

**VESTALIS AMETHYSTINA LIEFTINCK, 1965,
OF THE SIME ROAD SWAMP FOREST, SINGAPORE**

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INTRODUCTION

Vestalis amethystina (Fig. 1) belongs to the order Odonata, suborder Zygoptera, family Calopterygidae and subfamily Calopteryginae—the calopterygine damselflies, or demoiselles. Calopteryginae is a very large subfamily with 12 established genera and occurs worldwide but not in Australia and New Zealand (Silsby, 2001). To date, there are only three calopterygines recorded in Singapore, two highly similar *Vestalis* species, *Vestalis amethystina* and *Vestialis amoena*, and *Neurobasis chinensis*. The last species is the only metalwing demoiselle found in Singapore. It was collected only twice by D. H. Murphy in 1962 at MacRitchie Reservoir (male specimen, ZRC.ODO.01 and a female specimen, ZRC.ODO.02) and has never been collected since. Demoiselles generally prefer breeding in running water, such as forest streams with a pebble or sandy base with some mud (Silsby, 2001). Demoiselles have non-petiolate, densely-veined, broad wings, with numerous antenodals, which are the long and narrow discoidal cells which are cross veined (Silsby, 2001). These demoiselles have a habit of flying short distances and resting with their wings closed above their abdomens (Silsby, 2001).



Fig. 1. *Vestalis amethystina* adult female perching on a fern frond near the National Parks Board Jelutong Tower, adjacent to the Sime Golf Course of the Singapore Island Country Club.

Vestalis species, like other members of the Calopterygidae, occur in pristine habitats such as clear forest streams and swamp forest where there is good water quality (Orr, 2003). They usually have elaborate courtship—the male dances around the female displaying the sparkling colours of its iridescent wings (Orr, 2003). *Vestalis* species possess a number of unusual characteristics compared to other calopterygid genera. While many calopterygids oviposit into streams of aquatic plants (Silsby, 2001), and are mate-guarded by the male (Orr, 2003), several *Vestalis* species, such as *Vestalis amethystina* and *Vestalis beryllae* (Borneo endemic), oviposit in tandem. *Vestalis beryllae* is also unusual in that the male is twice as long as others in the subfamily and appears to be highly solitary (Silsby, 2001). *Vestalis anacolosa* (Borneo endemic) is also unusual in that the male only has vestigial inferior appendages (Silsby, 2001).

Vestalis amethystina is distinguished from the closely related *Vestalis amoena* in having longer inferior anal appendages (INF in Figs. 2 & 3) and slightly longer, more incurved, and less terminally expanded, superior, anal appendages (SUP in Figs. 2 & 3) in males (Orr, 2005) and in having a completely black labium as compared to the yellow labium with little blackish extremities in females (A. G. Orr, pers. comm.). *Vestalis amethystina* oviposits onto plant stems overhanging streams, sometimes several feet above the water, after which the larvae soon hatch and drop into the water below, while *Vestalis amoena* oviposits in dead leaves around the margins of streams (Silsby, 2001).

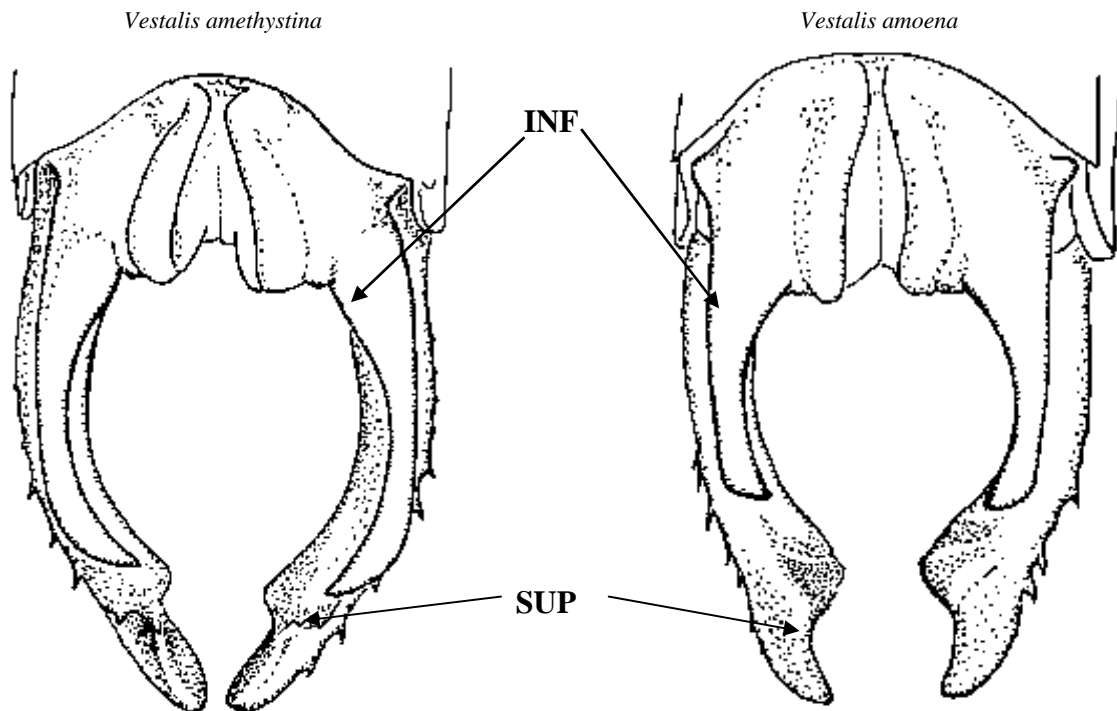


Fig. 2. Ventral view of male anal appendages of *Vestalis amethystina* (left) and *Vestalis amoena* (right). (Drawings from Orr, 2005, after Liefertinck, 1965). INF = inferior, anal appendages; SUP = superior, anal appendages.

