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Biodiversity Record: Wagler's pit viper at Admiralty Park

Alex **Figueroa**

Email: afigueroa21@gmail.com

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Subject: Wagler's pit viper, *Tropidolaemus wagleri* (Reptilia: Squamata: Viperidae).

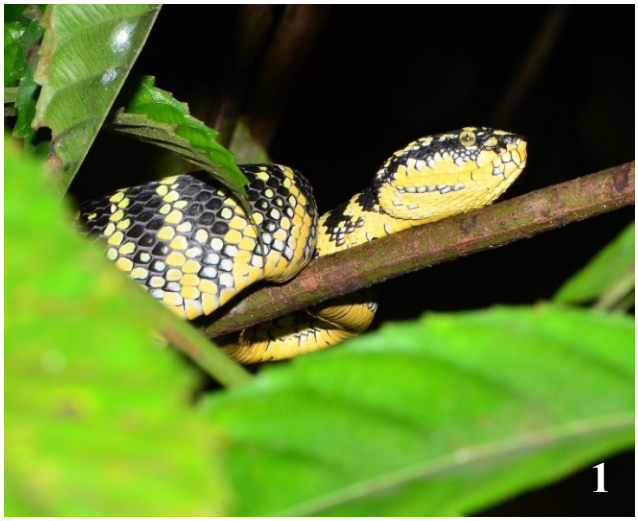
Subject identified by: Alex Figueroa.

Location, date and time: Singapore Island, Admiralty Park; 27 October 2022; 2232 hrs.

Habitat: Edge of young secondary forest.

Observer: Alex Figueroa.

Observation: An adult female of approximately 70 cm total length was observed about 1.8 m off the ground on a bandicoot berry (*Leea indica*) branch (Fig. 1). The snake was in a resting position with her prehensile tail firmly coiled around the branch (Fig. 2). A noticeable food bolus was projecting out at multiple points of her body (Fig. 3).



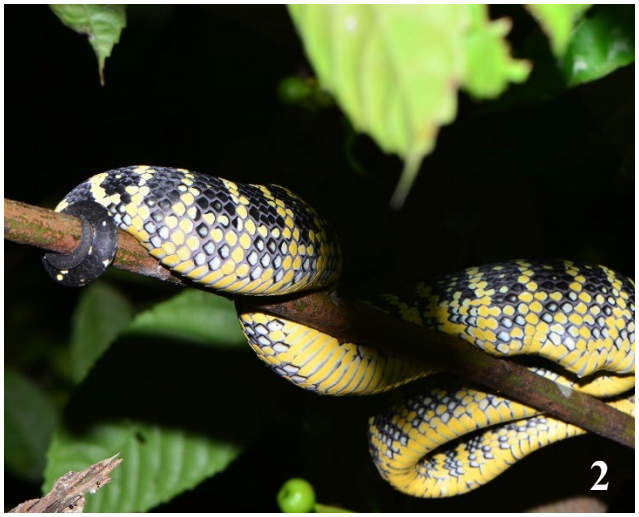


Fig. 1. Latero-ventral view of the head and anterior part of the adult female *Tropidolaemus wagleri* perched on *Leea indica*.
Fig. 2. Latero-ventral view of the rear part of the snake with the prehensile tail firmly coiled around the branch. (Photographs by: Alex Figueroa).

