

First record of the milk frog *Trachycephalus coriaceus* (Peters, 1867) for the state of Rondônia, Brazil (Anura: Hylidae)

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The hylid genus *Trachycephalus* Tschudi, 1838 is currently composed of 14 species, with a wide distribution reaching from the Mexican plains into Central and South America. In South America, species occur from the western versant of the Andes in Peru and Ecuador and the eastern slopes of the Andes further south, down to northern Argentina and eastern Brazil (Frost, 2016). Twelve species of *Trachycephalus* are found in Brazil (Segalla et al., 2016; Frost, 2016).

Five species of *Trachycephalus*, including *T. coriaceus* (Peters, 1867), *T. typhonius* (Linnaeus, 1758), *T. cunauaru* Gordo et al., 2013, *T. heloi* Nunes et al., 2013, and *T. resinifictrix* (Goeldi, 1907), are distributed throughout the Brazilian Amazon. *Trachycephalus coriaceus* (Fig. 1) differs from its congeners especially by its characteristic pair of bluish-black blotches where the forearm inserts into the body (Fig. 1C) and by a golden or dark bronze iris without radial lines (Fig. 1D), as well as other characteristics (Duellman, 1978, 2005). Apparently, *T. coriaceus* has a disjunct distribution with one population distributed from French Guiana to Suriname, and the other in the high Amazon Basin of Colombia, Ecuador, Peru, Bolivia, and the river that cuts through western Acre State (Souza, 2009) to the Manaus Region in Amazonas State, Brazil (Zimmerman & Rodrigues, 1990; Frost, 2016). The species is found

exclusively in well-conserved forests (Duellman, 1978, 2005; Souza, 2009).

During a faunal rescue near the Santo Antônio Hydroelectric Power Plant along the Madeira River, Porto Velho Municipality, Rondônia State, Brazil (ca. 8.8019° S, 63.9506° W, elev. 55 m), 12 specimens of *T. coriaceus* were collected between 2 October 2010 and 19 October 2011 (Table 1). Eleven adults and one juvenile (Table 1) have been deposited at the Coleção de Referência da Herpetofauna de Rondônia, Porto Velho, Rondônia, Brazil (UFRO-H). These specimens represent the first records of *T. coriaceus* for the state of Rondônia, Brazil (Fig. 2), all of them in areas of open rainforest, approximately 1657 km southwest of the type locality, given as “Surinam” (Peters, 1867). This location is also 1015 km east of the Parque Nacional da Serra do Divisor and Reserva Extrativista do Alto Juruá, Acre, Brazil (Souza, 2009), 623 km north of Beni Department, Bolivia (De la Riva et al., 2000), and 720 km southwest of the Manaus Region (Zimmerman & Rodrigues, 1990).

Table 1. List of the *Trachycephalus coriaceus* specimens collected, during the Faunal Rescue of UHE Santo Antônio, Porto Velho Municipality, Rondônia, Brazil, with their respective geographical coordinates of capture.

Accession Number	GPS Coordinates
UFRO-H 2379	9.0877°S, 64.3304°W
UFRO-H 2380	9.0513°S, 64.3078°W
UFRO-H 2381	9.0400°S, 64.3084°W
UFRO-H 2382	9.0400°S, 64.3084°W
UFRO-H 2383	9.0532°S, 64.3062°W
UFRO-H 2384	9.0473°S, 64.3071°W
UFRO-H 2983	9.0473°S, 64.3071°W
UFRO-H 2984	9.0473°S, 64.3071°W
UFRO-H 2985	9.0473°S, 64.3071°W
UFRO-H 2986	9.0473°S, 64.3071°W
UFRO-H 2987	9.0473°S, 64.3070°W
UFRO-H 2988	9.0472°S, 64.3071°W

