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NOTA BREVE / SHOR NOTE

ZOOLOGÍA

A NEW RECORD FOR THE MILK FROG *Trachycephalus coriaceus* (ANURA: HYLIDAE) FROM TELES PIRES RIVER, SOUTH AMAZONIA, BRAZIL

Un nuevo registro de la rana lechera *Trachycephalus coriaceus* (Anura: Hylidae) para el río Teles Pires, sur de la Amazonia, Brasil

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ABSTRACT

Herein, we report a new record of the milk frog *Trachycephalus coriaceus* for the Brazilian southern Amazonia and provide an updated geographic distribution map. We collected one specimen of *T. coriaceus* on 8 november 2016, during a nocturnal survey inside a dense *ombrophilous* forest in the right bank of the Teles Pires River, municipality of Jacareacanga, southern of Pará State. The record of *T. coriaceus* to Jacareacanga is the first to the State. The disjoint geographic distribution of this species along de Amazonia may just reflect the paucity of amphibian knowledge throughout this biome and the difficulty to detect this species in the field, given its explosive reproductive behavior.

Keywords: Amphibia, hydroelectric power plants, Pará state, tropical rain forest.

RESUMEN

Aquí, informamos sobre un nuevo registro de la rana lechera *Trachycephalus coriaceus* para el sur de la Amazonía brasileña y proporcionamos un mapa actualizado de su distribución geográfica. Recolectamos un espécimen de esta especie el 8 de noviembre de 2016, durante un muestreo nocturno dentro de un bosque denso ombrófilo en la margen derecha del río Teles Pires, municipio de Jacareacanga, al sur del estado de Pará. El registro de *T. coriaceus* en Jacareacanga es el primero en este estado. La distribución geográfica disyunta de esta especie a lo largo de Amazonia puede reflejar la escasez de conocimiento de anfibios en todo este bioma y la dificultad de detectar esta especie en campo, debido a su comportamiento reproductivo explosivo.

Palabras clave: Amphibia, bosque húmido tropical, centrales hidroeléctricas, Pará.

The genus *Trachycephalus* Tschudi, 1838 currently includes 18 valid species distributed throughout Mexico, Central, and South America (Blotto *et al*., 2020; Frost, 2020). At this time, 14 *Trachycephalus* species are known to occur in Brazil (Segalla *et al*., 2019; Blotto *et al*., 2020), and seven of them are found in the Amazonia: *Trachycephalus coriaceus* (Peters, 1867), *T. cunauaru* Gordo, Toledo, Suárez, Kawashita-Ribeiro, Ávila, Morais, and Nunes, 2013, *T. hadroceps* (Duellman and Hoogmoed, 1992), *T. helioi* Nunes, Suárez, Gordo, and Pombal, 2013, *T. resinifictrix* (Goeldi, 1907), *T. typhonius* (Linnaeus, 1758), and *T. venezolanus* (Mertens, 1950). Of these species, only *T. typhonius* is widely distributed in South America, while the six remaining are Amazonian species (La Marca *et al*., 2010; Gordo *et al*., 2013; Nunes *et al*., 2013; Meneghelli *et al*., 2017; Meneghelli and Calderon 2017; Carvalho *et al*., 2018).

As most species within this genus, the milk frog *Trachycephalus coriaceus* have a paired, lateral vocal sac, a putative morphological synapomorphy of the genus (Faivovich *et al*., 2005); the exceptions are *T. hadroceps* and *T. helioi*, which have a single, subgular vocal sac (Nunes *et al*., 2013). Besides, this species can be easily diagnosed from its congeners by having (1) a dark bronze or golden iris without radial lines, (2) a pair of black blotches where the forearm inserts into the body, and (3) dorsum and flanks covered by brown shades or distinct brown rectangular blotches that extends from the upper eyelids to the lower sacral region (Duellman, 2005).

