SINGAPORE BIODIVERSITY RECORDS 2016: 174-175 ISSN 2345-7597
Date of publication: 30 November 2016.

Whip spider and whip scorpion on Pulau Ubin

Subjects: Whip spider, unidentified taxon (Arachnida: Amblypygi: family undetermined);
Whip scorpion, *Thelyphonus* sp. (Arachnida: Uropygi: Thelyphonidae).

Subjects identified by: Contributor.

Location, date and time: Pulau Ubin, central part; 9 September 2016 at 2213 hrs and 10 September 2016 at 0026 hrs.

Habitat: Mature secondary coastal forest/old plantation and back mangroves.

Observer: Contributor

Observations: A whip spider of unknown identity, about 2.5 cm body length (Fig. 1), was found on a crumbling log in dense secondary forest/old plantation north of the Ubin Living Lab on 9 September 2016.

One whip scorpion of about 3 cm body length (Fig. 2) was found on an old log next to a track parallel to Sungei Puaka, in secondary forest adjacent to back mangroves on 10 September 2016. Although no images of these are available, a house centipede (*Thereuopoda longicornis*) and what appeared to be a courting pair of trapdoor spiders (*Damarchus workmani*) were observed on the same log.

Remarks: Whip spiders belong to the order Amblypygi, and are separate from true spiders (Araneae) in lacking both spinnerets (which true spiders use to produce silk) and venom glands. Amblypygids use a pair of extremely long raptorial palps with prominent terminal spines to secure (or impale) prey. To sense their environment, the first pair of legs have become antenniform, with several tibial and tarsal divisions that extends each appendage into a feeler-like organ equipped with various sensilla (bristles, setae and slit sense organs). The remaining three pairs of legs are used in locomotion and assume a latigrade (crab-like) posture that allows the dorso-ventrally flattened animal to squeeze into thin crevices and under loose bark (Beccaloni, 2009). In Singapore, the contributor has also observed whip spiders at the Bukit Brown Cemetery, on the trunks of mature trees covered by ferns and other epiphytes; and in the Central Nature Reserve, on or under logs. Examples identified as belonging to the genus *Sarax* were recently found in parkland habitat at Bishan-Ang Mo Kio Park (Soh, 2016).

Whip scorpions or uropygids may be confused with true scorpions but have a stingless tail and lack venom. Their 'tail' or flagellum serves as a sensory organ that is sensitive to chemical cues and air currents. Like amblypygids, uropygids capture prey using their palps, which are stoutly built and armed with spiny tarsi and tibia that form a movable 'pincer'. When threatened, uropygids release a strong mist of acetic acid from a pair of posterior glands near the base of the flagellum, which readily permeate the surrounding air as well as the offending organism. The vinegary fragrance can last for several hours (Beccaloni, 2009). Elsewhere in Singapore, the contributor has observed whip scorpions in the Central Nature Reserve in similar microhabitats (base of fallen trees, under logs). An apparently mating pair was observed at the Bukit Timah Nature Reserve (Lim, 2014).

References:
Beccaloni, J., 2009. *Arachnids*. University of California Press. 320 pp.
Lim, K. K. P., 2014. An apparently mating pair of whip-scorpions. *Singapore Biodiversity Records*. 2014: 267.
Soh, Z. W. W., 2016. Whip spiders of the genus *Sarax* in Bishan-Ang Mo Kio Park. *Singapore Biodiversity Records*. 2016: 115-116.

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Fig. 1. Dorsal view of whip spider from Pulau Ubin.

Fig. 2. Dorsal view of whip scorpion from Pulau Ubin.

Photographs by Marcus F. C. Ng