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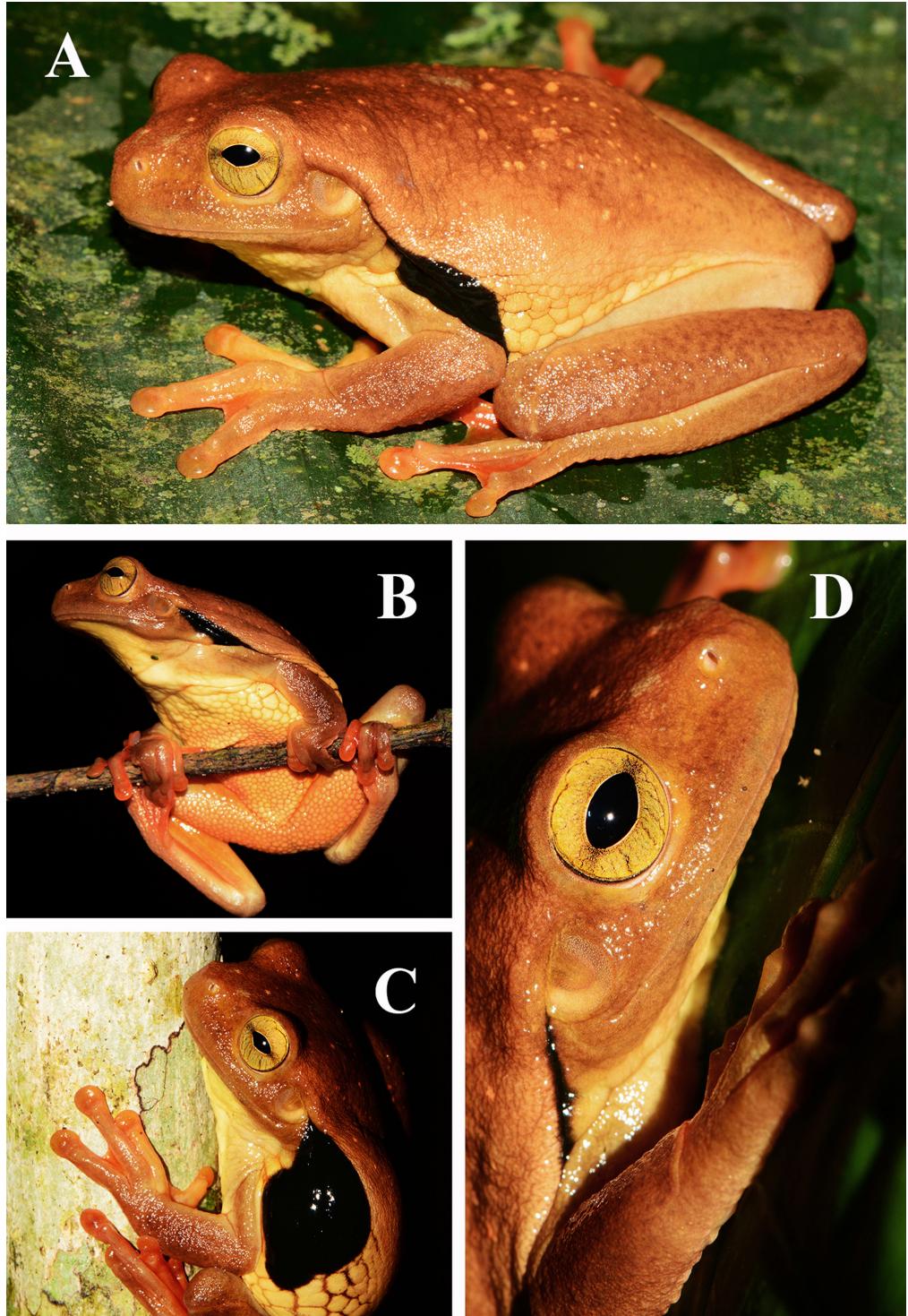


Figure 1. Images of an uncollected individual of *Trachycephalus coriaceus* from Porto Velho, Rondônia, Brazil. (A) Dorsolateral. (B) Ventral view. (C) Lateral view with the large bluish black spot above the forearm insertion exposed. (D) Lateral view of the head, featuring iris coloration (lacking radiating lines), the partial covering of the tympanum by a supratympanic fold, and the dark post-tympanic line.

Table 2. Records of *Trachycephalus coriaceus* in the literature, with their respective locations and geographical coordinates.

