First record of *Chironius brazili* Hamdan & Fernandes, 2015 (Squamata, Colubridae) for the state of Tocantins and the north region of Brazil

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Within the Brazilian Colubridae, *Chironius* Fitzinger, 1826 is the most representative genus, comprising 16 species (Guedes et al., 2023). All species of the genus are aglyphous, diurnal, and semi-arboreal snakes that feed mainly on hylid anurans (Vitt, 1996; Marques & Sazima, 2003; Menezes et al., 2018). They are easily identified by 10 or 12 rows of dorsal scales at midbody (Dixon et al., 1993; Hollis, 2006; Klaczko et al., 2014).

Chironius brazili Hamdan & Fernandes, 2015 was recently described (type locality in the municipality of Catas Altas, state of Minas Gerais) and is among the least known species of *Chironius*. Endemic to Brazil, it is distributed along the Cerrado, its ecotonal zones with the Atlantic Forest, and in the Pampa biomes (IBGE, 2019), in states of the Midwestern (Distrito Federal and Goiás), Southeastern (Minas Gerais and São Paulo) and Southern (Paraná and Rio Grande do Sul) regions (Hamdan & Fernandes, 2015; Abegg et al., 2016; Nogueira et al., 2019). It occurs between seven and 1,600 m elevation, mostly recorded at 700–900 m, inhabits forested areas, especially

gallery forests (Hamdan & Fernandes, 2015), using riverbank rocks for foraging (Parreira et al., 2023). Its conservation status was not evaluated by the International Union for Conservation of Nature Red List of Threatened Species (IUCN, 2023) and it is classified as of Least Concern by the Brazilian Ministry of Environment (Martins et al., 2023). Herein, we present the first record of *C. brazili* in the northern region of Brazil.

An adult of *Chironius brazili* (Fig. 1; approximate snout-vent length ~1200 mm) was encountered by MRU on 30 May 2023 in a natural touristic point near Complexo da Prata, municipality of Paranã (13.399028°S 47.640250°W; 940 m above sea level), state of Tocantins. The snake was observed between 08:00 and 09:00 h on a sandy trail, crossing a savannah environment towards a gallery forest. While crossing the trail the snake detected the observer (approx. two meters distance) and became motionless for a few minutes. It then began lateral movements of the anterior two thirds of the body. After a few seconds, the snake entered the vegetation next to the trail. The snake was not handled, and the SVL was estimated from the photographs. The photographs are housed in the Voucher book of the Coleção Científica de Serpentes of Instituto Vital Brazil (voucher IVB 4629).

This record extends the known distribution of *C. brazili* 80 km (straight line) north from its former northernmost known record, in Alto Paraíso de Goiás, state of Goiás (14.11°S, 47.51°W) (Nogueira et al., 2019) (Fig. 2A). The new record also increases the Extension of Occurrence (EOO) of the species from 97.048.497 km2 to 99.521.112 km2, a 10% increase (Fig. 2B).

Chironius brazili can be easily distinguished from its congeners, except for *C. flavolineatus* and *C. diamantina*, by presenting the anterior third of the body black dorsolaterally, a cream to yellow vertebral stripe, extending from nape to tail, top of head tan or brown, distinct from the background color of the anterior third of the body (Hamdan & Fernandes, 2015) (Fig. 1). Although *C. brazili* occurs sympatrically with *C. flavolineatus* (Hamdan & Fernandes, 2015; Nogueira et al., 2019) it differs from *C. flavolineatus* by having the venter black posteriorly (vs. uniformly light cream belly in *C. flavolineatus*). It also differs from *C. diamantina* by having 2-4 rows of keeled scales middorsally (vs 6-10 in *C. diamantina*) (Hamdan & Fernandes, 2015) (Fig. 1C). Furthermore, the range of *Chironius diamantina* (Chapada da Diamantina highlands, Bahia) is approximately 350 km north and 600 km east from the range of *C. brazili*.

The new record is located at the edge of the Planalto Goiano Central, a region with typical cerrado vegetation and humid tropical climate, with cooler temperatures ranging from 400 to 1200 m elevation (Nascimento, 1992). Hamdan et al. (2017) modeled the potential distribution of *C. brazili* and identified suitable habitat further north of the Planalto Central Goiano, on the border of the states of Tocantins and Bahia (Serra Geral), and near the region of Alto Xingu, state of Mato Grosso. Nevertheless, in the northernmost portion of the Planalto Central Goiano and the Alto Xingu, the average elevation is low and temperatures higher than where the species currently is known to occur (Hamdan & Fernandes 2015). Thus, considering the species is related to cooling environments and that their origin and evolution are tightly associated with temperature and forest formation (Hamdan et al., 2017), we suggest that the area between the Paranã area and the north of the Planalto Central Goiano and between the Paranã area and the Alto Xingu may not be optimal for *C. brazili*, and we hypothesize that the new record is near the northernmost range of the species.

