

Helminths of the frog *Pleurodema diplolister* (Anura, Leiuperidae) from the Caatingain Pernambuco State, Northeast Brazil

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1. Introduction

The leiuperid genus *Pleurodema* (Tshudi, 1838) currently comprises 15 species widely distributed in the Neotropical region (Frost, 2011), mainly in dry forests and open areas (Ferraro and Casagrande, 2009; Kolenc et al., 2009). *Pleurodema diplolister* (Peters, 1870) is the only species in the genus known to inhabit the Caatinga biome (shrub-like vegetation) (Cardoso and Arzabe, 1993). The species is also found in the Brazilian Cerrado and Cerrado-Caatinga transition zones (Andrade and Vaz-Silva, 2012).

Pleurodema diplolister is a fossorial and omnivorous frog, and its explosive reproduction shows greater specialization between the anuran communities of the Caatinga (Hödl, 1992; Cardoso and Arzabe, 1993; Santos et al., 2003).

Parasitological studies are important to understand host population dynamics, as well behavioral, morphological and dietary shifts, especially within highly specialized anurans such as *P. diplolister*. To date, only two records of parasitism in the genus *Pleurodema* are available, all of these by nematodes of the family Cosmoceridae: *Aplectana meriodionalis* Lent and Freitas, 1948 infecting *Pleurodema borellii* Peracca, 1895 (Baker, 1980) and *Oxyascaris oxyascaris* Travassos, 1920 in *P. diplolister* (Vicente et al., 1990).

Herein, we present data on helminth infection of the frog *P. diplolister* in the Caatinga of Pernambuco State, Brazil.

2. Material and Methods

The study was conducted on Angico Farm (08° 07' 55.7" S 40° 05' 3.2" W), located in the rural zone of the municipality of Ouricuri, in the Caatinga of Pernambuco State. The vegetation is characterized mainly by deciduous forest and hypoxerophytic Caatinga (CPRM, 2005).

Pleurodema diplolister specimens were collected in February 2012, using pitfall traps with drift fence or by hand, in a gallery forest near a temporary river after one of the few rains occurring that year. The specimens were euthanized with a lethal injection of lidocaine, fixed in 10% formalin and then stored in 70% ethanol. The snout-vent length was measured with a digital caliper (± 0.01 mm). Sex was assigned by the direct examination of the gonads.

Voucher specimens were deposited at Coleção Herpetológica da Universidade Regional do Cariri, Crato municipality, Ceará State (URCA-H: 2855-2858, 2866-2870).

Lungs, gall bladder and digestive tract were examined under a stereomicroscope for parasites. For identification, nematodes were cleared in lactophenol, and the cestodes were stained with carmine, dehydrated in an increasing alcohol series and cleared in creosote, where they were subsequently mounted on temporary slides and identified under a light microscope. All parasites were counted and stored in 70% ethanol. Voucher specimens were deposited in the Coleção Parasitológica da URCA (URCA-P: 357-359, 379-381).

Prevalence and mean intensity of infection were calculated according to Bush et al. (1997). A Pearson correlation (*R*) was conducted to determine the relationship between snout-vent length (SVL) and number of parasites using R software (R Development Core Team, 2013). The discrepancy index (*D*) was used to measure the level of aggregation of each helminth species, as suggested by Poulin (1993). This index was calculated with the software Quantitative Parasitology 3.0 (Rozsa et al., 2000).

3. Results

A total of 32 specimens of *P. diplolister* were examined, which included 11 males (33.04 ± 1.29 mm SVL) and 21 females (34.6 ± 1.71 mm SVL). Two helminth species were found infecting the intestines of *P. diplolister* from the Caatinga of Pernambuco State: *Raillietnema spectans* Gomes, 1964 (Nematoda: Cosmoceridae) and *Plerocercoid* larvae of the family Proteocephalidae (Cestoda). These larvae could not be identified due to the immature condition.

Of the total anuran hosts examined, six of them harbored at least one helminth species (overall prevalence of 18.75%; mean intensity of infection of 10 ± 13.59). For *R. spectans*, the prevalence was 15.6% and for the plerocercoid cestode larvae 3.1%. The prevalence was 19.4% for female hosts and 18.2% for males. Mean intensity of infection was 14.3 for females and 1 for males. Discrepancy index (*D*) was 0.901 for *R. spectans* and 1 for the cestode larvae.

4. Discussion

Helminth communities of amphibians are characterized by generalist species (Aho, 1990). The low host specificity, allied to the general lack of studies with Neotropical frog species, frequently are the main causes of new host records. In Brazil, species of Leptodactylidae and Bufonidae may be considered as hosts for a generalist helminth fauna, in view of studies conducted so far (Vicente et al., 1990, Goldberg et al., 2007, 2009; Luque et al., 2005). Regarding others amphibians taxa, further studies is still required to have any conclusion about the host specificity.

The leiuiperid *P. dipolister* is a new host record for the cosmocercid *R. spectans* and for the proteocephalidean cestode. In Brazil, *R. spectans* is known to infect the bufonids *Rhinella crucifer* (Wied-Neuwied, 1821), *Rhinella icterica* (Spix, 1824), and *Rhinella schneideri* (Werner, 1894) and the leptodactylid *Leptodactylus latrans* (Steffen, 1815) (Vicente et al., 1990).

Cestodes of the family Proteocephalidae are endoparasites of vertebrates, infecting mainly freshwater fishes (Pavanelli and Santos, 1991). It is also found in anurans of the families Leptodactylidae in Chile and Peru (Olmos and Muñoz, 2006; Iannaccone, 2003), Bufonidae in Peru (Tantaleán and Garcia, 1989), Hylidae in Ecuador (Dyer and Altig, 1977), and Ranidae in Costa Rica (Burseley and Goldberg, 2006) and Papua New Guinea (Burseley et al., 2008).

Brazil harbors a high diversity of amphibians with 946 species (Segalla et al., 2012). Despite this great diversity, parasitological studies focusing on ecological aspects, such as helminth community structure are scarce. Although there has been an increase in such studies in the past few years (Luque et al., 2005; Campião et al., 2009), further efforts are still necessary to understand the influence of parasites in the structure and dynamics of Brazilian anuran populations.

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