

Rhinella major* (Anura: Bufonidae) and *Leptodactylus macrosternum* (Anura: Leptodactylidae): predation and cannibalism by *Leptodactylus macrosternum

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ABSTRACT

Cannibalism in anurans is well known, both on eggs, tadpoles, and post-metamorphic specimens. Among adult anurans, however, less is known about cannibalism in the terrestrial phase of the anuran life cycle. We report an *in situ* observation of *Leptodactylus macrosternum* preying on an juvenile of *L. macrosternum*. During fieldwork in a rapid amphibian and reptile assessment at a flooded area, municipality of Santana, State of Amapá, Brazil, we found an adult male *L. macrosternum* trying to swallow a juvenile of *L. macrosternum*. The initial observation was prompted by following a distress call, revealed to be emitted by an individual of *L. macrosternum* which was biting the hind limbs of the *L. macrosternum* male. The stomach contents included two anuran species: *L. macrosternum* and *Rhinella major*. This record presented herein presents further evidence of the generalistic feeding behaviour of *L. macrosternum* and the first report of adult cannibalism in this species.

Among all tetrapods groups, amphibians are those most affected by predation (Loebmann, 2013). Amphibians play an essential role, occupying a variety of niches, consuming a wide spectrum of preys, and being preyed upon by a broad group of invertebrates (Toledo, 2005; Costa-Pereira *et al.*, 2010; Santos-Silva *et al.*, 2013; Maffei *et al.*, 2014) and vertebrates (Pombal Jr. 2007; Santos, 2009; Ringler *et al.*, 2010; Briso *et al.*, 2014; Oliveira *et al.*, 2014), including other amphibians (batracophagy; Figueiredo-de-Andrade *et al.*, 2012; Santana *et al.*, 2012; Heitor *et al.*, 2012).

Many frogs and toads are generalized feeders (Toft, 1985) so that other anurans (including conspecifics) are likely to be consumed occasionally (Duellman and Trueb, 1994). Cannibalism in anurans is well known, both on eggs, tadpoles, and post-metamorphic specimens (McDiarmid and Altig, 1999; Silva *et al.*, 2005; Pirani *et al.*, 2010; Jancowski and Orchard, 2013) and tends to occur most frequently in non-arboreal species (Toledo *et al.*, 2007; Wells 2007). This behavior is considered an opportunistic form of predation (Duellman and Trueb, 1994).

Herein, we report an *in situ* observation of *Leptodactylus macrosternum* preying on a juvenile of *L. macrosternum*. During fieldwork in a rapid

amphibian and reptile assessment at a flooded area (0.036311°N, 51.162481°W, datum WGS84; elev. 26 m), municipality of Santana, State of Amapá, Brazil, we found on June 16, 2014, at 21:49 h, an adult male *L. macrosternum* trying to swallow a juvenile of *L. macrosternum*. The initial observation was prompted by following a distress call, revealed to be emitted by an individual *L. macrosternum* which was biting the hind limbs of the male *L. macrosternum* (Fig. 1). For approximately 20 min we observed the attempting to cannibalism of the frog.

The individuals were collected and placed into a plastic bag and transported to the laboratory for analysis. The individual was immediately euthanized with anesthetic (2% lidocaine), weighed with a Pesola® scale (precision 0.01 g), fixed with 10% formalin, and preserved in 70% ethanol, as described by Heyer *et al.*, (1994). In the laboratory, measurements of snout-vent length (SVL) and mandible width (MW) were taken with a digital caliper (precision 0.1 mm). The stomach were removed through a ventral incision, and its contents were analyzed with a stereomicroscope.

The stomach contents of male *L. macrosternum* (SVL = 77 mm; MW = 25.19 mm; Weight = 34 g) included two anuran species: *L. macrosternum*,

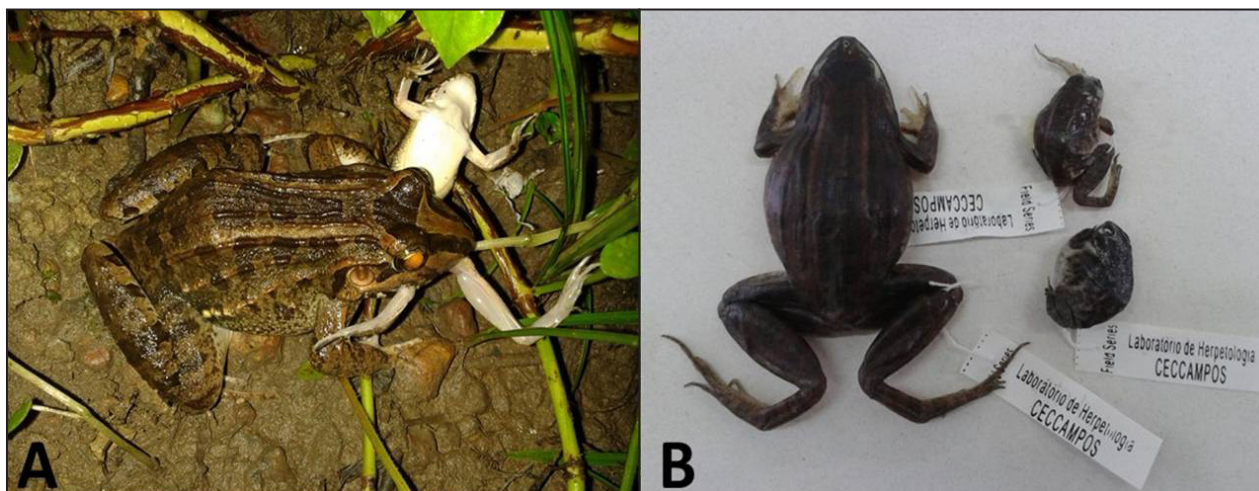


Figure 1. Male adult of *Leptodactylus macrosternum* preying on a juvenile conspecific (A). Juvenile *Leptodactylus macrosternum* and a partially digested *Rhinella major* with stomach contents, an male adult *Leptodactylus macrosternum*.

measuring 38.6 mm length, 14.6 mm width, and volume of 4275.9, and one specimens of *Rhinella major*, measuring 32.9 mm length, 17.2 mm width, and volume of 5096.3 mm.

Exemplars were collected under Permit # 41586-1 issued by SISBIO/ICMBio and the specimens were deposited in the Herpetological Collection of the Universidade Federal do Amapá (*Leptodactylus macrosternum*: CECCAMPOS 01159, 01160; *Rhinella major*: CECCAMPOS 01161).

According to Duellman and Trueb (1994), anurans can prey on many animals and other anurans, including conspecific individuals. This behavior may be associated with situations of high population density or low food resources, and could provide possible advantages such as obtaining energy while decreasing intraspecific competition (Toledo *et al.*, 2007; Pizzatto and Shine, 2008).

In the literature, cases of cannibalism in species of the genus *Leptodactylus* have been reported for *L. ocellatus* (Teixeira and Vrcibradic, 2003; França *et al.*, 2004, Kokobum and Rodrigues, 2005) and *L. vastus* (Guimarães *et al.*, 2015). In this sense, we propose that cannibalism in *L. macrosternum* may represent an opportunistic feeding habit when an increase in the juvenile population occurs. Moreover, no evidence of cannibalism could be found even in intensive comparative studies on stomach contents.

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