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Predation on *Physalaemus olfersii* (Anura: Leptodactylidae) by *Phoneutria nigriventer* (Aranae: Ctenidae) in Atlantic Forest, South-east of Brazil

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Anurans are essential in trophic chains (Duellman and Trueb, 1994), and are preyed upon many vertebrates and invertebrates (Toledo et al., 2007). Usually, predation on anurans by invertebrates occurs mostly during larval and adult stages, but they also attack on anuran spawns (Downie et al., 1995; Santos, 2009). Among the invertebrates that may feed on anurans, there are records of beetles, waterbugs, ants, spiders and crabs (Duellman and Trueb, 1994; Toledo et al., 2005; Caldart et al., 2011). Predation events, involving anurans and invertebrates, may be trivial in nature, however these records are dependent of fortuitous observations (Pombal Jr, 2007; Santana et al., 2009).

Although amphibians feed mainly on invertebrates, anurans are commonly documented as prey of invertebrates, this relationship is determined by the size of the individuals involved (e.g. Toledo et al. 2005; Santana et al., 2009; Caldart et al., 2011; Baracho et al., 2014). Therefore, the role frogs play in food webs may vary depending on their size (Gaiarsa et al., 2012).

Physalaemus olfersii (Lichtenstein and Martens, 1856) is a small frog species that reaches 26.2–36.4 mm of snout-vent length in males and 22.4–41.1 mm in females (Cassini et al. 2010), and is distributed in the Atlantic Rain Forest domain and its influence areas, from the municipality of Santa Teresa, state of Espírito Santo, southern region of the states of Minas Gerais and São Paulo (Cassini et al. 2010). Ctenid spiders of the genus *Phoneutria* have already been reported as anuran predators (Rego et al., 2005, Santana et al., 2009, Caldart et al., 2011, Pacheco et al., 2016), and are nocturnal with wandering habits, which actively seek their prey (Lucas, 1988). According to Brazil et al. (2009), *Phoneutria nigriventer* (Keyserling, 1891) has a wide distribution, ranging from the Northeast of Argentina to the South of Bahia, Brazil. Herein, we report a predation event, where an adult of *P. olfersii* was preyed upon *P. nigriventer*.

The record was observed on February 21, 2016, at Parque Natural Municipal Augusto Ruschi (PNMAR), municipality of São José dos Campos, state of São Paulo. The predation event occurred in a temporary pond (-23.0714ºS, -45.9313ºW, WGS-84) while the male of *P. olfersii* was vocalizing. During the occurrence, there were several other individuals of the frog species also calling. The air temperature was 21.3 °C and the relative air humidity was 82%. Abiotic data were taken at the site using a thermos-hygrometer (Instrutemp ITHT 2250). Both specimens were collected and are housed in the scientific collection of Instituto Butantan (*Physalaemus olfersii*: IBSP 1395; *Phoneutria nigriventer*: IBSP 167034).

At the beginning of the observation, the individual of *P. olfersii* was already involved by *P. nigriventer* pedipalps and the chelicerae sunk into the amphibian's ventral surface (Figure 1a). The anuran attempted to escape from the spider, while spider remained motionless. After the frog attempted to escape, the spider began to rotate it with the help of its pedipalps, starting the intake process (Figure 1b). Pacheco et al.

