Predation of *Hylodes phyllodes* (Anura: Hylodidae) by *Trechaleoides* sp. (Araneae: Trechaleidae)

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Anurans are small to medium-sized amphibians with generally numerous populations and intense social behavior during reproductive periods (Pombal 2007). These characteristics make them part of the diet of many vertebrates and invertebrates (Toledo et al. 2007; Costa et al. 2010). Among invertebrates, arthropods are anurans' main predators (Menin et al. 2005; Toledo 2005), and there are many records of this relationship in literature (e.g. Giarsa et al. 2012; Muscat et al. 2014; Pedrozo et al. 2017; Assis et al. 2018; Menegucci et al. 2020). Although these records have increased recently, the predation of vertebrates by arthropods remains underestimated (Valdez 2020). New records of these events improve understanding of prey-predator interactions and how they can shape vertebrate populations and communities, especially for threatened species (Valdez 2020). There is evidence that populations of *Hylodes phyllodes*, although classified as least concern (LC) in the IUCN red list, are decreasing (Rocha et al. 2010).

In this article we describe a feeding behavior by a fishing spider *Trechaleoides* sp. on a Boraceia stream frog *Hylodes phyllodes* Heyer and Cocroft, 1986, observed during routine night monitoring at the Projeto Dacnis private reserve (-23.464397°, -45.129784°; WGS-84; 135m above sea level) in Ubatuba, state of São Paulo, Brazil.

The predation event was observed on January 18, 2021, at 19:56, in a stream with small waterfalls in an ombrophilous forest environment. Temperature was 26.1°C and air humidity was 97.3%. The spider was identified following parameters suggested by Carico (2005): carapace length between 6.1 - 11.0 cm; legs varying in length, with the third

pair usually shortest, the remainder similar in size; only the tarsus is flexible. The study area is within the range proposed by Carico (2005) for this spider genus. The frog was identified by its advertisement call, habit, and a combination of morphological characters described by Heyer & Cocroft (1986).

The spider was stalking hunting at the stream edge while an individual of *Hylodes phyllodes* rested on a rock in the stream, upstream from the spider. When an observer approached, the frog jumped into the stream and was carried by the current; the spider caught the frog in the water, and carried it to a dry spot at the margin. The frog tried to escape for approximately three minutes, but the spider's chelicerae were firmly pinned to the anuran's hindquarters (Fig. 1A). The spider finally managed to immobilize the prey completely by embedding its chelicerae in its dorsal region. It then began feeding on the frog (Fig. 1B). The *H. phyllodes* continued breathing – its vocal sac moved – for about two minutes after being immobilized. We did not collect the individuals. However, we recorded the predation event and deposited the video at Fonoteca Neotropical Jacques Vielliard (ZUEC-VID 949– 951).

This behavior is similar to the observation by Gaiarsa et al. (2012) during predation of a juvenile *Cycloramphus boraceiensis* (Cycloramphidae) by *Trechaleoides biocellata*. In our record, the presence of the researchers influenced the predation event, because *H. phyllodes* probably jumped into the water because of the researcher's approach. Since *H. phyllodes* is diurnal (Hartmann et al. 2006) and *Trechaleoides* spiders are nocturnal and locate prey by detecting oscillations on the water surface (Silva et al. 2005), our approach may have facilitated opportunistic predation by the spider.

Although anurans have numerous escape mechanisms, they represent about 40% of vertebrate prey captured by arthropods (Valdez 2020). This is largely due to the ease of penetration of their skin, which would allow them to be preyed upon by virtually anything (Duellman & Trueb 1994; Valdez 2020). Due to the nocturnal habits and enigmatic behavior of arthropods, reports of predation on vertebrates are undersampled. Therefore, these records are essential for a better understanding of prey-predator interactions between arthropods and vertebrates, which are understudied compared to other taxa (Nordberg et al. 2018; Valdez 2020).

Trechaleoides spiders are frequently seen on stream margins in the study area. Because they belong to a family of spiders considered to be opportunistic and stalking predators (Santos 2014), they can act directly on the populations of small species in this environment,

such as *Hylodes phyllodes*. New natural history observations and studies can reveal more about these species, as well as others that may be part of the diet of *Trechaleiodes* sp., contributing to the understanding of predator-prey interactions and conservation of these species.

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Figure 1. Capture (A) and predation (B) of *Hylodes phyllodes* by a *Trechaleoides* spider at the Projeto Dacnis private reserve in Ubatuba, state of São Paulo, Brazil.