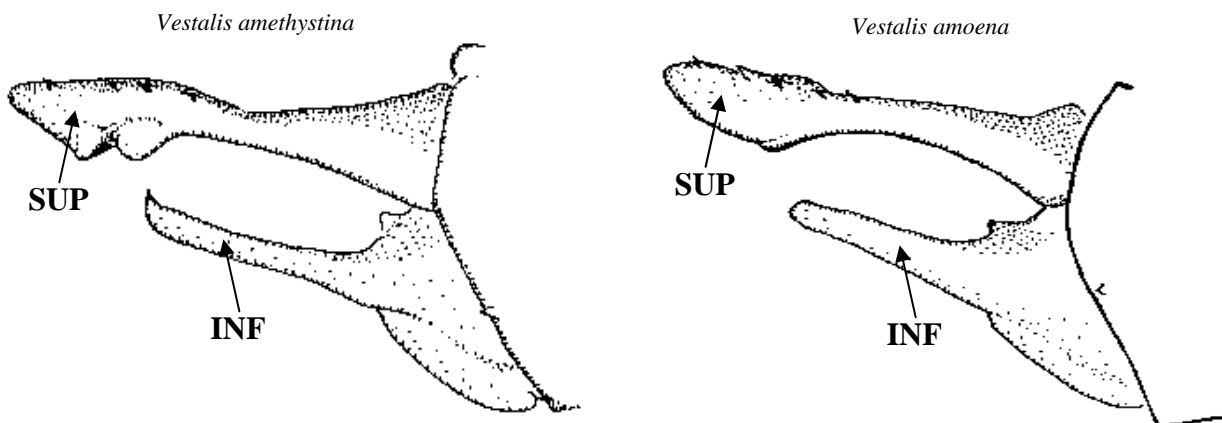


Fig. 3. Lateral view of male anal appendages of *Vestalis amethystina* (left) and *Vestalis amoena* (right). (Drawings from Orr, 2005, after Liefertinck, 1965).

DETAILS OF SIGHTINGS

Vestalis amethystina was encountered at the swampy area adjacent to the Sime Golf Course of the Singapore Island Country Club and MacRitchie Reservoir along the Sime Road Boardwalk near the National Park Board Jelutong Tower on 9 and 10 Oct.2008. Two specimens (male specimen, ZRC.ODO.05 and female specimen, ZRC.ODO.06) were collected and deposited in the Zoological Reference Collection (ZRC), Raffles Museum of Biodiversity Research of the National University of Singapore. This swampy area is dominated by *Dillenia suffruticosa* and *Alstonia spatulata* and is dissected by numerous fast- and slow-flowing streams. Some of the slow flowing streams have a heavier silt load and usually have fallen *Dillenia suffruticosa* leaves covering their bottoms (Fig. 4). The faster flowing streams have less silt build up and are lined with fallen dead *Dillenia suffruticosa* (Fig. 5). Most of the streams in the area flow under *Dillenia suffruticosa* cover, with the roots of these plants hanging down into the water (Fig. 5). *Vestalis amethystina* has been observed to frequently perch on these roots and males often guard a small patch of brightly lit territory from these perches, chasing away any intruding males and even other insects. Males favour brightly lit areas for displaying, probably to allow them to give the best visual display possible, as their iridescence is best seen under bright light. *Vestalis amethystina* was also reported from Chestnut Track previously, although I have not found them there myself despite numerous visits. It however is rather common in the Sime Road swamp forest area. This species is probably more common than we believe and has a wider range within the Central Catchment Nature Reserve because it can be easily overlooked in shaded areas where it appears dull and remains motionless (Fig. 6). Individuals of this species are easier to be noticed when perching in a sunny patch (Fig. 7).



Fig. 4. A slow-flowing stream in the swamp forest at Sime Road with a high silt load. (Photo by: Ng Ting Hui).



Fig. 5. A fast-flowing sandy stream flowing under *Dillenia suffruticosa* cover. (Photo by: Tan Heok Hui).



Fig. 6. Dull appearance of an adult female perched in the shade.



Fig. 7. The same adult female taken with a flash to simulate its iridescent appearance under the sun.

CONCLUSIONS

Vestalis amethystina is listed as being common in the Central Catchment Nature Reserve. However, if we take into consideration the limited number of suitable habitats in Singapore such as the streams in the Bukit Timah and the Central Catchment Nature Reserves, this species should be considered nationally vulnerable in Singapore. Although widespread in the Central Catchment Nature Reserve, its populations are highly localised, because they fly short distances and because of their highly territorial behaviour (Silsby, 2001), therefore any degradation or loss of their habitats can spell disaster for its local populations.

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