

Philodryas olfersii predation by *Philodryas patagoniensis* (Serpentes: Colubridae) in the Restinga ecosystem, north coast of Bahia, Brazil

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Snakes are a highly important group among squamates, which includes specialized and generalist ophidians with diets composed of a variety of organisms (Greene, 1997). Many records of colubrid diets include invertebrates, fishes, amphibians, lizards and their eggs, other snakes, birds and small rodents (Palmuti, Cassimiro and Bertoluci, 2009; Bernarde and Abe, 2010).

Colubrids of the genus *Philodryas* Wagler, 1830 are terrestrial, arboreal, semi-arboreal and diurnal snakes, distributed over Brazil and neighbouring countries (Peters and Orejas-Miranda, 1970; Thomas, 1976; Kacoliris, Horlent and Williams, 2006; Álvarez et al., 2009). There are 13 species of this genus occurring in Brazil (Bérnils and Costa, 2011). *Philodryas patagoniensis* (Girard, 1857) is a diurnal snake, mostly terrestrial and often found in wide open areas (Hartmann and Marques, 2005; Sawaya, Marques and Martins, 2008; Marques, Eterovic and Sazima, 2001; Hartmann, Hartmann and Martins, 2009a). It occurs within the biomes Cerrado, Caatinga and Atlantic rainforest, including restinga

costal sand dunes, an associated ecosystem of Atlantic rainforest (Vaz-Silva et al., 2007; Valdujo et al., 2009; Salles and Silva-Soares, 2010; Souza et al., 2010; Marques et al., 2011). Literature record compilations suggest its diet is composed of anurans, lizards, mammals, birds and other snakes (Marques, Eterovic and Sazima, 2001; Hartmann and Marques, 2005). Here we report on a natural *Philodryas olfersii* predation by *P. patagoniensis* in restinga environment during diurnal foraging activity.

The snake sampling occurred in a local restinga sand dune ecosystem in flooded vegetation habit, in Costa Azul site (-11.697618, -37.505505), within Jandaíra municipality on the north coast of Bahia on 26 October 2010 at 2:10 p.m. Time constrained visual encounter survey was used as a major project sampling method. At the moment of sight, the snake was found with a small portion of another snake's tail in its mouth, swallowing it and at the same time trying to escape from capture. The individual was manually collected and placed in a snake bag for later examination.

At the moment of capture, the individual of *P. patagoniensis*, a female with 1150 mm total length, 28 mm head length, 302 mm tail length and 235 g weight, presented many coils on the inside sideways and was taken to our research base for further procedures. After a few moments it was placed into the bag, the snake initiated the regurgitation process itself due to the stressful conditions presented by capture, partially regurgitating the tail portion of a *P. olfersii*. Thereafter, the *P. patagoniensis* was housed inside a transparent plastic box as illustrated in Fig. 1. It then continued the process itself; however it swallowed again the regurgitated portion. Then we started massaging its ventral portion, gently pushing the ingested material towards its mouth. It then slowly expelled a female *P. olfersii* (Fig. 1B), with 1.007 mm total length, 26,8 mm head length, 237 mm tail length and 100 g weight. We inspected the *P. patagoniensis*' body and found a bite

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Figure 1. (A) *Philodryas patagoniensis* specimen regurgitating *Philodryas olfersii*. (B) Regurgitated *P. olfersii*. (C) Gular portion drilling found in *P. patagoniensis* and jaw shaped marks. Photographs: Ricardo Marques.

on its gular portion (Fig. 1C), possibly caused by the *P. olfersii*, which presented wounds on the back portion of its head.

We collected morphometric measurements on both individuals and we released the *P. patagoniensis* 24 h later in the same place it was found. It presented normal behavior and apparently no reaction to what we assume was a *P. olfersii* bite. The latter was housed in the Centro de Ecologia e Conservação Animal reference herpetological collection (CHECOA 002527) for further examination.

Snake ingestion by Colubrids is recorded in many ecological studies (Bernarde and Abe, 2006; Hartmann, Hartmann and Martins, 2009a; Hartmann, Hartmann and Martins, 2009b; Palmuti, Cassimiro and Bertoluci, 2009; Bernarde and Abe, 2010), whilst the generalist diet of *P. patagoniensis* includes records of *Liophis poecilogyrus*, *P. patagoniensis*, *Pseudablabes agassizii* and possibly a pitviper of the genus *Bothrops* (Hartmann and Marques, 2005; Perroni e Travaglia-Cardoso, 2007). Predation on another species of the same genus may occur due to niche overlap between them, considering both species

possess similar habitat and behaviour (Leite, Kaefer and Cechin, 2009; Pontes, Pontes and Rocha, 2009).

Min and Das (2011) reported a predatory behavior of the colubrid *Boiga dendrophila* preying upon the viper *Parias sumatranus*, subduing its prey by the head portion. Considering the damages found here on *P. olfersii* specimens body, we suggest *P. patagoniensis* possesses similar predatory behavior and attacked the back of the head portion, where its prey may have been bitten. However, since this area allows head movement, we believe *P. olfersii* reacted and bit its predator, resulting on the wound illustrated on Fig. 1C.

Only Lema, Araujo and Azevedo (1983) reported a dead *P. patagoniensis* containing a *P. olfersii* in its stomach in a farming area. Herein we report this as the first report of such predation in restinga sand dune habitat in Bahia state and reinforce this prey item on *P. patagoniensis*' diet. We also presented suggestive data of subdue strategies of the species considering *P. olfersii* bite marks. We believe *P. patagoniensis* assume similar predatory behavior on snakes as observed by Min and Das (2011) considering our species also bites neck and head portions to immobilize and start swallowing when preying on lizards (Laurindo *et al.* 2010).

Furthermore, both species were reported previously by Brazil (2010) in Conde municipality as the northern record on the north coast of Bahia, we now register both species for the first time to Jandaira municipality, about 50 km NE and increase the geographic distribution as the northern record on the coast of Bahia state, limited by Sergipe's state boundaries.

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