Remarks: Baker & Lim (2012) described *Tropidolaemus wagleri* as inhabiting mature forests and restricted to the Bukit Timah and Central Catchment Nature Reserves and Pulau Tekong. The present record is not the first of this species found outside of these areas, the first was of an adult female photographed alongside the road at Neo Tiew Lane 1 on 5 October 2015 (Maury & Low, 2017). That record is unusual as the snake was found approximately 6.3 km away from the nearest extant population at Mandai in the Central Catchment Nature Reserve, which in Singapore, is substantial given the extent of urbanisation and lack of suitable forest connectivity (Yee et al., 2011). Furthermore, the habitat in Kranji is degraded waste-woodland and scrubland. Similarly, Admiralty Park is situated approximately 4 km away from the nearest extant population (also Mandai), and the habitat is young secondary forest. The locality records in Baker & Lim (2012) represent our prevailing understanding on the distribution of species within Singapore, with historical localities being precluded. After examining historical literature, the author found that the only localities outside of the Bukit Timah and Central Catchment Nature Reserves and Pulau Tekong where *Tropidolaemus wagleri* was reported from were Punggol, Sembawang, the Singapore Botanic Gardens and Pulau Ubin. However, given that primeval Singapore was covered in primary lowland dipterocarp forest (Yee et al., 2011), and that *Tropidolaemus wagleri* also inhabits mangroves and coastal swamps (David & Vogel, 1996), it is likely that *Tropidolaemus wagleri* once occupied all of Singapore Island and the

larger adjacent islands. Thus, like most forest dependent species in Singapore, the distribution of *Tropidolaemus wagleri* has contracted immensely. Certainly, establishing the existence of populations outside of the Bukit Timah and Central Catchment Nature Reserves contributes to the conservation and long-term survival of the species.

