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PENSOFT

First record of *Trachycephalus nigromaculatus* (Amphibia, Anura, Hylidae) in the state of Piauí, Brazil

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Abstract
We present the first occurrence of *Trachycephalus nigromaculatus* Tschudi, 1838 in the state of Piauí. This new record is from southern Piauí and represents the northwestern known occurrence record of this species, expanding its geographic distribution.

Key words
Cerrado, range expansion, Riacho Frio, treefrog.

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Introduction

According to Segalla et al. (2016), in Brazil there are 13 species of the genus *Trachycephalus*, represented by: *T. atlas* Bokermann, 1966, *T. cunauaru* Gordo, Toledo, Suárez, Kawashita-Ribeiro, Ávila, Morais & Nunes, 2013, *T. coriaceus* (Peters, 1867), *T. dibernardoi* Kwet & Solé, 2008, *T. hadroceps* (Duellman & Hoogmoed, 1992), *T. helioi* Nunes, Suárez, Gordo & Pombal, 2013, *T. imitatrix* (Miranda-Ribeiro, 1926), *T. lepidus* (Pombal, Haddad & Cruz, 2003), *T. mambaiensis* Cintra, Silva, Silva, Garcia & Zaher, 2009, *T. mesophaeus* (Hensel, 1867), *T. nigromaculatus*, *T. resinifictrix* (Goeldi, 1907), and *T. typhonius* (Linnaeus, 1758). *Trachycephalus nigromaculatus* is an arboreal, medium-sized treefrog (SVL 8–9.2 cm) that to date is known from the states of São Paulo, Rio de Janeiro, Espírito Santo, Bahia, Minas Gerais, Goiás, and Pernambuco (Haddad et al. 2013). This species occurs in forests, where it lives inside bromeliad plants or hollowed out tree branches (Moura et al. 2011). Its reproductive mode is characterized by eggs laid upon still or running water and tadpoles are exotrophic (Izecksohn and Carvalho-e-Silva 2001). The conservation status of this species is considered to be Least Concern according to Rocha et al. (2010). The population is currently believed to be stable (IUCN 2018).

Here, we present a new record of *T. nigromaculatus* in the state of Piauí, which expands the geographic distribution of this species in a northwest direction from the previous record in the state of Goiás.

Methods

In 2013, 2 specimens of *Trachycephalus nigromaculatus* from Riacho Frio municipality, Piauí, Brazil were analyzed and photographed with digital camera (Nikon D200). One individual was collected, euthanized by

Figure 1. Adult *Trachycephalus nigromaculatus* (MNRJ 87636) from the municipality of Riacho Frio, Piauí, Brazil. Photo by R.A. Martins.

anesthetic overdose (5% lidocaine), fixed in 10% formalin, preserved in 70% ethyl alcohol, and deposited at the Museu Nacional do Rio de Janeiro (MNRJ). A collection license was issued by the Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (process no. 02001.000111/2013-64; permission no. 263/2013).

Results

New record. Brazil: Piauí: Municipality of Riacho Frio: private farm, located ca 17 km from municipality center (10°13′22″ S, 044°51′11″ W, 634 m a.s.l.), observed/collected by Renato A. Martins and André M. Assalim, on 13 November 2013, at ca 8:42 pm. Two males were heard vocalizing and 1 specimen was collected and deposited (MNRJ 87636).

Trachycephalus nigromaculatus was found in a large flat area of land, a forested steep savannah phytophysionomy, where there is a forest fragment of Cerrado, the typical biome of the southern part of the state (Fig. 1). The vegetation here is characterized by micro- and nanophanerophytes, which have an average height of 5 m, thick trunks, very branched twigs, and generally are provided with thorns or spines (Veloso et al. 1992). *Trachycephalus nigromaculatus* was found in the canopy of the vegetation. There was little understorey vegetation and no bodies of water in the area. The collected specimen was calling inside the hollowed out base of a tree branch, which had a large accumulation of water; it was ca 7.87 m above the ground.

Identification. Specimens were recognized according to the description of cranial morphology as in Trueb (1970) and Bokermann (1966). *Trachycephalus nigromaculatus* differs from all 13 other species (except *T. mambaiensis*) by the presence of small reddish spots on the dorsum and differs from *T. mambaiensis* by completely developed frontoparietals, fully covering the prootics. The identification was performed by José Pombal Jr of the herpetology department of the Museu Nacional do Rio de Janeiro, and Ivan Nunes, of the Universidade Estadual Paulista.

Discussion

We record here *Trachycephalus nigromaculatus*, a third member of its genus for the state of Piauí, Brazil. Until now, only 2 species of *Trachycephalus* (*T. atlas* and *T. typhonius*) were known to occur in the state. Both of these species occur in areas of Cerrado as well as in the Atlantic Forest and Caatinga areas (Loebmann and Mai 2008, Haddad et al. 2013, Roberto et al. 2013, Freitas 2015, Dal Vechio et al. 2016).

