

OOPHAGY IN TADPOLES OF *LEPTODACTYLUS TROGLODYTES* (AMPHIBIA, ANURA, LEPTODACTYLIDAE)

MÁRCIO BORBA DA SILVA & FLORA ACUÑA JUNCÁ

Universidade Estadual de Feira de Santana, Departamento de Ciências Biológicas, Km 3, BR 116, 44031-460, Feira de Santana, Bahia, Brasil (fjunca@uefs.br)

(Ocorrência de oofagia em girinos de *Leptodactylus troglodytes* (Amphibia, Anura, Leptodactylidae)) – Dois girinos de *Leptodactylus troglodytes* foram registrados comendo ovos de *Physalaemus albifrons* em uma área do semi-árido do estado da Bahia, Brasil. O girino oófago estava no estágio 37 (GOSNER, 1960). Um deles apresentou 458 ovos no seu trato intestinal, estando 71% mais largo que os outros girinos de *L. troglodytes* que não foram observados comendo ovos. Girinos desenvolvendo-se em habitats sujeitos a estresse hídrico podem suplementar suas dietas com alimentos alternativos, adotando comportamento oofágico facultativo. Os girinos de *L. troglodytes* provavelmente são oofágicos oportunistas podendo também consumir ovos de outras espécies, assim como ovos de *P. albifrons*.

Palavras-chave: *Leptodactylus troglodytes*, girinos, oofagia.

(Oophagy in tadpoles of *Leptodactylus troglodytes* (Amphibia, Anura, Leptodactylidae)) – We recorded two tadpoles of *Leptodactylus troglodytes* eating *Physalaemus albifrons* eggs in a semiarid area located in the state of Bahia, Brazil. The oophagous tadpoles were in stage 37 (GOSNER, 1960). One of them contained 458 eggs in its intestinal tract and its width was 71% larger than other *L. troglodytes* tadpoles not observed eating eggs. Tadpoles developing in habitats subject to water stress may supplement their diets with alternative foods and adopt facultative oophagy. Tadpoles of *L. troglodytes* probably are oophagic opportunists and they may also consume eggs of other species besides *P. albifrons*.

Key words: *Leptodactylus troglodytes*, tadpoles, oophagy.

INTRODUCTION

Most tadpoles are opportunistic omnivores, using a variety of food resources including viruses, bacteria, protozoans, algae, annelids, copepods, nematodes, rotifers, gastrotriches, insects, anuran eggs and heterospecific and conspecific tadpoles (HOFF *et al.*, 1999). Frog eggs represent an energetically rich food (CROSSLAND, 1998) and they are consumed by many different organisms including tadpoles (BOKERMANN, 1957; MAGNUSSON & HERO 1991; JUNCÁ, 1996; HEYING, 2001; MENIN & GIARETTA 2003; HAKANSSON & LOMAN 2004; RÖDEL *et al.*, 2002).

Tadpoles of *Dendrobates pumilio*, *D. speciosus*, *D. histrionicus*, *D. vanzolinii*, *Chirixalus eiffingeri*, *Mantella laevigata* and *Leptodactylus falax* are obligatorily oophagous. In these species the female feeds her tadpoles with unfertilized eggs that she lays periodically in aquatic habitats (WEYGOLDT, 1980; DONNELLY, 1989; KAM *et al.*, 1998; CALDWELL & OLIVEIRA, 1999; HEYING, 2001; HOFF *et al.*, 1999) or in foam nests (GIBSON & BULEY, 2004). Other tadpole species are facultatively oophagous, such as *Leptodactylus pentadactylus* (CROSSLAND, 1998). Tadpoles of *Osteocephalus taurinus*, *Phrynohyas resinifictrix*, and *Hyla pseudopuma* have also been observed eating conspecific fertilized eggs that are probably an important source of energy for their development (CRUMP, 1983, 1990; SCHIESARI *et al.*, 1996). Tadpoles of various species in the genera *Anotheca*, *Hyla*, *Dendrobates*, *Philautus* and *Hoplophryne*, which develop in environments with limited food resources, such as bromeliads or tree-holes, can also eat anuran eggs (DUELLMAN & TRUEB, 1986). Tadpoles of some species

of the genera *Scaphiopus*, *Ceratophrys*, *Lechriodus* and *Pyxicephalus*, which inhabit ephemeral pools in xeric environments, show opportunistic oophagy as well (PETRANKA *et al.*, 1994). Nevertheless, there have been no previous reports on oophagous behavior for tadpoles in Brazil's xeric environments. Here, we report tadpoles of *Leptodactylus troglodytes* Lutz eating *Physalaemus albifrons* (Spix) eggs in a semiarid area located in the state of Bahia, Brazil.