The current known geographic distribution of *Trachycephalus coriaceus* in the Amazonia is characterized by extensive gaps, with sparse records throughout Guyana, Surinam, French Guyana, Colombia, Ecuador, Peru, Bolivia, and Brazil (e.g., Peters, 1867; De la Riva, 1994; Gottsberger and Gruber, 2001; Duellman, 2005; Cole *et al.,* 2013). In Brazil, *T. coriaceus* was already reported to occur in the States of Acre, Amapá, Amazonas, and Rondônia (Zimmerman and Rodrigues, 1990; Bernarde *et al*., 2011; Benício and Lima, 2017; Meneghelli *et al*., 2017). Herein, we report a new record of *T. coriaceus* for the Brazilian southern Amazonia, Pará state. Additionally, we provide an updated geographic distribution map for this species based on literature data (e.g., Gottsberger and Gruber, 2001; Bernarde *et al.,* 2011; Cole *et al.,* 2013; Benício and Lima, 2017; Meneghelli *et al*., 2017) and in our fieldwork (Supplementary material).

On November 8th of 2016, during a nocturnal survey inside a dense *ombrophilous* forest in the right bank of the Teles Pires River, municipality of Jacareacanga, southern of Pará state (9°15' S, and 56°47' W, 194 m. a. s. l), we collected one specimen of *Trachycephalus coriaceus* (Fig. 1a). The individual was fortuity found after it drop-down from a tree in front of the researcher. The collected specimen was euthanized using 5 % lidocaine, fixed in 10 % formalin, and then permanently stored in 70 % alcohol. We collected the specimen under permit ICMBio 54493-12 and deposited it at Coleção Zoológica da Universidade Federal de Mato Grosso do Sul (ZUFMS-AMP08782; Snout-vent length: 63.3 mm).

The record of *Trachycephalus coriaceus* to the municipality of Jacareacanga is the first for Pará state and extends its geographic distribution nearly 760 km southeast from the nearest record in the municipality of Manaus, Amazonas state (Zimmerman and Rodrigues, 1990), 790 km eastward from the municipality of Porto Velho, Rondônia state (Meneghelli *et al*., 2017), and 920 km northeast from the Puerto Almacén, Santa Cruz, Bolivia (De La Riva, 1994). This record also extends the range of *T. coriaceus* nearly 1480 km southward from the type locality, Suriname (Peters, 1867) (Fig. 2). This was the only observation of *T. coriaceus* so far after 12 field expeditions of 15 days each in the study area, between 2015 and 2019. In contrast, we observed the congener *T. cunauaru* (Fig. 1b) in reproductive behavior during different expeditions in the same area.

We believe that the highly disjointed geographic distribution of *T. coriaceus* likely emerges from an interaction between the *i*) extensive knowledge gaps throughout the Amazonia (e.g., Mayer *et al*., 2019; Cracraft *et al*., 2020), and *ii*) the explosive reproductive behavior of *T. coriaceus*,

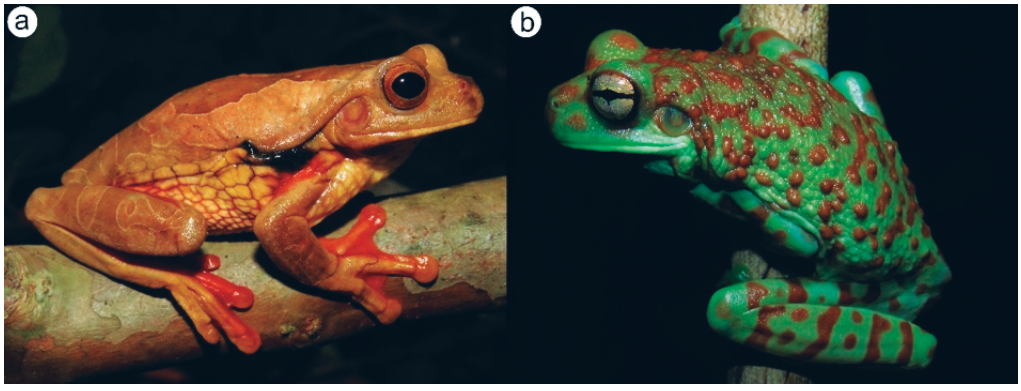

Figure 1. *Trachycephalus coriaceus* (ZUFMS-AMP08782) collected in Jacareacanga, Pará state (a), and *Trachycephalus cunauaru* (Field series: AAGARDA12670) recorded in Paranaíta, Mato Grosso state (b), Brazil.

