

Edible Anurans: Predation on a Juvenile Malayan Horned Frog *Megophrys nasuta* (Schlegel 1858) by a Long-legged House Centipede *Thereuopoda longicornis* in Selangor State, Peninsular Malaysia.

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Predation on pre- and post-metamorphic (tadpole, juvenile and adult) anurans by invertebrates is a well-documented occurrence (McCormick & Polis 1982, Toledo 2005). Whilst the majority of recorded instances are attributed to arthropods such as giant water bugs (Belostomatidae) and spiders (including Araneidae, Ctenidae, Lycosidae and Pisauridae), less frequently, predators of anurans also include scorpions (Buthidae), harvestmen (Opiliones), giant centipedes (Scolopendridae), ants and wasps (Hymenoptera) and beetles (Carabidae) (Warkentin 2000; Toledo 2003; Toledo 2005; Castanho & Pinto-da-Rocha 2005; Wizen & Gasith 2011; Muscat *et al.* 2014; Arrivillaga & Oakley 2019, Menegucci *et al.*, 2020). Furthermore, a single record of an unidentified long-legged house centipede of the family Scutigerae predating on a juvenile western tree frog (*Polypedates occidentalis*) has been reported from Karnataka State, India (Seshadri *et al.*, 2017). Critical periods for predator-prey interactions between invertebrates and anurans have been identified as during the tadpole stage and/or breeding period, when frogs enter waterbodies and

therefore at risk to predation by aquatic invertebrate predators, as well as for juveniles shortly following metamorphosis as they move from aquatic to terrestrial environments and are susceptible to a wider variety of predators (Toledo, 2003).

The Malayan horned frog (*Megophrys nasuta*; Schlegel, 1858) is a large frog species occurring in tropical lowland and submontane rainforests up to 1600 m ASL (Inger and Stuebing, 2017), and has a wide distribution encompassing southern Thailand, Peninsular Malaysia, Singapore, Sumatra and Borneo. It is strongly terrestrial and known to feed on a variety of invertebrates and small vertebrates. This species relies on cryptic camouflage as its primary defensive strategy, laying stationary on the forest floor to remain undetected by potential predators. However, observations of predation on *M. nasuta* appear to be poorly recorded. Herein, we report the first known record of predation on *M. nasuta* by the long-legged house centipede *Thereuopoda longicornis*.



Figure 1. *Thereuopoda longicornis* predating on juvenile *Megophrys nastua* within the Sungai Tua Forest Reserve of Selangor State, Peninsular Malaysia (Photos: Tom Charlton).

On the night of 29th February 2016 at approximately 22:30 h (MYT) we observed an adult *T. longicornis* in the process of predating on a juvenile *M. nasuta* within the Sungai Tua Forest Reserve of Selangor State, Peninsular Malaysia (approximate GPS: 3°20'0.84"N 101°42'11.69"E). Both were situated on a broad-leaf plant around 20 cm above ground on the verge of a forest trail. Neither animal was accurately measured though the *M. nasuta* was estimated to be 10 mm (SVL) and the *T. longicornis* 50 mm (TL, excluding antennae and terminal legs). At the time of the initial encounter the *M. nasuta* was alive but seemingly subdued and with an injury visible to the

left eye, with the *T. longicornis* seizing the frog by its hind legs. Our approach disturbed the act of predation, and after watching for several minutes without any further movement from either animal we left. Upon our return to the same spot later in the evening, both animals were re-encountered on the same broad-leaf plant; the centipede had proceeded to kill and begin consuming the *M. nasuta*, eating soft tissue from the underside of the frog. The long-legged centipede was identified through our photographic records as *Thereuopoda longicornis* (order Scutigeroforma, family Scutigeridae) (Figure 1).

Anurans are an important prey for a variety of animals, both vertebrate and invertebrate, and with body size being a significant factor in a frog's ability to evade predation, they therefore are particularly vulnerable during early life stages (Toledo, 2006). *M. nasuta* are large and robust frogs as adults, though tadpoles and juveniles of this species will be at risk to a wide variety of predators. As the frog increases in size, its ability to avoid predation greatly improves and predator-prey interactions between this species and invertebrates in particular will shift more favorably towards the *M. nasuta*. Long-legged house centipedes of the genus *Thereupoda* are opportunistic predators with a diet largely comprising arthropods (Lewis, 1981), though the observation reported here coupled with one further observation made by Seshadri *et al* in 2017 indicates that vertebrate prey is occasionally taken. Whilst invertebrates are considered capable of preying on anurans during all stages of their amphibious lifecycles, to the best of our knowledge this is the first known record of *T. longicornis* preying on a post-metamorphic *M. nasuta*.

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