L. troglodytes (Leptodactylidae) is restricted to northeastern Brazil, and *Physalaemus albifrons* probably occurs from Bahia to Minas Gerais (FROST, 2004). Both species occur in open areas called "Caatinga" (characteristic xeric vegetation from northeastern Brazil), or in secondary forests (ARZABE & ALMEIDA, 1997). Their tadpoles develop in ephemeral ponds (F. A. JUNCÁ, personal obs.; CASCON & PEIXOTO, 1985).

METHODOLOGY

We recorded oophagous behavior of tadpoles of *L. troglodytes* in municipality of Feira de Santana, state of Bahia, Brazil (12°11'S and 38°58'W). In this region, the average annual temperature is 26°C and the average annual precipitation is 1000 mm (NIMER, 1989). During the collection of an egg clutch of *P. albifrons* from an ephemeral pool in July 2001, we captured two tadpoles of *L. troglodytes* eating eggs of *P. albifrons*. One tadpole was immediately preserved in 5% formalin and the other was maintained in plastic containers until completion of metamorphosis. Every two days, the tadpole was fed with bird chow and the water was changed. The metamorph was preserved in 5% formalin.

We removed and observed the intestinal contents of the *L. troglodytes* tadpole, under a stereoscopic microscope equipped with graduated ocular micrometer. We measured the eggs according to ALTIG & McDIARMID (1999), with vernier calipers (0.01 mm precision). For comparison, we measured six other tadpoles of *L. troglodytes* that were collected in the same study area (July 2003), and they are housed in the “Coleção Herpetológica” of “Museu de Zoologia da Universidade Estadual de Feira de Santana” (MZUEFS-383). The tadpole developmental stages were determined according to GOSNER (1960).

RESULTS AND DISCUSSION

The oophagous tadpole in stage 37 contained 458 eggs in its intestinal tract (Fig. 1). The eggs averaged 1.3 mm in diameter (SD = 0.2; n = 30). Tadpole measurements were as follows: 51.0 mm in total length (TL) and 12.4 mm in body width (BW). Other tadpoles of *L. troglodytes* in stages 35-37, averaged 47 mm TL (SD = 3.0; n = 6), and 7.3 mm BW (SD = 0.7; n = 6). Width of the oophagous tadpole was 71% greater than the other *L. troglodytes* tadpoles not observed eating eggs.

In xeric environments survival of larvae is strongly dependent upon water body persistence (WARBURG, 1997). In these habitats, nutrient availability is strongly related to rainfall (ALFORD, 1999), and high rates of evaporation both reduce space for tadpoles and limit trophic resources for their survival. Moreover, tadpole development requires large quantities of food (WARBURG, 1997). Thus, tadpoles developing in habitats subjected to water stress could sup-

plement their diets with alternative foods and adopt facultative oophagy (ALFORD, 1999). This applies to the tadpoles of *L. troglodytes* that probably are oophagic opportunists and may also consume eggs of other species besides *P. albifrons* eggs.

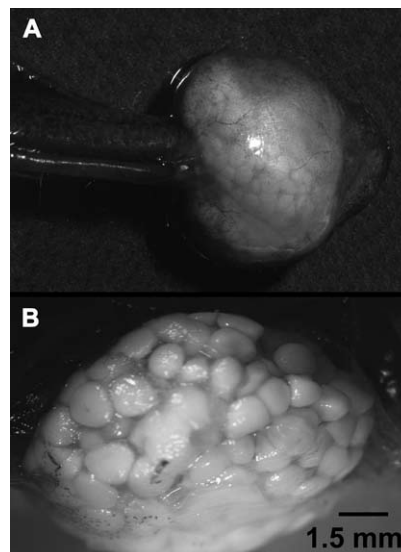


Fig. 1. A, ventral view of abdomen of live oophagous tadpole of *Leptodactylus troglodytes*. B, lateral view of digestive tract of preserved tadpole without abdominal skin and muscles showing the eggs in the intestines.

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