With the last-published distribution extensions of *T. nigromaculatus* (Cintra et al. 2009, Dias et al. 2010), important knowledge of this species' habitat was added, as individuals were found outside the Atlantic Forest in open areas of Cerrado (Silveira 2006). Although mostly found in the Atlantic Forest and mainly in coastal environments, restingas, and meadows (Rocha et al. 2010), *T. nigromaculatus* also occurs in areas of Cerrado and Caatinga, and in transition areas between the Atlantic Forest and Caatinga, as in Boa Nova municipality, southern Bahia state (Dias et al. 2010).

Our record extends this species' distribution to the southern part of Piauí. The new record extends the range of the species by 386 km north from the nearest

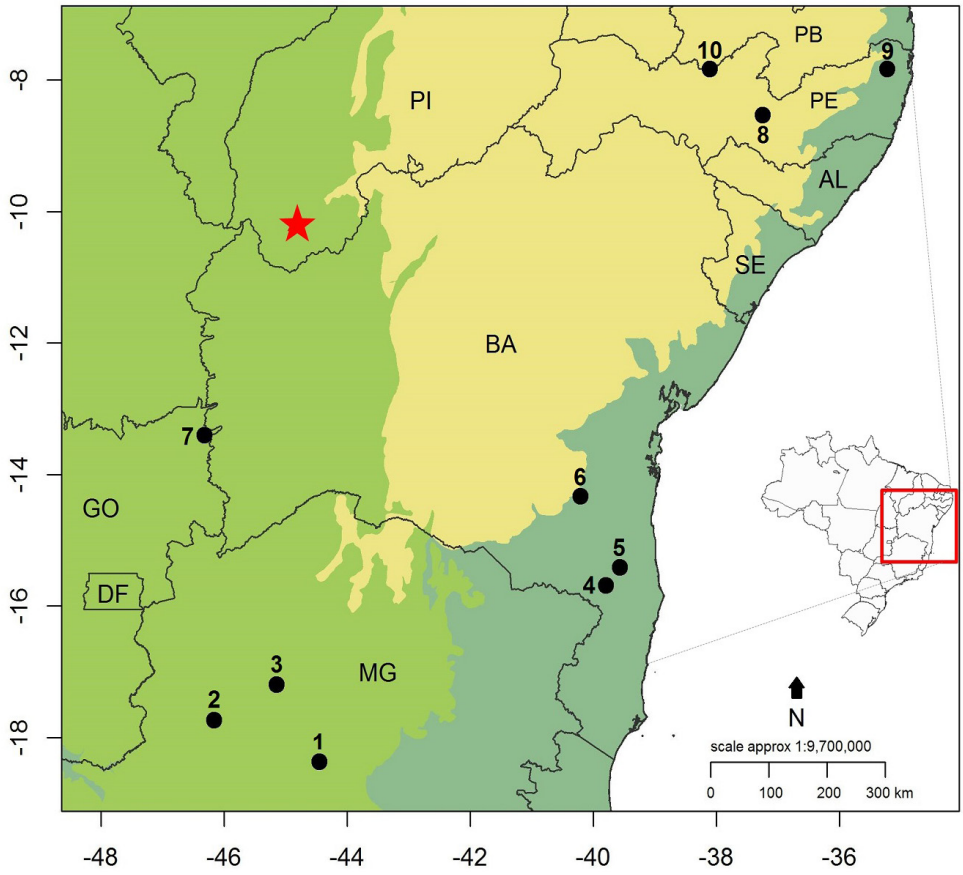

Figure 2. Geographic distribution of *Trachycephalus nigromaculatus*. Previous records in the last review on literature data (black circles), New record (red star). State abbreviations: MG = Minas Gerais, GO = Goiás, BA = Bahia, SE = Sergipe, AL = Alagoas, PE = Pernambuco, PB = Paraíba, PI = Piauí. Municipalities: 1 = Corinto (Cintra et al. 2009), 2 = João Pinheiro (Silveira 2006), 3 = Buritizeiro (Cintra et al. 2009), 4 = Potiraguá (Freitas 2009), 5 = Camacan (Dias et al. 2016), 6 = Boa Nova (Dias et al. 2016), 7 = São Domingos (Cintra et al. 2009), 8 = Buíque (Moura et al. 2011), 9 = Igarassu (Moura et al. 2011), 10 = Triunfo (Moura et al. 2011). Latest new record in red star: Riacho Frio. Atlantic Forest; Cerrado; Caatinga. Map by Marcos A. Melo.

previously known occurrence in São Domingos, Goiás (13°24′7.24″S, 046°19′8.53″ W) (Cintra et al. 2009), by 678 km northwest from Boa Nova, Bahia (14°19′33.3″ S, 040°12′50.5″ W) (Dias et al. 2010), and by 787 km west from Triunfo municipality, Pernambuco (07°49′46.99″ S, 038°06′ 48.91″ W) (Moura et al. 2011) (Fig. 2).

Our new record broadens the knowledge of the geographic distribution of *T. nigromaculatus* and shows that this species can live in drier and a wider range of habitats than other species of the genus (see also Dias et al. 2010). The new record demonstrates the need for more studies and increased sampling of the herpetofauna, but mainly of the anurofauna, in the state of Piauí and more broadly the northeastern region of Brazil.

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Authors' Contributions

RAM and AMA wrote the manuscript, collected data, identified the specimens, and produced the final manuscript.

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