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Nematode parasites of *Proceratophrys aridus* (Anura: Odontophrynidae), an endemic frog of the Caatinga domain of the Neotropical region in Brazil

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There are currently 48 species of Odontophrynidae (Segalla et al., 2016) inhabiting Brazil. The genus *Proceratophrys* is composed of 40 species present in South America, with records in Argentina, Brazil and Paraguay (Frost, 2016). The *Proceratophrys cristiceps* species group (Müller 1884; Giaretta et al., 2000) inhabits open areas in the Cerrado and the Caatinga. Of these, *P. cristiceps*, *P. caramaschii* and *P. aridus* are found in northeastern Brazil. *Proceratophrys aridus* mainly feeds on insects (Isoptera, Orthoptera and Coleoptera), but also on gastropods and millipedes (Brito et al., 2012). Recently, some studies have contributed to the knowledge about the species of helminths that infect amphibians in the Caatinga (Nascimento et al., 2012; Campião et al. 2014; Teles et al., 2014; Teles et al., 2015; Araujo Filho et al., 2015). Of the helminth fauna of the Odontophrynidae, only three species are known in South America: *Odontophrynus americanus* (Duméril & Bibron, 1841) from Argentina and *P. appendicullata* (Günther, 1873; Boquimpani-Freitas et al., 2001) and *P. boiei* (Wied-Neuwied, 1825) from Brazil (Campião et al., 2014).

The aim of this study was therefore to describe the composition of helminth parasites of *P. aridus* in the Neotropical region of the Caatinga domain, Brazil. A single specimen of *P. aridus* (female; 80 mm) was examined by necropsy after capture in the Estação Ecológica de Aiuaba (6.573476°S, 40.123564°W, datum SAD69; elev. 466 m) –ESEC-Aiuaba, Ceara State, northeastern Brazil, in May 2011, under the license SISBIO (Sistema de Autorização e Informação sobre a Biodiversidade: No. 27542-2). The body cavity and respiratory and gastrointestinal tracts were examined for helminth parasites under a stereomicroscope. The detected nematodes were counted and the site(s) of infection were identified. Nematodes were preserved in 70% alcohol, subsequently mounted on temporary slides using Hoyer's medium and identified with the help of an optical microscope. Slides were deposited in the Parasitological Collection of the Universidade Regional do Cariri (URCA-P: 503-504-505-506). A total of 187 nematodes were found in the lungs and gastrointestinal tract of *P. aridus*. The lungs were infected with *Rhabdias* sp. (n = 3) and the stomach with *Raillietnema spectans* Gomes, 1964 (n = 54) and *Physaloptera* sp. (n = 30), while Cosmocercidae larvae (n = 100) were found in the stomach (n = 50) and in the large (n = 10) and small intestines (n = 30). The genus *Rhabdias* Stiles & Hassal, 1905 commonly infects the lungs of frogs and, albeit less frequently, of lizards, snakes and salamanders (Baker, 1987; Martínez-Salazar & León-Règagnon, 2006; Ribeiro et al., 2012). There are approximately 96 *Rhabdias* species worldwide (Kuzmin et al., 2016; Kuzmin & Tkach, 2015), and 17 nominal species have been reported in amphibian hosts

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in the Neotropical region (Kuzmin et al., 2016). In this area, there are records of *Rhabdias* sp. infecting families of frogs, including Bufonidae, in Argentina (González and Hamann, 2008), Brazil (Vicente et al., 1991), Costa Rica (Bursey and Brooks, 2012), Guyana (McAllister et al., 2010a), Mexico (Martinez-Salazar, 2008), Nicaragua (Kuzmin et al., 2007), Paraguay (McAllister et al., 2010) and Peru (Iannacone, 2003); Hylidae in Brazil (Campião et al., 2014), Ecuador (McAllister et al., 2010b) and Mexico (Martinez-Salazar et al., 2009); Leptodactylidae in Brazil (Vicente et al., 1991) and Mexico (Mata Lopez et al., 2007) and Ranidae in Mexico (Cabrera-Guzmán et al., 2007). *Rhabdias* spp. have also been recorded in the following frog species from Brazil: Bufonidae – *Rhinella crucifer*, *R. icterica* and *R. marina*; Leptodactylidae – *Leptodactylus chaquensis*, *L. latrans* and *L. podicipinus*. Hylidae – *Hypsiboas albopunctatus* and *Pseudis paradoxa* (Campião et al. 2014). Nine species of the parasite genus *Raillietnema* Travassos, 1927 have been observed in the Neotropical region: *R. baylisi* Walton, 1933; *R. brachyspiculatum* Bursey et al., 1998; *R. gubernaculatum* Freitas and Ibanez, 1965; *R. kritscheri* Moravec, Maldonado and Lopez, 1993; *R. simples* Travassos,1925; *R. minor* Freitas and Dobbin Jr., 1961; *R. lynchi* Bursey and Goldberg, 2006; *R. ibañezi* Cordova, 1998 and *R. spectans*, which infects lizards (Bursey et al., 1998) and frogs in South America (Vicente et al., 1991; Teles et al., 2015). In Brazil, frogs infected with *R. spectans* are: *Rhinella crucifer*, *R. icterica*, *R. schneideri*, *L. latrans* (Vicente et al., 1991) and *Pleurodema diplolister* (Teles et al., 2015). The genus *Physaloptera* has also been commonly found infecting the stomachs of vertebrates, amphibians, reptiles, mammals, birds and, albeit rarely, fishes (Anderson, 2000). The following families of anurans have been recorded in Brazil: Bufonidae (Gonçalves et al., 2002), Hylidae (Vicente et al., 1991), Leiuperidae (Fabio, 1982; Vicente et al., 1991), Leptodactylidae (Vicente et al., 1991) and Odontophrynidae (Klaion et al., 2011). The specimen of *Physaloptera* we found were not identified at the species level since the sample examined consisted only of juveniles. Cosmocercid larvae can be found in the lungs and intestines of reptiles and frogs (Pinhão et al., 2009; Ávila & Silva, 2013). In the present study, Cosmocercidae larvae were found in the intestines and stomach of *P. aridus*. The Odontophrynidae *P. aridus* is a new host record for *Rhabdias* sp., *Physaloptera* sp., Cosmocercidae larvae and *R. spectans*. Furthermore, this is the first report of infection of the Odontophrynidae family from South America with *R. spectans*. This study contributes to the knowledge of helminth diversity associated with frogs in the Caatinga domain in northeastern Brazil.

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