of the physical appearance of the larva, however, resulted in ambiguity of the identity and therefore, the larva was reared in a plastic container [outer dimensions; 13.4 (length) × 5.8 (width) × 22.0 (height) cm] in the laboratory at 26–28°C and 60–80% humidity.

The sluggish, late-instar larva (Image 1) pupated eight days later inside the fruit (Image 2) and pupation was completed in eight days. The adult was identified as



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Image 1. *Deudorix epijarbas cinnabarus* larva feeding inside the fruit of *A. malaccensis*.



Image 2. Pupal skin of *Deudorix epijarbas cinnabarus* inside the rotted fruit.

a female *Deudorix epijarbas cinnabarus* Fruhstorfer with a wingspan of 2.7cm (Image 3). This female specimen has a dull colour on the upper side – dark brown to black while the underside is grey brown with white markings. The black lobes and tails protruding from the hindwings are used to deceive predators as they resemble the head and antennae when its wings are folded (Image 4) (Kirton 2014). Subspecies *cinnabarus* occurs from Singapore to southern Thailand (Kirton 2014).

*Deudorix epijarbas* Moore is a seed and fruit feeder. In India, Thailand and China, it has attained pest status due to its damaging habits on fruit crops such as *Punica granatum* (pomegranate) (Dubey et al. 1993), *Litchi chinensis* (lychee) (Balakrishnan et al. 2019),



Image 3. Adult female of *Deudorix epijarbas cinnabarus* (wingspan = 2.7cm).



Image 4. The underside of *Deudorix epijarbas cinnabarus* female.

*Dimocarpus longan* (longan) (DAFF 2004) and *Nephelium* sp. (rambutan) (CABI 2019). In Malaysia, the host plants of *D. epijarbas* were *Scorodocarpus borneensis* (garlic nut), *Aesculus indica* (Indian Horse Chestnut), *Panicum* sp. (panicgrass) and *Pinus kesiya* (Khasya Pine) in addition to pomegranate and rambutan (Robinson et al. 2010). Interestingly, the larva was feeding on the leaves of *P. kesiya* in the records by Robinson et al. (2010). This indicated that the larva could consume other parts of the plant when the seeds or fruits are depleted or unavailable, however, more information on the life history and host plants of this cryptic butterfly are needed. The *A. malaccensis* fruit had aborted prematurely as a result of *D. e. cinnabarus* attack; however, its presence is unlikely to have any significant impact on the reproduction of *A. malaccensis* trees.

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