

SHORT COMMUNICATION

Predation on *Xenophrys zhangii* (Anura: Megophryidae) by *Heteropoda* sp. (Araneae: Sparassidae) in Nepal

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Anurans in post-metamorphic stages are highly vulnerable to predation, and many are preyed upon by invertebrates such as spiders and aquatic insects (Menin *et al.* 2005, Toledo 2005, Luria-Manzano *et al.* 2020). Zhang's Horned Frog, *Xenophrys zhangii* (Ye and Fei, 1992), is the smallest frog among three species in the genus *Xenophrys* found in Nepal and can be identified by a W- or V-shaped mark on its dorsum (Bhattarai *et al.* 2020). It occurs near small streams in moderately disturbed secondary forests and is widely distributed in central and eastern Nepal between 500 and 1,000 m a.s.l. Juveniles are mostly found near rocks close to the water channel (Schleich and Kästle 2002, Bhattarai *et al.* 2020, Khatiwada *et al.* 2021).

Spiders are among the most common and abundant predators in terrestrial ecosystems

(Turnbull 1973, Coddington and Levi 1991, Nyffeler and Sunderland 2003). A global review of spiders that feed on frogs by Nyffeler and Altig (2020) reported a total 106 species of spiders that prey on frogs. Huntsman Spiders in the genus *Heteropoda* Latreille, 1804 are mostly distributed in tropical Asia and Australia (Sethi and Tikader 1988, Aíramé and Sierwald 2000, Jäger 2008). Feeding behavior of *Heteropoda* sp. in captivity by Aíramé and Sierwald (2000) reported that three events of frog larvae were preyed upon belonging to Megophryidae family. In Nepal, both frogs and spiders are understudied (Siliwal and Molur 2007, Bhattarai *et al.* 2018). We present here the first record of predation on *Xenophrys zhangii*, by *Heteropoda* sp., an addition to our knowledge of the interactions between frogs and spiders in Nepal.

On 14 April 2022, the first author was on a nocturnal herpetological survey along Phewa stream, Mangsebung, Ilam. At 19:40 h, he observed that a Huntsman Spider had grasped

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both hind limbs of a juvenile *Xenophrys zhang* on the bank of the stream. (Figure 1A). Both frog and spider remained stationary when the flashlight was focused on them for about two minutes. The observer dimmed the flashlight to observe the behavior. The frog tried to escape by stretching its fingers, but the spider had seized the frog's hind limbs and remained motionless. After approximately 1.5 min the prey appeared immobile with fatigued hind limbs. The sluggish frog did not open its mouth or produce any distress call. The spider slowly pulled the frog toward a safe place under a rock. When the observer again focused the flashlight on them, the spider stopped pulling the prey and remained motionless between rocks until the observer dimmed the light again. When the observer focused the light away from spider, it escaped into rock crevices with its prey (Figure 1B).


Generally, vertebrates (mostly snakes) are considered major predators of frogs. However, studies suggest that spiders are common predators of frogs (Menin *et al.* 2005, Toledo 2005). Spiders of the genus *Heteropoda* inhabit rock crevices and tree bark and are known to

hunt on the surface of shallow water (Airamé and Sierwald 2000). In general, predation tactics correlate with predator-prey size relationships (Toledo *et al.* 2007, Wells 2007). Frogs and spiders are competitors and have cross predation (Polis *et al.* 1989, Gaiarsa *et al.* 2012). Spiders frequently overpower frogs that are larger than themselves, whereas frogs exclusively kill spiders of smaller size than themselves (Labanick 1976, Parmelee 1999, Hirai and Matsui 2002, Arroyo *et al.* 2008). This behavior happens because spiders have extra-intestinal digestion whereas frogs swallow their prey whole (Nyffeler and Altig 2020). To the best of our knowledge, the interactions between frogs and spiders are not documented in Nepal. This study is the first observation of predation on *Xenophrys zhang* by a species of spider, suggesting that detailed studies on their cross predation are needed.

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Figure 1. (A) A Huntsman Spider (*Heteropoda* sp.) preying upon a Zhang's Horned Frog (*Xenophrys zhang*) and (B) dragging its prey into rock crevices.

Reptiles (SSAR), Josh's Frog, the Roger Williams Park Zoo, the Amphibian Survival Alliance (ASA), and Idea Wild to Bivek Gautam for a Salamander Conservation Project in Nepal. We also would like to thank Jeevan Gurung, Jash Hang Rai, and Netra Koirala for field assistance. 

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