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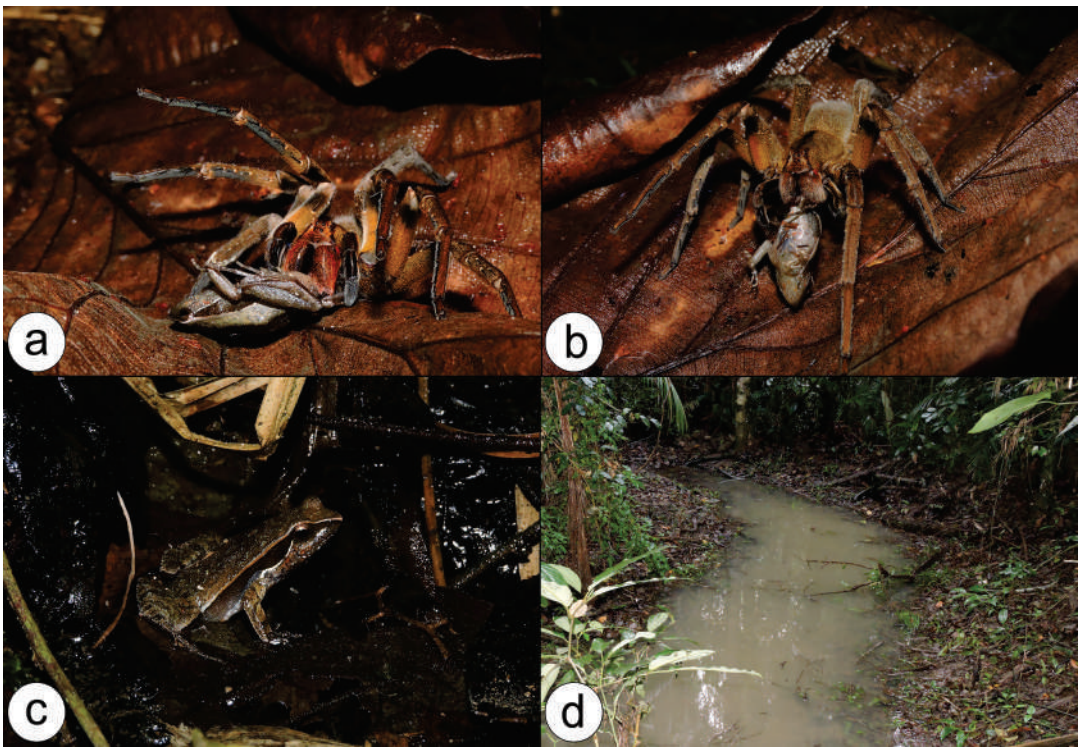

Figure 1. (a) At the beginning of the predation record, *Physalaemus olfersii* was already involved by the pedipalps and the chelicerae nailed in her belly; (b) After the anuran ceased struggling, the spider began to rotate it with the help of it pedipalps, starting the intake process; (c) Adult male of *P. olfersii* observed in the same place where predation occurred; (d) Temporary pond where the predation was observed in Parque Natural Municipal Augusto Ruschi (PNMAR), São José dos Campos municipality, state of São Paulo, Brazil (-23.0714ºS, -45.9313ºW, WGS-84). Photos: Matheus Moroti

(2016) recorded the predation of *Scinax crospedospilus* by *P. nigriventer* 30 cm above the ground. Santana et al. (2009) also recorded a predation event of this spider species on another species of anuran (*Dendropsophus elegans*), which occurred two meters above the ground. In our study, we observed that the spider species can also forage near temporary ponds and burlap (Figure 1c-d). Our observation suggest that this spider species can also feed on anuran species with terrestrial habits (e.g. *P. olfersii*), corroborating Pacheco et al. (2016) who suggested that this spider uses different habitats to forage.

Instances of anurans predated by spiders have been increasingly documented following a review by Toledo (2005) (e.g. Oliveira et al., 2010; Santos-Silva et al., 2013; Bovo et al., 2014; Maffei et al., 2014). These studies indicate that anurans may represent an important portion of invertebrate diets, especially by spiders, if both prey and predator have nocturnal habits (Maffei et al., 2010). Predations of adult amphibians by *P. nigriventer* are already known (Santana et al., 2009), and predation of species of *Physalaemus* has been reported for other species of spiders (Toledo, 2005), however this is the first record of an interaction of *P. olfersii* and *P. nigriventer*. We here reported another predation event involving *P. nigriventer*, reinforcing that it represent an important predator of anurans given the number of predation records involving this species.

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