REFERENCES	LOCALITY	COORDINATES
BOLIVIA		
De la Riva, 1994, 1995	Puerto Almacén, Santa Cruz, Bolivia	15.7667°S, 62.2500°W
De la Riva et al., 2000	Beni, Bolivia*	10.9167°S, 67.1000°W
De la Riva et al., 2000	La Paz, Bolivia*	14.0167°S, 68.1667°W
De la Riva et al., 2000	Pando, Bolivia*	13.2500°S, 65.1500°W
ECUADOR		
Duellman, 1978, 1968	Santa Cecilia, Napo, Ecuador	2.2667°S, 77.4000°W
Duellman, 1968	Limoncocha, Cantón Shushufindi, Napo, Ecuador	0.4187°S, 76.6152°W
PERÚ		
Duellman & Thomas, 1996	Vila de Baltar, Ucayali, Perú	10.2432°S, 71.2373°W
Duellman, 2005, 1995	Reserva Cusco Amazónico, Madre de Dios, Perú	12.6918°S, 72.8938°W
Duellman, 2005	Cocha Cashu, Madre de Dios, Perú	11.8961°S, 71.4070°W
Duellman, 2005	Centro Sachavacayoac, Madre de Dios, Perú	12.9170°S, 69.3563°W
Duellman, 2005	EcoAmazonia, Madre de DiosPerú	12.5269°S, 68.9390°W
Duellman, 2005	Explorer's Inn, Madre de Dios, Perú	12.8366°S, 69.2934°W
Duellman, 2005	Pakitzá, Madre de Dios, Perú	11.9441°S, 71.2816°W
Duellman, 2005	Tambopata Research Center, Madre de Dios, Perú	13.1294°S, 69.6157°W
Schlüter et al., 2004	Estación Biológica Panguana, Departamento Huánuco, Perú	9.3252°S, 76.1450°W
Rodrigues & Duellman, 1994	Iquitos, Loreto, Perú	9.4845°S, 73.8003°W
GUYANA		
Kok et al., 2005	Kaieteur National Park, Potaro-Siparuni, Guyana	5.1731°N, 59.4811°W
FRENCH GUIANA		
Lescure & Marty, 2000	Northern French Guiana*	4.6046°N, 53.0582°W
COLOMBIA		
Lynch, 2005	Leticia, Amazonas, Colombia	4.0028°S, 69.9498°W
SURINAME		
Peters, 1867	Suriname**	4.1291°N, 55.8834°W
BRAZIL		
Schiesari & Moreira, 1996	Reserva Gavião, Manaus, Amazonas, Brazil	2.5000°S, 60.0000°W
Souza, 2009	Parque Nacional da Serra do Divisor, Cruzeiro do Sul, Acre, Brazil	7.5292°S, 73.7033°W
Souza, 2009	Reserva Extrativista do Alto Juruá, Cruzeiro do Sul, Acre, Brazil	8.3535°S, 73.0108°W
Zimmermann & Rodrigues, 1990	Manaus, Amazonas, Brazil	2.6890°S, 60.3288°W

* approximate geographical coordinates

** central and approximate geographic coordinates

**Figure 2.** Distribution map for *Trachycephalus coriaceus* in South America, including the new records from Rondônia (red stars) and the type locality in Suriname (yellow star). Literature records (listed in Table 2) are indicated by white circles.

Although the geographical distribution of *Trachycephalus coriaceus* appears disjointed (Fig. 2), several sampling voids along the Amazonian lowlands may be due to the fact that this species is an explosive breeder (Duellman, 2005), which may make finding it difficult at other times. For example, in the region of Cusco Amazónico, Duellman (2005) recorded about 88% of *T. coriaceus* individuals during only two nights, during which hundreds of individuals were found. Since the new records presented here are all from the left bank of the upper Madeira River (Table 1), we predict *T. coriaceus* may possibly occur much more widely throughout the entire region of the Purus-Madeira confluence.

