

Predation on golden orb web spider by robber fly

Subjects: Golden orb web spider, *Nephila pilipes* (Arachnida: Araneae, Araneidae);
Robber fly, undetermined genus and species (Insecta: Diptera: Asilidae: Leptogastrinae).

Subjects identified by: Contributor.

Location, date and time: Pulau Ubin, along track leading from the bicycle parking lots to Chek Jawa guard hut; 3 June 2017; 1156 hrs.

Habitat: Old rubber plantation, grading into coastal forest.

Observer: Contributor.

Observation: An immature female golden orb web spider of about 1.5 cm body length was found at around 1 m from the ground by its web with its opistosoma pierced by a large (2 cm) robber fly. The spider was already motionless when found and the asilid was presumably imbibing the bodily fluids of its prey (see accompanying picture).

Remarks: Robber flies (asilids) are often large, powerful and predacious insects. Their large compound eyes and wings powered by heavily built thoraxes allow them to detect and rapidly intercept prey, which is pierced by a needle-like hypopharynx and paralysed by saliva containing nerve poisons and proteolytic enzymes. The latter also serve to liquefy the innards of the prey (Marshall, 2012; Wang & Grootaert, 2011). The contributor has seen small asilids (1 cm or less) preying on small mosquitoes and other flies, medium-sized asilids (around 1.5 cm) preying on small beetles and true bugs, and larger asilids feeding on damselflies and dragonflies (up to the size of *Neurothemis fluctuans*).

Most asilids capture their prey in mid-flight, but the subfamily Leptogastrinae, whose members have unusually long and gracile abdomens, are noted for their exceptional ability to hover and snatch prey from a leaf or tree trunk. Members of this subfamily have been recorded to prey on spiders, which may make up a significant portion of their diet. The genus *Leptogaster* is reported to forage close to the ground, weaving in-and-out of vegetation, hovering and striking at resting prey, including spiders in their webs (Dennis et al., 2012). Leptogastrine robber flies may thus be a significant contributor to mortality among immature *Nephila* spiders, which are active in the day and may have evolved the habit of building barrier webs as a first line of defence against aerial predators. Adult *Nephila*, which are probably too large to be preyed upon by robberflies, do not build such webs. The spider genus *Nephila* is included in the family Araneidae following Dimitrov et al. (2017).

References:

- Dimitrov, D., L. R. Benavides Silva, M. A. Arnedo, G. Giribet, C. E. Griswold, N. Scharff & G. Hormiga, 2017. Rounding up the usual suspects: a standard target-gene approach for resolving the interfamilial phylogenetic relationships of ecribellate orb-weaving spiders with a new family-rank classification (Araneae, Araneoidea). *Cladistics*. 33 (3): 221-250.
- Marshall, S., 2012. *Flies: The Natural History and Diversity of Diptera*. Firefly Books, New York. 616 pp.
- Wang L. K. & P. Grootaert, 2011. Robber flies. In: Ng, P. K. L., R. T. Corlett & H. T. W. Tan (eds.). *Singapore Biodiversity. An Encyclopedia of the Natural Environment and Sustainable Development*. Editions Didier Millet and the Raffles Museum of Biodiversity Research, Singapore. p. 432-433.
- Dennis, D. S., R. J. Lavigne & J. G. Dennis, 2012. Spiders (Araneae) as prey of robber flies (Diptera: Asilidae). *Journal of the Entomological Research Society*. 14 (1): 65-76.

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Lateral view of robber fly holding on to an immature golden orb web spider (ventro-lateral view). The motionless spider is having its opisthosoma pierced by the robber fly, which is presumably imbibing the spider's bodily fluids. Photograph by Marcus F. C. Ng