Predation of *Proceratophrys boiei* (Anura, Odontophrynidae) upon *Ololygon luizotavioi* (Anura, Hylidae)

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DOI: 10.5281/zenodo.13308220

Anurans are generalist predators that feed on small organisms, including invertebrates such as arthropods (Forti et al., 2011), and small vertebrates like fish (Solé et al., 2009), or even other anurans (Cuestas-Carrillo et al., 2019), a behavior known as batracophagy (Santos et al., 2004). Batracophagy in anurans is a common but understudied behavior (Toledo et al., 2007). In a recent survey on batracophagy by anurans, 67 records of this behavior were found in 18 Brazilian anuran species, distributed among the families Bufonidae, Ceratophryidae, Dendrobatidae, Hylidae, Leptodactylidae, and Ranidae (Benício, 2021).

The horned frog, *Proceratophrys boiei*, a species of the Odontophrynidae family, is widely distributed in Brazil, occurring in the states of Espírito Santo, Minas Gerais, Rio de Janeiro, São Paulo, Paraná, and Santa Catarina (Prado & Pombal, 2008; Frost, 2024). It inhabits the interior or edge of forests, streams, and lentic environments (Forti, 2009). This frog is considered a large species of *Proceratophrys*, with males measuring 39.8–61.9 mm SVL and females measuring 40.0–74.3 mm SVL (Prado and Pombal-Jr., 2008).

Species of the genus *Proceratophrys* are considered predators, with their diet consisting mainly of invertebrates (Teixeira & Coutinho, 2002; Brito et al., 2012; Almeida-Santos et al., 2017). They are also opportunistic animals that exhibit a sit-and-wait behavior, which contributes to their success in capturing and feeding on prey (Brito et al., 2012). The few studies addressing the feeding habits of *P. boiei* showed that its diet mainly consists of invertebrates, especially arthropods, some plant remains, nematodes, and a few vertebrates (Gi-

aretta et al., 1998; Klaion et al., 2011). Among the vertebrates, there is only a single record of batracophagy by *P. boiei*, in which it fed on two adult individuals of *Ischnocnema parva* (Girard, 1853) (Giaretta et al., 1998), a species of the family Brachycephalidae. Considering that information regarding the trophic ecology of a species is important to understand organism interactions (Ceron et al., 2019), in this note we present a second record of batracophagy by *P. boiei*.

During a field expedition to Serra do Brigadeiro (20°42'55"S; 42°26'51"W, WGS84 datum, approximately 1300 m a.s.l.), in the municipality of Ervália, state of Minas Gerais, on November 4th, 2021, we collected a male individual of *Proceratophrys boiei* (Figure 1A). The specimen is deposited in the Coleção Zoológica da Universidade Federal do Mato Grosso do Sul (ZUFMS-AMP 15673; SVL = 46.56 mm). While preparing this specimen for diaphanization, we opened the ventral region to remove the viscera (Figure 2). The stomach was opened to analyze its content due to its large volume.

Among the stomach contents, we found two *Ololygon luizotavioi* Caramaschi and Kisteumacher, 1989 (Hylidae) (Figure 1B). We were able to identify these specimens based on the smaller size of the female (20.0 mm) in comparison to its sympatric congeners, such as *Ololygon tripui* (37.0–39.2 mm) and *Ololygon flavoguttata* (40.0–45.4 mm) (Lourenço et al., 2009). Additionally, the distinct stripe pattern on the thighs and dorsum was diagnostic, and not present in *Ololygon* aff. *rizibilis* (see figure 5F in Moura et al., 2012). The ovigerous female had a ruptured belly, which caused the release of the ovocytes. Besides the two *O. luizotavioi*, we also identified other food items in the stomach of *P. boiei*: orthoptera legs and an unidentified Coleopteran.

There is one record of batracophagy in the genus *Proceratophrys*; *P. appendiculata* (Günther, 1873), which contained an adult *Ischnocnema* sp. Reinhardt & Lütken, 1862 (Boquimpani-Freitas et al., 2002). It is important to note that our record of batracophagy by *P. boiei* involves the ingestion of an arboreal anuran species. Previous records were of *Ischnocnema* that inhabit the forest litter, the same habitat as *Proceratophrys* species (Haddad et al., 2013).

This finding represents the second record of batracophagy by *P. boiei* (Giaretta *et al.*, 1998), and the third within the *Proceratophrys* genus (Boquimpani-Freitas et al., 2002), suggesting that such behavior might be relatively uncommon among this genus (43 species; Frost, 2024). A factor that might contribute to this behavior is that the individual was collected during the breed-

ing season, a period when anurans congregate in large groups for reproduction (Giaretta & Facure, 2006). In temporary ponds along the trail where the *P. boiei* individual was collected we observed many anurans in reproductive activities, including many *O. luizotavioi*: males were calling, and several couples were in amplexus (Figure 1B). It is likely that the couple found in the stomach of *P. boiei* was in amplexus at the time of predation. The gathering of a substantial number of anurans in a single location could lead to unusual behaviors due to the intense activities of the species, such as interspecific amplexus (*e.g.*, Pedro and Nali, 2020), amplexus with inanimate objects (*e.g.*, Mollov et al., 2010), and male-to-male or even female aggression (Pombal-Jr. & Haddad, 2005).

During the breeding season, anurans are exposed, and the male's call may reveal their location, which may lead to predation (Hinshaw & Sullivan, 1990; Giaretta and Menin, 2004). During amplexus, the female's locomotion decreases, and they have difficulty moving (Bowcock et al., 2009; Gray & Mackenzie, 2016), which can also make the couple more susceptible to predation. We believe that the risk of predation might increase when anurans are engaged in amplexus.

Records like the one presented here are important to understand the dietary habits of anurans, including the preference and availability of food resources in natural environments, as well as predator-prey dynamics (França et al., 2004; Santos et al., 2004; Forti et al., 2011).

ACKNOWLEDGEMENTS

L.C. thanks to Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) for his scholarship, and Programa de Pós-Graduação em Biologia Animal da Universidade Federal de Mato Grosso do Sul and Andressa Figueiredo de Oliveira for identifying the arthropods. DJS thanks CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico) for his research fellowship (309420/2020-2). SM thanks to CNPq for her research fellowship. Specimens were collected under permit number 81643-2 issued by SISBio.

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Editor: *Ariadne F. Sabbag*



Figure 1. A) *Proceratophrys boiei* (voucher ZUFMS-AMP 15673), and B) amplecting couple of *Ololygon luizotavioi* at the Serra do Brigadeiro, in the municipality of Ervália, state of Minas Gerais (not collected).



Figure 2. A) Skinless individual of *Proceratophrys boiei* in preparation for diaphanization (voucher ZUFMS-AMP 15673, SVL 46.56 mm), B) couple of *Ololygon luizotavioi* found in the stomach of *P. boiei*, C) other stomach contents.