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References

- De la Riva, I. (1994): An undescribed defensive mechanism in the neotropical hylid frog *Phrynohyas coriacea*. *Amphibia-Reptilia* **15**: 226–227.
- De la Riva, I., Márquez, R., Bosch, J. (1995): Advertisement calls of eight Bolivian hylids (Amphibia, Anura). *Journal of Herpetology* **29**: 113–118.
- De la Riva, I., Köhler, J., Lötters, L., Reichle, S. (2000): Ten years of research on Bolivian amphibians: updated checklist, distribution, taxonomic problems, literature and iconography. *Revista Española de Herpetología* **14**: 19–164.
- Duellman, W.E. (1968): The taxonomic status of some American hylid frogs. *Herpetologica* **24**: 205–207.
- Duellman, W.E. (1978): The biology of an equatorial herpetofauna in Amazonian Ecuador. University of Kansas, Museum of Natural History, Miscellaneous Publications **65**: 1–352.
- Duellman, W.E. (1995): Temporal fluctuations in abundances of anuran amphibians in a seasonal Amazonian rainforest. *Journal of Herpetology* **29**: 13–21.
- Duellman, W.E. (2005): Cusco Amazónico. The Lives of Amphibians and Reptiles in an Amazonian Rainforest. Ithaca, New York, USA, Cornell University Press.
- Duellman, W.E., Thomas, R. (1996): Anuran amphibians from a seasonally dry forest in southeastern Peru and comparisons of the anurans among sites in the Upper Amazon Basin. *Occasional Papers of the Natural History Museum*, The University of Kansas **180**: 1–34.
- Frost, D.R. (2016): *Trachycephalus coriaceus*. Amphibian Species of the World, an Online Reference. Version 6.0. Accessed on 16 December 2016. Electronic database accessible at <http://research.amnh.org/vz/herpetology/amphibia/index.html>.
- Haddad, C.F.B., Toledo, L.F., Prado, C.P.A., Loebman, D., Gasparini, J.L., Sazima, I. (2013): Guia dos Anfíbios da Mata Atlântica - Diversidade e Biologia. São Paulo, Brazil, Anolis Books.
- Kok, P.J.R., Bourne, G.R., Sambhu, H., Lenglet, G.L. (2005): Geographic distribution: *Phrynohyas coriacea* (Suriname Golden-Eyed Treefrog). *Herpetological Review* **36**: 462–463.
- Lescure, J., Marty, C. (2000): Atlas des Amphibiens de Guyane. Paris, France, Muséum National d'Histoire Naturelle.
- Lynch, J.D. (2005): Discovery of the richest frog fauna in the world – an exploration of the forests to the north of Leticia. *Revista de la Academia Colombiana de Ciencias Exactas Fisicas y Naturales* **29**: 581–588.
- Peters, W.C.H. (1867): Über Flederthiere (*Pteropus Gouldii*, *Rhinolophus Deckenii*, *Vespertilio lobipes*, *Vesperugo Temminckii*) und Amphibien (*Hypsilurus Godeffroyi*, *Lygosoma scutatum*, *Stenostoma narirostre*, *Onychocelaphalus unguirostris*, *Ahaetulla polylepis*, *Pseudechis scutellatus*, *Hoplobatrachus Reinhardtii*, *Hyla coriacea*). *Monatsberichte der Königlichen Preussischen Akademie der Wissenschaften zu Berlin* **1867**: 703–712.
- Rodriguez, L.O., Duellman, W.E. (1994): Guide to the Frogs of the Iquitos Region, Amazonian Peru. Lawrence, Kansas, USA, The University of Kansas.
- Savage, J.M. (2002): The Amphibians and Reptiles of Costa Rica. Chicago, Illinois, USA, University of Chicago Press.
- Schiesari, L.C., Moreira, G. (1996): The tadpole of *Phrynohyas coriacea* (Hylidae) with comments on the species' reproduction. *Journal of Herpetology* **30**: 404–407.
- Segalla, M.V., Caramaschi, U., Cruz, C.A.G., Grant, T., Haddad, C.F.B., Langone, J.A., Garcia, P.C.A., Berneck, B.V.M., Langone, J.A. (2016): Brazilian amphibians: list of species. *Herpetologia Brasileira* **5**: 34–46.
- Souza, M.B. (2009): Anfíbios: Reserva Extrativista do Alto Juruá e Parque Nacional da Serra do Divisor. Campinas, Brasil, Unicamp.
- Toledo, L.F., Sazima, I., Haddad, C.F.B. (2011): Behavioral defenses of anurans: an overview. *Ethology, Ecology & Evolution* **23**: 1–25.
- Zimmerman, B., Rodrigues, M.T. (1990): Frogs, snakes, and lizards of the INPA-WWF Reserves near Manaus, Brazil. In: Four Neotropical Rainforests, p. 426–454. Gentry, A.H., Ed., New Haven, Connecticut, USA, Yale University Press.