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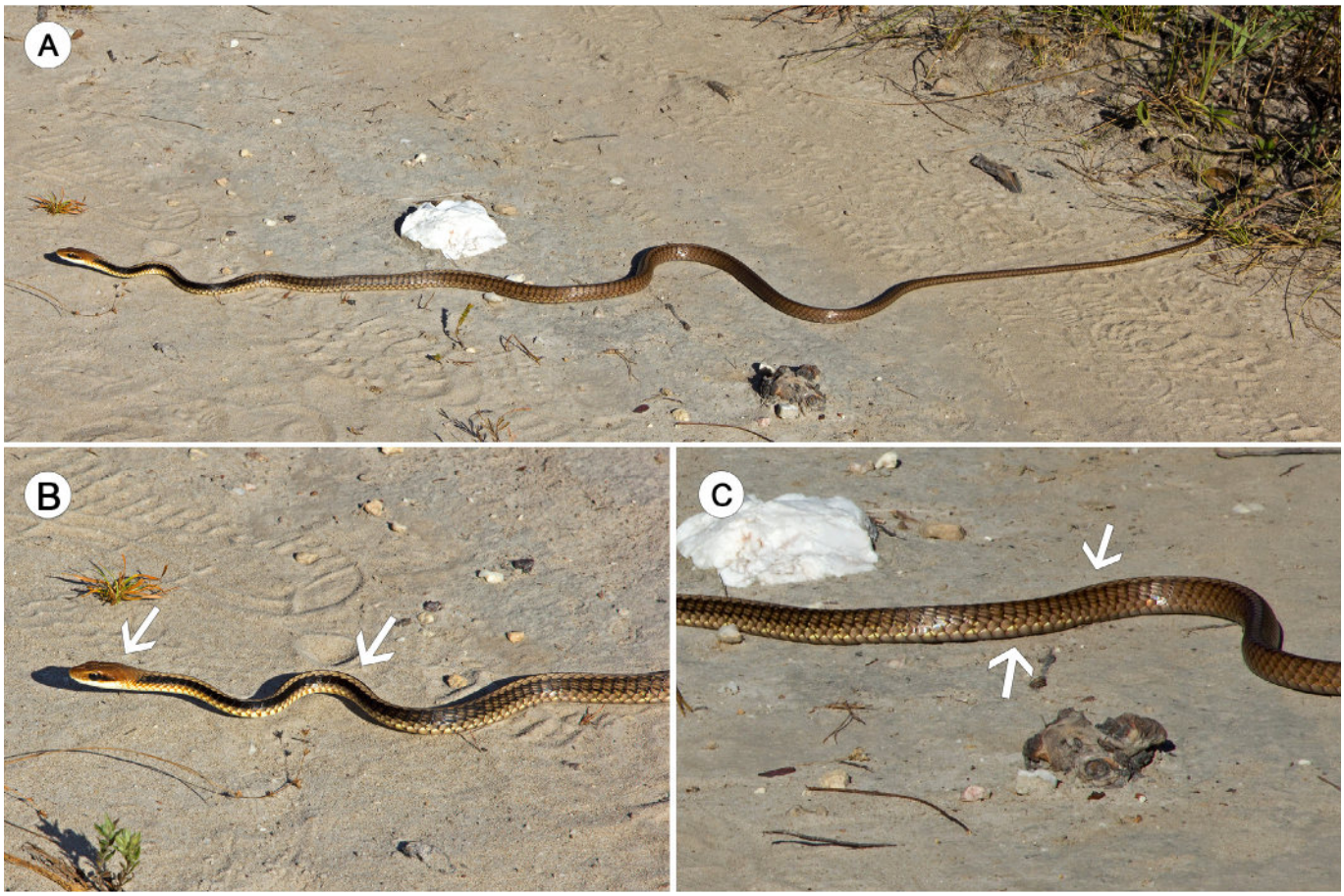

Figura 1. Individual of *Chironius brazili* near Complexo da Prata, municipality of Paranã, state of Tocantins, Brazil, active during the day, on a sandy soil trail: (A) View of the entire specimen; (B) Lateral view of the anterior third of the specimen showing diagnostic characters: black dorsolateral scales anteriorly, brown head, and yellow vertebral stripe; (C) Lateral view of the mid-dorsal portion of the body showing the ventrals gradually darkening towards the tail and absence of 6-10 keeled rows of dorsal scales.

