

Biodiversity Record: New Singapore record of the dragonfly, *Heliaeschna simplicia*

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Subject: *Heliaeschna simplicia* (Odonata: Anisoptera: Aeshnidae).

Subject identified by: Robin W. J. Ngiam and Albert G. Orr.

Location, date and time: Singapore Island, Kranji Marshes, Core Conservation Area; 3 September 2021; 0935 hrs.

Habitat: Young secondary forest dominated by exotic vegetation, beside a freshwater marsh (Fig. 1). In sunny weather.



Fig. 1. Forest habitat with swampy pools in the Core Conservation Area of Kranji Marshes, where *Heliaeschna simplicia* was found. (Photographs by: Veronica Tse Fen Foo).

Observers: Veronica Tse Fen Foo and Lim Kim Keang.

Observation: During a routine bird survey, a large dragonfly was flushed out along the trail in the forested area. It flew a few metres further up the trail and came to rest clinging to a branch of a hedge (Figs. 2–5). The height of the perch was about 1.5 m from the ground. Photographs were taken of the dragonfly before it flew out of sight into the dense vegetation.

Remarks: The subject was initially noted as a possible spear-tailed duskhawker (*Gynacantha dohrni*). Two other large dragonflies (possible *Gynacantha* species) were also encountered along the trail and photographs were taken as records. During examination of the photographs, two of the three dragonflies photographed were confirmed to be *Gynacantha dohrni* (see Tang et al., 2010). The first dragonfly was eventually identified as a male *Heliaeschna simplicia* by Robin Ngiam, using morphological characters referenced from Orr (2003). It represents the first record of *Heliaeschna simplicia* in Singapore.

The following description is based on Figs. 2 and 3 and terminology from Watson & O'Farrell (1991). The frons is dark, eyes are light apple-green with yellowish bordering posteriorly. Thorax is green. Wings hyaline, five cross veins in median space of forewings and four cross veins in median space of hindwings. Legs dark brown. Abdominal segments one (S1) and two (S2) are swollen and green with black markings. Green triangular auricles present on S2. The constricted S3 is black with green ventral-lateral markings. Thin green stripes are present dorsally on S3 to S7 which are predominantly black. S8 to S10 are entirely black. Superior anal appendages dark, long and broad. There is a distinctive notch on the inner margin of the lower half of the appendages. Inferior appendage short.



Fig. 2. Dorsal view of male *Heliaeschna simplicia* in situ at the Kranji Marshes. (Photograph by: Veronica Tse Fen Foo).



Fig. 3. Lateral view of the entire *Heliaeschna simplicia* individual. (Photograph by: Veronica Tse Fen Foo).

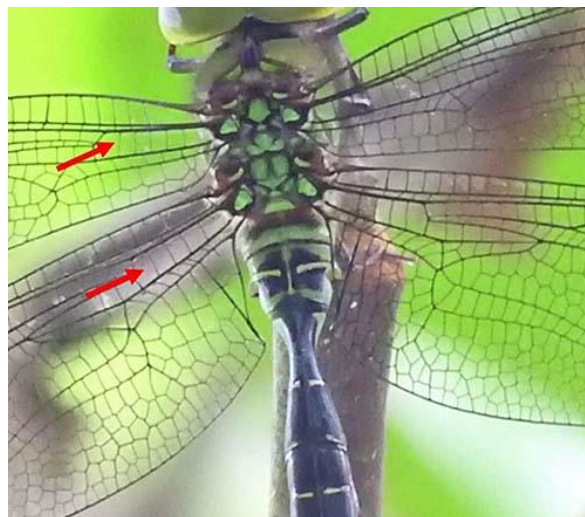


Fig. 4. Dorsal view of the thoracic area showing the cross veins (red arrows) in the median spaces of the fore and hind wings. (Photograph by: Veronica Tse Fen Foo).



Fig. 5. Dorsal view of the rear end of the abdomen showing diagnostic notch (red arrow) on superior anal appendages. (Photograph by: Veronica Tse Fen Foo).

Heliaeschna simplicia (Karsch, 1891) is one of 11 species in the genus (Schorr & Paulson, 2021), which is a group of largely crepuscular dragonflies widespread in Asia and Africa, and known to occur and breed in freshwater swamp forests (Orr, 2003). Prior to this discovery, two species were known locally: *Heliaeschna crassa* and *Heliaeschna uninervulata* (see Soh et al., 2019). *Heliaeschna simplicia* can be separated from *Heliaeschna uninervulata* by the presence of more than one cross vein in the base of wing median space (Fig. 4), and from *Heliaeschna crassa* by the shape of the superior appendages. The appendages of *Heliaeschna crassa* are narrower, inward curving and without a distinctive notch, while that of *Heliaeschna simplicia* is broad with a diagnostic notch (Fig. 5) on its lower half (Orr, 2003; Tang et al., 2010).

