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NATURAL HISTORY NOTES ON *PINGASA RUGINARIA* GUENÉE (LEPIDOPTERA: GEOMETRIDAE: GEOMETRINAE) IN SINGAPORE

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INTRODUCTION

The geometrid moth, *Pingasa ruginaria* Guenée, 1857 is the type species for the genus *Pingasa* Moore, and occurs throughout Southeast Asia up to North India and even the Ryukyu Islands (Holloway, 1996). In Singapore, encounters with adults of this species have so far been confined to the forests of the Central Nature Reserve. While sightings of the adults of this species in the day and at night are occasional, observations of its larval stage have not been previously reported in Singapore.

OBSERVATIONS

Upon landing and resting on flat, vertical surfaces, such as white walls, *Pingasa ruginaria* consistently adopts a characteristic posture, with its forewings outstretched towards the anterior (Fig. 1). Nevertheless, the patterns on both its forewings and hindwings would enable it to blend against the bark of a tree, especially one with lichen growth. While we may be familiar with the dorsal markings on the upperwing of this species while at rest, the underwing patterns are largely understated and seldom revealed.

Fig. 1. Typical resting posture of adult *Pingasa ruginaria*, found on the wall of the Central Nature Reserve office at Bukit Kallang on 5 Jan.2004. (Photograph by: Aidi Abdul Ghani).

Fig. 2. Dorsal view of an individual drinking beside a stream at Upper Peirce Reservoir forest on 8 Jul.2008. (Photograph by: Leong Tzi Ming).

While conducting nocturnal surveys in the Central Nature Reserve, the first author repeatedly encountered individuals of *Pingasa ruginaria* along the sandy/stony banks of small forest streams, appearing to be actively drinking from the moist substrate. The species never aggregates in large numbers and only one to four individuals are ever spotted in a site at any one time. While drinking, the moth holds back both sets of wings (Fig. 2) and clearly displays the bold black, white and yellow markings on its underwings (Fig. 3), in stark contrast to the camouflage pattern of its upperwings. These sightings have been observed in the MacRitchie forest and Upper Peirce forest.

Voucher specimens for this species from Singapore are deposited at the Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research (RMBR), National University of Singapore (NUS). These specimens are catalogued as ZRC.LEP.1–5. The earliest local specimen (ZRC.LEP.1) dates back to Apr.1957, without specific details on the exact locality or collector. The most recent specimen (ZRC.LEP.5) is an individual collected by the first author on 27 May 2008 (morning) from the wall of the Central Nature Reserve office at Bukit Kallang (MacRitchie Reservoir forest).

On 9 Jun.2008, the second author noticed a single caterpillar on the leaves of a native plant, *Gironniera nervosa* (Ulmaceae) beside a boardwalk within the MacRitchie Reservoir forest. It adopted an upright posture, supported by a pair of posterior prolegs. Its head was tucked in and the true legs were bunched together facing forwards. It was an overall light and dark apple green, with symmetrical white stripes throughout its body (Fig. 4). Its total length was approximately 4.5 cm. After some time, the caterpillar was observed to resume feeding on its foodplant and was photographed doing so (Fig. 5). At close range, the fine details of its unique texture were noticeable, especially the distribution of elongate, tooth-like dermal granules over its head and skin. The granules along its mid-lateral region appeared to be longer than the rest. The caterpillar was not collected/reared thereafter.

Upon investigation, this caterpillar was subsequently tentatively identified to be that of *Pingasa ruginaria*, closely matching the descriptions and illustration in Holloway (1996: Plate 12 — larva #3). The featured caterpillar was raised by M. J. Bascombe in Hong Kong. Earlier descriptions of the caterpillar of this species were based on Indian examples (Sevastopulo, 1947; Singh, 1957). Throughout its distributional range, the larvae of *Pingasa ruginaria* are known to be polyphagous, having been recorded to feed on at least 22 genera of plants, belonging to 12 families (Robinson et al., 2008). Our observation adds another genus (*Girroniera*) to this list and represents the second, after *Trema*, in the family Ulmaceae.

The authors are highly interested in feedback on subsequent sightings of this moth species (especially of the diagnostic caterpillar) by any visitors to the Central Nature Reserve and who are encouraged to report their encounters to the first author via e-mail. Such accounts would provide us with a better understanding of their larval hostplant preferences and provide us clues to possible seasonality patterns in their breeding cycle.

Fig. 3. Lateral view of a drinking indiviual beside a stream at Upper Peirce Reservoir forest on 8 Jul.2008. Note its extended proboscis and brightly coloured underwing pattern. (Photograph by: Leong Tzi Ming).

Fig. 4. Lateral view of the last instar larva on its observed foodplant *Gironniera nervosa* (Ulmaceae) from the MacRitchie Reservoir forest on 9 Jun.2008. (Photograph by: David Groenewoud).

Fig. 5. Close-up of head and thorax of the feeding larva. Note the presence and distribution of whitish granules on the head and skin. (Photograph by: David Groenewoud).

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