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First record of predation of the leopard tree frog *Boana pardalis* (Anura: Hylidae) by the water snake *Erythrolamprus miliaris* (Squamata: Dipsadidae)

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Feeding is one of the key components in snake natural history, directly influencing activity periods, behavior, and habitat use (Toft, 1985). Snakes can be considered the main predators of anurans, which are an important food source for the group (Vitt, 1983; Vitt & Vangilder, 1983; Sazima & Haddad, 1992; Strüssmann & Sazima, 1993; Toledo et al., 2007). Factors such as the gregarious behavior of anurans during reproductive periods (greater food availability for their predators) may be responsible for this (Wells, 2007).

The water snake *Erythrolamphrus miliaris* (Linnaeus, 1758) is a generalist feeder. Prey recorded for it include small mammals, reptiles, and fish, but overwhelmingly amphibians, mostly Hylidae, which comprise 77% of listed prey (van den Burg, 2020). There are also reports of necrophagy (Sazima & Strüssmann, 1990; Gomes et al., 2017). *Erythrolamphrus miliaris* is often found near water bodies, habitat used by many anurans during their reproductive season (Sazima & Haddad, 1992; Marques & Sazima, 2004).

On 5 October 2020, during routine fauna monitoring at 19:53 h, we observed a predation event on a small, muddy streambank located in a study area of the NGO Projeto Dacnis (22°53′44,7″ S, 45°56′29,4″ W), in the sub-district of São Francisco Xavier, municipality of São José dos Campos, state of São Paulo, Brazil. The snake had already begun ingesting its prey, an adult leopard tree frog *Boana pardalis* (Spix, 1824), by the head (Fig. 1A–1B). The anuran was moving its hind legs, and inflating its body to try to escape the snake's grasp, but its efforts were unsuccessful. From the time we arrived, the snake completely ingested the frog in 10 minutes (Fig. 1C–D).

This event includes another novelty: it is the first report of the defense mechanism of body inflation in *B. pardalis*. The mechanism's purpose is to enlarge the body, making capture and/or ingestion by a predator more difficult (Toledo et al., 2007; Caro, 2014). Six types of defense mechanisms have been reported for Hylidae (Alves et. al., 2018), but puffing up the body (*sensu* Toledo et al., 2011) in the leopard tree frog had not been recorded until now.

Boana pardalis is considered a large anuran (Rocha-Lima et al., 2018), and body inflation could pose a problem for *E. miliaris*. It is an aglyphous snake with undifferentiated dentition (isodonty) (Guedes et al., 2018), and does not have elongated posterior teeth to perforate an inflated frog's body as does *Xenodon merremii* (Wagler, 1824). *Xenodon merremii* is also aglyphous, but has differentiated dentition (heterodonty) (Amaral, 1934; Vanzolini et al., 1980; Duellman & Trueb, 1994; Jordão, 1996; Greene, 1997; Guedes et al., 2018) that facilitates puncturing inflated prey. Nonetheless, despite the predator/prey size ratio, inflated prey body, and the lack of differentiated teeth, *E. miliaris* was successful in its predation.

The defensive repertoire of a species or population may have evolved due to the constant and intense pressure exerted by its natural predators (Greene, 1997; Vamosi, 2005; Toledo et al., 2007). Conversely, predators may also have evolved to suppress antipredation mechanisms, generating cycles in which one evolves to overcome the other's adaptation (Brodie & Brodie, 1999a,b; Geffeney et al., 2002; Toledo et al., 2007). Therefore, the maintenance of a specific defensive behavior theoretically depends on its contribution to the species' survival (Greene, 1988). Likewise, a successful predation strategy means that the predator overcame its prey's defensive mechanisms (e.g., Muscat & Moroti, 2018).

Although predation events are seldom observed (Pombal, 2007), the number of records has increased recently. For *E. miliaris*, despite the significant variety of reported prey, its wide distribution range and shortage of records suggest that many prey species are as yet unknown (van den Burg & Miguel, 2020). We can now include *Boana pardalis* on this list, highlighting the snake's feeding success while lacking any morphological adaptation to counter the frog's inflation defense mechanism.

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Figure 1. Erythrolamprus miliaris preying on *Boana pardalis*. The snake began ingestion from the head (A and B), then the body (C), and after approximately 10 minutes, ingested the prey completely (D). The predation event took place in a stream in an open area, in São Francisco Xavier, state of São Paulo, on 5 October 2020 at 19:53. *Boana pardalis* was calling in the same environment at night. Photos: Matheus T. Moroti.