Globally, *Heliaeschna simplicia* ranges widely from Indonesia (Kalimantan, Sumatra) to East Malaysia (Sabah, Sarawak), Brunei and the islands of Bongao and Sanga-sanga in the Philippines (Villanueva, 2009). There are more recent records from Peninsular Malaysia, Thailand and Cambodia (iNaturalist, 2021). It is assessed by IUCN to be globally of Least Concern (Villanueva, 2009). However, based on the criteria set out by Ngiam & Cheong (2016) for Singapore, we provisionally confer *Heliaeschna simplicia* a national conservation status of Critically Endangered (found in only one location), Restricted (found only in Kranji Marshes) and Very Rare (low encounter rate). Taking reference from the scientific name ‘*simplicia*’, which is Latin for ‘simple things’, we propose the English vernacular name ‘Plain Nighthawker’. The crepuscular and fugitive adults may be difficult to find, but to attain a better understanding of its abundance and occurrence, searches can be conducted for its characteristic larvae (Butler & Orr, 2013) in swampy forest pools where it breeds.

This new record is not unexpected because Singapore is located within its distribution range and there are suitable freshwater swamp habitats there. Its elusiveness is probably the reason for the prior lack of records. Nevertheless, it is a welcome addition to Singapore’s dragonfly diversity. The discovery emphasises two aspects of local biodiversity conservation. First, the conservation and sensitive management of Kranji Marshes, not just for birds in the open marshland but also for other wildlife requiring a swampy, forested environment to thrive. The restricted Core Conservation Area of Kranji Marshes serves as a vital ecological refuge from human disturbance for wildlife to proliferate and become established in. Second, the finding was made serendipitously, during a bird census, by experienced volunteers. This highlights the vital contributions of a growing community of citizen scientists towards research and conservation outcomes, clearly demonstrating the importance of community stewardship as we strive towards the vision of a City in Nature.

Note: The authors are grateful to Albert G. Orr for corroborating the species identification, and for a discussion of the vernacular name. They also thank Yang Shufen and David Li for comments and inputs on the manuscript.

Literature cited:

- Butler SG & Orr AG (2013) The larva of *Heliaeschna simplicia* Karsch, 1891 (Anisoptera: Aeshnidae). *Odonatologica*, 42: 151–156.
- iNaturalist (2021) Observations. https://www.inaturalist.org/observations?place_id=any&taxon_id=102375 (Accessed 15 October 2021).
- Karsch F (1891) Kritik des Systems der Aeschniden. *Entomologische Nachrichten*, 17: 273–290.
- Ngiam RWJ & Cheong LF (2016) The dragonflies of Singapore: An updated checklist and revision of the national conservation statuses. *Nature in Singapore*, 9: 149–163.
- Orr AG (2003) *A Guide to the Dragonflies of Borneo. Their Identification and Biology*. Natural History Publications, Kota Kinabalu, Sabah, 205 pp.
- Schorr M & Paulson D (2021) World Odonata List. Revised on 29 September 2021. Slater Museum of Natural History, University of Puget Sound. <https://www2.pugetsound.edu/academics/academic-resources/slater-museum/biodiversity-resources/dragonflies/world-odonata-list2> (Accessed 15 October 2021).
- Soh M, Ng M & Ngiam WJ (2019) New Singapore record of a dragonfly, *Indothemis carnatica*, with an updated Singapore Odonata checklist. *Singapore Biodiversity Records*, 2019: 10–17.
- Tang HB, Wang LK & Hämäläinen M (2010) *A Photographic Guide to the Dragonflies of Singapore*. Raffles Museum of Biodiversity Research, Singapore, 223 pp.
- Villanueva RJT (2009) *Heliaeschna simplicia*. The IUCN Red List of Threatened Species 2009: e.T169267A6604346. <https://dx.doi.org/10.2305/IUCN.UK.2009-2.RLTS.T169267A6604346.en> (Accessed 15 October 2021).
- Watson JAL & O’Farrell AF (1991) Odonata (dragonflies and damselflies). In: Naumann ID, Carne PB, Lawrence JF, Nielsen ES, Spradbery JP, Taylor RW, Whitten MJ & Littlejohn MJ (eds.) *The Insects of Australia*. Second Edition. Melbourne University Press, Melbourne, pp. 294–310.