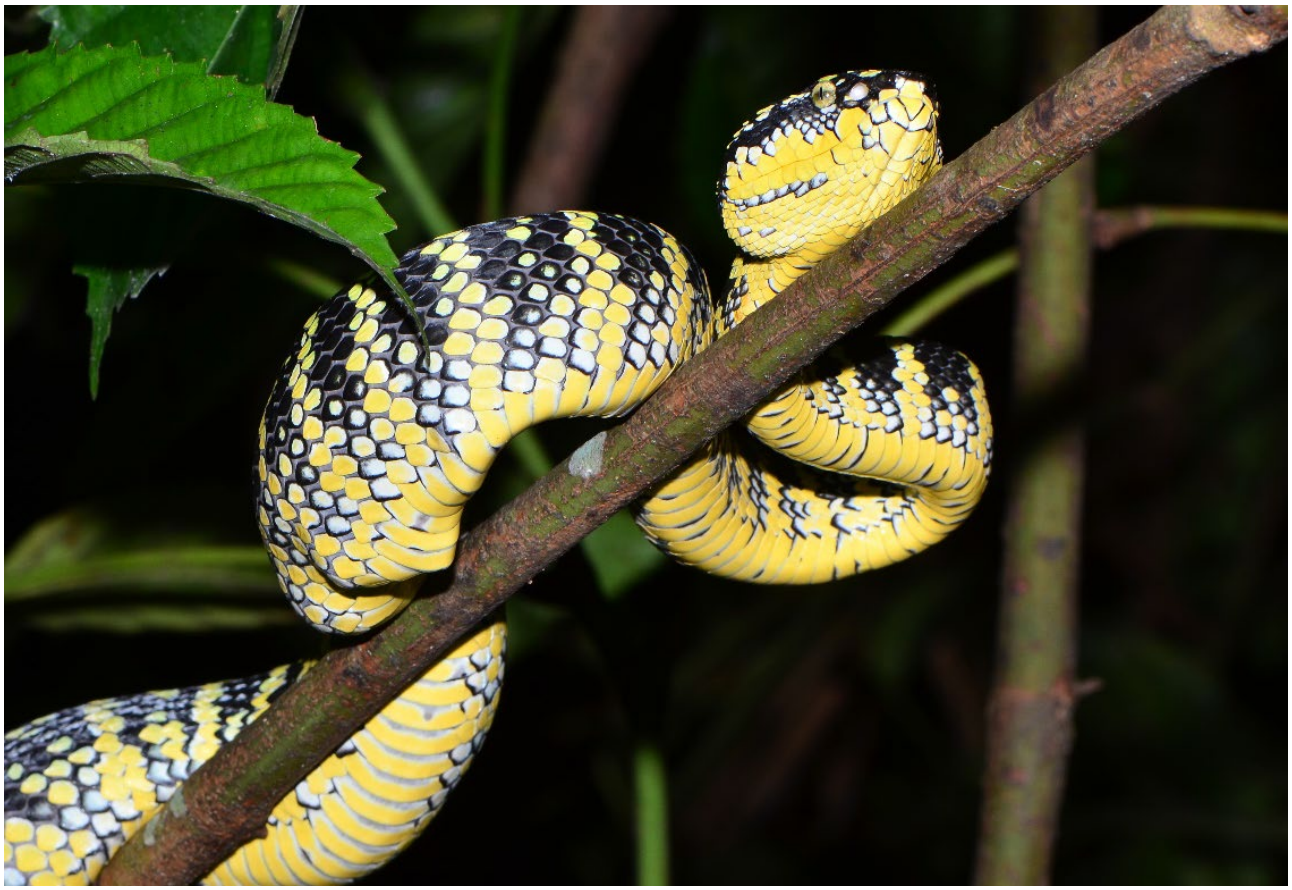


Fig. 3. Latero-ventral view of the *Tropidolaemus wagleri* showing the food bolus, presumably of a fruit bat. (Photograph by: Alex Figueroa).

To this day we have yet to formulate a clear understanding on the distribution of many species within Singapore, mainly due to a lack of surveys, and also because many sightings are likely to be unreported. Much progress was made over the past 30 years, first with publication of The Pangolin, a newsletter by the Nature Society (Singapore) that recorded natural history information on Singapore's non-avian vertebrate fauna between 1988 and 1995. This was followed more recently with Singapore Biodiversity Records (2013–2020) and Nature in Singapore, both by the Lee Kong Chian Natural History Museum at the National University of Singapore. These publications promote citizen science, and have greatly expanded our knowledge of Singapore's biodiversity. For this reason, it is imperative that observations continue to be reported.

The presence of a food bolus indicates that the featured viper had recently eaten. Given the odd shape of the food bolus, and that the snake was perched adjacent to a common yellow stem fig (*Ficus fistulosa*), the prey item is speculated to be a fruit bat, likely *Cynopterus brachyotis*. Figs from *Ficus* trees constitute a major portion of the diet of *Cynopterus brachyotis* (see Tan et al., 1998). The points of the bolus sticking out are believed to be the sharp, angled wing joints of the bat as exemplified in the photographs of another adult female *Tropidolaemus wagleri* observed eating a *Cynopterus brachyotis* (Aman et al., 2022). Food boli of frogs, lizards, and rodents are typically slightly elongate, uniform, or in the case of bulky prey that outsize the snake's body circumference, ovoid in shape as illustrated in the photographs of an adult female *Tropidolaemus wagleri* that consumed a plantain squirrel (*Callosciurus notatus*) (Qiu, 2022).

Regarding the diet of *Tropidolaemus wagleri* in the wild, it is generally believed that adults prey on mammals, birds, lizards and frogs, while juveniles feed on lizards and frogs (Orlov et al., 2002). However, given the extreme sexual dimorphism in size with females reaching up to 92 cm in total length and males only up to 52 cm (Vogel et al., 2007), the extent to which males feed on larger prey such as mammals and birds is unknown. In addition to the diet records mentioned above, another adult female *Tropidolaemus wagleri* was recorded having captured a *Cynopterus brachyotis*, but was not observed eating it (Tan & See, 2021). This suggests that adult female *Tropidolaemus wagleri* target small fruit bats as prey. This may help explain why adult female *Tropidolaemus wagleri* are often seen perched on or around *Ficus* trees. Adult male *Tropidolaemus wagleri* have been observed capturing and consuming gekkonid lizards, including a *Cnemaspis peninsularis* (Law, 2020) and a *Gekko monarchus* (Aman et al., 2022). Previously, the author recorded a juvenile female that regurgitated a *Gekko monarchus* (Fig. 4).

Fig. 4. A juvenile female *Tropidolaemus wagleri* that regurgitated a *Gekko monarchus*. (Photograph by: Alex Figueroa).

Note: This observation was made during a survey under NParks Permit No: NP/RP22-014, and the earlier record was made under NParks Permit No: NP/RP11-030.

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