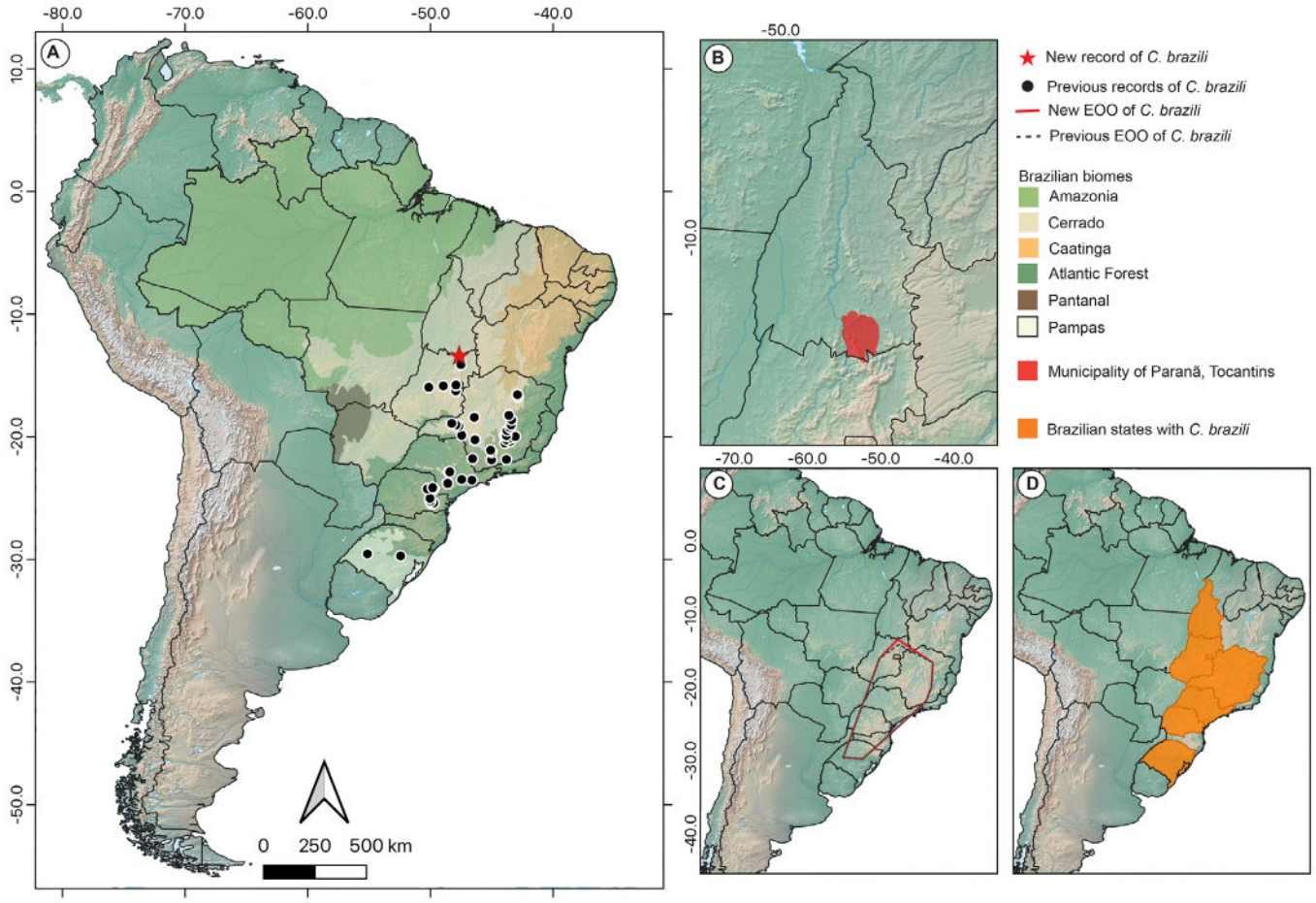

Figura 2. Map showing the updated geographic distribution of *Chironius brazili* in South America: (A) The new record along with the previous known distribution for the species (source: Nogueira et al., 2019) in the Cerrado biome; (B) The municipality of Paranã, at the southern border of the state of Tocantins; (C) The Extension of Occurrence (EOO) including previous data and the new record; (D) The Brazilian states (plus Federal District) where the species is known. The Map was drawn using QGis v. 3.4 (QGIS Core Team, 2018) using the limits of the Brazilian biomes provided by IBGE (2019).