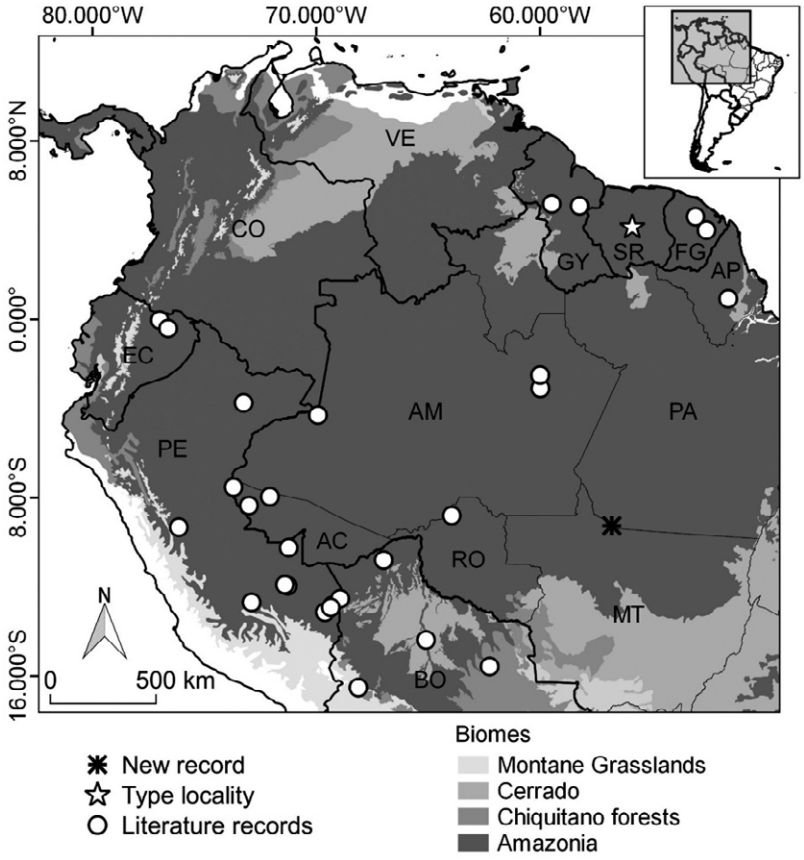

Figure 2. Geographic distribution map of *Trachycephalus coriaceus* in South America. Asterisk: new record for the Pará state; Star: type locality in Suriname. White circles: literature records.

since that the individuals of this species remain inactive most of the year and become active by just a few days (Duellman, 2005), which hamper its records during field surveys.

The Tapajos endemism center is one of the most jeopardized Amazonian regions by anthropogenic pressures (Braz *et al*., 2016). The Teles Pires River is located at the South of Tapajos endemism center and struggles with extensive damming by hydroelectric plants established along with it (e.g., ANA, 2020). As a consequence of this activity, the river becomes highly fragmented, the large artificial lakes provoke irreversible losses of natural habitats and drives the climate changes by the emission of methane gas (Fearnside, 2000). Even though fishes are the most obviously impacted groups by hydroelectric power plants (Pelicice *et al.,* 2015), deleterious effects of this activity on amphibians are also well demonstrated (Brandão and Araújo, 2008; Silva *et al.,* 2018). The effectiveness of public policies is diminished given the current situation of knowledge gaps regards the Amazonian amphibians. The new record of *T. coriaceus* from a highly threatened Amazonian region represents a small but essential step toward the great challenge of understanding the Amazonia biota and provides information for future conservation actions.

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