

First record of cannibalism in *Thamnodynastes phoenix* Franco, Trevine, Montingelli & Zaher, 2017 (Serpentes, Colubridae)

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Abstract

Cannibalism has been documented across many groups of snakes and the same is true for Brazilian snakes. Herein, we present the first observation of cannibalism in *Thamnodynastes phoenix* between two adult males from Caatinga biome of northeastern Brazil. We suggest this behavior could be influenced by a lack of resources caused by extreme abiotic conditions, as well as the opportunistic habits of this species.

Key Words

Brazil, Caatinga, diet, ecology, feeding habits, intraspecific predation, snake behavior

Cannibalism has been recognized as an important aspect in trophic ecology and it occurs in many animal species (mainly in captivity) despite being regarded as a maladaptive trait (Polis 1981). It may influence competitive interactions (for resources and mates), populations dynamics and behavior (Polis 1981; Polis and Myers 1985; Mitchell and Walls 2008). Cannibalism in reptiles occurs mostly in opportunistic foragers (Polis and Myers 1985). In snakes, besides the ophiophagous snakes, cannibalism has been documented in females that ingest their non-viable offspring and undeveloped eggs (Lourdais et al. 2005; Mociño-Deloya et al. 2009), between neonates and juveniles (Mienis 1986; Egler et al. 1996; Campbell and Lamar 2004) and in some adult individuals such as *Anilius scytale*, *Eunectes murinus*, *Helicops infrataeniatus* and *Siphophis compressus* (Rivas and Owens 2000; Aguiar

and Di-Bernardo 2004; Maschio et al. 2005; Alemu and Rowley 2008).

The genus *Thamnodynastes* comprises 20 species and occurs across South America (Bailey and Thomas 2007; Franco et al. 2017). In Brazil, 12 species are recognized and six of them can be found in the northern and northeast portion of Brazil (Franco et al. 2017). They are terrestrial and nocturnal snakes (Guedes et al. 2014), exhibiting viviparous reproduction that can live in a variety of habitats (Hamdan and Lira-da-Silva 2012). *Thamnodynastes phoenix* is associated with many types of Cerrado, but predominantly with the Caatinga formation of northeastern Brazil, from the state of Ceará to northern Minas Gerais (Franco et al. 2017).

Thamnodynastes snakes feed mainly on frogs (e.g. Bailey 1967; Bernarde et al. 2000; Bellini et al. 2013;

Dorigo et al. 2014; Pergentino and Ribeiro 2017), but specific data on their diet are available only for a few species. Here we report the first record of cannibalism in natural conditions for *T. phoenix*.

On 28 June 2019 at 12:35 hrs we observed an adult male *T. phoenix* (52.2 cm SVL, 15.2 cm tail length, 65 g) swallowing, head first, another adult male (49.5 cm SVL, 13.6 cm tail length) (Fig. 1). The observation was made in Natuba, a Caatinga area of Paraíba State, Brazil (-7.5840375S; -35.598379W). At the moment of sighting, the prey's head was totally ingested; the individuals were collected forty-five minutes after that, when the prey was half eaten and the ingestion continued in a collection bag. The prey was completely ingested after one hour and there was no regurgitation. The snakes were on the ground in an open shrubby Caatinga, one of the most common phytophysiognomies of the biome (Santos and Santos 2008).

The individuals were taken to the Animal Ecology Lab in Universidade Federal da Paraíba, Rio Tinto municipality, Paraíba State, Brazil (UFPB). The predator was dissected for stomach content examination after being euth-

anized following the proposal by Lillywhite et al. (2016), fixed in 10% formalin and preserved in 70% alcohol. Both snakes were deposited in the Herpetological Collection of UFPB under collection numbers RF 446 and RF 447. Morphometric measurements were made with a digital caliper (precision 0.03 mm) and a standard ruler; weight was obtained using a Pesola spring scale (precision of 0.3 g). The snakes were collected under ICMBio/SISBIO permit no. 21799-1.

This observation was quite unexpected. *Thamnodynastes phoenix*, like the other species of the genus, is considered an anurophagous snake although its congeners diets are known to include lizards, rodents and fishes (Guedes et al. 2014; Franco et al. 2017). Ophiophagy was recorded in *T. strigatus* preying on *Sibynomorphus ventrimaculatus* (Ruffato et al. 2003). A female *T. rutilus* cannibalized a newborn baby (Araújo et al. 1998).

Cannibalism of adult individuals has never been reported in the genus *Thamnodynastes*. This behavior can be considered a strategy for demographic control (Castilla and Van Damme 1996) or an answer to starvation and



Figure 1. Cannibalistic behavior in *Thamnodynastes phoenix*.

stress in natural conditions (Göçmen et al. 2008). Furthermore, our record was made in a habitat considered the driest and with the lowest rainfall rate of the Caatinga biome, which leads to stress, scarcity and unpredictability of resources (Leal et al. 2003).

Our observation provides important addition to the knowledge of predator-prey relationships, especially considering the scarcity of data on snake diet from the semiarid regions of Brazil and particularly for the genus *Thamnodynastes*.

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